

Electrical Characteristics

Operating Conditions

When Stratix® III devices are implemented in a system, they are rated according to a set of defined parameters. To maintain the highest possible performance and reliability of Stratix III devices, system designers must consider the operating requirements discussed in this chapter. Stratix III devices are offered in both commercial and industrial grades. Commercial devices are offered in –2 (fastest), –3, –4 and –4L speed grades. Industrial devices are offered only in –3, –4, and –4L speed grades.



In this chapter, a prefix associated with the operating temperature range is attached to the speed grades; commercial with “C” prefix and industrial with “I” prefix. Commercial devices are therefore indicated as C2, C3, C4, and C4L per respective speed grades. Industrial devices are indicated as I3, I4, and I4L.

Absolute Maximum Ratings

Absolute maximum ratings define the maximum operating conditions for Stratix III devices. The values are based on experiments conducted with the device and theoretical modeling of breakdown and damage mechanisms. The functional operation of the device is not implied at these conditions. Conditions beyond those listed in [Table 1–1](#) may cause permanent damage to the device. Additionally, device operation at the absolute maximum ratings for extended periods may have adverse effects on the device.

Table 1–1. Stratix III Device Absolute Maximum Ratings (*Note 1*) (Part 1 of 2)

Symbol	Parameter	Minimum	Maximum	Unit
V_{CC}	Selectable core voltage power supply	-0.5	1.65	V
V_{CC}	I/O registers power supply	-0.5	1.65	V
V_{CCD_PLL}	PLL digital power supply	-0.5	1.65	V
V_{CCA_PLL}	PLL analog power supply	-0.5	3.75	V
V_{CCPT}	Programmable power technology power supply	-0.5	3.75	V
V_{CCPGM}	Configuration pins power supply	-0.5	3.9	V
V_{CCPD}	I/O pre-driver power supply	-0.5	3.9	V
V_{CCIO}	I/O power supply	-0.5	3.9	V
V_{CC_CLKIN}	Differential clock input power supply (top and bottom I/O banks only)	-0.5	3.75	V
V_{CCBAT}	Battery back-up power supply for design security volatile key register	-0.5	3.75	V
V_I	DC Input voltage	-0.5	4.0	V

Table 1-1. Stratix III Device Absolute Maximum Ratings (Note 1) (Part 2 of 2)

Symbol	Parameter	Minimum	Maximum	Unit
T_J	Operating junction temperature	-55	125	°C
I_{OUT}	DC output current, per pin	-25	40	mA
T_{STG}	Storage temperature (No bias)	-65	150	°C

Note to Table 1-1:

(1) Supply voltage specifications apply to voltage readings taken at the device pins, not the power supply.

Maximum Allowed Overshoot/Undershoot Voltage

During transitions, input signals may overshoot to the voltage shown in Table 1-2 and undershoot to -2.0 V for input currents less than 100 mA and periods shorter than 20 ns.

Table 1-2 lists the maximum allowed input overshoot voltage and the duration of the overshoot voltage as a percentage over the lifetime of the device. The maximum allowed overshoot duration is specified as percentage of high-time over the lifetime of the device.

A DC signal is equivalent to 100 % duty cycle. For example, a signal that overshoot to 4.2 V can only be at 4.2 V for 15.8 % over the lifetime of the device; for device lifetime of 10 years, this amounts to 15.8/10ths of a year. Figure 1-1 shows the way to determine the overshoot duration.

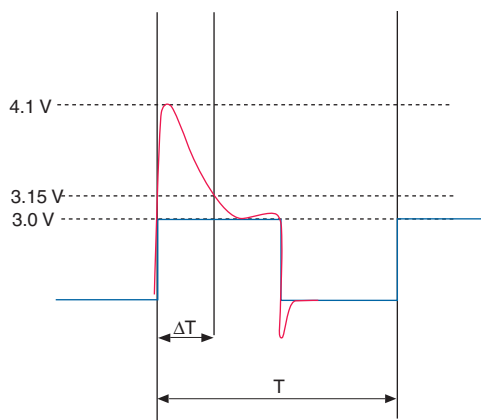
Figure 1-1. Overshoot Duration

Figure 1-1 shows the methodology to determine the overshoot duration. In the example shown in Figure 1-1, the overshoot voltage is shown in red and is present at the Stratix III pin, up to 4.1 V. From Table 1-2, for an overshoot of up to 4.1 V, the percentage of high time for overshoot > 3.15 V can be as high as 46% over an 11.4-year period. The percentage of high time is calculated as $(\Delta T / T) * 100$. This 11.4-year period assumes the device is always turned on with 100% I/O toggle rate and 50% duty cycle signal. For lower I/O toggle rates and situations where the device is in an idle state, lifetimes are increased.

Table 1-2. Maximum Allowed Overshoot During Transitions

Symbol	Parameter	Condition	Overshoot duration as % of high time	Unit
Vi (AC)	AC Input Voltage (1)	4	100.000	%
		4.05	79.330	%
		4.1	46.270	%
		4.15	27.030	%
		4.2	15.800	%
		4.25	9.240	%
		4.3	5.410	%
		4.35	3.160	%
		4.4	1.850	%
		4.45	1.080	%
		4.5	0.630	%
		4.55	0.370	%
		4.6	0.220	%
		4.65	0.130	%
		4.7	0.074	%
		4.75	0.043	%
		4.8	0.025	%
		4.85	0.015	%

Note to Table 1-2:

(1) This input voltage is regardless of the V_{CCIO} supply which is used to power up the input buffer.

Recommended Operating Conditions

This section lists the functional operation limits for AC and DC parameters for Stratix III devices. The steady-state voltage and current values expected from Stratix III devices are provided in Table 1-3. All supplies are required to monotonically reach their full-rail values within t_{RAMP} .

Table 1-3. Stratix III Device Recommended Operating Conditions (Part 1 of 2)

Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Unit
V_{CCL}	Selectable core voltage power supply for internal logic and input buffers	—	1.05	1.1	1.15	V
	Selectable core voltage power supply for internal logic and input buffers	—	0.86	0.9	0.94	V
V_{CC}	I/O registers power supply	—	1.05	1.1	1.15	V
V_{CCD_PLL}	PLL digital power supply	—	1.05	1.1	1.15	V
V_{CCA_PLL}	PLL analog power supply	—	2.375	2.5	2.625	V
V_{CCPT}	Power supply for the programmable power technology	—	2.375	2.5	2.625	V

Table 1-3. Stratix III Device Recommended Operating Conditions (Part 2 of 2)

Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Unit
V_{CCPGM}	Configuration pins power supply, 3.3 V	—	3.135	3.3	3.465	V
	Configuration pins power supply, 3.0 V	—	2.85	3	3.15	V
	Configuration pins power supply, 2.5 V	—	2.375	2.5	2.625	V
	Configuration pins power supply, 1.8 V	—	1.71	1.8	1.89	V
V_{CCPD} (1)	I/O pre-driver power supply, 3.3 V	—	3.135	3.3	3.465	V
	I/O pre-driver power supply, 3.0 V	—	2.85	3	3.15	V
	I/O pre-driver power supply, 2.5 V	—	2.375	2.5	2.625	V
V_{CCIO}	I/O power supply, 3.3 V	—	3.135	3.3	3.465	V
	I/O power supply, 3.0 V	—	2.85	3	3.15	V
	I/O power supply, 2.5 V	—	2.375	2.5	2.625	V
	I/O power supply, 1.8 V	—	1.71	1.8	1.89	V
	I/O power supply, 1.5 V	—	1.425	1.5	1.575	V
	I/O power supply, 1.2 V	—	1.14	1.2	1.26	V
V_{CC_CLKIN}	Differential clock input power supply (top and bottom I/O banks only)	—	2.375	2.5	2.625	V
V_{CCBAT} (3)	Battery back-up power supply for design security volatile key register	—	1.0	—	3.3	V
V_I	DC Input voltage	—	-0.3	—	3.6	V
V_O	Output voltage	—	0	—	V_{CCIO}	V
T_J	Operating junction temperature	For commercial use	0	—	85	°C
		For industrial use(2)	-40	—	100	°C
t_{RAMP}	Power Supply Ramptime (For V_{CCPT})	Normal POR (PORSEL=0)	50 μ s	—	5 ms	—
		Fast POR (PORSEL=1)	50 μ s	—	5 ms	—
	Power Supply Ramptime (For all power supplies except V_{CCPT})	Normal POR (PORSEL=0)	50 μ s	—	100 ms	—
		Fast POR (PORSEL=1)	50 μ s	—	12 ms	—

Notes to Table 1-3:

- (1) V_{CCPD} is 2.5 V, 3.0 V, or 3.3 V. For a 3.3-V I/O standard, V_{CCPD} =3.3 V. For a 3.0-V I/O standard, V_{CCPD} = 3.0 V. For a 2.5 V or lower I/O standard, V_{CCPD} = 2.5 V.
- (2) For the EP3SL340, EP3SE260, and EP3SL200 devices in the I4L ordering code, the industrial junction temperature range is from 0° C to 100° C, regardless of supply voltage.
- (3) Altera recommends a 3.0-V nominal battery voltage when connecting V_{CCBAT} to a battery for volatile key backup. If you do not use the volatile security key, you may connect the V_{CCBAT} to either GND or a 3.0-V power supply.

DC Characteristics

This section lists the input pin capacitances, on-chip termination tolerance, and hot-socketing specifications.

Supply Current

Standby current is the current the device draws after the device is configured with no inputs/outputs toggling and no activity in the device. Since these currents vary largely with the resources used, use the Excel-based Early Power Estimator (EPE) to get supply current estimates for your design.

Table 1-4 lists supply current specifications for V_{CC_CLKIN} and V_{CCPGM} . Use the EPE to get supply current estimates for remaining power supplies.

Table 1-4. Supply Current Specifications for V_{CC_CLKIN} and V_{CCPGM}

Symbol	Parameter	Min	Max	Unit
I_{CLKIN}	V_{CC_CLKIN} current specifications	0	250	mA
I_{PGM}	V_{CCPGM} current specifications	0	250	mA

I/O Pin Leakage Current

Table 1-5 defines Stratix III I/O Pin leakage current specifications.

Table 1-5. Stratix III I/O Pin Leakage Current (Note 1), (2)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_I	Input Pin Leakage Current	$V_I = V_{CCIO_MAX}$ to 0 V	-10	—	10	μA
I_{OZ}	Tri-stated I/O Pin Leakage Current	$V_O = V_{CCIO_MAX}$ to 0 V	-10	—	10	μA

Notes to Table 1-5:

- (1) This value is specified for normal device operation. The value may vary during power-up. This applies for all V_{CCIO} settings (3.3, 3.0, 2.5, 1.8, 1.5, and 1.2 V).
- (2) 10- μA I/O leakage current limit is applicable when the internal clamping diode is off. A higher current can be observed when the diode is on.

Bus Hold Specifications

Table 1-7 shows the Stratix III device family bus hold specifications.

Table 1-6. Bus Hold Parameters (Part 1 of 2)

Parameter	Symbol	Conditions	V _{CCIO}										Unit
			1.2V		1.5V		1.8V		2.5V		3.0V/3.3V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Low sustaining current	I _{SUSL}	V _{IN} >V _{IL} (maximum)	22.5	—	25.0	—	30.0	—	50.0	—	70.0	—	μA
High sustaining current	I _{SUSH}	V _{IN} <V _{IH} (minimum)	-22.5	—	-25.0	—	-30.0	—	-50.0	—	-70.0	—	μA
Low overdrive current	I _{ODL}	0V<V _{IN} <V _{CCIO}	—	120	—	160	—	200	—	300	—	500	μA

Table 1-6. Bus Hold Parameters (Part 2 of 2)

Parameter	Symbol	Conditions	V _{CCIO}										Unit
			1.2V		1.5V		1.8V		2.5V		3.0V/3.3V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
High overdrive current	I _{ODH}	0V<V _{IN} <V _{CCIO}	—	-120	—	-160	—	-200	—	-300	—	-500	μA
Bus-hold trip point	V _{TRIP}	—	0.45	0.95	0.50	1.00	0.68	1.07	0.70	1.70	0.80	2.00	V

On-Chip Termination (OCT) Specifications

If OCT calibration is enabled, calibration is automatically performed at power-up for I/Os connected to the calibration block. Table 1-7 lists the Stratix III OCT calibration block accuracy specifications.

Table 1-7. Stratix III On-Chip Termination Calibration Accuracy Specifications (Note 1)

Symbol	Description	Conditions	Calibration Accuracy			Unit
			C2	C3, I3	C4, I4	
25- Ω R_S (2) 3.3/3.0/2.5/1.8/1.5/1.2	Internal series termination with calibration (25- Ω setting)	$V_{CCIO} =$ 3.3/3.0/2.5/1.8/1.5/1.2 V	± 8	± 8	± 8	%
50- Ω R_S 3.3/3.0/2.5/1.8/1.5/1.2	Internal series termination with calibration (50- Ω setting)	$V_{CCIO} =$ 3.3/3.0/2.5/1.8/1.5/1.2 V	± 8	± 8	± 8	%
50- Ω R_T 2.5/1.8/1.5/1.2	Internal parallel termination with calibration (50- Ω setting)	$V_{CCIO} = 2.5/1.8/1.5/1.2$ V	± 10	± 10	± 10	%
20- Ω R_S to 60- Ω R_S 3.3/3.0/2.5/1.8/1.5/1.2	Expanded range for internal series termination with calibration (Between 20- Ω to 60- Ω setting)	$V_{CCIO} =$ 3.3/3.0/2.5/1.8/1.5/1.2 V (3)	± 10	± 10	± 10	%
25- Ω $R_{S_left_shift}$	Internal left shift series termination with calibration (25- Ω $R_{S_left_shift}$ setting)	$V_{CCIO} =$ 3.3/3.0/2.5/1.8/1.5/1.2 V	± 10	± 10	± 10	%
R_{OCT_CAL}	Internal series termination with calibration	(4)				
R_D	Internal differential termination for LVDS technology (100- Ω setting)	$V_{CCIO} = 2.5$ V	-15 to 35			%

Notes to Table 1-7:

- (1) OCT calibration accuracy is valid at the time of calibration only.
- (2) 25- Ω R_S not supported for 1.5-V and 1.2-V in Row I/O.
- (3) 1.5-V and 1.2-V only supports 40- Ω to 60- Ω expanded range.
- (4) For resistance tolerance after power-up calibration, refer to Equation 1-1 and Table 1-9.

The accuracy listed in Table 1-7 is valid at the time of calibration. If the voltage or temperature changes, the termination resistance value varies. Table 1-8 lists the resistance tolerance for Stratix III on chip termination.

Table 1-8. Stratix III On-Chip Termination Resistance Tolerance Specification

Symbol	Description	Conditions	Resistance Tolerance			Unit
			C2	C3, I3	C4, I4	
R_{OCT_UNCAL}	Internal series termination without calibration	—				
25- Ω R_S 3.3/3.0/2.5	Internal series termination without calibration (25- Ω setting)	$V_{CCIO} = 3.3/3.0/2.5$ V	± 30	± 40	± 40	%
25- Ω R_S 1.8/1.5	Internal series termination without calibration (25- Ω setting)	$V_{CCIO} = 1.8/1.5$ V	± 30	± 50	± 50	%
25- Ω R_S 1.2	Internal series termination without calibration (25- Ω setting)	$V_{CCIO} = 1.2$ V	± 35	± 60	± 60	%
50- Ω R_S 3.3/3.0/2.5	Internal series termination without calibration (50- Ω setting)	$V_{CCIO} = 3.3/3.0/2.5$ V	± 30	± 40	± 40	%
50- Ω R_S 1.8/1.5	Internal series termination without calibration (50- Ω setting)	$V_{CCIO} = 1.8/1.5$ V	± 30	± 50	± 50	%
50- Ω R_S 1.2	Internal series termination without calibration (50- Ω setting)	$V_{CCIO} = 1.2$ V	± 35	± 60	± 60	%

Table 1-9 lists OCT variation with temperature and voltage after power-up calibration. Use Table 1-9 and Equation 1-1 to determine OCT variation without re-calibration.

Equation 1-1. OCT Variation Without Re-Calibration (Note 1)

$$R_{OCT} = R_{SCAL} \left(1 + \left\langle \frac{dR}{dT} \times \Delta T \right\rangle \pm \left\langle \frac{dR}{dV} \times \Delta V \right\rangle \right)$$

Notes to Equation 1-1:

- (1) R_{OCT} value calculated from Equation 1-1 shows the range of OCT resistance with the variation of temperature and V_{CCIO} .
- (2) R_{SCAL} is the OCT resistance value at power-up.
- (3) ΔT is the variation of temperature with respect to the temperature at power-up.
- (4) ΔV is the variation of voltage with respect to the V_{CCIO} at power-up.
- (5) dR/dT is the percentage change of R_{SCAL} with temperature.
- (6) dR/dV is the percentage change of R_{SCAL} with voltage.

Table 1-9. On-Chip Termination Variation after Power-up Calibration (Part 1 of 2) (Note 1)

Symbol	Description	V_{CCIO} (V)	Commercial Typical	Unit
dR/dV	OCT variation with voltage without re-calibration	3	0.029	%/mV
		2.5	0.036	%/mV
		1.8	0.065	%/mV
		1.5	0.104	%/mV
		1.2	0.177	%/mV

Table 1–9. On-Chip Termination Variation after Power-up Calibration (Part 2 of 2) (Note 1)

Symbol	Description	V _{CCIO} (V)	Commercial Typical	Unit
dR/dT	OCT variation with temperature without re-calibration	3	0.294	%/°C
		2.5	0.301	%/°C
		1.8	0.355	%/°C
		1.5	0.344	%/°C
		1.2	0.348	%/°C

Note to Table 1–9:(1) Valid for V_{CCIO} range of ±5% and temperature range of 0° to 85° C.**Pin Capacitance**

Table 1–10 shows the Stratix III device family pin capacitance.

Table 1–10. Stratix III Device Capacitance

Symbol	Parameter	Typical	Unit
C _{IOTB}	Input capacitance on top/bottom I/O pins	4	pF
C _{IOLR}	Input capacitance on left/right I/O pins	4	pF
C _{CLKTB}	Input capacitance on top/bottom non-dedicated clock input pins	4	pF
C _{CLKLR}	Input capacitance on left/right non-dedicated clock input pins	4	pF
C _{OUTFB}	Input capacitance on dual-purpose clock output/feedback pins	5	pF
C _{CLK1} , C _{CLK3} , C _{CLK8} , and C _{CLK10}	Input capacitance for dedicated clock input pins	2	pF

Hot-Socketing

Table 1–11 lists the hot-socketing specifications for Stratix III devices.

Table 1–11. Stratix III Hot-Socketing Specifications

Symbol	Parameter	Maximum
I _{IOPIN} (DC)	DC current per I/O pin	300 μA
I _{IOPIN} (AC)	AC current per I/O pin	8 mA for ≤ 10 ns

Internal Weak Pull-Up Resistor

Table 1–12 lists the weak pull-up resistor values for Stratix III devices.

Table 1-12. Stratix III Internal Weak Pull-Up Resistor (Note 1), (3)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R_{PU}	Value of I/O pin pull-up resistor before and during configuration, as well as user mode if the programmable pull-up resistor option is enabled	$V_{CCIO} = 3.3 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$
		$V_{CCIO} = 3.0 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$
		$V_{CCIO} = 2.5 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$
		$V_{CCIO} = 1.8 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$
		$V_{CCIO} = 1.5 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$
		$V_{CCIO} = 1.2 \text{ V} \pm 5\%$ (2)	—	25	—	$k\Omega$

Notes to Table 1-12:

- (1) All I/O pins have an option to enable weak pull-up except configuration, test, and JTAG pin.
- (2) Pin pull-up resistance values may be lower if an external source drives the pin higher than V_{CCIO} .
- (3) The internal weak pull-down feature is only available for JTAG $\overline{TDCK}$ pin. The typical value for this internal weak pull-down resistor is around $25k\Omega$.

I/O Standard Specifications

The following tables list input voltage sensitivities (V_{IH} and V_{IL}), output voltages (V_{OH} and V_{OL}), and current drive characteristics (I_{OH} and I_{OL}) for all I/O standards supported by Stratix III devices. Table 1-13 through Table 1-18 show the Stratix III device family I/O standard specifications. Refer to “Glossary” for explanation of terms used in the Table 1-14 through Table 1-18. V_{OL} and V_{OH} values are valid at the corresponding I_{OL} and I_{OH} , respectively.

Table 1-13. Single-Ended I/O Standards Specifications

I/O Standard	V_{CCIO} (V)			V_L (V)		V_{IH} (V)		V_{OL} (V)	V_{OH} (V)	I_{OL} (mA)	I_{OH} (mA)
	Min	Typ	Max	Min	Max	Min	Max	Max	Min		
3.3-V LVTTTL	3.135	3.3	3.465	-0.3	0.8	1.7	3.6	0.4	2.4	2	-2
3.0-V LVTTTL	2.85	3	3.15	-0.3	0.8	1.7	3.6	0.4	2.4	2	-2
3.3-V LVCMOS	3.135	3.3	3.465	-0.3	0.8	1.7	3.6	0.2	$V_{CCIO} - 0.2$	0.1	-0.1
3.0-V LVCMOS	2.85	3	3.15	-0.3	0.8	1.7	3.6	0.2	$V_{CCIO} - 0.2$	0.1	-0.1
2.5-V LVTTTL / LVCMOS	2.375	2.5	2.625	-0.3	0.7	1.7	3.6	0.4	2	1	-1
1.8-V LVTTTL / LVCMOS	1.71	1.8	1.89	-0.3	$0.35 * V_{CCIO}$	$0.65 * V_{CCIO}$	$V_{CCIO} + 0.3$	0.45	$V_{CCIO} - 0.45$	2	-2
1.5-V LVTTTL / LVCMOS	1.425	1.5	1.575	-0.3	$0.35 * V_{CCIO}$	$0.65 * V_{CCIO}$	$V_{CCIO} + 0.3$	$0.25 * V_{CCIO}$	$0.75 * V_{CCIO}$	2	-2
1.2-V LVTTTL / LVCMOS	1.14	1.2	1.26	-0.3	$0.35 * V_{CCIO}$	$0.65 * V_{CCIO}$	$V_{CCIO} + 0.3$	$0.25 * V_{CCIO}$	$0.75 * V_{CCIO}$	2	-2
3.0-V PCI	2.85	3	3.15	—	$0.3 * V_{CCIO}$	$0.5 * V_{CCIO}$	3.6	$0.1 * V_{CCIO}$	$0.9 * V_{CCIO}$	1.5	-0.5
3.0-V PCI-X	2.85	3	3.15	—	$0.35 * V_{CCIO}$	$0.5 * V_{CCIO}$	—	$0.1 * V_{CCIO}$	$0.9 * V_{CCIO}$	1.5	-0.5

Refer to the figure in “Single-Ended Voltage Referenced I/O Standard” in the “Glossary” for voltage referenced receiver input waveform and explanation of terms used in Table 1-14.

Table 1-14. Single-Ended SSTL and HSTL I/O Reference Voltage Specifications

I/O Standard	V_{CCIO} (V)			V_{REF} (V)			V_{TT} (V)		
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
SSTL-2 CLASS I, II	2.375	2.5	2.625	$0.49 * V_{CCIO}$	$0.5 * V_{CCIO}$	$0.51 * V_{CCIO}$	$V_{REF} - 0.04$	V_{REF}	$V_{REF} + 0.04$
SSTL-18 CLASS I, II	1.71	1.8	1.89	0.833	0.9	0.969	$V_{REF} - 0.04$	V_{REF}	$V_{REF} + 0.04$
SSTL-15 CLASS I, II	1.425	1.5	1.575	$0.47 * V_{CCIO}$	$0.5 * V_{CCIO}$	$0.53 * V_{CCIO}$	$0.47 * V_{CCIO}$	V_{REF}	$0.53 * V_{CCIO}$
HSTL-18 CLASS I, II	1.71	1.8	1.89	0.85	0.9	0.95	—	$V_{CCIO}/2$	—
HSTL-15 CLASS I, II	1.425	1.5	1.575	0.68	0.75	0.9	—	$V_{CCIO}/2$	—
HSTL-12 CLASS I, II	1.14	1.2	1.26	$0.47 * V_{CCIO}$	$0.5 * V_{CCIO}$	$0.53 * V_{CCIO}$	—	$V_{CCIO}/2$	—

Table 1-15. Single-Ended SSTL and HSTL I/O Standards Signal Specifications (Note 1)

I/O Standard	$V_{IL(DC)}$ (V)		$V_{IH(DC)}$ (V)		$V_{IL(AC)}$ (V)	$V_{IH(AC)}$ (V)	V_{OL} (V)	V_{OH} (V)	I_{OL} (mA)	I_{OH} (mA)
	Min	Max	Min	Max	Max	Min	Max	Min		
SSTL-2 CLASS I	-0.3	$V_{REF} - 0.15$	$V_{REF} + 0.15$	$V_{CCIO} + 0.3$	$V_{REF} - 0.31$	$V_{REF} + 0.31$	$V_{TT} - 0.57$	$V_{TT} + 0.57$	8.1	-8.1
SSTL-2 CLASS II	-0.3	$V_{REF} - 0.15$	$V_{REF} + 0.15$	$V_{CCIO} + 0.3$	$V_{REF} - 0.31$	$V_{REF} + 0.31$	$V_{TT} - 0.76$	$V_{TT} + 0.76$	16.2	-16.2
SSTL-18 CLASS I	-0.3	$V_{REF} - 0.125$	$V_{REF} + 0.125$	$V_{CCIO} + 0.3$	$V_{REF} - 0.25$	$V_{REF} + 0.25$	$V_{TT} - 0.475$	$V_{TT} + 0.475$	6.7	-6.7
SSTL-18 CLASS II	-0.3	$V_{REF} - 0.125$	$V_{REF} + 0.125$	$V_{CCIO} + 0.3$	$V_{REF} - 0.25$	$V_{REF} + 0.25$	0.28	$V_{CCIO} - 0.28$	13.4	-13.4
SSTL-15 CLASS I	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.175$	$V_{REF} + 0.175$	$0.2 * V_{CCIO}$	$0.8 * V_{CCIO}$	8	-8
SSTL-15 CLASS II	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.175$	$V_{REF} + 0.175$	$0.2 * V_{CCIO}$	$0.8 * V_{CCIO}$	16	-16
HSTL-18 CLASS I	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.2$	$V_{REF} + 0.2$	0.4	$V_{CCIO} - 0.4$	8	-8
HSTL-18 CLASS II	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.2$	$V_{REF} + 0.2$	0.4	$V_{CCIO} - 0.4$	16	-16
HSTL-15 CLASS I	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.2$	$V_{REF} + 0.2$	0.4	$V_{CCIO} - 0.4$	8	-8
HSTL-15 CLASS II	—	$V_{REF} - 0.1$	$V_{REF} + 0.1$	—	$V_{REF} - 0.2$	$V_{REF} + 0.2$	0.4	$V_{CCIO} - 0.4$	16	-16
HSTL-12 CLASS I	-0.15	$V_{REF} - 0.08$	$V_{REF} + 0.08$	$V_{CCIO} + 0.15$	$V_{REF} - 0.15$	$V_{REF} + 0.15$	$0.25 * V_{CCIO}$	$0.75 * V_{CCIO}$	8	-8
HSTL-12 CLASS II	-0.15	$V_{REF} - 0.08$	$V_{REF} + 0.08$	$V_{CCIO} + 0.15$	$V_{REF} - 0.15$	$V_{REF} + 0.15$	$0.25 * V_{CCIO}$	$0.75 * V_{CCIO}$	16	-16

Note to Table 1-15:

- (1) Use current strength settings that are equal or larger than the I_{OL}/I_{OH} values listed to meet the V_{OL}/V_{OH} specifications for each line. OCT or lower current strengths may provide better signal integrity and lower power.

Refer to the figures for “Differential I/O Standards” in “**Glossary**” for receiver input and transmitter output waveforms, and for all differential I/O standards (LVDS, mini-LVDS, RSDS). V_{CC_CLKIN} is the power supply for differential column clock input pins. V_{CCPD} is the power supply for row I/Os and all other column I/Os.

Table 1-16. Differential SSTL I/O Standard Specifications

I/O Standard	V_{CCIO} (V)			$V_{SWING(DC)}$ (V)		$V_X(AC)$ (V)			$V_{SWING(AC)}$ (V)		$V_{OX(AC)}$ (V)		
	Min	Typ	Max	Min	Max	Min	Typ	Max	Min	Max	Min	Typ	Max
SSTL-2 CLASS I, II	2.375	2.5	2.625	0.3	$V_{CCIO} + 0.6$	$V_{CCIO}/2 - 0.2$	—	$V_{CCIO}/2 + 0.2$	0.62	$V_{CCIO} + 0.6$	$V_{CCIO}/2 - 0.15$	—	$V_{CCIO}/2 + 0.15$
SSTL-18 CLASS I, II	1.71	1.8	1.89	0.25	$V_{CCIO} + 0.6$	$V_{CCIO}/2 - 0.175$	—	$V_{CCIO}/2 + 0.175$	0.5	$V_{CCIO} + 0.6$	$V_{CCIO}/2 - 0.125$	—	$V_{CCIO}/2 + 0.125$
SSTL-15 CLASS I, II	1.425	1.5	1.575	0.2	—	—	$V_{CCIO}/2$	—	0.35	—	—	$V_{CCIO}/2$	—

Table 1-17. Differential HSTL I/O Standards Specifications

I/O Standard	V_{CCIO} (V)			$V_{DIF(DC)}$ (V)		$V_X(AC)$ (V)			$V_{CM(DC)}$ (V)			$V_{DIF(AC)}$ (V)	
	Min	Typ	Max	Min	Max	Min	Typ	Max	Min	Typ	Max	Min	Max
HSTL-18 CLASS I, II	1.71	1.8	1.89	0.2	—	0.78	—	1.12	0.78	—	1.12	0.4	—
HSTL-15 CLASS I, II	1.425	1.5	1.575	0.2	—	0.68	—	0.9	0.68	—	0.9	0.4	—
HSTL-12 CLASS I, II	1.14	1.2	1.26	0.16	$V_{CCIO} + 0.3$	—	$0.5 * V_{CCIO}$	—	$0.4 * V_{CCIO}$	$0.5 * V_{CCIO}$	$0.6 * V_{CCIO}$	0.3	$V_{CCIO} + 0.48$

Table 1-18. Differential I/O Standard Specifications (Part 1 of 2)

I/O Standard	V_{CCIO} (V)			$V_{ID}(V)(1)$			$V_{ICM(DC)}(V)$			$V_{OD}(V)(2)$			$V_{OCM}(V)(2)$		
	Min	Typ	Max	Min	Condition	Max	Min	Condition	Max	Min	Typ	Max	Min	Typ	Max
2.5 V LVDS (Row I/O)	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	0.05 (6)	$D_{max} \leq 700$ Mbps	1.8 (6)	0.247	—	0.6	1.125	1.25	1.375
	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	1.05 (6)	$D_{max} > 700$ Mbps	1.55 (6)	0.247	—	0.6	1.125	1.25	1.375
2.5 V LVDS (Column I/O)	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	0.05 (6)	$D_{max} \leq 700$ Mbps	1.8 (6)	0.247	—	0.6	1.0	1.25	1.5
	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	1.05 (6)	$D_{max} > 700$ Mbps	1.55 (6)	0.247	—	0.6	1.0	1.25	1.5
RSDS (Row I/O)	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	0.3	—	1.4	0.1	0.2	0.6	0.5	1.2	1.4
RSDS (Column I/O)	2.375	2.5	2.625	0.1	$V_{CM} = 1.25$	—	0.3	—	1.4	0.1	0.2	0.6	0.5	1.2	1.5
Mini-LVDS (Row I/O)	2.375	2.5	2.625	0.2	—	0.6	0.4	—	1.325	0.25	—	0.6	0.5	1.2	1.4
Mini-LVDS (Column I/O)	2.375	2.5	2.625	0.2	—	0.6	0.4	—	1.325	0.25	—	0.6	0.5	1.2	1.5

Table 1-18. Differential I/O Standard Specifications (Part 2 of 2)

I/O Standard	V_{CCIO} (V)			V_{ID} (V) (1)			$V_{ICM(DC)}$ (V)			V_{OD} (V) (2)			V_{OCH} (V) (2)		
	Min	Typ	Max	Min	Condition	Max	Min	Condition	Max	Min	Typ	Max	Min	Typ	Max
LVPECL (3)	2.375 (5)	2.5 (5)	2.625 (5)	0.3	—	—	0.6	$D_{max} \leq 700$ Mbps	1.8 (4)	—	—	—	—	—	—
	2.375 (5)	2.5 (5)	2.625 (5)	0.3	—	—	1.0	$D_{max} > 700$ Mbps	1.6 (4)	—	—	—	—	—	—

Notes to Table 1-18:

- (1) The minimum V_{ID} value is applicable over the entire common mode range, V_{CM} .
- (2) RL range: $90 \leq RL \leq 110 \Omega$
- (3) Column and row I/O banks support LVPECL I/O standards for input operation only on dedicated clock input pins. Differential clock inputs in column I/O use V_{CC_CLKIN} which should be powered by 2.5 V. Differential clock inputs in row I/O are powered by V_{CCPD} .
- (4) The receiver voltage input range for data rate when $D_{max} > 700$ Mbps, $0.85 V \leq V_{IN} \leq 1.75 V$.
The receiver voltage input range for data rate when $D_{max} \leq 700$ Mbps, $0.45 V \leq V_{IN} \leq 1.95 V$
- (5) Power supply for column I/O LVPECL differential clock input buffer is V_{CC_CLKIN} .
- (6) The receiver voltage input range for data rate when $D_{max} > 700$ Mbps, $1.0 V \leq V_{IN} \leq 1.6 V$.
The receiver voltage input range for data rate when $D_{max} \leq 700$ Mbps, zero $V \leq V_{IN} \leq 1.85 V$.

Power Consumption

Altera offers two ways to estimate power for a design: the Excel-based Early Power Estimator and the Quartus® II **PowerPlay Power Analyzer** feature.

The interactive Excel-based Early Power Estimator is typically used prior to designing the FPGA in order to get a magnitude estimate of the device power. The Quartus II **PowerPlay Power Analyzer** provides better quality estimates based on the specifics of the design after the place-and-route is complete. The **PowerPlay Power Analyzer** can apply a combination of user-entered, simulation-derived and estimated signal activities which, combined with detailed circuit models, can yield very accurate power estimates.

See Table 1-4 for supply current estimates for V_{CCPGM} and V_{CC_CLKIN} . Use the EPE and PowerPlay Power Analyzer for current estimates of remaining power supplies.



For more information about power estimation tools, refer to the *PowerPlay Early Power Estimator User Guide For Stratix III FPGAs* and the *PowerPlay Power Analysis* chapter in the *Quartus II Handbook*.

Switching Characteristics

This section provides performance characteristics of Stratix III core and periphery blocks for commercial grade devices.

These characteristics can be designated as **Preliminary** and **Final** and each designation is defined below.

Preliminary

Preliminary characteristics are created using simulation results, process data, and other known parameters.

Final

Final numbers are based on actual silicon characterization and testing. These numbers reflect the actual performance of the device under worst-case silicon process, voltage, and junction temperature conditions. The upper-right hand corner of a table shows the designation as **Preliminary** or **Final**.

Core Performance Specifications

These sections describe the Clock Tree, PLL, DSP, TriMatrix, and Configuration and JTAG Specifications.

Clock Tree Specifications

Table 1-19 lists the clock tree performance specifications for the logic array, DSP blocks, and TriMatrix Memory blocks for Stratix III devices.

Table 1-19. Stratix III Clock Tree Performance

Device	C2	C3, I3	C4, I4	C4L, I4L		Unit
	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
EP3SL50	600	500	450	450	375	MHz
EP3SL70	600	500	450	450	375	MHz
EP3SL110	600	500	450	450	375	MHz
EP3SL150	600	500	450	450	375	MHz
EP3SL200	600	500	450	450	375	MHz
EP3SE260	600	500	450	450	375	MHz
EP3SL340	600	500	450	450	375	MHz
EP3SE50	600	500	450	450	375	MHz
EP3SE80	600	500	450	450	375	MHz
EP3SE110	600	500	450	450	375	MHz

PLL Specifications

Table 1-20 describes the Stratix III PLL specifications when operating in both the commercial junction temperature range (0 to 85° C) and the industrial junction temperature range (-40 to 100° C), except for EP3SL340, EP3SE260, and EP3SL200 devices in the I4L ordering code, where the industrial junction temperature range is from 0° C to 100° C, regardless of supply voltage. Refer to the figure in “PLL Specifications” in “Glossary” for PLL block diagram.

Table 1–20. Stratix III PLL Specifications (Part 1 of 3)

Symbol	Parameter	C2			C3, I3			C4, I4			C4L, I4L						Unit
		V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 0.9V			
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f _{IN}	Input clock frequency	5	—	800 (1)	5	—	717 (1)	5	—	717 (1)	5	—	717 (1)	5	—	717 (1)	MHz
f _{INPFD}	Input frequency to the PFD	5	—	325	5	—	325	5	—	325	5	—	325	5	—	325	MHz
f _{VCO}	PLL VCO operating range	600	—	1600	600	—	1300	600	—	1300	600	—	1300	600	—	1300	MHz
t _{EINDUTY}	Input clock or external feedback clock input duty cycle	40	—	60	40	—	60	40	—	60	40	—	60	40	—	60	%
f _{OUT}	Output frequency for internal global or regional clock	—	—	600 (2)	—	—	500 (2)	—	—	450 (2)	—	—	450 (2)	—	—	375 (2)	MHz
f _{OUT_EXT}	Output frequency for dedicated external clock output	—	—	800 (2)	—	—	717 (2)	—	—	717 (2)	—	—	717 (2)	—	—	717 (2)	MHz
t _{OUTDUTY}	Duty cycle for external clock output (when set to 50%)	45	50	55	45	50	55	45	50	55	45	50	55	45	50	55	%
t _{FCOMP}	External feedback clock compensation time	—	—	10	—	—	10	—	—	10	—	—	10	—	—	10	ns
t _{CONFIGPLL}	Time required to reconfigure scan chain	—	3.5	—	—	3.5	—	—	3.5	—	—	3.5	—	—	3.5	—	scanclk cycles
t _{CONFIGPHASE}	Time required to reconfigure phase shift	—	1	—	—	1	—	—	1	—	—	1	—	—	1	—	scanclk cycles
f _{SCANCLK}	scanclk frequency	—	—	100	—	—	100	—	—	100	—	—	100	—	—	100	MHz
t _{LOCK}	Time required to lock from end of device configuration	—	—	1	—	—	1	—	—	1	—	—	1	—	—	1	ms
t _{DLOCK}	Time required to lock dynamically (after switchover or reconfiguring any non-post-scale counters/delays)	—	—	1	—	—	1	—	—	1	—	—	1	—	—	1	ms

Table 1–20. Stratix III PLL Specifications (Part 2 of 3)

Symbol	Parameter	C2			C3, I3			C4, I4			C4L, I4L						Unit
		V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 0.9V			
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f _{CLBW}	PLL closed-loop low bandwidth	—	0.3	—	—	0.3	—	—	0.3	—	—	0.3	—	—	0.3	—	MHz
	PLL closed-loop medium bandwidth	—	1.5	—	—	1.5	—	—	1.5	—	—	1.5	—	—	1.5	—	MHz
	PLL closed-loop high bandwidth (5)	—	4	—	—	4	—	—	4	—	—	4	—	—	4	—	MHz
t _{PLL_PSERR}	Accuracy of PLL phase shift	—	—	±50	—	—	±50	—	—	±50	—	—	±50	—	—	±50	ps
t _{ARESET}	Minimum pulse width on areset signal	10	—	—	10	—	—	10	—	—	10	—	—	10	—	—	ns
t _{INCCJ} (3)	Input clock cycle to cycle jitter (F _{REF} ≥ 100 MHz)	—	—	0.15	—	—	0.15	—	—	0.15	—	—	0.15	—	—	0.1	UI (p-p)
	Input clock cycle to cycle jitter (F _{REF} <100 MHz)	—	—	±750	—	—	±750	—	—	±750	—	—	±750	—	—	±500	ps (p-p)
t _{OUTPJ_DC} (4)	Period Jitter for dedicated clock output (F _{OUT} ≥100 MHz)	—	—	175	—	—	175	—	—	175	—	—	175	—	—	225	ps (p-p)
	Period Jitter for dedicated clock output (F _{OUT} <100 MHz)	—	—	17.5	—	—	17.5	—	—	17.5	—	—	17.5	—	—	22.5	mUI (p-p)
t _{OUTCCJ_DC} (4)	Cycle to Cycle Jitter for dedicated clock output (F _{OUT} ≥100 MHz)	—	—	175	—	—	175	—	—	175	—	—	175	—	—	225	ps (p-p)
	Cycle to Cycle Jitter for dedicated clock output (F _{OUT} <100 MHz)	—	—	17.5	—	—	17.5	—	—	17.5	—	—	17.5	—	—	22.5	mUI (p-p)
t _{OUTPJ_IO} (4), (7)	Period Jitter for clock output on regular IO (F _{OUT} ≥ 100 MHz)	—	—	600	—	—	600	—	—	600	—	—	600	—	—	750	ps (p-p)
	Period Jitter for clock output on regular IO (F _{OUT} <100 MHz)	—	—	60	—	—	60	—	—	60	—	—	60	—	—	75	mUI (p-p)

Table 1–20. Stratix III PLL Specifications (Part 3 of 3)

Symbol	Parameter	C2			C3, I3			C4, I4			C4L, I4L						Unit
		V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 1.1V			V _{CCL} = 0.9V			
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
t _{OUTCCJ_IO} (4), (7)	Cycle to Cycle Jitter for clock output on regular IO (F _{OUT} ≥100 MHz)	—	—	600	—	—	600	—	—	600	—	—	600	—	—	750	ps (p-p)
	Cycle to Cycle Jitter for clock output on regular IO (F _{OUT} <100 MHz)	—	—	60	—	—	60	—	—	60	—	—	60	—	—	75	mUI (p-p)
t _{CASC_OUTPJ_DC} (4), (6)	Period Jitter for dedicated clock output in cascaded PLLs (F _{OUT} ≥ 100 MHz)	—	—	250	—	—	250	—	—	250	—	—	250	—	—	325	ps (p-p)
	Period Jitter for dedicated clock output in cascaded PLLs (F _{OUT} <100 MHz)	—	—	25	—	—	25	—	—	25	—	—	25	—	—	32.5	mUI (p-p)
f _{DRIFT}	Frequency drift after PF _{DENA} is disabled for duration of 100 μs	—	—	±10	—	—	±10	—	—	±10	—	—	±10	—	—	±10	%

Notes to Table 1–20:

- (1) This specification is limited in Quartus II software by the I/O maximum frequency. The maximum I/O frequency is different for each I/O standard.
- (2) This specification is limited by the lower of the two: I/O f_{max} or f_{out} of the PLL.
- (3) A high input jitter will directly affect the PLL output jitter. To have low PLL output clock jitter, you need to provide a clean clock source, which is less than 120 ps.
- (4) Peak-to-peak jitter with a probability level of 10^{-12} (14 sigma, 99.9999999974404 % confidence level). The output jitter specification applies to the intrinsic jitter of the PLL, when an input jitter of 30 ps is applied.
- (5) High bandwidth PLL settings are not supported in external feedback mode.
- (6) Cascaded PLL spec only applicable with the following conditions:
 - a) Upstream PLL: $0.59 \text{ MHz} \leq \text{Upstream PLL BW} < 1 \text{ MHz}$
 - b) Downstream PLL: $\text{Downstream PLL BW} > 2 \text{ MHz}$
- (7) External memory interface clock output jitter specifications use a different measurement method and are available in Table 1–35.

DSP Block Specifications

Table 1-21 describes the Stratix III DSP block performance specifications.

Table 1-21. Stratix III DSP Block Performance Specifications (Note 1)

Mode	Number of Multipliers	C2 (5)	C3	C4	C4L		I3	I4	I4L	Unit
		V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
9×9-bit multiplier (a, c, e, g) (2)	1	440	365	315	315	240	345	315	225	MHz
9×9-bit multiplier (b, d, f, h) (2)	1	500	410	375	375	270	385	375	250	MHz
12×12-bit multiplier (a, e) (3)	1	440	365	315	315	240	345	315	225	MHz
12×12-bit multiplier (b, d, f, h) (3)	1	500	410	375	375	270	385	375	250	MHz
18×18-bit multiplier	1	600	495	440	440	320	470	440	300	MHz
36×36-bit multiplier	1	440	365	315	315	220	345	315	205	MHz
Double mode	1	440	365	315	315	220	345	315	205	MHz
18×18-bit multiply adder	2	490	405	345	345	250	380	345	235	MHz
18×18-bit multiply adder	4	490	405	345	345	250	380	345	235	MHz
18×18-bit multiply adder with loop back	2	490	405	345	345	250	380	345	235	MHz
18×18-bit multiply adder with loop back (4)	2	390	320	300	240	180	300	300	135	MHz
18×18-bit multiply accumulator	4	475	390	330	330	240	370	330	225	MHz
18×18-bit multiply adder with chainout	4	475	390	330	330	240	370	330	225	MHz
Input Cascade Independent output of four 18×18 bit multiplier	4	550	455	415	415	270	430	415	250	MHz
36-bit shift (32 bit data)	1	475	390	330	330	250	370	330	235	MHz

Notes to Table 1-21:

- (1) Maximum is for fully pipelined block with **Round** and **Saturation** disabled.
- (2) The DSP block implements 8 independent 9b × 9b multiplies using a, b, c, d for top DSP half block and e, f, g, h for bottom DSP half block multipliers.
- (3) The DSP block implements 6 independent 12b × 12b multiplies using a, b, d for top DSP half block and e, f, h for bottom DSP half block multipliers.
- (4) Maximum for loopback input registers disabled, **Round** and **Saturation** disabled, pipeline and output registers enabled.
- (5) The F_{max} for EP3SL200, EP3SE260, and EP3SL340 at C2 Speed Grade is 7% slower than the C2 values shown in the table.

TriMatrix Memory Block Specifications

Table 1–22 describes the Stratix III TriMatrix Memory Block specifications.

Table 1–22. Stratix III TriMatrix Memory Block Performance Specifications (*Note 1*) (Part 1 of 3)

Memory Block Type	Mode	ALUTs	TriMatrix Memory	C2 (6)	C3	C4	C4L		I3	I4	I4L	Unit
				V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
MLAB	Single port 16 × 10	0	1	600	500	450	450	340	475	450	320	MHz
	Simple dual-port 16 × 20	0	1	600	500	450	450	340	475	450	320	MHz
	ROM 64 × 10	0	1	600	500	450	450	370	475	450	350	MHz
	ROM 32 × 20	0	1	600	500	450	450	340	475	450	320	MHz
M9K (2)	Single-port 8K × 1	0	1	550	465	390	390	245	440	390	230	MHz
	Single-port 4K × 2 or 2K × 4	0	1	575	485	405	405	255	460	405	230	MHz
	Single-port 1K × 9, 512 × 18, or 256 × 36	0	1	565	475	395	395	245	450	395	220	MHz
	Simple dual-port, 8K × 1	0	1	545	460	385	385	240	435	385	225	MHz
	Simple dual-port, 4K × 2 or 2K × 4	0	1	570	480	400	400	250	455	400	225	MHz
	Simple dual-port, 1K × 9, 512 × 18, or 256 × 36	0	1	565	475	395	395	245	450	395	220	MHz
	Simple dual-port, 8K × 1, 4K × 2 or 2K × 4 with read-during-write option set to "Old Data"	0	1	375	312	265	265	205	295	265	185	MHz
	Simple dual-port, 1K × 9, 512 × 18, 256 × 36 with read-during-write option set to "Old Data"	0	1	375	312	265	265	200	295	265	180	MHz
	True dual-port, 8K × 1	0	1	530	440	370	370	230	420	370	215	MHz
	True dual-port, 4K × 2 or 2K × 4	0	1	550	460	385	385	240	435	385	215	MHz
	True dual-port, 1K × 9 or 512 × 18	0	1	545	460	380	380	235	435	380	210	MHz
	True dual-port, 8K × 1, 4K × 2, or 2K × 4 with read-during-write option set to "Old Data"	0	1	350	295	245	245	175	280	245	160	MHz
	True dual-port, 1K × 9 or 512 × 18 with read-during-write option set to "Old Data"	0	1	340	285	240	240	165	270	240	150	MHz
	ROM 1P, 8K × 1, 4K × 2, or 2K × 4	0	1	580	485	405	405	260	460	405	235	MHz
	ROM 1P, 1K × 9, 512 × 18, or 256 × 36	0	1	575	485	405	405	255	460	405	230	MHz
	ROM 2P, 8K × 1, 4K × 2, or 2K × 4	0	1	580	485	405	405	265	460	405	240	MHz
	ROM 2P, 1K × 9, or 512 × 18	0	1	575	485	405	405	260	460	405	235	MHz
	Min Pulse Width (Clock High Time)	—	—	800	1000	1100	1100	1800	1000	1100	1800	ps
	Min Pulse Width (Clock Low Time)	—	—	500	625	690	690	1100	625	690	1100	ps

Table 1-22. Stratix III TriMatrix Memory Block Performance Specifications (Note 1) (Part 2 of 3)

Memory Block Type	Mode	ALUTs	TriMatrix Memory	C2 (6)	C3	C4	C4L		I3	I4	I4L	Unit
				V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
M144K (3), (4)	True dual-port 16K × 9 or 8K × 18	0	1	350	300	245	245	180	280	245	170	MHz
	True dual-port 4K × 36	0	1	520	430	365	365	250	405	365	235	MHz
	Simple dual-port 16K × 9 or 8K × 18	0	1	350	300	245	245	180	280	245	170	MHz
	Simple dual-port 4K × 36 or 2K × 72	0	1	565	470	395	395	225	440	395	210	MHz
	ROM 1Port	0	1	580	470	425	425	260	470	425	260	MHz
	ROM 2 Port	0	1	545	450	380	380	260	425	380	245	MHz
	Single-port 16K × 9 or 8K × 18	0	1	385	330	270	270	240	310	270	195	MHz
	Single-port 4K × 36	0	1	580	470	425	425	210	470	425	195	MHz
	True dual-port 16K × 9, 8K × 18, or 4K × 36 with read-during-write option set to "Old Data"	0	1	325	270	225	225	165	255	225	155	MHz
	Simple dual-port 16K × 9, 8K × 18, 4K × 36, or 2K × 72 with read-during-write option set to "Old Data"	0	1	350	292	250	250	200	275	250	190	MHz
	Simple dual-port 2K × 64 (with ECC)	0	1	255	210	180	180	130	195	180	120	MHz
	Min Pulse Width (Clock High Time)	—	—	800	1000	1100	1100	1800	1000	1100	1800	ps
	Min Pulse Width (Clock Low Time)	—	—	500	625	690	690	1100	625	690	1100	ps
M144K (3), (5)	True dual-port 16K × 9 or 8K × 18	0	1	425	360	300	300	210	340	300	195	MHz
	True dual-port 4K × 36	0	1	520	430	365	365	250	405	365	235	MHz
	Simple dual-port 16K × 9 or 8K × 18	0	1	425	360	300	300	210	340	300	195	MHz
	Simple dual-port 4K × 36 or 2K × 72	0	1	565	470	395	395	225	440	395	210	MHz
	ROM 1Port	0	1	580	470	425	425	260	470	425	260	MHz
	ROM 2 Port	0	1	545	450	380	380	260	425	380	245	MHz
	Single-port 16K × 9 or 8K × 18	0	1	475	405	335	335	210	380	335	195	MHz
	Single-port 4K × 36	0	1	580	470	425	425	210	470	425	195	MHz
	True dual-port 16K × 9, 8K × 18, or 4K × 36 with read-during-write option set to "Old Data"	0	1	325	270	225	225	165	255	225	155	MHz
	Simple dual-port 16K × 9, 8K × 18, 4K × 36, or 2K × 72 with read-during-write option set to "Old Data"	0	1	350	292	250	250	200	275	250	190	MHz

Table 1–22. Stratix III TriMatrix Memory Block Performance Specifications (Note 1) (Part 3 of 3)

Memory Block Type	Mode	ALUTs	TriMatrix Memory	C2 (6)	C3	C4	C4L		I3	I4	I4L	Unit
				V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
M144K (3), (5)	Simple dual-port 2K × 64 (with ECC)	0	1	255	210	180	180	130	195	180	120	MHz
	Min Pulse Width (Clock High Time)	—	—	800	1000	1100	1100	1800	1000	1100	1800	ps
	Min Pulse Width (Clock Low Time)	—	—	500	625	690	690	1100	625	690	1100	ps

Notes to Table 1–22:

- (1) Use a memory block clock that comes through global clock routing from an on-chip PLL set to 50% output duty cycle to achieve the maximum memory block performance. Use Quartus II software to report timing for this and other memory block clocking schemes.
- (2) The F_{max} shown for M9K degrades 2 % when you use Error Detection CRC feature on the device, except for C4L speed grade with V_{CCL}=0.9 V. For C4L speed grade with V_{CCL}=0.9V, there is no degradation in F_{max} when Error Detection CRC feature is used.
- (3) The F_{max} shown for M144K degrades 10 MHz when you use byte-enable support on M144K.
- (4) The F_{max} is applicable when the **COMPTABILITY** option is turned ON.
- (5) The F_{max} is applicable when the **COMPTABILITY** option is turned OFF. This option is turned ON by default in Quartus II software.
- (6) The F_{max} for EP3SL200, EP3SE260, and EP3SL340 at C2 Speed Grade is 7% slower than the C2 values shown in the table.

Configuration and JTAG Specifications

Table 1–23 lists the Stratix III Configuration Mode Specifications.

Table 1–23. Stratix III Configuration Mode Specifications (Note 1)

Programming Mode	DCLK F _{max}	Unit
Passive Serial	100	MHz
Fast Passive Parallel (2)	100	MHz
Fast Active Serial (3)	40	MHz

Notes to Table 1–23:

- (1) DCLK F_{max} is restricted when Remote Update is enabled. For more information, refer to *Remote Update Circuitry (ALTREMOTE_UPDATE) Megafunction User Guide*.
- (2) Data rate must be 4× slower than the clock when decompression and/or encryption are used.
- (3) For more information about the minimum and typical DCLK F_{max} value in Fast Active Serial configuration, refer to the *Serial Configuration Devices Data Sheet* chapter in *Cyclone Device Handbook*.

Table 1–24 shows the JTAG timing parameters and values for Stratix III devices. Refer to figure for “HIGH-SPEED I/O Block” in “Glossary” for JTAG timing requirements.

Table 1–24. Stratix III JTAG Timing Parameters and Values

Symbol	Parameter	Min	Max	Unit
t _{JCP}	TCK clock period	30	—	ns
t _{JCH}	TCK clock high time	14	—	ns
t _{JCL}	TCK clock low time	14	—	ns
t _{JPSU} (TDI)	JTAG port setup time for TDI	1	—	ns
t _{JPSU} (TMS)	JTAG port setup time for TMS	3	—	ns
t _{JPH}	JTAG port hold time	5	—	ns
t _{JPCO}	JTAG port clock to output	—	11	ns
t _{JPZX}	JTAG port high impedance to valid output	—	14	ns
t _{JPXZ}	JTAG port valid output to high impedance	—	14	ns

Periphery Performance

This section describes periphery performance, including high-speed I/O and external memory interface.

I/O performance supports several system interfacing, such as the LVDS high-speed I/O interface, external memory interface, and the PCI/PCI-X bus interface. For example, Stratix III devices I/O configured with voltage referenced I/O standards can achieve up to the stated system interfacing speed as indicated in “[External Memory Interface Specifications](#)” on page 1–25. General-purpose I/O standards such as 3.3, 3.0, 2.5, 1.8, or 1.5 LVTTL/LVCMOS are capable of typical 167 MHz and 1.2 LVCMOS at 100MHz interfacing frequency with 10pF load.



Actual achievable frequency depends on design- and system-specific factors. You should perform HSPICE/IBIS simulations based on your specific design and system setup to determine the maximum achievable frequency in your system.

High-Speed I/O Specifications

Refer to the “[Glossary](#)” for definitions of high-speed timing specifications.

[Table 1–25](#) shows the high-speed I/O timing for Stratix III devices.

Table 1–25. True & Emulated LVDS Specifications ([Note 1](#)), ([2](#)) (Part 1 of 3)

Symbol	Conditions	C2			C3, I3			C4, I4			C4L, I4L			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{\text{HCLK_in}}$ (input clock frequency)	Clock boost factor $W = 1$ to 40 (3)	5	—	800	5	—	717	5	—	717	5	—	717	MHz
$f_{\text{HCLK_out}}$ (output clock frequency)	—	5	—	800 (7)	5	—	717 (7)	5	—	717 (7)	5	—	717 (7)	MHz
Transmitter														
f_{HSDR} (data rate)	SERDES factor $J = 3$ to 10 (8)	(4)	—	1600	(4)	—	1250	(4)	—	1250	(4)	—	1250	Mbps
	SERDES factor $J = 2$, Uses DDR Register	(4)	—	(4)	(4)	—	(4)	(4)	—	(4)	(4)	—	(4)	Mbps
	SERDES factor $J = 1$, Uses SDR Register	(4)	—	(4)	(4)	—	(4)	(4)	—	(4)	(4)	—	(4)	Mbps
LVDS_E_3R - f_{HSDR} (data rate)	SERDES factor $J = 4$ to 10	(4)	—	1100	(4)	—	1100	(4)	—	800	(4)	—	800	Mbps
LVDS_E_1R - f_{HSDR} (data rate)	SERDES factor $J = 4$ to 10	(4)	—	311	(4)	—	200	(4)	—	200	(4)	—	200	Mbps

Table 1–25. True & Emulated LVDS Specifications (Note 1), (2) (Part 2 of 3)

Symbol	Conditions	C2			C3, I3			C4, I4			C4L, I4L			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$t_{x \text{ jitter}}$ (5)	Total Jitter for Data Rate, 600 Mbps – 1.6 Gbps	—	—	160	—	—	160	—	—	160	—	—	160	ps
	Total Jitter for Data Rate, < 600 Mbps	—	—	0.1	—	—	0.1	—	—	0.1	—	—	0.1	UI
t_{DUTY}	T_x output duty cycle for both True and Emulated Differential I/O	45	50	55	45	50	55	45	50	55	45	50	55	%
$t_{\text{RISE}} \text{ \& } t_{\text{FALL}}$	True Differential I/O Standards	—	—	160	—	—	200	—	—	200	—	—	200	ps
$t_{\text{RISE}} \text{ \& } t_{\text{FALL}}$	Emulated Differential I/O Standards with Three External Output Resistor Network	—	—	310	—	—	310	—	—	350	—	—	350	ps
$t_{\text{RISE}} \text{ \& } t_{\text{FALL}}$	Emulated Differential I/O Standards with One External Output Resistor Network	—	—	460	—	—	500	—	—	500	—	—	500	ps
TCCS	True Differential I/O Standards	—	—	100	—	—	100	—	—	100	—	—	100	ps
TCCS	Emulated Differential I/O Standards	—	—	250	—	—	250	—	—	250	—	—	250	ps
Receiver														
$f_{\text{HSDR DPA}}$ (data rate)	SERDES factor J = 3 to 10	150	—	1600	150	—	1250	150	—	1250	150	—	1250	Mbps
f_{HSDR} (data rate)	SERDES factor J = 3 to 10	(4)	—	(6)	(4)	—	(6)	(4)	—	(6)	(4)	—	(6)	Mbps
DPA														
DPA run length	—	—	—	10000	—	—	10000	—	—	10000	—	—	10000	UI
Soft CDR mode														
Soft-CDR PPM tolerance	—	—	—	300	—	—	300	—	—	300	—	—	300	± PPM

Table 1-25. True & Emulated LVDS Specifications (Note 1), (2) (Part 3 of 3)

Symbol	Conditions	C2			C3, I3			C4, I4			C4L, I4L			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Non DPA Mode														
Sampling Window	—	—	—	300	—	—	300	—	—	300	—	—	300	ps

Notes to Table 1-25:

- (1) When J = 3 to 10, the SERDES block is used.
- (2) When J = 1 or 2, the SERDES block is bypassed.
- (3) Clock Boost Factor (W) is the ratio between input data rate to the input clock rate.
- (4) The minimum and maximum specification is dependent on the clock source (PLL and clock pin, for example) and the clock routing resource (global, regional, or local) utilized. The I/O differential buffer and input register do not have a minimum toggle rate.
- (5) The t_{ditter} specification is for true LVDS IO standard only.
- (6) You can estimate the achievable maximum data rate for non-DPA mode by performing the link timing closure analysis. You should consider the board skew margin, transmitter delay margin as well as the receiver sampling margin to determine the maximum data rate supported.
- (7) This is achieved by using the LVDS and DPA clock network.
- (8) If the receiver with DPA enabled and transmitter are using shared PLLs, the minimum data rate is 150 Mbps.

Table 1-26. Stratix III DPA Lock Time Specifications (Note 1), (2), (3) (Part 1 of 2)

Standard	Training Pattern	Number of Data Transitions in one repetition of training pattern	Number of repetitions per 256 data transition (4)	Condition (5)	Min	Typ	Max
SPI-4	0000000000 1111111111	2	128	without DPA PLL calibration	256 data transitions	—	—
				with DPA PLL calibration	3×256 data transitions + 2×96 slow clock cycles (6)	—	—
Parallel Rapid I/O	00001111	2	128	without DPA PLL calibration	256 data transitions	—	—
				with DPA PLL calibration	3×256 data transitions + 2×96 slow clock cycles (6)	—	—
	10010000	4	64	without DPA PLL calibration	256 data transitions	—	—
				with DPA PLL calibration	3×256 data transitions + 2×96 slow clock cycles (6)	—	—

Table 1–26. Stratix III DPA Lock Time Specifications (Note 1), (2), (3) (Part 2 of 2)

Standard	Training Pattern	Number of Data Transitions in one repetition of training pattern	Number of repetitions per 256 data transition (4)	Condition (5)	Min	Typ	Max
Miscellaneous	10101010	8	32	without DPA PLL calibration	256 data transitions	—	—
				with DPA PLL calibration	3×256 data transitions + 2×96 slow clock cycles (6)	—	—
	01010101	8	32	without DPA PLL calibration	256 data transitions	—	—
				with DPA PLL calibration	3×256 data transitions + 2×96 slow clock cycles (6)	—	—

Notes to Table 1–26:

- (1) The DPA lock time is for one channel.
- (2) One data transition is defined as a 0 to 1 or 1 to 0 transition.
- (3) The DPA lock time stated in the table apply to both commercial and industrial grade.
- (4) These are the number of repetitions for the stated training pattern to achieve 256 data transitions.
- (5) PLL re-calibration is recommended for situations below to guarantee DPA locking:
 - Sparse data transitions. For example: Repeating sequence of ten 1s and ten 0s.
 - 0 PPM frequency difference and/or 0° phase difference between clock and data.
- (6) Slow clock = Data rate (Hz)/ Deserialization factor.

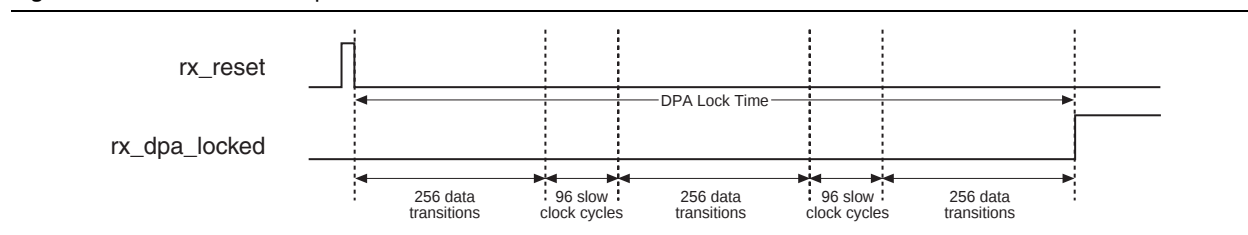
Figure 1–2. DPA Lock Time Specification with DPA PLL Calibration Enabled

Figure 1–3. Stratix III LVDS Soft-CDR/DPA Sinusoidal Jitter Tolerance Spec

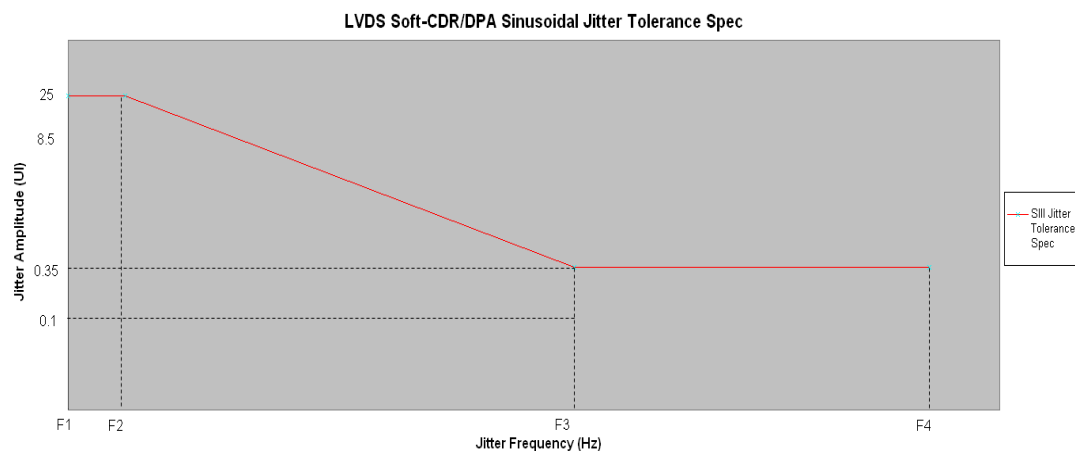


Table 1–27. Stratix III LVDS Soft-CDR/DPA Sinusoidal Jitter Mask Values

Jitter Frequency (Hz)		Jitter Amplitude	Unit
F1	10,000	25.000	UI
F2	17,565	25.000	UI
F3	1,493,000	0.350	UI
F4	50,000,000	0.350	UI

External Memory Interface Specifications

Table 1–28 through Table 1–35 list the external memory interface specifications for the Stratix III device family.

Use Table 1–28 through Table 1–33 to perform memory interface timing analysis.

Table 1–28. Stratix III Maximum Clock Rate Support for External Memory Interfaces with Half-Rate Controller (Note 1), (2) (Part 1 of 2)

Memory Standards	C2	C3, I3	C4, I4	C4L, I4L		Unit
	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DDR3 SDRAM (3)	533	400	333	333	—	MHz
DDR2 SDRAM (4)	400	333	333	333	200	MHz
DDR SDRAM (4)	200	200	200	200	200	MHz
QDR II+ SRAM (2.5 clock cycle latency only) (1.5 or 1.8V) (5)	400 (8)	350	300	300	—	MHz
QDR II SRAM (1.5 or 1.8V)	350	300	300	300	167	MHz

Table 1–28. Stratix III Maximum Clock Rate Support for External Memory Interfaces with Half-Rate Controller (*Note 1*), (*2*) (Part 2 of 2)

Memory Standards	C2	C3, I3	C4, I4	C4L, I4L		Unit
	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
QDRII+ SRAM (×36 emulated mode) (2.5 clock cycle latency only) (1.5 or 1.8V) (<i>5</i>), (<i>6</i>), (<i>7</i>)	300	250	250	250	—	MHz
QDRII SRAM (×36 emulated mode) (1.5 or 1.8V) (<i>6</i>), (<i>7</i>)	300	250	250	250	—	MHz
RLDRAM II (1.5 or 1.8V)	400	333	300	300	—	MHz

Notes to Table 1–28:

- (1) The supported operating frequencies listed here are memory interface maximums for the FPGA device family. Your design's actual achievable performance is based on design- and system-specific factors, as well as static timing analysis of the completed design.
- (2) The values apply to Column I/Os, Row I/Os, and hybrid mode interface. Column I/Os refer to Top and Bottom I/Os. Hybrid mode refers to DQ/DQS groups wrapping over Column I/Os and Row I/Os of the device.
- (3) This applies to interfaces with single chip-select discrete components and single-rank, unregistered modules.
- (4) This performance specification applies for interfaces with single chip-select discrete components and single-rank unregistered modules. For more information on a list of other supported configurations and corresponding performance specifications, refer to the *External Memory PHY Interface (ALTMEMPHY) Megafunction User Guide*.
- (5) The QDRII+ SRAM devices with 2.0 clock cycle latency are not supported due to hardware limitations.
- (6) The performance for ×36 emulated mode is lower than the performance for non ×36 emulated mode due to the double-loading of the CQ/CQn pins. Double-loading causes degradation in the signal slew rate which affects FPGA delay. Furthermore, due to the difference in slew rate, there is a shift in the setup and hold time window. You can perform an IBIS simulation to illustrate the shift in the clock signals.
- (7) For more information about ×36 QDRII+/QDRII SRAM emulation mode, refer to the *External Memory PHY Interface (ALTMEMPHY) Megafunction User Guide*.
- (8) To achieve this data rate, Altera requires the QDRII+ SRAM device to have an echo clock tCQHCQ#H specification of 0.9ns or higher. QDRII+ devices with this specification are targeted for release later in 2009. In the interim, you can safely prototype with existing QDRII+ SRAM devices up to 375MHz.

Table 1-29. Stratix III Maximum Clock Rate Support for External Memory Interfaces with Full-Rate Controller (Note 1), (2), (3), (4)

Memory Standards	C2	C3, I3	C4, I4	C4L, I4L		Unit
	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DDR2 SDRAM (5)	300	267	233	233	167	MHz
DDR SDRAM	200	200	200	200	167	MHz

Notes to Table 1-29:

- (1) The supported operating frequencies listed here are memory interface maximums for the FPGA device family. Your design's actual achievable performance is based on design- and system-specific factors, as well as static timing analysis of the completed design.
- (2) This performance specification applies for interfaces with single rank unregistered DIMMs and single chip-select discrete components. For more information on a list of other supported configurations and corresponding performance specifications, refer to the *External Memory PHY Interface (ALTMEMPHY) Megafunction User Guide*.
- (3) The values apply to column I/Os, Rows I/Os and Hybrid mode interface. Column I/Os refers to Top and Bottom I/Os. Row I/Os refers to Left and Right I/Os. Hybrid mode refers to DQ/DQS groups wrapping over Column I/Os and Row I/Os of the device.
- (4) It may be possible to close timing at up to 33MHz higher, depending on your design and the Quartus setting used. Refer to the section on advanced settings in *External Memory PHY Interface (ALTMEMPHY) Megafunction User Guide*.
- (5) We recommend use of ALTMEMPHY AFI mode to achieve these quoted maximum clock rate due to lower performance of Non-AFI mode.

External Memory I/O Timing Specifications

Table 1-30 and Table 1-31 list Stratix III device timing uncertainties on the read and write data paths. Use these specifications to determine timing margins for source synchronous paths between the Stratix III FPGA and the external memory device. Refer to the figure for "SW (sampling window)" in "Glossary"

Table 1-30. Sampling Window (SW) - Read Side (Note 1) (Part 1 of 2)

Memory Type	I/O Standard	Width	C2		C3, I3		C4, I4		C4L, I4L		C4L, I4L	
			V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 0.9V	
			SW (ps)		SW (ps)		SW (ps)		SW (ps)		SW (ps)	
			Setup	Hold	Setup	Hold	Setup	Hold	Setup	Hold	Setup	Hold
DDR3 SDRAM (with 8 or 10 tap phase offset, 300MHz-400MHz)	1.5V SSTL	×4, ×8	172	296	234	296	257	311	257	311	257	311
DDR3 SDRAM (with Deskew circuitry, 401MHz-533MHz)	1.5V SSTL	×4, ×8	300	213	—	—	—	—	—	—	—	—
DDR2 SDRAM Differential DQS	1.8V SSTL	×4, ×8	181	306	234	326	257	326	257	326	257	326
DDR2 SDRAM Single-ended DQS	1.8V SSTL	×4, ×8	231	256	284	276	307	276	307	276	307	276
DDR SDRAM Single-ended DQS	2.5V SSTL	×4, ×8	231	256	284	261	307	261	307	261	307	261
QDRII/II+ SRAM	1.5 V HSTL	×9, ×18, ×36	261	286	314	291	337	291	337	291	337	291
QDRII/II+ SRAM Emulation (2)	1.5 V HSTL	×36	261	328	314	337	337	350	337	350	337	350

Table 1-30. Sampling Window (SW) - Read Side (*Note 1*) (Part 2 of 2)

Memory Type	I/O Standard	Width	C2		C3, I3		C4, I4		C4L, I4L		C4L, I4L	
			V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 0.9V	
			SW (ps)		SW (ps)		SW (ps)		SW (ps)		SW (ps)	
			Setup	Hold	Setup	Hold	Setup	Hold	Setup	Hold	Setup	Hold
QDRII/II+ SRAM	1.8 V HSTL	×9, ×18, ×36	261	286	314	291	337	291	337	291	337	291
QDRII/II+ SRAM Emulation (<i>2</i>)	1.8 V HSTL	×36	261	328	314	337	337	350	337	350	337	350
RLDRAM II	1.5 V HSTL	×9, ×18	211	336	264	356	287	356	287	356	287	356
RLDRAM II	1.8 V HSTL	×9, ×18	211	336	264	356	287	356	287	356	287	356

Notes to Table 1-30:

- (1) The values apply to Column I/Os, Row I/Os and Hybrid mode interface. Column I/Os refer to Top and Bottom I/Os. Hybrid mode refers to DQ/DQS groups wrapping over Column I/Os and Row I/Os of the device.
- (2) Please refer to the section “Supporting ×36 QDRII+/QDRII SRAM Interfaces in the F780 and F1152-Pin Packages” on page 8–20 in chapter 8 *External Memory Interface* in Stratix III Devices for the implementation.

Table 1-31. Transmitter Channel-to-Channel Skew (TCCS) - Write Side (*Note 1*) (Part 1 of 2)

Memory Type	I/O Standard	Width	C2		C3, I3		C4, I4		C4L, I4L		C4L, I4L	
			V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 0.9V	
			TCCS (ps)		TCCS (ps)		TCCS (ps)		TCCS (ps)		TCCS (ps)	
			Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
DDR3 SDRAM (with Deskew circuitry, 401MHz–533MHz)	1.5V SSTL	×4, ×8	253	262	—	—	—	—	—	—	—	—
DDR3 SDRAM(8-tap phase offset, 375MHz–400MHz)	1.5V SSTL	×4, ×8	293	284	341	332	—	—	—	—	—	—
DDR3 SDRAM (8-tap phase offset, 360MHz–375MHz)	1.5V SSTL	×4, ×8	293	284	341	373	—	—	—	—	—	—
DDR3 SDRAM(10-tap phase offset, 333MHz–360MHz)	1.5V SSTL	×4, ×8	169	470	217	496	258	528	258	528	—	—
DDR3 SDRAM(10-tap phase offset, 300MHz–333MHz)	1.5V SSTL	×4, ×8	169	470	217	496	258	528	258	528	—	—
DDR2 SDRAM Differential DQS	1.8V SSTL	×4, ×8	229	246	230	355	250	388	250	388	350	488
DDR2 SDRAM Single-ended DQS	1.8V SSTL	×4, ×8	316	168	318	239	346	260	346	260	446	360

Table 1–31. Transmitter Channel-to-Channel Skew (TCCS) - Write Side (Note 1) (Part 2 of 2)

Memory Type	I/O Standard	Width	C2		C3, I3		C4, I4		C4L, I4L		C4L, I4L	
			V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 0.9V	
			TCCS (ps)		TCCS (ps)		TCCS (ps)		TCCS (ps)		TCCS (ps)	
			Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
DDR SDRAM Single-ended DQS	2.5V SSTL	×4, ×8	313	157	315	222	343	242	343	242	443	342
QDRII/II+ SRAM	1.5 V HSTL	×9, ×18, ×36	290	278	292	388	315	421	315	421	415	521
QDRII/II+ SRAM Emulation (2)	1.5 V HSTL	×36	310	298	312	408	335	441	335	441	435	541
QDRII/II+ SRAM	1.8 V HSTL	×9, ×18, ×36	259	276	260	385	280	418	280	418	380	518
QDRII/II+ SRAM Emulation (2)	1.8 V HSTL	×36	279	296	280	405	300	438	300	438	400	538
RLDRAM II	1.5 V HSTL	×9, ×18	290	278	292	388	315	421	315	421	415	521
RLDRAM II	1.8 V HSTL	×9, ×18	259	276	260	385	280	418	280	418	380	518

Notes to Table 1–31:

- (1) The values apply to Column I/Os, Row I/Os and Hybrid mode interface. Column I/Os refer to Top and Bottom I/Os. Hybrid mode refers to DQ/DQS groups wrapping over Column I/Os and Row I/Os of the device.
- (2) Please refer to the section “Supporting ×36 QDRII+/QDRII SRAM Interfaces in the F780 and F1152-Pin Packages” on page 8–20 in chapter 8 *External Memory Interface* in Stratix III Devices for the implementation.

DLL and DQS Logic Block Specifications

Table 1–32 describes the DLL frequency range specifications for Stratix III devices.

Table 1–32. Stratix III DLL Frequency Range Specifications

Frequency Mode	Frequency Range (MHz)				Available Phase Shift	Number of Delay Chains	DQS Delay Buffer Mode (1)
	C2	C3, I3	C4, I4	C4L, I4L			
0	90 – 150	90 – 140	90 – 120	90 – 120	22.5°, 45°, 67.5°, 90°	16	Low
1	120 – 200	120 – 190	120 – 170	120 – 170	30°, 60°, 90°, 120°	12	Low
2	150 – 240	150 – 230	150 – 200	150 – 200	36°, 72°, 108°, 144°	10	Low
3	180 – 300	180 – 290	180 – 250	180 – 250	45°, 90°, 135°, 180°	8	Low
4	240 – 370	240 – 350	240 – 310	240 – 310	30°, 60°, 90°, 120°	12	High
5	290 – 450	290 – 420	290 – 370	290 – 370	36°, 72°, 108°, 144°	10	High
6	360 – 560	360 – 530	360 – 460	360 – 460	45°, 90°, 135°, 180°	8	High
7	470 – 740	470 – 700	470 – 610	470 – 610	60°, 120°, 180°, 240°	6	High

Note to Table 1–32:

- (1) Low indicates 6-bit DQS delay setting, high indicates 5-bit DQS delay setting.

Table 1–33 describes the average DQS phase offset delay per setting for Stratix III devices.

Table 1–33. Average DQS Phase Offset Delay per Setting (Note 1), (2), (3)

Speed Grade	Min	Typ	Max	Unit
C2	7	10	13	ps
C3, I3	7	11	15	ps
C4, I4	7	11.5	16	ps
C4L, I4L	7	11.5	16	ps

Notes to Table 1–33:

- (1) The valid settings for phase offset are -64 to +63 for frequency modes 0 to 3 and -32 to +31 for frequency modes 4 to 6.
- (2) The typical value equals the average of the minimum and maximum values.
- (3) The delay settings are linear with a cumulative delay variation of ± 20 ps for all speed grades. For example, when using a C2 speed grade and applying 10° phase offset settings to a 90° phase shift at 400 MHz, the expected minimum cumulative delay is $[625 \text{ ps} + (10 \times 7 \text{ ps}) - 20 \text{ ps}] = 675 \text{ ps}$.

Table 1–34. Stratix III DQS Phase Shift Error Specification for DLL-Delayed Clock (tDQS_PSERR) (Note 1)

Number of DQS Delay Buffer	C2	C3, I3	C4, C4L, I4, I4L	Unit
1	± 13	± 14	± 15	ps
2	± 26	± 28	± 30	ps
3	± 39	± 42	± 45	ps
4	± 52	± 56	± 60	ps

Note to Table 1–34:

- (1) This error specification is the absolute maximum and minimum error. For example, skew on 3 DQS delay buffer in a C2 speed grade is ± 39 ps.

Table 1-35. Stratix III Memory Output Clock Jitter Specification (Note 1), (2), (3)

Parameter	Clock Network	Symbol	C2		C3, I3		C4, I4		C4L, I4L				Unit
			V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 1.1V		V _{CCL} = 0.9V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Clock period jitter	Regional	tJIT(per)	−70	70	−85	85	−100	100	−100	100	−120	120	ps
Cycle-to-cycle period jitter	Regional	tJIT(cc)	−150	150	−170	170	−190	190	−190	190	−230	230	ps
Duty cycle jitter	Regional	tJIT(duty)	−80	80	−90	90	−100	100	−100	100	−140	140	ps
Clock period jitter	Global	tJIT(per)	−105	105	−128	128	−150	150	−150	150	−180	180	ps
Cycle-to-cycle period jitter	Global	tJIT(cc)	−225	225	−255	255	−285	285	−285	285	−340	340	ps
Duty cycle jitter	Global	tJIT(duty)	−120	120	−135	135	−150	150	−150	150	−180	180	ps

Notes to Table 1-35:

- (1) The memory output clock jitter measurements are for 200 consecutive clock cycles, as specified in the JEDEC DDR2/DDR3 standard.
- (2) The clock jitter specification applies to memory output clock pins generated using differential signal-splitter & DDIO circuits clocked by a PLL output routed on a regional or global clock network as specified. Use of regional clock networks are recommended whenever possible.
- (3) The memory output clock jitter stated in the table is applicable when an input jitter of 30ps is applied.

OCT Calibration Block Specifications

Table 1-36 shows the on-chip termination calibration block specifications for Stratix III devices.

Table 1-36. On-Chip Termination Calibration Block Specification

Symbol	Description	Min	Typical	Max	Unit
OCTUSRCLK	Clock required by OCT calibration blocks	—	—	20	MHz
t _{OCTCAL}	Number of OCTUSRCLK clock cycles required for OCT Rs and Rt calibration	—	1000	—	cycles
t _{OCTSHIFT}	Number of OCTUSRCLK clock cycles required for OCT code to shift out per OCT calibration block	—	28	—	cycles
t _{RS_RT}	Time required to dynamically switch from Rs to Rt	—	2.5	—	ns

DCD Specifications

Table 1-37 lists the worst case duty cycle distortion for Stratix III devices. Detailed information on duty cycle distortion will be published after characterization.

Table 1-37. Duty Cycle Distortion on Stratix III I/O Pins (Note 1)

Symbol	C2		C3		C4		Unit
	Min	Max	Min	Max	Min	Max	
Output Duty Cycle	45	55	45	55	45	55	%

Note to Table 1-37:

- (1) DCD specification applies to clock outputs from PLLs, global clock tree, and IOE driving dedicated and general purpose I/O pins.

I/O Timing

Timing Model

The DirectDrive™ technology and MultiTrack™ interconnect ensure predictable performance, accurate simulation, and accurate timing analysis across all Stratix III device densities and speed grades. This section describes and specifies the performance of I/Os.

All specifications except the fast model are representative of worst-case supply voltage and junction temperature conditions. Fast model specifications are representative of best case process, supply voltage, and junction temperature conditions.

The timing numbers listed in the tables of this section are extracted from the Quartus II software version 8.1.

Preliminary and Final Timing

Timing models can have either preliminary or final status. The Quartus II software issues an informational message during the design compilation if the timing models are preliminary. [Table 1–38](#) shows the status of the Stratix III device timing models.

Preliminary status means that the timing models are subject to change in future Quartus II releases. Initially, timing numbers are created using simulation results, process data, and other known parameters. Parts of the timing models may be correlated to silicon measurements. Various tests are used to make the preliminary numbers as close to the actual timing parameters as possible.

Final timing models are based on simulation models that are characterized versus the actual device measurements under all allowable operating conditions. When the timing models are final, all or most of the Stratix III family devices have been completely characterized and no further changes to the timing model are expected.

Table 1–38. Stratix III Device Timing Model Status

Device	Preliminary	Final
EP3SL50	—	✓
EP3SL70	—	✓
EP3SL110	—	✓
EP3SL150	—	✓
EP3SL200	—	✓
EP3SL340	—	✓
EP3SE50	—	✓
EP3SE80	—	✓
EP3SE110	—	✓
EP3SE260	—	✓

I/O Timing Measurement Methodology

Altera characterizes timing delays at the worst-case process, minimum voltage, and maximum temperature for input register setup time (t_{su}) and hold time (t_h). The Quartus II software uses the following equations to calculate t_{su} and t_h timing for Stratix III devices input signals.

$$t_{su} =$$

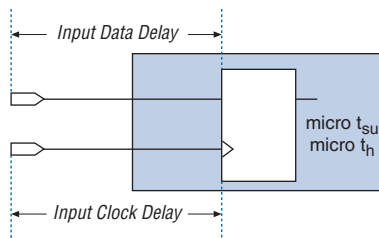
- + data delay from input pin to input register
- + micro setup time of the input register
- clock delay from input pin to input register

$$t_h =$$

- data delay from input pin to input register
- + micro hold time of the input register
- + clock delay from input pin to input register

Figure 1-4 shows the setup and hold timing diagram for input registers.

Figure 1-4. Input Register Setup and Hold Timing Diagram

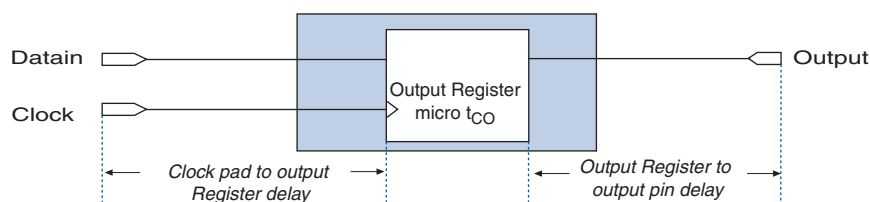


For output timing, different I/O standards require different baseline loading techniques for reporting timing delays. Altera characterizes timing delays with the required termination for each I/O standard and with 0 pF (except for PCI and PCI-X, which use 10 pF) loading and the timing is specified up to the output pin of the FPGA device. The Quartus II software calculates the I/O timing for each I/O standard with a default baseline loading as specified by the I/O standards.

The following measurements are made during device characterization. Altera measures clock-to-output delays (t_{co}) at worst-case process, minimum voltage, and maximum temperature (PVT) for default loading conditions shown in Table 1-39. The following equation describes clock pin to output pin timing for Stratix III devices.

The t_{co} from clock pin to I/O pin =

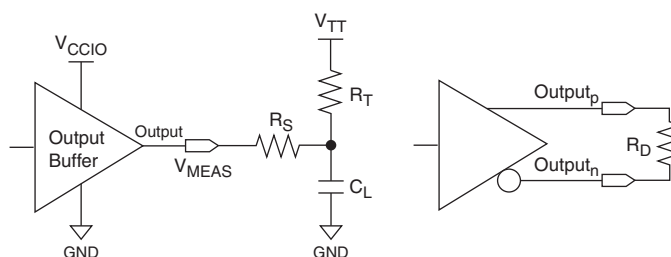
- + delay from clock pad to I/O output register
- + IOE output register clock-to-output delay
- + delay from output register to output pin

Figure 1-5. Output Register Clock to Output Timing Diagram

Simulation using IBIS models is required to determine the delays on the PCB traces in addition to the output pin delay timing reported by the Quartus II software and the timing model in the device handbook.

1. Simulate the output driver of choice into the generalized test setup, using values from [Table 1-39](#).
2. Record the time to V_{MEAS} at the far end of the PCB trace.
3. Simulate the output driver of choice into the actual PCB trace and load, using the appropriate IBIS model or capacitance value to represent the load.
4. Record the time to V_{MEAS} at the far end of the PCB trace.
5. Compare the results of steps 2 and 4. The increase or decrease in delay should be added to or subtracted from the I/O Standard Output Adder delays to yield the actual worst-case propagation delay (clock-to-output) of the PCB trace.

The Quartus II software reports the timing with the conditions shown in [Table 1-39](#) using the above equation. [Figure 1-6](#) shows the model of the circuit that is represented by the output timing of the Quartus II software.

Figure 1-6. Output Delay Timing Reporting Setup Modeled by Quartus II Software for Single-Ended Outputs and Dedicated Differential Outputs (*Note 1*)**Note to Figure 1-6:**

- (1) Output pin timing is reported at the output pin of the FPGA device. Additional delays for loading and board trace delay need to be accounted for with IBIS model simulations.

Figure 1-7 and Figure 1-8 show the model of the circuit that is represented by the output timing of the Quartus II software for differential outputs with single and multiple external resistors.

Figure 1-7. Output Delay Timing Reporting Setup Modeled by Quartus II Software for Differential Outputs with Single External Resistor

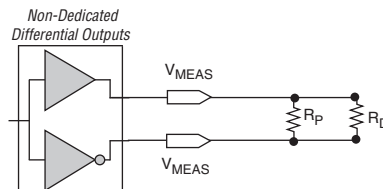


Figure 1-8. Output Delay Timing Reporting Setup modeled by Quartus II Software for Differential Outputs with Three External Resistor

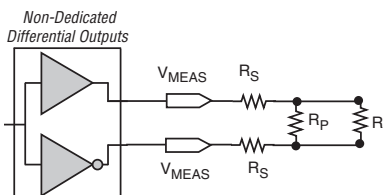


Table 1-39. Output Timing Measurement Methodology for Output Pins (Part 1 of 3)

I/O Standard	Loading and Terminations									Measurement Point
	R_S	R_D	R_T	R_P	V_{CCIO}	V_{CCPD}	V_{CC}	V_{TT}	C_L (pF)	V_{MEAS} (v)
3.3-V LVTTTL	—	—	—	—	3.135	3.135	1.05	—	0	1.5675
3.3-V LVCMOS	—	—	—	—	3.135	3.135	1.05	—	0	1.5675
3.0-V LVTTTL	—	—	—	—	2.85	2.85	1.05	—	0	1.425
3.0-V LVCMOS	—	—	—	—	2.85	2.85	1.05	—	0	1.425
2.5-V	—	—	—	—	2.375	2.375	1.05	—	0	1.1875
1.8-V	—	—	—	—	1.71	2.375	1.05	—	0	0.855
1.5-V	—	—	—	—	1.425	2.375	1.05	—	0	0.7125
1.2-V	—	—	—	—	1.14	2.375	1.05	—	0	0.57
PCI	—	—	—	—	2.85	2.85	1.05	—	10	1.425
PCI-X	—	—	—	—	2.85	2.85	1.05	—	10	1.425
SSTL-2 CLASS I	25	—	50	—	2.325	2.325	1.02	1.25	0	1.1625
SSTL-2 CLASS II	25	—	25	—	2.325	2.325	1.02	1.25	0	1.1625
SSTL-18 CLASS I	25	—	50	—	1.66	2.325	1.02	0.90	0	0.83
SSTL-18 CLASS II	25	—	25	—	1.66	2.325	1.02	0.90	0	0.83
SSTL-15 CLASS I	25	—	50	—	1.375	2.325	1.02	0.75	0	0.6875
SSTL-15 CLASS II	25	—	25	—	1.375	2.325	1.02	0.75	0	0.6875
1.8-V HSTL CLASS I	—	—	50	—	1.66	2.325	1.02	0.90	0	0.83

Table 1-39. Output Timing Measurement Methodology for Output Pins (Part 2 of 3)

I/O Standard	Loading and Terminations									Measurement Point
	R_s	R_D	R_T	R_P	V_{CCIO}	V_{CCPD}	V_{CC}	V_{TT}	C_L (pF)	V_{MEAS} (v)
1.8-V HSTL CLASS II	—	—	25	—	1.66	2.325	1.02	0.90	0	0.83
1.5-V HSTL CLASS I	—	—	50	—	1.375	2.325	1.02	0.75	0	0.6875
1.5-V HSTL CLASS II	—	—	25	—	1.375	2.325	1.02	0.75	0	0.6875
1.2-V HSTL CLASS I	—	—	50	—	1.09	2.325	1.02	0.60	0	0.545
1.2-V HSTL CLASS II	—	—	25	—	1.09	2.325	1.02	0.60	0	0.545
Differential SSTL-2 CLASS I	25	—	50	—	2.325	2.325	1.02	1.25	0	1.1625
Differential SSTL-2 CLASS II	25	—	25	—	2.325	2.325	1.02	1.25	0	1.1625
Differential SSTL-18 CLASS I	25	—	50	—	1.66	2.325	1.02	0.90	0	0.83
Differential SSTL-18 CLASS II	25	—	25	—	1.66	2.325	1.02	0.90	0	0.83
1.8-V Differential HSTL CLASS I	—	—	50	—	1.66	2.325	1.02	0.90	0	0.83
1.8-V Differential HSTL CLASS II	—	—	25	—	1.66	2.325	1.02	0.90	0	0.83
1.5-V Differential HSTL CLASS I	—	—	50	—	1.375	2.325	1.02	0.75	0	0.6875
1.5-V Differential HSTL CLASS II	—	—	25	—	1.375	2.325	1.02	0.75	0	0.6875
1.2-V Differential HSTL CLASS I	—	—	50	—	1.09	2.325	1.02	0.60	0	0.545
1.2-V Differential HSTL CLASS II	—	—	25	—	1.09	2.325	1.02	0.60	0	0.545
LVDS	—	100	—	—	2.325	2.325	1.02	—	0	1.1625
MINI-LVDS	—	100	—	—	2.325	2.325	1.02	—	0	1.1625
RSDS	—	100	—	—	2.325	2.325	1.02	—	0	1.1625
LVDS_E_1R	—	100	—	120	2.325	2.325	1.02	—	0	1.1625
LVDS_E_3R	120	100	—	170	2.325	2.325	1.02	—	0	1.1625

Table 1-39. Output Timing Measurement Methodology for Output Pins (Part 3 of 3)

I/O Standard	Loading and Terminations									Measurement Point
	R_s	R_D	R_T	R_P	V_{CCIO}	V_{CCPD}	V_{CC}	V_{TT}	C_L (pF)	V_{MEAS} (v)
MINI-LVDS_E_1R	—	100	—	120	2.325	2.325	1.02	—	0	1.1625
MINI-LVDS_E_3R	120	100	—	170	2.325	2.325	1.02	—	0	1.1625
RSDS_E_1R	—	100	—	120	2.325	2.325	1.02	—	0	1.1625
RSDS_E_3R	120	100	—	170	2.325	2.325	1.02	—	0	1.1625

Notes to Table 1-39:

- (1) Hyper transport is not supported by Stratix III.
- (2) LVPECL outputs are not supported by Stratix III.
- (3) Quartus timing conditions can be changed using the Advanced I/O Timing feature.
- (4) V_{CC} is nominally 1.1 V less 50 mV (1.05 V).
- (5) Terminated I/O standards require an additional 30 mV IR drop on V_{CC} (1.02 V).
- (6) Terminated I/O standards required an additional 50 mV IR drop on V_{CCIO} and V_{CCPD} .

I/O Default Capacitive Loading

See Table 1-40 for default capacitive loading of different I/O standards.

Table 1-40. Default Loading of Different I/O Standards for Stratix III (Part 1 of 2)

I/O Standard	Capacitive Load	Unit
3.3-V LVTTTL	0	pF
3.3-V LVCMOS	0	pF
3.0-V LVTTTL	0	pF
3.0-V LVCMOS	0	pF
2.5-V LVTTTL/LVCMOS	0	pF
1.8-V LVTTTL/LVCMOS	0	pF
1.5-V LVTTTL/LVCMOS	0	pF
3.0-V PCI	10	pF
3.0-V PCI-X	10	pF
SSTL-2 CLASS I	0	pF
SSTL-2 CLASS II	0	pF
SSTL-18 CLASS I	0	pF
SSTL-18 CLASS II	0	pF
1.5-V HSTL CLASS I	0	pF
1.5-V HSTL CLASS II	0	pF
1.8-V HSTL CLASS I	0	pF
1.8-V HSTL CLASS II	0	pF
1.2-V HSTL	0	pF
Differential SSTL-2 CLASS I	0	pF
Differential SSTL-2 CLASS II	0	pF
Differential SSTL-18 CLASS I	0	pF

Table 1–40. Default Loading of Different I/O Standards for Stratix III (Part 2 of 2)

I/O Standard	Capacitive Load	Unit
Differential SSTL-18 CLASS II	0	pF
1.8-V Differential HSTL CLASS I	0	pF
1.8-V Differential HSTL CLASS II	0	pF
1.5-V Differential HSTL CLASS I	0	pF
1.5-V Differential HSTL CLASS II	0	pF
1.2-V Differential HSTL CLASS I	0	pF
1.2-V Differential HSTL CLASS II	0	pF
LVDS	0	pF

Programmable IOE Delay

Table 1–41 shows Stratix III IOE programmable delay settings. For more information on the annotation of delays in the IOE, refer to Figure 7–7 in the *Stratix III Device I/O Features* chapter in volume 1 of the *Stratix III Device Handbook*.

Table 1–41. Stratix III IOE Programmable Delay (Note 1)

Parameter	Available Settings	Min Offset (2)	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Unit
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
			Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	Max Offset	
D1	15	0	442	491	748	829	916	871	833	870	957	915	833	ps
D2	7	0	248	285	387	412	442	427	411	433	464	448	411	ps
D3	7	0	1625	1806	2747	3058	3371	3218	3084	3210	3540	3382	3084	ps
D4	15	0	491	517	726	872	884	844	808	845	928	887	808	ps
D5	15	0	452	503	764	801	930	887	850	889	977	932	850	ps
D6	6	0	179	199	305	337	370	354	339	354	389	371	339	ps

Notes to Table 1–41:

- (1) You can set the parameter values in the Quartus II software by selecting D1, D2, D3, D4, D5, and D6 in the Assignment Name column.
- (2) The minimum offset represented in the table does not include the intrinsic delay.

Programmable Output Buffer Delay

Table 1–42 lists the delay chain settings that control the rising and falling edge delays of the output buffer. Default delay is 0 ps.

Table 1–42. Programmable Output Buffer Delay (Note 1)

Symbol	Parameter	Typical	Unit
D _{OUTBUF}	Rising and/or Falling Edge delay	0 (default)	ps
		50	ps
		100	ps
		150	ps

Note to Table 1–42:

- (1) You can set the programmable output buffer delay in the Quartus II software by selecting the 'Output Buffer Delay Control' assignment to either positive, negative or both edges with the specific values as stated in the table above in ps for the 'Output Buffer Delay' assignment.

User I/O Pin Timing

Table 1–43 through Table 1–142 show user I/O pin timing for Stratix III devices. I/O buffer t_{su} , t_h , and t_{co} are reported for the cases when I/O clock is driven by a non-PLL global clock (GCLK) and a PLL driven global clock (GCLK-PLL). For t_{su} , t_h , and t_{co} using regional clock, add the value from the adder tables listed for each device to the GCLK/GCLK-PLL values for the device.

EP3SL50 I/O Timing Parameters

Table 1-43 through Table 1-46 show the maximum I/O timing parameters for EP3SL50 devices for single-ended I/O standards.

Table 1-43 specifies EP3SL50 column pins input timing parameters for single-ended I/O standards.

Table 1-43. EP3SL50 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.912	-0.932	-1.333	-1.464	-1.705	-1.645	-1.926	-1.477	-1.702	-1.646	-1.954	ns
		t _h	1.025	1.059	1.515	1.669	1.932	1.859	2.142	1.691	1.938	1.869	2.169	ns
	GCLK PLL	t _{su}	0.730	0.827	1.357	1.543	1.498	1.403	1.421	1.431	1.512	1.415	1.476	ns
		t _h	-0.487	-0.567	-0.967	-1.102	-1.012	-0.947	-0.955	-0.986	-1.016	-0.951	-1.010	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.912	-0.932	-1.333	-1.464	-1.705	-1.645	-1.926	-1.477	-1.702	-1.646	-1.954	ns
		t _h	1.025	1.059	1.515	1.669	1.932	1.859	2.142	1.691	1.938	1.869	2.169	ns
	GCLK PLL	t _{su}	0.730	0.827	1.357	1.543	1.498	1.403	1.421	1.431	1.512	1.415	1.476	ns
		t _h	-0.487	-0.567	-0.967	-1.102	-1.012	-0.947	-0.955	-0.986	-1.016	-0.951	-1.010	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.918	-0.943	-1.332	-1.466	-1.704	-1.644	-1.925	-1.477	-1.707	-1.651	-1.959	ns
		t _h	1.031	1.070	1.514	1.671	1.931	1.858	2.141	1.691	1.943	1.874	2.174	ns
	GCLK PLL	t _{su}	0.724	0.816	1.358	1.541	1.499	1.404	1.422	1.431	1.507	1.410	1.471	ns
		t _h	-0.481	-0.556	-0.968	-1.100	-1.013	-0.948	-0.956	-0.986	-1.011	-0.946	-1.005	ns
3.0-V LVCMOS	GCLK	t _{su}	-0.918	-0.943	-1.332	-1.466	-1.704	-1.644	-1.925	-1.477	-1.707	-1.651	-1.959	ns
		t _h	1.031	1.070	1.514	1.671	1.931	1.858	2.141	1.691	1.943	1.874	2.174	ns
	GCLK PLL	t _{su}	0.724	0.816	1.358	1.541	1.499	1.404	1.422	1.431	1.507	1.410	1.471	ns
		t _h	-0.481	-0.556	-0.968	-1.100	-1.013	-0.948	-0.956	-0.986	-1.011	-0.946	-1.005	ns
2.5 V	GCLK	t _{su}	-0.908	-0.938	-1.341	-1.478	-1.723	-1.663	-1.944	-1.487	-1.718	-1.662	-1.970	ns
		t _h	1.021	1.065	1.523	1.683	1.950	1.877	2.160	1.701	1.954	1.885	2.185	ns
	GCLK PLL	t _{su}	0.734	0.821	1.349	1.529	1.480	1.385	1.403	1.421	1.496	1.399	1.460	ns
		t _h	-0.491	-0.561	-0.959	-1.088	-0.994	-0.929	-0.937	-0.976	-1.000	-0.935	-0.994	ns
1.8 V	GCLK	t _{su}	-0.926	-0.960	-1.381	-1.514	-1.721	-1.661	-1.942	-1.521	-1.721	-1.665	-1.973	ns
		t _h	1.041	1.089	1.563	1.719	1.948	1.875	2.158	1.735	1.957	1.888	2.188	ns
	GCLK PLL	t _{su}	0.716	0.801	1.309	1.493	1.482	1.387	1.405	1.387	1.493	1.396	1.457	ns
		t _h	-0.471	-0.539	-0.919	-1.052	-0.996	-0.931	-0.939	-0.942	-0.997	-0.932	-0.991	ns
1.5 V	GCLK	t _{su}	-0.919	-0.950	-1.358	-1.482	-1.651	-1.591	-1.872	-1.490	-1.655	-1.599	-1.907	ns
		t _h	1.034	1.079	1.540	1.687	1.878	1.805	2.088	1.704	1.891	1.822	2.122	ns
	GCLK PLL	t _{su}	0.723	0.811	1.332	1.525	1.552	1.457	1.475	1.418	1.559	1.462	1.523	ns
		t _h	-0.478	-0.549	-0.942	-1.084	-1.066	-1.001	-1.009	-0.973	-1.063	-0.998	-1.057	ns
1.2 V	GCLK	t _{su}	-0.859	-0.898	-1.281	-1.383	-1.495	-1.435	-1.716	-1.394	-1.502	-1.446	-1.754	ns
		t _h	0.974	1.027	1.463	1.588	1.722	1.649	1.932	1.608	1.738	1.669	1.969	ns
	GCLK PLL	t _{su}	0.783	0.863	1.409	1.624	1.708	1.613	1.631	1.514	1.712	1.615	1.676	ns
		t _h	-0.538	-0.601	-1.019	-1.183	-1.222	-1.157	-1.165	-1.069	-1.216	-1.151	-1.210	ns

Table 1-43. EP3SL50 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-0.840	-0.869	-1.253	-1.367	-1.497	-1.437	-1.718	-1.373	-1.498	-1.442	-1.750	ns
		t _h	0.955	0.998	1.435	1.572	1.724	1.651	1.934	1.587	1.734	1.665	1.965	ns
	GCLK PLL	t _{su}	0.802	0.892	1.437	1.640	1.706	1.611	1.629	1.535	1.716	1.619	1.680	ns
		t _h	-0.557	-0.630	-1.047	-1.199	-1.220	-1.155	-1.163	-1.090	-1.220	-1.155	-1.214	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.840	-0.869	-1.253	-1.367	-1.497	-1.437	-1.718	-1.373	-1.498	-1.442	-1.750	ns
		t _h	0.955	0.998	1.435	1.572	1.724	1.651	1.934	1.587	1.734	1.665	1.965	ns
	GCLK PLL	t _{su}	0.802	0.892	1.437	1.640	1.706	1.611	1.629	1.535	1.716	1.619	1.680	ns
		t _h	-0.557	-0.630	-1.047	-1.199	-1.220	-1.155	-1.163	-1.090	-1.220	-1.155	-1.214	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.833	-0.863	-1.240	-1.359	-1.494	-1.432	-1.716	-1.366	-1.499	-1.441	-1.751	ns
		t _h	0.948	0.992	1.422	1.561	1.718	1.645	1.927	1.577	1.731	1.663	1.961	ns
	GCLK PLL	t _{su}	0.809	0.898	1.449	1.645	1.709	1.616	1.631	1.542	1.715	1.620	1.679	ns
		t _h	-0.564	-0.636	-1.060	-1.207	-1.226	-1.161	-1.170	-1.100	-1.223	-1.157	-1.218	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.833	-0.863	-1.240	-1.359	-1.494	-1.432	-1.716	-1.366	-1.499	-1.441	-1.751	ns
		t _h	0.948	0.992	1.422	1.561	1.718	1.645	1.927	1.577	1.731	1.663	1.961	ns
	GCLK PLL	t _{su}	0.809	0.898	1.449	1.645	1.709	1.616	1.631	1.542	1.715	1.620	1.679	ns
		t _h	-0.564	-0.636	-1.060	-1.207	-1.226	-1.161	-1.170	-1.100	-1.223	-1.157	-1.218	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.821	-0.852	-1.229	-1.348	-1.475	-1.413	-1.697	-1.355	-1.481	-1.423	-1.733	ns
		t _h	0.936	0.981	1.410	1.550	1.699	1.626	1.908	1.566	1.713	1.645	1.943	ns
	GCLK PLL	t _{su}	0.821	0.909	1.458	1.656	1.728	1.635	1.650	1.553	1.733	1.638	1.697	ns
		t _h	-0.576	-0.647	-1.070	-1.218	-1.245	-1.180	-1.189	-1.111	-1.241	-1.175	-1.236	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.821	-0.852	-1.229	-1.348	-1.475	-1.413	-1.697	-1.355	-1.481	-1.423	-1.733	ns
		t _h	0.936	0.981	1.410	1.550	1.699	1.626	1.908	1.566	1.713	1.645	1.943	ns
	GCLK PLL	t _{su}	0.821	0.909	1.458	1.656	1.728	1.635	1.650	1.553	1.733	1.638	1.697	ns
		t _h	-0.576	-0.647	-1.070	-1.218	-1.245	-1.180	-1.189	-1.111	-1.241	-1.175	-1.236	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.833	-0.863	-1.240	-1.359	-1.494	-1.432	-1.716	-1.366	-1.499	-1.441	-1.751	ns
		t _h	0.948	0.992	1.422	1.561	1.718	1.645	1.927	1.577	1.731	1.663	1.961	ns
	GCLK PLL	t _{su}	0.809	0.898	1.449	1.645	1.709	1.616	1.631	1.542	1.715	1.620	1.679	ns
		t _h	-0.564	-0.636	-1.060	-1.207	-1.226	-1.161	-1.170	-1.100	-1.223	-1.157	-1.218	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.833	-0.863	-1.240	-1.359	-1.494	-1.432	-1.716	-1.366	-1.499	-1.441	-1.751	ns
		t _h	0.948	0.992	1.422	1.561	1.718	1.645	1.927	1.577	1.731	1.663	1.961	ns
	GCLK PLL	t _{su}	0.809	0.898	1.449	1.645	1.709	1.616	1.631	1.542	1.715	1.620	1.679	ns
		t _h	-0.564	-0.636	-1.060	-1.207	-1.226	-1.161	-1.170	-1.100	-1.223	-1.157	-1.218	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.821	-0.852	-1.229	-1.348	-1.475	-1.413	-1.697	-1.355	-1.481	-1.423	-1.733	ns
		t _h	0.936	0.981	1.410	1.550	1.699	1.626	1.908	1.566	1.713	1.645	1.943	ns
	GCLK PLL	t _{su}	0.821	0.909	1.458	1.656	1.728	1.635	1.650	1.553	1.733	1.638	1.697	ns
		t _h	-0.576	-0.647	-1.070	-1.218	-1.245	-1.180	-1.189	-1.111	-1.241	-1.175	-1.236	ns

Table 1-43. EP3SL50 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.821	-0.852	-1.229	-1.348	-1.475	-1.413	-1.697	-1.355	-1.481	-1.423	-1.733	ns
		t_h	0.936	0.981	1.410	1.550	1.699	1.626	1.908	1.566	1.713	1.645	1.943	ns
	GCLK PLL	t_{su}	0.821	0.909	1.458	1.656	1.728	1.635	1.650	1.553	1.733	1.638	1.697	ns
		t_h	-0.576	-0.647	-1.070	-1.218	-1.245	-1.180	-1.189	-1.111	-1.241	-1.175	-1.236	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.813	-0.840	-1.219	-1.337	-1.459	-1.397	-1.681	-1.344	-1.466	-1.408	-1.718	ns
		t_h	0.928	0.969	1.400	1.539	1.683	1.610	1.892	1.555	1.698	1.630	1.928	ns
	GCLK PLL	t_{su}	0.829	0.921	1.468	1.667	1.744	1.651	1.666	1.564	1.748	1.653	1.712	ns
		t_h	-0.584	-0.659	-1.080	-1.229	-1.261	-1.196	-1.205	-1.122	-1.256	-1.190	-1.251	ns
3.0-V PCI	GCLK	t_{su}	-0.813	-0.840	-1.219	-1.337	-1.459	-1.397	-1.681	-1.344	-1.466	-1.408	-1.718	ns
		t_h	0.928	0.969	1.400	1.539	1.683	1.610	1.892	1.555	1.698	1.630	1.928	ns
	GCLK PLL	t_{su}	0.829	0.921	1.468	1.667	1.744	1.651	1.666	1.564	1.748	1.653	1.712	ns
		t_h	-0.584	-0.659	-1.080	-1.229	-1.261	-1.196	-1.205	-1.122	-1.256	-1.190	-1.251	ns
3.0-V PCI-X	GCLK	t_{su}	-0.918	-0.943	-1.332	-1.466	-1.704	-1.644	-1.925	-1.477	-1.707	-1.651	-1.959	ns
		t_h	1.031	1.070	1.514	1.671	1.931	1.858	2.141	1.691	1.943	1.874	2.174	ns
	GCLK PLL	t_{su}	0.724	0.816	1.358	1.541	1.499	1.404	1.422	1.431	1.507	1.410	1.471	ns
		t_h	-0.481	-0.556	-0.968	-1.100	-1.013	-0.948	-0.956	-0.986	-1.011	-0.946	-1.005	ns

Table 1-44 specifies EP3SL50 row pins input timing parameters for single-ended I/O standards.

Table 1-44. EP3SL50 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-0.884	-0.914	-1.291	-1.412	-1.634	-1.580	-1.842	-1.428	-1.639	-1.588	-1.875	ns
		t_h	0.997	1.040	1.476	1.619	1.864	1.796	2.057	1.645	1.878	1.814	2.090	ns
	GCLK PLL	t_{su}	0.910	0.917	1.554	1.774	1.924	1.808	1.834	1.768	1.931	1.777	1.885	ns
		t_h	-0.661	-0.656	-1.157	-1.325	-1.424	-1.339	-1.358	-1.312	-1.421	-1.297	-1.407	ns
3.3-V LVCMOS	GCLK	t_{su}	-0.884	-0.914	-1.291	-1.412	-1.634	-1.580	-1.842	-1.428	-1.639	-1.588	-1.875	ns
		t_h	0.997	1.040	1.476	1.619	1.864	1.796	2.057	1.645	1.878	1.814	2.090	ns
	GCLK PLL	t_{su}	0.910	0.917	1.554	1.774	1.924	1.808	1.834	1.768	1.931	1.777	1.885	ns
		t_h	-0.661	-0.656	-1.157	-1.325	-1.424	-1.339	-1.358	-1.312	-1.421	-1.297	-1.407	ns
3.0-V LVTTTL	GCLK	t_{su}	-0.890	-0.925	-1.288	-1.413	-1.637	-1.583	-1.845	-1.427	-1.644	-1.593	-1.880	ns
		t_h	1.003	1.051	1.473	1.620	1.867	1.799	2.060	1.644	1.883	1.819	2.095	ns
	GCLK PLL	t_{su}	0.904	0.906	1.557	1.773	1.921	1.805	1.831	1.769	1.926	1.772	1.880	ns
		t_h	-0.655	-0.645	-1.160	-1.324	-1.421	-1.336	-1.355	-1.313	-1.416	-1.292	-1.402	ns

Table 1-44. EP3SL50 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.0-V LVCMOS	GCLK	t_{su}	-0.890	-0.925	-1.288	-1.413	-1.637	-1.583	-1.845	-1.427	-1.644	-1.593	-1.880	ns
		t_h	1.003	1.051	1.473	1.620	1.867	1.799	2.060	1.644	1.883	1.819	2.095	ns
	GCLK PLL	t_{su}	0.904	0.906	1.557	1.773	1.921	1.805	1.831	1.769	1.926	1.772	1.880	ns
		t_h	-0.655	-0.645	-1.160	-1.324	-1.421	-1.336	-1.355	-1.313	-1.416	-1.292	-1.402	ns
2.5 V	GCLK	t_{su}	-0.878	-0.918	-1.297	-1.426	-1.652	-1.598	-1.860	-1.436	-1.654	-1.603	-1.890	ns
		t_h	0.991	1.044	1.482	1.633	1.882	1.814	2.075	1.653	1.893	1.829	2.105	ns
	GCLK PLL	t_{su}	0.916	0.913	1.548	1.760	1.906	1.790	1.816	1.760	1.916	1.762	1.870	ns
		t_h	-0.667	-0.652	-1.151	-1.311	-1.406	-1.321	-1.340	-1.304	-1.406	-1.282	-1.392	ns
1.8 V	GCLK	t_{su}	-0.940	-0.982	-1.369	-1.491	-1.684	-1.629	-1.895	-1.501	-1.688	-1.635	-1.926	ns
		t_h	1.054	1.109	1.554	1.698	1.914	1.845	2.111	1.718	1.928	1.862	2.141	ns
	GCLK PLL	t_{su}	0.930	0.925	1.551	1.770	1.914	1.799	1.828	1.772	1.922	1.804	1.879	ns
		t_h	-0.680	-0.663	-1.154	-1.321	-1.414	-1.330	-1.351	-1.316	-1.411	-1.325	-1.401	ns
1.5 V	GCLK	t_{su}	-0.930	-0.971	-1.345	-1.459	-1.616	-1.561	-1.827	-1.470	-1.623	-1.570	-1.861	ns
		t_h	1.044	1.098	1.530	1.666	1.846	1.777	2.043	1.687	1.863	1.797	2.076	ns
	GCLK PLL	t_{su}	0.940	0.936	1.575	1.802	1.982	1.867	1.896	1.803	1.987	1.869	1.944	ns
		t_h	-0.690	-0.674	-1.178	-1.353	-1.482	-1.398	-1.419	-1.347	-1.476	-1.390	-1.466	ns
1.2 V	GCLK	t_{su}	-0.870	-0.918	-1.266	-1.358	-1.457	-1.402	-1.668	-1.374	-1.468	-1.415	-1.706	ns
		t_h	0.984	1.045	1.451	1.565	1.687	1.618	1.884	1.591	1.708	1.642	1.921	ns
	GCLK PLL	t_{su}	1.000	0.989	1.654	1.903	2.141	2.026	2.055	1.899	2.142	2.024	2.099	ns
		t_h	-0.750	-0.727	-1.257	-1.454	-1.641	-1.557	-1.578	-1.443	-1.631	-1.545	-1.621	ns
SSTL-2 CLASS I	GCLK	t_{su}	-0.821	-0.860	-1.211	-1.317	-1.432	-1.378	-1.640	-1.324	-1.437	-1.386	-1.673	ns
		t_h	0.935	0.987	1.396	1.524	1.662	1.594	1.855	1.541	1.676	1.612	1.888	ns
	GCLK PLL	t_{su}	0.973	0.971	1.634	1.869	2.126	2.010	2.036	1.872	2.133	1.979	2.087	ns
		t_h	-0.723	-0.709	-1.237	-1.420	-1.626	-1.541	-1.560	-1.416	-1.623	-1.499	-1.609	ns
SSTL-2 CLASS II	GCLK	t_{su}	-0.821	-0.860	-1.211	-1.317	-1.432	-1.378	-1.640	-1.324	-1.437	-1.386	-1.673	ns
		t_h	0.935	0.987	1.396	1.524	1.662	1.594	1.855	1.541	1.676	1.612	1.888	ns
	GCLK PLL	t_{su}	0.973	0.971	1.634	1.869	2.126	2.010	2.036	1.872	2.133	1.979	2.087	ns
		t_h	-0.723	-0.709	-1.237	-1.420	-1.626	-1.541	-1.560	-1.416	-1.623	-1.499	-1.609	ns
SSTL-18 CLASS I	GCLK	t_{su}	-0.844	-0.883	-1.228	-1.331	-1.452	-1.396	-1.664	-1.342	-1.461	-1.407	-1.699	ns
		t_h	0.958	1.010	1.413	1.536	1.680	1.611	1.876	1.557	1.698	1.633	1.910	ns
	GCLK PLL	t_{su}	1.026	1.024	1.692	1.930	2.146	2.032	2.059	1.931	2.149	2.032	2.106	ns
		t_h	-0.776	-0.762	-1.295	-1.483	-1.648	-1.564	-1.586	-1.477	-1.641	-1.554	-1.632	ns
SSTL-18 CLASS II	GCLK	t_{su}	-0.844	-0.883	-1.228	-1.331	-1.452	-1.396	-1.664	-1.342	-1.461	-1.407	-1.699	ns
		t_h	0.958	1.010	1.413	1.536	1.680	1.611	1.876	1.557	1.698	1.633	1.910	ns
	GCLK PLL	t_{su}	1.026	1.024	1.692	1.930	2.146	2.032	2.059	1.931	2.149	2.032	2.106	ns
		t_h	-0.776	-0.762	-1.295	-1.483	-1.648	-1.564	-1.586	-1.477	-1.641	-1.554	-1.632	ns

Table 1-44. EP3SL50 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
SSTL-15 CLASS I	GCLK	t_{su}	-0.830	-0.871	-1.213	-1.321	-1.434	-1.378	-1.646	-1.331	-1.444	-1.390	-1.682	ns
		t_h	0.944	0.998	1.399	1.526	1.662	1.593	1.858	1.546	1.681	1.616	1.893	ns
	GCLK PLL	t_{su}	1.040	1.036	1.707	1.940	2.164	2.050	2.077	1.942	2.166	2.049	2.123	ns
		t_h	-0.790	-0.774	-1.309	-1.493	-1.666	-1.582	-1.604	-1.488	-1.658	-1.571	-1.649	ns
1.8-V HSTL CLASS I	GCLK	t_{su}	-0.844	-0.883	-1.228	-1.331	-1.452	-1.396	-1.664	-1.342	-1.461	-1.407	-1.699	ns
		t_h	0.958	1.010	1.413	1.536	1.680	1.611	1.876	1.557	1.698	1.633	1.910	ns
	GCLK PLL	t_{su}	1.026	1.024	1.692	1.930	2.146	2.032	2.059	1.931	2.149	2.032	2.106	ns
		t_h	-0.776	-0.762	-1.295	-1.483	-1.648	-1.564	-1.586	-1.477	-1.641	-1.554	-1.632	ns
1.8-V HSTL CLASS II	GCLK	t_{su}	-0.844	-0.883	-1.228	-1.331	-1.452	-1.396	-1.664	-1.342	-1.461	-1.407	-1.699	ns
		t_h	0.958	1.010	1.413	1.536	1.680	1.611	1.876	1.557	1.698	1.633	1.910	ns
	GCLK PLL	t_{su}	1.026	1.024	1.692	1.930	2.146	2.032	2.059	1.931	2.149	2.032	2.106	ns
		t_h	-0.776	-0.762	-1.295	-1.483	-1.648	-1.564	-1.586	-1.477	-1.641	-1.554	-1.632	ns
1.5-V HSTL CLASS I	GCLK	t_{su}	-0.830	-0.871	-1.213	-1.321	-1.434	-1.378	-1.646	-1.331	-1.444	-1.390	-1.682	ns
		t_h	0.944	0.998	1.399	1.526	1.662	1.593	1.858	1.546	1.681	1.616	1.893	ns
	GCLK PLL	t_{su}	1.040	1.036	1.707	1.940	2.164	2.050	2.077	1.942	2.166	2.049	2.123	ns
		t_h	-0.790	-0.774	-1.309	-1.493	-1.666	-1.582	-1.604	-1.488	-1.658	-1.571	-1.649	ns
1.5-V HSTL CLASS II	GCLK	t_{su}	-0.830	-0.871	-1.213	-1.321	-1.434	-1.378	-1.646	-1.331	-1.444	-1.390	-1.682	ns
		t_h	0.944	0.998	1.399	1.526	1.662	1.593	1.858	1.546	1.681	1.616	1.893	ns
	GCLK PLL	t_{su}	1.040	1.036	1.707	1.940	2.164	2.050	2.077	1.942	2.166	2.049	2.123	ns
		t_h	-0.790	-0.774	-1.309	-1.493	-1.666	-1.582	-1.604	-1.488	-1.658	-1.571	-1.649	ns
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.821	-0.859	-1.204	-1.311	-1.418	-1.362	-1.630	-1.322	-1.428	-1.374	-1.666	ns
		t_h	0.935	0.986	1.390	1.516	1.646	1.577	1.842	1.537	1.665	1.600	1.877	ns
	GCLK PLL	t_{su}	1.049	1.048	1.716	1.950	2.180	2.066	2.093	1.951	2.182	2.065	2.139	ns
		t_h	-0.799	-0.786	-1.318	-1.503	-1.682	-1.598	-1.620	-1.497	-1.674	-1.587	-1.665	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.821	-0.859	-1.204	-1.311	-1.418	-1.362	-1.630	-1.322	-1.428	-1.374	-1.666	ns
		t_h	0.935	0.986	1.390	1.516	1.646	1.577	1.842	1.537	1.665	1.600	1.877	ns
	GCLK PLL	t_{su}	1.049	1.048	1.716	1.950	2.180	2.066	2.093	1.951	2.182	2.065	2.139	ns
		t_h	-0.799	-0.786	-1.318	-1.503	-1.682	-1.598	-1.620	-1.497	-1.674	-1.587	-1.665	ns
3.0-V PCI	GCLK	t_{su}	-0.890	-0.925	-1.288	-1.413	-1.637	-1.583	-1.845	-1.427	-1.644	-1.593	-1.880	ns
		t_h	1.003	1.051	1.473	1.620	1.867	1.799	2.060	1.644	1.883	1.819	2.095	ns
	GCLK PLL	t_{su}	0.904	0.906	1.557	1.773	1.921	1.805	1.831	1.769	1.926	1.772	1.880	ns
		t_h	-0.655	-0.645	-1.160	-1.324	-1.421	-1.336	-1.355	-1.313	-1.416	-1.292	-1.402	ns
3.0-V PCI-X	GCLK	t_{su}	-0.890	-0.925	-1.288	-1.413	-1.637	-1.583	-1.845	-1.427	-1.644	-1.593	-1.880	ns
		t_h	1.003	1.051	1.473	1.620	1.867	1.799	2.060	1.644	1.883	1.819	2.095	ns
	GCLK PLL	t_{su}	0.904	0.906	1.557	1.773	1.921	1.805	1.831	1.769	1.926	1.772	1.880	ns
		t_h	-0.655	-0.645	-1.160	-1.324	-1.421	-1.336	-1.355	-1.313	-1.416	-1.292	-1.402	ns

Table 1-45 specifies EP3SL50 column pins output timing parameters for single-ended I/O standards.

Table 1-45. EP3SL50 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.018	3.239	4.510	4.896	5.390	5.257	5.485	5.018	5.510	5.380	5.555	ns
		GCLK PLL	t _{co}	1.583	1.767	2.207	2.312	2.529	2.534	2.475	2.422	2.640	2.644	2.463	ns
	8mA	GCLK	t _{co}	2.939	3.150	4.407	4.784	5.273	5.140	5.368	4.902	5.390	5.260	5.435	ns
		GCLK PLL	t _{co}	1.505	1.678	2.104	2.201	2.412	2.417	2.358	2.307	2.520	2.524	2.343	ns
	12mA	GCLK	t _{co}	2.910	3.118	4.340	4.714	5.203	5.070	5.298	4.832	5.323	5.193	5.368	ns
		GCLK PLL	t _{co}	1.474	1.645	2.037	2.130	2.342	2.347	2.288	2.237	2.452	2.456	2.275	ns
	16mA	GCLK	t _{co}	2.896	3.104	4.319	4.691	5.175	5.042	5.270	4.806	5.290	5.160	5.335	ns
		GCLK PLL	t _{co}	1.460	1.630	2.016	2.106	2.314	2.319	2.260	2.209	2.418	2.422	2.241	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	2.956	3.172	4.437	4.813	5.302	5.169	5.397	4.932	5.422	5.292	5.467	ns
		GCLK PLL	t _{co}	1.521	1.700	2.135	2.230	2.442	2.447	2.388	2.337	2.552	2.556	2.375	ns
	8mA	GCLK	t _{co}	2.885	3.095	4.315	4.687	5.171	5.038	5.266	4.802	5.285	5.155	5.330	ns
		GCLK PLL	t _{co}	1.449	1.622	2.012	2.103	2.310	2.315	2.256	2.206	2.414	2.418	2.237	ns
	12mA	GCLK	t _{co}	2.860	3.067	4.286	4.660	5.146	5.013	5.241	4.775	5.260	5.130	5.305	ns
		GCLK PLL	t _{co}	1.425	1.594	1.983	2.076	2.284	2.289	2.230	2.178	2.388	2.392	2.211	ns
	16mA	GCLK	t _{co}	2.853	3.060	4.278	4.651	5.137	5.004	5.232	4.766	5.251	5.121	5.296	ns
		GCLK PLL	t _{co}	1.419	1.587	1.974	2.067	2.275	2.280	2.221	2.169	2.378	2.382	2.201	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.016	3.248	4.544	4.932	5.429	5.296	5.524	5.057	5.552	5.422	5.597	ns
		GCLK PLL	t _{co}	1.580	1.776	2.241	2.349	2.588	2.593	2.534	2.461	2.681	2.685	2.504	ns
	8mA	GCLK	t _{co}	2.949	3.163	4.440	4.821	5.313	5.180	5.408	4.942	5.434	5.304	5.479	ns
		GCLK PLL	t _{co}	1.515	1.691	2.138	2.238	2.494	2.499	2.440	2.347	2.563	2.567	2.386	ns
	12mA	GCLK	t _{co}	2.911	3.126	4.372	4.749	5.239	5.106	5.334	4.868	5.358	5.228	5.403	ns
		GCLK PLL	t _{co}	1.476	1.653	2.069	2.165	2.430	2.435	2.376	2.272	2.486	2.490	2.309	ns
	16mA	GCLK	t _{co}	2.889	3.099	4.337	4.710	5.197	5.064	5.292	4.828	5.314	5.184	5.359	ns
		GCLK PLL	t _{co}	1.453	1.626	2.034	2.127	2.407	2.412	2.353	2.232	2.443	2.447	2.266	ns

Table 1-45. EP3SL50 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	2.970	3.188	4.474	4.854	5.348	5.215	5.443	4.976	5.470	5.340	5.515	ns
		GCLK PLL	t _{co}	1.536	1.715	2.172	2.271	2.530	2.535	2.476	2.380	2.599	2.603	2.422	ns
	8mA	GCLK	t _{co}	2.898	3.109	4.351	4.725	5.213	5.080	5.308	4.843	5.331	5.201	5.376	ns
		GCLK PLL	t _{co}	1.462	1.636	2.048	2.141	2.420	2.425	2.366	2.247	2.459	2.463	2.282	ns
	12mA	GCLK	t _{co}	2.874	3.080	4.311	4.686	5.172	5.039	5.267	4.803	5.289	5.159	5.334	ns
		GCLK PLL	t _{co}	1.438	1.608	2.008	2.101	2.386	2.391	2.332	2.207	2.418	2.422	2.241	ns
	16mA	GCLK	t _{co}	2.874	3.080	4.303	4.676	5.162	5.029	5.257	4.792	5.277	5.147	5.322	ns
		GCLK PLL	t _{co}	1.438	1.607	1.999	2.092	2.394	2.399	2.340	2.196	2.405	2.409	2.228	ns
2.5 V	4mA	GCLK	t _{co}	3.074	3.303	4.681	5.081	5.595	5.462	5.690	5.209	5.725	5.595	5.770	ns
		GCLK PLL	t _{co}	1.639	1.830	2.378	2.496	2.738	2.743	2.684	2.612	2.853	2.857	2.676	ns
	8mA	GCLK	t _{co}	2.991	3.210	4.562	4.955	5.463	5.330	5.558	5.081	5.589	5.459	5.634	ns
		GCLK PLL	t _{co}	1.557	1.738	2.259	2.371	2.614	2.619	2.560	2.485	2.718	2.722	2.541	ns
	12mA	GCLK	t _{co}	2.936	3.166	4.470	4.859	5.363	5.230	5.458	4.983	5.487	5.357	5.532	ns
		GCLK PLL	t _{co}	1.501	1.693	2.167	2.275	2.536	2.541	2.482	2.387	2.616	2.620	2.439	ns
	16mA	GCLK	t _{co}	2.902	3.120	4.436	4.822	5.322	5.189	5.417	4.944	5.443	5.313	5.488	ns
		GCLK PLL	t _{co}	1.467	1.647	2.133	2.238	2.479	2.484	2.425	2.347	2.572	2.576	2.395	ns

Table 1-45. EP3SL50 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.188	3.431	4.876	5.290	5.813	5.680	5.908	5.427	5.951	5.821	5.996	ns
		GCLK PLL	t _{co}	1.754	1.959	2.573	2.707	2.956	2.961	2.902	2.833	3.081	3.085	2.904	ns
	4mA	GCLK	t _{co}	3.090	3.320	4.724	5.132	5.652	5.519	5.747	5.268	5.785	5.655	5.830	ns
		GCLK PLL	t _{co}	1.656	1.848	2.421	2.548	2.804	2.809	2.750	2.673	2.915	2.919	2.738	ns
	6mA	GCLK	t _{co}	3.008	3.233	4.597	4.994	5.508	5.375	5.603	5.124	5.638	5.508	5.683	ns
		GCLK PLL	t _{co}	1.573	1.760	2.293	2.409	2.663	2.668	2.609	2.527	2.766	2.770	2.589	ns
	8mA	GCLK	t _{co}	2.983	3.200	4.536	4.928	5.433	5.300	5.528	5.053	5.557	5.427	5.602	ns
		GCLK PLL	t _{co}	1.548	1.727	2.233	2.344	2.584	2.589	2.530	2.457	2.686	2.690	2.509	ns
	10mA	GCLK	t _{co}	2.912	3.136	4.448	4.834	5.334	5.201	5.429	4.956	5.456	5.326	5.501	ns
		GCLK PLL	t _{co}	1.477	1.663	2.145	2.250	2.502	2.507	2.448	2.360	2.585	2.589	2.408	ns
	12mA	GCLK	t _{co}	2.907	3.126	4.442	4.828	5.327	5.194	5.422	4.949	5.449	5.319	5.494	ns
		GCLK PLL	t _{co}	1.472	1.654	2.139	2.244	2.496	2.501	2.442	2.353	2.578	2.582	2.401	ns
1.5 V	2mA	GCLK	t _{co}	3.129	3.398	4.814	5.217	5.741	5.608	5.836	5.357	5.884	5.754	5.929	ns
		GCLK PLL	t _{co}	1.694	1.926	2.512	2.635	2.895	2.900	2.841	2.762	3.014	3.018	2.837	ns
	4mA	GCLK	t _{co}	2.997	3.217	4.571	4.963	5.470	5.337	5.565	5.089	5.598	5.468	5.643	ns
		GCLK PLL	t _{co}	1.562	1.744	2.267	2.378	2.626	2.631	2.572	2.493	2.726	2.730	2.549	ns
	6mA	GCLK	t _{co}	2.953	3.180	4.490	4.883	5.390	5.257	5.485	5.009	5.515	5.385	5.560	ns
		GCLK PLL	t _{co}	1.518	1.707	2.187	2.299	2.564	2.569	2.510	2.413	2.643	2.647	2.466	ns
	8mA	GCLK	t _{co}	2.941	3.174	4.484	4.876	5.381	5.248	5.476	5.002	5.507	5.377	5.552	ns
		GCLK PLL	t _{co}	1.507	1.701	2.181	2.291	2.557	2.562	2.503	2.406	2.635	2.639	2.458	ns
	10mA	GCLK	t _{co}	2.906	3.123	4.436	4.822	5.320	5.187	5.415	4.943	5.442	5.312	5.487	ns
		GCLK PLL	t _{co}	1.471	1.651	2.133	2.238	2.498	2.503	2.444	2.347	2.571	2.575	2.394	ns
	12mA	GCLK	t _{co}	2.902	3.116	4.416	4.801	5.300	5.167	5.395	4.922	5.421	5.291	5.466	ns
		GCLK PLL	t _{co}	1.467	1.644	2.112	2.216	2.495	2.500	2.441	2.326	2.549	2.553	2.372	ns

Table 1–45. EP3SL50 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.108	3.341	4.768	5.171	5.684	5.551	5.779	5.304	5.818	5.688	5.863	ns
		GCLK PLL	t _{co}	1.674	1.869	2.466	2.588	2.841	2.846	2.787	2.709	2.949	2.953	2.772	ns
	4mA	GCLK	t _{co}	2.986	3.206	4.549	4.940	5.444	5.311	5.539	5.065	5.570	5.440	5.615	ns
		GCLK PLL	t _{co}	1.551	1.733	2.246	2.355	2.617	2.622	2.563	2.469	2.698	2.702	2.521	ns
	6mA	GCLK	t _{co}	2.933	3.165	4.473	4.863	5.370	5.237	5.465	4.990	5.497	5.367	5.542	ns
		GCLK PLL	t _{co}	1.497	1.692	2.170	2.279	2.563	2.568	2.509	2.394	2.625	2.629	2.448	ns
	8mA	GCLK	t _{co}	2.912	3.131	4.434	4.820	5.320	5.187	5.415	4.941	5.440	5.310	5.485	ns
		GCLK PLL	t _{co}	1.477	1.658	2.131	2.236	2.528	2.533	2.474	2.345	2.569	2.573	2.392	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	2.926	3.139	4.442	4.828	5.328	5.195	5.423	4.947	5.445	5.315	5.490	ns
		GCLK PLL	t _{co}	1.491	1.666	2.138	2.243	2.520	2.525	2.466	2.349	2.573	2.577	2.396	ns
	10mA	GCLK	t _{co}	2.929	3.142	4.446	4.832	5.332	5.199	5.427	4.950	5.449	5.319	5.494	ns
		GCLK PLL	t _{co}	1.494	1.669	2.142	2.247	2.526	2.531	2.472	2.353	2.577	2.581	2.400	ns
	12mA	GCLK	t _{co}	2.910	3.122	4.425	4.810	5.310	5.177	5.405	4.929	5.427	5.297	5.472	ns
		GCLK PLL	t _{co}	1.475	1.649	2.120	2.226	2.499	2.504	2.445	2.332	2.555	2.559	2.378	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	2.905	3.115	4.410	4.794	5.293	5.160	5.388	4.912	5.410	5.280	5.455	ns
		GCLK PLL	t _{co}	1.470	1.642	2.105	2.209	2.497	2.502	2.443	2.315	2.537	2.541	2.360	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	2.944	3.159	4.465	4.851	5.351	5.218	5.446	4.970	5.469	5.339	5.514	ns
		GCLK PLL	t _{co}	1.509	1.686	2.161	2.266	2.550	2.555	2.496	2.373	2.596	2.600	2.419	ns
	6mA	GCLK	t _{co}	2.925	3.138	4.443	4.829	5.329	5.196	5.424	4.948	5.446	5.316	5.491	ns
		GCLK PLL	t _{co}	1.490	1.666	2.139	2.244	2.526	2.531	2.472	2.351	2.574	2.578	2.397	ns
	8mA	GCLK	t _{co}	2.926	3.141	4.451	4.838	5.339	5.206	5.434	4.958	5.457	5.327	5.502	ns
		GCLK PLL	t _{co}	1.491	1.668	2.147	2.253	2.546	2.551	2.492	2.361	2.585	2.589	2.408	ns
	10mA	GCLK	t _{co}	2.909	3.121	4.427	4.813	5.314	5.181	5.409	4.932	5.432	5.302	5.477	ns
		GCLK PLL	t _{co}	1.474	1.648	2.123	2.228	2.521	2.526	2.467	2.335	2.560	2.564	2.383	ns
	12mA	GCLK	t _{co}	2.905	3.117	4.423	4.809	5.309	5.176	5.404	4.928	5.428	5.298	5.473	ns
		GCLK PLL	t _{co}	1.470	1.645	2.119	2.224	2.516	2.521	2.462	2.331	2.556	2.560	2.379	ns

Table 1-45. EP3SL50 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	2.906	3.116	4.410	4.795	5.293	5.160	5.388	4.913	5.410	5.280	5.455	ns
		GCLK PLL	t _{co}	1.470	1.643	2.106	2.210	2.501	2.506	2.447	2.316	2.538	2.542	2.361	ns
	16mA	GCLK	t _{co}	2.905	3.116	4.418	4.805	5.305	5.172	5.400	4.923	5.423	5.293	5.468	ns
		GCLK PLL	t _{co}	1.469	1.643	2.114	2.220	2.508	2.513	2.454	2.326	2.551	2.555	2.374	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	2.935	3.150	4.458	4.844	5.343	5.210	5.438	4.963	5.461	5.331	5.506	ns
		GCLK PLL	t _{co}	1.500	1.677	2.153	2.258	2.543	2.548	2.489	2.366	2.589	2.593	2.412	ns
	6mA	GCLK	t _{co}	2.920	3.134	4.444	4.831	5.331	5.198	5.426	4.950	5.450	5.320	5.495	ns
		GCLK PLL	t _{co}	1.485	1.661	2.140	2.246	2.539	2.544	2.485	2.354	2.578	2.582	2.401	ns
	8mA	GCLK	t _{co}	2.907	3.119	4.424	4.810	5.311	5.178	5.406	4.930	5.429	5.299	5.474	ns
		GCLK PLL	t _{co}	1.472	1.647	2.120	2.226	2.521	2.526	2.467	2.333	2.557	2.561	2.380	ns
	10mA	GCLK	t _{co}	2.908	3.120	4.425	4.812	5.314	5.181	5.409	4.932	5.432	5.302	5.477	ns
		GCLK PLL	t _{co}	1.472	1.647	2.121	2.227	2.532	2.537	2.478	2.335	2.560	2.564	2.383	ns
	12mA	GCLK	t _{co}	2.903	3.115	4.418	4.805	5.306	5.173	5.401	4.924	5.424	5.294	5.469	ns
		GCLK PLL	t _{co}	1.468	1.642	2.114	2.220	2.524	2.529	2.470	2.327	2.552	2.556	2.375	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	2.921	3.132	4.426	4.810	5.308	5.175	5.403	4.928	5.425	5.295	5.470	ns
		GCLK PLL	t _{co}	1.486	1.659	2.121	2.225	2.512	2.517	2.458	2.331	2.553	2.557	2.376	ns
	16mA	GCLK	t _{co}	2.920	3.132	4.430	4.815	5.314	5.181	5.409	4.933	5.431	5.301	5.476	ns
		GCLK PLL	t _{co}	1.485	1.659	2.126	2.230	2.530	2.535	2.476	2.337	2.559	2.563	2.382	ns

Table 1–45. EP3SL50 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	2.907	3.118	4.414	4.799	5.298	5.165	5.393	4.917	5.415	5.285	5.460	ns
		GCLK PLL	t _{co}	1.472	1.645	2.110	2.214	2.512	2.517	2.458	2.320	2.543	2.547	2.366	ns
	6mA	GCLK	t _{co}	2.903	3.113	4.408	4.793	5.292	5.159	5.387	4.911	5.409	5.279	5.454	ns
		GCLK PLL	t _{co}	1.467	1.640	2.104	2.208	2.501	2.506	2.447	2.314	2.537	2.541	2.360	ns
	8mA	GCLK	t _{co}	2.905	3.116	4.413	4.798	5.298	5.165	5.393	4.917	5.416	5.286	5.461	ns
		GCLK PLL	t _{co}	1.469	1.643	2.109	2.214	2.522	2.527	2.468	2.320	2.543	2.547	2.366	ns
	10mA	GCLK	t _{co}	2.904	3.114	4.406	4.791	5.290	5.157	5.385	4.909	5.407	5.277	5.452	ns
		GCLK PLL	t _{co}	1.469	1.641	2.102	2.206	2.503	2.508	2.449	2.312	2.534	2.538	2.357	ns
	12mA	GCLK	t _{co}	2.922	3.133	4.428	4.812	5.311	5.178	5.406	4.931	5.428	5.298	5.473	ns
		GCLK PLL	t _{co}	1.487	1.660	2.124	2.227	2.517	2.522	2.463	2.333	2.555	2.559	2.378	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	2.917	3.129	4.426	4.811	5.310	5.177	5.405	4.930	5.427	5.297	5.472	ns
		GCLK PLL	t _{co}	1.482	1.656	2.122	2.226	2.524	2.529	2.470	2.333	2.555	2.559	2.378	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	2.917	3.128	4.427	4.812	5.311	5.178	5.406	4.931	5.428	5.298	5.473	ns
		GCLK PLL	t _{co}	1.481	1.656	2.123	2.227	2.525	2.530	2.471	2.334	2.556	2.560	2.379	ns
	6mA	GCLK	t _{co}	2.907	3.118	4.415	4.800	5.299	5.166	5.394	4.918	5.416	5.286	5.461	ns
		GCLK PLL	t _{co}	1.472	1.645	2.110	2.215	2.512	2.517	2.458	2.321	2.544	2.548	2.367	ns
	8mA	GCLK	t _{co}	2.909	3.120	4.420	4.807	5.307	5.174	5.402	4.925	5.425	5.295	5.470	ns
		GCLK PLL	t _{co}	1.474	1.648	2.116	2.221	2.527	2.532	2.473	2.328	2.552	2.556	2.375	ns
	10mA	GCLK	t _{co}	2.931	3.145	4.448	4.834	5.333	5.200	5.428	4.953	5.452	5.322	5.497	ns
		GCLK PLL	t _{co}	1.495	1.672	2.144	2.249	2.545	2.550	2.491	2.356	2.579	2.583	2.402	ns
	12mA	GCLK	t _{co}	2.920	3.133	4.436	4.822	5.322	5.189	5.417	4.941	5.440	5.310	5.485	ns
		GCLK PLL	t _{co}	1.485	1.660	2.132	2.237	2.535	2.540	2.481	2.344	2.568	2.572	2.391	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	2.919	3.131	4.434	4.820	5.320	5.187	5.415	4.940	5.439	5.309	5.484	ns
		GCLK PLL	t _{co}	1.483	1.659	2.130	2.236	2.540	2.545	2.486	2.343	2.567	2.571	2.390	ns

Table 1-45. EP3SL50 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	2.916	3.129	4.433	4.820	5.320	5.187	5.415	4.939	5.439	5.309	5.484	ns
		GCLK PLL	t _{co}	1.481	1.656	2.128	2.235	2.542	2.547	2.488	2.342	2.566	2.570	2.389	ns
	6mA	GCLK	t _{co}	2.912	3.125	4.427	4.813	5.313	5.180	5.408	4.932	5.432	5.302	5.477	ns
		GCLK PLL	t _{co}	1.477	1.652	2.122	2.228	2.533	2.538	2.479	2.335	2.559	2.563	2.382	ns
	8mA	GCLK	t _{co}	2.989	3.200	4.444	4.821	5.310	5.177	5.405	4.940	5.429	5.299	5.474	ns
		GCLK PLL	t _{co}	1.554	1.727	2.141	2.237	2.509	2.514	2.455	2.344	2.558	2.562	2.381	ns
	10mA	GCLK	t _{co}	2.989	3.200	4.444	4.821	5.310	5.177	5.405	4.940	5.429	5.299	5.474	ns
		GCLK PLL	t _{co}	1.554	1.727	2.141	2.237	2.509	2.514	2.455	2.344	2.558	2.562	2.381	ns
	12mA	GCLK	t _{co}	3.018	3.239	4.510	4.896	5.390	5.257	5.485	5.018	5.510	5.380	5.555	ns
		GCLK PLL	t _{co}	1.583	1.767	2.207	2.312	2.529	2.534	2.475	2.422	2.640	2.644	2.463	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	2.939	3.150	4.407	4.784	5.273	5.140	5.368	4.902	5.390	5.260	5.435	ns
		GCLK PLL	t _{co}	1.505	1.678	2.104	2.201	2.412	2.417	2.358	2.307	2.520	2.524	2.343	ns
3.0-V PCI	—	GCLK	t _{co}	2.910	3.118	4.340	4.714	5.203	5.070	5.298	4.832	5.323	5.193	5.368	ns
		GCLK PLL	t _{co}	1.474	1.645	2.037	2.130	2.342	2.347	2.288	2.237	2.452	2.456	2.275	ns
3.0-V PCI-X	—	GCLK	t _{co}	2.896	3.104	4.319	4.691	5.175	5.042	5.270	4.806	5.290	5.160	5.335	ns
		GCLK PLL	t _{co}	1.460	1.630	2.016	2.106	2.314	2.319	2.260	2.209	2.418	2.422	2.241	ns

Table 1–46 specifies EP3SL50 row pins output timing parameters for single-ended I/O standards.

Table 1–46. EP3SL50 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	4mA	GCLK	t_{CO}	3.197	3.438	4.781	5.176	5.684	5.549	5.751	5.305	5.818	5.682	5.828	ns
		GCLK PLL	t_{CO}	1.482	1.677	2.061	2.175	2.372	2.388	2.308	2.295	2.495	2.512	2.303	ns
	8mA	GCLK	t_{CO}	3.104	3.333	4.651	5.038	5.540	5.405	5.607	5.164	5.669	5.533	5.679	ns
		GCLK PLL	t_{CO}	1.415	1.606	1.951	2.037	2.228	2.244	2.164	2.154	2.346	2.363	2.154	ns
	12mA	GCLK	t_{CO}	3.014	3.233	4.532	4.915	5.412	5.277	5.479	5.037	5.537	5.401	5.547	ns
		GCLK PLL	t_{CO}	1.336	1.517	1.845	1.930	2.100	2.116	2.036	2.046	2.214	2.260	2.022	ns
3.3-V LVCMOS	4mA	GCLK	t_{CO}	3.207	3.442	4.789	5.181	5.689	5.554	5.756	5.311	5.823	5.687	5.833	ns
		GCLK PLL	t_{CO}	1.492	1.684	2.065	2.180	2.377	2.393	2.313	2.301	2.500	2.517	2.308	ns
	8mA	GCLK	t_{CO}	3.018	3.237	4.538	4.921	5.418	5.283	5.485	5.043	5.544	5.408	5.554	ns
		GCLK PLL	t_{CO}	1.340	1.521	1.856	1.945	2.106	2.122	2.042	2.058	2.221	2.269	2.029	ns
3.0-V LVTTTL	4mA	GCLK	t_{CO}	3.151	3.384	4.733	5.129	5.641	5.506	5.708	5.262	5.776	5.640	5.786	ns
		GCLK PLL	t_{CO}	1.442	1.638	2.028	2.128	2.329	2.345	2.265	2.252	2.453	2.470	2.261	ns
	8mA	GCLK	t_{CO}	3.026	3.257	4.580	4.970	5.477	5.342	5.544	5.100	5.612	5.475	5.621	ns
		GCLK PLL	t_{CO}	1.341	1.526	1.891	1.969	2.165	2.181	2.101	2.090	2.289	2.305	2.096	ns
	12mA	GCLK	t_{CO}	2.987	3.206	4.498	4.887	5.389	5.254	5.456	5.014	5.519	5.382	5.528	ns
		GCLK PLL	t_{CO}	1.304	1.488	1.831	1.903	2.077	2.093	2.013	2.016	2.196	2.222	2.003	ns
3.0-V LVCMOS	4mA	GCLK	t_{CO}	3.065	3.303	4.627	5.022	5.530	5.395	5.597	5.154	5.665	5.528	5.674	ns
		GCLK PLL	t_{CO}	1.363	1.550	1.926	2.021	2.218	2.234	2.154	2.144	2.342	2.358	2.149	ns
	8mA	GCLK	t_{CO}	2.969	3.188	4.463	4.848	5.350	5.215	5.417	4.974	5.479	5.342	5.488	ns
		GCLK PLL	t_{CO}	1.291	1.472	1.803	1.874	2.038	2.054	1.974	1.986	2.156	2.193	1.963	ns
2.5 V	4mA	GCLK	t_{CO}	3.177	3.420	4.865	5.283	5.813	5.678	5.880	5.422	5.955	5.818	5.964	ns
		GCLK PLL	t_{CO}	1.468	1.675	2.136	2.282	2.501	2.517	2.437	2.412	2.632	2.648	2.439	ns
	8mA	GCLK	t_{CO}	3.067	3.321	4.710	5.120	5.643	5.508	5.710	5.255	5.781	5.644	5.790	ns
		GCLK PLL	t_{CO}	1.383	1.572	2.012	2.119	2.331	2.347	2.267	2.245	2.458	2.474	2.265	ns
	12mA	GCLK	t_{CO}	3.021	3.245	4.599	5.001	5.517	5.382	5.584	5.132	5.651	5.514	5.660	ns
		GCLK PLL	t_{CO}	1.326	1.528	1.928	2.015	2.205	2.221	2.141	2.132	2.328	2.354	2.135	ns

Table 1-46. EP3SL50 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.8 V	2mA	GCLK	t_{co}	3.410	3.667	5.251	5.711	6.288	6.153	6.355	5.859	6.439	6.303	6.449	ns
		GCLK PLL	t_{co}	1.695	1.941	2.589	2.710	2.976	2.992	2.912	2.849	3.116	3.133	2.924	ns
	4mA	GCLK	t_{co}	3.191	3.465	4.924	5.343	5.883	5.748	5.950	5.494	6.033	5.896	6.042	ns
		GCLK PLL	t_{co}	1.470	1.739	2.262	2.342	2.571	2.587	2.507	2.484	2.710	2.726	2.517	ns
	6mA	GCLK	t_{co}	3.120	3.363	4.771	5.193	5.724	5.589	5.791	5.326	5.860	5.724	5.870	ns
		GCLK PLL	t_{co}	1.405	1.637	2.109	2.192	2.412	2.428	2.348	2.316	2.537	2.554	2.345	ns
	8mA	GCLK	t_{co}	3.098	3.327	4.698	5.111	5.630	5.494	5.701	5.242	5.766	5.630	5.776	ns
		GCLK PLL	t_{co}	1.367	1.563	2.032	2.099	2.316	2.332	2.252	2.221	2.443	2.460	2.251	ns
1.5 V	2mA	GCLK	t_{co}	3.321	3.585	5.161	5.625	6.216	6.081	6.283	5.766	6.363	6.227	6.373	ns
		GCLK PLL	t_{co}	1.606	1.859	2.499	2.624	2.904	2.920	2.840	2.756	3.040	3.057	2.848	ns
	4mA	GCLK	t_{co}	3.114	3.344	4.756	5.188	5.725	5.590	5.792	5.320	5.859	5.723	5.869	ns
		GCLK PLL	t_{co}	1.383	1.602	2.094	2.187	2.413	2.429	2.349	2.310	2.536	2.553	2.344	ns
	6mA	GCLK	t_{co}	3.087	3.318	4.683	5.103	5.630	5.494	5.701	5.235	5.762	5.627	5.773	ns
		GCLK PLL	t_{co}	1.356	1.554	2.021	2.091	2.307	2.323	2.243	2.212	2.431	2.448	2.239	ns
	8mA	GCLK	t_{co}	3.068	3.307	4.666	5.079	5.611	5.475	5.682	5.211	5.743	5.608	5.754	ns
		GCLK PLL	t_{co}	1.337	1.545	1.999	2.073	2.288	2.304	2.224	2.194	2.409	2.426	2.217	ns
1.2 V	2mA	GCLK	t_{co}	3.264	3.510	5.071	5.539	6.141	6.006	6.208	5.678	6.279	6.143	6.289	ns
		GCLK PLL	t_{co}	1.549	1.784	2.409	2.538	2.829	2.845	2.765	2.668	2.956	2.973	2.764	ns
	4mA	GCLK	t_{co}	3.119	3.348	4.778	5.216	5.766	5.631	5.833	5.345	5.901	5.765	5.911	ns
		GCLK PLL	t_{co}	1.388	1.595	2.116	2.215	2.454	2.470	2.390	2.335	2.578	2.595	2.386	ns
SSTL-2 CLASS I	8mA	GCLK	t_{co}	3.008	3.232	4.577	4.973	5.485	5.350	5.552	5.099	5.613	5.477	5.623	ns
		GCLK PLL	t_{co}	1.330	1.516	1.921	2.006	2.173	2.189	2.109	2.119	2.290	2.340	2.098	ns
	12mA	GCLK	t_{co}	3.003	3.228	4.571	4.968	5.477	5.342	5.544	5.095	5.606	5.470	5.616	ns
		GCLK PLL	t_{co}	1.325	1.512	1.918	2.004	2.166	2.184	2.106	2.118	2.284	2.339	2.096	ns
SSTL-2 CLASS II	16mA	GCLK	t_{co}	2.994	3.217	4.556	4.952	5.450	5.315	5.517	5.078	5.579	5.452	5.589	ns
		GCLK PLL	t_{co}	1.316	1.501	1.903	1.988	2.149	2.167	2.089	2.101	2.266	2.321	2.078	ns

Table 1–46. EP3SL50 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
SSTL-18 CLASS I	4mA	GCLK	t_{co}	3.047	3.271	4.617	5.015	5.525	5.389	5.596	5.141	5.653	5.518	5.664	ns
		GCLK PLL	t_{co}	1.316	1.519	1.927	1.998	2.198	2.216	2.138	2.111	2.316	2.333	2.127	ns
	6mA	GCLK	t_{co}	3.042	3.266	4.615	5.014	5.524	5.388	5.595	5.139	5.651	5.516	5.662	ns
		GCLK PLL	t_{co}	1.311	1.505	1.924	1.997	2.197	2.215	2.137	2.109	2.314	2.331	2.125	ns
	8mA	GCLK	t_{co}	3.031	3.255	4.605	5.004	5.514	5.378	5.585	5.130	5.642	5.507	5.653	ns
		GCLK PLL	t_{co}	1.300	1.493	1.907	1.987	2.187	2.205	2.127	2.100	2.305	2.322	2.116	ns
	10mA	GCLK	t_{co}	3.020	3.244	4.592	4.991	5.501	5.365	5.572	5.118	5.630	5.495	5.641	ns
		GCLK PLL	t_{co}	1.289	1.476	1.891	1.974	2.174	2.192	2.114	2.088	2.293	2.310	2.104	ns
	12mA	GCLK	t_{co}	3.020	3.243	4.592	4.991	5.501	5.365	5.572	5.117	5.630	5.495	5.641	ns
		GCLK PLL	t_{co}	1.289	1.475	1.890	1.974	2.174	2.192	2.114	2.087	2.293	2.310	2.104	ns
SSTL-18 CLASS II	8mA	GCLK	t_{co}	3.028	3.250	4.591	4.988	5.496	5.360	5.567	5.113	5.624	5.489	5.635	ns
		GCLK PLL	t_{co}	1.297	1.482	1.888	1.971	2.169	2.187	2.109	2.083	2.287	2.304	2.098	ns
	16mA	GCLK	t_{co}	3.029	3.253	4.597	4.996	5.506	5.370	5.577	5.122	5.635	5.500	5.646	ns
		GCLK PLL	t_{co}	1.298	1.485	1.892	1.979	2.179	2.197	2.119	2.092	2.298	2.315	2.109	ns
SSTL-15 CLASS I	4mA	GCLK	t_{co}	3.050	3.274	4.626	5.026	5.538	5.402	5.609	5.151	5.665	5.530	5.676	ns
		GCLK PLL	t_{co}	1.319	1.515	1.938	2.009	2.211	2.229	2.151	2.121	2.328	2.345	2.139	ns
	6mA	GCLK	t_{co}	3.036	3.260	4.615	5.016	5.528	5.392	5.599	5.142	5.656	5.521	5.667	ns
		GCLK PLL	t_{co}	1.305	1.493	1.920	1.999	2.201	2.219	2.141	2.112	2.319	2.336	2.130	ns
	8mA	GCLK	t_{co}	3.025	3.248	4.602	5.003	5.515	5.379	5.586	5.129	5.643	5.508	5.654	ns
		GCLK PLL	t_{co}	1.294	1.480	1.903	1.986	2.188	2.206	2.128	2.099	2.306	2.323	2.117	ns

Table 1-46. EP3SL50 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.035	3.256	4.590	4.986	5.494	5.358	5.565	5.112	5.621	5.486	5.632	ns
		GCLK PLL	t _{co}	1.304	1.491	1.894	1.969	2.167	2.185	2.107	2.082	2.284	2.301	2.095	ns
	6mA	GCLK	t _{co}	3.028	3.250	4.588	4.985	5.493	5.357	5.564	5.111	5.621	5.486	5.632	ns
		GCLK PLL	t _{co}	1.297	1.482	1.885	1.968	2.166	2.184	2.106	2.081	2.284	2.301	2.095	ns
	8mA	GCLK	t _{co}	3.019	3.242	4.581	4.978	5.486	5.350	5.557	5.104	5.614	5.479	5.625	ns
		GCLK PLL	t _{co}	1.288	1.474	1.877	1.961	2.159	2.177	2.099	2.074	2.277	2.294	2.088	ns
	10mA	GCLK	t _{co}	3.022	3.244	4.584	4.981	5.490	5.354	5.561	5.107	5.617	5.482	5.628	ns
		GCLK PLL	t _{co}	1.291	1.476	1.879	1.964	2.163	2.181	2.103	2.077	2.280	2.297	2.091	ns
	12mA	GCLK	t _{co}	3.018	3.241	4.586	4.984	5.493	5.357	5.564	5.110	5.622	5.487	5.633	ns
		GCLK PLL	t _{co}	1.287	1.473	1.881	1.967	2.166	2.184	2.106	2.080	2.285	2.302	2.096	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.026	3.249	4.584	4.981	5.489	5.353	5.560	5.106	5.616	5.481	5.627	ns
		GCLK PLL	t _{co}	1.295	1.481	1.879	1.964	2.162	2.180	2.102	2.076	2.279	2.296	2.090	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.041	3.262	4.599	4.996	5.505	5.369	5.576	5.121	5.632	5.497	5.643	ns
		GCLK PLL	t _{co}	1.310	1.498	1.905	1.979	2.178	2.196	2.118	2.091	2.295	2.312	2.106	ns
	6mA	GCLK	t _{co}	3.035	3.257	4.600	4.998	5.507	5.371	5.578	5.123	5.635	5.500	5.646	ns
		GCLK PLL	t _{co}	1.304	1.489	1.901	1.981	2.180	2.198	2.120	2.093	2.298	2.315	2.109	ns
	8mA	GCLK	t _{co}	3.031	3.253	4.595	4.993	5.502	5.366	5.573	5.118	5.629	5.494	5.640	ns
		GCLK PLL	t _{co}	1.300	1.485	1.895	1.976	2.175	2.193	2.115	2.088	2.292	2.309	2.103	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.043	3.264	4.612	5.012	5.524	5.388	5.595	5.137	5.651	5.516	5.662	ns
		GCLK PLL	t _{co}	1.312	1.497	1.916	1.995	2.197	2.215	2.137	2.107	2.314	2.331	2.125	ns
	6mA	GCLK	t _{co}	3.034	3.256	4.603	5.003	5.515	5.379	5.586	5.128	5.642	5.507	5.653	ns
		GCLK PLL	t _{co}	1.303	1.488	1.905	1.986	2.188	2.206	2.128	2.098	2.305	2.322	2.116	ns
	8mA	GCLK	t _{co}	3.033	3.256	4.610	5.011	5.524	5.388	5.595	5.137	5.652	5.517	5.663	ns
		GCLK PLL	t _{co}	1.302	1.488	1.909	1.994	2.197	2.215	2.137	2.107	2.315	2.332	2.126	ns
3.0-V PCI	—	GCLK	t _{co}	3.114	3.338	4.626	5.016	5.494	5.359	5.561	5.144	5.625	5.513	5.635	ns
		GCLK PLL	t _{co}	1.436	1.622	1.973	2.052	2.208	2.226	2.148	2.167	2.327	2.382	2.139	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.114	3.338	4.626	5.016	5.494	5.359	5.561	5.144	5.625	5.513	5.635	ns
		GCLK PLL	t _{co}	1.436	1.622	1.973	2.052	2.208	2.226	2.148	2.167	2.327	2.382	2.139	ns

Table 1-47 through Table 1-50 show the maximum I/O timing parameters for EP3SL50 devices for differential I/O standards.

Table 1-47 specifies EP3SL50 column pins input timing parameters for differential I/O standards.

Table 1-47. EP3SL50 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
MINI-LVDS	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
RSDS	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns

Table 1-47. EP3SL50 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.724	-0.746	-1.103	-1.209	-1.329	-1.274	-1.558	-1.209	-1.324	-1.273	-1.591	ns
		t _h	0.841	0.878	1.290	1.419	1.560	1.492	1.779	1.427	1.565	1.501	1.811	ns
	GCLK PLL	t _{su}	1.116	1.130	1.790	2.026	2.244	2.129	2.138	2.037	2.260	2.142	2.190	ns
		t _h	-0.865	-0.864	-1.391	-1.576	-1.743	-1.658	-1.657	-1.579	-1.749	-1.662	-1.708	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.724	-0.746	-1.103	-1.209	-1.329	-1.274	-1.558	-1.209	-1.324	-1.273	-1.591	ns
		t _h	0.841	0.878	1.290	1.419	1.560	1.492	1.779	1.427	1.565	1.501	1.811	ns
	GCLK PLL	t _{su}	1.116	1.130	1.790	2.026	2.244	2.129	2.138	2.037	2.260	2.142	2.190	ns
		t _h	-0.865	-0.864	-1.391	-1.576	-1.743	-1.658	-1.657	-1.579	-1.749	-1.662	-1.708	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns

Table 1-48 specifies EP3SL50 row pins input timing parameters for differential I/O standards.

Table 1-48. EP3SL50 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{su}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t _h	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t _{su}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t _h	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
MINI-LVDS	GCLK	t _{su}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t _h	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t _{su}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t _h	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
RSDS	GCLK	t _{su}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t _h	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t _{su}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t _h	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.734	-0.764	-1.085	-1.186	-1.286	-1.234	-1.505	-1.193	-1.291	-1.242	-1.543	ns
		t _h	0.850	0.893	1.274	1.394	1.516	1.451	1.720	1.410	1.531	1.470	1.758	ns
	GCLK PLL	t _{su}	1.077	1.081	1.776	2.019	2.257	2.138	2.163	2.024	2.263	2.144	2.209	ns
		t _h	-0.827	-0.819	-1.375	-1.570	-1.756	-1.667	-1.687	-1.565	-1.751	-1.663	-1.730	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.734	-0.764	-1.085	-1.186	-1.286	-1.234	-1.505	-1.193	-1.291	-1.242	-1.543	ns
		t _h	0.850	0.893	1.274	1.394	1.516	1.451	1.720	1.410	1.531	1.470	1.758	ns
	GCLK PLL	t _{su}	1.077	1.081	1.776	2.019	2.257	2.138	2.163	2.024	2.263	2.144	2.209	ns
		t _h	-0.827	-0.819	-1.375	-1.570	-1.756	-1.667	-1.687	-1.565	-1.751	-1.663	-1.730	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _h	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{su}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _h	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _h	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{su}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _h	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _h	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{su}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _h	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns

Table 1-48. EP3SL50 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _h	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{su}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _h	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _h	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{su}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _h	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _h	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{su}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _h	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _h	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{su}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _h	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _h	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{su}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _h	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.756	-0.787	-1.112	-1.212	-1.321	-1.270	-1.540	-1.214	-1.320	-1.273	-1.573	ns
		t _h	0.872	0.916	1.300	1.422	1.554	1.489	1.759	1.434	1.563	1.502	1.792	ns
	GCLK PLL	t _{su}	1.045	1.048	1.739	1.983	2.212	2.092	2.118	1.993	2.224	2.103	2.169	ns
		t _h	-0.795	-0.786	-1.339	-1.532	-1.708	-1.619	-1.638	-1.531	-1.709	-1.621	-1.686	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.756	-0.787	-1.112	-1.212	-1.321	-1.270	-1.540	-1.214	-1.320	-1.273	-1.573	ns
		t _h	0.872	0.916	1.300	1.422	1.554	1.489	1.759	1.434	1.563	1.502	1.792	ns
	GCLK PLL	t _{su}	1.045	1.048	1.739	1.983	2.212	2.092	2.118	1.993	2.224	2.103	2.169	ns
		t _h	-0.795	-0.786	-1.339	-1.532	-1.708	-1.619	-1.638	-1.531	-1.709	-1.621	-1.686	ns

Table 1–49 specifies EP3SL50 Column Pins Output Timing parameters for differential I/O standards.

Table 1–49. EP3SL50 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
LVDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
RSDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
RSDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.037	3.259	4.622	5.028	5.543	5.404	5.622	5.155	5.670	5.532	5.690	ns
		GCLK PLL	t _{co}	1.337	1.524	1.947	2.039	2.246	2.260	2.193	2.154	2.363	2.377	2.179	ns
	6mA	GCLK	t _{co}	3.027	3.249	4.612	5.017	5.533	5.394	5.612	5.144	5.660	5.522	5.680	ns
		GCLK PLL	t _{co}	1.327	1.514	1.937	2.028	2.236	2.250	2.183	2.143	2.353	2.367	2.169	ns
	8mA	GCLK	t _{co}	3.027	3.249	4.615	5.021	5.537	5.398	5.616	5.149	5.665	5.527	5.685	ns
		GCLK PLL	t _{co}	1.327	1.514	1.940	2.032	2.240	2.254	2.187	2.148	2.358	2.372	2.174	ns
	10mA	GCLK	t _{co}	3.020	3.243	4.608	5.015	5.531	5.392	5.610	5.142	5.659	5.521	5.679	ns
		GCLK PLL	t _{co}	1.320	1.508	1.933	2.026	2.234	2.248	2.181	2.141	2.352	2.366	2.168	ns
	12mA	GCLK	t _{co}	3.019	3.241	4.605	5.012	5.528	5.389	5.607	5.139	5.655	5.517	5.675	ns
		GCLK PLL	t _{co}	1.319	1.506	1.930	2.023	2.231	2.245	2.178	2.138	2.348	2.362	2.164	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.041	3.263	4.626	5.032	5.547	5.408	5.626	5.159	5.675	5.537	5.695	ns
		GCLK PLL	t _{co}	1.341	1.528	1.951	2.043	2.250	2.264	2.197	2.158	2.368	2.382	2.184	ns

Table 1-49. EP3SL50 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.031	3.252	4.605	5.009	5.522	5.383	5.601	5.135	5.648	5.510	5.668	ns
		GCLK PLL	t _{co}	1.331	1.517	1.930	2.020	2.225	2.239	2.172	2.134	2.341	2.355	2.157	ns
	6mA	GCLK	t _{co}	3.026	3.248	4.605	5.009	5.523	5.384	5.602	5.136	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.326	1.513	1.930	2.020	2.226	2.240	2.173	2.135	2.343	2.357	2.159	ns
	8mA	GCLK	t _{co}	3.024	3.246	4.604	5.008	5.521	5.382	5.600	5.135	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.324	1.511	1.929	2.019	2.224	2.238	2.171	2.134	2.342	2.356	2.158	ns
	10mA	GCLK	t _{co}	3.016	3.237	4.594	4.998	5.512	5.373	5.591	5.125	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.316	1.502	1.919	2.009	2.215	2.229	2.162	2.124	2.332	2.346	2.148	ns
	12mA	GCLK	t _{co}	3.017	3.239	4.600	5.005	5.520	5.381	5.599	5.133	5.648	5.510	5.668	ns
		GCLK PLL	t _{co}	1.317	1.504	1.925	2.016	2.223	2.237	2.170	2.132	2.341	2.355	2.157	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.016	3.236	4.583	4.986	5.498	5.359	5.577	5.112	5.624	5.486	5.644	ns
		GCLK PLL	t _{co}	1.316	1.501	1.908	1.997	2.201	2.215	2.148	2.111	2.317	2.331	2.133	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.028	3.249	4.601	5.004	5.516	5.377	5.595	5.131	5.643	5.505	5.663	ns
		GCLK PLL	t _{co}	1.328	1.514	1.926	2.015	2.219	2.233	2.166	2.130	2.336	2.350	2.152	ns
	6mA	GCLK	t _{co}	3.024	3.246	4.602	5.006	5.520	5.381	5.599	5.133	5.647	5.509	5.667	ns
		GCLK PLL	t _{co}	1.324	1.511	1.927	2.017	2.223	2.237	2.170	2.132	2.340	2.354	2.156	ns
	8mA	GCLK	t _{co}	3.014	3.235	4.591	4.995	5.508	5.369	5.587	5.122	5.635	5.497	5.655	ns
		GCLK PLL	t _{co}	1.314	1.500	1.916	2.006	2.211	2.225	2.158	2.121	2.328	2.342	2.144	ns
	10mA	GCLK	t _{co}	3.012	3.233	4.589	4.992	5.506	5.367	5.585	5.120	5.633	5.495	5.653	ns
		GCLK PLL	t _{co}	1.312	1.498	1.914	2.003	2.209	2.223	2.156	2.119	2.326	2.340	2.142	ns
	12mA	GCLK	t _{co}	3.012	3.234	4.592	4.997	5.511	5.372	5.590	5.124	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.312	1.499	1.917	2.008	2.214	2.228	2.161	2.123	2.332	2.346	2.148	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.016	3.237	4.589	4.992	5.505	5.366	5.584	5.119	5.632	5.494	5.652	ns
		GCLK PLL	t _{co}	1.316	1.502	1.914	2.003	2.208	2.222	2.155	2.118	2.325	2.339	2.141	ns

Table 1–49. EP3SL50 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.042	3.266	4.634	5.040	5.555	5.416	5.634	5.167	5.682	5.544	5.702	ns
		GCLK PLL	t _{co}	1.342	1.531	1.959	2.051	2.258	2.272	2.205	2.166	2.375	2.389	2.191	ns
	6mA	GCLK	t _{co}	3.028	3.252	4.622	5.029	5.545	5.406	5.624	5.157	5.673	5.535	5.693	ns
		GCLK PLL	t _{co}	1.328	1.517	1.947	2.040	2.248	2.262	2.195	2.156	2.366	2.380	2.182	ns
	8mA	GCLK	t _{co}	3.016	3.239	4.605	5.011	5.527	5.388	5.606	5.139	5.655	5.517	5.675	ns
		GCLK PLL	t _{co}	1.316	1.504	1.930	2.022	2.230	2.244	2.177	2.138	2.348	2.362	2.164	ns
	10mA	GCLK	t _{co}	3.016	3.239	4.608	5.015	5.531	5.392	5.610	5.143	5.660	5.522	5.680	ns
		GCLK PLL	t _{co}	1.316	1.504	1.933	2.026	2.234	2.248	2.181	2.142	2.353	2.367	2.169	ns
	12mA	GCLK	t _{co}	3.012	3.235	4.601	5.007	5.524	5.385	5.603	5.136	5.652	5.514	5.672	ns
		GCLK PLL	t _{co}	1.312	1.500	1.926	2.018	2.227	2.241	2.174	2.135	2.345	2.359	2.161	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.016	3.237	4.594	4.998	5.512	5.373	5.591	5.125	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.316	1.502	1.919	2.009	2.215	2.229	2.162	2.124	2.332	2.346	2.148	ns
	16mA	GCLK	t _{co}	3.017	3.239	4.602	5.008	5.523	5.384	5.602	5.135	5.651	5.513	5.671	ns
		GCLK PLL	t _{co}	1.317	1.504	1.927	2.019	2.226	2.240	2.173	2.134	2.344	2.358	2.160	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.045	3.269	4.633	5.038	5.553	5.414	5.632	5.166	5.680	5.542	5.700	ns
		GCLK PLL	t _{co}	1.345	1.534	1.958	2.049	2.256	2.270	2.203	2.165	2.373	2.387	2.189	ns
	6mA	GCLK	t _{co}	3.034	3.257	4.621	5.026	5.541	5.402	5.620	5.154	5.668	5.530	5.688	ns
		GCLK PLL	t _{co}	1.334	1.522	1.946	2.037	2.244	2.258	2.191	2.153	2.361	2.375	2.177	ns
	8mA	GCLK	t _{co}	3.029	3.253	4.621	5.027	5.542	5.403	5.621	5.155	5.670	5.532	5.690	ns
		GCLK PLL	t _{co}	1.329	1.518	1.946	2.038	2.245	2.259	2.192	2.154	2.363	2.377	2.179	ns
	10mA	GCLK	t _{co}	3.015	3.238	4.603	5.008	5.523	5.384	5.602	5.136	5.652	5.514	5.672	ns
		GCLK PLL	t _{co}	1.315	1.503	1.928	2.019	2.226	2.240	2.173	2.135	2.345	2.359	2.161	ns
	12mA	GCLK	t _{co}	3.013	3.236	4.601	5.006	5.521	5.382	5.600	5.134	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.313	1.501	1.926	2.017	2.224	2.238	2.171	2.133	2.342	2.356	2.158	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.017	3.238	4.593	4.996	5.509	5.370	5.588	5.123	5.636	5.498	5.656	ns
		GCLK PLL	t _{co}	1.317	1.503	1.918	2.007	2.212	2.226	2.159	2.122	2.329	2.343	2.145	ns
	16mA	GCLK	t _{co}	3.017	3.239	4.601	5.006	5.521	5.382	5.600	5.134	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.317	1.504	1.926	2.017	2.224	2.238	2.171	2.133	2.342	2.356	2.158	ns

Table 1-49. EP3SL50 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.033	3.256	4.617	5.021	5.535	5.396	5.614	5.149	5.662	5.524	5.682	ns
		GCLK PLL	t _{co}	1.333	1.521	1.942	2.032	2.238	2.252	2.185	2.148	2.355	2.369	2.171	ns
	10mA	GCLK	t _{co}	3.033	3.256	4.617	5.021	5.535	5.396	5.614	5.149	5.662	5.524	5.682	ns
		GCLK PLL	t _{co}	1.333	1.521	1.942	2.032	2.238	2.252	2.185	2.148	2.355	2.369	2.171	ns
	12mA	GCLK	t _{co}	3.023	3.246	4.607	5.011	5.525	5.386	5.604	5.139	5.653	5.515	5.673	ns
		GCLK PLL	t _{co}	1.323	1.511	1.932	2.022	2.228	2.242	2.175	2.138	2.346	2.360	2.162	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.016	3.238	4.593	4.996	5.509	5.370	5.588	5.123	5.636	5.498	5.656	ns
		GCLK PLL	t _{co}	1.316	1.503	1.918	2.007	2.212	2.226	2.159	2.122	2.329	2.343	2.145	ns

Table 1-50 specifies EP3SL50 row pins output timing parameters for differential I/O standards.

Table 1-50. EP3SL50 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns
LVDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
LVDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
MINI-LVDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
RSDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns

Table 1-50. EP3SL50 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
RSDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.079	3.311	4.706	5.119	5.644	5.501	5.700	5.254	5.781	5.637	5.767	ns
		GCLK PLL	t _{co}	1.402	1.595	2.054	2.156	2.371	2.383	2.293	2.278	2.498	2.506	2.281	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	6mA	GCLK	t _{co}	3.065	3.297	4.693	5.106	5.631	5.488	5.687	5.240	5.768	5.624	5.754	ns
		GCLK PLL	t _{co}	1.388	1.581	2.041	2.143	2.358	2.370	2.280	2.264	2.485	2.493	2.268	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	8mA	GCLK	t _{co}	3.061	3.293	4.691	5.106	5.632	5.489	5.688	5.240	5.770	5.626	5.756	ns
		GCLK PLL	t _{co}	1.384	1.577	2.039	2.143	2.359	2.371	2.281	2.264	2.487	2.495	2.270	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.077	3.308	4.692	5.103	5.626	5.483	5.682	5.237	5.763	5.619	5.749	ns
		GCLK PLL	t _{co}	1.400	1.592	2.040	2.140	2.353	2.365	2.275	2.261	2.480	2.488	2.263	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	6mA	GCLK	t _{co}	3.066	3.298	4.688	5.099	5.623	5.480	5.679	5.234	5.760	5.616	5.746	ns
		GCLK PLL	t _{co}	1.389	1.582	2.036	2.136	2.350	2.362	2.272	2.258	2.477	2.485	2.260	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	8mA	GCLK	t _{co}	3.063	3.295	4.686	5.097	5.621	5.478	5.677	5.232	5.759	5.615	5.745	ns
		GCLK PLL	t _{co}	1.386	1.579	2.034	2.134	2.348	2.360	2.270	2.256	2.476	2.484	2.259	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.074	3.305	4.687	5.098	5.620	5.477	5.676	5.231	5.757	5.613	5.743	ns
		GCLK PLL	t _{co}	1.397	1.589	2.035	2.135	2.347	2.359	2.269	2.255	2.474	2.482	2.257	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	6mA	GCLK	t _{co}	3.064	3.296	4.685	5.096	5.619	5.476	5.675	5.231	5.757	5.613	5.743	ns
		GCLK PLL	t _{co}	1.387	1.580	2.033	2.133	2.346	2.358	2.268	2.255	2.474	2.482	2.257	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	8mA	GCLK	t _{co}	3.050	3.282	4.670	5.081	5.605	5.462	5.661	5.216	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.373	1.566	2.018	2.118	2.332	2.344	2.254	2.240	2.459	2.467	2.242	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	10mA	GCLK	t _{co}	3.047	3.278	4.666	5.077	5.601	5.458	5.657	5.212	5.738	5.594	5.724	ns
		GCLK PLL	t _{co}	1.370	1.562	2.014	2.114	2.328	2.340	2.250	2.236	2.455	2.463	2.238	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	12mA	GCLK	t _{co}	3.044	3.276	4.667	5.080	5.604	5.461	5.660	5.215	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.367	1.560	2.015	2.117	2.331	2.343	2.253	2.239	2.459	2.467	2.242	ns

Table 1-50. EP3SL50 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.045	3.276	4.657	5.068	5.591	5.448	5.647	5.202	5.728	5.584	5.714	ns
		GCLK PLL	t _{co}	1.368	1.560	2.005	2.105	2.318	2.330	2.240	2.226	2.445	2.453	2.228	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.094	3.329	4.728	5.141	5.667	5.524	5.723	5.276	5.804	5.660	5.790	ns
		GCLK PLL	t _{co}	1.417	1.613	2.076	2.178	2.394	2.406	2.316	2.300	2.521	2.529	2.304	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	6mA	GCLK	t _{co}	3.070	3.305	4.710	5.124	5.650	5.507	5.706	5.259	5.789	5.645	5.775	ns
		GCLK PLL	t _{co}	1.393	1.589	2.058	2.161	2.377	2.389	2.299	2.283	2.506	2.514	2.289	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.052	3.286	4.688	5.102	5.628	5.485	5.684	5.237	5.767	5.623	5.753	ns
		GCLK PLL	t _{co}	1.375	1.570	2.036	2.139	2.355	2.367	2.277	2.261	2.484	2.492	2.267	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.098	3.332	4.728	5.141	5.666	5.523	5.722	5.276	5.804	5.660	5.790	ns
		GCLK PLL	t _{co}	1.421	1.616	2.076	2.178	2.393	2.405	2.315	2.300	2.521	2.529	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	6mA	GCLK	t _{co}	3.083	3.317	4.714	5.126	5.651	5.508	5.707	5.261	5.789	5.645	5.775	ns
		GCLK PLL	t _{co}	1.406	1.601	2.062	2.163	2.378	2.390	2.300	2.285	2.506	2.514	2.289	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	8mA	GCLK	t _{co}	3.072	3.306	4.709	5.123	5.648	5.505	5.704	5.258	5.787	5.643	5.773	ns
		GCLK PLL	t _{co}	1.395	1.590	2.057	2.160	2.375	2.387	2.297	2.282	2.504	2.512	2.287	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	10mA	GCLK	t _{co}	3.052	3.286	4.686	5.099	5.625	5.482	5.681	5.235	5.763	5.619	5.749	ns
		GCLK PLL	t _{co}	1.375	1.570	2.034	2.136	2.352	2.364	2.274	2.259	2.480	2.488	2.263	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	12mA	GCLK	t _{co}	3.049	3.282	4.682	5.096	5.621	5.478	5.677	5.231	5.760	5.616	5.746	ns
		GCLK PLL	t _{co}	1.372	1.566	2.030	2.133	2.348	2.360	2.270	2.255	2.477	2.485	2.260	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.054	3.286	4.673	5.084	5.607	5.464	5.663	5.218	5.744	5.600	5.730	ns
		GCLK PLL	t _{co}	1.377	1.570	2.021	2.121	2.334	2.346	2.256	2.242	2.461	2.469	2.244	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	16mA	GCLK	t _{co}	3.047	3.279	4.672	5.085	5.610	5.467	5.666	5.221	5.749	5.605	5.735	ns
		GCLK PLL	t _{co}	1.370	1.563	2.020	2.122	2.337	2.349	2.259	2.245	2.466	2.474	2.249	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.075	3.308	4.700	5.112	5.636	5.493	5.692	5.247	5.774	5.630	5.760	ns
		GCLK PLL	t _{co}	1.418	1.612	2.068	2.169	2.383	2.395	2.305	2.291	2.511	2.519	2.294	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	12mA	GCLK	t _{co}	3.057	3.291	4.685	5.097	5.621	5.478	5.677	5.232	5.759	5.615	5.745	ns
		GCLK PLL	t _{co}	1.400	1.595	2.053	2.154	2.368	2.380	2.290	2.276	2.496	2.504	2.279	ns

Table 1–50. EP3SL50 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{co}	3.043	3.275	4.662	5.073	5.596	5.453	5.652	5.208	5.734	5.590	5.720	ns
		GCLK PLL	t_{co}	1.386	1.579	2.030	2.130	2.343	2.355	2.265	2.252	2.471	2.479	2.254	ns

Table 1–51 and Table 1–52 show EP3SL50 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III.

Table 1–51 specifies EP3SL50 Column Pin delay adders when using the regional clock.

Table 1–51. EP3SL50 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.239	0.258	0.341	0.365	0.39	0.377	0.439	0.375	0.399	0.388	0.441	ns
RCLK PLL input adder	0.008	0.009	0.014	0.017	0.019	0.017	0.02	0.018	0.019	0.017	0.02	ns
RCLK output adder	-0.068	-0.07	-0.09	-0.092	-0.094	-0.091	-0.169	-0.086	-0.087	-0.09	-0.17	ns
RCLK PLL output adder	1.614	1.649	2.575	2.89	3.164	3.011	3.22	2.908	3.217	3.063	3.338	ns

Table 1–52 specifies EP3SL50 Row Pin delay adders when using the regional clock.

Table 1–52. EP3SL50 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.111	0.124	0.178	0.193	0.208	0.2	0.263	0.197	0.213	0.203	0.266	ns
RCLK PLL input adder	0.101	0.107	0.156	0.174	0.194	0.184	0.251	0.177	0.196	0.188	0.249	ns
RCLK output adder	-0.113	-0.127	-0.181	-0.196	-0.213	-0.205	-0.271	-0.199	-0.217	-0.209	-0.273	ns
RCLK PLL output adder	-0.107	-0.113	-0.164	-0.185	-0.213	-0.2	-0.266	-0.184	-0.212	-0.198	-0.262	ns

EP3SL70 I/O Timing Parameters

Table 1–53 through Table 1–56 show the maximum I/O timing parameters for EP3SL70 devices for single-ended I/O standards.

Table 1–53 specifies EP3SL70 column pins input timing parameters for single-ended I/O standards.

Table 1-53. EP3SL70 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.833	-0.844	-1.217	-1.340	-1.572	-1.515	-1.800	-1.346	-1.561	-1.510	-1.828	ns
		t _h	0.948	0.974	1.405	1.550	1.804	1.734	2.022	1.565	1.803	1.738	2.048	ns
	GCLK PLL	t _{su}	0.811	0.836	1.371	1.560	1.635	1.535	1.356	1.565	1.655	1.552	1.412	ns
		t _h	-0.566	-0.577	-0.984	-1.120	-1.144	-1.074	-0.889	-1.116	-1.153	-1.083	-0.944	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.833	-0.844	-1.217	-1.340	-1.572	-1.515	-1.800	-1.346	-1.561	-1.510	-1.828	ns
		t _h	0.948	0.974	1.405	1.550	1.804	1.734	2.022	1.565	1.803	1.738	2.048	ns
	GCLK PLL	t _{su}	0.811	0.836	1.371	1.560	1.635	1.535	1.356	1.565	1.655	1.552	1.412	ns
		t _h	-0.566	-0.577	-0.984	-1.120	-1.144	-1.074	-0.889	-1.116	-1.153	-1.083	-0.944	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.839	-0.855	-1.216	-1.342	-1.571	-1.514	-1.799	-1.346	-1.566	-1.515	-1.833	ns
		t _h	0.954	0.985	1.404	1.552	1.803	1.733	2.021	1.565	1.808	1.743	2.053	ns
	GCLK PLL	t _{su}	0.805	0.825	1.372	1.558	1.636	1.536	1.357	1.565	1.650	1.547	1.407	ns
		t _h	-0.560	-0.566	-0.985	-1.118	-1.145	-1.075	-0.890	-1.116	-1.148	-1.078	-0.939	ns
3.0-V LVCMOS	GCLK	t _{su}	-0.839	-0.855	-1.216	-1.342	-1.571	-1.514	-1.799	-1.346	-1.566	-1.515	-1.833	ns
		t _h	0.954	0.985	1.404	1.552	1.803	1.733	2.021	1.565	1.808	1.743	2.053	ns
	GCLK PLL	t _{su}	0.805	0.825	1.372	1.558	1.636	1.536	1.357	1.565	1.650	1.547	1.407	ns
		t _h	-0.560	-0.566	-0.985	-1.118	-1.145	-1.075	-0.890	-1.116	-1.148	-1.078	-0.939	ns
2.5 V	GCLK	t _{su}	-0.829	-0.850	-1.225	-1.354	-1.590	-1.533	-1.818	-1.356	-1.577	-1.526	-1.844	ns
		t _h	0.944	0.980	1.413	1.564	1.822	1.752	2.040	1.575	1.819	1.754	2.064	ns
	GCLK PLL	t _{su}	0.815	0.830	1.363	1.546	1.617	1.517	1.338	1.555	1.639	1.536	1.396	ns
		t _h	-0.570	-0.571	-0.976	-1.106	-1.126	-1.056	-0.871	-1.106	-1.137	-1.067	-0.928	ns
1.8 V	GCLK	t _{su}	-0.845	-0.870	-1.265	-1.390	-1.588	-1.531	-1.816	-1.390	-1.580	-1.529	-1.847	ns
		t _h	0.962	1.002	1.453	1.600	1.820	1.750	2.038	1.609	1.822	1.757	2.067	ns
	GCLK PLL	t _{su}	0.799	0.810	1.323	1.510	1.619	1.519	1.340	1.521	1.636	1.533	1.393	ns
		t _h	-0.552	-0.549	-0.936	-1.070	-1.128	-1.058	-0.873	-1.072	-1.134	-1.064	-0.925	ns
1.5 V	GCLK	t _{su}	-0.838	-0.860	-1.242	-1.358	-1.518	-1.461	-1.746	-1.359	-1.514	-1.463	-1.781	ns
		t _h	0.955	0.992	1.430	1.568	1.750	1.680	1.968	1.578	1.756	1.691	2.001	ns
	GCLK PLL	t _{su}	0.806	0.820	1.346	1.542	1.689	1.589	1.410	1.552	1.702	1.599	1.459	ns
		t _h	-0.559	-0.559	-0.959	-1.102	-1.198	-1.128	-0.943	-1.103	-1.200	-1.130	-0.991	ns
1.2 V	GCLK	t _{su}	-0.778	-0.808	-1.165	-1.259	-1.362	-1.305	-1.590	-1.263	-1.361	-1.310	-1.628	ns
		t _h	0.895	0.940	1.353	1.469	1.594	1.524	1.812	1.482	1.603	1.538	1.848	ns
	GCLK PLL	t _{su}	0.866	0.872	1.423	1.641	1.845	1.745	1.566	1.648	1.855	1.752	1.612	ns
		t _h	-0.619	-0.611	-1.036	-1.201	-1.354	-1.284	-1.099	-1.199	-1.353	-1.283	-1.144	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.759	-0.779	-1.137	-1.243	-1.364	-1.307	-1.592	-1.242	-1.357	-1.306	-1.624	ns
		t _h	0.876	0.911	1.325	1.453	1.596	1.526	1.814	1.461	1.599	1.534	1.844	ns
	GCLK PLL	t _{su}	0.885	0.901	1.451	1.657	1.843	1.743	1.564	1.669	1.859	1.756	1.616	ns
		t _h	-0.638	-0.640	-1.064	-1.217	-1.352	-1.282	-1.097	-1.220	-1.357	-1.287	-1.148	ns

Table 1-53. EP3SL70 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
SSTL-2 CLASS II	GCLK	t_{su}	-0.759	-0.779	-1.137	-1.243	-1.364	-1.307	-1.592	-1.242	-1.357	-1.306	-1.624	ns
		t_h	0.876	0.911	1.325	1.453	1.596	1.526	1.814	1.461	1.599	1.534	1.844	ns
	GCLK PLL	t_{su}	0.885	0.901	1.451	1.657	1.843	1.743	1.564	1.669	1.859	1.756	1.616	ns
		t_h	-0.638	-0.640	-1.064	-1.217	-1.352	-1.282	-1.097	-1.220	-1.357	-1.287	-1.148	ns
SSTL-18 CLASS I	GCLK	t_{su}	-0.752	-0.773	-1.125	-1.238	-1.364	-1.305	-1.593	-1.238	-1.362	-1.308	-1.628	ns
		t_h	0.869	0.905	1.312	1.445	1.593	1.523	1.810	1.454	1.599	1.535	1.843	ns
	GCLK PLL	t_{su}	0.892	0.907	1.463	1.662	1.843	1.745	1.566	1.673	1.854	1.754	1.615	ns
		t_h	-0.645	-0.646	-1.077	-1.225	-1.355	-1.285	-1.104	-1.227	-1.357	-1.286	-1.152	ns
SSTL-18 CLASS II	GCLK	t_{su}	-0.752	-0.773	-1.125	-1.238	-1.364	-1.305	-1.593	-1.238	-1.362	-1.308	-1.628	ns
		t_h	0.869	0.905	1.312	1.445	1.593	1.523	1.810	1.454	1.599	1.535	1.843	ns
	GCLK PLL	t_{su}	0.892	0.907	1.463	1.662	1.843	1.745	1.566	1.673	1.854	1.754	1.615	ns
		t_h	-0.645	-0.646	-1.077	-1.225	-1.355	-1.285	-1.104	-1.227	-1.357	-1.286	-1.152	ns
SSTL-15 CLASS I	GCLK	t_{su}	-0.740	-0.762	-1.116	-1.227	-1.345	-1.286	-1.574	-1.227	-1.344	-1.290	-1.610	ns
		t_h	0.857	0.894	1.302	1.434	1.574	1.504	1.791	1.443	1.581	1.517	1.825	ns
	GCLK PLL	t_{su}	0.904	0.918	1.472	1.673	1.862	1.764	1.585	1.684	1.872	1.772	1.633	ns
		t_h	-0.657	-0.657	-1.087	-1.236	-1.374	-1.304	-1.123	-1.238	-1.375	-1.304	-1.170	ns
1.8-V HSTL CLASS I	GCLK	t_{su}	-0.740	-0.762	-1.116	-1.227	-1.345	-1.286	-1.574	-1.227	-1.344	-1.290	-1.610	ns
		t_h	0.857	0.894	1.302	1.434	1.574	1.504	1.791	1.443	1.581	1.517	1.825	ns
	GCLK PLL	t_{su}	0.904	0.918	1.472	1.673	1.862	1.764	1.585	1.684	1.872	1.772	1.633	ns
		t_h	-0.657	-0.657	-1.087	-1.236	-1.374	-1.304	-1.123	-1.238	-1.375	-1.304	-1.170	ns
1.8-V HSTL CLASS II	GCLK	t_{su}	-0.752	-0.773	-1.125	-1.238	-1.364	-1.305	-1.593	-1.238	-1.362	-1.308	-1.628	ns
		t_h	0.869	0.905	1.312	1.445	1.593	1.523	1.810	1.454	1.599	1.535	1.843	ns
	GCLK PLL	t_{su}	0.892	0.907	1.463	1.662	1.843	1.745	1.566	1.673	1.854	1.754	1.615	ns
		t_h	-0.645	-0.646	-1.077	-1.225	-1.355	-1.285	-1.104	-1.227	-1.357	-1.286	-1.152	ns
1.5-V HSTL CLASS I	GCLK	t_{su}	-0.752	-0.773	-1.125	-1.238	-1.364	-1.305	-1.593	-1.238	-1.362	-1.308	-1.628	ns
		t_h	0.869	0.905	1.312	1.445	1.593	1.523	1.810	1.454	1.599	1.535	1.843	ns
	GCLK PLL	t_{su}	0.892	0.907	1.463	1.662	1.843	1.745	1.566	1.673	1.854	1.754	1.615	ns
		t_h	-0.645	-0.646	-1.077	-1.225	-1.355	-1.285	-1.104	-1.227	-1.357	-1.286	-1.152	ns
1.5-V HSTL CLASS II	GCLK	t_{su}	-0.740	-0.762	-1.116	-1.227	-1.345	-1.286	-1.574	-1.227	-1.344	-1.290	-1.610	ns
		t_h	0.857	0.894	1.302	1.434	1.574	1.504	1.791	1.443	1.581	1.517	1.825	ns
	GCLK PLL	t_{su}	0.904	0.918	1.472	1.673	1.862	1.764	1.585	1.684	1.872	1.772	1.633	ns
		t_h	-0.657	-0.657	-1.087	-1.236	-1.374	-1.304	-1.123	-1.238	-1.375	-1.304	-1.170	ns
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.740	-0.762	-1.116	-1.227	-1.345	-1.286	-1.574	-1.227	-1.344	-1.290	-1.610	ns
		t_h	0.857	0.894	1.302	1.434	1.574	1.504	1.791	1.443	1.581	1.517	1.825	ns
	GCLK PLL	t_{su}	0.904	0.918	1.472	1.673	1.862	1.764	1.585	1.684	1.872	1.772	1.633	ns
		t_h	-0.657	-0.657	-1.087	-1.236	-1.374	-1.304	-1.123	-1.238	-1.375	-1.304	-1.170	ns

Table 1-53. EP3SL70 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.732	-0.750	-1.106	-1.216	-1.329	-1.270	-1.558	-1.216	-1.329	-1.275	-1.595	ns
		t_h	0.849	0.882	1.292	1.423	1.558	1.488	1.775	1.432	1.566	1.502	1.810	ns
	GCLK PLL	t_{su}	0.912	0.930	1.482	1.684	1.878	1.780	1.601	1.695	1.887	1.787	1.648	ns
		t_h	-0.665	-0.669	-1.097	-1.247	-1.390	-1.320	-1.139	-1.249	-1.390	-1.319	-1.185	ns
3.0-V PCI	GCLK	t_{su}	-0.732	-0.750	-1.106	-1.216	-1.329	-1.270	-1.558	-1.216	-1.329	-1.275	-1.595	ns
		t_h	0.849	0.882	1.292	1.423	1.558	1.488	1.775	1.432	1.566	1.502	1.810	ns
	GCLK PLL	t_{su}	0.912	0.930	1.482	1.684	1.878	1.780	1.601	1.695	1.887	1.787	1.648	ns
		t_h	-0.665	-0.669	-1.097	-1.247	-1.390	-1.320	-1.139	-1.249	-1.390	-1.319	-1.185	ns
3.0-V PCI-X	GCLK	t_{su}	-0.839	-0.855	-1.216	-1.342	-1.571	-1.514	-1.799	-1.346	-1.566	-1.515	-1.833	ns
		t_h	0.954	0.985	1.404	1.552	1.803	1.733	2.021	1.565	1.808	1.743	2.053	ns
	GCLK PLL	t_{su}	0.805	0.825	1.372	1.558	1.636	1.536	1.357	1.565	1.650	1.547	1.407	ns
		t_h	-0.560	-0.566	-0.985	-1.118	-1.145	-1.075	-0.890	-1.116	-1.148	-1.078	-0.939	ns

Table 1-54 specifies EP3SL70 row pins input timing parameters for single-ended I/O standards.

Table 1-54. EP3SL70 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-0.811	-0.836	-1.185	-1.296	-1.513	-1.460	-1.732	-1.306	-1.513	-1.464	-1.763	ns
		t_h	0.925	0.962	1.371	1.505	1.747	1.679	1.951	1.526	1.756	1.693	1.982	ns
	GCLK PLL	t_{su}	0.937	0.945	1.582	1.801	1.915	1.799	1.814	1.796	1.923	1.804	1.865	ns
		t_h	-0.688	-0.684	-1.184	-1.352	-1.415	-1.329	-1.338	-1.339	-1.411	-1.325	-1.386	ns
3.3-V LVCMOS	GCLK	t_{su}	-0.811	-0.836	-1.185	-1.296	-1.513	-1.460	-1.732	-1.306	-1.513	-1.464	-1.763	ns
		t_h	0.925	0.962	1.371	1.505	1.747	1.679	1.951	1.526	1.756	1.693	1.982	ns
	GCLK PLL	t_{su}	0.937	0.945	1.582	1.801	1.915	1.799	1.814	1.796	1.923	1.804	1.865	ns
		t_h	-0.688	-0.684	-1.184	-1.352	-1.415	-1.329	-1.338	-1.339	-1.411	-1.325	-1.386	ns
3.0-V LVTTTL	GCLK	t_{su}	-0.817	-0.847	-1.182	-1.297	-1.516	-1.463	-1.735	-1.305	-1.518	-1.469	-1.768	ns
		t_h	0.931	0.973	1.368	1.506	1.750	1.682	1.954	1.525	1.761	1.698	1.987	ns
	GCLK PLL	t_{su}	0.931	0.934	1.585	1.800	1.912	1.796	1.811	1.797	1.918	1.799	1.860	ns
		t_h	-0.682	-0.673	-1.187	-1.351	-1.412	-1.326	-1.335	-1.340	-1.406	-1.320	-1.381	ns
3.0-V LVCMOS	GCLK	t_{su}	-0.817	-0.847	-1.182	-1.297	-1.516	-1.463	-1.735	-1.305	-1.518	-1.469	-1.768	ns
		t_h	0.931	0.973	1.368	1.506	1.750	1.682	1.954	1.525	1.761	1.698	1.987	ns
	GCLK PLL	t_{su}	0.931	0.934	1.585	1.800	1.912	1.796	1.811	1.797	1.918	1.799	1.860	ns
		t_h	-0.682	-0.673	-1.187	-1.351	-1.412	-1.326	-1.335	-1.340	-1.406	-1.320	-1.381	ns

Table 1-54. EP3SL70 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
2.5 V	GCLK	t _{su}	-0.805	-0.840	-1.191	-1.310	-1.531	-1.478	-1.750	-1.314	-1.528	-1.479	-1.778	ns
		t _h	0.919	0.966	1.377	1.519	1.765	1.697	1.969	1.534	1.771	1.708	1.997	ns
	GCLK PLL	t _{su}	0.943	0.941	1.576	1.787	1.897	1.781	1.796	1.788	1.908	1.789	1.850	ns
		t _h	-0.694	-0.680	-1.178	-1.338	-1.397	-1.311	-1.320	-1.331	-1.396	-1.310	-1.371	ns
1.8 V	GCLK	t _{su}	-0.946	-0.899	-1.259	-1.469	-1.662	-1.607	-1.898	-1.507	-1.694	-1.641	-1.931	ns
		t _h	1.060	1.028	1.447	1.676	1.892	1.823	2.114	1.723	1.933	1.867	2.146	ns
	GCLK PLL	t _{su}	0.914	0.891	1.518	1.758	1.994	1.874	1.798	1.758	1.917	1.798	1.849	ns
		t _h	-0.666	-0.629	-1.121	-1.310	-1.490	-1.401	-1.322	-1.300	-1.405	-1.319	-1.370	ns
1.5 V	GCLK	t _{su}	-0.936	-0.888	-1.235	-1.437	-1.594	-1.539	-1.830	-1.476	-1.629	-1.576	-1.866	ns
		t _h	1.050	1.017	1.423	1.644	1.824	1.755	2.046	1.692	1.868	1.802	2.081	ns
	GCLK PLL	t _{su}	0.924	0.902	1.542	1.790	2.062	1.942	1.866	1.789	1.982	1.863	1.914	ns
		t _h	-0.676	-0.640	-1.145	-1.342	-1.558	-1.469	-1.390	-1.331	-1.470	-1.384	-1.435	ns
1.2 V	GCLK	t _{su}	-0.876	-0.835	-1.156	-1.336	-1.435	-1.380	-1.671	-1.380	-1.474	-1.421	-1.711	ns
		t _h	0.990	0.964	1.344	1.543	1.665	1.596	1.887	1.596	1.713	1.647	1.926	ns
	GCLK PLL	t _{su}	0.984	0.955	1.621	1.891	2.221	2.101	2.025	1.885	2.137	2.018	2.069	ns
		t _h	-0.736	-0.693	-1.224	-1.443	-1.717	-1.628	-1.549	-1.427	-1.625	-1.539	-1.590	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.747	-0.781	-1.105	-1.201	-1.311	-1.258	-1.530	-1.202	-1.311	-1.262	-1.561	ns
		t _h	0.862	0.908	1.291	1.410	1.545	1.477	1.749	1.422	1.554	1.491	1.780	ns
	GCLK PLL	t _{su}	1.000	0.999	1.662	1.896	2.117	2.001	2.016	1.900	2.125	2.006	2.067	ns
		t _h	-0.750	-0.737	-1.264	-1.447	-1.617	-1.531	-1.540	-1.443	-1.613	-1.527	-1.588	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.747	-0.781	-1.105	-1.201	-1.311	-1.258	-1.530	-1.202	-1.311	-1.262	-1.561	ns
		t _h	0.862	0.908	1.291	1.410	1.545	1.477	1.749	1.422	1.554	1.491	1.780	ns
	GCLK PLL	t _{su}	1.000	0.999	1.662	1.896	2.117	2.001	2.016	1.900	2.125	2.006	2.067	ns
		t _h	-0.750	-0.737	-1.264	-1.447	-1.617	-1.531	-1.540	-1.443	-1.613	-1.527	-1.588	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.850	-0.800	-1.118	-1.309	-1.430	-1.374	-1.667	-1.348	-1.467	-1.413	-1.704	ns
		t _h	0.964	0.929	1.306	1.514	1.658	1.589	1.879	1.562	1.703	1.638	1.915	ns
	GCLK PLL	t _{su}	1.010	0.990	1.659	1.918	2.223	2.104	2.029	1.917	2.144	2.026	2.076	ns
		t _h	-0.762	-0.728	-1.262	-1.472	-1.722	-1.633	-1.557	-1.461	-1.635	-1.548	-1.601	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.850	-0.800	-1.118	-1.309	-1.430	-1.374	-1.667	-1.348	-1.467	-1.413	-1.704	ns
		t _h	0.964	0.929	1.306	1.514	1.658	1.589	1.879	1.562	1.703	1.638	1.915	ns
	GCLK PLL	t _{su}	1.010	0.990	1.659	1.918	2.223	2.104	2.029	1.917	2.144	2.026	2.076	ns
		t _h	-0.762	-0.728	-1.262	-1.472	-1.722	-1.633	-1.557	-1.461	-1.635	-1.548	-1.601	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.836	-0.788	-1.105	-1.299	-1.412	-1.356	-1.649	-1.337	-1.450	-1.396	-1.687	ns
		t _h	0.950	0.917	1.294	1.504	1.640	1.571	1.861	1.551	1.686	1.621	1.898	ns
	GCLK PLL	t _{su}	1.024	1.002	1.674	1.928	2.241	2.122	2.047	1.928	2.161	2.043	2.093	ns
		t _h	-0.776	-0.740	-1.276	-1.482	-1.740	-1.651	-1.575	-1.472	-1.652	-1.565	-1.618	ns

Table 1-54. EP3SL70 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.850	-0.800	-1.118	-1.309	-1.430	-1.374	-1.667	-1.348	-1.467	-1.413	-1.704	ns
		t _h	0.964	0.929	1.306	1.514	1.658	1.589	1.879	1.562	1.703	1.638	1.915	ns
	GCLK PLL	t _{su}	1.010	0.990	1.659	1.918	2.223	2.104	2.029	1.917	2.144	2.026	2.076	ns
		t _h	-0.762	-0.728	-1.262	-1.472	-1.722	-1.633	-1.557	-1.461	-1.635	-1.548	-1.601	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.850	-0.800	-1.118	-1.309	-1.430	-1.374	-1.667	-1.348	-1.467	-1.413	-1.704	ns
		t _h	0.964	0.929	1.306	1.514	1.658	1.589	1.879	1.562	1.703	1.638	1.915	ns
	GCLK PLL	t _{su}	1.010	0.990	1.659	1.918	2.223	2.104	2.029	1.917	2.144	2.026	2.076	ns
		t _h	-0.762	-0.728	-1.262	-1.472	-1.722	-1.633	-1.557	-1.461	-1.635	-1.548	-1.601	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.836	-0.788	-1.105	-1.299	-1.412	-1.356	-1.649	-1.337	-1.450	-1.396	-1.687	ns
		t _h	0.950	0.917	1.294	1.504	1.640	1.571	1.861	1.551	1.686	1.621	1.898	ns
	GCLK PLL	t _{su}	1.024	1.002	1.674	1.928	2.241	2.122	2.047	1.928	2.161	2.043	2.093	ns
		t _h	-0.776	-0.740	-1.276	-1.482	-1.740	-1.651	-1.575	-1.472	-1.652	-1.565	-1.618	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.836	-0.788	-1.105	-1.299	-1.412	-1.356	-1.649	-1.337	-1.450	-1.396	-1.687	ns
		t _h	0.950	0.917	1.294	1.504	1.640	1.571	1.861	1.551	1.686	1.621	1.898	ns
	GCLK PLL	t _{su}	1.024	1.002	1.674	1.928	2.241	2.122	2.047	1.928	2.161	2.043	2.093	ns
		t _h	-0.776	-0.740	-1.276	-1.482	-1.740	-1.651	-1.575	-1.472	-1.652	-1.565	-1.618	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.827	-0.776	-1.096	-1.289	-1.396	-1.340	-1.633	-1.328	-1.434	-1.380	-1.671	ns
		t _h	0.941	0.905	1.285	1.494	1.624	1.555	1.845	1.542	1.670	1.605	1.882	ns
	GCLK PLL	t _{su}	1.033	1.014	1.683	1.938	2.257	2.138	2.063	1.937	2.177	2.059	2.109	ns
		t _h	-0.785	-0.752	-1.285	-1.492	-1.756	-1.667	-1.591	-1.481	-1.668	-1.581	-1.634	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.827	-0.776	-1.096	-1.289	-1.396	-1.340	-1.633	-1.328	-1.434	-1.380	-1.671	ns
		t _h	0.941	0.905	1.285	1.494	1.624	1.555	1.845	1.542	1.670	1.605	1.882	ns
	GCLK PLL	t _{su}	1.033	1.014	1.683	1.938	2.257	2.138	2.063	1.937	2.177	2.059	2.109	ns
		t _h	-0.785	-0.752	-1.285	-1.492	-1.756	-1.667	-1.591	-1.481	-1.668	-1.581	-1.634	ns
3.0-V PCI	GCLK	t _{su}	-0.817	-0.847	-1.182	-1.297	-1.516	-1.463	-1.735	-1.305	-1.518	-1.469	-1.768	ns
		t _h	0.931	0.973	1.368	1.506	1.750	1.682	1.954	1.525	1.761	1.698	1.987	ns
	GCLK PLL	t _{su}	0.931	0.934	1.585	1.800	1.912	1.796	1.811	1.797	1.918	1.799	1.860	ns
		t _h	-0.682	-0.673	-1.187	-1.351	-1.412	-1.326	-1.335	-1.340	-1.406	-1.320	-1.381	ns
3.0-V PCI-X	GCLK	t _{su}	-0.817	-0.847	-1.182	-1.297	-1.516	-1.463	-1.735	-1.305	-1.518	-1.469	-1.768	ns
		t _h	0.931	0.973	1.368	1.506	1.750	1.682	1.954	1.525	1.761	1.698	1.987	ns
	GCLK PLL	t _{su}	0.931	0.934	1.585	1.800	1.912	1.796	1.811	1.797	1.918	1.799	1.860	ns
		t _h	-0.682	-0.673	-1.187	-1.351	-1.412	-1.326	-1.335	-1.340	-1.406	-1.320	-1.381	ns

Table 1–55 specifies EP3SL70 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.064	3.283	4.557	4.943	5.437	5.303	5.531	5.064	5.556	5.426	5.600	ns
		GCLK PLL	t _{co}	1.553	1.738	2.181	2.288	2.504	2.508	2.475	2.397	2.615	2.620	2.463	ns
	8mA	GCLK	t _{co}	2.985	3.194	4.454	4.831	5.320	5.186	5.414	4.948	5.436	5.306	5.480	ns
		GCLK PLL	t _{co}	1.474	1.649	2.077	2.176	2.387	2.391	2.358	2.281	2.495	2.500	2.343	ns
	12mA	GCLK	t _{co}	2.956	3.162	4.387	4.761	5.250	5.116	5.344	4.878	5.369	5.239	5.413	ns
		GCLK PLL	t _{co}	1.444	1.617	2.010	2.106	2.317	2.321	2.288	2.211	2.428	2.433	2.275	ns
	16mA	GCLK	t _{co}	2.942	3.148	4.366	4.738	5.222	5.088	5.316	4.852	5.336	5.206	5.380	ns
		GCLK PLL	t _{co}	1.430	1.603	1.989	2.083	2.289	2.293	2.260	2.185	2.394	2.399	2.241	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.002	3.216	4.484	4.860	5.349	5.215	5.443	4.978	5.468	5.338	5.512	ns
		GCLK PLL	t _{co}	1.490	1.671	2.108	2.205	2.416	2.420	2.388	2.311	2.527	2.532	2.375	ns
	8mA	GCLK	t _{co}	2.931	3.139	4.362	4.734	5.218	5.084	5.312	4.848	5.331	5.201	5.375	ns
		GCLK PLL	t _{co}	1.419	1.594	1.986	2.079	2.285	2.289	2.256	2.181	2.390	2.395	2.237	ns
	12mA	GCLK	t _{co}	2.906	3.111	4.333	4.707	5.193	5.059	5.287	4.821	5.306	5.176	5.350	ns
		GCLK PLL	t _{co}	1.395	1.566	1.957	2.052	2.260	2.264	2.230	2.154	2.365	2.370	2.211	ns
	16mA	GCLK	t _{co}	2.899	3.104	4.325	4.698	5.184	5.050	5.278	4.812	5.297	5.167	5.341	ns
		GCLK PLL	t _{co}	1.388	1.559	1.949	2.043	2.251	2.255	2.221	2.144	2.355	2.360	2.201	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.062	3.292	4.591	4.979	5.476	5.342	5.570	5.103	5.598	5.468	5.642	ns
		GCLK PLL	t _{co}	1.550	1.747	2.215	2.324	2.543	2.547	2.534	2.435	2.657	2.662	2.504	ns
	8mA	GCLK	t _{co}	2.995	3.207	4.487	4.868	5.360	5.226	5.454	4.988	5.480	5.350	5.524	ns
		GCLK PLL	t _{co}	1.483	1.662	2.111	2.212	2.427	2.431	2.440	2.321	2.538	2.543	2.386	ns
	12mA	GCLK	t _{co}	2.957	3.170	4.419	4.796	5.286	5.152	5.380	4.914	5.404	5.274	5.448	ns
		GCLK PLL	t _{co}	1.445	1.625	2.043	2.141	2.353	2.357	2.376	2.247	2.462	2.467	2.309	ns
	16mA	GCLK	t _{co}	2.935	3.143	4.384	4.757	5.244	5.110	5.338	4.874	5.360	5.230	5.404	ns
		GCLK PLL	t _{co}	1.423	1.598	2.008	2.102	2.311	2.315	2.353	2.207	2.419	2.424	2.266	ns

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.016	3.232	4.521	4.901	5.395	5.261	5.489	5.022	5.516	5.386	5.560	ns
		GCLK PLL	t _{co}	1.505	1.687	2.145	2.246	2.462	2.466	2.476	2.355	2.575	2.580	2.422	ns
	8mA	GCLK	t _{co}	2.944	3.153	4.398	4.772	5.260	5.126	5.354	4.889	5.377	5.247	5.421	ns
		GCLK PLL	t _{co}	1.432	1.608	2.021	2.117	2.327	2.331	2.366	2.222	2.435	2.440	2.282	ns
	12mA	GCLK	t _{co}	2.920	3.124	4.358	4.733	5.219	5.085	5.313	4.849	5.335	5.205	5.379	ns
		GCLK PLL	t _{co}	1.408	1.579	1.982	2.077	2.286	2.290	2.332	2.182	2.394	2.399	2.241	ns
	16mA	GCLK	t _{co}	2.920	3.124	4.350	4.723	5.209	5.075	5.303	4.838	5.323	5.193	5.367	ns
		GCLK PLL	t _{co}	1.408	1.579	1.974	2.068	2.276	2.280	2.340	2.171	2.382	2.387	2.228	ns
2.5 V	4mA	GCLK	t _{co}	3.120	3.347	4.728	5.128	5.642	5.508	5.736	5.255	5.771	5.641	5.815	ns
		GCLK PLL	t _{co}	1.609	1.802	2.352	2.473	2.709	2.713	2.684	2.588	2.830	2.835	2.676	ns
	8mA	GCLK	t _{co}	3.037	3.254	4.609	5.002	5.510	5.376	5.604	5.127	5.635	5.505	5.679	ns
		GCLK PLL	t _{co}	1.526	1.709	2.233	2.347	2.577	2.581	2.560	2.460	2.694	2.699	2.541	ns
	12mA	GCLK	t _{co}	2.982	3.210	4.517	4.906	5.410	5.276	5.504	5.029	5.533	5.403	5.577	ns
		GCLK PLL	t _{co}	1.470	1.665	2.141	2.251	2.477	2.481	2.482	2.362	2.592	2.597	2.439	ns
	16mA	GCLK	t _{co}	2.948	3.164	4.483	4.869	5.369	5.235	5.463	4.990	5.489	5.359	5.533	ns
		GCLK PLL	t _{co}	1.437	1.619	2.107	2.214	2.436	2.440	2.425	2.322	2.548	2.553	2.395	ns

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.234	3.475	4.923	5.337	5.860	5.726	5.954	5.473	5.997	5.867	6.041	ns
		GCLK PLL	t _{co}	1.723	1.930	2.546	2.682	2.927	2.931	2.902	2.806	3.056	3.061	2.904	ns
	4mA	GCLK	t _{co}	3.136	3.364	4.771	5.179	5.699	5.565	5.793	5.314	5.831	5.701	5.875	ns
		GCLK PLL	t _{co}	1.625	1.819	2.394	2.524	2.766	2.770	2.750	2.647	2.890	2.895	2.738	ns
	6mA	GCLK	t _{co}	3.054	3.277	4.644	5.041	5.555	5.421	5.649	5.170	5.684	5.554	5.728	ns
		GCLK PLL	t _{co}	1.543	1.732	2.267	2.386	2.622	2.626	2.609	2.503	2.742	2.747	2.589	ns
	8mA	GCLK	t _{co}	3.029	3.244	4.583	4.975	5.480	5.346	5.574	5.099	5.603	5.473	5.647	ns
		GCLK PLL	t _{co}	1.517	1.699	2.207	2.320	2.547	2.551	2.530	2.432	2.662	2.667	2.509	ns
	10mA	GCLK	t _{co}	2.958	3.180	4.495	4.881	5.381	5.247	5.475	5.002	5.502	5.372	5.546	ns
		GCLK PLL	t _{co}	1.446	1.635	2.119	2.226	2.448	2.452	2.448	2.335	2.561	2.566	2.408	ns
	12mA	GCLK	t _{co}	2.953	3.170	4.489	4.875	5.374	5.240	5.468	4.995	5.495	5.365	5.539	ns
		GCLK PLL	t _{co}	1.441	1.625	2.113	2.220	2.441	2.445	2.442	2.328	2.554	2.559	2.401	ns
1.5 V	2mA	GCLK	t _{co}	3.175	3.442	4.861	5.264	5.788	5.654	5.882	5.403	5.930	5.800	5.974	ns
		GCLK PLL	t _{co}	1.663	1.897	2.485	2.609	2.855	2.859	2.841	2.736	2.989	2.994	2.837	ns
	4mA	GCLK	t _{co}	3.043	3.261	4.618	5.010	5.517	5.383	5.611	5.135	5.644	5.514	5.688	ns
		GCLK PLL	t _{co}	1.532	1.716	2.241	2.355	2.584	2.588	2.572	2.468	2.702	2.707	2.549	ns
	6mA	GCLK	t _{co}	2.999	3.224	4.537	4.930	5.437	5.303	5.531	5.055	5.561	5.431	5.605	ns
		GCLK PLL	t _{co}	1.487	1.679	2.161	2.275	2.504	2.508	2.510	2.388	2.619	2.624	2.466	ns
	8mA	GCLK	t _{co}	2.987	3.218	4.531	4.923	5.428	5.294	5.522	5.048	5.553	5.423	5.597	ns
		GCLK PLL	t _{co}	1.476	1.673	2.155	2.267	2.495	2.499	2.503	2.381	2.612	2.617	2.458	ns
	10mA	GCLK	t _{co}	2.952	3.167	4.483	4.869	5.367	5.233	5.461	4.989	5.488	5.358	5.532	ns
		GCLK PLL	t _{co}	1.441	1.622	2.107	2.214	2.434	2.438	2.444	2.322	2.547	2.552	2.394	ns
	12mA	GCLK	t _{co}	2.948	3.160	4.463	4.848	5.347	5.213	5.441	4.968	5.467	5.337	5.511	ns
		GCLK PLL	t _{co}	1.437	1.615	2.086	2.193	2.414	2.418	2.441	2.301	2.525	2.530	2.372	ns

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.154	3.385	4.815	5.218	5.731	5.597	5.825	5.350	5.864	5.734	5.908	ns
		GCLK PLL	t _{co}	1.643	1.840	2.439	2.563	2.798	2.802	2.787	2.683	2.923	2.928	2.772	ns
	4mA	GCLK	t _{co}	3.032	3.250	4.596	4.987	5.491	5.357	5.585	5.111	5.616	5.486	5.660	ns
		GCLK PLL	t _{co}	1.520	1.705	2.220	2.332	2.558	2.562	2.563	2.444	2.674	2.679	2.521	ns
	6mA	GCLK	t _{co}	2.979	3.209	4.520	4.910	5.417	5.283	5.511	5.036	5.543	5.413	5.587	ns
		GCLK PLL	t _{co}	1.467	1.664	2.144	2.255	2.484	2.488	2.509	2.369	2.602	2.607	2.448	ns
	8mA	GCLK	t _{co}	2.958	3.175	4.481	4.867	5.367	5.233	5.461	4.987	5.486	5.356	5.530	ns
		GCLK PLL	t _{co}	1.447	1.630	2.105	2.212	2.434	2.438	2.474	2.320	2.545	2.550	2.392	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	2.972	3.183	4.489	4.875	5.375	5.241	5.469	4.993	5.491	5.361	5.535	ns
		GCLK PLL	t _{co}	1.460	1.638	2.113	2.220	2.442	2.446	2.466	2.325	2.550	2.555	2.396	ns
	10mA	GCLK	t _{co}	2.975	3.186	4.493	4.879	5.379	5.245	5.473	4.996	5.495	5.365	5.539	ns
		GCLK PLL	t _{co}	1.463	1.641	2.117	2.224	2.446	2.450	2.472	2.329	2.554	2.559	2.400	ns
	12mA	GCLK	t _{co}	2.956	3.166	4.472	4.857	5.357	5.223	5.451	4.975	5.473	5.343	5.517	ns
		GCLK PLL	t _{co}	1.445	1.621	2.095	2.202	2.424	2.428	2.445	2.308	2.532	2.537	2.378	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	2.951	3.159	4.457	4.841	5.340	5.206	5.434	4.958	5.456	5.326	5.500	ns
		GCLK PLL	t _{co}	1.440	1.614	2.080	2.186	2.407	2.411	2.443	2.291	2.514	2.519	2.360	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	2.990	3.203	4.512	4.898	5.398	5.264	5.492	5.016	5.515	5.385	5.559	ns
		GCLK PLL	t _{co}	1.478	1.658	2.136	2.243	2.465	2.469	2.496	2.349	2.574	2.579	2.419	ns
	6mA	GCLK	t _{co}	2.971	3.182	4.490	4.876	5.376	5.242	5.470	4.994	5.492	5.362	5.536	ns
		GCLK PLL	t _{co}	1.459	1.637	2.114	2.221	2.443	2.447	2.472	2.327	2.551	2.556	2.397	ns
	8mA	GCLK	t _{co}	2.972	3.185	4.498	4.885	5.386	5.252	5.480	5.004	5.503	5.373	5.547	ns
		GCLK PLL	t _{co}	1.460	1.640	2.122	2.230	2.453	2.457	2.492	2.337	2.562	2.567	2.408	ns
	10mA	GCLK	t _{co}	2.955	3.165	4.474	4.860	5.361	5.227	5.455	4.978	5.478	5.348	5.522	ns
		GCLK PLL	t _{co}	1.443	1.620	2.097	2.205	2.428	2.432	2.467	2.311	2.536	2.541	2.383	ns
	12mA	GCLK	t _{co}	2.951	3.161	4.470	4.856	5.356	5.222	5.450	4.974	5.474	5.344	5.518	ns
		GCLK PLL	t _{co}	1.440	1.616	2.093	2.201	2.423	2.427	2.462	2.307	2.532	2.537	2.379	ns

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	2.952	3.160	4.457	4.842	5.340	5.206	5.434	4.959	5.456	5.326	5.500	ns
		GCLK PLL	t _{co}	1.440	1.615	2.081	2.186	2.407	2.411	2.447	2.292	2.515	2.520	2.361	ns
	16mA	GCLK	t _{co}	2.951	3.160	4.465	4.852	5.352	5.218	5.446	4.969	5.469	5.339	5.513	ns
		GCLK PLL	t _{co}	1.439	1.615	2.089	2.196	2.419	2.423	2.454	2.302	2.528	2.533	2.374	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	2.981	3.194	4.505	4.891	5.390	5.256	5.484	5.009	5.507	5.377	5.551	ns
		GCLK PLL	t _{co}	1.470	1.649	2.129	2.236	2.457	2.461	2.489	2.342	2.566	2.571	2.412	ns
	6mA	GCLK	t _{co}	2.966	3.178	4.491	4.878	5.378	5.244	5.472	4.996	5.496	5.366	5.540	ns
		GCLK PLL	t _{co}	1.455	1.633	2.115	2.223	2.445	2.449	2.485	2.329	2.555	2.560	2.401	ns
	8mA	GCLK	t _{co}	2.953	3.163	4.471	4.857	5.358	5.224	5.452	4.976	5.475	5.345	5.519	ns
		GCLK PLL	t _{co}	1.442	1.618	2.095	2.202	2.425	2.429	2.467	2.309	2.534	2.539	2.380	ns
	10mA	GCLK	t _{co}	2.954	3.164	4.472	4.859	5.361	5.227	5.455	4.978	5.478	5.348	5.522	ns
		GCLK PLL	t _{co}	1.442	1.619	2.096	2.204	2.428	2.432	2.478	2.311	2.537	2.542	2.383	ns
	12mA	GCLK	t _{co}	2.949	3.159	4.465	4.852	5.353	5.219	5.447	4.970	5.470	5.340	5.514	ns
		GCLK PLL	t _{co}	1.438	1.614	2.089	2.197	2.420	2.424	2.470	2.303	2.529	2.534	2.375	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	2.967	3.176	4.473	4.857	5.355	5.221	5.449	4.974	5.471	5.341	5.515	ns
		GCLK PLL	t _{co}	1.456	1.631	2.097	2.202	2.422	2.426	2.458	2.307	2.530	2.535	2.376	ns
	16mA	GCLK	t _{co}	2.966	3.176	4.477	4.862	5.361	5.227	5.455	4.979	5.477	5.347	5.521	ns
		GCLK PLL	t _{co}	1.455	1.631	2.101	2.207	2.428	2.432	2.476	2.312	2.536	2.541	2.382	ns

Table 1–55. EP3SL70 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	2.953	3.162	4.461	4.846	5.345	5.211	5.439	4.963	5.461	5.331	5.505	ns
		GCLK PLL	t _{co}	1.442	1.617	2.085	2.191	2.412	2.416	2.458	2.296	2.520	2.525	2.366	ns
	6mA	GCLK	t _{co}	2.949	3.157	4.455	4.840	5.339	5.205	5.433	4.957	5.455	5.325	5.499	ns
		GCLK PLL	t _{co}	1.437	1.612	2.079	2.185	2.406	2.410	2.447	2.290	2.514	2.519	2.360	ns
	8mA	GCLK	t _{co}	2.951	3.160	4.460	4.845	5.345	5.211	5.439	4.963	5.462	5.332	5.506	ns
		GCLK PLL	t _{co}	1.439	1.615	2.084	2.190	2.412	2.416	2.468	2.296	2.520	2.525	2.366	ns
	10mA	GCLK	t _{co}	2.950	3.158	4.453	4.838	5.337	5.203	5.431	4.955	5.453	5.323	5.497	ns
		GCLK PLL	t _{co}	1.438	1.613	2.077	2.183	2.404	2.408	2.449	2.288	2.511	2.516	2.357	ns
	12mA	GCLK	t _{co}	2.968	3.177	4.475	4.859	5.358	5.224	5.452	4.977	5.474	5.344	5.518	ns
		GCLK PLL	t _{co}	1.457	1.632	2.099	2.204	2.425	2.429	2.463	2.310	2.532	2.537	2.378	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	2.963	3.173	4.473	4.858	5.357	5.223	5.451	4.976	5.473	5.343	5.517	ns
		GCLK PLL	t _{co}	1.452	1.628	2.097	2.203	2.424	2.428	2.470	2.309	2.532	2.537	2.378	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	2.963	3.172	4.474	4.859	5.358	5.224	5.452	4.977	5.474	5.344	5.518	ns
		GCLK PLL	t _{co}	1.451	1.627	2.098	2.204	2.425	2.429	2.471	2.310	2.533	2.538	2.379	ns
	6mA	GCLK	t _{co}	2.953	3.162	4.462	4.847	5.346	5.212	5.440	4.964	5.462	5.332	5.506	ns
		GCLK PLL	t _{co}	1.442	1.617	2.085	2.192	2.413	2.417	2.458	2.297	2.521	2.526	2.367	ns
	8mA	GCLK	t _{co}	2.955	3.164	4.467	4.854	5.354	5.220	5.448	4.971	5.471	5.341	5.515	ns
		GCLK PLL	t _{co}	1.443	1.619	2.091	2.198	2.421	2.425	2.473	2.304	2.529	2.534	2.375	ns
	10mA	GCLK	t _{co}	2.977	3.189	4.495	4.881	5.380	5.246	5.474	4.999	5.498	5.368	5.542	ns
		GCLK PLL	t _{co}	1.465	1.644	2.119	2.225	2.447	2.451	2.491	2.332	2.556	2.561	2.402	ns
	12mA	GCLK	t _{co}	2.966	3.177	4.483	4.869	5.369	5.235	5.463	4.987	5.486	5.356	5.530	ns
		GCLK PLL	t _{co}	1.455	1.632	2.107	2.214	2.436	2.440	2.481	2.320	2.545	2.550	2.391	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	2.965	3.175	4.481	4.867	5.367	5.233	5.461	4.986	5.485	5.355	5.529	ns
		GCLK PLL	t _{co}	1.453	1.630	2.105	2.212	2.434	2.438	2.486	2.319	2.544	2.549	2.390	ns

Table 1-55. EP3SL70 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	2.962	3.173	4.480	4.867	5.367	5.233	5.461	4.985	5.485	5.355	5.529	ns
		GCLK PLL	t _{co}	1.451	1.628	2.104	2.212	2.434	2.438	2.488	2.318	2.544	2.549	2.389	ns
	6mA	GCLK	t _{co}	2.958	3.169	4.474	4.860	5.360	5.226	5.454	4.978	5.478	5.348	5.522	ns
		GCLK PLL	t _{co}	1.447	1.624	2.097	2.205	2.427	2.431	2.479	2.311	2.536	2.541	2.382	ns
	8mA	GCLK	t _{co}	3.035	3.244	4.491	4.868	5.357	5.223	5.451	4.986	5.475	5.345	5.519	ns
		GCLK PLL	t _{co}	1.524	1.699	2.115	2.213	2.424	2.428	2.455	2.319	2.534	2.539	2.381	ns
	10mA	GCLK	t _{co}	3.035	3.244	4.491	4.868	5.357	5.223	5.451	4.986	5.475	5.345	5.519	ns
		GCLK PLL	t _{co}	1.524	1.699	2.115	2.213	2.424	2.428	2.455	2.319	2.534	2.539	2.381	ns
	12mA	GCLK	t _{co}	3.064	3.283	4.557	4.943	5.437	5.303	5.531	5.064	5.556	5.426	5.600	ns
		GCLK PLL	t _{co}	1.553	1.738	2.181	2.288	2.504	2.508	2.475	2.397	2.615	2.620	2.463	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	2.985	3.194	4.454	4.831	5.320	5.186	5.414	4.948	5.436	5.306	5.480	ns
		GCLK PLL	t _{co}	1.474	1.649	2.077	2.176	2.387	2.391	2.358	2.281	2.495	2.500	2.343	ns
3.0-V PCI	—	GCLK	t _{co}	2.956	3.162	4.387	4.761	5.250	5.116	5.344	4.878	5.369	5.239	5.413	ns
		GCLK PLL	t _{co}	1.444	1.617	2.010	2.106	2.317	2.321	2.288	2.211	2.428	2.433	2.275	ns
3.0-V PCI-X	—	GCLK	t _{co}	2.942	3.148	4.366	4.738	5.222	5.088	5.316	4.852	5.336	5.206	5.380	ns
		GCLK PLL	t _{co}	1.430	1.603	1.989	2.083	2.289	2.293	2.260	2.185	2.394	2.399	2.241	ns

Table 1-56 specifies EP3SL70 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1-56. EP3SL70 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.182	3.424	4.767	5.163	5.668	5.532	5.739	5.293	5.802	5.667	5.813	ns
		GCLK PLL	t _{co}	1.474	1.669	2.054	2.135	2.377	2.393	2.266	2.251	2.501	2.515	2.258	ns
	8mA	GCLK	t _{co}	3.089	3.319	4.637	5.025	5.524	5.388	5.595	5.152	5.653	5.518	5.664	ns
		GCLK PLL	t _{co}	1.408	1.598	1.944	2.023	2.233	2.249	2.152	2.138	2.352	2.366	2.142	ns
	12mA	GCLK	t _{co}	2.990	3.213	4.518	4.902	5.396	5.260	5.467	5.025	5.521	5.386	5.532	ns
		GCLK PLL	t _{co}	1.329	1.509	1.838	1.923	2.119	2.138	2.056	2.039	2.235	2.252	2.043	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.192	3.428	4.775	5.168	5.673	5.537	5.744	5.299	5.807	5.672	5.818	ns
		GCLK PLL	t _{co}	1.476	1.676	2.058	2.140	2.382	2.398	2.275	2.259	2.506	2.520	2.270	ns
	8mA	GCLK	t _{co}	2.994	3.219	4.524	4.908	5.402	5.266	5.473	5.031	5.528	5.393	5.539	ns
		GCLK PLL	t _{co}	1.333	1.513	1.849	1.938	2.129	2.148	2.066	2.051	2.244	2.261	2.052	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.136	3.370	4.719	5.116	5.625	5.489	5.696	5.250	5.760	5.625	5.771	ns
		GCLK PLL	t _{co}	1.435	1.630	2.021	2.103	2.334	2.350	2.232	2.219	2.459	2.473	2.224	ns
	8mA	GCLK	t _{co}	3.011	3.243	4.566	4.957	5.461	5.325	5.532	5.088	5.596	5.460	5.606	ns
		GCLK PLL	t _{co}	1.334	1.518	1.884	1.961	2.170	2.186	2.087	2.077	2.295	2.308	2.078	ns
	12mA	GCLK	t _{co}	2.972	3.192	4.484	4.874	5.373	5.237	5.444	5.002	5.503	5.367	5.513	ns
		GCLK PLL	t _{co}	1.297	1.480	1.824	1.896	2.082	2.099	2.017	2.009	2.202	2.215	2.005	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.050	3.289	4.613	5.009	5.514	5.378	5.585	5.142	5.649	5.513	5.659	ns
		GCLK PLL	t _{co}	1.356	1.542	1.919	1.996	2.223	2.239	2.123	2.111	2.348	2.361	2.114	ns
	8mA	GCLK	t _{co}	2.950	3.170	4.449	4.835	5.334	5.198	5.405	4.962	5.463	5.327	5.473	ns
		GCLK PLL	t _{co}	1.284	1.464	1.796	1.867	2.052	2.071	1.989	1.979	2.169	2.185	1.976	ns
2.5 V	4mA	GCLK	t _{co}	3.162	3.406	4.851	5.270	5.797	5.661	5.868	5.410	5.939	5.803	5.949	ns
		GCLK PLL	t _{co}	1.461	1.667	2.129	2.229	2.506	2.522	2.377	2.351	2.638	2.651	2.376	ns
	8mA	GCLK	t _{co}	3.052	3.307	4.696	5.107	5.627	5.491	5.698	5.243	5.765	5.629	5.775	ns
		GCLK PLL	t _{co}	1.376	1.564	2.005	2.094	2.336	2.352	2.235	2.214	2.464	2.477	2.231	ns
	12mA	GCLK	t _{co}	3.006	3.231	4.585	4.988	5.501	5.365	5.572	5.120	5.635	5.499	5.645	ns
		GCLK PLL	t _{co}	1.319	1.520	1.921	2.008	2.210	2.226	2.144	2.125	2.334	2.347	2.137	ns

Table 1-56. EP3SL70 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.350	3.691	5.275	5.573	6.134	5.998	6.210	5.723	6.286	6.151	6.297	ns
		GCLK PLL	t _{co}	1.728	1.915	2.562	2.717	2.981	2.999	2.946	2.881	3.150	3.167	2.958	ns
	4mA	GCLK	t _{co}	3.177	3.489	4.948	5.247	5.774	5.638	5.850	5.397	5.925	5.789	5.935	ns
		GCLK PLL	t _{co}	1.503	1.713	2.235	2.349	2.576	2.594	2.541	2.516	2.744	2.760	2.551	ns
	6mA	GCLK	t _{co}	3.102	3.387	4.795	5.142	5.673	5.537	5.749	5.283	5.819	5.684	5.830	ns
		GCLK PLL	t _{co}	1.438	1.611	2.082	2.199	2.417	2.435	2.382	2.348	2.571	2.588	2.379	ns
	8mA	GCLK	t _{co}	3.084	3.313	4.718	5.089	5.608	5.472	5.684	5.227	5.747	5.612	5.758	ns
		GCLK PLL	t _{co}	1.378	1.557	2.005	2.106	2.321	2.339	2.286	2.253	2.477	2.494	2.285	ns
1.5 V	2mA	GCLK	t _{co}	3.292	3.609	5.185	5.500	6.071	5.935	6.147	5.644	6.221	6.086	6.232	ns
		GCLK PLL	t _{co}	1.639	1.833	2.472	2.631	2.909	2.927	2.874	2.788	3.074	3.091	2.882	ns
	4mA	GCLK	t _{co}	3.100	3.352	4.780	5.142	5.677	5.541	5.753	5.280	5.820	5.685	5.831	ns
		GCLK PLL	t _{co}	1.397	1.576	2.067	2.194	2.418	2.436	2.383	2.342	2.570	2.587	2.378	ns
	6mA	GCLK	t _{co}	3.073	3.304	4.707	5.081	5.608	5.472	5.684	5.220	5.747	5.612	5.758	ns
		GCLK PLL	t _{co}	1.370	1.548	1.994	2.098	2.312	2.330	2.277	2.244	2.465	2.482	2.273	ns
	8mA	GCLK	t _{co}	3.054	3.295	4.685	5.057	5.589	5.453	5.665	5.196	5.728	5.593	5.739	ns
		GCLK PLL	t _{co}	1.361	1.537	1.972	2.080	2.293	2.311	2.258	2.226	2.443	2.460	2.251	ns
1.2 V	2mA	GCLK	t _{co}	3.222	3.534	5.095	5.432	6.010	5.874	6.086	5.576	6.152	6.017	6.163	ns
		GCLK PLL	t _{co}	1.582	1.758	2.382	2.545	2.834	2.852	2.799	2.700	2.990	3.007	2.798	ns
	4mA	GCLK	t _{co}	3.105	3.345	4.802	5.170	5.725	5.589	5.801	5.309	5.864	5.729	5.875	ns
		GCLK PLL	t _{co}	1.402	1.578	2.089	2.222	2.459	2.477	2.424	2.367	2.612	2.629	2.420	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	2.991	3.217	4.563	4.960	5.469	5.333	5.540	5.087	5.597	5.462	5.608	ns
		GCLK PLL	t _{co}	1.323	1.508	1.914	1.999	2.197	2.216	2.134	2.112	2.315	2.332	2.123	ns
	12mA	GCLK	t _{co}	2.979	3.205	4.555	4.952	5.461	5.325	5.532	5.079	5.590	5.455	5.601	ns
		GCLK PLL	t _{co}	1.318	1.504	1.911	1.997	2.195	2.214	2.132	2.111	2.314	2.331	2.122	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	2.963	3.187	4.530	4.927	5.434	5.298	5.505	5.053	5.563	5.428	5.574	ns
		GCLK PLL	t _{co}	1.309	1.493	1.896	1.981	2.178	2.197	2.115	2.094	2.296	2.313	2.104	ns

Table 1-56. EP3SL70 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.033	3.269	4.613	4.993	5.503	5.367	5.579	5.126	5.638	5.503	5.649	ns
		GCLK PLL	t _{co}	1.339	1.501	1.909	1.997	2.194	2.212	2.159	2.134	2.340	2.357	2.148	ns
	6mA	GCLK	t _{co}	3.028	3.255	4.610	4.992	5.502	5.366	5.578	5.124	5.636	5.501	5.647	ns
		GCLK PLL	t _{co}	1.324	1.496	1.907	1.996	2.192	2.210	2.157	2.132	2.338	2.355	2.146	ns
	8mA	GCLK	t _{co}	3.017	3.243	4.593	4.982	5.492	5.356	5.568	5.115	5.627	5.492	5.638	ns
		GCLK PLL	t _{co}	1.313	1.485	1.897	1.986	2.175	2.193	2.140	2.115	2.322	2.339	2.130	ns
	10mA	GCLK	t _{co}	3.006	3.220	4.577	4.969	5.479	5.343	5.555	5.103	5.615	5.480	5.626	ns
		GCLK PLL	t _{co}	1.290	1.474	1.884	1.973	2.160	2.178	2.125	2.100	2.307	2.324	2.115	ns
	12mA	GCLK	t _{co}	3.006	3.219	4.576	4.969	5.479	5.343	5.555	5.102	5.615	5.480	5.626	ns
		GCLK PLL	t _{co}	1.290	1.473	1.884	1.973	2.159	2.177	2.124	2.099	2.306	2.323	2.114	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.014	3.228	4.574	4.966	5.474	5.338	5.550	5.098	5.609	5.474	5.620	ns
		GCLK PLL	t _{co}	1.299	1.480	1.883	1.970	2.153	2.171	2.118	2.094	2.299	2.316	2.107	ns
	16mA	GCLK	t _{co}	3.015	3.223	4.573	4.974	5.484	5.348	5.560	5.107	5.620	5.485	5.631	ns
		GCLK PLL	t _{co}	1.299	1.483	1.889	1.978	2.155	2.173	2.120	2.096	2.303	2.320	2.111	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.036	3.265	4.624	5.004	5.516	5.380	5.592	5.136	5.650	5.515	5.661	ns
		GCLK PLL	t _{co}	1.335	1.504	1.918	2.008	2.211	2.229	2.176	2.147	2.356	2.373	2.164	ns
	6mA	GCLK	t _{co}	3.022	3.243	4.606	4.994	5.506	5.370	5.582	5.127	5.641	5.506	5.652	ns
		GCLK PLL	t _{co}	1.312	1.490	1.907	1.998	2.194	2.212	2.159	2.131	2.340	2.357	2.148	ns
	8mA	GCLK	t _{co}	3.011	3.226	4.589	4.981	5.493	5.357	5.569	5.114	5.628	5.493	5.639	ns
		GCLK PLL	t _{co}	1.295	1.478	1.894	1.985	2.176	2.194	2.141	2.113	2.323	2.340	2.131	ns

Table 1-56. EP3SL70 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.021	3.241	4.580	4.964	5.472	5.336	5.548	5.097	5.606	5.471	5.617	ns
		GCLK PLL	t _{co}	1.314	1.486	1.882	1.968	2.156	2.174	2.121	2.098	2.302	2.319	2.110	ns
	6mA	GCLK	t _{co}	3.014	3.229	4.571	4.963	5.471	5.335	5.547	5.096	5.606	5.471	5.617	ns
		GCLK PLL	t _{co}	1.302	1.480	1.880	1.967	2.148	2.166	2.113	2.090	2.295	2.312	2.103	ns
	8mA	GCLK	t _{co}	3.005	3.217	4.563	4.956	5.464	5.328	5.540	5.089	5.599	5.464	5.610	ns
		GCLK PLL	t _{co}	1.289	1.472	1.873	1.960	2.140	2.158	2.105	2.082	2.287	2.304	2.095	ns
	10mA	GCLK	t _{co}	3.008	3.219	4.565	4.959	5.468	5.332	5.544	5.092	5.602	5.467	5.613	ns
		GCLK PLL	t _{co}	1.292	1.474	1.876	1.963	2.143	2.161	2.108	2.085	2.290	2.307	2.098	ns
	12mA	GCLK	t _{co}	3.004	3.214	4.563	4.962	5.471	5.335	5.547	5.095	5.607	5.472	5.618	ns
		GCLK PLL	t _{co}	1.288	1.471	1.878	1.966	2.143	2.161	2.108	2.085	2.291	2.308	2.099	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.012	3.218	4.558	4.959	5.467	5.331	5.543	5.091	5.601	5.466	5.612	ns
		GCLK PLL	t _{co}	1.296	1.479	1.876	1.963	2.134	2.152	2.099	2.078	2.280	2.297	2.088	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.027	3.248	4.591	4.974	5.483	5.347	5.559	5.106	5.617	5.482	5.628	ns
		GCLK PLL	t _{co}	1.321	1.492	1.891	1.978	2.171	2.189	2.136	2.110	2.316	2.333	2.124	ns
	6mA	GCLK	t _{co}	3.021	3.238	4.587	4.976	5.485	5.349	5.561	5.108	5.620	5.485	5.631	ns
		GCLK PLL	t _{co}	1.309	1.487	1.892	1.980	2.167	2.185	2.132	2.107	2.313	2.330	2.121	ns
	8mA	GCLK	t _{co}	3.017	3.233	4.581	4.971	5.480	5.344	5.556	5.103	5.614	5.479	5.625	ns
		GCLK PLL	t _{co}	1.305	1.483	1.887	1.975	2.161	2.179	2.126	2.101	2.307	2.324	2.115	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.029	3.247	4.602	4.990	5.502	5.366	5.578	5.122	5.636	5.501	5.647	ns
		GCLK PLL	t _{co}	1.320	1.494	1.904	1.994	2.189	2.207	2.154	2.124	2.333	2.350	2.141	ns
	6mA	GCLK	t _{co}	3.020	3.235	4.591	4.981	5.493	5.357	5.569	5.113	5.627	5.492	5.638	ns
		GCLK PLL	t _{co}	1.308	1.486	1.895	1.985	2.177	2.195	2.142	2.113	2.322	2.339	2.130	ns
	8mA	GCLK	t _{co}	3.019	3.233	4.595	4.989	5.502	5.366	5.578	5.122	5.637	5.502	5.648	ns
		GCLK PLL	t _{co}	1.305	1.486	1.902	1.993	2.183	2.201	2.148	2.119	2.329	2.346	2.137	ns
3.0-V PCI	—	GCLK	t _{co}	3.076	3.300	4.588	4.978	5.480	5.342	5.550	5.105	5.610	5.474	5.621	ns
		GCLK PLL	t _{co}	1.429	1.614	1.966	2.045	2.237	2.256	2.174	2.160	2.357	2.374	2.165	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.076	3.300	4.588	4.978	5.480	5.342	5.550	5.105	5.610	5.474	5.621	ns
		GCLK PLL	t _{co}	1.429	1.614	1.966	2.045	2.237	2.256	2.174	2.160	2.357	2.374	2.165	ns

Table 1-57 through Table 1-62 show the maximum I/O timing parameters for EP3SL70 devices for differential I/O standards.

Table 1-57 specifies EP3SL70 column pins input timing parameters for differential I/O standards.

Table 1-57. EP3SL70 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
MINI-LVDS	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
RSDS	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns

Table 1-57. EP3SL70 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.717	-0.740	-1.091	-1.204	-1.329	-1.272	-1.559	-1.205	-1.329	-1.275	-1.595	ns
		t _h	0.834	0.872	1.277	1.411	1.557	1.489	1.775	1.420	1.565	1.502	1.810	ns
	GCLK PLL	t _{su}	1.123	1.136	1.802	2.031	2.244	2.131	2.137	2.041	2.255	2.140	2.186	ns
		t _h	-0.872	-0.870	-1.404	-1.584	-1.746	-1.661	-1.661	-1.586	-1.749	-1.661	-1.709	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.724	-0.746	-1.103	-1.209	-1.329	-1.274	-1.558	-1.209	-1.324	-1.273	-1.591	ns
		t _h	0.841	0.878	1.290	1.419	1.560	1.492	1.779	1.427	1.565	1.501	1.811	ns
	GCLK PLL	t _{su}	1.116	1.130	1.790	2.026	2.244	2.129	2.138	2.037	2.260	2.142	2.190	ns
		t _h	-0.865	-0.864	-1.391	-1.576	-1.743	-1.658	-1.657	-1.579	-1.749	-1.662	-1.708	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.724	-0.746	-1.103	-1.209	-1.329	-1.274	-1.558	-1.209	-1.324	-1.273	-1.591	ns
		t _h	0.841	0.878	1.290	1.419	1.560	1.492	1.779	1.427	1.565	1.501	1.811	ns
	GCLK PLL	t _{su}	1.116	1.130	1.790	2.026	2.244	2.129	2.138	2.037	2.260	2.142	2.190	ns
		t _h	-0.865	-0.864	-1.391	-1.576	-1.743	-1.658	-1.657	-1.579	-1.749	-1.662	-1.708	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.697	-0.717	-1.072	-1.182	-1.294	-1.237	-1.524	-1.183	-1.296	-1.242	-1.562	ns
		t _h	0.814	0.849	1.257	1.389	1.522	1.454	1.740	1.398	1.532	1.469	1.777	ns
	GCLK PLL	t _{su}	1.143	1.159	1.821	2.053	2.279	2.166	2.172	2.063	2.288	2.173	2.219	ns
		t _h	-0.892	-0.893	-1.424	-1.606	-1.781	-1.696	-1.696	-1.608	-1.782	-1.694	-1.742	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.705	-0.729	-1.082	-1.193	-1.310	-1.253	-1.540	-1.194	-1.311	-1.257	-1.577	ns
		t _h	0.822	0.861	1.267	1.400	1.538	1.470	1.756	1.409	1.547	1.484	1.792	ns
	GCLK PLL	t _{su}	1.135	1.147	1.811	2.042	2.263	2.150	2.156	2.052	2.273	2.158	2.204	ns
		t _h	-0.884	-0.881	-1.414	-1.595	-1.765	-1.680	-1.680	-1.597	-1.767	-1.679	-1.727	ns

Table 1-58 specifies EP3SL70 row pins input timing parameters for differential I/O standards.

Table 1-58. EP3SL70 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{SU}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t_H	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t_{SU}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t_H	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
MINI-LVDS	GCLK	t_{SU}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t_H	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t_{SU}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t_H	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
RSDS	GCLK	t_{SU}	-0.919	-0.939	-0.988	-0.952	-1.089	-1.040	-1.316	-0.916	-1.048	-1.000	-1.349	ns
		t_H	1.042	1.077	1.209	1.205	1.369	1.306	1.580	1.182	1.339	1.280	1.613	ns
	GCLK PLL	t_{SU}	0.882	0.896	1.863	2.243	2.446	2.322	2.342	2.291	2.500	2.376	2.393	ns
		t_H	-0.625	-0.625	-1.430	-1.749	-1.896	-1.802	-1.817	-1.783	-1.936	-1.843	-1.865	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{SU}	-0.734	-0.764	-1.085	-1.186	-1.286	-1.234	-1.505	-1.193	-1.291	-1.242	-1.543	ns
		t_H	0.850	0.893	1.274	1.394	1.516	1.451	1.720	1.410	1.531	1.470	1.758	ns
	GCLK PLL	t_{SU}	1.077	1.081	1.776	2.019	2.257	2.138	2.163	2.024	2.263	2.144	2.209	ns
		t_H	-0.827	-0.819	-1.375	-1.570	-1.756	-1.667	-1.687	-1.565	-1.751	-1.663	-1.730	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{SU}	-0.734	-0.764	-1.085	-1.186	-1.286	-1.234	-1.505	-1.193	-1.291	-1.242	-1.543	ns
		t_H	0.850	0.893	1.274	1.394	1.516	1.451	1.720	1.410	1.531	1.470	1.758	ns
	GCLK PLL	t_{SU}	1.077	1.081	1.776	2.019	2.257	2.138	2.163	2.024	2.263	2.144	2.209	ns
		t_H	-0.827	-0.819	-1.375	-1.570	-1.756	-1.667	-1.687	-1.565	-1.751	-1.663	-1.730	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{SU}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t_H	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t_{SU}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t_H	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{SU}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t_H	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t_{SU}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t_H	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{SU}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t_H	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t_{SU}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t_H	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns

Table 1-58. EP3SL70 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{SU}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _H	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{SU}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _H	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{SU}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _H	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{SU}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _H	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{SU}	-0.743	-0.776	-1.094	-1.196	-1.302	-1.250	-1.521	-1.202	-1.307	-1.258	-1.559	ns
		t _H	0.859	0.905	1.283	1.404	1.532	1.467	1.736	1.419	1.547	1.486	1.774	ns
	GCLK PLL	t _{SU}	1.068	1.069	1.767	2.009	2.241	2.122	2.147	2.015	2.247	2.128	2.193	ns
		t _H	-0.818	-0.807	-1.366	-1.560	-1.740	-1.651	-1.671	-1.556	-1.735	-1.647	-1.714	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{SU}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _H	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{SU}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _H	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{SU}	-0.757	-0.788	-1.107	-1.206	-1.320	-1.268	-1.539	-1.213	-1.324	-1.275	-1.576	ns
		t _H	0.873	0.917	1.295	1.414	1.550	1.485	1.754	1.430	1.564	1.503	1.791	ns
	GCLK PLL	t _{SU}	1.054	1.057	1.754	1.999	2.223	2.104	2.129	2.004	2.230	2.111	2.176	ns
		t _H	-0.804	-0.795	-1.354	-1.550	-1.722	-1.633	-1.653	-1.545	-1.718	-1.630	-1.697	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{SU}	-0.756	-0.787	-1.112	-1.212	-1.321	-1.270	-1.540	-1.214	-1.320	-1.273	-1.573	ns
		t _H	0.872	0.916	1.300	1.422	1.554	1.489	1.759	1.434	1.563	1.502	1.792	ns
	GCLK PLL	t _{SU}	1.045	1.048	1.739	1.983	2.212	2.092	2.118	1.993	2.224	2.103	2.169	ns
		t _H	-0.795	-0.786	-1.339	-1.532	-1.708	-1.619	-1.638	-1.531	-1.709	-1.621	-1.686	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{SU}	-0.756	-0.787	-1.112	-1.212	-1.321	-1.270	-1.540	-1.214	-1.320	-1.273	-1.573	ns
		t _H	0.872	0.916	1.300	1.422	1.554	1.489	1.759	1.434	1.563	1.502	1.792	ns
	GCLK PLL	t _{SU}	1.045	1.048	1.739	1.983	2.212	2.092	2.118	1.993	2.224	2.103	2.169	ns
		t _H	-0.795	-0.786	-1.339	-1.532	-1.708	-1.619	-1.638	-1.531	-1.709	-1.621	-1.686	ns

Table 1-59 specifies EP3SL70 Column Pins Output Timing parameters for differential I/O standards.

Table 1-59. EP3SL70 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
LVDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
RSDS_E_1R	—	GCLK	t _{co}	3.010	3.226	4.551	4.950	5.459	5.320	5.538	5.075	5.584	5.446	5.604	ns
		GCLK PLL	t _{co}	1.310	1.491	1.876	1.961	2.162	2.176	2.109	2.074	2.277	2.291	2.093	ns
RSDS_E_3R	—	GCLK	t _{co}	3.006	3.229	4.598	5.005	5.521	5.382	5.600	5.134	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.306	1.494	1.923	2.016	2.224	2.238	2.171	2.133	2.343	2.357	2.159	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.037	3.259	4.622	5.028	5.543	5.404	5.622	5.155	5.670	5.532	5.690	ns
		GCLK PLL	t _{co}	1.337	1.524	1.947	2.039	2.246	2.260	2.193	2.154	2.363	2.377	2.179	ns
	6mA	GCLK	t _{co}	3.027	3.249	4.612	5.017	5.533	5.394	5.612	5.144	5.660	5.522	5.680	ns
		GCLK PLL	t _{co}	1.327	1.514	1.937	2.028	2.236	2.250	2.183	2.143	2.353	2.367	2.169	ns
	8mA	GCLK	t _{co}	3.027	3.249	4.615	5.021	5.537	5.398	5.616	5.149	5.665	5.527	5.685	ns
		GCLK PLL	t _{co}	1.327	1.514	1.940	2.032	2.240	2.254	2.187	2.148	2.358	2.372	2.174	ns
	10mA	GCLK	t _{co}	3.020	3.243	4.608	5.015	5.531	5.392	5.610	5.142	5.659	5.521	5.679	ns
		GCLK PLL	t _{co}	1.320	1.508	1.933	2.026	2.234	2.248	2.181	2.141	2.352	2.366	2.168	ns
	12mA	GCLK	t _{co}	3.019	3.241	4.605	5.012	5.528	5.389	5.607	5.139	5.655	5.517	5.675	ns
		GCLK PLL	t _{co}	1.319	1.506	1.930	2.023	2.231	2.245	2.178	2.138	2.348	2.362	2.164	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.041	3.263	4.626	5.032	5.547	5.408	5.626	5.159	5.675	5.537	5.695	ns
		GCLK PLL	t _{co}	1.341	1.528	1.951	2.043	2.250	2.264	2.197	2.158	2.368	2.382	2.184	ns

Table 1-59. EP3SL70 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.031	3.252	4.605	5.009	5.522	5.383	5.601	5.135	5.648	5.510	5.668	ns
		GCLK PLL	t _{co}	1.331	1.517	1.930	2.020	2.225	2.239	2.172	2.134	2.341	2.355	2.157	ns
	6mA	GCLK	t _{co}	3.026	3.248	4.605	5.009	5.523	5.384	5.602	5.136	5.650	5.512	5.670	ns
		GCLK PLL	t _{co}	1.326	1.513	1.930	2.020	2.226	2.240	2.173	2.135	2.343	2.357	2.159	ns
	8mA	GCLK	t _{co}	3.024	3.246	4.604	5.008	5.521	5.382	5.600	5.135	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.324	1.511	1.929	2.019	2.224	2.238	2.171	2.134	2.342	2.356	2.158	ns
	10mA	GCLK	t _{co}	3.016	3.237	4.594	4.998	5.512	5.373	5.591	5.125	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.316	1.502	1.919	2.009	2.215	2.229	2.162	2.124	2.332	2.346	2.148	ns
	12mA	GCLK	t _{co}	3.017	3.239	4.600	5.005	5.520	5.381	5.599	5.133	5.648	5.510	5.668	ns
		GCLK PLL	t _{co}	1.317	1.504	1.925	2.016	2.223	2.237	2.170	2.132	2.341	2.355	2.157	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.016	3.236	4.583	4.986	5.498	5.359	5.577	5.112	5.624	5.486	5.644	ns
		GCLK PLL	t _{co}	1.316	1.501	1.908	1.997	2.201	2.215	2.148	2.111	2.317	2.331	2.133	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.028	3.249	4.601	5.004	5.516	5.377	5.595	5.131	5.643	5.505	5.663	ns
		GCLK PLL	t _{co}	1.328	1.514	1.926	2.015	2.219	2.233	2.166	2.130	2.336	2.350	2.152	ns
	6mA	GCLK	t _{co}	3.024	3.246	4.602	5.006	5.520	5.381	5.599	5.133	5.647	5.509	5.667	ns
		GCLK PLL	t _{co}	1.324	1.511	1.927	2.017	2.223	2.237	2.170	2.132	2.340	2.354	2.156	ns
	8mA	GCLK	t _{co}	3.014	3.235	4.591	4.995	5.508	5.369	5.587	5.122	5.635	5.497	5.655	ns
		GCLK PLL	t _{co}	1.314	1.500	1.916	2.006	2.211	2.225	2.158	2.121	2.328	2.342	2.144	ns
	10mA	GCLK	t _{co}	3.012	3.233	4.589	4.992	5.506	5.367	5.585	5.120	5.633	5.495	5.653	ns
		GCLK PLL	t _{co}	1.312	1.498	1.914	2.003	2.209	2.223	2.156	2.119	2.326	2.340	2.142	ns
	12mA	GCLK	t _{co}	3.012	3.234	4.592	4.997	5.511	5.372	5.590	5.124	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.312	1.499	1.917	2.008	2.214	2.228	2.161	2.123	2.332	2.346	2.148	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.016	3.237	4.589	4.992	5.505	5.366	5.584	5.119	5.632	5.494	5.652	ns
		GCLK PLL	t _{co}	1.316	1.502	1.914	2.003	2.208	2.222	2.155	2.118	2.325	2.339	2.141	ns

Table 1-59. EP3SL70 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.042	3.266	4.634	5.040	5.555	5.416	5.634	5.167	5.682	5.544	5.702	ns
		GCLK PLL	t _{co}	1.342	1.531	1.959	2.051	2.258	2.272	2.205	2.166	2.375	2.389	2.191	ns
	6mA	GCLK	t _{co}	3.028	3.252	4.622	5.029	5.545	5.406	5.624	5.157	5.673	5.535	5.693	ns
		GCLK PLL	t _{co}	1.328	1.517	1.947	2.040	2.248	2.262	2.195	2.156	2.366	2.380	2.182	ns
	8mA	GCLK	t _{co}	3.016	3.239	4.605	5.011	5.527	5.388	5.606	5.139	5.655	5.517	5.675	ns
		GCLK PLL	t _{co}	1.316	1.504	1.930	2.022	2.230	2.244	2.177	2.138	2.348	2.362	2.164	ns
	10mA	GCLK	t _{co}	3.016	3.239	4.608	5.015	5.531	5.392	5.610	5.143	5.660	5.522	5.680	ns
		GCLK PLL	t _{co}	1.316	1.504	1.933	2.026	2.234	2.248	2.181	2.142	2.353	2.367	2.169	ns
	12mA	GCLK	t _{co}	3.012	3.235	4.601	5.007	5.524	5.385	5.603	5.136	5.652	5.514	5.672	ns
		GCLK PLL	t _{co}	1.312	1.500	1.926	2.018	2.227	2.241	2.174	2.135	2.345	2.359	2.161	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.016	3.237	4.594	4.998	5.512	5.373	5.591	5.125	5.639	5.501	5.659	ns
		GCLK PLL	t _{co}	1.316	1.502	1.919	2.009	2.215	2.229	2.162	2.124	2.332	2.346	2.148	ns
	16mA	GCLK	t _{co}	3.017	3.239	4.602	5.008	5.523	5.384	5.602	5.135	5.651	5.513	5.671	ns
		GCLK PLL	t _{co}	1.317	1.504	1.927	2.019	2.226	2.240	2.173	2.134	2.344	2.358	2.160	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.045	3.269	4.633	5.038	5.553	5.414	5.632	5.166	5.680	5.542	5.700	ns
		GCLK PLL	t _{co}	1.345	1.534	1.958	2.049	2.256	2.270	2.203	2.165	2.373	2.387	2.189	ns
	6mA	GCLK	t _{co}	3.034	3.257	4.621	5.026	5.541	5.402	5.620	5.154	5.668	5.530	5.688	ns
		GCLK PLL	t _{co}	1.334	1.522	1.946	2.037	2.244	2.258	2.191	2.153	2.361	2.375	2.177	ns
	8mA	GCLK	t _{co}	3.029	3.253	4.621	5.027	5.542	5.403	5.621	5.155	5.670	5.532	5.690	ns
		GCLK PLL	t _{co}	1.329	1.518	1.946	2.038	2.245	2.259	2.192	2.154	2.363	2.377	2.179	ns
	10mA	GCLK	t _{co}	3.015	3.238	4.603	5.008	5.523	5.384	5.602	5.136	5.652	5.514	5.672	ns
		GCLK PLL	t _{co}	1.315	1.503	1.928	2.019	2.226	2.240	2.173	2.135	2.345	2.359	2.161	ns
	12mA	GCLK	t _{co}	3.013	3.236	4.601	5.006	5.521	5.382	5.600	5.134	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.313	1.501	1.926	2.017	2.224	2.238	2.171	2.133	2.342	2.356	2.158	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.017	3.238	4.593	4.996	5.509	5.370	5.588	5.123	5.636	5.498	5.656	ns
		GCLK PLL	t _{co}	1.317	1.503	1.918	2.007	2.212	2.226	2.159	2.122	2.329	2.343	2.145	ns
	16mA	GCLK	t _{co}	3.017	3.239	4.601	5.006	5.521	5.382	5.600	5.134	5.649	5.511	5.669	ns
		GCLK PLL	t _{co}	1.317	1.504	1.926	2.017	2.224	2.238	2.171	2.133	2.342	2.356	2.158	ns

Table 1-59. EP3SL70 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t_{CO}	3.033	3.256	4.617	5.021	5.535	5.396	5.614	5.149	5.662	5.524	5.682	ns
		GCLK PLL	t_{CO}	1.333	1.521	1.942	2.032	2.238	2.252	2.185	2.148	2.355	2.369	2.171	ns
	10mA	GCLK	t_{CO}	3.033	3.256	4.617	5.021	5.535	5.396	5.614	5.149	5.662	5.524	5.682	ns
		GCLK PLL	t_{CO}	1.333	1.521	1.942	2.032	2.238	2.252	2.185	2.148	2.355	2.369	2.171	ns
	12mA	GCLK	t_{CO}	3.023	3.246	4.607	5.011	5.525	5.386	5.604	5.139	5.653	5.515	5.673	ns
		GCLK PLL	t_{CO}	1.323	1.511	1.932	2.022	2.228	2.242	2.175	2.138	2.346	2.360	2.162	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{CO}	3.016	3.238	4.593	4.996	5.509	5.370	5.588	5.123	5.636	5.498	5.656	ns
		GCLK PLL	t_{CO}	1.316	1.503	1.918	2.007	2.212	2.226	2.159	2.122	2.329	2.343	2.145	ns

Table 1–60 specifies EP3SL70 Row Pins Output Timing parameters for differential I/O standards.

Table 1–60. EP3SL70 Row Pins output Timing Parameters (Part 1 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns
LVDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
LVDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
MINI-LVDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
RSDS	—	GCLK	t _{co}	2.665	2.838	3.975	4.342	4.820	4.684	4.891	4.449	4.928	4.793	4.939	ns
		GCLK PLL	t _{co}	1.008	1.142	1.343	1.399	1.567	1.586	1.504	1.493	1.665	1.682	1.473	ns
RSDS_E_1R	—	GCLK	t _{co}	3.043	3.268	4.622	5.029	5.547	5.404	5.603	5.160	5.681	5.537	5.667	ns
		GCLK PLL	t _{co}	1.386	1.572	1.990	2.086	2.294	2.306	2.216	2.204	2.418	2.426	2.201	ns
RSDS_E_3R	—	GCLK	t _{co}	3.025	3.258	4.660	5.075	5.601	5.458	5.657	5.211	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.368	1.562	2.028	2.132	2.348	2.360	2.270	2.255	2.479	2.487	2.262	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.079	3.311	4.706	5.119	5.644	5.501	5.700	5.254	5.781	5.637	5.767	ns
		GCLK PLL	t _{co}	1.402	1.595	2.054	2.156	2.371	2.383	2.293	2.278	2.498	2.506	2.281	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	6mA	GCLK	t _{co}	3.065	3.297	4.693	5.106	5.631	5.488	5.687	5.240	5.768	5.624	5.754	ns
		GCLK PLL	t _{co}	1.388	1.581	2.041	2.143	2.358	2.370	2.280	2.264	2.485	2.493	2.268	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	8mA	GCLK	t _{co}	3.061	3.293	4.691	5.106	5.632	5.489	5.688	5.240	5.770	5.626	5.756	ns
		GCLK PLL	t _{co}	1.384	1.577	2.039	2.143	2.359	2.371	2.281	2.264	2.487	2.495	2.270	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.077	3.308	4.692	5.103	5.626	5.483	5.682	5.237	5.763	5.619	5.749	ns
		GCLK PLL	t _{co}	1.400	1.592	2.040	2.140	2.353	2.365	2.275	2.261	2.480	2.488	2.263	ns

Table 1-60. EP3SL70 Row Pins output Timing Parameters (Part 2 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	6mA	GCLK	t _{co}	3.066	3.298	4.688	5.099	5.623	5.480	5.679	5.234	5.760	5.616	5.746	ns
		GCLK PLL	t _{co}	1.389	1.582	2.036	2.136	2.350	2.362	2.272	2.258	2.477	2.485	2.260	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	8mA	GCLK	t _{co}	3.063	3.295	4.686	5.097	5.621	5.478	5.677	5.232	5.759	5.615	5.745	ns
		GCLK PLL	t _{co}	1.386	1.579	2.034	2.134	2.348	2.360	2.270	2.256	2.476	2.484	2.259	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.074	3.305	4.687	5.098	5.620	5.477	5.676	5.231	5.757	5.613	5.743	ns
		GCLK PLL	t _{co}	1.397	1.589	2.035	2.135	2.347	2.359	2.269	2.255	2.474	2.482	2.257	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	6mA	GCLK	t _{co}	3.064	3.296	4.685	5.096	5.619	5.476	5.675	5.231	5.757	5.613	5.743	ns
		GCLK PLL	t _{co}	1.387	1.580	2.033	2.133	2.346	2.358	2.268	2.255	2.474	2.482	2.257	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	8mA	GCLK	t _{co}	3.050	3.282	4.670	5.081	5.605	5.462	5.661	5.216	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.373	1.566	2.018	2.118	2.332	2.344	2.254	2.240	2.459	2.467	2.242	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	10mA	GCLK	t _{co}	3.047	3.278	4.666	5.077	5.601	5.458	5.657	5.212	5.738	5.594	5.724	ns
		GCLK PLL	t _{co}	1.370	1.562	2.014	2.114	2.328	2.340	2.250	2.236	2.455	2.463	2.238	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	12mA	GCLK	t _{co}	3.044	3.276	4.667	5.080	5.604	5.461	5.660	5.215	5.742	5.598	5.728	ns
		GCLK PLL	t _{co}	1.367	1.560	2.015	2.117	2.331	2.343	2.253	2.239	2.459	2.467	2.242	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.045	3.276	4.657	5.068	5.591	5.448	5.647	5.202	5.728	5.584	5.714	ns
		GCLK PLL	t _{co}	1.368	1.560	2.005	2.105	2.318	2.330	2.240	2.226	2.445	2.453	2.228	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.094	3.329	4.728	5.141	5.667	5.524	5.723	5.276	5.804	5.660	5.790	ns
		GCLK PLL	t _{co}	1.417	1.613	2.076	2.178	2.394	2.406	2.316	2.300	2.521	2.529	2.304	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	6mA	GCLK	t _{co}	3.070	3.305	4.710	5.124	5.650	5.507	5.706	5.259	5.789	5.645	5.775	ns
		GCLK PLL	t _{co}	1.393	1.589	2.058	2.161	2.377	2.389	2.299	2.283	2.506	2.514	2.289	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.052	3.286	4.688	5.102	5.628	5.485	5.684	5.237	5.767	5.623	5.753	ns
		GCLK PLL	t _{co}	1.375	1.570	2.036	2.139	2.355	2.367	2.277	2.261	2.484	2.492	2.267	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.098	3.332	4.728	5.141	5.666	5.523	5.722	5.276	5.804	5.660	5.790	ns
		GCLK PLL	t _{co}	1.421	1.616	2.076	2.178	2.393	2.405	2.315	2.300	2.521	2.529	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	6mA	GCLK	t _{co}	3.083	3.317	4.714	5.126	5.651	5.508	5.707	5.261	5.789	5.645	5.775	ns
		GCLK PLL	t _{co}	1.406	1.601	2.062	2.163	2.378	2.390	2.300	2.285	2.506	2.514	2.289	ns

Table 1-60. EP3SL70 Row Pins output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	8mA	GCLK	t _{co}	3.072	3.306	4.709	5.123	5.648	5.505	5.704	5.258	5.787	5.643	5.773	ns
		GCLK PLL	t _{co}	1.395	1.590	2.057	2.160	2.375	2.387	2.297	2.282	2.504	2.512	2.287	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	10mA	GCLK	t _{co}	3.052	3.286	4.686	5.099	5.625	5.482	5.681	5.235	5.763	5.619	5.749	ns
		GCLK PLL	t _{co}	1.375	1.570	2.034	2.136	2.352	2.364	2.274	2.259	2.480	2.488	2.263	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	12mA	GCLK	t _{co}	3.049	3.282	4.682	5.096	5.621	5.478	5.677	5.231	5.760	5.616	5.746	ns
		GCLK PLL	t _{co}	1.372	1.566	2.030	2.133	2.348	2.360	2.270	2.255	2.477	2.485	2.260	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.054	3.286	4.673	5.084	5.607	5.464	5.663	5.218	5.744	5.600	5.730	ns
		GCLK PLL	t _{co}	1.377	1.570	2.021	2.121	2.334	2.346	2.256	2.242	2.461	2.469	2.244	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	16mA	GCLK	t _{co}	3.047	3.279	4.672	5.085	5.610	5.467	5.666	5.221	5.749	5.605	5.735	ns
		GCLK PLL	t _{co}	1.370	1.563	2.020	2.122	2.337	2.349	2.259	2.245	2.466	2.474	2.249	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.075	3.308	4.700	5.112	5.636	5.493	5.692	5.247	5.774	5.630	5.760	ns
		GCLK PLL	t _{co}	1.418	1.612	2.068	2.169	2.383	2.395	2.305	2.291	2.511	2.519	2.294	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	12mA	GCLK	t _{co}	3.057	3.291	4.685	5.097	5.621	5.478	5.677	5.232	5.759	5.615	5.745	ns
		GCLK PLL	t _{co}	1.400	1.595	2.053	2.154	2.368	2.380	2.290	2.276	2.496	2.504	2.279	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.043	3.275	4.662	5.073	5.596	5.453	5.652	5.208	5.734	5.590	5.720	ns
		GCLK PLL	t _{co}	1.386	1.579	2.030	2.130	2.343	2.355	2.265	2.252	2.471	2.479	2.254	ns

Table 1-61 and Table 1-62 show EP3SL70 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-61 specifies EP3SL70 Column Pin delay adders when using the regional clock.

Table 1-61. EP3SL70 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RCLK input adder	0.158	0.168	0.225	0.241	0.257	0.247	0.313	0.244	0.258	0.252	0.315	ns
RCLK PLL input adder	-0.014	-0.012	-0.007	-0.003	-0.002	-0.005	0.191	-0.003	-0.003	-0.004	0.191	ns
RCLK output adder	-0.114	-0.116	-0.137	-0.139	-0.141	-0.137	-0.215	-0.132	-0.133	-0.136	-0.215	ns
RCLK PLL output adder	1.642	1.675	2.599	2.912	3.223	3.071	3.22	2.931	3.238	3.083	3.338	ns

Table 1-62 specifies EP3SL70 Row Pin delay adders when using the regional clock.

Table 1-62. EP3SL70 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.111	0.123	0.177	0.192	0.207	0.198	0.263	0.194	0.212	0.201	0.266	ns
RCLK PLL input adder	0.099	0.105	0.156	0.175	0.195	0.185	0.263	0.177	0.195	0.188	0.263	ns
RCLK output adder	-0.113	-0.127	-0.183	-0.198	-0.213	-0.205	-0.272	-0.202	-0.216	-0.21	-0.273	ns
RCLK PLL output adder	-0.107	-0.112	-0.164	-0.185	-0.202	-0.193	-0.258	-0.184	-0.204	-0.197	-0.257	ns

EP3SL110 I/O Timing Parameters

Table 1-63 through Table 1-67 show the maximum I/O timing parameters for EP3SL110 devices for single-ended I/O standards.

Table 1-63 specifies EP3SL110 column pins input timing parameters for single-ended I/O standards.

Table 1-63. EP3SL110 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-0.941	-1.032	-1.486	-1.625	-1.875	-1.811	-2.056	-1.553	-1.778	-1.818	-2.171	ns
		t_h	1.061	1.163	1.672	1.836	2.108	2.030	2.287	1.780	2.031	2.046	2.394	ns
	GCLK PLL	t_{su}	0.747	0.771	1.257	1.422	1.476	1.387	1.379	1.423	1.491	1.401	1.439	ns
		t_h	-0.499	-0.504	-0.858	-0.973	-0.975	-0.917	-0.896	-0.965	-0.980	-0.920	-0.953	ns
3.3-V LVCMOS	GCLK	t_{su}	-0.941	-1.032	-1.486	-1.625	-1.875	-1.811	-2.056	-1.553	-1.778	-1.818	-2.171	ns
		t_h	1.061	1.163	1.672	1.836	2.108	2.030	2.287	1.780	2.031	2.046	2.394	ns
	GCLK PLL	t_{su}	0.747	0.771	1.257	1.422	1.476	1.387	1.379	1.423	1.491	1.401	1.439	ns
		t_h	-0.499	-0.504	-0.858	-0.973	-0.975	-0.917	-0.896	-0.965	-0.980	-0.920	-0.953	ns
3.0-V LVTTTL	GCLK	t_{su}	-0.947	-1.043	-1.485	-1.627	-1.874	-1.810	-2.055	-1.553	-1.783	-1.823	-2.176	ns
		t_h	1.067	1.174	1.671	1.838	2.107	2.029	2.286	1.780	2.036	2.051	2.399	ns
	GCLK PLL	t_{su}	0.741	0.760	1.258	1.420	1.477	1.388	1.380	1.423	1.486	1.396	1.434	ns
		t_h	-0.493	-0.493	-0.859	-0.971	-0.976	-0.918	-0.897	-0.965	-0.975	-0.915	-0.948	ns
3.0-V LVCMOS	GCLK	t_{su}	-0.947	-1.043	-1.485	-1.627	-1.874	-1.810	-2.055	-1.553	-1.783	-1.823	-2.176	ns
		t_h	1.067	1.174	1.671	1.838	2.107	2.029	2.286	1.780	2.036	2.051	2.399	ns
	GCLK PLL	t_{su}	0.741	0.760	1.258	1.420	1.477	1.388	1.380	1.423	1.486	1.396	1.434	ns
		t_h	-0.493	-0.493	-0.859	-0.971	-0.976	-0.918	-0.897	-0.965	-0.975	-0.915	-0.948	ns
2.5 V	GCLK	t_{su}	-0.937	-1.038	-1.494	-1.639	-1.893	-1.829	-2.074	-1.563	-1.794	-1.834	-2.187	ns
		t_h	1.057	1.169	1.680	1.850	2.126	2.048	2.305	1.790	2.047	2.062	2.410	ns
	GCLK PLL	t_{su}	0.751	0.765	1.249	1.408	1.458	1.369	1.361	1.413	1.475	1.385	1.423	ns
		t_h	-0.503	-0.498	-0.850	-0.959	-0.957	-0.899	-0.878	-0.955	-0.964	-0.904	-0.937	ns

Table 1-63. EP3SL110 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.8 V	GCLK	t _{su}	-0.953	-1.060	-1.534	-1.675	-1.891	-1.827	-2.072	-1.597	-1.797	-1.837	-2.190	ns
		t _h	1.075	1.193	1.720	1.886	2.124	2.046	2.303	1.824	2.050	2.065	2.413	ns
	GCLK PLL	t _{su}	0.733	0.743	1.209	1.372	1.460	1.371	1.363	1.379	1.472	1.382	1.420	ns
		t _h	-0.483	-0.474	-0.810	-0.923	-0.959	-0.901	-0.880	-0.921	-0.961	-0.901	-0.934	ns
1.5 V	GCLK	t _{su}	-0.946	-1.050	-1.511	-1.643	-1.821	-1.757	-2.002	-1.566	-1.731	-1.771	-2.124	ns
		t _h	1.068	1.183	1.697	1.854	2.054	1.976	2.233	1.793	1.984	1.999	2.347	ns
	GCLK PLL	t _{su}	0.740	0.753	1.232	1.404	1.530	1.441	1.433	1.410	1.538	1.448	1.486	ns
		t _h	-0.490	-0.484	-0.833	-0.955	-1.029	-0.971	-0.950	-0.952	-1.027	-0.967	-1.000	ns
1.2 V	GCLK	t _{su}	-0.886	-0.998	-1.434	-1.544	-1.665	-1.601	-1.846	-1.470	-1.578	-1.618	-1.971	ns
		t _h	1.008	1.131	1.620	1.755	1.898	1.820	2.077	1.697	1.831	1.846	2.194	ns
	GCLK PLL	t _{su}	0.800	0.805	1.309	1.503	1.686	1.597	1.589	1.506	1.691	1.601	1.639	ns
		t _h	-0.550	-0.536	-0.910	-1.054	-1.185	-1.127	-1.106	-1.048	-1.180	-1.120	-1.153	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.867	-0.969	-1.406	-1.528	-1.667	-1.603	-1.848	-1.449	-1.574	-1.614	-1.967	ns
		t _h	0.989	1.102	1.592	1.739	1.900	1.822	2.079	1.676	1.827	1.842	2.190	ns
	GCLK PLL	t _{su}	0.819	0.834	1.337	1.519	1.684	1.595	1.587	1.527	1.695	1.605	1.643	ns
		t _h	-0.569	-0.565	-0.938	-1.070	-1.183	-1.125	-1.104	-1.069	-1.184	-1.124	-1.157	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.867	-0.969	-1.406	-1.528	-1.667	-1.603	-1.848	-1.449	-1.574	-1.614	-1.967	ns
		t _h	0.989	1.102	1.592	1.739	1.900	1.822	2.079	1.676	1.827	1.842	2.190	ns
	GCLK PLL	t _{su}	0.819	0.834	1.337	1.519	1.684	1.595	1.587	1.527	1.695	1.605	1.643	ns
		t _h	-0.569	-0.565	-0.938	-1.070	-1.183	-1.125	-1.104	-1.069	-1.184	-1.124	-1.157	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.860	-0.963	-1.393	-1.520	-1.664	-1.598	-1.849	-1.445	-1.579	-1.613	-1.968	ns
		t _h	0.982	1.096	1.579	1.728	1.894	1.816	2.075	1.669	1.827	1.840	2.186	ns
	GCLK PLL	t _{su}	0.826	0.840	1.350	1.527	1.687	1.600	1.589	1.534	1.694	1.606	1.642	ns
		t _h	-0.576	-0.571	-0.951	-1.081	-1.189	-1.131	-1.111	-1.079	-1.187	-1.126	-1.161	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.860	-0.963	-1.393	-1.520	-1.664	-1.598	-1.849	-1.445	-1.579	-1.613	-1.968	ns
		t _h	0.982	1.096	1.579	1.728	1.894	1.816	2.075	1.669	1.827	1.840	2.186	ns
	GCLK PLL	t _{su}	0.826	0.840	1.350	1.527	1.687	1.600	1.589	1.534	1.694	1.606	1.642	ns
		t _h	-0.576	-0.571	-0.951	-1.081	-1.189	-1.131	-1.111	-1.079	-1.187	-1.126	-1.161	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.848	-0.952	-1.382	-1.509	-1.645	-1.579	-1.830	-1.434	-1.561	-1.595	-1.950	ns
		t _h	0.970	1.085	1.567	1.717	1.875	1.797	2.056	1.658	1.809	1.822	2.168	ns
	GCLK PLL	t _{su}	0.838	0.851	1.361	1.538	1.706	1.619	1.608	1.545	1.712	1.624	1.660	ns
		t _h	-0.588	-0.582	-0.963	-1.092	-1.208	-1.150	-1.130	-1.090	-1.205	-1.144	-1.179	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.848	-0.952	-1.382	-1.509	-1.645	-1.579	-1.830	-1.434	-1.561	-1.595	-1.950	ns
		t _h	0.970	1.085	1.567	1.717	1.875	1.797	2.056	1.658	1.809	1.822	2.168	ns
	GCLK PLL	t _{su}	0.838	0.851	1.361	1.538	1.706	1.619	1.608	1.545	1.712	1.624	1.660	ns
		t _h	-0.588	-0.582	-0.963	-1.092	-1.208	-1.150	-1.130	-1.090	-1.205	-1.144	-1.179	ns

Table 1-63. EP3SL110 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.860	-0.963	-1.393	-1.520	-1.664	-1.598	-1.849	-1.445	-1.579	-1.613	-1.968	ns
		t _h	0.982	1.096	1.579	1.728	1.894	1.816	2.075	1.669	1.827	1.840	2.186	ns
	GCLK PLL	t _{su}	0.826	0.840	1.350	1.527	1.687	1.600	1.589	1.534	1.694	1.606	1.642	ns
		t _h	-0.576	-0.571	-0.951	-1.081	-1.189	-1.131	-1.111	-1.079	-1.187	-1.126	-1.161	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.860	-0.963	-1.393	-1.520	-1.664	-1.598	-1.849	-1.445	-1.579	-1.613	-1.968	ns
		t _h	0.982	1.096	1.579	1.728	1.894	1.816	2.075	1.669	1.827	1.840	2.186	ns
	GCLK PLL	t _{su}	0.826	0.840	1.350	1.527	1.687	1.600	1.589	1.534	1.694	1.606	1.642	ns
		t _h	-0.576	-0.571	-0.951	-1.081	-1.189	-1.131	-1.111	-1.079	-1.187	-1.126	-1.161	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.848	-0.952	-1.382	-1.509	-1.645	-1.579	-1.830	-1.434	-1.561	-1.595	-1.950	ns
		t _h	0.970	1.085	1.567	1.717	1.875	1.797	2.056	1.658	1.809	1.822	2.168	ns
	GCLK PLL	t _{su}	0.838	0.851	1.361	1.538	1.706	1.619	1.608	1.545	1.712	1.624	1.660	ns
		t _h	-0.588	-0.582	-0.963	-1.092	-1.208	-1.150	-1.130	-1.090	-1.205	-1.144	-1.179	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.848	-0.952	-1.382	-1.509	-1.645	-1.579	-1.830	-1.434	-1.561	-1.595	-1.950	ns
		t _h	0.970	1.085	1.567	1.717	1.875	1.797	2.056	1.658	1.809	1.822	2.168	ns
	GCLK PLL	t _{su}	0.838	0.851	1.361	1.538	1.706	1.619	1.608	1.545	1.712	1.624	1.660	ns
		t _h	-0.588	-0.582	-0.963	-1.092	-1.208	-1.150	-1.130	-1.090	-1.205	-1.144	-1.179	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.840	-0.940	-1.372	-1.498	-1.629	-1.563	-1.814	-1.423	-1.546	-1.580	-1.935	ns
		t _h	0.962	1.073	1.557	1.706	1.859	1.781	2.040	1.647	1.794	1.807	2.153	ns
	GCLK PLL	t _{su}	0.846	0.863	1.371	1.549	1.722	1.635	1.624	1.556	1.727	1.639	1.675	ns
		t _h	-0.596	-0.594	-0.973	-1.103	-1.224	-1.166	-1.146	-1.101	-1.220	-1.159	-1.194	ns
3.0-V PCI	GCLK	t _{su}	-0.840	-0.940	-1.372	-1.498	-1.629	-1.563	-1.814	-1.423	-1.546	-1.580	-1.935	ns
		t _h	0.962	1.073	1.557	1.706	1.859	1.781	2.040	1.647	1.794	1.807	2.153	ns
	GCLK PLL	t _{su}	0.846	0.863	1.371	1.549	1.722	1.635	1.624	1.556	1.727	1.639	1.675	ns
		t _h	-0.596	-0.594	-0.973	-1.103	-1.224	-1.166	-1.146	-1.101	-1.220	-1.159	-1.194	ns
3.0-V PCI-X	GCLK	t _{su}	-0.947	-1.043	-1.485	-1.627	-1.874	-1.810	-2.055	-1.553	-1.783	-1.823	-2.176	ns
		t _h	1.067	1.174	1.671	1.838	2.107	2.029	2.286	1.780	2.036	2.051	2.399	ns
	GCLK PLL	t _{su}	0.741	0.760	1.258	1.420	1.477	1.388	1.380	1.423	1.486	1.396	1.434	ns
		t _h	-0.493	-0.493	-0.859	-0.971	-0.976	-0.918	-0.897	-0.965	-0.975	-0.915	-0.948	ns

Table 1-64 specifies EP3SL110 row pins input timing parameters for single-ended I/O standards.

Table 1-64. EP3SL110 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.910	-0.883	-1.252	-1.441	-1.559	-1.604	-1.843	-1.465	-1.551	-1.605	-1.881	ns
		t _h	1.025	1.015	1.440	1.648	1.792	1.822	2.066	1.682	1.794	1.831	2.104	ns
	GCLK PLL	t _{su}	0.992	1.013	1.646	1.862	1.976	1.860	1.804	1.870	1.998	1.880	1.856	ns
		t _h	-0.741	-0.746	-1.246	-1.412	-1.475	-1.388	-1.322	-1.411	-1.486	-1.398	-1.371	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.910	-0.883	-1.252	-1.441	-1.559	-1.604	-1.843	-1.465	-1.551	-1.605	-1.881	ns
		t _h	1.025	1.015	1.440	1.648	1.792	1.822	2.066	1.682	1.794	1.831	2.104	ns
	GCLK PLL	t _{su}	0.992	1.013	1.646	1.862	1.976	1.860	1.804	1.870	1.998	1.880	1.856	ns
		t _h	-0.741	-0.746	-1.246	-1.412	-1.475	-1.388	-1.322	-1.411	-1.486	-1.398	-1.371	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.916	-0.894	-1.249	-1.442	-1.562	-1.607	-1.846	-1.464	-1.556	-1.610	-1.886	ns
		t _h	1.031	1.026	1.437	1.649	1.795	1.825	2.069	1.681	1.799	1.836	2.109	ns
	GCLK PLL	t _{su}	0.986	1.002	1.649	1.861	1.973	1.857	1.801	1.871	1.993	1.875	1.851	ns
		t _h	-0.735	-0.735	-1.249	-1.411	-1.472	-1.385	-1.319	-1.412	-1.481	-1.393	-1.366	ns
3.0-V LVCMOS	GCLK	t _{su}	-0.916	-0.894	-1.249	-1.442	-1.562	-1.607	-1.846	-1.464	-1.556	-1.610	-1.886	ns
		t _h	1.031	1.026	1.437	1.649	1.795	1.825	2.069	1.681	1.799	1.836	2.109	ns
	GCLK PLL	t _{su}	0.986	1.002	1.649	1.861	1.973	1.857	1.801	1.871	1.993	1.875	1.851	ns
		t _h	-0.735	-0.735	-1.249	-1.411	-1.472	-1.385	-1.319	-1.412	-1.481	-1.393	-1.366	ns
2.5 V	GCLK	t _{su}	-0.904	-0.887	-1.258	-1.455	-1.577	-1.622	-1.861	-1.473	-1.566	-1.620	-1.896	ns
		t _h	1.019	1.019	1.446	1.662	1.810	1.840	2.084	1.690	1.809	1.846	2.119	ns
	GCLK PLL	t _{su}	0.998	1.009	1.640	1.848	1.958	1.842	1.786	1.862	1.983	1.865	1.841	ns
		t _h	-0.747	-0.742	-1.240	-1.398	-1.457	-1.370	-1.304	-1.403	-1.471	-1.383	-1.356	ns
1.8 V	GCLK	t _{su}	-0.873	-0.918	-1.298	-1.402	-1.575	-1.530	-1.859	-1.402	-1.567	-1.526	-1.897	ns
		t _h	0.990	1.051	1.486	1.612	1.808	1.751	2.082	1.622	1.810	1.756	2.120	ns
	GCLK PLL	t _{su}	0.968	0.977	1.600	1.815	1.960	1.844	1.788	1.829	1.982	1.864	1.840	ns
		t _h	-0.716	-0.709	-1.200	-1.365	-1.459	-1.372	-1.306	-1.370	-1.470	-1.382	-1.355	ns
1.5 V	GCLK	t _{su}	-0.863	-0.907	-1.274	-1.370	-1.507	-1.462	-1.791	-1.371	-1.502	-1.461	-1.832	ns
		t _h	0.980	1.040	1.462	1.580	1.740	1.683	2.014	1.591	1.745	1.691	2.055	ns
	GCLK PLL	t _{su}	0.978	0.988	1.624	1.847	2.028	1.912	1.856	1.860	2.047	1.929	1.905	ns
		t _h	-0.726	-0.720	-1.224	-1.397	-1.527	-1.440	-1.374	-1.401	-1.535	-1.447	-1.420	ns
1.2 V	GCLK	t _{su}	-0.803	-0.854	-1.195	-1.269	-1.348	-1.303	-1.632	-1.275	-1.347	-1.306	-1.677	ns
		t _h	0.920	0.987	1.383	1.479	1.581	1.524	1.855	1.495	1.590	1.536	1.900	ns
	GCLK PLL	t _{su}	1.038	1.041	1.703	1.948	2.187	2.071	2.015	1.956	2.202	2.084	2.060	ns
		t _h	-0.786	-0.773	-1.303	-1.498	-1.686	-1.599	-1.533	-1.497	-1.690	-1.602	-1.575	ns

Table 1-64. EP3SL110 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-0.847	-0.828	-1.172	-1.346	-1.357	-1.402	-1.641	-1.361	-1.349	-1.403	-1.679	ns
		t _h	0.963	0.961	1.360	1.553	1.590	1.620	1.864	1.578	1.592	1.629	1.902	ns
	GCLK PLL	t _{su}	1.055	1.067	1.726	1.957	2.178	2.062	2.006	1.974	2.200	2.082	2.058	ns
		t _h	-0.803	-0.799	-1.326	-1.507	-1.677	-1.590	-1.524	-1.515	-1.688	-1.600	-1.573	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.847	-0.828	-1.172	-1.346	-1.357	-1.402	-1.641	-1.361	-1.349	-1.403	-1.679	ns
		t _h	0.963	0.961	1.360	1.553	1.590	1.620	1.864	1.578	1.592	1.629	1.902	ns
	GCLK PLL	t _{su}	1.055	1.067	1.726	1.957	2.178	2.062	2.006	1.974	2.200	2.082	2.058	ns
		t _h	-0.803	-0.799	-1.326	-1.507	-1.677	-1.590	-1.524	-1.515	-1.688	-1.600	-1.573	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.777	-0.819	-1.157	-1.244	-1.346	-1.300	-1.630	-1.246	-1.343	-1.300	-1.672	ns
		t _h	0.894	0.952	1.345	1.452	1.576	1.519	1.849	1.463	1.583	1.529	1.891	ns
	GCLK PLL	t _{su}	1.064	1.076	1.741	1.975	2.192	2.077	2.019	1.988	2.209	2.092	2.067	ns
		t _h	-0.812	-0.808	-1.341	-1.527	-1.693	-1.606	-1.541	-1.531	-1.700	-1.611	-1.586	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.777	-0.819	-1.157	-1.244	-1.346	-1.300	-1.630	-1.246	-1.343	-1.300	-1.672	ns
		t _h	0.894	0.952	1.345	1.452	1.576	1.519	1.849	1.463	1.583	1.529	1.891	ns
	GCLK PLL	t _{su}	1.064	1.076	1.741	1.975	2.192	2.077	2.019	1.988	2.209	2.092	2.067	ns
		t _h	-0.812	-0.808	-1.341	-1.527	-1.693	-1.606	-1.541	-1.531	-1.700	-1.611	-1.586	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.763	-0.807	-1.144	-1.234	-1.328	-1.282	-1.612	-1.235	-1.326	-1.283	-1.655	ns
		t _h	0.880	0.940	1.333	1.442	1.558	1.501	1.831	1.452	1.566	1.512	1.874	ns
	GCLK PLL	t _{su}	1.078	1.088	1.756	1.985	2.210	2.095	2.037	1.999	2.226	2.109	2.084	ns
		t _h	-0.826	-0.820	-1.355	-1.537	-1.711	-1.624	-1.559	-1.542	-1.717	-1.628	-1.603	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.777	-0.819	-1.157	-1.244	-1.346	-1.300	-1.630	-1.246	-1.343	-1.300	-1.672	ns
		t _h	0.894	0.952	1.345	1.452	1.576	1.519	1.849	1.463	1.583	1.529	1.891	ns
	GCLK PLL	t _{su}	1.064	1.076	1.741	1.975	2.192	2.077	2.019	1.988	2.209	2.092	2.067	ns
		t _h	-0.812	-0.808	-1.341	-1.527	-1.693	-1.606	-1.541	-1.531	-1.700	-1.611	-1.586	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.777	-0.819	-1.157	-1.244	-1.346	-1.300	-1.630	-1.246	-1.343	-1.300	-1.672	ns
		t _h	0.894	0.952	1.345	1.452	1.576	1.519	1.849	1.463	1.583	1.529	1.891	ns
	GCLK PLL	t _{su}	1.064	1.076	1.741	1.975	2.192	2.077	2.019	1.988	2.209	2.092	2.067	ns
		t _h	-0.812	-0.808	-1.341	-1.527	-1.693	-1.606	-1.541	-1.531	-1.700	-1.611	-1.586	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.763	-0.807	-1.144	-1.234	-1.328	-1.282	-1.612	-1.235	-1.326	-1.283	-1.655	ns
		t _h	0.880	0.940	1.333	1.442	1.558	1.501	1.831	1.452	1.566	1.512	1.874	ns
	GCLK PLL	t _{su}	1.078	1.088	1.756	1.985	2.210	2.095	2.037	1.999	2.226	2.109	2.084	ns
		t _h	-0.826	-0.820	-1.355	-1.537	-1.711	-1.624	-1.559	-1.542	-1.717	-1.628	-1.603	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.763	-0.807	-1.144	-1.234	-1.328	-1.282	-1.612	-1.235	-1.326	-1.283	-1.655	ns
		t _h	0.880	0.940	1.333	1.442	1.558	1.501	1.831	1.452	1.566	1.512	1.874	ns
	GCLK PLL	t _{su}	1.078	1.088	1.756	1.985	2.210	2.095	2.037	1.999	2.226	2.109	2.084	ns
		t _h	-0.826	-0.820	-1.355	-1.537	-1.711	-1.624	-1.559	-1.542	-1.717	-1.628	-1.603	ns

Table 1-64. EP3SL110 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.754	-0.795	-1.135	-1.224	-1.312	-1.266	-1.596	-1.226	-1.310	-1.267	-1.639	ns
		t_h	0.871	0.928	1.324	1.432	1.542	1.485	1.815	1.443	1.550	1.496	1.858	ns
	GCLK PLL	t_{su}	1.087	1.100	1.765	1.995	2.226	2.111	2.053	2.008	2.242	2.125	2.100	ns
		t_h	-0.835	-0.832	-1.364	-1.547	-1.727	-1.640	-1.575	-1.551	-1.733	-1.644	-1.619	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.754	-0.795	-1.135	-1.224	-1.312	-1.266	-1.596	-1.226	-1.310	-1.267	-1.639	ns
		t_h	0.871	0.928	1.324	1.432	1.542	1.485	1.815	1.443	1.550	1.496	1.858	ns
	GCLK PLL	t_{su}	1.087	1.100	1.765	1.995	2.226	2.111	2.053	2.008	2.242	2.125	2.100	ns
		t_h	-0.835	-0.832	-1.364	-1.547	-1.727	-1.640	-1.575	-1.551	-1.733	-1.644	-1.619	ns
3.0-V PCI	GCLK	t_{su}	-0.916	-0.894	-1.249	-1.442	-1.562	-1.607	-1.846	-1.464	-1.556	-1.610	-1.886	ns
		t_h	1.031	1.026	1.437	1.649	1.795	1.825	2.069	1.681	1.799	1.836	2.109	ns
	GCLK PLL	t_{su}	0.986	1.002	1.649	1.861	1.973	1.857	1.801	1.871	1.993	1.875	1.851	ns
		t_h	-0.735	-0.735	-1.249	-1.411	-1.472	-1.385	-1.319	-1.412	-1.481	-1.393	-1.366	ns
3.0-V PCI-X	GCLK	t_{su}	-0.916	-0.894	-1.249	-1.442	-1.562	-1.607	-1.846	-1.464	-1.556	-1.610	-1.886	ns
		t_h	1.031	1.026	1.437	1.649	1.795	1.825	2.069	1.681	1.799	1.836	2.109	ns
	GCLK PLL	t_{su}	0.986	1.002	1.649	1.861	1.973	1.857	1.801	1.871	1.993	1.875	1.851	ns
		t_h	-0.735	-0.735	-1.249	-1.411	-1.472	-1.385	-1.319	-1.412	-1.481	-1.393	-1.366	ns

Table 1-65 specifies EP3SL110 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	4mA	GCLK	t_{co}	3.198	3.443	4.777	5.173	5.678	5.539	5.818	5.301	5.805	5.669	5.893	ns
		GCLK PLL	t_{co}	1.575	1.757	2.219	2.336	2.565	2.563	2.529	2.444	2.674	2.673	2.515	ns
	8mA	GCLK	t_{co}	3.119	3.354	4.673	5.061	5.561	5.422	5.701	5.185	5.685	5.549	5.773	ns
		GCLK PLL	t_{co}	1.496	1.668	2.116	2.224	2.448	2.446	2.412	2.328	2.554	2.553	2.395	ns
	12mA	GCLK	t_{co}	3.089	3.322	4.606	4.991	5.491	5.352	5.631	5.115	5.618	5.482	5.706	ns
		GCLK PLL	t_{co}	1.467	1.636	2.049	2.154	2.378	2.376	2.342	2.258	2.487	2.486	2.328	ns
	16mA	GCLK	t_{co}	3.075	3.308	4.585	4.968	5.463	5.324	5.603	5.089	5.584	5.448	5.672	ns
		GCLK PLL	t_{co}	1.453	1.622	2.028	2.131	2.350	2.348	2.314	2.232	2.454	2.453	2.295	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.135	3.376	4.704	5.090	5.590	5.451	5.730	5.215	5.717	5.581	5.805	ns
		GCLK PLL	t _{co}	1.513	1.690	2.146	2.253	2.477	2.475	2.441	2.358	2.586	2.585	2.427	ns
	8mA	GCLK	t _{co}	3.064	3.299	4.582	4.964	5.459	5.320	5.599	5.085	5.580	5.444	5.668	ns
		GCLK PLL	t _{co}	1.442	1.613	2.024	2.127	2.346	2.344	2.310	2.228	2.449	2.448	2.290	ns
	12mA	GCLK	t _{co}	3.040	3.271	4.553	4.937	5.434	5.295	5.574	5.058	5.555	5.419	5.643	ns
		GCLK PLL	t _{co}	1.417	1.585	1.995	2.100	2.321	2.319	2.285	2.201	2.424	2.423	2.265	ns
	16mA	GCLK	t _{co}	3.033	3.264	4.545	4.928	5.425	5.286	5.565	5.048	5.545	5.409	5.633	ns
		GCLK PLL	t _{co}	1.410	1.578	1.987	2.091	2.312	2.310	2.276	2.192	2.415	2.414	2.256	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.195	3.452	4.811	5.209	5.717	5.578	5.857	5.339	5.847	5.711	5.935	ns
		GCLK PLL	t _{co}	1.573	1.766	2.253	2.372	2.604	2.602	2.568	2.483	2.716	2.715	2.557	ns
	8mA	GCLK	t _{co}	3.128	3.367	4.707	5.097	5.601	5.462	5.741	5.225	5.728	5.592	5.816	ns
		GCLK PLL	t _{co}	1.506	1.681	2.149	2.261	2.488	2.486	2.452	2.368	2.598	2.597	2.439	ns
	12mA	GCLK	t _{co}	3.090	3.330	4.639	5.026	5.527	5.388	5.667	5.151	5.652	5.516	5.740	ns
		GCLK PLL	t _{co}	1.468	1.644	2.081	2.189	2.414	2.412	2.378	2.294	2.522	2.521	2.363	ns
	16mA	GCLK	t _{co}	3.068	3.303	4.604	4.987	5.485	5.346	5.625	5.111	5.609	5.473	5.697	ns
		GCLK PLL	t _{co}	1.446	1.617	2.046	2.150	2.372	2.370	2.336	2.254	2.478	2.477	2.319	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.150	3.392	4.741	5.131	5.636	5.497	5.776	5.259	5.765	5.629	5.853	ns
		GCLK PLL	t _{co}	1.527	1.706	2.183	2.294	2.523	2.521	2.487	2.402	2.634	2.633	2.475	ns
	8mA	GCLK	t _{co}	3.077	3.313	4.617	5.002	5.501	5.362	5.641	5.126	5.625	5.489	5.713	ns
		GCLK PLL	t _{co}	1.455	1.627	2.060	2.165	2.388	2.386	2.352	2.269	2.495	2.494	2.336	ns
	12mA	GCLK	t _{co}	3.053	3.284	4.578	4.962	5.460	5.321	5.600	5.086	5.584	5.448	5.672	ns
		GCLK PLL	t _{co}	1.431	1.598	2.020	2.126	2.347	2.345	2.311	2.229	2.453	2.452	2.294	ns
	16mA	GCLK	t _{co}	3.053	3.284	4.570	4.953	5.450	5.311	5.590	5.075	5.572	5.436	5.660	ns
		GCLK PLL	t _{co}	1.431	1.598	2.012	2.116	2.337	2.335	2.301	2.218	2.441	2.440	2.282	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
2.5 V	4mA	GCLK	t _{co}	3.254	3.507	4.948	5.358	5.883	5.744	6.023	5.492	6.020	5.884	6.108	ns
		GCLK PLL	t _{co}	1.631	1.821	2.390	2.521	2.770	2.768	2.734	2.635	2.889	2.888	2.730	ns
	8mA	GCLK	t _{co}	3.171	3.414	4.829	5.232	5.751	5.612	5.891	5.364	5.884	5.748	5.972	ns
		GCLK PLL	t _{co}	1.548	1.728	2.271	2.395	2.638	2.636	2.602	2.507	2.753	2.752	2.594	ns
	12mA	GCLK	t _{co}	3.115	3.370	4.737	5.136	5.651	5.512	5.791	5.266	5.782	5.646	5.870	ns
		GCLK PLL	t _{co}	1.493	1.684	2.179	2.299	2.538	2.536	2.502	2.409	2.651	2.650	2.492	ns
	16mA	GCLK	t _{co}	3.082	3.324	4.703	5.099	5.610	5.471	5.750	5.226	5.738	5.602	5.826	ns
		GCLK PLL	t _{co}	1.459	1.638	2.145	2.262	2.497	2.495	2.461	2.370	2.607	2.606	2.448	ns
1.8 V	2mA	GCLK	t _{co}	3.368	3.635	5.142	5.567	6.101	5.962	6.241	5.710	6.246	6.110	6.334	ns
		GCLK PLL	t _{co}	1.745	1.949	2.585	2.730	2.988	2.986	2.952	2.853	3.115	3.114	2.956	ns
	4mA	GCLK	t _{co}	3.270	3.524	4.990	5.409	5.940	5.801	6.080	5.551	6.080	5.944	6.168	ns
		GCLK PLL	t _{co}	1.647	1.838	2.433	2.572	2.827	2.825	2.791	2.694	2.949	2.948	2.790	ns
	6mA	GCLK	t _{co}	3.188	3.437	4.863	5.271	5.796	5.657	5.936	5.407	5.932	5.796	6.020	ns
		GCLK PLL	t _{co}	1.565	1.751	2.306	2.434	2.683	2.681	2.647	2.550	2.802	2.801	2.643	ns
	8mA	GCLK	t _{co}	3.162	3.404	4.803	5.205	5.721	5.582	5.861	5.336	5.852	5.716	5.940	ns
		GCLK PLL	t _{co}	1.540	1.718	2.245	2.368	2.608	2.606	2.572	2.479	2.721	2.720	2.562	ns
	10mA	GCLK	t _{co}	3.091	3.340	4.715	5.111	5.622	5.483	5.762	5.239	5.751	5.615	5.839	ns
		GCLK PLL	t _{co}	1.469	1.654	2.157	2.274	2.509	2.507	2.473	2.382	2.620	2.619	2.461	ns
	12mA	GCLK	t _{co}	3.086	3.330	4.709	5.105	5.615	5.476	5.755	5.232	5.744	5.608	5.832	ns
		GCLK PLL	t _{co}	1.464	1.644	2.151	2.268	2.502	2.500	2.466	2.375	2.613	2.612	2.454	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.5 V	2mA	GCLK	t _{co}	3.308	3.602	5.081	5.494	6.029	5.890	6.169	5.640	6.179	6.043	6.267	ns
		GCLK PLL	t _{co}	1.686	1.916	2.523	2.657	2.916	2.914	2.880	2.783	3.048	3.047	2.889	ns
	4mA	GCLK	t _{co}	3.177	3.421	4.837	5.240	5.758	5.619	5.898	5.372	5.892	5.756	5.980	ns
		GCLK PLL	t _{co}	1.554	1.735	2.280	2.403	2.645	2.643	2.609	2.515	2.762	2.761	2.603	ns
	6mA	GCLK	t _{co}	3.132	3.384	4.757	5.160	5.678	5.539	5.818	5.292	5.809	5.673	5.897	ns
		GCLK PLL	t _{co}	1.510	1.698	2.199	2.323	2.565	2.563	2.529	2.435	2.679	2.678	2.520	ns
	8mA	GCLK	t _{co}	3.121	3.378	4.751	5.152	5.669	5.530	5.809	5.285	5.802	5.666	5.890	ns
		GCLK PLL	t _{co}	1.498	1.692	2.193	2.316	2.556	2.554	2.520	2.428	2.671	2.670	2.512	ns
	10mA	GCLK	t _{co}	3.086	3.327	4.703	5.099	5.608	5.469	5.748	5.226	5.737	5.601	5.825	ns
		GCLK PLL	t _{co}	1.463	1.641	2.145	2.262	2.495	2.493	2.459	2.369	2.606	2.605	2.447	ns
	12mA	GCLK	t _{co}	3.082	3.320	4.682	5.078	5.588	5.449	5.728	5.205	5.715	5.579	5.803	ns
		GCLK PLL	t _{co}	1.459	1.634	2.125	2.241	2.475	2.473	2.439	2.348	2.585	2.584	2.426	ns
1.2 V	2mA	GCLK	t _{co}	3.288	3.545	5.035	5.448	5.972	5.833	6.112	5.587	6.113	5.977	6.201	ns
		GCLK PLL	t _{co}	1.665	1.859	2.477	2.611	2.859	2.857	2.823	2.730	2.982	2.981	2.823	ns
	4mA	GCLK	t _{co}	3.165	3.410	4.816	5.217	5.732	5.593	5.872	5.348	5.864	5.728	5.952	ns
		GCLK PLL	t _{co}	1.543	1.724	2.258	2.380	2.619	2.617	2.583	2.491	2.734	2.733	2.575	ns
	6mA	GCLK	t _{co}	3.112	3.369	4.740	5.140	5.658	5.519	5.798	5.273	5.792	5.656	5.880	ns
		GCLK PLL	t _{co}	1.490	1.683	2.182	2.303	2.545	2.543	2.509	2.416	2.661	2.660	2.502	ns
	8mA	GCLK	t _{co}	3.092	3.335	4.701	5.097	5.608	5.469	5.748	5.224	5.735	5.599	5.823	ns
		GCLK PLL	t _{co}	1.469	1.649	2.143	2.260	2.495	2.493	2.459	2.367	2.604	2.603	2.445	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.105	3.343	4.709	5.105	5.616	5.477	5.756	5.229	5.740	5.604	5.828	ns
		GCLK PLL	t _{co}	1.483	1.657	2.151	2.268	2.503	2.501	2.467	2.373	2.609	2.608	2.450	ns
	10mA	GCLK	t _{co}	3.108	3.346	4.713	5.109	5.620	5.481	5.760	5.233	5.744	5.608	5.832	ns
		GCLK PLL	t _{co}	1.486	1.660	2.155	2.272	2.507	2.505	2.471	2.376	2.613	2.612	2.454	ns
	12mA	GCLK	t _{co}	3.090	3.326	4.691	5.087	5.598	5.459	5.738	5.212	5.722	5.586	5.810	ns
		GCLK PLL	t _{co}	1.467	1.640	2.134	2.250	2.485	2.483	2.449	2.355	2.591	2.590	2.432	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.085	3.319	4.676	5.071	5.581	5.442	5.721	5.195	5.704	5.568	5.792	ns
		GCLK PLL	t _{co}	1.462	1.633	2.119	2.234	2.468	2.466	2.432	2.338	2.574	2.573	2.415	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.123	3.363	4.732	5.128	5.639	5.500	5.779	5.253	5.764	5.628	5.852	ns
		GCLK PLL	t _{co}	1.501	1.677	2.174	2.291	2.526	2.524	2.490	2.396	2.633	2.632	2.474	ns
	6mA	GCLK	t _{co}	3.104	3.342	4.710	5.106	5.617	5.478	5.757	5.231	5.741	5.605	5.829	ns
		GCLK PLL	t _{co}	1.482	1.656	2.152	2.269	2.504	2.502	2.468	2.374	2.610	2.609	2.451	ns
	8mA	GCLK	t _{co}	3.105	3.345	4.718	5.115	5.627	5.488	5.767	5.241	5.752	5.616	5.840	ns
		GCLK PLL	t _{co}	1.483	1.659	2.160	2.278	2.514	2.512	2.478	2.384	2.621	2.620	2.462	ns
	10mA	GCLK	t _{co}	3.088	3.325	4.693	5.090	5.602	5.463	5.742	5.215	5.726	5.590	5.814	ns
		GCLK PLL	t _{co}	1.466	1.639	2.136	2.253	2.489	2.487	2.453	2.358	2.596	2.595	2.437	ns
	12mA	GCLK	t _{co}	3.085	3.321	4.689	5.086	5.597	5.458	5.737	5.211	5.722	5.586	5.810	ns
		GCLK PLL	t _{co}	1.462	1.635	2.132	2.249	2.484	2.482	2.448	2.354	2.592	2.591	2.433	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.085	3.320	4.677	5.071	5.581	5.442	5.721	5.196	5.705	5.569	5.793	ns
		GCLK PLL	t _{co}	1.463	1.634	2.119	2.235	2.468	2.466	2.432	2.339	2.574	2.573	2.415	ns
	16mA	GCLK	t _{co}	3.084	3.320	4.685	5.081	5.593	5.454	5.733	5.206	5.718	5.582	5.806	ns
		GCLK PLL	t _{co}	1.462	1.634	2.127	2.245	2.480	2.478	2.444	2.349	2.587	2.586	2.428	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.115	3.354	4.725	5.121	5.631	5.492	5.771	5.246	5.756	5.620	5.844	ns
		GCLK PLL	t _{co}	1.492	1.668	2.167	2.284	2.518	2.516	2.482	2.389	2.625	2.624	2.466	ns
	6mA	GCLK	t _{co}	3.100	3.338	4.711	5.108	5.619	5.480	5.759	5.233	5.745	5.609	5.833	ns
		GCLK PLL	t _{co}	1.477	1.652	2.153	2.271	2.506	2.504	2.470	2.376	2.614	2.613	2.455	ns
	8mA	GCLK	t _{co}	3.087	3.323	4.691	5.087	5.599	5.460	5.739	5.213	5.724	5.588	5.812	ns
		GCLK PLL	t _{co}	1.464	1.637	2.133	2.250	2.486	2.484	2.450	2.356	2.593	2.592	2.434	ns
	10mA	GCLK	t _{co}	3.087	3.324	4.692	5.089	5.602	5.463	5.742	5.215	5.727	5.591	5.815	ns
		GCLK PLL	t _{co}	1.465	1.638	2.134	2.252	2.489	2.487	2.453	2.358	2.596	2.595	2.437	ns
	12mA	GCLK	t _{co}	3.083	3.319	4.685	5.082	5.594	5.455	5.734	5.207	5.719	5.583	5.807	ns
		GCLK PLL	t _{co}	1.460	1.633	2.127	2.245	2.481	2.479	2.445	2.350	2.588	2.587	2.429	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.101	3.336	4.693	5.087	5.596	5.457	5.736	5.211	5.720	5.584	5.808	ns
		GCLK PLL	t _{co}	1.478	1.650	2.135	2.250	2.483	2.481	2.447	2.354	2.589	2.588	2.430	ns
	16mA	GCLK	t _{co}	3.100	3.336	4.697	5.092	5.602	5.463	5.742	5.216	5.726	5.590	5.814	ns
		GCLK PLL	t _{co}	1.477	1.650	2.139	2.255	2.489	2.487	2.453	2.359	2.595	2.594	2.436	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.087	3.322	4.681	5.076	5.586	5.447	5.726	5.200	5.710	5.574	5.798	ns
		GCLK PLL	t _{co}	1.464	1.636	2.123	2.239	2.473	2.471	2.437	2.343	2.579	2.578	2.420	ns
	6mA	GCLK	t _{co}	3.082	3.317	4.675	5.070	5.580	5.441	5.720	5.194	5.704	5.568	5.792	ns
		GCLK PLL	t _{co}	1.460	1.631	2.117	2.233	2.467	2.465	2.431	2.337	2.573	2.572	2.414	ns
	8mA	GCLK	t _{co}	3.084	3.320	4.680	5.075	5.586	5.447	5.726	5.200	5.710	5.574	5.798	ns
		GCLK PLL	t _{co}	1.462	1.634	2.122	2.238	2.473	2.471	2.437	2.343	2.580	2.579	2.421	ns
	10mA	GCLK	t _{co}	3.083	3.318	4.673	5.068	5.578	5.439	5.718	5.192	5.701	5.565	5.789	ns
		GCLK PLL	t _{co}	1.461	1.632	2.115	2.231	2.465	2.463	2.429	2.335	2.571	2.570	2.412	ns
	12mA	GCLK	t _{co}	3.102	3.337	4.695	5.089	5.599	5.460	5.739	5.214	5.722	5.586	5.810	ns
		GCLK PLL	t _{co}	1.479	1.651	2.137	2.252	2.486	2.484	2.450	2.357	2.592	2.591	2.433	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.097	3.333	4.693	5.088	5.598	5.459	5.738	5.213	5.722	5.586	5.810	ns
		GCLK PLL	t _{co}	1.474	1.647	2.135	2.251	2.485	2.483	2.449	2.356	2.591	2.590	2.432	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.096	3.332	4.694	5.089	5.599	5.460	5.739	5.214	5.723	5.587	5.811	ns
		GCLK PLL	t _{co}	1.474	1.646	2.136	2.252	2.486	2.484	2.450	2.357	2.592	2.591	2.433	ns
	6mA	GCLK	t _{co}	3.087	3.322	4.681	5.077	5.587	5.448	5.727	5.201	5.711	5.575	5.799	ns
		GCLK PLL	t _{co}	1.464	1.636	2.124	2.240	2.474	2.472	2.438	2.344	2.580	2.579	2.421	ns
	8mA	GCLK	t _{co}	3.088	3.324	4.687	5.083	5.595	5.456	5.735	5.208	5.719	5.583	5.807	ns
		GCLK PLL	t _{co}	1.466	1.638	2.129	2.247	2.482	2.480	2.446	2.351	2.589	2.588	2.430	ns
	10mA	GCLK	t _{co}	3.110	3.349	4.715	5.110	5.621	5.482	5.761	5.236	5.746	5.610	5.834	ns
		GCLK PLL	t _{co}	1.488	1.663	2.157	2.274	2.508	2.506	2.472	2.379	2.616	2.615	2.457	ns
	12mA	GCLK	t _{co}	3.100	3.337	4.703	5.099	5.610	5.471	5.750	5.224	5.735	5.599	5.823	ns
		GCLK PLL	t _{co}	1.477	1.651	2.145	2.262	2.497	2.495	2.461	2.367	2.604	2.603	2.445	ns

Table 1-65. EP3SL110 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.098	3.335	4.701	5.097	5.608	5.469	5.748	5.223	5.734	5.598	5.822	ns
		GCLK PLL	t _{co}	1.476	1.649	2.143	2.260	2.495	2.493	2.459	2.366	2.603	2.602	2.444	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.096	3.333	4.700	5.097	5.608	5.469	5.748	5.222	5.734	5.598	5.822	ns
		GCLK PLL	t _{co}	1.473	1.647	2.142	2.260	2.495	2.493	2.459	2.365	2.603	2.602	2.444	ns
	6mA	GCLK	t _{co}	3.092	3.329	4.693	5.090	5.601	5.462	5.741	5.215	5.726	5.590	5.814	ns
		GCLK PLL	t _{co}	1.469	1.643	2.136	2.253	2.488	2.486	2.452	2.358	2.596	2.595	2.437	ns
	8mA	GCLK	t _{co}	3.169	3.404	4.711	5.098	5.598	5.459	5.738	5.223	5.724	5.588	5.812	ns
		GCLK PLL	t _{co}	1.546	1.718	2.153	2.261	2.485	2.483	2.449	2.366	2.593	2.592	2.434	ns
	10mA	GCLK	t _{co}	3.169	3.404	4.711	5.098	5.598	5.459	5.738	5.223	5.724	5.588	5.812	ns
		GCLK PLL	t _{co}	1.546	1.718	2.153	2.261	2.485	2.483	2.449	2.366	2.593	2.592	2.434	ns
	12mA	GCLK	t _{co}	3.198	3.443	4.777	5.173	5.678	5.539	5.818	5.301	5.805	5.669	5.893	ns
		GCLK PLL	t _{co}	1.575	1.757	2.219	2.336	2.565	2.563	2.529	2.444	2.674	2.673	2.515	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.119	3.354	4.673	5.061	5.561	5.422	5.701	5.185	5.685	5.549	5.773	ns
		GCLK PLL	t _{co}	1.496	1.668	2.116	2.224	2.448	2.446	2.412	2.328	2.554	2.553	2.395	ns
3.0-V PCI	—	GCLK	t _{co}	3.089	3.322	4.606	4.991	5.491	5.352	5.631	5.115	5.618	5.482	5.706	ns
		GCLK PLL	t _{co}	1.467	1.636	2.049	2.154	2.378	2.376	2.342	2.258	2.487	2.486	2.328	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.075	3.308	4.585	4.968	5.463	5.324	5.603	5.089	5.584	5.448	5.672	ns
		GCLK PLL	t _{co}	1.453	1.622	2.028	2.131	2.350	2.348	2.314	2.232	2.454	2.453	2.295	ns

Table 1–66 specifies EP3SL110 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1–66. EP3SL110 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	4mA	GCLK	t_{co}	3.182	3.481	4.833	5.216	5.678	5.579	5.814	5.256	5.802	5.703	5.896	ns
		GCLK PLL	t_{co}	1.457	1.650	2.051	2.136	2.329	2.349	2.337	2.239	2.435	2.454	2.331	ns
	8mA	GCLK	t_{co}	3.116	3.376	4.703	5.078	5.533	5.434	5.669	5.143	5.653	5.554	5.747	ns
		GCLK PLL	t_{co}	1.364	1.545	1.921	1.998	2.184	2.204	2.192	2.098	2.286	2.305	2.182	ns
	12mA	GCLK	t_{co}	3.037	3.270	4.584	4.955	5.405	5.306	5.541	5.044	5.521	5.422	5.615	ns
		GCLK PLL	t_{co}	1.265	1.439	1.802	1.875	2.056	2.076	2.064	1.971	2.154	2.173	2.050	ns
3.3-V LVCMOS	4mA	GCLK	t_{co}	3.184	3.485	4.841	5.221	5.682	5.583	5.818	5.264	5.806	5.707	5.900	ns
		GCLK PLL	t_{co}	1.467	1.654	2.059	2.141	2.333	2.353	2.341	2.245	2.439	2.458	2.335	ns
	8mA	GCLK	t_{co}	3.041	3.276	4.590	4.961	5.411	5.312	5.548	5.056	5.528	5.429	5.622	ns
		GCLK PLL	t_{co}	1.269	1.445	1.808	1.881	2.062	2.082	2.070	1.977	2.161	2.180	2.057	ns
3.0-V LVTTTL	4mA	GCLK	t_{co}	3.143	3.427	4.785	5.169	5.634	5.535	5.770	5.224	5.760	5.661	5.854	ns
		GCLK PLL	t_{co}	1.411	1.596	2.003	2.089	2.285	2.305	2.293	2.196	2.393	2.412	2.289	ns
	8mA	GCLK	t_{co}	3.042	3.300	4.632	5.010	5.470	5.371	5.606	5.082	5.596	5.496	5.689	ns
		GCLK PLL	t_{co}	1.286	1.469	1.850	1.930	2.121	2.141	2.129	2.034	2.229	2.247	2.124	ns
	12mA	GCLK	t_{co}	3.005	3.249	4.550	4.927	5.382	5.283	5.518	5.014	5.503	5.403	5.596	ns
		GCLK PLL	t_{co}	1.247	1.418	1.768	1.847	2.033	2.053	2.041	1.948	2.136	2.154	2.031	ns
3.0-V LVCMOS	4mA	GCLK	t_{co}	3.064	3.346	4.679	5.062	5.524	5.425	5.660	5.115	5.649	5.549	5.742	ns
		GCLK PLL	t_{co}	1.325	1.515	1.897	1.982	2.175	2.195	2.183	2.088	2.282	2.300	2.177	ns
	8mA	GCLK	t_{co}	2.992	3.227	4.515	4.888	5.343	5.244	5.479	4.984	5.463	5.363	5.556	ns
		GCLK PLL	t_{co}	1.225	1.396	1.733	1.808	1.994	2.014	2.002	1.908	2.096	2.114	1.991	ns
2.5 V	4mA	GCLK	t_{co}	3.169	3.463	4.917	5.323	5.806	5.707	5.942	5.356	5.939	5.839	6.032	ns
		GCLK PLL	t_{co}	1.437	1.632	2.135	2.243	2.457	2.477	2.465	2.356	2.572	2.590	2.467	ns
	8mA	GCLK	t_{co}	3.084	3.365	4.762	5.160	5.636	5.537	5.772	5.219	5.765	5.665	5.858	ns
		GCLK PLL	t_{co}	1.327	1.534	1.980	2.080	2.287	2.307	2.295	2.189	2.398	2.416	2.293	ns
	12mA	GCLK	t_{co}	3.027	3.288	4.651	5.041	5.510	5.411	5.646	5.130	5.635	5.535	5.728	ns
		GCLK PLL	t_{co}	1.281	1.457	1.869	1.961	2.161	2.181	2.169	2.066	2.268	2.286	2.163	ns

Table 1-66. EP3SL110 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.438	3.706	5.298	5.747	6.303	6.177	6.439	5.888	6.445	6.318	6.538	ns
		GCLK PLL	t _{co}	1.670	1.879	2.521	2.672	2.932	2.952	2.937	2.793	3.056	3.075	2.949	ns
	4mA	GCLK	t _{co}	3.213	3.504	4.971	5.378	5.898	5.772	6.034	5.523	6.039	5.911	6.131	ns
		GCLK PLL	t _{co}	1.445	1.677	2.194	2.303	2.527	2.547	2.532	2.428	2.650	2.668	2.542	ns
	6mA	GCLK	t _{co}	3.148	3.402	4.818	5.228	5.739	5.613	5.875	5.355	5.866	5.739	5.959	ns
		GCLK PLL	t _{co}	1.380	1.575	2.041	2.153	2.368	2.388	2.373	2.260	2.477	2.496	2.370	ns
	8mA	GCLK	t _{co}	3.088	3.328	4.741	5.134	5.642	5.516	5.778	5.260	5.772	5.645	5.865	ns
		GCLK PLL	t _{co}	1.320	1.501	1.964	2.059	2.271	2.291	2.276	2.165	2.383	2.402	2.276	ns
1.5 V	2mA	GCLK	t _{co}	3.349	3.624	5.208	5.660	6.231	6.105	6.367	5.795	6.369	6.242	6.462	ns
		GCLK PLL	t _{co}	1.581	1.797	2.431	2.585	2.860	2.880	2.865	2.700	2.980	2.999	2.873	ns
	4mA	GCLK	t _{co}	3.107	3.366	4.803	5.223	5.740	5.614	5.876	5.349	5.865	5.738	5.958	ns
		GCLK PLL	t _{co}	1.339	1.539	2.026	2.148	2.369	2.389	2.374	2.254	2.476	2.495	2.369	ns
	6mA	GCLK	t _{co}	3.080	3.319	4.730	5.127	5.634	5.508	5.770	5.251	5.760	5.633	5.853	ns
		GCLK PLL	t _{co}	1.312	1.492	1.953	2.052	2.263	2.283	2.268	2.156	2.371	2.390	2.264	ns
	8mA	GCLK	t _{co}	3.071	3.310	4.708	5.109	5.615	5.489	5.751	5.233	5.738	5.611	5.831	ns
		GCLK PLL	t _{co}	1.303	1.483	1.931	2.034	2.244	2.264	2.249	2.138	2.349	2.368	2.242	ns
1.2 V	2mA	GCLK	t _{co}	3.292	3.549	5.118	5.574	6.156	6.030	6.292	5.707	6.285	6.158	6.378	ns
		GCLK PLL	t _{co}	1.524	1.722	2.341	2.499	2.785	2.805	2.790	2.612	2.896	2.915	2.789	ns
	4mA	GCLK	t _{co}	3.112	3.360	4.825	5.251	5.781	5.655	5.917	5.374	5.907	5.780	6.000	ns
		GCLK PLL	t _{co}	1.344	1.533	2.048	2.176	2.410	2.430	2.415	2.279	2.518	2.537	2.411	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.031	3.274	4.629	5.013	5.478	5.379	5.616	5.117	5.597	5.498	5.692	ns
		GCLK PLL	t _{co}	1.266	1.443	1.847	1.933	2.129	2.149	2.137	2.033	2.230	2.249	2.126	ns
	12mA	GCLK	t _{co}	3.026	3.262	4.621	5.005	5.476	5.371	5.614	5.116	5.596	5.491	5.691	ns
		GCLK PLL	t _{co}	1.254	1.431	1.839	1.925	2.121	2.141	2.129	2.025	2.223	2.242	2.119	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.017	3.244	4.596	4.980	5.459	5.344	5.597	5.099	5.578	5.464	5.673	ns
		GCLK PLL	t _{co}	1.238	1.413	1.814	1.900	2.094	2.114	2.102	1.999	2.196	2.215	2.092	ns

Table 1-66. EP3SL110 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.049	3.284	4.636	5.022	5.516	5.390	5.652	5.141	5.635	5.508	5.728	ns
		GCLK PLL	t _{co}	1.281	1.457	1.859	1.947	2.145	2.165	2.150	2.046	2.246	2.265	2.139	ns
	6mA	GCLK	t _{co}	3.034	3.270	4.633	5.020	5.514	5.388	5.650	5.139	5.633	5.506	5.726	ns
		GCLK PLL	t _{co}	1.266	1.443	1.856	1.945	2.143	2.163	2.148	2.044	2.244	2.263	2.137	ns
	8mA	GCLK	t _{co}	3.023	3.258	4.616	5.003	5.497	5.371	5.633	5.122	5.617	5.490	5.710	ns
		GCLK PLL	t _{co}	1.255	1.431	1.839	1.928	2.126	2.146	2.131	2.027	2.228	2.247	2.121	ns
	10mA	GCLK	t _{co}	2.999	3.235	4.600	4.987	5.482	5.356	5.618	5.107	5.602	5.475	5.695	ns
		GCLK PLL	t _{co}	1.231	1.408	1.823	1.912	2.111	2.131	2.116	2.012	2.213	2.232	2.106	ns
	12mA	GCLK	t _{co}	2.999	3.234	4.599	4.986	5.481	5.355	5.617	5.106	5.601	5.474	5.694	ns
		GCLK PLL	t _{co}	1.231	1.407	1.822	1.911	2.110	2.130	2.116	2.011	2.212	2.231	2.106	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.009	3.243	4.597	4.982	5.475	5.349	5.611	5.101	5.594	5.467	5.687	ns
		GCLK PLL	t _{co}	1.241	1.416	1.820	1.907	2.104	2.124	2.111	2.006	2.205	2.224	2.100	ns
	16mA	GCLK	t _{co}	3.004	3.238	4.596	4.983	5.477	5.351	5.613	5.103	5.598	5.471	5.691	ns
		GCLK PLL	t _{co}	1.235	1.411	1.819	1.908	2.106	2.126	2.121	2.008	2.209	2.228	2.111	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.045	3.280	4.647	5.036	5.533	5.407	5.669	5.154	5.651	5.524	5.744	ns
		GCLK PLL	t _{co}	1.277	1.453	1.870	1.961	2.162	2.182	2.167	2.059	2.262	2.281	2.155	ns
	6mA	GCLK	t _{co}	3.022	3.258	4.629	5.019	5.516	5.390	5.652	5.138	5.635	5.508	5.728	ns
		GCLK PLL	t _{co}	1.254	1.431	1.852	1.944	2.145	2.165	2.150	2.043	2.246	2.265	2.139	ns
	8mA	GCLK	t _{co}	3.005	3.241	4.612	5.001	5.498	5.372	5.634	5.120	5.618	5.491	5.711	ns
		GCLK PLL	t _{co}	1.237	1.414	1.835	1.926	2.127	2.147	2.132	2.025	2.229	2.248	2.122	ns

Table 1-66. EP3SL110 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.024	3.256	4.603	4.987	5.478	5.352	5.614	5.105	5.597	5.470	5.690	ns
		GCLK PLL	t _{co}	1.256	1.429	1.826	1.912	2.107	2.127	2.112	2.010	2.208	2.227	2.101	ns
	6mA	GCLK	t _{co}	3.012	3.244	4.594	4.979	5.470	5.344	5.606	5.097	5.590	5.463	5.683	ns
		GCLK PLL	t _{co}	1.244	1.417	1.817	1.904	2.099	2.119	2.108	2.002	2.201	2.220	2.097	ns
	8mA	GCLK	t _{co}	2.999	3.232	4.585	4.970	5.462	5.336	5.598	5.089	5.582	5.455	5.675	ns
		GCLK PLL	t _{co}	1.231	1.405	1.808	1.895	2.091	2.111	2.101	1.994	2.193	2.212	2.090	ns
	10mA	GCLK	t _{co}	3.001	3.234	4.588	4.973	5.465	5.339	5.601	5.092	5.585	5.458	5.678	ns
		GCLK PLL	t _{co}	1.233	1.407	1.811	1.898	2.094	2.114	2.105	1.997	2.196	2.215	2.093	ns
	12mA	GCLK	t _{co}	2.994	3.229	4.586	4.972	5.465	5.339	5.601	5.092	5.586	5.459	5.679	ns
		GCLK PLL	t _{co}	1.226	1.402	1.809	1.897	2.094	2.114	2.108	1.997	2.197	2.216	2.098	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.001	3.234	4.581	4.964	5.457	5.330	5.595	5.083	5.575	5.448	5.670	ns
		GCLK PLL	t _{co}	1.232	1.406	1.804	1.889	2.085	2.105	2.104	1.988	2.186	2.205	2.092	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.031	3.263	4.614	5.000	5.493	5.367	5.629	5.117	5.611	5.484	5.704	ns
		GCLK PLL	t _{co}	1.263	1.436	1.837	1.925	2.122	2.142	2.127	2.022	2.222	2.241	2.115	ns
	6mA	GCLK	t _{co}	3.019	3.253	4.610	4.996	5.489	5.363	5.625	5.114	5.608	5.481	5.701	ns
		GCLK PLL	t _{co}	1.251	1.426	1.833	1.921	2.118	2.138	2.123	2.019	2.219	2.238	2.112	ns
	8mA	GCLK	t _{co}	3.015	3.248	4.604	4.990	5.483	5.357	5.619	5.108	5.602	5.475	5.695	ns
		GCLK PLL	t _{co}	1.247	1.421	1.827	1.915	2.112	2.132	2.117	2.013	2.213	2.232	2.106	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.030	3.262	4.625	5.014	5.511	5.385	5.647	5.131	5.628	5.501	5.721	ns
		GCLK PLL	t _{co}	1.262	1.435	1.848	1.939	2.140	2.160	2.145	2.036	2.239	2.258	2.132	ns
	6mA	GCLK	t _{co}	3.018	3.250	4.614	5.002	5.499	5.373	5.635	5.120	5.617	5.490	5.710	ns
		GCLK PLL	t _{co}	1.250	1.423	1.837	1.927	2.128	2.148	2.133	2.025	2.228	2.247	2.121	ns
	8mA	GCLK	t _{co}	3.014	3.248	4.618	5.007	5.505	5.379	5.641	5.126	5.624	5.497	5.717	ns
		GCLK PLL	t _{co}	1.246	1.421	1.841	1.932	2.134	2.154	2.139	2.031	2.235	2.254	2.128	ns
3.0-V PCI	—	GCLK	t _{co}	3.137	3.357	4.654	5.031	5.518	5.390	5.656	5.165	5.639	5.511	5.734	ns
		GCLK PLL	t _{co}	1.351	1.526	1.872	1.951	2.138	2.158	2.146	2.051	2.242	2.261	2.138	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.137	3.357	4.654	5.031	5.518	5.390	5.656	5.165	5.639	5.511	5.734	ns
		GCLK PLL	t _{co}	1.351	1.526	1.872	1.951	2.138	2.158	2.146	2.051	2.242	2.261	2.138	ns

Table 1-67 through Table 1-72 show the maximum I/O timing parameters for EP3SL110 devices for differential I/O standards.

Table 1-67 specifies EP3SL110 column pins input timing parameters for differential I/O standards.

Table 1-67. EP3SL110 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
MINI-LVDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
RSDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.794	-0.829	-1.228	-1.334	-1.445	-1.387	-1.743	-1.333	-1.443	-1.391	-1.786	ns
		t _h	0.913	0.967	1.416	1.546	1.677	1.610	1.964	1.554	1.684	1.621	2.007	ns
	GCLK PLL	t _{su}	1.151	1.178	1.808	2.031	2.245	2.139	2.048	2.049	2.266	2.155	2.095	ns
		t _h	-0.898	-0.904	-1.405	-1.576	-1.742	-1.661	-1.565	-1.587	-1.753	-1.668	-1.609	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.794	-0.829	-1.228	-1.334	-1.445	-1.387	-1.743	-1.333	-1.443	-1.391	-1.786	ns
		t _h	0.913	0.967	1.416	1.546	1.677	1.610	1.964	1.554	1.684	1.621	2.007	ns
	GCLK PLL	t _{su}	1.151	1.178	1.808	2.031	2.245	2.139	2.048	2.049	2.266	2.155	2.095	ns
		t _h	-0.898	-0.904	-1.405	-1.576	-1.742	-1.661	-1.565	-1.587	-1.753	-1.668	-1.609	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _h	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{su}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _h	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns

Table 1-67. EP3SL110 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{SU}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _H	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{SU}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _H	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{SU}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _H	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{SU}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _H	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{SU}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _H	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{SU}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _H	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{SU}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _H	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{SU}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _H	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{SU}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _H	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{SU}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _H	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{SU}	-0.821	-0.858	-1.259	-1.361	-1.480	-1.424	-1.777	-1.359	-1.471	-1.422	-1.815	ns
		t _H	0.940	0.996	1.449	1.576	1.715	1.648	2.003	1.583	1.717	1.653	2.041	ns
	GCLK PLL	t _{SU}	1.124	1.149	1.777	2.004	2.210	2.102	2.014	2.023	2.238	2.124	2.066	ns
		t _H	-0.871	-0.875	-1.372	-1.546	-1.704	-1.623	-1.526	-1.558	-1.720	-1.636	-1.575	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{SU}	-0.821	-0.858	-1.259	-1.361	-1.480	-1.424	-1.777	-1.359	-1.471	-1.422	-1.815	ns
		t _H	0.940	0.996	1.449	1.576	1.715	1.648	2.003	1.583	1.717	1.653	2.041	ns
	GCLK PLL	t _{SU}	1.124	1.149	1.777	2.004	2.210	2.102	2.014	2.023	2.238	2.124	2.066	ns
		t _H	-0.871	-0.875	-1.372	-1.546	-1.704	-1.623	-1.526	-1.558	-1.720	-1.636	-1.575	ns

Table 1-68 specifies EP3SL110 parameters for differential I/O standards.

Table 1-68. EP3SL110 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t _H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t _{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t _H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns

Table 1-68. EP3SL110 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
MINI-LVDS	GCLK	t _{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t _H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t _{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t _H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns
RSDS	GCLK	t _{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t _H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t _{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t _H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{SU}	-0.724	-0.765	-1.113	-1.210	-1.304	-1.254	-1.583	-1.211	-1.303	-1.255	-1.626	ns
		t _H	0.841	0.898	1.302	1.420	1.535	1.474	1.802	1.429	1.543	1.483	1.846	ns
	GCLK PLL	t _{SU}	1.154	1.172	1.862	2.100	2.338	2.219	2.155	2.117	2.360	2.238	2.203	ns
		t _H	-0.900	-0.902	-1.458	-1.649	-1.837	-1.746	-1.674	-1.657	-1.847	-1.753	-1.718	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{SU}	-0.724	-0.765	-1.113	-1.210	-1.304	-1.254	-1.583	-1.211	-1.303	-1.255	-1.626	ns
		t _H	0.841	0.898	1.302	1.420	1.535	1.474	1.802	1.429	1.543	1.483	1.846	ns
	GCLK PLL	t _{SU}	1.154	1.172	1.862	2.100	2.338	2.219	2.155	2.117	2.360	2.238	2.203	ns
		t _H	-0.900	-0.902	-1.458	-1.649	-1.837	-1.746	-1.674	-1.657	-1.847	-1.753	-1.718	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{SU}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _H	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{SU}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _H	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{SU}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _H	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{SU}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _H	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{SU}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _H	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{SU}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _H	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{SU}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _H	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{SU}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _H	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{SU}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _H	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{SU}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _H	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns

Table 1-68. EP3SL110 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _h	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{su}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _h	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _h	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{su}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _h	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _h	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{su}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _h	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.756	-0.798	-1.145	-1.241	-1.345	-1.296	-1.623	-1.238	-1.337	-1.291	-1.661	ns
		t _h	0.873	0.931	1.336	1.454	1.579	1.518	1.847	1.459	1.582	1.521	1.886	ns
	GCLK PLL	t _{su}	1.122	1.139	1.825	2.064	2.293	2.173	2.110	2.086	2.321	2.197	2.163	ns
		t _h	-0.868	-0.869	-1.422	-1.611	-1.789	-1.698	-1.625	-1.623	-1.805	-1.711	-1.674	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.756	-0.798	-1.145	-1.241	-1.345	-1.296	-1.623	-1.238	-1.337	-1.291	-1.661	ns
		t _h	0.873	0.931	1.336	1.454	1.579	1.518	1.847	1.459	1.582	1.521	1.886	ns
	GCLK PLL	t _{su}	1.122	1.139	1.825	2.064	2.293	2.173	2.110	2.086	2.321	2.197	2.163	ns
		t _h	-0.868	-0.869	-1.422	-1.611	-1.789	-1.698	-1.625	-1.623	-1.805	-1.711	-1.674	ns

Table 1-69 specifies EP3SL110 Column Pins Output Timing parameters for differential I/O standards.

Table 1-69. EP3SL110 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t _{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
LVDS_E_3R	—	GCLK	t _{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t _{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns
MINI- LVDS_E_1R	—	GCLK	t _{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t _{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
MINI- LVDS_E_3R	—	GCLK	t _{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t _{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns

Table 1–69. EP3SL110 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t _{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
RSDS_E_3R	—	GCLK	t _{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t _{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.127	3.363	4.758	5.157	5.670	5.531	5.815	5.280	5.792	5.656	5.889	ns
		GCLK PLL	t _{co}	1.335	1.513	1.956	2.056	2.272	2.283	2.310	2.161	2.379	2.389	2.297	ns
	6mA	GCLK	t _{co}	3.117	3.353	4.748	5.146	5.660	5.521	5.805	5.269	5.782	5.646	5.879	ns
		GCLK PLL	t _{co}	1.325	1.503	1.946	2.045	2.262	2.273	2.300	2.150	2.369	2.379	2.287	ns
	8mA	GCLK	t _{co}	3.117	3.353	4.751	5.150	5.664	5.525	5.809	5.274	5.787	5.651	5.884	ns
		GCLK PLL	t _{co}	1.325	1.503	1.949	2.049	2.266	2.277	2.304	2.155	2.374	2.384	2.292	ns
	10mA	GCLK	t _{co}	3.110	3.347	4.744	5.144	5.658	5.519	5.803	5.267	5.781	5.645	5.878	ns
		GCLK PLL	t _{co}	1.318	1.497	1.942	2.043	2.260	2.271	2.298	2.148	2.368	2.378	2.286	ns
	12mA	GCLK	t _{co}	3.109	3.345	4.741	5.141	5.655	5.516	5.800	5.264	5.777	5.641	5.874	ns
		GCLK PLL	t _{co}	1.317	1.495	1.939	2.040	2.257	2.268	2.295	2.145	2.364	2.374	2.282	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.131	3.367	4.762	5.161	5.674	5.535	5.819	5.284	5.797	5.661	5.894	ns
		GCLK PLL	t _{co}	1.339	1.517	1.960	2.060	2.276	2.287	2.314	2.165	2.384	2.394	2.302	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.121	3.356	4.741	5.138	5.649	5.510	5.794	5.260	5.770	5.634	5.867	ns
		GCLK PLL	t _{co}	1.329	1.506	1.939	2.037	2.251	2.262	2.289	2.141	2.357	2.367	2.275	ns
	6mA	GCLK	t _{co}	3.116	3.352	4.741	5.138	5.650	5.511	5.795	5.261	5.772	5.636	5.869	ns
		GCLK PLL	t _{co}	1.324	1.502	1.939	2.037	2.252	2.263	2.290	2.142	2.359	2.369	2.277	ns
	8mA	GCLK	t _{co}	3.114	3.350	4.740	5.137	5.648	5.509	5.793	5.260	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.322	1.500	1.938	2.036	2.250	2.261	2.288	2.141	2.358	2.368	2.276	ns
	10mA	GCLK	t _{co}	3.106	3.341	4.730	5.127	5.639	5.500	5.784	5.250	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.314	1.491	1.928	2.026	2.241	2.252	2.279	2.131	2.348	2.358	2.266	ns
	12mA	GCLK	t _{co}	3.107	3.343	4.736	5.134	5.647	5.508	5.792	5.258	5.770	5.634	5.867	ns
		GCLK PLL	t _{co}	1.315	1.493	1.934	2.033	2.249	2.260	2.287	2.139	2.357	2.367	2.275	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.340	4.719	5.115	5.625	5.486	5.770	5.237	5.746	5.610	5.843	ns
		GCLK PLL	t _{co}	1.314	1.490	1.917	2.014	2.227	2.238	2.265	2.118	2.333	2.343	2.251	ns

Table 1-69. EP3SL110 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.118	3.353	4.737	5.133	5.643	5.504	5.788	5.256	5.765	5.629	5.862	ns
		GCLK PLL	t _{co}	1.326	1.503	1.935	2.032	2.245	2.256	2.283	2.137	2.352	2.362	2.270	ns
	6mA	GCLK	t _{co}	3.114	3.350	4.738	5.135	5.647	5.508	5.792	5.258	5.769	5.633	5.866	ns
		GCLK PLL	t _{co}	1.322	1.500	1.936	2.034	2.249	2.260	2.287	2.139	2.356	2.366	2.274	ns
	8mA	GCLK	t _{co}	3.104	3.339	4.727	5.124	5.635	5.496	5.780	5.247	5.757	5.621	5.854	ns
		GCLK PLL	t _{co}	1.312	1.489	1.925	2.023	2.237	2.248	2.275	2.128	2.344	2.354	2.262	ns
	10mA	GCLK	t _{co}	3.102	3.337	4.725	5.121	5.633	5.494	5.778	5.245	5.755	5.619	5.852	ns
		GCLK PLL	t _{co}	1.310	1.487	1.923	2.020	2.235	2.246	2.273	2.126	2.342	2.352	2.260	ns
	12mA	GCLK	t _{co}	3.102	3.338	4.728	5.126	5.638	5.499	5.783	5.249	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.310	1.488	1.926	2.025	2.240	2.251	2.278	2.130	2.348	2.358	2.266	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.341	4.725	5.121	5.632	5.493	5.777	5.244	5.754	5.618	5.851	ns
		GCLK PLL	t _{co}	1.314	1.491	1.923	2.020	2.234	2.245	2.272	2.125	2.341	2.351	2.259	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.132	3.370	4.770	5.169	5.682	5.543	5.827	5.292	5.804	5.668	5.901	ns
		GCLK PLL	t _{co}	1.340	1.520	1.968	2.068	2.284	2.295	2.322	2.173	2.391	2.401	2.309	ns
	6mA	GCLK	t _{co}	3.118	3.356	4.758	5.158	5.672	5.533	5.817	5.282	5.795	5.659	5.892	ns
		GCLK PLL	t _{co}	1.326	1.506	1.956	2.057	2.274	2.285	2.312	2.163	2.382	2.392	2.300	ns
	8mA	GCLK	t _{co}	3.106	3.343	4.741	5.140	5.654	5.515	5.799	5.264	5.777	5.641	5.874	ns
		GCLK PLL	t _{co}	1.314	1.493	1.939	2.039	2.256	2.267	2.294	2.145	2.364	2.374	2.282	ns
	10mA	GCLK	t _{co}	3.106	3.343	4.744	5.144	5.658	5.519	5.803	5.268	5.782	5.646	5.879	ns
		GCLK PLL	t _{co}	1.314	1.493	1.942	2.043	2.260	2.271	2.298	2.149	2.369	2.379	2.287	ns
	12mA	GCLK	t _{co}	3.102	3.339	4.737	5.136	5.651	5.512	5.796	5.261	5.774	5.638	5.871	ns
		GCLK PLL	t _{co}	1.310	1.489	1.935	2.035	2.253	2.264	2.291	2.142	2.361	2.371	2.279	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.106	3.341	4.730	5.127	5.639	5.500	5.784	5.250	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.314	1.491	1.928	2.026	2.241	2.252	2.279	2.131	2.348	2.358	2.266	ns
	16mA	GCLK	t _{co}	3.107	3.343	4.738	5.137	5.650	5.511	5.795	5.260	5.773	5.637	5.870	ns
		GCLK PLL	t _{co}	1.315	1.493	1.936	2.036	2.252	2.263	2.290	2.141	2.360	2.370	2.278	ns

Table 1-69. EP3SL110 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.135	3.373	4.769	5.167	5.680	5.541	5.825	5.291	5.802	5.666	5.899	ns
		GCLK PLL	t _{co}	1.343	1.523	1.967	2.066	2.282	2.293	2.320	2.172	2.389	2.399	2.307	ns
	6mA	GCLK	t _{co}	3.124	3.361	4.757	5.155	5.668	5.529	5.813	5.279	5.790	5.654	5.887	ns
		GCLK PLL	t _{co}	1.332	1.511	1.955	2.054	2.270	2.281	2.308	2.160	2.377	2.387	2.295	ns
	8mA	GCLK	t _{co}	3.119	3.357	4.757	5.156	5.669	5.530	5.814	5.280	5.792	5.656	5.889	ns
		GCLK PLL	t _{co}	1.327	1.507	1.955	2.055	2.271	2.282	2.309	2.161	2.379	2.389	2.297	ns
	10mA	GCLK	t _{co}	3.105	3.342	4.739	5.137	5.650	5.511	5.795	5.261	5.774	5.638	5.871	ns
		GCLK PLL	t _{co}	1.313	1.492	1.937	2.036	2.252	2.263	2.290	2.142	2.361	2.371	2.279	ns
	12mA	GCLK	t _{co}	3.103	3.340	4.737	5.135	5.648	5.509	5.793	5.259	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.311	1.490	1.935	2.034	2.250	2.261	2.288	2.140	2.358	2.368	2.276	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.107	3.342	4.729	5.125	5.636	5.497	5.781	5.248	5.758	5.622	5.855	ns
		GCLK PLL	t _{co}	1.315	1.492	1.927	2.024	2.238	2.249	2.276	2.129	2.345	2.355	2.263	ns
	16mA	GCLK	t _{co}	3.107	3.343	4.737	5.135	5.648	5.509	5.793	5.259	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.315	1.493	1.935	2.034	2.250	2.261	2.288	2.140	2.358	2.368	2.276	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.123	3.360	4.753	5.150	5.662	5.523	5.807	5.274	5.784	5.648	5.881	ns
		GCLK PLL	t _{co}	1.331	1.510	1.951	2.049	2.264	2.275	2.302	2.155	2.371	2.381	2.289	ns
	10mA	GCLK	t _{co}	3.123	3.360	4.753	5.150	5.662	5.523	5.807	5.274	5.784	5.648	5.881	ns
		GCLK PLL	t _{co}	1.331	1.510	1.951	2.049	2.264	2.275	2.302	2.155	2.371	2.381	2.289	ns
	12mA	GCLK	t _{co}	3.113	3.350	4.743	5.140	5.652	5.513	5.797	5.264	5.775	5.639	5.872	ns
		GCLK PLL	t _{co}	1.321	1.500	1.941	2.039	2.254	2.265	2.292	2.145	2.362	2.372	2.280	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.342	4.729	5.125	5.636	5.497	5.781	5.248	5.758	5.622	5.855	ns
		GCLK PLL	t _{co}	1.314	1.492	1.927	2.024	2.238	2.249	2.276	2.129	2.345	2.355	2.263	ns

Table 1-70 specifies EP3SL110 Row Pins Output Timing parameters for differential I/O standards.

Table 1-70. EP3SL110 Row Pins output Timing Parameters (Part 1 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t _{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
LVDS_E_1R	—	GCLK	t _{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t _{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
LVDS_E_3R	—	GCLK	t _{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t _{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
MINI-LVDS	—	GCLK	t _{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t _{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t _{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t _{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
RSDS	—	GCLK	t _{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t _{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
RSDS_E_1R	—	GCLK	t _{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t _{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
RSDS_E_3R	—	GCLK	t _{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t _{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.132	3.375	4.783	5.187	5.698	5.562	5.817	5.313	5.826	5.689	5.892	ns
		GCLK PLL	t _{co}	1.352	1.536	1.993	2.096	2.309	2.322	2.325	2.204	2.420	2.430	2.312	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	6mA	GCLK	t _{co}	3.118	3.361	4.770	5.174	5.685	5.549	5.804	5.299	5.813	5.676	5.879	ns
		GCLK PLL	t _{co}	1.338	1.522	1.980	2.083	2.296	2.309	2.312	2.190	2.407	2.417	2.299	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	8mA	GCLK	t _{co}	3.114	3.357	4.768	5.174	5.686	5.550	5.805	5.299	5.815	5.678	5.881	ns
		GCLK PLL	t _{co}	1.334	1.518	1.978	2.083	2.297	2.310	2.313	2.190	2.409	2.419	2.301	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.130	3.372	4.769	5.171	5.680	5.544	5.799	5.296	5.808	5.671	5.874	ns
		GCLK PLL	t _{co}	1.350	1.533	1.979	2.080	2.291	2.304	2.307	2.187	2.402	2.412	2.294	ns

Table 1-70. EP3SL110 Row Pins output Timing Parameters (Part 2 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	6mA	GCLK	t _{co}	3.119	3.362	4.765	5.167	5.677	5.541	5.796	5.293	5.805	5.668	5.871	ns
		GCLK PLL	t _{co}	1.339	1.523	1.975	2.076	2.288	2.301	2.304	2.184	2.399	2.409	2.291	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	8mA	GCLK	t _{co}	3.116	3.359	4.763	5.165	5.675	5.539	5.794	5.291	5.804	5.667	5.870	ns
		GCLK PLL	t _{co}	1.336	1.520	1.973	2.074	2.286	2.299	2.302	2.182	2.398	2.408	2.290	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.127	3.369	4.764	5.166	5.674	5.538	5.793	5.291	5.802	5.665	5.868	ns
		GCLK PLL	t _{co}	1.347	1.530	1.974	2.075	2.285	2.298	2.301	2.182	2.396	2.406	2.288	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	6mA	GCLK	t _{co}	3.117	3.360	4.762	5.164	5.673	5.537	5.792	5.290	5.802	5.665	5.868	ns
		GCLK PLL	t _{co}	1.337	1.521	1.972	2.073	2.284	2.297	2.300	2.181	2.396	2.406	2.288	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	8mA	GCLK	t _{co}	3.103	3.346	4.747	5.149	5.659	5.523	5.778	5.275	5.787	5.650	5.853	ns
		GCLK PLL	t _{co}	1.323	1.507	1.957	2.058	2.270	2.283	2.286	2.166	2.381	2.391	2.273	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	10mA	GCLK	t _{co}	3.100	3.342	4.743	5.145	5.655	5.519	5.774	5.271	5.783	5.646	5.849	ns
		GCLK PLL	t _{co}	1.320	1.503	1.953	2.054	2.266	2.279	2.282	2.162	2.377	2.387	2.269	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	12mA	GCLK	t _{co}	3.097	3.340	4.744	5.148	5.658	5.522	5.777	5.274	5.787	5.650	5.853	ns
		GCLK PLL	t _{co}	1.317	1.501	1.954	2.057	2.269	2.282	2.285	2.165	2.381	2.391	2.273	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.098	3.340	4.734	5.136	5.645	5.509	5.764	5.261	5.773	5.636	5.839	ns
		GCLK PLL	t _{co}	1.318	1.501	1.944	2.045	2.256	2.269	2.272	2.152	2.367	2.377	2.259	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.147	3.393	4.805	5.209	5.721	5.585	5.840	5.335	5.849	5.712	5.915	ns
		GCLK PLL	t _{co}	1.367	1.554	2.015	2.118	2.332	2.345	2.348	2.226	2.443	2.453	2.335	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	6mA	GCLK	t _{co}	3.123	3.369	4.787	5.192	5.704	5.568	5.823	5.318	5.834	5.697	5.900	ns
		GCLK PLL	t _{co}	1.343	1.530	1.997	2.101	2.315	2.328	2.331	2.209	2.428	2.438	2.320	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.106	3.350	4.765	5.170	5.682	5.546	5.801	5.296	5.812	5.675	5.878	ns
		GCLK PLL	t _{co}	1.326	1.511	1.975	2.079	2.293	2.306	2.309	2.187	2.406	2.416	2.298	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.151	3.396	4.805	5.209	5.720	5.584	5.839	5.335	5.849	5.712	5.915	ns
		GCLK PLL	t _{co}	1.371	1.557	2.015	2.118	2.331	2.344	2.347	2.226	2.443	2.453	2.335	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	6mA	GCLK	t _{co}	3.136	3.381	4.791	5.194	5.705	5.569	5.824	5.320	5.834	5.697	5.900	ns
		GCLK PLL	t _{co}	1.356	1.542	2.001	2.103	2.316	2.329	2.332	2.211	2.428	2.438	2.320	ns

Table 1-70. EP3SL110 Row Pins output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	8mA	GCLK	t _{co}	3.125	3.370	4.786	5.191	5.702	5.566	5.821	5.317	5.832	5.695	5.898	ns
		GCLK PLL	t _{co}	1.345	1.531	1.996	2.100	2.313	2.326	2.329	2.208	2.426	2.436	2.318	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	10mA	GCLK	t _{co}	3.105	3.350	4.763	5.167	5.679	5.543	5.798	5.294	5.808	5.671	5.874	ns
		GCLK PLL	t _{co}	1.325	1.511	1.973	2.076	2.290	2.303	2.306	2.185	2.402	2.412	2.294	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	12mA	GCLK	t _{co}	3.102	3.346	4.759	5.164	5.675	5.539	5.794	5.290	5.805	5.668	5.871	ns
		GCLK PLL	t _{co}	1.322	1.507	1.969	2.073	2.286	2.299	2.302	2.181	2.399	2.409	2.291	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.107	3.350	4.750	5.152	5.661	5.525	5.780	5.277	5.789	5.652	5.855	ns
		GCLK PLL	t _{co}	1.327	1.511	1.960	2.061	2.272	2.285	2.288	2.168	2.383	2.393	2.275	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	16mA	GCLK	t _{co}	3.100	3.343	4.749	5.153	5.664	5.528	5.783	5.280	5.794	5.657	5.860	ns
		GCLK PLL	t _{co}	1.320	1.504	1.959	2.062	2.275	2.288	2.291	2.171	2.388	2.398	2.280	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.138	3.382	4.787	5.190	5.700	5.564	5.819	5.316	5.829	5.692	5.895	ns
		GCLK PLL	t _{co}	1.358	1.543	1.997	2.099	2.311	2.324	2.327	2.207	2.423	2.433	2.315	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	12mA	GCLK	t _{co}	3.120	3.365	4.772	5.175	5.685	5.549	5.804	5.301	5.814	5.677	5.880	ns
		GCLK PLL	t _{co}	1.340	1.526	1.982	2.084	2.296	2.309	2.312	2.192	2.408	2.418	2.300	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.349	4.749	5.151	5.660	5.524	5.779	5.277	5.789	5.652	5.855	ns
		GCLK PLL	t _{co}	1.326	1.510	1.959	2.060	2.271	2.284	2.287	2.168	2.383	2.393	2.275	ns

Table 1-71 and Table 1-72 show EP3SL110 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-71 specifies EP3SL110 Column Pin delay adders when using the regional clock.

Table 1-71. EP3SL110 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RCLK input adder	0.186	0.171	0.245	0.255	0.268	0.261	0.393	0.248	0.277	0.267	0.364	ns
RCLK PLL input adder	2.391	2.371	3.577	4.036	4.418	4.225	4.574	4.044	4.442	4.246	4.635	ns
RCLK output adder	-0.374	-0.162	-0.226	-0.233	-0.244	-0.239	-0.367	-0.111	-0.123	-0.116	-0.296	ns
RCLK PLL output adder	-2.001	-1.786	-2.669	-2.844	-2.996	-2.879	-2.722	-2.699	-3.067	-2.798	-2.773	ns

Table 1-72 specifies EP3SL110 Row Pin delay adders when using the regional clock.

Table 1-72. EP3SL110 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.086	0.109	0.158	0.16	0.161	0.159	0.281	0.137	0.153	0.153	0.285	ns
RCLK PLL input adder	0.075	0.075	0.117	0.123	0.129	0.125	0.222	0.113	0.118	0.114	0.226	ns
RCLK output adder	-0.072	-0.097	-0.137	-0.135	-0.116	-0.134	-0.24	-0.11	-0.104	-0.124	-0.244	ns
RCLK PLL output adder	-0.063	-0.065	-0.097	-0.1	-0.104	-0.101	-0.198	-0.088	-0.09	-0.088	-0.201	ns

EP3SL150 I/O Timing Parameters

Table 1-73 through Table 1-76 show the maximum I/O timing parameters for EP3SL150 devices for single-ended I/O standards.

Table 1-73 specifies EP3SL150 column pins input timing parameters for single-ended I/O standards.

Table 1-73. EP3SL150 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-1.036	-1.079	-1.538	-1.647	-1.930	-1.866	-2.197	-1.700	-1.935	-1.874	-2.155	ns
		t_h	1.154	1.214	1.730	1.858	2.168	2.089	2.423	1.922	2.182	2.106	2.378	ns
	GCLK PLL	t_{su}	0.708	0.731	1.217	1.392	1.435	1.347	1.339	1.383	1.451	1.360	1.398	ns
		t_h	-0.459	-0.463	-0.818	-0.943	-0.935	-0.877	-0.856	-0.924	-0.940	-0.880	-0.912	ns
3.3-V LVCMOS	GCLK	t_{su}	-1.036	-1.079	-1.538	-1.647	-1.930	-1.866	-2.197	-1.700	-1.935	-1.874	-2.155	ns
		t_h	1.154	1.214	1.730	1.858	2.168	2.089	2.423	1.922	2.182	2.106	2.378	ns
	GCLK PLL	t_{su}	0.708	0.731	1.217	1.392	1.435	1.347	1.339	1.383	1.451	1.360	1.398	ns
		t_h	-0.459	-0.463	-0.818	-0.943	-0.935	-0.877	-0.856	-0.924	-0.940	-0.880	-0.912	ns
3.0-V LVTTTL	GCLK	t_{su}	-1.042	-1.090	-1.537	-1.649	-1.929	-1.865	-2.196	-1.700	-1.940	-1.879	-2.160	ns
		t_h	1.160	1.225	1.729	1.860	2.167	2.088	2.422	1.922	2.187	2.111	2.383	ns
	GCLK PLL	t_{su}	0.702	0.720	1.218	1.390	1.436	1.348	1.340	1.383	1.446	1.355	1.393	ns
		t_h	-0.453	-0.452	-0.819	-0.941	-0.936	-0.878	-0.857	-0.924	-0.935	-0.875	-0.907	ns
3.0-V LVCMOS	GCLK	t_{su}	-1.042	-1.090	-1.537	-1.649	-1.929	-1.865	-2.196	-1.700	-1.940	-1.879	-2.160	ns
		t_h	1.160	1.225	1.729	1.860	2.167	2.088	2.422	1.922	2.187	2.111	2.383	ns
	GCLK PLL	t_{su}	0.702	0.720	1.218	1.390	1.436	1.348	1.340	1.383	1.446	1.355	1.393	ns
		t_h	-0.453	-0.452	-0.819	-0.941	-0.936	-0.878	-0.857	-0.924	-0.935	-0.875	-0.907	ns
2.5 V	GCLK	t_{su}	-1.032	-1.085	-1.546	-1.661	-1.948	-1.884	-2.215	-1.710	-1.951	-1.890	-2.171	ns
		t_h	1.150	1.220	1.738	1.872	2.186	2.107	2.441	1.932	2.198	2.122	2.394	ns
	GCLK PLL	t_{su}	0.712	0.725	1.209	1.378	1.417	1.329	1.321	1.373	1.435	1.344	1.382	ns
		t_h	-0.463	-0.457	-0.810	-0.929	-0.917	-0.859	-0.838	-0.914	-0.924	-0.864	-0.896	ns

Table 1-73. EP3SL150 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	GCLK	t _{SU}	-1.050	-1.107	-1.586	-1.697	-1.946	-1.882	-2.213	-1.744	-1.954	-1.893	-2.174	ns
		t _H	1.170	1.244	1.778	1.908	2.184	2.105	2.439	1.966	2.201	2.125	2.397	ns
	GCLK PLL	t _{SU}	0.694	0.703	1.169	1.342	1.419	1.331	1.323	1.339	1.432	1.341	1.379	ns
		t _H	-0.443	-0.433	-0.770	-0.893	-0.919	-0.861	-0.840	-0.880	-0.921	-0.861	-0.893	ns
1.5 V	GCLK	t _{SU}	-1.043	-1.097	-1.563	-1.665	-1.876	-1.812	-2.143	-1.713	-1.888	-1.827	-2.108	ns
		t _H	1.163	1.234	1.755	1.876	2.114	2.035	2.369	1.935	2.135	2.059	2.331	ns
	GCLK PLL	t _{SU}	0.701	0.713	1.192	1.374	1.489	1.401	1.393	1.370	1.498	1.407	1.445	ns
		t _H	-0.450	-0.443	-0.793	-0.925	-0.989	-0.931	-0.910	-0.911	-0.987	-0.927	-0.959	ns
1.2 V	GCLK	t _{SU}	-0.983	-1.045	-1.486	-1.566	-1.720	-1.656	-1.987	-1.617	-1.735	-1.674	-1.955	ns
		t _H	1.103	1.182	1.678	1.777	1.958	1.879	2.213	1.839	1.982	1.906	2.178	ns
	GCLK PLL	t _{SU}	0.761	0.765	1.269	1.473	1.645	1.557	1.549	1.466	1.651	1.560	1.598	ns
		t _H	-0.510	-0.495	-0.870	-1.024	-1.145	-1.087	-1.066	-1.007	-1.140	-1.080	-1.112	ns
SSTL-2 CLASS I	GCLK	t _{SU}	-0.964	-1.016	-1.458	-1.550	-1.722	-1.658	-1.989	-1.596	-1.731	-1.670	-1.951	ns
		t _H	1.084	1.153	1.650	1.761	1.960	1.881	2.215	1.818	1.978	1.902	2.174	ns
	GCLK PLL	t _{SU}	0.780	0.794	1.297	1.489	1.643	1.555	1.547	1.487	1.655	1.564	1.602	ns
		t _H	-0.529	-0.524	-0.898	-1.040	-1.143	-1.085	-1.064	-1.028	-1.144	-1.084	-1.116	ns
SSTL-2 CLASS II	GCLK	t _{SU}	-0.964	-1.016	-1.458	-1.550	-1.722	-1.658	-1.989	-1.596	-1.731	-1.670	-1.951	ns
		t _H	1.084	1.153	1.650	1.761	1.960	1.881	2.215	1.818	1.978	1.902	2.174	ns
	GCLK PLL	t _{SU}	0.780	0.794	1.297	1.489	1.643	1.555	1.547	1.487	1.655	1.564	1.602	ns
		t _H	-0.529	-0.524	-0.898	-1.040	-1.143	-1.085	-1.064	-1.028	-1.144	-1.084	-1.116	ns
SSTL-18 CLASS I	GCLK	t _{SU}	-0.957	-1.010	-1.445	-1.542	-1.719	-1.653	-1.987	-1.589	-1.732	-1.669	-1.952	ns
		t _H	1.077	1.147	1.637	1.750	1.954	1.875	2.208	1.808	1.975	1.900	2.170	ns
	GCLK PLL	t _{SU}	0.787	0.800	1.310	1.497	1.646	1.560	1.549	1.494	1.654	1.565	1.601	ns
		t _H	-0.536	-0.530	-0.911	-1.051	-1.149	-1.091	-1.071	-1.038	-1.147	-1.086	-1.120	ns
SSTL-18 CLASS II	GCLK	t _{SU}	-0.957	-1.010	-1.445	-1.542	-1.719	-1.653	-1.987	-1.589	-1.732	-1.669	-1.952	ns
		t _H	1.077	1.147	1.637	1.750	1.954	1.875	2.208	1.808	1.975	1.900	2.170	ns
	GCLK PLL	t _{SU}	0.787	0.800	1.310	1.497	1.646	1.560	1.549	1.494	1.654	1.565	1.601	ns
		t _H	-0.536	-0.530	-0.911	-1.051	-1.149	-1.091	-1.071	-1.038	-1.147	-1.086	-1.120	ns
SSTL-15 CLASS I	GCLK	t _{SU}	-0.945	-0.999	-1.434	-1.531	-1.700	-1.634	-1.968	-1.578	-1.714	-1.651	-1.934	ns
		t _H	1.065	1.136	1.625	1.739	1.935	1.856	2.189	1.797	1.957	1.882	2.152	ns
	GCLK PLL	t _{SU}	0.799	0.811	1.321	1.508	1.665	1.579	1.568	1.505	1.672	1.583	1.619	ns
		t _H	-0.548	-0.541	-0.923	-1.062	-1.168	-1.110	-1.090	-1.049	-1.165	-1.104	-1.138	ns
1.8-V HSTL CLASS I	GCLK	t _{SU}	-0.945	-0.999	-1.434	-1.531	-1.700	-1.634	-1.968	-1.578	-1.714	-1.651	-1.934	ns
		t _H	1.065	1.136	1.625	1.739	1.935	1.856	2.189	1.797	1.957	1.882	2.152	ns
	GCLK PLL	t _{SU}	0.799	0.811	1.321	1.508	1.665	1.579	1.568	1.505	1.672	1.583	1.619	ns
		t _H	-0.548	-0.541	-0.923	-1.062	-1.168	-1.110	-1.090	-1.049	-1.165	-1.104	-1.138	ns

Table 1-73. EP3SL150 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.957	-1.010	-1.445	-1.542	-1.719	-1.653	-1.987	-1.589	-1.732	-1.669	-1.952	ns
		t _h	1.077	1.147	1.637	1.750	1.954	1.875	2.208	1.808	1.975	1.900	2.170	ns
	GCLK PLL	t _{su}	0.787	0.800	1.310	1.497	1.646	1.560	1.549	1.494	1.654	1.565	1.601	ns
		t _h	-0.536	-0.530	-0.911	-1.051	-1.149	-1.091	-1.071	-1.038	-1.147	-1.086	-1.120	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.957	-1.010	-1.445	-1.542	-1.719	-1.653	-1.987	-1.589	-1.732	-1.669	-1.952	ns
		t _h	1.077	1.147	1.637	1.750	1.954	1.875	2.208	1.808	1.975	1.900	2.170	ns
	GCLK PLL	t _{su}	0.787	0.800	1.310	1.497	1.646	1.560	1.549	1.494	1.654	1.565	1.601	ns
		t _h	-0.536	-0.530	-0.911	-1.051	-1.149	-1.091	-1.071	-1.038	-1.147	-1.086	-1.120	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.945	-0.999	-1.434	-1.531	-1.700	-1.634	-1.968	-1.578	-1.714	-1.651	-1.934	ns
		t _h	1.065	1.136	1.625	1.739	1.935	1.856	2.189	1.797	1.957	1.882	2.152	ns
	GCLK PLL	t _{su}	0.799	0.811	1.321	1.508	1.665	1.579	1.568	1.505	1.672	1.583	1.619	ns
		t _h	-0.548	-0.541	-0.923	-1.062	-1.168	-1.110	-1.090	-1.049	-1.165	-1.104	-1.138	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.945	-0.999	-1.434	-1.531	-1.700	-1.634	-1.968	-1.578	-1.714	-1.651	-1.934	ns
		t _h	1.065	1.136	1.625	1.739	1.935	1.856	2.189	1.797	1.957	1.882	2.152	ns
	GCLK PLL	t _{su}	0.799	0.811	1.321	1.508	1.665	1.579	1.568	1.505	1.672	1.583	1.619	ns
		t _h	-0.548	-0.541	-0.923	-1.062	-1.168	-1.110	-1.090	-1.049	-1.165	-1.104	-1.138	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.937	-0.987	-1.424	-1.520	-1.684	-1.618	-1.952	-1.567	-1.699	-1.636	-1.919	ns
		t _h	1.057	1.124	1.615	1.728	1.919	1.840	2.173	1.786	1.942	1.867	2.137	ns
	GCLK PLL	t _{su}	0.807	0.823	1.331	1.519	1.681	1.595	1.584	1.516	1.687	1.598	1.634	ns
		t _h	-0.556	-0.553	-0.933	-1.073	-1.184	-1.126	-1.106	-1.060	-1.180	-1.119	-1.153	ns
3.0-V PCI	GCLK	t _{su}	-0.937	-0.987	-1.424	-1.520	-1.684	-1.618	-1.952	-1.567	-1.699	-1.636	-1.919	ns
		t _h	1.057	1.124	1.615	1.728	1.919	1.840	2.173	1.786	1.942	1.867	2.137	ns
	GCLK PLL	t _{su}	0.807	0.823	1.331	1.519	1.681	1.595	1.584	1.516	1.687	1.598	1.634	ns
		t _h	-0.556	-0.553	-0.933	-1.073	-1.184	-1.126	-1.106	-1.060	-1.180	-1.119	-1.153	ns
3.0-V PCI-X	GCLK	t _{su}	-1.042	-1.090	-1.537	-1.649	-1.929	-1.865	-2.196	-1.700	-1.940	-1.879	-2.160	ns
		t _h	1.160	1.225	1.729	1.860	2.167	2.088	2.422	1.922	2.187	2.111	2.383	ns
	GCLK PLL	t _{su}	0.702	0.720	1.218	1.390	1.436	1.348	1.340	1.383	1.446	1.355	1.393	ns
		t _h	-0.453	-0.452	-0.819	-0.941	-0.936	-0.878	-0.857	-0.924	-0.935	-0.875	-0.907	ns

Table 1-74 specifies EP3SL150 row pins input timing parameters for single-ended I/O standards.

Table 1-74. EP3SL150 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.925	-0.964	-1.360	-1.470	-1.682	-1.633	-1.954	-1.480	-1.679	-1.634	-1.993	ns
		t _h	1.040	1.094	1.544	1.677	1.910	1.851	2.173	1.698	1.917	1.860	2.212	ns
	GCLK PLL	t _{su}	0.988	1.009	1.642	1.858	1.971	1.855	1.796	1.865	1.993	1.875	1.848	ns
		t _h	-0.737	-0.741	-1.241	-1.407	-1.471	-1.383	-1.314	-1.407	-1.482	-1.393	-1.363	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.925	-0.964	-1.360	-1.470	-1.682	-1.633	-1.954	-1.480	-1.679	-1.634	-1.993	ns
		t _h	1.040	1.094	1.544	1.677	1.910	1.851	2.173	1.698	1.917	1.860	2.212	ns
	GCLK PLL	t _{su}	0.988	1.009	1.642	1.858	1.971	1.855	1.796	1.865	1.993	1.875	1.848	ns
		t _h	-0.737	-0.741	-1.241	-1.407	-1.471	-1.383	-1.314	-1.407	-1.482	-1.393	-1.363	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.931	-0.975	-1.357	-1.471	-1.685	-1.636	-1.957	-1.479	-1.684	-1.639	-1.998	ns
		t _h	1.046	1.105	1.541	1.678	1.913	1.854	2.176	1.697	1.922	1.865	2.217	ns
	GCLK PLL	t _{su}	0.982	0.998	1.645	1.857	1.968	1.852	1.793	1.866	1.988	1.870	1.843	ns
		t _h	-0.731	-0.730	-1.244	-1.406	-1.468	-1.380	-1.311	-1.408	-1.477	-1.388	-1.358	ns
3.0-V LVCMOS	GCLK	t _{su}	-0.931	-0.975	-1.357	-1.471	-1.685	-1.636	-1.957	-1.479	-1.684	-1.639	-1.998	ns
		t _h	1.046	1.105	1.541	1.678	1.913	1.854	2.176	1.697	1.922	1.865	2.217	ns
	GCLK PLL	t _{su}	0.982	0.998	1.645	1.857	1.968	1.852	1.793	1.866	1.988	1.870	1.843	ns
		t _h	-0.731	-0.730	-1.244	-1.406	-1.468	-1.380	-1.311	-1.408	-1.477	-1.388	-1.358	ns
2.5 V	GCLK	t _{su}	-0.919	-0.968	-1.366	-1.484	-1.700	-1.651	-1.972	-1.488	-1.694	-1.649	-2.008	ns
		t _h	1.034	1.098	1.550	1.691	1.928	1.869	2.191	1.706	1.932	1.875	2.227	ns
	GCLK PLL	t _{su}	0.994	1.005	1.636	1.844	1.953	1.837	1.778	1.857	1.978	1.860	1.833	ns
		t _h	-0.743	-0.737	-1.235	-1.393	-1.453	-1.365	-1.296	-1.399	-1.467	-1.378	-1.348	ns
1.8 V	GCLK	t _{su}	-0.949	-1.000	-1.406	-1.530	-1.590	-1.662	-1.875	-1.521	-1.582	-1.663	-1.913	ns
		t _h	1.065	1.131	1.590	1.738	1.824	1.880	2.098	1.739	1.826	1.889	2.137	ns
	GCLK PLL	t _{su}	0.964	0.966	1.589	1.806	1.955	1.835	1.780	1.824	1.977	1.854	1.832	ns
		t _h	-0.712	-0.698	-1.190	-1.356	-1.455	-1.362	-1.298	-1.366	-1.466	-1.372	-1.347	ns
1.5 V	GCLK	t _{su}	-0.939	-0.989	-1.382	-1.498	-1.522	-1.594	-1.807	-1.490	-1.517	-1.598	-1.848	ns
		t _h	1.055	1.120	1.566	1.706	1.756	1.812	2.030	1.708	1.761	1.824	2.072	ns
	GCLK PLL	t _{su}	0.974	0.977	1.613	1.838	2.023	1.903	1.848	1.855	2.042	1.919	1.897	ns
		t _h	-0.722	-0.709	-1.214	-1.388	-1.523	-1.430	-1.366	-1.397	-1.531	-1.437	-1.412	ns
1.2 V	GCLK	t _{su}	-0.879	-0.936	-1.303	-1.397	-1.363	-1.435	-1.648	-1.394	-1.362	-1.443	-1.693	ns
		t _h	0.995	1.067	1.487	1.605	1.597	1.653	1.871	1.612	1.606	1.669	1.917	ns
	GCLK PLL	t _{su}	1.034	1.030	1.692	1.939	2.182	2.062	2.007	1.951	2.197	2.074	2.052	ns
		t _h	-0.782	-0.762	-1.293	-1.489	-1.682	-1.589	-1.525	-1.493	-1.686	-1.592	-1.567	ns

Table 1-74. EP3SL150 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-0.862	-0.910	-1.280	-1.375	-1.480	-1.431	-1.752	-1.376	-1.477	-1.432	-1.791	ns
		t _h	0.978	1.041	1.464	1.582	1.708	1.649	1.971	1.594	1.715	1.658	2.010	ns
	GCLK PLL	t _{su}	1.051	1.063	1.722	1.953	2.173	2.057	1.998	1.969	2.195	2.077	2.050	ns
		t _h	-0.799	-0.794	-1.321	-1.502	-1.673	-1.585	-1.516	-1.511	-1.684	-1.595	-1.565	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.862	-0.910	-1.280	-1.375	-1.480	-1.431	-1.752	-1.376	-1.477	-1.432	-1.791	ns
		t _h	0.978	1.041	1.464	1.582	1.708	1.649	1.971	1.594	1.715	1.658	2.010	ns
	GCLK PLL	t _{su}	1.051	1.063	1.722	1.953	2.173	2.057	1.998	1.969	2.195	2.077	2.050	ns
		t _h	-0.799	-0.794	-1.321	-1.502	-1.673	-1.585	-1.516	-1.511	-1.684	-1.595	-1.565	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.853	-0.901	-1.265	-1.370	-1.361	-1.429	-1.646	-1.362	-1.358	-1.435	-1.688	ns
		t _h	0.969	1.032	1.449	1.576	1.592	1.646	1.865	1.578	1.599	1.660	1.908	ns
	GCLK PLL	t _{su}	1.060	1.065	1.730	1.966	2.187	2.068	2.011	1.983	2.204	2.082	2.059	ns
		t _h	-0.808	-0.797	-1.331	-1.518	-1.689	-1.596	-1.533	-1.527	-1.696	-1.601	-1.578	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.853	-0.901	-1.265	-1.370	-1.361	-1.429	-1.646	-1.362	-1.358	-1.435	-1.688	ns
		t _h	0.969	1.032	1.449	1.576	1.592	1.646	1.865	1.578	1.599	1.660	1.908	ns
	GCLK PLL	t _{su}	1.060	1.065	1.730	1.966	2.187	2.068	2.011	1.983	2.204	2.082	2.059	ns
		t _h	-0.808	-0.797	-1.331	-1.518	-1.689	-1.596	-1.533	-1.527	-1.696	-1.601	-1.578	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.839	-0.889	-1.250	-1.360	-1.343	-1.411	-1.628	-1.351	-1.341	-1.418	-1.671	ns
		t _h	0.955	1.020	1.435	1.566	1.574	1.628	1.847	1.567	1.582	1.643	1.891	ns
	GCLK PLL	t _{su}	1.074	1.077	1.745	1.976	2.205	2.086	2.029	1.994	2.221	2.099	2.076	ns
		t _h	-0.822	-0.809	-1.345	-1.528	-1.707	-1.614	-1.551	-1.538	-1.713	-1.618	-1.595	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.853	-0.901	-1.265	-1.370	-1.361	-1.429	-1.646	-1.362	-1.358	-1.435	-1.688	ns
		t _h	0.969	1.032	1.449	1.576	1.592	1.646	1.865	1.578	1.599	1.660	1.908	ns
	GCLK PLL	t _{su}	1.060	1.065	1.730	1.966	2.187	2.068	2.011	1.983	2.204	2.082	2.059	ns
		t _h	-0.808	-0.797	-1.331	-1.518	-1.689	-1.596	-1.533	-1.527	-1.696	-1.601	-1.578	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.853	-0.901	-1.265	-1.370	-1.361	-1.429	-1.646	-1.362	-1.358	-1.435	-1.688	ns
		t _h	0.969	1.032	1.449	1.576	1.592	1.646	1.865	1.578	1.599	1.660	1.908	ns
	GCLK PLL	t _{su}	1.060	1.065	1.730	1.966	2.187	2.068	2.011	1.983	2.204	2.082	2.059	ns
		t _h	-0.808	-0.797	-1.331	-1.518	-1.689	-1.596	-1.533	-1.527	-1.696	-1.601	-1.578	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.839	-0.889	-1.250	-1.360	-1.343	-1.411	-1.628	-1.351	-1.341	-1.418	-1.671	ns
		t _h	0.955	1.020	1.435	1.566	1.574	1.628	1.847	1.567	1.582	1.643	1.891	ns
	GCLK PLL	t _{su}	1.074	1.077	1.745	1.976	2.205	2.086	2.029	1.994	2.221	2.099	2.076	ns
		t _h	-0.822	-0.809	-1.345	-1.528	-1.707	-1.614	-1.551	-1.538	-1.713	-1.618	-1.595	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.839	-0.889	-1.250	-1.360	-1.343	-1.411	-1.628	-1.351	-1.341	-1.418	-1.671	ns
		t _h	0.955	1.020	1.435	1.566	1.574	1.628	1.847	1.567	1.582	1.643	1.891	ns
	GCLK PLL	t _{su}	1.074	1.077	1.745	1.976	2.205	2.086	2.029	1.994	2.221	2.099	2.076	ns
		t _h	-0.822	-0.809	-1.345	-1.528	-1.707	-1.614	-1.551	-1.538	-1.713	-1.618	-1.595	ns

Table 1-74. EP3SL150 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.830	-0.877	-1.241	-1.350	-1.327	-1.395	-1.612	-1.342	-1.325	-1.402	-1.655	ns
		t _h	0.946	1.008	1.426	1.556	1.558	1.612	1.831	1.558	1.566	1.627	1.875	ns
	GCLK PLL	t _{su}	1.083	1.089	1.754	1.986	2.221	2.102	2.045	2.003	2.237	2.115	2.092	ns
		t _h	-0.831	-0.821	-1.354	-1.538	-1.723	-1.630	-1.567	-1.547	-1.729	-1.634	-1.611	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.830	-0.877	-1.241	-1.350	-1.327	-1.395	-1.612	-1.342	-1.325	-1.402	-1.655	ns
		t _h	0.946	1.008	1.426	1.556	1.558	1.612	1.831	1.558	1.566	1.627	1.875	ns
	GCLK PLL	t _{su}	1.083	1.089	1.754	1.986	2.221	2.102	2.045	2.003	2.237	2.115	2.092	ns
		t _h	-0.831	-0.821	-1.354	-1.538	-1.723	-1.630	-1.567	-1.547	-1.729	-1.634	-1.611	ns
3.0-V PCI	GCLK	t _{su}	-0.931	-0.975	-1.357	-1.471	-1.685	-1.636	-1.957	-1.479	-1.684	-1.639	-1.998	ns
		t _h	1.046	1.105	1.541	1.678	1.913	1.854	2.176	1.697	1.922	1.865	2.217	ns
	GCLK PLL	t _{su}	0.982	0.998	1.645	1.857	1.968	1.852	1.793	1.866	1.988	1.870	1.843	ns
		t _h	-0.731	-0.730	-1.244	-1.406	-1.468	-1.380	-1.311	-1.408	-1.477	-1.388	-1.358	ns
3.0-V PCI-X	GCLK	t _{su}	-0.931	-0.975	-1.357	-1.471	-1.685	-1.636	-1.957	-1.479	-1.684	-1.639	-1.998	ns
		t _h	1.046	1.105	1.541	1.678	1.913	1.854	2.176	1.697	1.922	1.865	2.217	ns
	GCLK PLL	t _{su}	0.982	0.998	1.645	1.857	1.968	1.852	1.793	1.866	1.988	1.870	1.843	ns
		t _h	-0.731	-0.730	-1.244	-1.406	-1.468	-1.380	-1.311	-1.408	-1.477	-1.388	-1.358	ns

Table 1-75 specifies EP3SL150 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1-75. EP3SL150 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.198	3.443	4.777	5.155	5.678	5.539	5.818	5.301	5.805	5.669	5.862	ns
		GCLK PLL	t _{co}	1.553	1.734	2.197	2.314	2.565	2.541	2.527	2.422	2.652	2.651	2.513	ns
	8mA	GCLK	t _{co}	3.119	3.354	4.673	5.043	5.561	5.422	5.701	5.185	5.685	5.549	5.742	ns
		GCLK PLL	t _{co}	1.474	1.645	2.094	2.202	2.448	2.424	2.410	2.306	2.532	2.531	2.393	ns
	12mA	GCLK	t _{co}	3.089	3.322	4.606	4.973	5.491	5.352	5.631	5.115	5.618	5.482	5.674	ns
		GCLK PLL	t _{co}	1.445	1.613	2.027	2.132	2.378	2.354	2.340	2.236	2.465	2.464	2.326	ns
	16mA	GCLK	t _{co}	3.075	3.308	4.585	4.950	5.463	5.324	5.603	5.089	5.584	5.448	5.640	ns
		GCLK PLL	t _{co}	1.431	1.599	2.006	2.109	2.350	2.326	2.312	2.210	2.432	2.431	2.292	ns

Table 1–75. EP3SL150 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.135	3.376	4.704	5.072	5.590	5.451	5.730	5.215	5.717	5.581	5.774	ns
		GCLK PLL	t _{co}	1.491	1.667	2.124	2.231	2.477	2.453	2.439	2.336	2.564	2.563	2.425	ns
	8mA	GCLK	t _{co}	3.064	3.299	4.582	4.946	5.459	5.320	5.599	5.085	5.580	5.444	5.636	ns
		GCLK PLL	t _{co}	1.420	1.590	2.002	2.105	2.346	2.322	2.308	2.206	2.427	2.426	2.288	ns
	12mA	GCLK	t _{co}	3.040	3.271	4.553	4.919	5.434	5.295	5.574	5.058	5.555	5.419	5.610	ns
		GCLK PLL	t _{co}	1.395	1.562	1.973	2.078	2.321	2.297	2.283	2.179	2.402	2.401	2.263	ns
	16mA	GCLK	t _{co}	3.033	3.264	4.545	4.910	5.425	5.286	5.565	5.048	5.545	5.409	5.600	ns
		GCLK PLL	t _{co}	1.388	1.555	1.965	2.069	2.312	2.288	2.274	2.170	2.393	2.392	2.253	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.195	3.452	4.811	5.191	5.717	5.578	5.857	5.339	5.847	5.711	5.903	ns
		GCLK PLL	t _{co}	1.551	1.743	2.231	2.350	2.604	2.580	2.566	2.461	2.694	2.693	2.555	ns
	8mA	GCLK	t _{co}	3.128	3.367	4.707	5.079	5.601	5.462	5.741	5.225	5.728	5.592	5.785	ns
		GCLK PLL	t _{co}	1.484	1.658	2.127	2.239	2.488	2.464	2.450	2.346	2.576	2.575	2.436	ns
	12mA	GCLK	t _{co}	3.090	3.330	4.639	5.008	5.527	5.388	5.667	5.151	5.652	5.516	5.708	ns
		GCLK PLL	t _{co}	1.446	1.621	2.059	2.167	2.414	2.390	2.376	2.272	2.500	2.499	2.360	ns
	16mA	GCLK	t _{co}	3.068	3.303	4.604	4.969	5.485	5.346	5.625	5.111	5.609	5.473	5.665	ns
		GCLK PLL	t _{co}	1.424	1.594	2.024	2.128	2.372	2.348	2.334	2.232	2.456	2.455	2.317	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.150	3.392	4.741	5.113	5.636	5.497	5.776	5.259	5.765	5.629	5.821	ns
		GCLK PLL	t _{co}	1.505	1.683	2.161	2.272	2.523	2.499	2.485	2.380	2.612	2.611	2.473	ns
	8mA	GCLK	t _{co}	3.077	3.313	4.617	4.984	5.501	5.362	5.641	5.126	5.625	5.489	5.681	ns
		GCLK PLL	t _{co}	1.433	1.604	2.038	2.143	2.388	2.364	2.350	2.247	2.473	2.472	2.333	ns
	12mA	GCLK	t _{co}	3.053	3.284	4.578	4.944	5.460	5.321	5.600	5.086	5.584	5.448	5.640	ns
		GCLK PLL	t _{co}	1.409	1.575	1.998	2.104	2.347	2.323	2.309	2.207	2.431	2.430	2.292	ns
	16mA	GCLK	t _{co}	3.053	3.284	4.570	4.935	5.450	5.311	5.590	5.075	5.572	5.436	5.627	ns
		GCLK PLL	t _{co}	1.409	1.575	1.990	2.094	2.337	2.313	2.299	2.196	2.419	2.418	2.280	ns

Table 1-75. EP3SL150 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
2.5 V	4mA	GCLK	t _{co}	3.254	3.507	4.948	5.340	5.883	5.744	6.023	5.492	6.020	5.884	6.075	ns
		GCLK PLL	t _{co}	1.609	1.798	2.368	2.499	2.770	2.746	2.732	2.613	2.867	2.866	2.728	ns
	8mA	GCLK	t _{co}	3.171	3.414	4.829	5.214	5.751	5.612	5.891	5.364	5.884	5.748	5.940	ns
		GCLK PLL	t _{co}	1.526	1.705	2.249	2.373	2.638	2.614	2.600	2.485	2.731	2.730	2.592	ns
	12mA	GCLK	t _{co}	3.115	3.370	4.737	5.118	5.651	5.512	5.791	5.266	5.782	5.646	5.838	ns
		GCLK PLL	t _{co}	1.471	1.661	2.157	2.277	2.538	2.514	2.500	2.387	2.629	2.628	2.490	ns
	16mA	GCLK	t _{co}	3.082	3.324	4.703	5.081	5.610	5.471	5.750	5.226	5.738	5.602	5.794	ns
		GCLK PLL	t _{co}	1.437	1.615	2.123	2.240	2.497	2.473	2.459	2.348	2.585	2.584	2.446	ns
1.8 V	2mA	GCLK	t _{co}	3.368	3.635	5.142	5.549	6.101	5.962	6.241	5.710	6.246	6.110	6.303	ns
		GCLK PLL	t _{co}	1.723	1.926	2.563	2.708	2.988	2.964	2.950	2.831	3.093	3.092	2.954	ns
	4mA	GCLK	t _{co}	3.270	3.524	4.990	5.391	5.940	5.801	6.080	5.551	6.080	5.944	6.137	ns
		GCLK PLL	t _{co}	1.625	1.815	2.411	2.550	2.827	2.803	2.789	2.672	2.927	2.926	2.788	ns
	6mA	GCLK	t _{co}	3.188	3.437	4.863	5.253	5.796	5.657	5.936	5.407	5.932	5.796	5.988	ns
		GCLK PLL	t _{co}	1.543	1.728	2.284	2.412	2.683	2.659	2.645	2.528	2.780	2.779	2.640	ns
	8mA	GCLK	t _{co}	3.162	3.404	4.803	5.187	5.721	5.582	5.861	5.336	5.852	5.716	5.908	ns
		GCLK PLL	t _{co}	1.518	1.695	2.223	2.346	2.608	2.584	2.570	2.457	2.699	2.698	2.560	ns
	10mA	GCLK	t _{co}	3.091	3.340	4.715	5.093	5.622	5.483	5.762	5.239	5.751	5.615	5.807	ns
		GCLK PLL	t _{co}	1.447	1.631	2.135	2.252	2.509	2.485	2.471	2.360	2.598	2.597	2.459	ns
	12mA	GCLK	t _{co}	3.086	3.330	4.709	5.087	5.615	5.476	5.755	5.232	5.744	5.608	5.800	ns
		GCLK PLL	t _{co}	1.442	1.621	2.129	2.246	2.502	2.478	2.464	2.353	2.591	2.590	2.452	ns

Table 1–75. EP3SL150 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.308	3.602	5.081	5.476	6.029	5.890	6.169	5.640	6.179	6.043	6.236	ns
		GCLK PLL	t _{co}	1.664	1.893	2.501	2.635	2.916	2.892	2.878	2.761	3.026	3.025	2.887	ns
	4mA	GCLK	t _{co}	3.177	3.421	4.837	5.222	5.758	5.619	5.898	5.372	5.892	5.756	5.948	ns
		GCLK PLL	t _{co}	1.532	1.712	2.258	2.381	2.645	2.621	2.607	2.493	2.740	2.739	2.600	ns
	6mA	GCLK	t _{co}	3.132	3.384	4.757	5.142	5.678	5.539	5.818	5.292	5.809	5.673	5.865	ns
		GCLK PLL	t _{co}	1.488	1.675	2.177	2.301	2.565	2.541	2.527	2.413	2.657	2.656	2.517	ns
	8mA	GCLK	t _{co}	3.121	3.378	4.751	5.134	5.669	5.530	5.809	5.285	5.802	5.666	5.857	ns
		GCLK PLL	t _{co}	1.476	1.669	2.171	2.294	2.556	2.532	2.518	2.406	2.649	2.648	2.510	ns
	10mA	GCLK	t _{co}	3.086	3.327	4.703	5.081	5.608	5.469	5.748	5.226	5.737	5.601	5.793	ns
		GCLK PLL	t _{co}	1.441	1.618	2.123	2.240	2.495	2.471	2.457	2.347	2.584	2.583	2.445	ns
	12mA	GCLK	t _{co}	3.082	3.320	4.682	5.060	5.588	5.449	5.728	5.205	5.715	5.579	5.771	ns
		GCLK PLL	t _{co}	1.437	1.611	2.103	2.219	2.475	2.451	2.437	2.326	2.563	2.562	2.423	ns
1.2 V	2mA	GCLK	t _{co}	3.288	3.545	5.035	5.430	5.972	5.833	6.112	5.587	6.113	5.977	6.171	ns
		GCLK PLL	t _{co}	1.643	1.836	2.455	2.589	2.859	2.835	2.821	2.708	2.960	2.959	2.821	ns
	4mA	GCLK	t _{co}	3.165	3.410	4.816	5.199	5.732	5.593	5.872	5.348	5.864	5.728	5.920	ns
		GCLK PLL	t _{co}	1.521	1.701	2.236	2.358	2.619	2.595	2.581	2.469	2.712	2.711	2.572	ns
	6mA	GCLK	t _{co}	3.112	3.369	4.740	5.122	5.658	5.519	5.798	5.273	5.792	5.656	5.847	ns
		GCLK PLL	t _{co}	1.468	1.660	2.160	2.281	2.545	2.521	2.507	2.394	2.639	2.638	2.500	ns
	8mA	GCLK	t _{co}	3.092	3.335	4.701	5.079	5.608	5.469	5.748	5.224	5.735	5.599	5.791	ns
		GCLK PLL	t _{co}	1.447	1.626	2.121	2.238	2.495	2.471	2.457	2.345	2.582	2.581	2.443	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.105	3.343	4.709	5.087	5.616	5.477	5.756	5.229	5.740	5.604	5.795	ns
		GCLK PLL	t _{co}	1.461	1.634	2.129	2.246	2.503	2.479	2.465	2.351	2.587	2.586	2.448	ns
	10mA	GCLK	t _{co}	3.108	3.346	4.713	5.091	5.620	5.481	5.760	5.233	5.744	5.608	5.799	ns
		GCLK PLL	t _{co}	1.464	1.637	2.133	2.250	2.507	2.483	2.469	2.354	2.591	2.590	2.452	ns
	12mA	GCLK	t _{co}	3.090	3.326	4.691	5.069	5.598	5.459	5.738	5.212	5.722	5.586	5.777	ns
		GCLK PLL	t _{co}	1.445	1.617	2.112	2.228	2.485	2.461	2.447	2.333	2.569	2.568	2.430	ns

Table 1-75. EP3SL150 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.085	3.319	4.676	5.053	5.581	5.442	5.721	5.195	5.704	5.568	5.759	ns
		GCLK PLL	t _{co}	1.440	1.610	2.097	2.212	2.468	2.444	2.430	2.316	2.552	2.551	2.412	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.123	3.363	4.732	5.110	5.639	5.500	5.779	5.253	5.764	5.628	5.818	ns
		GCLK PLL	t _{co}	1.479	1.654	2.152	2.269	2.526	2.502	2.488	2.374	2.611	2.610	2.472	ns
	6mA	GCLK	t _{co}	3.104	3.342	4.710	5.088	5.617	5.478	5.757	5.231	5.741	5.605	5.796	ns
		GCLK PLL	t _{co}	1.460	1.633	2.130	2.247	2.504	2.480	2.466	2.352	2.588	2.587	2.449	ns
	8mA	GCLK	t _{co}	3.105	3.345	4.718	5.097	5.627	5.488	5.767	5.241	5.752	5.616	5.807	ns
		GCLK PLL	t _{co}	1.461	1.636	2.138	2.256	2.514	2.490	2.476	2.362	2.599	2.598	2.460	ns
	10mA	GCLK	t _{co}	3.088	3.325	4.693	5.072	5.602	5.463	5.742	5.215	5.726	5.590	5.782	ns
		GCLK PLL	t _{co}	1.444	1.616	2.114	2.231	2.489	2.465	2.451	2.336	2.574	2.573	2.434	ns
	12mA	GCLK	t _{co}	3.085	3.321	4.689	5.068	5.597	5.458	5.737	5.211	5.722	5.586	5.778	ns
		GCLK PLL	t _{co}	1.440	1.612	2.110	2.227	2.484	2.460	2.446	2.332	2.570	2.569	2.430	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.085	3.320	4.677	5.053	5.581	5.442	5.721	5.196	5.705	5.569	5.760	ns
		GCLK PLL	t _{co}	1.441	1.611	2.097	2.213	2.468	2.444	2.430	2.317	2.552	2.551	2.413	ns
	16mA	GCLK	t _{co}	3.084	3.320	4.685	5.063	5.593	5.454	5.733	5.206	5.718	5.582	5.773	ns
		GCLK PLL	t _{co}	1.440	1.611	2.105	2.223	2.480	2.456	2.442	2.327	2.565	2.564	2.426	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.115	3.354	4.725	5.103	5.631	5.492	5.771	5.246	5.756	5.620	5.811	ns
		GCLK PLL	t _{co}	1.470	1.645	2.145	2.262	2.518	2.494	2.480	2.367	2.603	2.602	2.464	ns
	6mA	GCLK	t _{co}	3.100	3.338	4.711	5.090	5.619	5.480	5.759	5.233	5.745	5.609	5.800	ns
		GCLK PLL	t _{co}	1.455	1.629	2.131	2.249	2.506	2.482	2.468	2.354	2.592	2.591	2.453	ns
	8mA	GCLK	t _{co}	3.087	3.323	4.691	5.069	5.599	5.460	5.739	5.213	5.724	5.588	5.779	ns
		GCLK PLL	t _{co}	1.442	1.614	2.111	2.228	2.486	2.462	2.448	2.334	2.571	2.570	2.432	ns
	10mA	GCLK	t _{co}	3.087	3.324	4.692	5.071	5.602	5.463	5.742	5.215	5.727	5.591	5.782	ns
		GCLK PLL	t _{co}	1.443	1.615	2.112	2.230	2.489	2.465	2.451	2.336	2.574	2.573	2.435	ns
	12mA	GCLK	t _{co}	3.083	3.319	4.685	5.064	5.594	5.455	5.734	5.207	5.719	5.583	5.774	ns
		GCLK PLL	t _{co}	1.438	1.610	2.105	2.223	2.481	2.457	2.443	2.328	2.566	2.565	2.427	ns

Table 1–75. EP3SL150 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.101	3.336	4.693	5.069	5.596	5.457	5.736	5.211	5.720	5.584	5.775	ns
		GCLK PLL	t _{co}	1.456	1.627	2.113	2.228	2.483	2.459	2.445	2.332	2.567	2.566	2.428	ns
	16mA	GCLK	t _{co}	3.100	3.336	4.697	5.074	5.602	5.463	5.742	5.216	5.726	5.590	5.781	ns
		GCLK PLL	t _{co}	1.455	1.627	2.117	2.233	2.489	2.465	2.451	2.337	2.573	2.572	2.434	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.087	3.322	4.681	5.058	5.586	5.447	5.726	5.200	5.710	5.574	5.765	ns
		GCLK PLL	t _{co}	1.442	1.613	2.101	2.217	2.473	2.449	2.435	2.321	2.557	2.556	2.418	ns
	6mA	GCLK	t _{co}	3.082	3.317	4.675	5.052	5.580	5.441	5.720	5.194	5.704	5.568	5.759	ns
		GCLK PLL	t _{co}	1.438	1.608	2.095	2.211	2.467	2.443	2.429	2.315	2.551	2.550	2.412	ns
	8mA	GCLK	t _{co}	3.084	3.320	4.680	5.057	5.586	5.447	5.726	5.200	5.710	5.574	5.765	ns
		GCLK PLL	t _{co}	1.440	1.611	2.100	2.216	2.473	2.449	2.435	2.321	2.558	2.557	2.418	ns
	10mA	GCLK	t _{co}	3.083	3.318	4.673	5.050	5.578	5.439	5.718	5.192	5.701	5.565	5.756	ns
		GCLK PLL	t _{co}	1.439	1.609	2.093	2.209	2.465	2.441	2.427	2.313	2.549	2.548	2.409	ns
	12mA	GCLK	t _{co}	3.102	3.337	4.695	5.071	5.599	5.460	5.739	5.214	5.722	5.586	5.777	ns
		GCLK PLL	t _{co}	1.457	1.628	2.115	2.230	2.486	2.462	2.448	2.335	2.570	2.569	2.430	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.097	3.333	4.693	5.070	5.598	5.459	5.738	5.213	5.722	5.586	5.777	ns
		GCLK PLL	t _{co}	1.452	1.624	2.113	2.229	2.485	2.461	2.447	2.334	2.569	2.568	2.430	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.096	3.332	4.694	5.071	5.599	5.460	5.739	5.214	5.723	5.587	5.778	ns
		GCLK PLL	t _{co}	1.452	1.623	2.114	2.230	2.486	2.462	2.448	2.335	2.570	2.569	2.431	ns
	6mA	GCLK	t _{co}	3.087	3.322	4.681	5.059	5.587	5.448	5.727	5.201	5.711	5.575	5.766	ns
		GCLK PLL	t _{co}	1.442	1.613	2.102	2.218	2.474	2.450	2.436	2.322	2.558	2.557	2.419	ns
	8mA	GCLK	t _{co}	3.088	3.324	4.687	5.065	5.595	5.456	5.735	5.208	5.719	5.583	5.774	ns
		GCLK PLL	t _{co}	1.444	1.615	2.107	2.225	2.482	2.458	2.444	2.329	2.567	2.566	2.427	ns
	10mA	GCLK	t _{co}	3.110	3.349	4.715	5.092	5.621	5.482	5.761	5.236	5.746	5.610	5.801	ns
		GCLK PLL	t _{co}	1.466	1.640	2.135	2.252	2.508	2.484	2.470	2.357	2.594	2.593	2.454	ns
	12mA	GCLK	t _{co}	3.100	3.337	4.703	5.081	5.610	5.471	5.750	5.224	5.735	5.599	5.790	ns
		GCLK PLL	t _{co}	1.455	1.628	2.123	2.240	2.497	2.473	2.459	2.345	2.582	2.581	2.443	ns

Table 1-75. EP3SL150 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.098	3.335	4.701	5.079	5.608	5.469	5.748	5.223	5.734	5.598	5.789	ns
		GCLK PLL	t _{co}	1.454	1.626	2.121	2.238	2.495	2.471	2.457	2.344	2.581	2.580	2.442	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.096	3.333	4.700	5.079	5.608	5.469	5.748	5.222	5.734	5.598	5.788	ns
		GCLK PLL	t _{co}	1.451	1.624	2.120	2.238	2.495	2.471	2.457	2.343	2.581	2.580	2.442	ns
	6mA	GCLK	t _{co}	3.092	3.329	4.693	5.072	5.601	5.462	5.741	5.215	5.726	5.590	5.781	ns
		GCLK PLL	t _{co}	1.447	1.620	2.114	2.231	2.488	2.464	2.450	2.336	2.574	2.573	2.434	ns
	8mA	GCLK	t _{co}	3.169	3.404	4.711	5.080	5.598	5.459	5.738	5.223	5.724	5.588	5.780	ns
		GCLK PLL	t _{co}	1.524	1.695	2.131	2.239	2.485	2.461	2.447	2.344	2.571	2.570	2.432	ns
	10mA	GCLK	t _{co}	3.169	3.404	4.711	5.080	5.598	5.459	5.738	5.223	5.724	5.588	5.780	ns
		GCLK PLL	t _{co}	1.524	1.695	2.131	2.239	2.485	2.461	2.447	2.344	2.571	2.570	2.432	ns
	12mA	GCLK	t _{co}	3.198	3.443	4.777	5.155	5.678	5.539	5.818	5.301	5.805	5.669	5.862	ns
		GCLK PLL	t _{co}	1.553	1.734	2.197	2.314	2.565	2.541	2.527	2.422	2.652	2.651	2.513	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.119	3.354	4.673	5.043	5.561	5.422	5.701	5.185	5.685	5.549	5.742	ns
		GCLK PLL	t _{co}	1.474	1.645	2.094	2.202	2.448	2.424	2.410	2.306	2.532	2.531	2.393	ns
3.0-V PCI	—	GCLK	t _{co}	3.089	3.322	4.606	4.973	5.491	5.352	5.631	5.115	5.618	5.482	5.674	ns
		GCLK PLL	t _{co}	1.445	1.613	2.027	2.132	2.378	2.354	2.340	2.236	2.465	2.464	2.326	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.075	3.308	4.585	4.950	5.463	5.324	5.603	5.089	5.584	5.448	5.640	ns
		GCLK PLL	t _{co}	1.431	1.599	2.006	2.109	2.350	2.326	2.312	2.210	2.432	2.431	2.292	ns

Table 1-76 specifies EP3SL150 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1-76. EP3SL150 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	
3.3-V LVTTTL	4mA	GCLK	t_{CO}	3.214	3.466	4.819	5.204	5.693	5.566	5.831	5.325	5.817	5.689	5.913	ns
		GCLK PLL	t_{CO}	1.420	1.606	1.985	2.065	2.256	2.277	2.285	2.167	2.360	2.380	2.277	ns
	8mA	GCLK	t_{CO}	3.121	3.361	4.689	5.066	5.548	5.421	5.686	5.184	5.668	5.540	5.764	ns
		GCLK PLL	t_{CO}	1.354	1.535	1.875	1.954	2.142	2.163	2.171	2.054	2.245	2.265	2.162	ns
	12mA	GCLK	t_{CO}	3.042	3.271	4.570	4.943	5.420	5.293	5.558	5.057	5.536	5.408	5.632	ns
		GCLK PLL	t_{CO}	1.275	1.446	1.769	1.854	2.046	2.067	2.075	1.955	2.145	2.165	2.062	ns
3.3-V LVCMOS	4mA	GCLK	t_{CO}	3.224	3.470	4.827	5.209	5.697	5.570	5.835	5.331	5.821	5.693	5.917	ns
		GCLK PLL	t_{CO}	1.422	1.613	1.989	2.071	2.265	2.286	2.294	2.175	2.372	2.392	2.289	ns
	8mA	GCLK	t_{CO}	3.046	3.275	4.576	4.949	5.427	5.301	5.564	5.063	5.543	5.417	5.639	ns
		GCLK PLL	t_{CO}	1.279	1.450	1.780	1.869	2.056	2.077	2.085	1.967	2.154	2.174	2.071	ns
3.0-V LVTTTL	4mA	GCLK	t_{CO}	3.168	3.412	4.771	5.157	5.649	5.522	5.787	5.282	5.775	5.647	5.871	ns
		GCLK PLL	t_{CO}	1.381	1.567	1.952	2.034	2.222	2.243	2.251	2.135	2.326	2.346	2.243	ns
	8mA	GCLK	t_{CO}	3.047	3.285	4.618	4.998	5.485	5.358	5.623	5.120	5.611	5.482	5.706	ns
		GCLK PLL	t_{CO}	1.280	1.455	1.815	1.892	2.077	2.098	2.106	1.993	2.181	2.200	2.097	ns
	12mA	GCLK	t_{CO}	3.010	3.242	4.536	4.915	5.397	5.270	5.535	5.034	5.518	5.389	5.613	ns
		GCLK PLL	t_{CO}	1.243	1.417	1.755	1.827	2.007	2.028	2.036	1.925	2.107	2.127	2.024	ns
3.0-V LVCMOS	4mA	GCLK	t_{CO}	3.082	3.331	4.665	5.050	5.539	5.412	5.677	5.174	5.664	5.535	5.759	ns
		GCLK PLL	t_{CO}	1.302	1.479	1.850	1.927	2.113	2.134	2.142	2.026	2.217	2.236	2.133	ns
	8mA	GCLK	t_{CO}	2.997	3.226	4.502	4.876	5.358	5.231	5.496	4.994	5.478	5.349	5.573	ns
		GCLK PLL	t_{CO}	1.230	1.401	1.727	1.798	1.979	2.000	2.008	1.895	2.079	2.098	1.995	ns
2.5 V	4mA	GCLK	t_{CO}	3.194	3.448	4.903	5.311	5.821	5.694	5.959	5.442	5.954	5.825	6.049	ns
		GCLK PLL	t_{CO}	1.407	1.604	2.060	2.160	2.367	2.388	2.396	2.267	2.478	2.498	2.395	ns
	8mA	GCLK	t_{CO}	3.089	3.350	4.748	5.148	5.651	5.524	5.789	5.275	5.780	5.651	5.875	ns
		GCLK PLL	t_{CO}	1.322	1.501	1.936	2.025	2.225	2.246	2.254	2.130	2.334	2.353	2.250	ns
	12mA	GCLK	t_{CO}	3.038	3.282	4.637	5.029	5.525	5.398	5.663	5.152	5.650	5.521	5.745	ns
		GCLK PLL	t_{CO}	1.265	1.457	1.852	1.939	2.134	2.155	2.163	2.041	2.239	2.259	2.156	ns

Table 1-76. EP3SL150 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.431	3.699	5.291	5.740	6.296	6.169	6.434	5.882	6.438	6.310	6.534	ns
		GCLK PLL	t _{co}	1.655	1.850	2.491	2.527	2.770	2.796	2.799	2.776	2.888	2.913	2.805	ns
	4mA	GCLK	t _{co}	3.206	3.497	4.964	5.371	5.891	5.764	6.029	5.517	6.032	5.903	6.127	ns
		GCLK PLL	t _{co}	1.430	1.648	2.164	2.201	2.410	2.436	2.439	2.411	2.527	2.551	2.443	ns
	6mA	GCLK	t _{co}	3.141	3.395	4.811	5.221	5.732	5.605	5.870	5.349	5.859	5.731	5.955	ns
		GCLK PLL	t _{co}	1.365	1.546	2.011	2.096	2.310	2.336	2.339	2.243	2.421	2.446	2.338	ns
	8mA	GCLK	t _{co}	3.081	3.321	4.734	5.127	5.635	5.508	5.773	5.254	5.765	5.637	5.861	ns
		GCLK PLL	t _{co}	1.327	1.508	1.937	2.043	2.244	2.270	2.273	2.148	2.349	2.374	2.266	ns
1.5 V	2mA	GCLK	t _{co}	3.342	3.617	5.201	5.653	6.224	6.097	6.362	5.789	6.362	6.234	6.458	ns
		GCLK PLL	t _{co}	1.566	1.768	2.401	2.454	2.707	2.733	2.736	2.683	2.823	2.848	2.740	ns
	4mA	GCLK	t _{co}	3.100	3.359	4.796	5.216	5.733	5.606	5.871	5.343	5.858	5.730	5.954	ns
		GCLK PLL	t _{co}	1.343	1.525	1.996	2.096	2.313	2.339	2.342	2.237	2.422	2.447	2.339	ns
	6mA	GCLK	t _{co}	3.073	3.312	4.723	5.120	5.627	5.502	5.765	5.245	5.753	5.625	5.849	ns
		GCLK PLL	t _{co}	1.316	1.499	1.923	2.035	2.244	2.270	2.273	2.139	2.349	2.374	2.266	ns
	8mA	GCLK	t _{co}	3.064	3.303	4.701	5.102	5.608	5.483	5.746	5.227	5.731	5.606	5.827	ns
		GCLK PLL	t _{co}	1.297	1.488	1.905	2.010	2.225	2.251	2.254	2.121	2.330	2.355	2.247	ns
1.2 V	2mA	GCLK	t _{co}	3.285	3.542	5.111	5.567	6.149	6.022	6.287	5.701	6.278	6.150	6.374	ns
		GCLK PLL	t _{co}	1.509	1.693	2.311	2.386	2.646	2.672	2.675	2.595	2.754	2.779	2.671	ns
	4mA	GCLK	t _{co}	3.105	3.353	4.818	5.244	5.774	5.647	5.912	5.368	5.900	5.772	5.996	ns
		GCLK PLL	t _{co}	1.348	1.529	2.018	2.124	2.361	2.387	2.390	2.262	2.466	2.491	2.383	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.036	3.270	4.620	5.004	5.495	5.369	5.631	5.123	5.614	5.488	5.708	ns
		GCLK PLL	t _{co}	1.269	1.445	1.845	1.930	2.124	2.145	2.153	2.028	2.225	2.245	2.142	ns
	12mA	GCLK	t _{co}	3.031	3.266	4.617	5.002	5.493	5.367	5.628	5.122	5.613	5.487	5.706	ns
		GCLK PLL	t _{co}	1.264	1.441	1.842	1.928	2.122	2.143	2.151	2.027	2.224	2.244	2.141	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.022	3.255	4.602	4.986	5.476	5.350	5.611	5.105	5.595	5.469	5.688	ns
		GCLK PLL	t _{co}	1.255	1.430	1.827	1.912	2.105	2.126	2.134	2.010	2.206	2.226	2.123	ns

Table 1-76. EP3SL150 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.042	3.277	4.629	5.031	5.512	5.397	5.647	5.135	5.631	5.516	5.724	ns
		GCLK PLL	t _{co}	1.276	1.452	1.856	1.947	2.139	2.165	2.168	2.041	2.240	2.265	2.157	ns
	6mA	GCLK	t _{co}	3.027	3.263	4.626	5.030	5.511	5.396	5.646	5.133	5.629	5.514	5.722	ns
		GCLK PLL	t _{co}	1.271	1.447	1.854	1.946	2.138	2.164	2.167	2.039	2.238	2.263	2.155	ns
	8mA	GCLK	t _{co}	3.016	3.251	4.609	5.020	5.501	5.386	5.636	5.116	5.620	5.505	5.713	ns
		GCLK PLL	t _{co}	1.260	1.436	1.844	1.936	2.128	2.154	2.157	2.030	2.229	2.254	2.146	ns
	10mA	GCLK	t _{co}	2.992	3.228	4.593	5.007	5.488	5.373	5.623	5.101	5.608	5.493	5.701	ns
		GCLK PLL	t _{co}	1.249	1.425	1.831	1.923	2.115	2.141	2.144	2.018	2.217	2.242	2.134	ns
	12mA	GCLK	t _{co}	2.992	3.227	4.592	5.007	5.488	5.373	5.623	5.100	5.608	5.493	5.701	ns
		GCLK PLL	t _{co}	1.249	1.424	1.831	1.923	2.115	2.141	2.144	2.017	2.217	2.242	2.134	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.002	3.236	4.590	5.004	5.483	5.368	5.618	5.095	5.602	5.487	5.695	ns
		GCLK PLL	t _{co}	1.257	1.431	1.830	1.920	2.110	2.136	2.139	2.013	2.211	2.236	2.128	ns
	16mA	GCLK	t _{co}	2.996	3.231	4.589	5.012	5.493	5.378	5.628	5.097	5.613	5.498	5.706	ns
		GCLK PLL	t _{co}	1.258	1.434	1.836	1.928	2.120	2.146	2.149	2.022	2.222	2.247	2.139	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.038	3.273	4.640	5.042	5.526	5.410	5.664	5.148	5.644	5.528	5.740	ns
		GCLK PLL	t _{co}	1.279	1.455	1.865	1.958	2.152	2.178	2.181	2.051	2.252	2.277	2.169	ns
	6mA	GCLK	t _{co}	3.015	3.251	4.622	5.032	5.515	5.400	5.650	5.132	5.634	5.519	5.727	ns
		GCLK PLL	t _{co}	1.265	1.441	1.854	1.948	2.142	2.168	2.171	2.042	2.243	2.268	2.160	ns
	8mA	GCLK	t _{co}	2.998	3.234	4.605	5.019	5.502	5.387	5.637	5.114	5.621	5.506	5.714	ns
		GCLK PLL	t _{co}	1.254	1.429	1.841	1.935	2.129	2.155	2.158	2.029	2.230	2.255	2.147	ns

Table 1-76. EP3SL150 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.017	3.249	4.596	5.002	5.481	5.366	5.616	5.099	5.599	5.484	5.692	ns
		GCLK PLL	t _{co}	1.264	1.437	1.829	1.918	2.108	2.134	2.137	2.012	2.208	2.233	2.125	ns
	6mA	GCLK	t _{co}	3.005	3.237	4.587	5.001	5.480	5.365	5.615	5.091	5.599	5.484	5.692	ns
		GCLK PLL	t _{co}	1.257	1.431	1.827	1.917	2.107	2.133	2.136	2.011	2.208	2.233	2.125	ns
	8mA	GCLK	t _{co}	2.992	3.225	4.578	4.994	5.473	5.358	5.608	5.083	5.592	5.477	5.685	ns
		GCLK PLL	t _{co}	1.248	1.423	1.820	1.910	2.100	2.126	2.129	2.004	2.201	2.226	2.118	ns
	10mA	GCLK	t _{co}	2.994	3.227	4.581	4.997	5.477	5.362	5.612	5.086	5.595	5.480	5.688	ns
		GCLK PLL	t _{co}	1.251	1.425	1.823	1.913	2.104	2.130	2.133	2.007	2.204	2.229	2.121	ns
	12mA	GCLK	t _{co}	2.987	3.222	4.579	5.000	5.480	5.365	5.615	5.086	5.600	5.485	5.693	ns
		GCLK PLL	t _{co}	1.247	1.422	1.825	1.916	2.107	2.133	2.136	2.010	2.209	2.234	2.126	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	2.993	3.226	4.574	4.997	5.476	5.361	5.611	5.077	5.594	5.479	5.687	ns
		GCLK PLL	t _{co}	1.255	1.430	1.823	1.913	2.103	2.129	2.132	2.006	2.203	2.228	2.120	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.024	3.256	4.607	5.012	5.492	5.377	5.627	5.111	5.610	5.495	5.703	ns
		GCLK PLL	t _{co}	1.270	1.443	1.838	1.928	2.119	2.145	2.148	2.021	2.219	2.244	2.136	ns
	6mA	GCLK	t _{co}	3.012	3.246	4.603	5.014	5.494	5.379	5.629	5.108	5.613	5.498	5.706	ns
		GCLK PLL	t _{co}	1.264	1.438	1.839	1.930	2.121	2.147	2.150	2.023	2.222	2.247	2.139	ns
	8mA	GCLK	t _{co}	3.008	3.241	4.597	5.009	5.489	5.374	5.624	5.102	5.607	5.492	5.700	ns
		GCLK PLL	t _{co}	1.260	1.434	1.834	1.925	2.116	2.142	2.145	2.018	2.216	2.241	2.133	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.023	3.255	4.618	5.028	5.511	5.396	5.646	5.125	5.629	5.514	5.722	ns
		GCLK PLL	t _{co}	1.272	1.445	1.851	1.944	2.138	2.164	2.167	2.037	2.238	2.263	2.155	ns
	6mA	GCLK	t _{co}	3.011	3.243	4.607	5.019	5.502	5.387	5.637	5.114	5.620	5.505	5.713	ns
		GCLK PLL	t _{co}	1.263	1.437	1.842	1.935	2.129	2.155	2.158	2.028	2.229	2.254	2.146	ns
	8mA	GCLK	t _{co}	3.007	3.241	4.611	5.027	5.511	5.396	5.646	5.120	5.630	5.515	5.723	ns
		GCLK PLL	t _{co}	1.262	1.437	1.849	1.943	2.138	2.164	2.167	2.037	2.239	2.264	2.156	ns
3.0-V PCI	—	GCLK	t _{co}	3.142	3.376	4.672	5.050	5.535	5.409	5.670	5.171	5.656	5.530	5.749	ns
		GCLK PLL	t _{co}	1.375	1.551	1.897	1.976	2.164	2.185	2.193	2.076	2.267	2.287	2.184	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.142	3.376	4.672	5.050	5.535	5.409	5.670	5.171	5.656	5.530	5.749	ns
		GCLK PLL	t _{co}	1.375	1.551	1.897	1.976	2.164	2.185	2.193	2.076	2.267	2.287	2.184	ns

Table 1-77 through Table 1-77 show the maximum I/O timing parameters for EP3SL150 devices for differential I/O standards.

Table 1-77 specifies EP3SL150 column pins input timing parameters for differential I/O standards.

Table 1-77. EP3SL150 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
MINI-LVDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
RSDS	GCLK	t _{su}	-0.978	-1.006	-1.151	-1.135	-1.286	-1.233	-1.594	-1.098	-1.339	-1.193	-1.632	ns
		t _h	1.104	1.152	1.371	1.387	1.564	1.502	1.860	1.361	1.634	1.471	1.898	ns
	GCLK PLL	t _{su}	0.967	1.001	1.885	2.230	2.404	2.293	2.197	2.284	2.556	2.353	2.249	ns
		t _h	-0.707	-0.719	-1.450	-1.735	-1.855	-1.769	-1.669	-1.780	-1.984	-1.818	-1.718	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.794	-0.829	-1.228	-1.334	-1.445	-1.387	-1.743	-1.333	-1.443	-1.391	-1.786	ns
		t _h	0.913	0.967	1.416	1.546	1.677	1.610	1.964	1.554	1.684	1.621	2.007	ns
	GCLK PLL	t _{su}	1.151	1.178	1.808	2.031	2.245	2.139	2.048	2.049	2.266	2.155	2.095	ns
		t _h	-0.898	-0.904	-1.405	-1.576	-1.742	-1.661	-1.565	-1.587	-1.753	-1.668	-1.609	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.794	-0.829	-1.228	-1.334	-1.445	-1.387	-1.743	-1.333	-1.443	-1.391	-1.786	ns
		t _h	0.913	0.967	1.416	1.546	1.677	1.610	1.964	1.554	1.684	1.621	2.007	ns
	GCLK PLL	t _{su}	1.151	1.178	1.808	2.031	2.245	2.139	2.048	2.049	2.266	2.155	2.095	ns
		t _h	-0.898	-0.904	-1.405	-1.576	-1.742	-1.661	-1.565	-1.587	-1.753	-1.668	-1.609	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _h	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{su}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _h	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns

Table 1-77. EP3SL150 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _h	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{su}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _h	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.802	-0.841	-1.238	-1.345	-1.461	-1.403	-1.759	-1.344	-1.458	-1.406	-1.801	ns
		t _h	0.921	0.979	1.426	1.557	1.693	1.626	1.980	1.565	1.699	1.636	2.022	ns
	GCLK PLL	t _{su}	1.143	1.166	1.798	2.020	2.229	2.123	2.032	2.038	2.251	2.140	2.080	ns
		t _h	-0.890	-0.892	-1.395	-1.565	-1.726	-1.645	-1.549	-1.576	-1.738	-1.653	-1.594	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _h	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{su}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _h	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.814	-0.852	-1.247	-1.356	-1.480	-1.422	-1.778	-1.355	-1.476	-1.424	-1.819	ns
		t _h	0.933	0.990	1.436	1.568	1.712	1.645	1.999	1.576	1.717	1.654	2.040	ns
	GCLK PLL	t _{su}	1.131	1.155	1.789	2.009	2.210	2.104	2.013	2.027	2.233	2.122	2.062	ns
		t _h	-0.878	-0.881	-1.385	-1.554	-1.707	-1.626	-1.530	-1.565	-1.720	-1.635	-1.576	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.821	-0.858	-1.259	-1.361	-1.480	-1.424	-1.777	-1.359	-1.471	-1.422	-1.815	ns
		t _h	0.940	0.996	1.449	1.576	1.715	1.648	2.003	1.583	1.717	1.653	2.041	ns
	GCLK PLL	t _{su}	1.124	1.149	1.777	2.004	2.210	2.102	2.014	2.023	2.238	2.124	2.066	ns
		t _h	-0.871	-0.875	-1.372	-1.546	-1.704	-1.623	-1.526	-1.558	-1.720	-1.636	-1.575	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.821	-0.858	-1.259	-1.361	-1.480	-1.424	-1.777	-1.359	-1.471	-1.422	-1.815	ns
		t _h	0.940	0.996	1.449	1.576	1.715	1.648	2.003	1.583	1.717	1.653	2.041	ns
	GCLK PLL	t _{su}	1.124	1.149	1.777	2.004	2.210	2.102	2.014	2.023	2.238	2.124	2.066	ns
		t _h	-0.871	-0.875	-1.372	-1.546	-1.704	-1.623	-1.526	-1.558	-1.720	-1.636	-1.575	ns

Table 1-78 specifies EP3SL150 row pins input timing parameters for differential I/O standards.

Table 1-78. EP3SL150 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t_H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t_{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t_H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns
MINI-LVDS	GCLK	t_{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t_H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t_{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t_H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns
RSDS	GCLK	t_{SU}	-0.919	-0.950	-1.021	-0.981	-1.115	-1.070	-1.404	-0.940	-1.066	-1.023	-1.442	ns
		t_H	1.043	1.092	1.245	1.237	1.395	1.339	1.672	1.207	1.358	1.303	1.711	ns
	GCLK PLL	t_{SU}	0.959	0.987	1.949	2.324	2.527	2.403	2.334	2.384	2.597	2.470	2.387	ns
		t_H	-0.698	-0.708	-1.513	-1.828	-1.977	-1.881	-1.804	-1.875	-2.032	-1.933	-1.853	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{SU}	-0.724	-0.765	-1.113	-1.210	-1.304	-1.254	-1.583	-1.211	-1.303	-1.255	-1.626	ns
		t_H	0.841	0.898	1.302	1.420	1.535	1.474	1.802	1.429	1.543	1.483	1.846	ns
	GCLK PLL	t_{SU}	1.154	1.172	1.862	2.100	2.338	2.219	2.155	2.117	2.360	2.238	2.203	ns
		t_H	-0.900	-0.902	-1.458	-1.649	-1.837	-1.746	-1.674	-1.657	-1.847	-1.753	-1.718	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{SU}	-0.724	-0.765	-1.113	-1.210	-1.304	-1.254	-1.583	-1.211	-1.303	-1.255	-1.626	ns
		t_H	0.841	0.898	1.302	1.420	1.535	1.474	1.802	1.429	1.543	1.483	1.846	ns
	GCLK PLL	t_{SU}	1.154	1.172	1.862	2.100	2.338	2.219	2.155	2.117	2.360	2.238	2.203	ns
		t_H	-0.900	-0.902	-1.458	-1.649	-1.837	-1.746	-1.674	-1.657	-1.847	-1.753	-1.718	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{SU}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t_H	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t_{SU}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t_H	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{SU}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t_H	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t_{SU}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t_H	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{SU}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t_H	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t_{SU}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t_H	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns

Table 1-78. EP3SL150 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _h	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{su}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _h	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _h	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{su}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _h	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.733	-0.777	-1.122	-1.220	-1.320	-1.270	-1.599	-1.220	-1.319	-1.271	-1.642	ns
		t _h	0.850	0.910	1.311	1.430	1.551	1.490	1.818	1.438	1.559	1.499	1.862	ns
	GCLK PLL	t _{su}	1.145	1.160	1.853	2.090	2.322	2.203	2.139	2.108	2.344	2.222	2.187	ns
		t _h	-0.891	-0.890	-1.449	-1.639	-1.821	-1.730	-1.658	-1.648	-1.831	-1.737	-1.702	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _h	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{su}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _h	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.747	-0.789	-1.131	-1.230	-1.338	-1.288	-1.617	-1.231	-1.336	-1.288	-1.659	ns
		t _h	0.864	0.922	1.321	1.440	1.569	1.508	1.836	1.449	1.576	1.516	1.879	ns
	GCLK PLL	t _{su}	1.131	1.148	1.840	2.080	2.304	2.185	2.121	2.097	2.327	2.205	2.170	ns
		t _h	-0.877	-0.878	-1.437	-1.629	-1.803	-1.712	-1.640	-1.637	-1.814	-1.720	-1.685	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.756	-0.798	-1.145	-1.241	-1.345	-1.296	-1.623	-1.238	-1.337	-1.291	-1.661	ns
		t _h	0.873	0.931	1.336	1.454	1.579	1.518	1.847	1.459	1.582	1.521	1.886	ns
	GCLK PLL	t _{su}	1.122	1.139	1.825	2.064	2.293	2.173	2.110	2.086	2.321	2.197	2.163	ns
		t _h	-0.868	-0.869	-1.422	-1.611	-1.789	-1.698	-1.625	-1.623	-1.805	-1.711	-1.674	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.756	-0.798	-1.145	-1.241	-1.345	-1.296	-1.623	-1.238	-1.337	-1.291	-1.661	ns
		t _h	0.873	0.931	1.336	1.454	1.579	1.518	1.847	1.459	1.582	1.521	1.886	ns
	GCLK PLL	t _{su}	1.122	1.139	1.825	2.064	2.293	2.173	2.110	2.086	2.321	2.197	2.163	ns
		t _h	-0.868	-0.869	-1.422	-1.611	-1.789	-1.698	-1.625	-1.623	-1.805	-1.711	-1.674	ns

Table 1-79 specifies EP3SL150 Column Pins Output Timing parameters for differential I/O standards.

Table 1-79. EP3SL150 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS_E_1R	—	GCLK	t_{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t_{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
LVDS_E_3R	—	GCLK	t_{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t_{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t_{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t_{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns
RSDS_E_1R	—	GCLK	t_{co}	3.100	3.330	4.687	5.079	5.586	5.447	5.731	5.200	5.706	5.570	5.803	ns
		GCLK PLL	t_{co}	1.308	1.480	1.885	1.978	2.188	2.199	2.226	2.081	2.293	2.303	2.211	ns
RSDS_E_3R	—	GCLK	t_{co}	3.096	3.333	4.734	5.134	5.648	5.509	5.793	5.259	5.772	5.636	5.869	ns
		GCLK PLL	t_{co}	1.304	1.483	1.932	2.033	2.250	2.261	2.288	2.140	2.359	2.369	2.277	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.127	3.363	4.758	5.157	5.670	5.531	5.815	5.280	5.792	5.656	5.889	ns
		GCLK PLL	t_{co}	1.335	1.513	1.956	2.056	2.272	2.283	2.310	2.161	2.379	2.389	2.297	ns
	6mA	GCLK	t_{co}	3.117	3.353	4.748	5.146	5.660	5.521	5.805	5.269	5.782	5.646	5.879	ns
		GCLK PLL	t_{co}	1.325	1.503	1.946	2.045	2.262	2.273	2.300	2.150	2.369	2.379	2.287	ns
	8mA	GCLK	t_{co}	3.117	3.353	4.751	5.150	5.664	5.525	5.809	5.274	5.787	5.651	5.884	ns
		GCLK PLL	t_{co}	1.325	1.503	1.949	2.049	2.266	2.277	2.304	2.155	2.374	2.384	2.292	ns
	10mA	GCLK	t_{co}	3.110	3.347	4.744	5.144	5.658	5.519	5.803	5.267	5.781	5.645	5.878	ns
		GCLK PLL	t_{co}	1.318	1.497	1.942	2.043	2.260	2.271	2.298	2.148	2.368	2.378	2.286	ns
	12mA	GCLK	t_{co}	3.109	3.345	4.741	5.141	5.655	5.516	5.800	5.264	5.777	5.641	5.874	ns
		GCLK PLL	t_{co}	1.317	1.495	1.939	2.040	2.257	2.268	2.295	2.145	2.364	2.374	2.282	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.131	3.367	4.762	5.161	5.674	5.535	5.819	5.284	5.797	5.661	5.894	ns
		GCLK PLL	t_{co}	1.339	1.517	1.960	2.060	2.276	2.287	2.314	2.165	2.384	2.394	2.302	ns

Table 1-79. EP3SL150 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.121	3.356	4.741	5.138	5.649	5.510	5.794	5.260	5.770	5.634	5.867	ns
		GCLK PLL	t _{co}	1.329	1.506	1.939	2.037	2.251	2.262	2.289	2.141	2.357	2.367	2.275	ns
	6mA	GCLK	t _{co}	3.116	3.352	4.741	5.138	5.650	5.511	5.795	5.261	5.772	5.636	5.869	ns
		GCLK PLL	t _{co}	1.324	1.502	1.939	2.037	2.252	2.263	2.290	2.142	2.359	2.369	2.277	ns
	8mA	GCLK	t _{co}	3.114	3.350	4.740	5.137	5.648	5.509	5.793	5.260	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.322	1.500	1.938	2.036	2.250	2.261	2.288	2.141	2.358	2.368	2.276	ns
	10mA	GCLK	t _{co}	3.106	3.341	4.730	5.127	5.639	5.500	5.784	5.250	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.314	1.491	1.928	2.026	2.241	2.252	2.279	2.131	2.348	2.358	2.266	ns
	12mA	GCLK	t _{co}	3.107	3.343	4.736	5.134	5.647	5.508	5.792	5.258	5.770	5.634	5.867	ns
		GCLK PLL	t _{co}	1.315	1.493	1.934	2.033	2.249	2.260	2.287	2.139	2.357	2.367	2.275	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.340	4.719	5.115	5.625	5.486	5.770	5.237	5.746	5.610	5.843	ns
		GCLK PLL	t _{co}	1.314	1.490	1.917	2.014	2.227	2.238	2.265	2.118	2.333	2.343	2.251	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.118	3.353	4.737	5.133	5.643	5.504	5.788	5.256	5.765	5.629	5.862	ns
		GCLK PLL	t _{co}	1.326	1.503	1.935	2.032	2.245	2.256	2.283	2.137	2.352	2.362	2.270	ns
	6mA	GCLK	t _{co}	3.114	3.350	4.738	5.135	5.647	5.508	5.792	5.258	5.769	5.633	5.866	ns
		GCLK PLL	t _{co}	1.322	1.500	1.936	2.034	2.249	2.260	2.287	2.139	2.356	2.366	2.274	ns
	8mA	GCLK	t _{co}	3.104	3.339	4.727	5.124	5.635	5.496	5.780	5.247	5.757	5.621	5.854	ns
		GCLK PLL	t _{co}	1.312	1.489	1.925	2.023	2.237	2.248	2.275	2.128	2.344	2.354	2.262	ns
	10mA	GCLK	t _{co}	3.102	3.337	4.725	5.121	5.633	5.494	5.778	5.245	5.755	5.619	5.852	ns
		GCLK PLL	t _{co}	1.310	1.487	1.923	2.020	2.235	2.246	2.273	2.126	2.342	2.352	2.260	ns
	12mA	GCLK	t _{co}	3.102	3.338	4.728	5.126	5.638	5.499	5.783	5.249	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.310	1.488	1.926	2.025	2.240	2.251	2.278	2.130	2.348	2.358	2.266	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.341	4.725	5.121	5.632	5.493	5.777	5.244	5.754	5.618	5.851	ns
		GCLK PLL	t _{co}	1.314	1.491	1.923	2.020	2.234	2.245	2.272	2.125	2.341	2.351	2.259	ns

Table 1-79. EP3SL150 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.132	3.370	4.770	5.169	5.682	5.543	5.827	5.292	5.804	5.668	5.901	ns
		GCLK PLL	t _{co}	1.340	1.520	1.968	2.068	2.284	2.295	2.322	2.173	2.391	2.401	2.309	ns
	6mA	GCLK	t _{co}	3.118	3.356	4.758	5.158	5.672	5.533	5.817	5.282	5.795	5.659	5.892	ns
		GCLK PLL	t _{co}	1.326	1.506	1.956	2.057	2.274	2.285	2.312	2.163	2.382	2.392	2.300	ns
	8mA	GCLK	t _{co}	3.106	3.343	4.741	5.140	5.654	5.515	5.799	5.264	5.777	5.641	5.874	ns
		GCLK PLL	t _{co}	1.314	1.493	1.939	2.039	2.256	2.267	2.294	2.145	2.364	2.374	2.282	ns
	10mA	GCLK	t _{co}	3.106	3.343	4.744	5.144	5.658	5.519	5.803	5.268	5.782	5.646	5.879	ns
		GCLK PLL	t _{co}	1.314	1.493	1.942	2.043	2.260	2.271	2.298	2.149	2.369	2.379	2.287	ns
	12mA	GCLK	t _{co}	3.102	3.339	4.737	5.136	5.651	5.512	5.796	5.261	5.774	5.638	5.871	ns
		GCLK PLL	t _{co}	1.310	1.489	1.935	2.035	2.253	2.264	2.291	2.142	2.361	2.371	2.279	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.106	3.341	4.730	5.127	5.639	5.500	5.784	5.250	5.761	5.625	5.858	ns
		GCLK PLL	t _{co}	1.314	1.491	1.928	2.026	2.241	2.252	2.279	2.131	2.348	2.358	2.266	ns
	16mA	GCLK	t _{co}	3.107	3.343	4.738	5.137	5.650	5.511	5.795	5.260	5.773	5.637	5.870	ns
		GCLK PLL	t _{co}	1.315	1.493	1.936	2.036	2.252	2.263	2.290	2.141	2.360	2.370	2.278	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.135	3.373	4.769	5.167	5.680	5.541	5.825	5.291	5.802	5.666	5.899	ns
		GCLK PLL	t _{co}	1.343	1.523	1.967	2.066	2.282	2.293	2.320	2.172	2.389	2.399	2.307	ns
	6mA	GCLK	t _{co}	3.124	3.361	4.757	5.155	5.668	5.529	5.813	5.279	5.790	5.654	5.887	ns
		GCLK PLL	t _{co}	1.332	1.511	1.955	2.054	2.270	2.281	2.308	2.160	2.377	2.387	2.295	ns
	8mA	GCLK	t _{co}	3.119	3.357	4.757	5.156	5.669	5.530	5.814	5.280	5.792	5.656	5.889	ns
		GCLK PLL	t _{co}	1.327	1.507	1.955	2.055	2.271	2.282	2.309	2.161	2.379	2.389	2.297	ns
	10mA	GCLK	t _{co}	3.105	3.342	4.739	5.137	5.650	5.511	5.795	5.261	5.774	5.638	5.871	ns
		GCLK PLL	t _{co}	1.313	1.492	1.937	2.036	2.252	2.263	2.290	2.142	2.361	2.371	2.279	ns
	12mA	GCLK	t _{co}	3.103	3.340	4.737	5.135	5.648	5.509	5.793	5.259	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.311	1.490	1.935	2.034	2.250	2.261	2.288	2.140	2.358	2.368	2.276	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.107	3.342	4.729	5.125	5.636	5.497	5.781	5.248	5.758	5.622	5.855	ns
		GCLK PLL	t _{co}	1.315	1.492	1.927	2.024	2.238	2.249	2.276	2.129	2.345	2.355	2.263	ns
	16mA	GCLK	t _{co}	3.107	3.343	4.737	5.135	5.648	5.509	5.793	5.259	5.771	5.635	5.868	ns
		GCLK PLL	t _{co}	1.315	1.493	1.935	2.034	2.250	2.261	2.288	2.140	2.358	2.368	2.276	ns

Table 1-79. EP3SL150 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.123	3.360	4.753	5.150	5.662	5.523	5.807	5.274	5.784	5.648	5.881	ns
		GCLK PLL	t _{co}	1.331	1.510	1.951	2.049	2.264	2.275	2.302	2.155	2.371	2.381	2.289	ns
	10mA	GCLK	t _{co}	3.123	3.360	4.753	5.150	5.662	5.523	5.807	5.274	5.784	5.648	5.881	ns
		GCLK PLL	t _{co}	1.331	1.510	1.951	2.049	2.264	2.275	2.302	2.155	2.371	2.381	2.289	ns
	12mA	GCLK	t _{co}	3.113	3.350	4.743	5.140	5.652	5.513	5.797	5.264	5.775	5.639	5.872	ns
		GCLK PLL	t _{co}	1.321	1.500	1.941	2.039	2.254	2.265	2.292	2.145	2.362	2.372	2.280	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.106	3.342	4.729	5.125	5.636	5.497	5.781	5.248	5.758	5.622	5.855	ns
		GCLK PLL	t _{co}	1.314	1.492	1.927	2.024	2.238	2.249	2.276	2.129	2.345	2.355	2.263	ns

Table 1–80 specifies EP3SL150 Row Pins Output Timing parameters for differential I/O standards.

Table 1–80. EP3SL150 Row Pins output Timing Parameters (Part 1 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
LVDS	—	GCLK	t_{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t_{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
LVDS_E_1R	—	GCLK	t_{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t_{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
LVDS_E_3R	—	GCLK	t_{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t_{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
MINI-LVDS	—	GCLK	t_{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t_{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t_{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t_{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
RSDS	—	GCLK	t_{co}	2.711	2.894	4.033	4.387	4.843	4.717	4.978	4.486	4.943	4.816	5.035	ns
		GCLK PLL	t_{co}	0.934	1.059	1.248	1.300	1.459	1.480	1.491	1.379	1.542	1.561	1.459	ns
RSDS_E_1R	—	GCLK	t_{co}	3.106	3.342	4.709	5.107	5.611	5.475	5.730	5.229	5.736	5.599	5.802	ns
		GCLK PLL	t_{co}	1.326	1.503	1.919	2.016	2.222	2.235	2.238	2.120	2.330	2.340	2.222	ns
RSDS_E_3R	—	GCLK	t_{co}	3.088	3.332	4.747	5.153	5.665	5.529	5.784	5.280	5.797	5.660	5.863	ns
		GCLK PLL	t_{co}	1.308	1.493	1.957	2.062	2.276	2.289	2.292	2.171	2.391	2.401	2.283	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.132	3.375	4.783	5.187	5.698	5.562	5.817	5.313	5.826	5.689	5.892	ns
		GCLK PLL	t_{co}	1.352	1.536	1.993	2.096	2.309	2.322	2.325	2.204	2.420	2.430	2.312	ns
	6mA	GCLK	t_{co}	3.118	3.361	4.770	5.174	5.685	5.549	5.804	5.299	5.813	5.676	5.879	ns
		GCLK PLL	t_{co}	1.338	1.522	1.980	2.083	2.296	2.309	2.312	2.190	2.407	2.417	2.299	ns
	8mA	GCLK	t_{co}	3.114	3.357	4.768	5.174	5.686	5.550	5.805	5.299	5.815	5.678	5.881	ns
		GCLK PLL	t_{co}	1.334	1.518	1.978	2.083	2.297	2.310	2.313	2.190	2.409	2.419	2.301	ns

Table 1-80. EP3SL150 Row Pins output Timing Parameters (Part 2 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.130	3.372	4.769	5.171	5.680	5.544	5.799	5.296	5.808	5.671	5.874	ns
		GCLK PLL	t _{co}	1.350	1.533	1.979	2.080	2.291	2.304	2.307	2.187	2.402	2.412	2.294	ns
	6mA	GCLK	t _{co}	3.119	3.362	4.765	5.167	5.677	5.541	5.796	5.293	5.805	5.668	5.871	ns
		GCLK PLL	t _{co}	1.339	1.523	1.975	2.076	2.288	2.301	2.304	2.184	2.399	2.409	2.291	ns
	8mA	GCLK	t _{co}	3.116	3.359	4.763	5.165	5.675	5.539	5.794	5.291	5.804	5.667	5.870	ns
		GCLK PLL	t _{co}	1.336	1.520	1.973	2.074	2.286	2.299	2.302	2.182	2.398	2.408	2.290	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.127	3.369	4.764	5.166	5.674	5.538	5.793	5.291	5.802	5.665	5.868	ns
		GCLK PLL	t _{co}	1.347	1.530	1.974	2.075	2.285	2.298	2.301	2.182	2.396	2.406	2.288	ns
	6mA	GCLK	t _{co}	3.117	3.360	4.762	5.164	5.673	5.537	5.792	5.290	5.802	5.665	5.868	ns
		GCLK PLL	t _{co}	1.337	1.521	1.972	2.073	2.284	2.297	2.300	2.181	2.396	2.406	2.288	ns
	8mA	GCLK	t _{co}	3.103	3.346	4.747	5.149	5.659	5.523	5.778	5.275	5.787	5.650	5.853	ns
		GCLK PLL	t _{co}	1.323	1.507	1.957	2.058	2.270	2.283	2.286	2.166	2.381	2.391	2.273	ns
	10mA	GCLK	t _{co}	3.100	3.342	4.743	5.145	5.655	5.519	5.774	5.271	5.783	5.646	5.849	ns
		GCLK PLL	t _{co}	1.320	1.503	1.953	2.054	2.266	2.279	2.282	2.162	2.377	2.387	2.269	ns
	12mA	GCLK	t _{co}	3.097	3.340	4.744	5.148	5.658	5.522	5.777	5.274	5.787	5.650	5.853	ns
		GCLK PLL	t _{co}	1.317	1.501	1.954	2.057	2.269	2.282	2.285	2.165	2.381	2.391	2.273	ns
	16mA	GCLK	t _{co}	3.098	3.340	4.734	5.136	5.645	5.509	5.764	5.261	5.773	5.636	5.839	ns
		GCLK PLL	t _{co}	1.318	1.501	1.944	2.045	2.256	2.269	2.272	2.152	2.367	2.377	2.259	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.147	3.393	4.805	5.209	5.721	5.585	5.840	5.335	5.849	5.712	5.915	ns
		GCLK PLL	t _{co}	1.367	1.554	2.015	2.118	2.332	2.345	2.348	2.226	2.443	2.453	2.335	ns
	6mA	GCLK	t _{co}	3.123	3.369	4.787	5.192	5.704	5.568	5.823	5.318	5.834	5.697	5.900	ns
		GCLK PLL	t _{co}	1.343	1.530	1.997	2.101	2.315	2.328	2.331	2.209	2.428	2.438	2.320	ns
	8mA	GCLK	t _{co}	3.106	3.350	4.765	5.170	5.682	5.546	5.801	5.296	5.812	5.675	5.878	ns
		GCLK PLL	t _{co}	1.326	1.511	1.975	2.079	2.293	2.306	2.309	2.187	2.406	2.416	2.298	ns

Table 1–80. EP3SL150 Row Pins output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t_{co}	3.151	3.396	4.805	5.209	5.720	5.584	5.839	5.335	5.849	5.712	5.915	ns
		GCLK PLL	t_{co}	1.371	1.557	2.015	2.118	2.331	2.344	2.347	2.226	2.443	2.453	2.335	ns
	6mA	GCLK	t_{co}	3.136	3.381	4.791	5.194	5.705	5.569	5.824	5.320	5.834	5.697	5.900	ns
		GCLK PLL	t_{co}	1.356	1.542	2.001	2.103	2.316	2.329	2.332	2.211	2.428	2.438	2.320	ns
	8mA	GCLK	t_{co}	3.125	3.370	4.786	5.191	5.702	5.566	5.821	5.317	5.832	5.695	5.898	ns
		GCLK PLL	t_{co}	1.345	1.531	1.996	2.100	2.313	2.326	2.329	2.208	2.426	2.436	2.318	ns
	10mA	GCLK	t_{co}	3.105	3.350	4.763	5.167	5.679	5.543	5.798	5.294	5.808	5.671	5.874	ns
		GCLK PLL	t_{co}	1.325	1.511	1.973	2.076	2.290	2.303	2.306	2.185	2.402	2.412	2.294	ns
	12mA	GCLK	t_{co}	3.102	3.346	4.759	5.164	5.675	5.539	5.794	5.290	5.805	5.668	5.871	ns
		GCLK PLL	t_{co}	1.322	1.507	1.969	2.073	2.286	2.299	2.302	2.181	2.399	2.409	2.291	ns
	8mA	GCLK	t_{co}	3.107	3.350	4.750	5.152	5.661	5.525	5.780	5.277	5.789	5.652	5.855	ns
		GCLK PLL	t_{co}	1.327	1.511	1.960	2.061	2.272	2.285	2.288	2.168	2.383	2.393	2.275	ns
	16mA	GCLK	t_{co}	3.100	3.343	4.749	5.153	5.664	5.528	5.783	5.280	5.794	5.657	5.860	ns
		GCLK PLL	t_{co}	1.320	1.504	1.959	2.062	2.275	2.288	2.291	2.171	2.388	2.398	2.280	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t_{co}	3.138	3.382	4.787	5.190	5.700	5.564	5.819	5.316	5.829	5.692	5.895	ns
		GCLK PLL	t_{co}	1.358	1.543	1.997	2.099	2.311	2.324	2.327	2.207	2.423	2.433	2.315	ns
	12mA	GCLK	t_{co}	3.120	3.365	4.772	5.175	5.685	5.549	5.804	5.301	5.814	5.677	5.880	ns
		GCLK PLL	t_{co}	1.340	1.526	1.982	2.084	2.296	2.309	2.312	2.192	2.408	2.418	2.300	ns
	16mA	GCLK	t_{co}	3.106	3.349	4.749	5.151	5.660	5.524	5.779	5.277	5.789	5.652	5.855	ns
		GCLK PLL	t_{co}	1.326	1.510	1.959	2.060	2.271	2.284	2.287	2.168	2.383	2.393	2.275	ns

Table 1–81 and Table 1–82 show EP3SL150 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1–81 specifies EP3SL150 Column Pin delay adders when using the regional clock.

Table 1-81. EP3SL150 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
RCLK input adder	0.198	0.152	0.22	0.258	0.27	0.262	0.393	0.244	0.271	0.261	0.495	ns
RCLK PLL input adder	2.453	2.426	3.654	4.098	4.422	4.224	4.664	4.106	4.447	4.101	4.707	ns
RCLK output adder	-0.374	-0.152	-0.216	-0.232	-0.248	-0.227	-0.367	-0.11	-0.127	-0.106	-0.303	ns
RCLK PLL output adder	-2.017	-1.798	-2.68	-2.859	-3.011	-2.872	-2.715	-2.714	-3.082	-2.791	-2.766	ns

Table 1-82 specifies EP3SL150 Row Pin delay adders when using the regional clock.

Table 1-82. EP3SL150 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
RCLK input adder	0.107	0.115	0.164	0.165	0.167	0.165	0.285	0.158	0.159	0.158	0.29	ns
RCLK PLL input adder	0.074	0.075	0.116	0.123	0.129	0.126	0.218	0.114	0.118	0.114	0.223	ns
RCLK output adder	-0.093	-0.103	-0.137	-0.136	-0.133	-0.134	-0.257	-0.125	-0.121	-0.122	-0.261	ns
RCLK PLL output adder	-0.063	-0.065	-0.097	-0.102	-0.103	-0.102	-0.198	-0.088	-0.089	-0.088	-0.202	ns

EP3SL200 I/O Timing Parameters

Table 1-83 through Table 1-86 show the maximum I/O timing parameters for EP3SL200 devices for single-ended I/O standards.

Table 1-83 specifies EP3SL200 column pins input timing parameters for single-ended I/O standards.

Table 1-83. EP3SL200 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-1.222	-1.283	-1.958	-2.003	-2.310	-2.232	-2.701	-2.026	-2.284	-2.244	-2.703	ns
		t _h	1.356	1.436	2.194	2.245	2.576	2.483	2.958	2.278	2.560	2.505	2.961	ns
	GCLK PLL	t _{su}	0.710	0.726	1.290	1.374	1.412	1.311	1.322	1.373	1.519	1.320	1.381	ns
		t _h	-0.440	-0.435	-0.824	-0.891	-0.876	-0.806	-0.797	-0.879	-0.967	-0.806	-0.853	ns
3.3-V LVCMOS	GCLK	t _{su}	-1.222	-1.283	-1.958	-2.003	-2.310	-2.232	-2.701	-2.026	-2.284	-2.244	-2.703	ns
		t _h	1.356	1.436	2.194	2.245	2.576	2.483	2.958	2.278	2.560	2.505	2.961	ns
	GCLK PLL	t _{su}	0.710	0.726	1.290	1.374	1.412	1.311	1.322	1.373	1.519	1.320	1.381	ns
		t _h	-0.440	-0.435	-0.824	-0.891	-0.876	-0.806	-0.797	-0.879	-0.967	-0.806	-0.853	ns
3.0-V LVTTTL	GCLK	t _{su}	-1.228	-1.294	-1.957	-2.005	-2.309	-2.231	-2.700	-2.026	-2.289	-2.249	-2.708	ns
		t _h	1.362	1.447	2.193	2.247	2.575	2.482	2.957	2.278	2.565	2.510	2.966	ns
	GCLK PLL	t _{su}	0.704	0.715	1.291	1.372	1.413	1.312	1.323	1.373	1.514	1.315	1.376	ns
		t _h	-0.434	-0.424	-0.825	-0.889	-0.877	-0.807	-0.798	-0.879	-0.962	-0.801	-0.848	ns

Table 1-83. EP3SL200 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.0-V LVCMOS	GCLK	t _{su}	-1.228	-1.294	-1.957	-2.005	-2.309	-2.231	-2.700	-2.026	-2.289	-2.249	-2.708	ns
		t _h	1.362	1.447	2.193	2.247	2.575	2.482	2.957	2.278	2.565	2.510	2.966	ns
	GCLK PLL	t _{su}	0.704	0.715	1.291	1.372	1.413	1.312	1.323	1.373	1.514	1.315	1.376	ns
		t _h	-0.434	-0.424	-0.825	-0.889	-0.877	-0.807	-0.798	-0.879	-0.962	-0.801	-0.848	ns
2.5 V	GCLK	t _{su}	-1.218	-1.289	-1.966	-2.017	-2.328	-2.250	-2.719	-2.036	-2.300	-2.260	-2.719	ns
		t _h	1.352	1.442	2.202	2.259	2.594	2.501	2.976	2.288	2.576	2.521	2.977	ns
	GCLK PLL	t _{su}	0.714	0.720	1.282	1.360	1.394	1.293	1.304	1.363	1.503	1.304	1.365	ns
		t _h	-0.444	-0.429	-0.816	-0.877	-0.858	-0.788	-0.779	-0.869	-0.951	-0.790	-0.837	ns
1.8 V	GCLK	t _{su}	-1.234	-1.309	-2.006	-2.053	-2.326	-2.248	-2.717	-2.070	-2.303	-2.263	-2.722	ns
		t _h	1.370	1.464	2.242	2.295	2.592	2.499	2.974	2.322	2.579	2.524	2.980	ns
	GCLK PLL	t _{su}	0.696	0.698	1.242	1.324	1.396	1.295	1.306	1.329	1.500	1.301	1.362	ns
		t _h	-0.424	-0.405	-0.776	-0.841	-0.860	-0.790	-0.781	-0.835	-0.948	-0.787	-0.834	ns
1.5 V	GCLK	t _{su}	-1.227	-1.299	-1.983	-2.021	-2.256	-2.178	-2.647	-2.039	-2.237	-2.197	-2.656	ns
		t _h	1.363	1.454	2.219	2.263	2.522	2.429	2.904	2.291	2.513	2.458	2.914	ns
	GCLK PLL	t _{su}	0.703	0.708	1.265	1.356	1.466	1.365	1.376	1.360	1.566	1.367	1.428	ns
		t _h	-0.431	-0.415	-0.799	-0.873	-0.930	-0.860	-0.851	-0.866	-1.014	-0.853	-0.900	ns
1.2 V	GCLK	t _{su}	-1.167	-1.247	-1.906	-1.922	-2.100	-2.022	-2.491	-1.943	-2.084	-2.044	-2.503	ns
		t _h	1.303	1.402	2.142	2.164	2.366	2.273	2.748	2.195	2.360	2.305	2.761	ns
	GCLK PLL	t _{su}	0.763	0.760	1.342	1.455	1.622	1.521	1.532	1.456	1.719	1.520	1.581	ns
		t _h	-0.491	-0.467	-0.876	-0.972	-1.086	-1.016	-1.007	-0.962	-1.167	-1.006	-1.053	ns
SSTL-2 CLASS I	GCLK	t _{su}	-1.148	-1.218	-1.878	-1.906	-2.102	-2.024	-2.493	-1.922	-2.080	-2.040	-2.499	ns
		t _h	1.284	1.373	2.114	2.148	2.368	2.275	2.750	2.174	2.356	2.301	2.757	ns
	GCLK PLL	t _{su}	0.782	0.789	1.370	1.471	1.620	1.519	1.530	1.477	1.723	1.524	1.585	ns
		t _h	-0.510	-0.496	-0.904	-0.988	-1.084	-1.014	-1.005	-0.983	-1.171	-1.010	-1.057	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.148	-1.218	-1.878	-1.906	-2.102	-2.024	-2.493	-1.922	-2.080	-2.040	-2.499	ns
		t _h	1.284	1.373	2.114	2.148	2.368	2.275	2.750	2.174	2.356	2.301	2.757	ns
	GCLK PLL	t _{su}	0.782	0.789	1.370	1.471	1.620	1.519	1.530	1.477	1.723	1.524	1.585	ns
		t _h	-0.510	-0.496	-0.904	-0.988	-1.084	-1.014	-1.005	-0.983	-1.171	-1.010	-1.057	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.141	-1.212	-1.866	-1.901	-2.102	-2.022	-2.494	-1.918	-2.085	-2.042	-2.503	ns
		t _h	1.277	1.367	2.101	2.140	2.365	2.272	2.746	2.167	2.356	2.302	2.756	ns
	GCLK PLL	t _{su}	0.789	0.795	1.383	1.479	1.623	1.524	1.532	1.484	1.718	1.525	1.584	ns
		t _h	-0.517	-0.502	-0.917	-0.999	-1.090	-1.020	-1.012	-0.993	-1.171	-1.012	-1.061	ns
SSTL-18 CLASS II	GCLK	t _{su}	-1.141	-1.212	-1.866	-1.901	-2.102	-2.022	-2.494	-1.918	-2.085	-2.042	-2.503	ns
		t _h	1.277	1.367	2.101	2.140	2.365	2.272	2.746	2.167	2.356	2.302	2.756	ns
	GCLK PLL	t _{su}	0.789	0.795	1.383	1.479	1.623	1.524	1.532	1.484	1.718	1.525	1.584	ns
		t _h	-0.517	-0.502	-0.917	-0.999	-1.090	-1.020	-1.012	-0.993	-1.171	-1.012	-1.061	ns

Table 1-83. EP3SL200 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-15 CLASS I	GCLK	t _{su}	-1.129	-1.201	-1.857	-1.890	-2.083	-2.003	-2.475	-1.907	-2.067	-2.024	-2.485	ns
		t _h	1.265	1.356	2.092	2.129	2.346	2.253	2.727	2.156	2.338	2.284	2.738	ns
	GCLK PLL	t _{su}	0.801	0.806	1.394	1.490	1.642	1.543	1.551	1.495	1.736	1.543	1.602	ns
		t _h	-0.529	-0.513	-0.929	-1.010	-1.109	-1.039	-1.031	-1.004	-1.189	-1.030	-1.079	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.129	-1.201	-1.857	-1.890	-2.083	-2.003	-2.475	-1.907	-2.067	-2.024	-2.485	ns
		t _h	1.265	1.356	2.092	2.129	2.346	2.253	2.727	2.156	2.338	2.284	2.738	ns
	GCLK PLL	t _{su}	0.801	0.806	1.394	1.490	1.642	1.543	1.551	1.495	1.736	1.543	1.602	ns
		t _h	-0.529	-0.513	-0.929	-1.010	-1.109	-1.039	-1.031	-1.004	-1.189	-1.030	-1.079	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.141	-1.212	-1.866	-1.901	-2.102	-2.022	-2.494	-1.918	-2.085	-2.042	-2.503	ns
		t _h	1.277	1.367	2.101	2.140	2.365	2.272	2.746	2.167	2.356	2.302	2.756	ns
	GCLK PLL	t _{su}	0.789	0.795	1.383	1.479	1.623	1.524	1.532	1.484	1.718	1.525	1.584	ns
		t _h	-0.517	-0.502	-0.917	-0.999	-1.090	-1.020	-1.012	-0.993	-1.171	-1.012	-1.061	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.141	-1.212	-1.866	-1.901	-2.102	-2.022	-2.494	-1.918	-2.085	-2.042	-2.503	ns
		t _h	1.277	1.367	2.101	2.140	2.365	2.272	2.746	2.167	2.356	2.302	2.756	ns
	GCLK PLL	t _{su}	0.789	0.795	1.383	1.479	1.623	1.524	1.532	1.484	1.718	1.525	1.584	ns
		t _h	-0.517	-0.502	-0.917	-0.999	-1.090	-1.020	-1.012	-0.993	-1.171	-1.012	-1.061	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.129	-1.201	-1.857	-1.890	-2.083	-2.003	-2.475	-1.907	-2.067	-2.024	-2.485	ns
		t _h	1.265	1.356	2.092	2.129	2.346	2.253	2.727	2.156	2.338	2.284	2.738	ns
	GCLK PLL	t _{su}	0.801	0.806	1.394	1.490	1.642	1.543	1.551	1.495	1.736	1.543	1.602	ns
		t _h	-0.529	-0.513	-0.929	-1.010	-1.109	-1.039	-1.031	-1.004	-1.189	-1.030	-1.079	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.129	-1.201	-1.857	-1.890	-2.083	-2.003	-2.475	-1.907	-2.067	-2.024	-2.485	ns
		t _h	1.265	1.356	2.092	2.129	2.346	2.253	2.727	2.156	2.338	2.284	2.738	ns
	GCLK PLL	t _{su}	0.801	0.806	1.394	1.490	1.642	1.543	1.551	1.495	1.736	1.543	1.602	ns
		t _h	-0.529	-0.513	-0.929	-1.010	-1.109	-1.039	-1.031	-1.004	-1.189	-1.030	-1.079	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.121	-1.189	-1.847	-1.879	-2.067	-1.987	-2.459	-1.896	-2.052	-2.009	-2.470	ns
		t _h	1.257	1.344	2.082	2.118	2.330	2.237	2.711	2.145	2.323	2.269	2.723	ns
	GCLK PLL	t _{su}	0.809	0.818	1.404	1.501	1.658	1.559	1.567	1.506	1.751	1.558	1.617	ns
		t _h	-0.537	-0.525	-0.939	-1.021	-1.125	-1.055	-1.047	-1.015	-1.204	-1.045	-1.094	ns
3.0-V PCI	GCLK	t _{su}	-1.121	-1.189	-1.847	-1.879	-2.067	-1.987	-2.459	-1.896	-2.052	-2.009	-2.470	ns
		t _h	1.257	1.344	2.082	2.118	2.330	2.237	2.711	2.145	2.323	2.269	2.723	ns
	GCLK PLL	t _{su}	0.809	0.818	1.404	1.501	1.658	1.559	1.567	1.506	1.751	1.558	1.617	ns
		t _h	-0.537	-0.525	-0.939	-1.021	-1.125	-1.055	-1.047	-1.015	-1.204	-1.045	-1.094	ns
3.0-V PCI-X	GCLK	t _{su}	-1.228	-1.294	-1.957	-2.005	-2.309	-2.231	-2.700	-2.026	-2.289	-2.249	-2.708	ns
		t _h	1.362	1.447	2.193	2.247	2.575	2.482	2.957	2.278	2.565	2.510	2.966	ns
	GCLK PLL	t _{su}	0.704	0.715	1.291	1.372	1.413	1.312	1.323	1.373	1.514	1.315	1.376	ns
		t _h	-0.434	-0.424	-0.825	-0.889	-0.877	-0.807	-0.798	-0.879	-0.962	-0.801	-0.848	ns

Table 1-84 specifies EP3SL200 row pins input timing parameters for single-ended I/O standards.

Table 1-84. EP3SL200 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{SU}	-1.298	-1.321	-1.972	-1.978	-2.368	-2.291	-2.712	-2.132	-2.388	-2.291	-2.712	ns
		t_H	1.432	1.473	2.210	2.223	2.633	2.541	2.966	2.384	2.665	2.541	2.966	ns
	GCLK PLL	t_{SU}	0.915	0.938	1.671	1.862	1.969	1.850	1.775	1.751	1.869	1.850	1.775	ns
		t_H	-0.638	-0.643	-1.193	-1.362	-1.413	-1.326	-1.239	-1.241	-1.304	-1.326	-1.239	ns
3.3-V LVCMOS	GCLK	t_{SU}	-1.298	-1.321	-1.972	-1.978	-2.368	-2.291	-2.712	-2.132	-2.388	-2.291	-2.712	ns
		t_H	1.432	1.473	2.210	2.223	2.633	2.541	2.966	2.384	2.665	2.541	2.966	ns
	GCLK PLL	t_{SU}	0.915	0.938	1.671	1.862	1.969	1.850	1.775	1.751	1.869	1.850	1.775	ns
		t_H	-0.638	-0.643	-1.193	-1.362	-1.413	-1.326	-1.239	-1.241	-1.304	-1.326	-1.239	ns
3.0-V LVTTTL	GCLK	t_{SU}	-1.304	-1.332	-1.969	-1.979	-2.371	-2.294	-2.715	-2.131	-2.393	-2.294	-2.715	ns
		t_H	1.438	1.484	2.207	2.224	2.636	2.544	2.969	2.383	2.670	2.544	2.969	ns
	GCLK PLL	t_{SU}	0.909	0.927	1.674	1.861	1.966	1.847	1.772	1.752	1.864	1.847	1.772	ns
		t_H	-0.632	-0.632	-1.196	-1.361	-1.410	-1.323	-1.236	-1.242	-1.299	-1.323	-1.236	ns
3.0-V LVCMOS	GCLK	t_{SU}	-1.304	-1.332	-1.969	-1.979	-2.371	-2.294	-2.715	-2.131	-2.393	-2.294	-2.715	ns
		t_H	1.438	1.484	2.207	2.224	2.636	2.544	2.969	2.383	2.670	2.544	2.969	ns
	GCLK PLL	t_{SU}	0.909	0.927	1.674	1.861	1.966	1.847	1.772	1.752	1.864	1.847	1.772	ns
		t_H	-0.632	-0.632	-1.196	-1.361	-1.410	-1.323	-1.236	-1.242	-1.299	-1.323	-1.236	ns
2.5 V	GCLK	t_{SU}	-1.292	-1.325	-1.978	-1.992	-2.386	-2.309	-2.730	-2.140	-2.403	-2.309	-2.730	ns
		t_H	1.426	1.477	2.216	2.237	2.651	2.559	2.984	2.392	2.680	2.559	2.984	ns
	GCLK PLL	t_{SU}	0.921	0.934	1.665	1.848	1.951	1.832	1.757	1.743	1.854	1.832	1.757	ns
		t_H	-0.644	-0.639	-1.187	-1.348	-1.395	-1.308	-1.221	-1.233	-1.289	-1.308	-1.221	ns
1.8 V	GCLK	t_{SU}	-1.322	-1.354	-2.017	-2.051	-2.384	-2.307	-2.728	-2.173	-2.404	-2.307	-2.728	ns
		t_H	1.457	1.507	2.254	2.297	2.649	2.557	2.982	2.425	2.681	2.557	2.982	ns
	GCLK PLL	t_{SU}	0.891	0.902	1.625	1.722	1.945	1.834	1.742	1.710	1.853	1.834	1.742	ns
		t_H	-0.613	-0.606	-1.147	-1.225	-1.388	-1.310	-1.206	-1.200	-1.288	-1.310	-1.206	ns
1.5 V	GCLK	t_{SU}	-1.312	-1.343	-1.993	-2.019	-2.316	-2.239	-2.660	-2.142	-2.339	-2.239	-2.660	ns
		t_H	1.447	1.496	2.230	2.265	2.581	2.489	2.914	2.394	2.616	2.489	2.914	ns
	GCLK PLL	t_{SU}	0.901	0.913	1.649	1.754	2.013	1.902	1.810	1.741	1.918	1.902	1.810	ns
		t_H	-0.623	-0.617	-1.171	-1.257	-1.456	-1.378	-1.274	-1.231	-1.353	-1.378	-1.274	ns
1.2 V	GCLK	t_{SU}	-1.252	-1.290	-1.914	-1.918	-2.157	-2.080	-2.501	-2.046	-2.184	-2.080	-2.501	ns
		t_H	1.387	1.443	2.151	2.164	2.422	2.330	2.755	2.298	2.461	2.330	2.755	ns
	GCLK PLL	t_{SU}	0.961	0.966	1.728	1.855	2.172	2.061	1.969	1.837	2.073	2.061	1.969	ns
		t_H	-0.683	-0.670	-1.250	-1.358	-1.615	-1.537	-1.433	-1.327	-1.508	-1.537	-1.433	ns

Table 1-84. EP3SL200 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-1.235	-1.266	-1.892	-1.883	-2.166	-2.089	-2.510	-2.028	-2.186	-2.089	-2.510	ns
		t _h	1.370	1.419	2.130	2.128	2.431	2.339	2.764	2.280	2.463	2.339	2.764	ns
	GCLK PLL	t _{su}	0.978	0.992	1.751	1.957	2.171	2.052	1.977	1.855	2.071	2.052	1.977	ns
		t _h	-0.700	-0.696	-1.273	-1.457	-1.615	-1.528	-1.441	-1.345	-1.506	-1.528	-1.441	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.235	-1.266	-1.892	-1.883	-2.166	-2.089	-2.510	-2.028	-2.186	-2.089	-2.510	ns
		t _h	1.370	1.419	2.130	2.128	2.431	2.339	2.764	2.280	2.463	2.339	2.764	ns
	GCLK PLL	t _{su}	0.978	0.992	1.751	1.957	2.171	2.052	1.977	1.855	2.071	2.052	1.977	ns
		t _h	-0.700	-0.696	-1.273	-1.457	-1.615	-1.528	-1.441	-1.345	-1.506	-1.528	-1.441	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.226	-1.255	-1.876	-1.893	-2.152	-2.074	-2.497	-2.014	-2.177	-2.074	-2.497	ns
		t _h	1.361	1.408	2.113	2.137	2.415	2.323	2.747	2.264	2.451	2.323	2.747	ns
	GCLK PLL	t _{su}	0.987	1.001	1.766	1.882	2.174	2.064	1.973	1.869	2.080	2.064	1.973	ns
		t _h	-0.709	-0.705	-1.288	-1.387	-1.620	-1.542	-1.441	-1.361	-1.518	-1.542	-1.441	ns
SSTL-18 CLASS II	GCLK	t _{su}	-1.226	-1.255	-1.876	-1.893	-2.152	-2.074	-2.497	-2.014	-2.177	-2.074	-2.497	ns
		t _h	1.361	1.408	2.113	2.137	2.415	2.323	2.747	2.264	2.451	2.323	2.747	ns
	GCLK PLL	t _{su}	0.987	1.001	1.766	1.882	2.174	2.064	1.973	1.869	2.080	2.064	1.973	ns
		t _h	-0.709	-0.705	-1.288	-1.387	-1.620	-1.542	-1.441	-1.361	-1.518	-1.542	-1.441	ns
SSTL-15 CLASS I	GCLK	t _{su}	-1.212	-1.243	-1.863	-1.883	-2.134	-2.056	-2.479	-2.003	-2.160	-2.056	-2.479	ns
		t _h	1.347	1.396	2.101	2.127	2.397	2.305	2.729	2.253	2.434	2.305	2.729	ns
	GCLK PLL	t _{su}	1.001	1.013	1.781	1.892	2.192	2.082	1.991	1.880	2.097	2.082	1.991	ns
		t _h	-0.723	-0.717	-1.302	-1.397	-1.638	-1.560	-1.459	-1.372	-1.535	-1.560	-1.459	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.226	-1.255	-1.876	-1.893	-2.152	-2.074	-2.497	-2.014	-2.177	-2.074	-2.497	ns
		t _h	1.361	1.408	2.113	2.137	2.415	2.323	2.747	2.264	2.451	2.323	2.747	ns
	GCLK PLL	t _{su}	0.987	1.001	1.766	1.882	2.174	2.064	1.973	1.869	2.080	2.064	1.973	ns
		t _h	-0.709	-0.705	-1.288	-1.387	-1.620	-1.542	-1.441	-1.361	-1.518	-1.542	-1.441	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.226	-1.255	-1.876	-1.893	-2.152	-2.074	-2.497	-2.014	-2.177	-2.074	-2.497	ns
		t _h	1.361	1.408	2.113	2.137	2.415	2.323	2.747	2.264	2.451	2.323	2.747	ns
	GCLK PLL	t _{su}	0.987	1.001	1.766	1.882	2.174	2.064	1.973	1.869	2.080	2.064	1.973	ns
		t _h	-0.709	-0.705	-1.288	-1.387	-1.620	-1.542	-1.441	-1.361	-1.518	-1.542	-1.441	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.212	-1.243	-1.863	-1.883	-2.134	-2.056	-2.479	-2.003	-2.160	-2.056	-2.479	ns
		t _h	1.347	1.396	2.101	2.127	2.397	2.305	2.729	2.253	2.434	2.305	2.729	ns
	GCLK PLL	t _{su}	1.001	1.013	1.781	1.892	2.192	2.082	1.991	1.880	2.097	2.082	1.991	ns
		t _h	-0.723	-0.717	-1.302	-1.397	-1.638	-1.560	-1.459	-1.372	-1.535	-1.560	-1.459	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.212	-1.243	-1.863	-1.883	-2.134	-2.056	-2.479	-2.003	-2.160	-2.056	-2.479	ns
		t _h	1.347	1.396	2.101	2.127	2.397	2.305	2.729	2.253	2.434	2.305	2.729	ns
	GCLK PLL	t _{su}	1.001	1.013	1.781	1.892	2.192	2.082	1.991	1.880	2.097	2.082	1.991	ns
		t _h	-0.723	-0.717	-1.302	-1.397	-1.638	-1.560	-1.459	-1.372	-1.535	-1.560	-1.459	ns

Table 1–84. EP3SL200 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.203	-1.231	-1.854	-1.873	-2.118	-2.040	-2.463	-1.994	-2.144	-2.040	-2.463	ns
		t _h	1.338	1.384	2.092	2.117	2.381	2.289	2.713	2.244	2.418	2.289	2.713	ns
	GCLK PLL	t _{su}	1.010	1.025	1.790	1.902	2.208	2.098	2.007	1.889	2.113	2.098	2.007	ns
		t _h	-0.732	-0.729	-1.311	-1.407	-1.654	-1.576	-1.475	-1.381	-1.551	-1.576	-1.475	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.203	-1.231	-1.854	-1.873	-2.118	-2.040	-2.463	-1.994	-2.144	-2.040	-2.463	ns
		t _h	1.338	1.384	2.092	2.117	2.381	2.289	2.713	2.244	2.418	2.289	2.713	ns
	GCLK PLL	t _{su}	1.010	1.025	1.790	1.902	2.208	2.098	2.007	1.889	2.113	2.098	2.007	ns
		t _h	-0.732	-0.729	-1.311	-1.407	-1.654	-1.576	-1.475	-1.381	-1.551	-1.576	-1.475	ns
3.0-V PCI	GCLK	t _{su}	-1.304	-1.332	-1.969	-1.979	-2.371	-2.294	-2.715	-2.131	-2.393	-2.294	-2.715	ns
		t _h	1.438	1.484	2.207	2.224	2.636	2.544	2.969	2.383	2.670	2.544	2.969	ns
	GCLK PLL	t _{su}	0.909	0.927	1.674	1.861	1.966	1.847	1.772	1.752	1.864	1.847	1.772	ns
		t _h	-0.632	-0.632	-1.196	-1.361	-1.410	-1.323	-1.236	-1.242	-1.299	-1.323	-1.236	ns
3.0-V PCI-X	GCLK	t _{su}	-1.304	-1.332	-1.969	-1.979	-2.371	-2.294	-2.715	-2.131	-2.393	-2.294	-2.715	ns
		t _h	1.438	1.484	2.207	2.224	2.636	2.544	2.969	2.383	2.670	2.544	2.969	ns
	GCLK PLL	t _{su}	0.909	0.927	1.674	1.861	1.966	1.847	1.772	1.752	1.864	1.847	1.772	ns
		t _h	-0.632	-0.632	-1.196	-1.361	-1.410	-1.323	-1.236	-1.242	-1.299	-1.323	-1.236	ns

Table 1–85 specifies EP3SL200 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–85. EP3SL200 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.475	3.747	5.436	5.640	6.177	6.023	6.436	5.779	6.315	6.162	6.514	ns
		GCLK PLL	t _{co}	1.631	1.820	2.330	2.414	2.639	2.650	2.757	2.526	2.726	2.748	2.598	ns
	8mA	GCLK	t _{co}	3.396	3.658	5.332	5.528	6.060	5.906	6.319	5.663	6.195	6.042	6.394	ns
		GCLK PLL	t _{co}	1.552	1.731	2.226	2.302	2.522	2.533	2.589	2.410	2.606	2.628	2.478	ns
	12mA	GCLK	t _{co}	3.366	3.626	5.265	5.458	5.990	5.836	6.249	5.593	6.128	5.975	6.327	ns
		GCLK PLL	t _{co}	1.522	1.699	2.159	2.232	2.452	2.463	2.489	2.340	2.539	2.561	2.411	ns
	16mA	GCLK	t _{co}	3.352	3.612	5.244	5.435	5.962	5.808	6.221	5.567	6.094	5.941	6.293	ns
		GCLK PLL	t _{co}	1.508	1.685	2.138	2.209	2.424	2.435	2.446	2.314	2.506	2.528	2.378	ns

Table 1-85. EP3SL200 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.412	3.680	5.363	5.557	6.089	5.935	6.348	5.693	6.227	6.074	6.426	ns
		GCLK PLL	t _{co}	1.568	1.753	2.257	2.331	2.552	2.562	2.635	2.440	2.638	2.660	2.510	ns
	8mA	GCLK	t _{co}	3.341	3.603	5.241	5.431	5.958	5.804	6.217	5.563	6.090	5.937	6.289	ns
		GCLK PLL	t _{co}	1.497	1.676	2.135	2.205	2.420	2.431	2.437	2.310	2.501	2.523	2.373	ns
	12mA	GCLK	t _{co}	3.317	3.575	5.212	5.404	5.933	5.779	6.192	5.536	6.065	5.912	6.264	ns
		GCLK PLL	t _{co}	1.473	1.648	2.106	2.178	2.394	2.406	2.378	2.283	2.476	2.498	2.348	ns
	16mA	GCLK	t _{co}	3.310	3.568	5.204	5.395	5.924	5.770	6.183	5.526	6.055	5.902	6.254	ns
		GCLK PLL	t _{co}	1.466	1.641	2.098	2.169	2.385	2.397	2.358	2.273	2.467	2.489	2.339	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.472	3.756	5.470	5.676	6.216	6.062	6.475	5.817	6.357	6.204	6.556	ns
		GCLK PLL	t _{co}	1.628	1.829	2.364	2.450	2.698	2.689	2.817	2.564	2.768	2.790	2.640	ns
	8mA	GCLK	t _{co}	3.405	3.671	5.366	5.564	6.100	5.946	6.359	5.703	6.238	6.085	6.437	ns
		GCLK PLL	t _{co}	1.561	1.744	2.260	2.338	2.604	2.573	2.664	2.450	2.650	2.672	2.522	ns
	12mA	GCLK	t _{co}	3.367	3.634	5.298	5.493	6.026	5.872	6.285	5.629	6.162	6.009	6.361	ns
		GCLK PLL	t _{co}	1.523	1.707	2.192	2.267	2.540	2.499	2.562	2.376	2.574	2.596	2.446	ns
	16mA	GCLK	t _{co}	3.345	3.607	5.263	5.454	5.984	5.830	6.243	5.589	6.119	5.966	6.318	ns
		GCLK PLL	t _{co}	1.501	1.680	2.157	2.228	2.517	2.457	2.512	2.336	2.530	2.552	2.402	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.427	3.696	5.400	5.598	6.135	5.981	6.394	5.737	6.275	6.122	6.474	ns
		GCLK PLL	t _{co}	1.583	1.769	2.294	2.372	2.640	2.608	2.718	2.484	2.686	2.708	2.558	ns
	8mA	GCLK	t _{co}	3.354	3.617	5.276	5.469	6.000	5.846	6.259	5.604	6.135	5.982	6.334	ns
		GCLK PLL	t _{co}	1.510	1.690	2.170	2.243	2.530	2.473	2.536	2.351	2.547	2.569	2.419	ns
	12mA	GCLK	t _{co}	3.330	3.588	5.237	5.429	5.959	5.805	6.218	5.564	6.094	5.941	6.293	ns
		GCLK PLL	t _{co}	1.486	1.661	2.131	2.203	2.496	2.432	2.465	2.311	2.505	2.527	2.377	ns
	16mA	GCLK	t _{co}	3.330	3.588	5.229	5.420	5.949	5.795	6.208	5.553	6.082	5.929	6.281	ns
		GCLK PLL	t _{co}	1.486	1.661	2.123	2.194	2.504	2.422	2.466	2.300	2.493	2.515	2.365	ns

Table 1–85. EP3SL200 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
2.5 V	4mA	GCLK	t _{co}	3.531	3.811	5.607	5.825	6.382	6.228	6.641	5.970	6.530	6.377	6.729	ns
		GCLK PLL	t _{co}	1.687	1.884	2.501	2.599	2.848	2.855	3.000	2.717	2.941	2.963	2.813	ns
	8mA	GCLK	t _{co}	3.448	3.718	5.488	5.699	6.250	6.096	6.509	5.842	6.394	6.241	6.593	ns
		GCLK PLL	t _{co}	1.604	1.791	2.382	2.473	2.724	2.723	2.803	2.589	2.805	2.827	2.677	ns
	12mA	GCLK	t _{co}	3.392	3.674	5.396	5.603	6.150	5.996	6.409	5.744	6.292	6.139	6.491	ns
		GCLK PLL	t _{co}	1.548	1.747	2.290	2.377	2.646	2.623	2.663	2.491	2.703	2.725	2.575	ns
	16mA	GCLK	t _{co}	3.359	3.628	5.362	5.566	6.109	5.955	6.368	5.704	6.248	6.095	6.447	ns
		GCLK PLL	t _{co}	1.515	1.701	2.256	2.340	2.589	2.582	2.613	2.451	2.659	2.681	2.531	ns
1.8 V	2mA	GCLK	t _{co}	3.645	3.939	5.801	6.034	6.600	6.446	6.859	6.188	6.756	6.603	6.955	ns
		GCLK PLL	t _{co}	1.801	2.012	2.695	2.808	3.066	3.073	3.327	2.935	3.167	3.189	3.039	ns
	4mA	GCLK	t _{co}	3.547	3.828	5.649	5.876	6.439	6.285	6.698	6.029	6.590	6.437	6.789	ns
		GCLK PLL	t _{co}	1.703	1.901	2.543	2.650	2.914	2.912	3.077	2.776	3.001	3.023	2.873	ns
	6mA	GCLK	t _{co}	3.465	3.741	5.522	5.738	6.295	6.141	6.554	5.885	6.442	6.289	6.641	ns
		GCLK PLL	t _{co}	1.621	1.814	2.416	2.512	2.773	2.768	2.873	2.632	2.854	2.876	2.726	ns
	8mA	GCLK	t _{co}	3.439	3.708	5.462	5.672	6.220	6.066	6.479	5.814	6.362	6.209	6.561	ns
		GCLK PLL	t _{co}	1.595	1.781	2.356	2.446	2.694	2.693	2.763	2.561	2.773	2.795	2.645	ns
	10mA	GCLK	t _{co}	3.368	3.644	5.374	5.578	6.121	5.967	6.380	5.717	6.261	6.108	6.460	ns
		GCLK PLL	t _{co}	1.524	1.717	2.268	2.352	2.612	2.594	2.633	2.464	2.672	2.694	2.544	ns
	12mA	GCLK	t _{co}	3.363	3.634	5.368	5.572	6.114	5.960	6.373	5.710	6.254	6.101	6.453	ns
		GCLK PLL	t _{co}	1.519	1.707	2.262	2.346	2.606	2.587	2.628	2.457	2.665	2.687	2.537	ns

Table 1-85. EP3SL200 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.585	3.906	5.740	5.961	6.528	6.374	6.787	6.118	6.689	6.536	6.888	ns
		GCLK PLL	t _{co}	1.741	1.979	2.634	2.735	3.005	3.001	3.215	2.865	3.100	3.122	2.972	ns
	4mA	GCLK	t _{co}	3.454	3.725	5.496	5.707	6.257	6.103	6.516	5.850	6.402	6.249	6.601	ns
		GCLK PLL	t _{co}	1.610	1.798	2.390	2.481	2.736	2.730	2.812	2.597	2.814	2.836	2.686	ns
	6mA	GCLK	t _{co}	3.409	3.688	5.416	5.627	6.177	6.023	6.436	5.770	6.319	6.166	6.518	ns
		GCLK PLL	t _{co}	1.565	1.761	2.310	2.401	2.674	2.650	2.705	2.517	2.731	2.753	2.603	ns
	8mA	GCLK	t _{co}	3.398	3.682	5.410	5.619	6.168	6.014	6.427	5.763	6.312	6.159	6.511	ns
		GCLK PLL	t _{co}	1.554	1.755	2.304	2.393	2.667	2.641	2.690	2.510	2.723	2.745	2.595	ns
	10mA	GCLK	t _{co}	3.363	3.631	5.362	5.566	6.107	5.953	6.366	5.704	6.247	6.094	6.446	ns
		GCLK PLL	t _{co}	1.519	1.704	2.256	2.340	2.608	2.580	2.620	2.451	2.658	2.680	2.530	ns
	12mA	GCLK	t _{co}	3.359	3.624	5.341	5.545	6.087	5.933	6.346	5.683	6.225	6.072	6.424	ns
		GCLK PLL	t _{co}	1.515	1.697	2.235	2.319	2.605	2.560	2.596	2.430	2.637	2.659	2.509	ns
1.2 V	2mA	GCLK	t _{co}	3.565	3.849	5.694	5.915	6.471	6.317	6.730	6.065	6.623	6.470	6.822	ns
		GCLK PLL	t _{co}	1.721	1.922	2.588	2.689	2.951	2.944	3.139	2.812	3.034	3.056	2.906	ns
	4mA	GCLK	t _{co}	3.442	3.714	5.475	5.684	6.231	6.077	6.490	5.826	6.374	6.221	6.573	ns
		GCLK PLL	t _{co}	1.598	1.787	2.369	2.458	2.727	2.704	2.782	2.573	2.786	2.808	2.658	ns
	6mA	GCLK	t _{co}	3.389	3.673	5.399	5.607	6.157	6.003	6.416	5.751	6.302	6.149	6.501	ns
		GCLK PLL	t _{co}	1.545	1.746	2.293	2.381	2.673	2.630	2.681	2.498	2.713	2.735	2.585	ns
	8mA	GCLK	t _{co}	3.369	3.639	5.360	5.564	6.107	5.953	6.366	5.702	6.245	6.092	6.444	ns
		GCLK PLL	t _{co}	1.525	1.712	2.254	2.338	2.638	2.580	2.631	2.449	2.656	2.678	2.528	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.382	3.647	5.368	5.572	6.115	5.961	6.374	5.707	6.250	6.097	6.449	ns
		GCLK PLL	t _{co}	1.538	1.720	2.262	2.346	2.630	2.588	2.644	2.454	2.661	2.683	2.533	ns
	10mA	GCLK	t _{co}	3.385	3.650	5.372	5.576	6.119	5.965	6.378	5.711	6.254	6.101	6.453	ns
		GCLK PLL	t _{co}	1.541	1.723	2.266	2.350	2.636	2.592	2.652	2.458	2.665	2.687	2.537	ns
	12mA	GCLK	t _{co}	3.367	3.630	5.350	5.554	6.097	5.943	6.356	5.690	6.232	6.079	6.431	ns
		GCLK PLL	t _{co}	1.523	1.703	2.244	2.328	2.609	2.570	2.610	2.437	2.643	2.665	2.515	ns

Table 1–85. EP3SL200 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.362	3.623	5.335	5.538	6.080	5.926	6.339	5.673	6.214	6.061	6.413	ns
		GCLK PLL	t _{co}	1.518	1.696	2.229	2.312	2.607	2.553	2.591	2.420	2.626	2.648	2.498	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.400	3.667	5.391	5.595	6.138	5.984	6.397	5.731	6.274	6.121	6.473	ns
		GCLK PLL	t _{co}	1.556	1.740	2.285	2.369	2.660	2.611	2.674	2.478	2.685	2.707	2.557	ns
	6mA	GCLK	t _{co}	3.381	3.646	5.369	5.573	6.116	5.962	6.375	5.709	6.251	6.098	6.450	ns
		GCLK PLL	t _{co}	1.537	1.719	2.263	2.347	2.636	2.589	2.639	2.456	2.662	2.684	2.534	ns
	8mA	GCLK	t _{co}	3.382	3.649	5.377	5.582	6.126	5.972	6.385	5.719	6.262	6.109	6.461	ns
		GCLK PLL	t _{co}	1.538	1.722	2.271	2.356	2.656	2.599	2.656	2.466	2.673	2.695	2.545	ns
	10mA	GCLK	t _{co}	3.365	3.629	5.352	5.557	6.101	5.947	6.360	5.693	6.236	6.083	6.435	ns
		GCLK PLL	t _{co}	1.521	1.702	2.246	2.331	2.631	2.574	2.616	2.440	2.648	2.670	2.520	ns
	12mA	GCLK	t _{co}	3.362	3.625	5.348	5.553	6.096	5.942	6.355	5.689	6.232	6.079	6.431	ns
		GCLK PLL	t _{co}	1.518	1.698	2.242	2.327	2.626	2.569	2.608	2.436	2.644	2.666	2.516	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.362	3.624	5.336	5.538	6.080	5.926	6.339	5.674	6.215	6.062	6.414	ns
		GCLK PLL	t _{co}	1.518	1.697	2.230	2.312	2.611	2.553	2.590	2.421	2.626	2.648	2.498	ns
	16mA	GCLK	t _{co}	3.361	3.624	5.344	5.548	6.092	5.938	6.351	5.684	6.228	6.075	6.427	ns
		GCLK PLL	t _{co}	1.517	1.697	2.238	2.322	2.618	2.565	2.586	2.431	2.639	2.661	2.511	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.392	3.658	5.384	5.588	6.130	5.976	6.389	5.724	6.266	6.113	6.465	ns
		GCLK PLL	t _{co}	1.548	1.731	2.278	2.362	2.653	2.603	2.655	2.471	2.677	2.699	2.549	ns
	6mA	GCLK	t _{co}	3.377	3.642	5.370	5.575	6.118	5.964	6.377	5.711	6.255	6.102	6.454	ns
		GCLK PLL	t _{co}	1.533	1.715	2.264	2.349	2.649	2.591	2.639	2.458	2.666	2.688	2.538	ns
	8mA	GCLK	t _{co}	3.364	3.627	5.350	5.554	6.098	5.944	6.357	5.691	6.234	6.081	6.433	ns
		GCLK PLL	t _{co}	1.520	1.700	2.244	2.328	2.631	2.571	2.611	2.438	2.645	2.667	2.517	ns
	10mA	GCLK	t _{co}	3.364	3.628	5.351	5.556	6.101	5.947	6.360	5.693	6.237	6.084	6.436	ns
		GCLK PLL	t _{co}	1.520	1.701	2.245	2.330	2.642	2.574	2.616	2.440	2.648	2.670	2.520	ns
	12mA	GCLK	t _{co}	3.360	3.623	5.344	5.549	6.093	5.939	6.352	5.685	6.229	6.076	6.428	ns
		GCLK PLL	t _{co}	1.516	1.696	2.238	2.323	2.634	2.566	2.605	2.432	2.640	2.662	2.512	ns

Table 1-85. EP3SL200 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.378	3.640	5.352	5.554	6.095	5.941	6.354	5.689	6.230	6.077	6.429	ns
		GCLK PLL	t _{co}	1.534	1.713	2.246	2.328	2.622	2.568	2.613	2.436	2.641	2.663	2.513	ns
	16mA	GCLK	t _{co}	3.377	3.640	5.356	5.559	6.101	5.947	6.360	5.694	6.236	6.083	6.435	ns
		GCLK PLL	t _{co}	1.533	1.713	2.250	2.333	2.640	2.574	2.628	2.441	2.647	2.669	2.519	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.364	3.626	5.340	5.543	6.085	5.931	6.344	5.678	6.220	6.067	6.419	ns
		GCLK PLL	t _{co}	1.520	1.699	2.234	2.317	2.622	2.558	2.601	2.425	2.631	2.653	2.503	ns
	6mA	GCLK	t _{co}	3.359	3.621	5.334	5.537	6.079	5.925	6.338	5.672	6.214	6.061	6.413	ns
		GCLK PLL	t _{co}	1.515	1.694	2.228	2.311	2.611	2.552	2.586	2.419	2.625	2.647	2.497	ns
	8mA	GCLK	t _{co}	3.361	3.624	5.339	5.542	6.085	5.931	6.344	5.678	6.220	6.067	6.419	ns
		GCLK PLL	t _{co}	1.517	1.697	2.233	2.316	2.632	2.558	2.603	2.425	2.632	2.654	2.504	ns
	10mA	GCLK	t _{co}	3.360	3.622	5.332	5.535	6.077	5.923	6.336	5.670	6.211	6.058	6.410	ns
		GCLK PLL	t _{co}	1.516	1.695	2.226	2.309	2.613	2.550	2.576	2.417	2.623	2.645	2.495	ns
	12mA	GCLK	t _{co}	3.379	3.641	5.354	5.556	6.098	5.944	6.357	5.692	6.232	6.079	6.431	ns
		GCLK PLL	t _{co}	1.535	1.714	2.248	2.330	2.627	2.571	2.613	2.439	2.644	2.666	2.516	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.374	3.637	5.352	5.555	6.097	5.943	6.356	5.691	6.232	6.079	6.431	ns
		GCLK PLL	t _{co}	1.530	1.710	2.246	2.329	2.634	2.570	2.616	2.438	2.643	2.665	2.515	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.373	3.636	5.353	5.556	6.098	5.944	6.357	5.692	6.233	6.080	6.432	ns
		GCLK PLL	t _{co}	1.529	1.709	2.247	2.330	2.635	2.571	2.617	2.439	2.644	2.666	2.516	ns
	6mA	GCLK	t _{co}	3.364	3.626	5.340	5.544	6.086	5.932	6.345	5.679	6.221	6.068	6.420	ns
		GCLK PLL	t _{co}	1.520	1.699	2.234	2.318	2.622	2.559	2.598	2.426	2.632	2.654	2.504	ns
	8mA	GCLK	t _{co}	3.365	3.628	5.346	5.550	6.094	5.940	6.353	5.686	6.229	6.076	6.428	ns
		GCLK PLL	t _{co}	1.521	1.701	2.240	2.324	2.637	2.567	2.608	2.433	2.641	2.663	2.513	ns
	10mA	GCLK	t _{co}	3.387	3.653	5.374	5.577	6.120	5.966	6.379	5.714	6.256	6.103	6.455	ns
		GCLK PLL	t _{co}	1.543	1.726	2.268	2.351	2.655	2.593	2.638	2.461	2.668	2.690	2.540	ns
	12mA	GCLK	t _{co}	3.377	3.641	5.362	5.566	6.109	5.955	6.368	5.702	6.245	6.092	6.444	ns
		GCLK PLL	t _{co}	1.533	1.714	2.256	2.340	2.645	2.582	2.624	2.449	2.656	2.678	2.528	ns

Table 1-85. EP3SL200 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.375	3.639	5.360	5.564	6.107	5.953	6.366	5.701	6.244	6.091	6.443	ns
		GCLK PLL	t _{co}	1.531	1.712	2.254	2.338	2.650	2.580	2.623	2.448	2.655	2.677	2.527	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.373	3.637	5.359	5.564	6.107	5.953	6.366	5.700	6.244	6.091	6.443	ns
		GCLK PLL	t _{co}	1.529	1.710	2.253	2.338	2.652	2.580	2.621	2.447	2.655	2.677	2.527	ns
	6mA	GCLK	t _{co}	3.369	3.633	5.352	5.557	6.100	5.946	6.359	5.693	6.236	6.083	6.435	ns
		GCLK PLL	t _{co}	1.525	1.706	2.246	2.331	2.643	2.573	2.611	2.440	2.648	2.670	2.520	ns
	8mA	GCLK	t _{co}	3.446	3.708	5.370	5.565	6.097	5.943	6.356	5.701	6.234	6.081	6.433	ns
		GCLK PLL	t _{co}	1.602	1.781	2.264	2.339	2.619	2.570	2.580	2.448	2.645	2.667	2.517	ns
	10mA	GCLK	t _{co}	3.446	3.708	5.370	5.565	6.097	5.943	6.356	5.701	6.234	6.081	6.433	ns
		GCLK PLL	t _{co}	1.602	1.781	2.264	2.339	2.619	2.570	2.580	2.448	2.645	2.667	2.517	ns
	12mA	GCLK	t _{co}	3.475	3.747	5.436	5.640	6.177	6.023	6.436	5.779	6.315	6.162	6.514	ns
		GCLK PLL	t _{co}	1.631	1.820	2.330	2.414	2.639	2.650	2.757	2.526	2.726	2.748	2.598	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.396	3.658	5.332	5.528	6.060	5.906	6.319	5.663	6.195	6.042	6.394	ns
		GCLK PLL	t _{co}	1.552	1.731	2.226	2.302	2.522	2.533	2.589	2.410	2.606	2.628	2.478	ns
3.0-V PCI	—	GCLK	t _{co}	3.366	3.626	5.265	5.458	5.990	5.836	6.249	5.593	6.128	5.975	6.327	ns
		GCLK PLL	t _{co}	1.522	1.699	2.159	2.232	2.452	2.463	2.489	2.340	2.539	2.561	2.411	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.352	3.612	5.244	5.435	5.962	5.808	6.221	5.567	6.094	5.941	6.293	ns
		GCLK PLL	t _{co}	1.508	1.685	2.138	2.209	2.424	2.435	2.446	2.314	2.506	2.528	2.378	ns

Table 1-86 specifies EP3SL200 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1-86. EP3SL200 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.639	3.902	5.663	5.916	6.397	6.238	6.709	6.053	6.634	6.238	6.709	ns
		GCLK PLL	t _{co}	1.551	1.768	2.210	2.317	2.505	2.518	2.444	2.409	2.649	2.518	2.444	ns
	8mA	GCLK	t _{co}	3.548	3.813	5.533	5.778	6.283	6.124	6.565	5.912	6.485	6.124	6.565	ns
		GCLK PLL	t _{co}	1.468	1.663	2.080	2.179	2.361	2.374	2.300	2.268	2.500	2.374	2.300	ns
	12mA	GCLK	t _{co}	3.469	3.724	5.414	5.655	6.187	6.028	6.437	5.785	6.353	6.028	6.437	ns
		GCLK PLL	t _{co}	1.389	1.560	1.961	2.056	2.233	2.246	2.172	2.147	2.368	2.246	2.172	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.649	3.906	5.671	5.921	6.406	6.247	6.714	6.059	6.639	6.247	6.714	ns
		GCLK PLL	t _{co}	1.561	1.772	2.218	2.322	2.510	2.523	2.449	2.415	2.654	2.523	2.449	ns
	8mA	GCLK	t _{co}	3.473	3.728	5.420	5.661	6.197	6.038	6.443	5.794	6.360	6.038	6.443	ns
		GCLK PLL	t _{co}	1.393	1.564	1.967	2.062	2.239	2.252	2.178	2.159	2.375	2.252	2.178	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.593	3.848	5.615	5.869	6.363	6.204	6.666	6.010	6.592	6.204	6.666	ns
		GCLK PLL	t _{co}	1.505	1.714	2.162	2.270	2.462	2.475	2.401	2.366	2.607	2.475	2.401	ns
	8mA	GCLK	t _{co}	3.474	3.733	5.463	5.710	6.218	6.059	6.502	5.848	6.428	6.059	6.502	ns
		GCLK PLL	t _{co}	1.394	1.587	2.010	2.111	2.298	2.311	2.237	2.204	2.443	2.311	2.237	ns
	12mA	GCLK	t _{co}	3.437	3.695	5.395	5.627	6.148	5.989	6.414	5.762	6.335	5.989	6.414	ns
		GCLK PLL	t _{co}	1.357	1.536	1.928	2.028	2.210	2.223	2.149	2.118	2.350	2.223	2.149	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.507	3.767	5.510	5.762	6.254	6.095	6.555	5.902	6.481	6.095	6.555	ns
		GCLK PLL	t _{co}	1.419	1.633	2.057	2.163	2.351	2.364	2.290	2.258	2.496	2.364	2.290	ns
	8mA	GCLK	t _{co}	3.424	3.679	5.368	5.588	6.120	5.961	6.375	5.722	6.295	5.961	6.375	ns
		GCLK PLL	t _{co}	1.344	1.515	1.893	1.989	2.171	2.184	2.110	2.087	2.310	2.184	2.110	ns
2.5 V	4mA	GCLK	t _{co}	3.619	3.884	5.748	6.023	6.508	6.349	6.838	6.170	6.771	6.349	6.838	ns
		GCLK PLL	t _{co}	1.531	1.750	2.295	2.424	2.634	2.647	2.573	2.526	2.786	2.647	2.573	ns
	8mA	GCLK	t _{co}	3.516	3.785	5.593	5.860	6.366	6.207	6.668	6.003	6.597	6.207	6.668	ns
		GCLK PLL	t _{co}	1.436	1.651	2.140	2.261	2.464	2.477	2.403	2.359	2.612	2.477	2.403	ns
	12mA	GCLK	t _{co}	3.463	3.735	5.492	5.741	6.275	6.116	6.542	5.880	6.467	6.116	6.542	ns
		GCLK PLL	t _{co}	1.379	1.575	2.029	2.142	2.338	2.351	2.277	2.236	2.482	2.351	2.277	ns

Table 1–86. EP3SL200 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.863	4.170	6.174	6.451	7.093	6.933	7.278	6.617	7.250	6.933	7.278	ns
		GCLK PLL	t _{co}	1.795	2.018	2.703	2.852	3.121	3.130	3.066	2.995	3.095	3.130	3.066	ns
	4mA	GCLK	t _{co}	3.638	3.968	5.848	6.083	6.688	6.528	6.873	6.252	6.844	6.528	6.873	ns
		GCLK PLL	t _{co}	1.570	1.816	2.377	2.484	2.716	2.725	2.661	2.630	2.734	2.725	2.661	ns
	6mA	GCLK	t _{co}	3.573	3.866	5.694	5.933	6.529	6.369	6.714	6.084	6.671	6.369	6.714	ns
		GCLK PLL	t _{co}	1.505	1.714	2.223	2.334	2.557	2.566	2.502	2.462	2.628	2.566	2.502	ns
	8mA	GCLK	t _{co}	3.521	3.792	5.617	5.840	6.433	6.273	6.618	5.989	6.577	6.273	6.618	ns
		GCLK PLL	t _{co}	1.445	1.640	2.146	2.241	2.461	2.470	2.406	2.367	2.556	2.470	2.406	ns
1.5 V	2mA	GCLK	t _{co}	3.774	4.088	6.084	6.365	7.021	6.861	7.206	6.524	7.174	6.861	7.206	ns
		GCLK PLL	t _{co}	1.706	1.936	2.613	2.766	3.049	3.058	2.994	2.902	3.030	3.058	2.994	ns
	4mA	GCLK	t _{co}	3.537	3.831	5.679	5.928	6.530	6.370	6.715	6.078	6.670	6.370	6.715	ns
		GCLK PLL	t _{co}	1.464	1.679	2.208	2.329	2.558	2.567	2.503	2.456	2.629	2.567	2.503	ns
	6mA	GCLK	t _{co}	3.510	3.783	5.606	5.832	6.424	6.264	6.609	5.980	6.565	6.264	6.609	ns
		GCLK PLL	t _{co}	1.437	1.631	2.135	2.233	2.452	2.461	2.397	2.358	2.556	2.461	2.397	ns
	8mA	GCLK	t _{co}	3.496	3.774	5.584	5.814	6.405	6.245	6.590	5.962	6.543	6.245	6.590	ns
		GCLK PLL	t _{co}	1.428	1.622	2.113	2.215	2.433	2.442	2.378	2.340	2.537	2.442	2.378	ns
1.2 V	2mA	GCLK	t _{co}	3.717	4.013	5.994	6.279	6.946	6.786	7.131	6.436	7.090	6.786	7.131	ns
		GCLK PLL	t _{co}	1.649	1.861	2.523	2.680	2.974	2.983	2.919	2.814	2.961	2.983	2.919	ns
	4mA	GCLK	t _{co}	3.542	3.824	5.701	5.956	6.571	6.411	6.756	6.103	6.712	6.411	6.756	ns
		GCLK PLL	t _{co}	1.469	1.672	2.230	2.357	2.599	2.608	2.544	2.481	2.673	2.608	2.544	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.463	3.723	5.485	5.713	6.265	6.106	6.510	5.855	6.429	6.106	6.510	ns
		GCLK PLL	t _{co}	1.383	1.561	2.006	2.114	2.306	2.319	2.245	2.220	2.444	2.319	2.245	ns
	12mA	GCLK	t _{co}	3.458	3.719	5.482	5.705	6.263	6.104	6.502	5.854	6.422	6.104	6.502	ns
		GCLK PLL	t _{co}	1.378	1.555	1.999	2.106	2.298	2.311	2.237	2.219	2.437	2.311	2.237	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.449	3.708	5.467	5.680	6.246	6.087	6.475	5.837	6.395	6.087	6.475	ns
		GCLK PLL	t _{co}	1.369	1.544	1.984	2.081	2.271	2.284	2.210	2.202	2.413	2.284	2.210	ns

Table 1-86. EP3SL200 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.474	3.748	5.512	5.727	6.306	6.146	6.491	5.870	6.440	6.146	6.491	ns
		GCLK PLL	t _{co}	1.406	1.596	2.041	2.128	2.334	2.343	2.279	2.248	2.447	2.343	2.279	ns
	6mA	GCLK	t _{co}	3.465	3.734	5.509	5.725	6.304	6.144	6.489	5.868	6.438	6.144	6.489	ns
		GCLK PLL	t _{co}	1.391	1.582	2.038	2.126	2.332	2.341	2.277	2.246	2.445	2.341	2.277	ns
	8mA	GCLK	t _{co}	3.454	3.722	5.492	5.708	6.287	6.127	6.472	5.857	6.422	6.127	6.472	ns
		GCLK PLL	t _{co}	1.380	1.570	2.021	2.109	2.315	2.324	2.260	2.229	2.436	2.324	2.260	ns
	10mA	GCLK	t _{co}	3.443	3.699	5.476	5.692	6.272	6.112	6.457	5.845	6.407	6.112	6.457	ns
		GCLK PLL	t _{co}	1.363	1.547	2.005	2.093	2.300	2.309	2.245	2.214	2.424	2.309	2.245	ns
	12mA	GCLK	t _{co}	3.443	3.698	5.475	5.691	6.271	6.111	6.456	5.844	6.406	6.111	6.456	ns
		GCLK PLL	t _{co}	1.363	1.546	2.004	2.092	2.299	2.308	2.244	2.213	2.424	2.308	2.244	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.451	3.707	5.473	5.687	6.265	6.105	6.450	5.840	6.399	6.105	6.450	ns
		GCLK PLL	t _{co}	1.371	1.555	2.002	2.088	2.293	2.302	2.238	2.208	2.418	2.302	2.238	ns
	16mA	GCLK	t _{co}	3.452	3.702	5.472	5.688	6.267	6.107	6.458	5.849	6.408	6.107	6.458	ns
		GCLK PLL	t _{co}	1.372	1.550	2.001	2.093	2.295	2.304	2.240	2.214	2.429	2.304	2.240	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.473	3.744	5.523	5.741	6.323	6.163	6.508	5.883	6.456	6.163	6.508	ns
		GCLK PLL	t _{co}	1.402	1.592	2.052	2.142	2.351	2.360	2.296	2.261	2.459	2.360	2.296	ns
	6mA	GCLK	t _{co}	3.459	3.722	5.505	5.724	6.306	6.146	6.491	5.869	6.440	6.146	6.491	ns
		GCLK PLL	t _{co}	1.379	1.570	2.034	2.125	2.334	2.343	2.279	2.245	2.450	2.343	2.279	ns
	8mA	GCLK	t _{co}	3.448	3.705	5.488	5.706	6.288	6.128	6.473	5.856	6.423	6.128	6.473	ns
		GCLK PLL	t _{co}	1.368	1.553	2.017	2.107	2.316	2.325	2.261	2.227	2.437	2.325	2.261	ns

Table 1–86. EP3SL200 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.458	3.720	5.479	5.692	6.268	6.108	6.453	5.839	6.402	6.108	6.453	ns
		GCLK PLL	t _{co}	1.381	1.568	2.008	2.093	2.296	2.305	2.241	2.212	2.415	2.305	2.241	ns
	6mA	GCLK	t _{co}	3.451	3.708	5.470	5.684	6.260	6.100	6.445	5.838	6.395	6.100	6.445	ns
		GCLK PLL	t _{co}	1.371	1.556	1.999	2.085	2.288	2.297	2.233	2.204	2.415	2.297	2.233	ns
	8mA	GCLK	t _{co}	3.442	3.696	5.462	5.675	6.252	6.092	6.438	5.831	6.387	6.092	6.438	ns
		GCLK PLL	t _{co}	1.362	1.544	1.991	2.076	2.280	2.289	2.225	2.196	2.408	2.289	2.225	ns
	10mA	GCLK	t _{co}	3.445	3.698	5.464	5.678	6.255	6.095	6.442	5.834	6.390	6.095	6.442	ns
		GCLK PLL	t _{co}	1.365	1.546	1.993	2.079	2.283	2.292	2.228	2.199	2.411	2.292	2.228	ns
	12mA	GCLK	t _{co}	3.441	3.693	5.462	5.677	6.255	6.095	6.445	5.837	6.395	6.095	6.445	ns
		GCLK PLL	t _{co}	1.361	1.541	1.991	2.081	2.283	2.292	2.228	2.202	2.416	2.292	2.228	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.449	3.697	5.457	5.669	6.246	6.086	6.441	5.833	6.389	6.086	6.441	ns
		GCLK PLL	t _{co}	1.369	1.545	1.986	2.078	2.274	2.283	2.219	2.198	2.410	2.283	2.219	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.464	3.727	5.490	5.705	6.283	6.123	6.468	5.848	6.416	6.123	6.468	ns
		GCLK PLL	t _{co}	1.388	1.575	2.019	2.106	2.311	2.320	2.256	2.224	2.426	2.320	2.256	ns
	6mA	GCLK	t _{co}	3.458	3.717	5.486	5.701	6.279	6.119	6.464	5.850	6.413	6.119	6.464	ns
		GCLK PLL	t _{co}	1.378	1.565	2.015	2.102	2.307	2.316	2.252	2.221	2.429	2.316	2.252	ns
	8mA	GCLK	t _{co}	3.454	3.712	5.480	5.695	6.273	6.113	6.458	5.845	6.407	6.113	6.458	ns
		GCLK PLL	t _{co}	1.374	1.560	2.009	2.096	2.301	2.310	2.246	2.215	2.423	2.310	2.246	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.466	3.726	5.501	5.719	6.301	6.141	6.486	5.864	6.433	6.141	6.486	ns
		GCLK PLL	t _{co}	1.387	1.574	2.030	2.120	2.329	2.338	2.274	2.238	2.445	2.338	2.274	ns
	6mA	GCLK	t _{co}	3.457	3.714	5.490	5.707	6.289	6.129	6.474	5.855	6.422	6.129	6.474	ns
		GCLK PLL	t _{co}	1.377	1.562	2.019	2.108	2.317	2.326	2.262	2.227	2.436	2.326	2.262	ns
	8mA	GCLK	t _{co}	3.456	3.712	5.494	5.712	6.295	6.135	6.480	5.864	6.429	6.135	6.480	ns
		GCLK PLL	t _{co}	1.376	1.560	2.023	2.113	2.323	2.332	2.268	2.233	2.446	2.332	2.268	ns
3.0-V PCI	—	GCLK	t _{co}	3.569	3.829	5.537	5.731	6.305	6.146	6.519	5.903	6.453	6.146	6.519	ns
		GCLK PLL	t _{co}	1.489	1.665	2.054	2.132	2.315	2.328	2.267	2.268	2.474	2.328	2.267	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.569	3.829	5.537	5.731	6.305	6.146	6.519	5.903	6.453	6.146	6.519	ns
		GCLK PLL	t _{co}	1.489	1.665	2.054	2.132	2.315	2.328	2.267	2.268	2.474	2.328	2.267	ns

Table 1-87 through Table 1-90 show the maximum I/O timing parameters for EP3SL200 devices for differential I/O standards.

Table 1-87 specifies EP3SL200 column pins input timing parameters for differential I/O standards.

Table 1-87. EP3SL200 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC} = 1.1V$	$V_{CC} = 1.1V$	$V_{CC} = 1.1V$	$V_{CC} = 1.1V$	$V_{CC} = 0.9V$	$V_{CC} = 1.1V$	$V_{CC} = 1.1V$	$V_{CC} = 1.1V$	$V_{CC} = 0.9V$	
LVDS	GCLK	t_{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t_h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t_{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t_h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
MINI-LVDS	GCLK	t_{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t_h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t_{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t_h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
RSDS	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns

Table 1-87. EP3SL200 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t _h	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t _{su}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t _h	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t _h	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t _{su}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t _h	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns

Table 1-88 specifies EP3SL200 row pins input timing parameters for differential I/O standards.

Table 1-88. EP3SL200 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
LVDS	GCLK	t _{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t _H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t _{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t _H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
MINI-LVDS	GCLK	t _{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t _H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t _{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t _H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
RSDS	GCLK	t _{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t _H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t _{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t _H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{SU}	-1.137	-1.216	-1.849	-1.877	-2.030	-1.953	-2.400	-1.901	-2.052	-1.953	-2.400	ns
		t _H	1.274	1.369	2.088	2.122	2.297	2.206	2.656	2.156	2.330	2.206	2.656	ns
	GCLK PLL	t _{SU}	1.064	1.071	1.866	1.981	2.216	2.098	2.118	1.985	2.221	2.098	2.118	ns
		t _H	-0.783	-0.772	-1.384	-1.483	-1.663	-1.576	-1.581	-1.474	-1.654	-1.576	-1.581	ns
	GCLK	t _{SU}	-1.137	-1.216	-1.849	-1.877	-2.030	-1.953	-2.400	-1.901	-2.052	-1.953	-2.400	ns
		t _H	1.274	1.369	2.088	2.122	2.297	2.206	2.656	2.156	2.330	2.206	2.656	ns
	GCLK PLL	t _{SU}	1.064	1.071	1.866	1.981	2.216	2.098	2.118	1.985	2.221	2.098	2.118	ns
		t _H	-0.783	-0.772	-1.384	-1.483	-1.663	-1.576	-1.581	-1.474	-1.654	-1.576	-1.581	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
	GCLK	t _{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns

Table 1-88. EP3SL200 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{SU}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _H	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{SU}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _H	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
	GCLK	t _{SU}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _H	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{SU}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _H	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
	GCLK	t _{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{SU}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _H	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{SU}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _H	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
	GCLK	t _{SU}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _H	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{SU}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _H	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{SU}	-1.169	-1.249	-1.881	-1.908	-2.071	-1.995	-2.440	-1.928	-2.086	-1.995	-2.440	ns
		t _H	1.306	1.402	2.121	2.156	2.341	2.250	2.701	2.186	2.369	2.250	2.701	ns
	GCLK PLL	t _{SU}	1.032	1.038	1.829	1.945	2.171	2.052	2.073	1.954	2.182	2.052	2.073	ns
		t _H	-0.751	-0.739	-1.348	-1.445	-1.615	-1.528	-1.532	-1.440	-1.612	-1.528	-1.532	ns
	GCLK	t _{SU}	-1.169	-1.249	-1.881	-1.908	-2.071	-1.995	-2.440	-1.928	-2.086	-1.995	-2.440	ns
		t _H	1.306	1.402	2.121	2.156	2.341	2.250	2.701	2.186	2.369	2.250	2.701	ns
	GCLK PLL	t _{SU}	1.032	1.038	1.829	1.945	2.171	2.052	2.073	1.954	2.182	2.052	2.073	ns
		t _H	-0.751	-0.739	-1.348	-1.445	-1.615	-1.528	-1.532	-1.440	-1.612	-1.528	-1.532	ns

Table 1-89 specifies EP3SL200 Column Pins Output Timing parameters for differential I/O standards.

Table 1-89. EP3SL200 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
LVDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
RSDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
RSDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.487	3.763	5.551	5.764	6.326	6.163	6.570	5.908	6.469	6.163	6.570	ns
		GCLK PLL	t _{co}	1.401	1.595	2.063	2.151	2.366	2.375	2.326	2.268	2.485	2.375	2.326	ns
	6mA	GCLK	t _{co}	3.477	3.753	5.541	5.753	6.316	6.153	6.560	5.897	6.459	6.153	6.560	ns
		GCLK PLL	t _{co}	1.391	1.585	2.053	2.140	2.356	2.365	2.316	2.257	2.475	2.365	2.316	ns
	8mA	GCLK	t _{co}	3.477	3.753	5.544	5.757	6.320	6.157	6.564	5.902	6.464	6.157	6.564	ns
		GCLK PLL	t _{co}	1.391	1.585	2.056	2.144	2.360	2.369	2.320	2.262	2.480	2.369	2.320	ns
	10mA	GCLK	t _{co}	3.470	3.747	5.537	5.751	6.314	6.151	6.558	5.895	6.458	6.151	6.558	ns
		GCLK PLL	t _{co}	1.384	1.579	2.049	2.138	2.354	2.363	2.314	2.255	2.474	2.363	2.314	ns
	12mA	GCLK	t _{co}	3.469	3.745	5.534	5.748	6.311	6.148	6.555	5.892	6.454	6.148	6.555	ns
		GCLK PLL	t _{co}	1.383	1.577	2.046	2.135	2.351	2.360	2.311	2.252	2.470	2.360	2.311	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.491	3.767	5.555	5.768	6.330	6.167	6.574	5.912	6.474	6.167	6.574	ns
		GCLK PLL	t _{co}	1.405	1.599	2.067	2.155	2.370	2.379	2.330	2.272	2.490	2.379	2.330	ns

Table 1–89. EP3SL200 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.481	3.756	5.534	5.745	6.305	6.142	6.549	5.888	6.447	6.142	6.549	ns
		GCLK PLL	t _{co}	1.395	1.588	2.046	2.132	2.345	2.354	2.305	2.248	2.463	2.354	2.305	ns
	6mA	GCLK	t _{co}	3.476	3.752	5.534	5.745	6.306	6.143	6.550	5.889	6.449	6.143	6.550	ns
		GCLK PLL	t _{co}	1.390	1.584	2.046	2.132	2.346	2.355	2.306	2.249	2.465	2.355	2.306	ns
	8mA	GCLK	t _{co}	3.474	3.750	5.533	5.744	6.304	6.141	6.548	5.888	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.388	1.582	2.045	2.131	2.344	2.353	2.304	2.248	2.464	2.353	2.304	ns
	10mA	GCLK	t _{co}	3.466	3.741	5.523	5.734	6.295	6.132	6.539	5.878	6.438	6.132	6.539	ns
		GCLK PLL	t _{co}	1.380	1.573	2.035	2.121	2.335	2.344	2.295	2.238	2.454	2.344	2.295	ns
	12mA	GCLK	t _{co}	3.467	3.743	5.529	5.741	6.303	6.140	6.547	5.886	6.447	6.140	6.547	ns
		GCLK PLL	t _{co}	1.381	1.575	2.041	2.128	2.343	2.352	2.303	2.246	2.463	2.352	2.303	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.740	5.512	5.722	6.281	6.118	6.525	5.865	6.423	6.118	6.525	ns
		GCLK PLL	t _{co}	1.380	1.572	2.024	2.109	2.321	2.330	2.281	2.225	2.439	2.330	2.281	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.478	3.753	5.530	5.740	6.299	6.136	6.543	5.884	6.442	6.136	6.543	ns
		GCLK PLL	t _{co}	1.392	1.585	2.042	2.127	2.339	2.348	2.299	2.244	2.458	2.348	2.299	ns
	6mA	GCLK	t _{co}	3.474	3.750	5.531	5.742	6.303	6.140	6.547	5.886	6.446	6.140	6.547	ns
		GCLK PLL	t _{co}	1.388	1.582	2.043	2.129	2.343	2.352	2.303	2.246	2.462	2.352	2.303	ns
	8mA	GCLK	t _{co}	3.464	3.739	5.520	5.731	6.291	6.128	6.535	5.875	6.434	6.128	6.535	ns
		GCLK PLL	t _{co}	1.378	1.571	2.032	2.118	2.331	2.340	2.291	2.235	2.450	2.340	2.291	ns
	10mA	GCLK	t _{co}	3.462	3.737	5.518	5.728	6.289	6.126	6.533	5.873	6.432	6.126	6.533	ns
		GCLK PLL	t _{co}	1.376	1.569	2.030	2.115	2.329	2.338	2.289	2.233	2.448	2.338	2.289	ns
	12mA	GCLK	t _{co}	3.462	3.738	5.521	5.733	6.294	6.131	6.538	5.877	6.438	6.131	6.538	ns
		GCLK PLL	t _{co}	1.376	1.570	2.033	2.120	2.334	2.343	2.294	2.237	2.454	2.343	2.294	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.741	5.518	5.728	6.288	6.125	6.532	5.872	6.431	6.125	6.532	ns
		GCLK PLL	t _{co}	1.380	1.573	2.030	2.115	2.328	2.337	2.288	2.232	2.447	2.337	2.288	ns

Table 1-89. EP3SL200 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.492	3.770	5.563	5.776	6.338	6.175	6.582	5.920	6.481	6.175	6.582	ns
		GCLK PLL	t _{co}	1.406	1.602	2.075	2.163	2.378	2.387	2.338	2.280	2.497	2.387	2.338	ns
	6mA	GCLK	t _{co}	3.478	3.756	5.551	5.765	6.328	6.165	6.572	5.910	6.472	6.165	6.572	ns
		GCLK PLL	t _{co}	1.392	1.588	2.063	2.152	2.368	2.377	2.328	2.270	2.488	2.377	2.328	ns
	8mA	GCLK	t _{co}	3.466	3.743	5.534	5.747	6.310	6.147	6.554	5.892	6.454	6.147	6.554	ns
		GCLK PLL	t _{co}	1.380	1.575	2.046	2.134	2.350	2.359	2.310	2.252	2.470	2.359	2.310	ns
	10mA	GCLK	t _{co}	3.466	3.743	5.537	5.751	6.314	6.151	6.558	5.896	6.459	6.151	6.558	ns
		GCLK PLL	t _{co}	1.380	1.575	2.049	2.138	2.354	2.363	2.314	2.256	2.475	2.363	2.314	ns
	12mA	GCLK	t _{co}	3.462	3.739	5.530	5.743	6.307	6.144	6.551	5.889	6.451	6.144	6.551	ns
		GCLK PLL	t _{co}	1.376	1.571	2.042	2.130	2.347	2.356	2.307	2.249	2.467	2.356	2.307	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.466	3.741	5.523	5.734	6.295	6.132	6.539	5.878	6.438	6.132	6.539	ns
		GCLK PLL	t _{co}	1.380	1.573	2.035	2.121	2.335	2.344	2.295	2.238	2.454	2.344	2.295	ns
	16mA	GCLK	t _{co}	3.467	3.743	5.531	5.744	6.306	6.143	6.550	5.888	6.450	6.143	6.550	ns
		GCLK PLL	t _{co}	1.381	1.575	2.043	2.131	2.346	2.355	2.306	2.248	2.466	2.355	2.306	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.495	3.773	5.562	5.774	6.336	6.173	6.580	5.919	6.479	6.173	6.580	ns
		GCLK PLL	t _{co}	1.409	1.605	2.074	2.161	2.376	2.385	2.336	2.279	2.495	2.385	2.336	ns
	6mA	GCLK	t _{co}	3.484	3.761	5.550	5.762	6.324	6.161	6.568	5.907	6.467	6.161	6.568	ns
		GCLK PLL	t _{co}	1.398	1.593	2.062	2.149	2.364	2.373	2.324	2.267	2.483	2.373	2.324	ns
	8mA	GCLK	t _{co}	3.479	3.757	5.550	5.763	6.325	6.162	6.569	5.908	6.469	6.162	6.569	ns
		GCLK PLL	t _{co}	1.393	1.589	2.062	2.150	2.365	2.374	2.325	2.268	2.485	2.374	2.325	ns
	10mA	GCLK	t _{co}	3.465	3.742	5.532	5.744	6.306	6.143	6.550	5.889	6.451	6.143	6.550	ns
		GCLK PLL	t _{co}	1.379	1.574	2.044	2.131	2.346	2.355	2.306	2.249	2.467	2.355	2.306	ns
	12mA	GCLK	t _{co}	3.463	3.740	5.530	5.742	6.304	6.141	6.548	5.887	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.377	1.572	2.042	2.129	2.344	2.353	2.304	2.247	2.464	2.353	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.467	3.742	5.522	5.732	6.292	6.129	6.536	5.876	6.435	6.129	6.536	ns
		GCLK PLL	t _{co}	1.381	1.574	2.034	2.119	2.332	2.341	2.292	2.236	2.451	2.341	2.292	ns
	16mA	GCLK	t _{co}	3.467	3.743	5.530	5.742	6.304	6.141	6.548	5.887	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.381	1.575	2.042	2.129	2.344	2.353	2.304	2.247	2.464	2.353	2.304	ns

Table 1–89. EP3SL200 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.483	3.760	5.546	5.757	6.318	6.155	6.562	5.902	6.461	6.155	6.562	ns
		GCLK PLL	t _{co}	1.397	1.592	2.058	2.144	2.358	2.367	2.318	2.262	2.477	2.367	2.318	ns
	10mA	GCLK	t _{co}	3.483	3.760	5.546	5.757	6.318	6.155	6.562	5.902	6.461	6.155	6.562	ns
		GCLK PLL	t _{co}	1.397	1.592	2.058	2.144	2.358	2.367	2.318	2.262	2.477	2.367	2.318	ns
	12mA	GCLK	t _{co}	3.473	3.750	5.536	5.747	6.308	6.145	6.552	5.892	6.452	6.145	6.552	ns
		GCLK PLL	t _{co}	1.387	1.582	2.048	2.134	2.348	2.357	2.308	2.252	2.468	2.357	2.308	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.742	5.522	5.732	6.292	6.129	6.536	5.876	6.435	6.129	6.536	ns
		GCLK PLL	t _{co}	1.380	1.574	2.034	2.119	2.332	2.341	2.292	2.236	2.451	2.341	2.292	ns

Table 1-90 specifies EP3SL200 Row Pins Output Timing parameters for differential I/O standards.

Table 1-90. EP3SL200 Row Pins output Timing Parameters (Part 1 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	—	GCLK	t_{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t_{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns
LVDS_E_1R	—	GCLK	t_{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t_{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
LVDS_E_3R	—	GCLK	t_{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t_{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
MINI-LVDS	—	GCLK	t_{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t_{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t_{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t_{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
RSDS	—	GCLK	t_{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t_{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns
RSDS_E_1R	—	GCLK	t_{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t_{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
RSDS_E_3R	—	GCLK	t_{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t_{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.553	3.835	5.662	5.878	6.450	6.284	6.663	6.030	6.603	6.284	6.663	ns
		GCLK PLL	t_{co}	1.481	1.679	2.186	2.280	2.499	2.509	2.435	2.404	2.627	2.509	2.435	ns
	6mA	GCLK	t_{co}	3.539	3.821	5.649	5.865	6.437	6.271	6.650	6.016	6.590	6.271	6.650	ns
		GCLK PLL	t_{co}	1.467	1.665	2.173	2.267	2.486	2.496	2.422	2.390	2.614	2.496	2.422	ns
	8mA	GCLK	t_{co}	3.535	3.817	5.647	5.865	6.438	6.272	6.651	6.016	6.592	6.272	6.651	ns
		GCLK PLL	t_{co}	1.463	1.661	2.171	2.267	2.487	2.497	2.423	2.390	2.616	2.497	2.423	ns

Table 1–90. EP3SL200 Row Pins output Timing Parameters (Part 2 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.551	3.832	5.648	5.862	6.432	6.266	6.645	6.013	6.585	6.266	6.645	ns
		GCLK PLL	t _{co}	1.479	1.676	2.172	2.264	2.481	2.491	2.417	2.387	2.609	2.491	2.417	ns
	6mA	GCLK	t _{co}	3.540	3.822	5.644	5.858	6.429	6.263	6.642	6.010	6.582	6.263	6.642	ns
		GCLK PLL	t _{co}	1.468	1.666	2.168	2.260	2.478	2.488	2.414	2.384	2.606	2.488	2.414	ns
	8mA	GCLK	t _{co}	3.537	3.819	5.642	5.856	6.427	6.261	6.640	6.008	6.581	6.261	6.640	ns
		GCLK PLL	t _{co}	1.465	1.663	2.166	2.258	2.476	2.486	2.412	2.382	2.605	2.486	2.412	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.548	3.829	5.643	5.857	6.426	6.260	6.639	6.007	6.579	6.260	6.639	ns
		GCLK PLL	t _{co}	1.476	1.673	2.167	2.259	2.475	2.485	2.411	2.381	2.603	2.485	2.411	ns
	6mA	GCLK	t _{co}	3.538	3.820	5.641	5.855	6.425	6.259	6.638	6.007	6.579	6.259	6.638	ns
		GCLK PLL	t _{co}	1.466	1.664	2.165	2.257	2.474	2.484	2.410	2.381	2.603	2.484	2.410	ns
	8mA	GCLK	t _{co}	3.524	3.806	5.626	5.840	6.411	6.245	6.624	5.992	6.564	6.245	6.624	ns
		GCLK PLL	t _{co}	1.452	1.650	2.150	2.242	2.460	2.470	2.396	2.366	2.588	2.470	2.396	ns
	10mA	GCLK	t _{co}	3.521	3.802	5.622	5.836	6.407	6.241	6.620	5.988	6.560	6.241	6.620	ns
		GCLK PLL	t _{co}	1.449	1.646	2.146	2.238	2.456	2.466	2.392	2.362	2.584	2.466	2.392	ns
	12mA	GCLK	t _{co}	3.518	3.800	5.623	5.839	6.410	6.244	6.623	5.991	6.564	6.244	6.623	ns
		GCLK PLL	t _{co}	1.446	1.644	2.147	2.241	2.459	2.469	2.395	2.365	2.588	2.469	2.395	ns
	16mA	GCLK	t _{co}	3.519	3.800	5.613	5.827	6.397	6.231	6.610	5.978	6.550	6.231	6.610	ns
		GCLK PLL	t _{co}	1.447	1.644	2.137	2.229	2.446	2.456	2.382	2.352	2.574	2.456	2.382	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.568	3.853	5.684	5.900	6.473	6.307	6.686	6.052	6.626	6.307	6.686	ns
		GCLK PLL	t _{co}	1.496	1.697	2.208	2.302	2.522	2.532	2.458	2.426	2.650	2.532	2.458	ns
	6mA	GCLK	t _{co}	3.544	3.829	5.666	5.883	6.456	6.290	6.669	6.035	6.611	6.290	6.669	ns
		GCLK PLL	t _{co}	1.472	1.673	2.190	2.285	2.505	2.515	2.441	2.409	2.635	2.515	2.441	ns
	8mA	GCLK	t _{co}	3.526	3.810	5.644	5.861	6.434	6.268	6.647	6.013	6.589	6.268	6.647	ns
		GCLK PLL	t _{co}	1.454	1.654	2.168	2.263	2.483	2.493	2.419	2.387	2.613	2.493	2.419	ns

Table 1–90. EP3SL200 Row Pins output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.572	3.856	5.684	5.900	6.472	6.306	6.685	6.052	6.626	6.306	6.685	ns
		GCLK PLL	t _{co}	1.500	1.700	2.208	2.302	2.521	2.531	2.457	2.426	2.650	2.531	2.457	ns
	6mA	GCLK	t _{co}	3.557	3.841	5.670	5.885	6.457	6.291	6.670	6.037	6.611	6.291	6.670	ns
		GCLK PLL	t _{co}	1.485	1.685	2.194	2.287	2.506	2.516	2.442	2.411	2.635	2.516	2.442	ns
	8mA	GCLK	t _{co}	3.546	3.830	5.665	5.882	6.454	6.288	6.667	6.034	6.609	6.288	6.667	ns
		GCLK PLL	t _{co}	1.474	1.674	2.189	2.284	2.503	2.513	2.439	2.408	2.633	2.513	2.439	ns
	10mA	GCLK	t _{co}	3.526	3.810	5.642	5.858	6.431	6.265	6.644	6.011	6.585	6.265	6.644	ns
		GCLK PLL	t _{co}	1.454	1.654	2.166	2.260	2.480	2.490	2.416	2.385	2.609	2.490	2.416	ns
	12mA	GCLK	t _{co}	3.523	3.806	5.638	5.855	6.427	6.261	6.640	6.007	6.582	6.261	6.640	ns
		GCLK PLL	t _{co}	1.451	1.650	2.162	2.257	2.476	2.486	2.412	2.381	2.606	2.486	2.412	ns
	8mA	GCLK	t _{co}	3.528	3.810	5.629	5.843	6.413	6.247	6.626	5.994	6.566	6.247	6.626	ns
		GCLK PLL	t _{co}	1.456	1.654	2.153	2.245	2.462	2.472	2.398	2.368	2.590	2.472	2.398	ns
	16mA	GCLK	t _{co}	3.521	3.803	5.628	5.844	6.416	6.250	6.629	5.997	6.571	6.250	6.629	ns
		GCLK PLL	t _{co}	1.449	1.647	2.152	2.246	2.465	2.475	2.401	2.371	2.595	2.475	2.401	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.559	3.842	5.666	5.881	6.452	6.286	6.665	6.033	6.606	6.286	6.665	ns
		GCLK PLL	t _{co}	1.477	1.676	2.180	2.273	2.491	2.501	2.427	2.397	2.620	2.501	2.427	ns
	12mA	GCLK	t _{co}	3.541	3.825	5.651	5.866	6.437	6.271	6.650	6.018	6.591	6.271	6.650	ns
		GCLK PLL	t _{co}	1.459	1.659	2.165	2.258	2.476	2.486	2.412	2.382	2.605	2.486	2.412	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.527	3.809	5.628	5.842	6.412	6.246	6.625	5.994	6.566	6.246	6.625	ns
		GCLK PLL	t _{co}	1.445	1.643	2.142	2.234	2.451	2.461	2.387	2.358	2.580	2.461	2.387	ns

Table 1–91 and Table 1–92 show EP3SL200 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-91 specifies EP3SL200 Column Pin delay adders when using the regional clock.

Table 1-91. EP3SL200 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.204	0.235	0.378	0.378	0.403	0.392	0.509	0.387	0.411	0.392	0.509	ns
RCLK PLL input adder	0.036	0.046	0.078	0.078	-0.047	-0.038	-0.036	0.085	-0.046	-0.038	-0.036	ns
RCLK output adder	-0.211	-0.234	-0.332	-0.328	-0.34	-0.334	-0.464	-0.327	-0.339	-0.334	-0.464	ns
RCLK PLL output adder	1.904	1.965	3.193	3.323	3.688	3.496	3.804	3.351	3.716	3.496	3.804	ns

Table 1-92 specifies EP3SL200 Row Pin delay adders when using the regional clock.

Table 1-92. EP3SL200 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.272	0.301	0.446	0.424	0.473	0.46	0.547	0.454	0.481	0.46	0.547	ns
RCLK PLL input adder	0.14	0.149	0.226	0.216	0.235	0.226	0.306	0.232	0.254	0.226	0.306	ns
RCLK output adder	-0.278	-0.306	-0.418	-0.434	-0.486	-0.472	-0.592	-0.464	-0.493	-0.472	-0.592	ns
RCLK PLL output adder	-0.15	-0.15	-0.227	-0.233	-0.254	-0.243	-0.322	-0.243	-0.258	-0.243	-0.322	ns

EP3SL340 I/O Timing Parameters

Table 1-93 through Table 1-96 show the maximum I/O timing parameters for EP3SL340 devices for single-ended I/O standards.

Table 1-93 specifies EP3SL340 column pins input timing parameters for single-ended I/O standards.

Table 1-93. EP3SL340 Column Pins Input Timing Parameters (Part 1 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-1.469	-1.445	-2.196	-2.240	-2.531	-2.574	-2.974	-2.425	-2.680	-2.476	-3.011	ns
		t_h	1.600	1.594	2.424	2.477	2.791	2.819	3.231	2.670	2.949	2.735	3.269	ns
	GCLK PLL	t_{su}	0.630	0.633	1.173	1.252	1.305	1.231	1.218	1.246	1.315	1.198	1.271	ns
		t_h	-0.359	-0.343	-0.708	-0.768	-0.767	-0.728	-0.694	-0.751	-0.765	-0.680	-0.744	ns
3.3-V LVCMOS	GCLK	t_{su}	-1.469	-1.445	-2.196	-2.240	-2.531	-2.574	-2.974	-2.425	-2.680	-2.476	-3.011	ns
		t_h	1.600	1.594	2.424	2.477	2.791	2.819	3.231	2.670	2.949	2.735	3.269	ns
	GCLK PLL	t_{su}	0.630	0.633	1.173	1.252	1.305	1.231	1.218	1.246	1.315	1.198	1.271	ns
		t_h	-0.359	-0.343	-0.708	-0.768	-0.767	-0.728	-0.694	-0.751	-0.765	-0.680	-0.744	ns

Table 1-93. EP3SL340 Column Pins Input Timing Parameters (Part 2 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVTTL	GCLK	t _{su}	-1.475	-1.456	-2.195	-2.242	-2.530	-2.573	-2.973	-2.425	-2.685	-2.481	-3.016	ns
		t _h	1.606	1.605	2.423	2.479	2.790	2.818	3.230	2.670	2.954	2.740	3.274	ns
	GCLK PLL	t _{su}	0.624	0.622	1.174	1.250	1.306	1.232	1.219	1.246	1.310	1.193	1.266	ns
		t _h	-0.353	-0.332	-0.709	-0.766	-0.768	-0.729	-0.695	-0.751	-0.760	-0.675	-0.739	ns
3.0-V LVCMOS	GCLK	t _{su}	-1.475	-1.456	-2.195	-2.242	-2.530	-2.573	-2.973	-2.425	-2.685	-2.481	-3.016	ns
		t _h	1.606	1.605	2.423	2.479	2.790	2.818	3.230	2.670	2.954	2.740	3.274	ns
	GCLK PLL	t _{su}	0.624	0.622	1.174	1.250	1.306	1.232	1.219	1.246	1.310	1.193	1.266	ns
		t _h	-0.353	-0.332	-0.709	-0.766	-0.768	-0.729	-0.695	-0.751	-0.760	-0.675	-0.739	ns
2.5 V	GCLK	t _{su}	-1.465	-1.451	-2.204	-2.254	-2.549	-2.592	-2.992	-2.435	-2.696	-2.492	-3.027	ns
		t _h	1.596	1.600	2.432	2.491	2.809	2.837	3.249	2.680	2.965	2.751	3.285	ns
	GCLK PLL	t _{su}	0.634	0.627	1.165	1.238	1.287	1.213	1.200	1.236	1.299	1.182	1.255	ns
		t _h	-0.363	-0.337	-0.700	-0.754	-0.749	-0.710	-0.676	-0.741	-0.749	-0.664	-0.728	ns
1.8 V	GCLK	t _{su}	-1.483	-1.471	-2.244	-2.290	-2.547	-2.590	-2.990	-2.469	-2.699	-2.495	-3.030	ns
		t _h	1.616	1.622	2.472	2.527	2.807	2.835	3.247	2.714	2.968	2.754	3.288	ns
	GCLK PLL	t _{su}	0.616	0.605	1.125	1.202	1.289	1.215	1.202	1.202	1.296	1.179	1.252	ns
		t _h	-0.343	-0.313	-0.660	-0.718	-0.751	-0.712	-0.678	-0.707	-0.746	-0.661	-0.725	ns
1.5 V	GCLK	t _{su}	-1.476	-1.461	-2.221	-2.258	-2.477	-2.520	-2.920	-2.438	-2.633	-2.429	-2.964	ns
		t _h	1.609	1.612	2.449	2.495	2.737	2.765	3.177	2.683	2.902	2.688	3.222	ns
	GCLK PLL	t _{su}	0.623	0.615	1.148	1.234	1.359	1.285	1.272	1.233	1.362	1.245	1.318	ns
		t _h	-0.350	-0.323	-0.683	-0.750	-0.821	-0.782	-0.748	-0.738	-0.812	-0.727	-0.791	ns
1.2 V	GCLK	t _{su}	-1.416	-1.409	-2.144	-2.159	-2.321	-2.364	-2.764	-2.342	-2.480	-2.276	-2.811	ns
		t _h	1.549	1.560	2.372	2.396	2.581	2.609	3.021	2.587	2.749	2.535	3.069	ns
	GCLK PLL	t _{su}	0.683	0.667	1.225	1.333	1.515	1.441	1.428	1.329	1.515	1.398	1.471	ns
		t _h	-0.410	-0.375	-0.760	-0.849	-0.977	-0.938	-0.904	-0.834	-0.965	-0.880	-0.944	ns
SSTL-2 CLASS I	GCLK	t _{su}	-1.397	-1.380	-2.116	-2.143	-2.323	-2.366	-2.766	-2.321	-2.476	-2.272	-2.807	ns
		t _h	1.530	1.531	2.344	2.380	2.583	2.611	3.023	2.566	2.745	2.531	3.065	ns
	GCLK PLL	t _{su}	0.702	0.696	1.253	1.349	1.513	1.439	1.426	1.350	1.519	1.402	1.475	ns
		t _h	-0.429	-0.404	-0.788	-0.865	-0.975	-0.936	-0.902	-0.855	-0.969	-0.884	-0.948	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.397	-1.380	-2.116	-2.143	-2.323	-2.366	-2.766	-2.321	-2.476	-2.272	-2.807	ns
		t _h	1.530	1.531	2.344	2.380	2.583	2.611	3.023	2.566	2.745	2.531	3.065	ns
	GCLK PLL	t _{su}	0.702	0.696	1.253	1.349	1.513	1.439	1.426	1.350	1.519	1.402	1.475	ns
		t _h	-0.429	-0.404	-0.788	-0.865	-0.975	-0.936	-0.902	-0.855	-0.969	-0.884	-0.948	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.390	-1.374	-2.104	-2.138	-2.323	-2.361	-2.767	-2.314	-2.477	-2.274	-2.811	ns
		t _h	1.523	1.525	2.331	2.372	2.580	2.605	3.019	2.556	2.742	2.532	3.064	ns
	GCLK PLL	t _{su}	0.709	0.702	1.266	1.357	1.516	1.444	1.428	1.357	1.518	1.403	1.474	ns
		t _h	-0.436	-0.410	-0.801	-0.876	-0.981	-0.942	-0.909	-0.865	-0.972	-0.886	-0.952	ns

Table 1-93. EP3SL340 Column Pins Input Timing Parameters (Part 3 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	GCLK	t _{su}	-1.390	-1.374	-2.104	-2.138	-2.323	-2.361	-2.767	-2.314	-2.477	-2.274	-2.811	ns
		t _h	1.523	1.525	2.331	2.372	2.580	2.605	3.019	2.556	2.742	2.532	3.064	ns
	GCLK PLL	t _{su}	0.709	0.702	1.266	1.357	1.516	1.444	1.428	1.357	1.518	1.403	1.474	ns
		t _h	-0.436	-0.410	-0.801	-0.876	-0.981	-0.942	-0.909	-0.865	-0.972	-0.886	-0.952	ns
SSTL-15 CLASS I	GCLK	t _{su}	-1.378	-1.363	-2.095	-2.127	-2.304	-2.342	-2.748	-2.303	-2.459	-2.256	-2.793	ns
		t _h	1.511	1.514	2.322	2.361	2.561	2.586	3.000	2.545	2.724	2.514	3.046	ns
	GCLK PLL	t _{su}	0.721	0.713	1.277	1.368	1.535	1.463	1.447	1.368	1.536	1.421	1.492	ns
		t _h	-0.448	-0.421	-0.813	-0.887	-1.000	-0.961	-0.928	-0.876	-0.990	-0.904	-0.970	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.378	-1.363	-2.095	-2.127	-2.304	-2.342	-2.748	-2.303	-2.459	-2.256	-2.793	ns
		t _h	1.511	1.514	2.322	2.361	2.561	2.586	3.000	2.545	2.724	2.514	3.046	ns
	GCLK PLL	t _{su}	0.721	0.713	1.277	1.368	1.535	1.463	1.447	1.368	1.536	1.421	1.492	ns
		t _h	-0.448	-0.421	-0.813	-0.887	-1.000	-0.961	-0.928	-0.876	-0.990	-0.904	-0.970	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.390	-1.374	-2.104	-2.138	-2.323	-2.361	-2.767	-2.314	-2.477	-2.274	-2.811	ns
		t _h	1.523	1.525	2.331	2.372	2.580	2.605	3.019	2.556	2.742	2.532	3.064	ns
	GCLK PLL	t _{su}	0.709	0.702	1.266	1.357	1.516	1.444	1.428	1.357	1.518	1.403	1.474	ns
		t _h	-0.436	-0.410	-0.801	-0.876	-0.981	-0.942	-0.909	-0.865	-0.972	-0.886	-0.952	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.390	-1.374	-2.104	-2.138	-2.323	-2.361	-2.767	-2.314	-2.477	-2.274	-2.811	ns
		t _h	1.523	1.525	2.331	2.372	2.580	2.605	3.019	2.556	2.742	2.532	3.064	ns
	GCLK PLL	t _{su}	0.709	0.702	1.266	1.357	1.516	1.444	1.428	1.357	1.518	1.403	1.474	ns
		t _h	-0.436	-0.410	-0.801	-0.876	-0.981	-0.942	-0.909	-0.865	-0.972	-0.886	-0.952	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.378	-1.363	-2.095	-2.127	-2.304	-2.342	-2.748	-2.303	-2.459	-2.256	-2.793	ns
		t _h	1.511	1.514	2.322	2.361	2.561	2.586	3.000	2.545	2.724	2.514	3.046	ns
	GCLK PLL	t _{su}	0.721	0.713	1.277	1.368	1.535	1.463	1.447	1.368	1.536	1.421	1.492	ns
		t _h	-0.448	-0.421	-0.813	-0.887	-1.000	-0.961	-0.928	-0.876	-0.990	-0.904	-0.970	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.378	-1.363	-2.095	-2.127	-2.304	-2.342	-2.748	-2.303	-2.459	-2.256	-2.793	ns
		t _h	1.511	1.514	2.322	2.361	2.561	2.586	3.000	2.545	2.724	2.514	3.046	ns
	GCLK PLL	t _{su}	0.721	0.713	1.277	1.368	1.535	1.463	1.447	1.368	1.536	1.421	1.492	ns
		t _h	-0.448	-0.421	-0.813	-0.887	-1.000	-0.961	-0.928	-0.876	-0.990	-0.904	-0.970	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.370	-1.351	-2.085	-2.116	-2.288	-2.326	-2.732	-2.292	-2.444	-2.241	-2.778	ns
		t _h	1.503	1.502	2.312	2.350	2.545	2.570	2.984	2.534	2.709	2.499	3.031	ns
	GCLK PLL	t _{su}	0.729	0.725	1.287	1.379	1.551	1.479	1.463	1.379	1.551	1.436	1.507	ns
		t _h	-0.456	-0.433	-0.823	-0.898	-1.016	-0.977	-0.944	-0.887	-1.005	-0.919	-0.985	ns
3.0-V PCI	GCLK	t _{su}	-1.370	-1.351	-2.085	-2.116	-2.288	-2.326	-2.732	-2.292	-2.444	-2.241	-2.778	ns
		t _h	1.503	1.502	2.312	2.350	2.545	2.570	2.984	2.534	2.709	2.499	3.031	ns
	GCLK PLL	t _{su}	0.729	0.725	1.287	1.379	1.551	1.479	1.463	1.379	1.551	1.436	1.507	ns
		t _h	-0.456	-0.433	-0.823	-0.898	-1.016	-0.977	-0.944	-0.887	-1.005	-0.919	-0.985	ns

Table 1-93. EP3SL340 Column Pins Input Timing Parameters (Part 4 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V PCI-X	GCLK	t _{su}	-1.475	-1.456	-2.195	-2.242	-2.530	-2.573	-2.973	-2.425	-2.685	-2.481	-3.016	ns
		t _h	1.606	1.605	2.423	2.479	2.790	2.818	3.230	2.670	2.954	2.740	3.274	ns
	GCLK PLL	t _{su}	0.624	0.622	1.174	1.250	1.306	1.232	1.219	1.246	1.310	1.193	1.266	ns
		t _h	-0.353	-0.332	-0.709	-0.766	-0.768	-0.729	-0.695	-0.751	-0.760	-0.675	-0.739	ns

Table 1-94 specifies EP3SL340 row pins input timing parameters for single-ended I/O standards.

Table 1-94. EP3SL340 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-1.239	-1.296	-1.925	-1.956	-2.199	-2.135	-2.587	-1.973	-2.204	-2.142	-2.522	ns
		t _h	1.362	1.435	2.137	2.177	2.442	2.366	2.822	2.205	2.456	2.382	2.763	ns
	GCLK PLL	t _{su}	0.879	0.945	1.670	1.687	1.786	1.680	1.689	1.689	1.807	1.695	1.746	ns
		t _h	-0.615	-0.660	-1.216	-1.217	-1.263	-1.188	-1.178	-1.208	-1.273	-1.193	-1.231	ns
3.3-V LVCMOS	GCLK	t _{su}	-1.239	-1.296	-1.925	-1.956	-2.199	-2.135	-2.587	-1.973	-2.204	-2.142	-2.522	ns
		t _h	1.362	1.435	2.137	2.177	2.442	2.366	2.822	2.205	2.456	2.382	2.763	ns
	GCLK PLL	t _{su}	0.879	0.945	1.670	1.687	1.786	1.680	1.689	1.689	1.807	1.695	1.746	ns
		t _h	-0.615	-0.660	-1.216	-1.217	-1.263	-1.188	-1.178	-1.208	-1.273	-1.193	-1.231	ns
3.0-V LVTTTL	GCLK	t _{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t _h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t _{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t _h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns
3.0-V LVCMOS	GCLK	t _{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t _h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t _{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t _h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns
2.5 V	GCLK	t _{su}	-1.233	-1.300	-1.931	-1.970	-2.217	-2.153	-2.605	-1.981	-2.219	-2.157	-2.537	ns
		t _h	1.356	1.439	2.143	2.191	2.460	2.384	2.840	2.213	2.471	2.397	2.778	ns
	GCLK PLL	t _{su}	0.885	0.941	1.664	1.673	1.768	1.662	1.671	1.681	1.792	1.680	1.731	ns
		t _h	-0.621	-0.656	-1.210	-1.203	-1.245	-1.170	-1.160	-1.200	-1.258	-1.178	-1.216	ns
1.8 V	GCLK	t _{su}	-1.251	-1.343	-1.980	-1.995	-2.204	-2.138	-2.582	-2.003	-2.208	-2.153	-2.621	ns
		t _h	1.377	1.482	2.193	2.216	2.447	2.369	2.817	2.234	2.461	2.393	2.859	ns
	GCLK PLL	t _{su}	0.827	0.910	1.624	1.634	1.857	1.742	1.565	1.620	1.886	1.762	1.619	ns
		t _h	-0.562	-0.624	-1.170	-1.164	-1.330	-1.246	-1.060	-1.140	-1.347	-1.255	-1.107	ns

Table 1-94. EP3SL340 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.5 V	GCLK	t _{su}	-1.241	-1.332	-1.956	-1.963	-2.136	-2.070	-2.514	-1.972	-2.143	-2.088	-2.556	ns
		t _h	1.367	1.471	2.169	2.184	2.379	2.301	2.749	2.203	2.396	2.328	2.794	ns
	GCLK PLL	t _{su}	0.837	0.921	1.648	1.666	1.925	1.810	1.633	1.651	1.951	1.827	1.684	ns
		t _h	-0.572	-0.635	-1.194	-1.196	-1.398	-1.314	-1.128	-1.171	-1.412	-1.320	-1.172	ns
1.2 V	GCLK	t _{su}	-1.181	-1.279	-1.877	-1.862	-1.977	-1.911	-2.355	-1.876	-1.988	-1.933	-2.401	ns
		t _h	1.307	1.418	2.090	2.083	2.220	2.142	2.590	2.107	2.241	2.173	2.639	ns
	GCLK PLL	t _{su}	0.897	0.974	1.727	1.767	2.084	1.969	1.792	1.747	2.106	1.982	1.839	ns
		t _h	-0.632	-0.688	-1.273	-1.297	-1.557	-1.473	-1.287	-1.267	-1.567	-1.475	-1.327	ns
SSTL-2 CLASS I	GCLK	t _{su}	-1.176	-1.242	-1.845	-1.861	-1.997	-1.933	-2.385	-1.869	-2.002	-1.940	-2.320	ns
		t _h	1.300	1.382	2.057	2.082	2.240	2.164	2.620	2.101	2.254	2.180	2.561	ns
	GCLK PLL	t _{su}	0.942	1.000	1.750	1.782	1.988	1.882	1.891	1.793	2.009	1.897	1.948	ns
		t _h	-0.677	-0.714	-1.296	-1.312	-1.465	-1.390	-1.380	-1.312	-1.475	-1.395	-1.433	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.176	-1.242	-1.845	-1.861	-1.997	-1.933	-2.385	-1.869	-2.002	-1.940	-2.320	ns
		t _h	1.300	1.382	2.057	2.082	2.240	2.164	2.620	2.101	2.254	2.180	2.561	ns
	GCLK PLL	t _{su}	0.942	1.000	1.750	1.782	1.988	1.882	1.891	1.793	2.009	1.897	1.948	ns
		t _h	-0.677	-0.714	-1.296	-1.312	-1.465	-1.390	-1.380	-1.312	-1.475	-1.395	-1.433	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t _h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t _{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t _h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
SSTL-18 CLASS II	GCLK	t _{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t _h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t _{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t _h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
SSTL-15 CLASS I	GCLK	t _{su}	-1.141	-1.232	-1.824	-1.825	-1.954	-1.887	-2.333	-1.833	-1.964	-1.908	-2.377	ns
		t _h	1.267	1.371	2.038	2.044	2.195	2.117	2.564	2.062	2.214	2.147	2.611	ns
	GCLK PLL	t _{su}	0.937	1.021	1.778	1.804	2.104	1.990	1.814	1.790	2.127	2.005	1.863	ns
		t _h	-0.672	-0.735	-1.323	-1.336	-1.580	-1.496	-1.313	-1.312	-1.591	-1.499	-1.355	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t _h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t _{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t _h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t _h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t _{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t _h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns

Table 1-94. EP3SL340 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.141	-1.232	-1.824	-1.825	-1.954	-1.887	-2.333	-1.833	-1.964	-1.908	-2.377	ns
		t _h	1.267	1.371	2.038	2.044	2.195	2.117	2.564	2.062	2.214	2.147	2.611	ns
	GCLK PLL	t _{su}	0.937	1.021	1.778	1.804	2.104	1.990	1.814	1.790	2.127	2.005	1.863	ns
		t _h	-0.672	-0.735	-1.323	-1.336	-1.580	-1.496	-1.313	-1.312	-1.591	-1.499	-1.355	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.141	-1.232	-1.824	-1.825	-1.954	-1.887	-2.333	-1.833	-1.964	-1.908	-2.377	ns
		t _h	1.267	1.371	2.038	2.044	2.195	2.117	2.564	2.062	2.214	2.147	2.611	ns
	GCLK PLL	t _{su}	0.937	1.021	1.778	1.804	2.104	1.990	1.814	1.790	2.127	2.005	1.863	ns
		t _h	-0.672	-0.735	-1.323	-1.336	-1.580	-1.496	-1.313	-1.312	-1.591	-1.499	-1.355	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.132	-1.220	-1.815	-1.815	-1.938	-1.871	-2.317	-1.824	-1.948	-1.892	-2.361	ns
		t _h	1.258	1.359	2.029	2.034	2.179	2.101	2.548	2.053	2.198	2.131	2.595	ns
	GCLK PLL	t _{su}	0.946	1.033	1.787	1.814	2.120	2.006	1.830	1.799	2.143	2.021	1.879	ns
		t _h	-0.681	-0.747	-1.332	-1.346	-1.596	-1.512	-1.329	-1.321	-1.607	-1.515	-1.371	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.132	-1.220	-1.815	-1.815	-1.938	-1.871	-2.317	-1.824	-1.948	-1.892	-2.361	ns
		t _h	1.258	1.359	2.029	2.034	2.179	2.101	2.548	2.053	2.198	2.131	2.595	ns
	GCLK PLL	t _{su}	0.946	1.033	1.787	1.814	2.120	2.006	1.830	1.799	2.143	2.021	1.879	ns
		t _h	-0.681	-0.747	-1.332	-1.346	-1.596	-1.512	-1.329	-1.321	-1.607	-1.515	-1.371	ns
3.0-V PCI	GCLK	t _{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t _h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t _{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t _h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns
3.0-V PCI-X	GCLK	t _{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t _h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t _{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t _h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns

Table 1–95 specifies EP3SL340 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–95. EP3SL340 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	4mA	GCLK	t_{co}	3.593	3.920	5.689	5.892	6.444	6.307	6.698	5.998	6.612	6.451	6.779	ns
		GCLK PLL	t_{co}	1.692	1.892	2.426	2.517	2.749	2.744	2.731	2.634	2.865	2.862	2.726	ns
	8mA	GCLK	t_{co}	3.514	3.831	5.585	5.780	6.327	6.190	6.581	5.882	6.492	6.331	6.659	ns
		GCLK PLL	t_{co}	1.613	1.803	2.322	2.405	2.632	2.627	2.614	2.518	2.745	2.742	2.606	ns
	12mA	GCLK	t_{co}	3.484	3.799	5.518	5.710	6.257	6.120	6.511	5.812	6.425	6.264	6.592	ns
		GCLK PLL	t_{co}	1.583	1.771	2.255	2.335	2.562	2.557	2.544	2.448	2.678	2.674	2.539	ns
	16mA	GCLK	t_{co}	3.470	3.785	5.497	5.687	6.229	6.092	6.483	5.786	6.391	6.231	6.559	ns
		GCLK PLL	t_{co}	1.569	1.757	2.234	2.312	2.534	2.529	2.516	2.422	2.644	2.640	2.505	ns
3.3-V LVCMOS	4mA	GCLK	t_{co}	3.530	3.853	5.616	5.809	6.356	6.219	6.610	5.912	6.524	6.363	6.691	ns
		GCLK PLL	t_{co}	1.629	1.825	2.353	2.434	2.661	2.657	2.643	2.548	2.777	2.774	2.638	ns
	8mA	GCLK	t_{co}	3.459	3.776	5.494	5.683	6.225	6.088	6.479	5.782	6.387	6.226	6.554	ns
		GCLK PLL	t_{co}	1.558	1.748	2.231	2.308	2.530	2.525	2.512	2.418	2.640	2.636	2.501	ns
	12mA	GCLK	t_{co}	3.435	3.748	5.465	5.656	6.200	6.063	6.454	5.755	6.362	6.201	6.529	ns
		GCLK PLL	t_{co}	1.534	1.720	2.202	2.281	2.505	2.499	2.487	2.391	2.615	2.610	2.476	ns
	16mA	GCLK	t_{co}	3.428	3.741	5.457	5.647	6.191	6.054	6.445	5.745	6.352	6.192	6.520	ns
		GCLK PLL	t_{co}	1.527	1.713	2.194	2.272	2.496	2.490	2.478	2.381	2.605	2.600	2.466	ns
3.0-V LVTTTL	4mA	GCLK	t_{co}	3.590	3.929	5.723	5.928	6.483	6.346	6.737	6.036	6.654	6.493	6.821	ns
		GCLK PLL	t_{co}	1.689	1.901	2.460	2.553	2.788	2.803	2.770	2.672	2.907	2.903	2.768	ns
	8mA	GCLK	t_{co}	3.523	3.844	5.619	5.816	6.367	6.230	6.621	5.922	6.535	6.375	6.703	ns
		GCLK PLL	t_{co}	1.622	1.816	2.356	2.441	2.672	2.709	2.654	2.558	2.788	2.785	2.649	ns
	12mA	GCLK	t_{co}	3.485	3.807	5.551	5.745	6.293	6.156	6.547	5.848	6.459	6.299	6.627	ns
		GCLK PLL	t_{co}	1.584	1.779	2.288	2.370	2.598	2.645	2.580	2.484	2.712	2.708	2.573	ns
	16mA	GCLK	t_{co}	3.463	3.780	5.516	5.706	6.251	6.114	6.505	5.808	6.416	6.255	6.583	ns
		GCLK PLL	t_{co}	1.562	1.752	2.253	2.331	2.556	2.622	2.538	2.444	2.669	2.665	2.530	ns

Table 1-95. EP3SL340 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.545	3.869	5.653	5.850	6.402	6.265	6.656	5.956	6.572	6.411	6.739	ns
		GCLK PLL	t _{co}	1.644	1.841	2.390	2.475	2.707	2.745	2.689	2.592	2.825	2.821	2.686	ns
	8mA	GCLK	t _{co}	3.472	3.790	5.529	5.721	6.267	6.130	6.521	5.823	6.432	6.272	6.600	ns
		GCLK PLL	t _{co}	1.571	1.762	2.266	2.346	2.572	2.635	2.554	2.459	2.685	2.681	2.546	ns
	12mA	GCLK	t _{co}	3.448	3.761	5.490	5.681	6.226	6.089	6.480	5.783	6.391	6.230	6.558	ns
		GCLK PLL	t _{co}	1.547	1.733	2.227	2.306	2.531	2.601	2.513	2.419	2.644	2.640	2.505	ns
	16mA	GCLK	t _{co}	3.448	3.761	5.482	5.672	6.216	6.079	6.470	5.772	6.379	6.218	6.546	ns
		GCLK PLL	t _{co}	1.547	1.733	2.219	2.297	2.521	2.609	2.503	2.408	2.632	2.627	2.493	ns
2.5 V	4mA	GCLK	t _{co}	3.649	3.984	5.860	6.077	6.649	6.512	6.903	6.189	6.827	6.666	6.994	ns
		GCLK PLL	t _{co}	1.748	1.956	2.597	2.702	2.954	2.953	2.936	2.825	3.080	3.075	2.941	ns
	8mA	GCLK	t _{co}	3.566	3.891	5.741	5.951	6.517	6.380	6.771	6.061	6.691	6.530	6.858	ns
		GCLK PLL	t _{co}	1.665	1.863	2.478	2.576	2.822	2.829	2.804	2.697	2.944	2.940	2.805	ns
	12mA	GCLK	t _{co}	3.510	3.847	5.649	5.855	6.417	6.280	6.671	5.963	6.589	6.428	6.756	ns
		GCLK PLL	t _{co}	1.609	1.819	2.386	2.480	2.722	2.751	2.704	2.599	2.842	2.838	2.703	ns
	16mA	GCLK	t _{co}	3.477	3.801	5.615	5.818	6.376	6.239	6.630	5.923	6.545	6.384	6.712	ns
		GCLK PLL	t _{co}	1.576	1.773	2.352	2.443	2.681	2.694	2.663	2.559	2.798	2.794	2.659	ns

Table 1–95. EP3SL340 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.763	4.112	6.054	6.286	6.867	6.730	7.121	6.407	7.053	6.892	7.220	ns
		GCLK PLL	t _{co}	1.862	2.084	2.791	2.911	3.172	3.171	3.154	3.043	3.306	3.303	3.167	ns
	4mA	GCLK	t _{co}	3.665	4.001	5.902	6.128	6.706	6.569	6.960	6.248	6.887	6.726	7.054	ns
		GCLK PLL	t _{co}	1.764	1.973	2.639	2.753	3.011	3.019	2.993	2.884	3.140	3.137	3.001	ns
	6mA	GCLK	t _{co}	3.583	3.914	5.775	5.990	6.562	6.425	6.816	6.104	6.739	6.579	6.907	ns
		GCLK PLL	t _{co}	1.682	1.886	2.512	2.615	2.867	2.878	2.849	2.740	2.992	2.988	2.853	ns
	8mA	GCLK	t _{co}	3.557	3.881	5.715	5.924	6.487	6.350	6.741	6.033	6.659	6.498	6.826	ns
		GCLK PLL	t _{co}	1.656	1.853	2.452	2.549	2.792	2.799	2.774	2.669	2.912	2.908	2.773	ns
	10mA	GCLK	t _{co}	3.486	3.817	5.627	5.830	6.388	6.251	6.642	5.936	6.558	6.397	6.725	ns
		GCLK PLL	t _{co}	1.585	1.789	2.364	2.455	2.693	2.717	2.675	2.572	2.811	2.807	2.672	ns
	12mA	GCLK	t _{co}	3.481	3.807	5.621	5.824	6.381	6.244	6.635	5.929	6.551	6.390	6.718	ns
		GCLK PLL	t _{co}	1.580	1.779	2.358	2.449	2.686	2.711	2.668	2.565	2.804	2.800	2.665	ns
1.5 V	2mA	GCLK	t _{co}	3.703	4.079	5.993	6.213	6.795	6.658	7.049	6.337	6.986	6.825	7.153	ns
		GCLK PLL	t _{co}	1.802	2.051	2.730	2.838	3.100	3.110	3.082	2.973	3.239	3.236	3.100	ns
	4mA	GCLK	t _{co}	3.572	3.898	5.749	5.959	6.524	6.387	6.778	6.069	6.699	6.539	6.867	ns
		GCLK PLL	t _{co}	1.671	1.870	2.486	2.584	2.829	2.841	2.811	2.705	2.952	2.948	2.813	ns
	6mA	GCLK	t _{co}	3.527	3.861	5.669	5.879	6.444	6.307	6.698	5.989	6.616	6.456	6.784	ns
		GCLK PLL	t _{co}	1.626	1.833	2.406	2.504	2.749	2.779	2.731	2.625	2.869	2.865	2.730	ns
	8mA	GCLK	t _{co}	3.516	3.855	5.663	5.871	6.435	6.298	6.689	5.982	6.609	6.448	6.776	ns
		GCLK PLL	t _{co}	1.615	1.827	2.400	2.496	2.740	2.772	2.722	2.618	2.862	2.857	2.723	ns
	10mA	GCLK	t _{co}	3.481	3.804	5.615	5.818	6.374	6.237	6.628	5.923	6.544	6.383	6.711	ns
		GCLK PLL	t _{co}	1.580	1.776	2.352	2.443	2.679	2.713	2.661	2.559	2.797	2.793	2.658	ns
	12mA	GCLK	t _{co}	3.477	3.797	5.594	5.797	6.354	6.217	6.608	5.902	6.522	6.362	6.690	ns
		GCLK PLL	t _{co}	1.576	1.769	2.331	2.422	2.659	2.710	2.641	2.538	2.775	2.771	2.636	ns

Table 1-95. EP3SL340 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.683	4.022	5.947	6.167	6.738	6.601	6.992	6.284	6.920	6.759	7.087	ns
		GCLK PLL	t _{co}	1.782	1.994	2.684	2.792	3.043	3.056	3.025	2.920	3.173	3.171	3.034	ns
	4mA	GCLK	t _{co}	3.560	3.887	5.728	5.936	6.498	6.361	6.752	6.045	6.671	6.511	6.839	ns
		GCLK PLL	t _{co}	1.659	1.859	2.465	2.561	2.803	2.832	2.785	2.681	2.924	2.920	2.785	ns
	6mA	GCLK	t _{co}	3.507	3.846	5.652	5.859	6.424	6.287	6.678	5.970	6.599	6.438	6.766	ns
		GCLK PLL	t _{co}	1.606	1.818	2.389	2.484	2.729	2.778	2.711	2.606	2.852	2.847	2.713	ns
	8mA	GCLK	t _{co}	3.487	3.812	5.613	5.816	6.374	6.237	6.628	5.921	6.542	6.381	6.709	ns
		GCLK PLL	t _{co}	1.586	1.784	2.350	2.441	2.679	2.743	2.661	2.557	2.795	2.791	2.656	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.500	3.820	5.621	5.824	6.382	6.245	6.636	5.926	6.547	6.386	6.714	ns
		GCLK PLL	t _{co}	1.599	1.792	2.358	2.449	2.687	2.735	2.669	2.562	2.800	2.795	2.661	ns
	10mA	GCLK	t _{co}	3.503	3.823	5.625	5.828	6.386	6.249	6.640	5.930	6.551	6.390	6.718	ns
		GCLK PLL	t _{co}	1.602	1.795	2.362	2.453	2.691	2.741	2.673	2.566	2.804	2.799	2.665	ns
	12mA	GCLK	t _{co}	3.485	3.803	5.603	5.806	6.364	6.227	6.618	5.909	6.529	6.368	6.696	ns
		GCLK PLL	t _{co}	1.584	1.775	2.340	2.431	2.669	2.714	2.651	2.545	2.782	2.777	2.643	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.480	3.796	5.588	5.790	6.347	6.210	6.601	5.892	6.511	6.351	6.679	ns
		GCLK PLL	t _{co}	1.579	1.768	2.325	2.415	2.652	2.712	2.634	2.528	2.764	2.759	2.625	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.518	3.840	5.644	5.847	6.405	6.268	6.659	5.950	6.571	6.410	6.738	ns
		GCLK PLL	t _{co}	1.617	1.812	2.381	2.472	2.710	2.765	2.692	2.586	2.824	2.818	2.685	ns
	6mA	GCLK	t _{co}	3.499	3.819	5.622	5.825	6.383	6.246	6.637	5.928	6.548	6.387	6.715	ns
		GCLK PLL	t _{co}	1.598	1.791	2.359	2.450	2.688	2.741	2.670	2.564	2.801	2.796	2.662	ns
	8mA	GCLK	t _{co}	3.500	3.822	5.630	5.834	6.393	6.256	6.647	5.938	6.559	6.398	6.726	ns
		GCLK PLL	t _{co}	1.599	1.794	2.367	2.459	2.698	2.761	2.680	2.574	2.812	2.807	2.673	ns
	10mA	GCLK	t _{co}	3.483	3.802	5.605	5.809	6.368	6.231	6.622	5.912	6.533	6.373	6.701	ns
		GCLK PLL	t _{co}	1.582	1.774	2.342	2.434	2.673	2.736	2.655	2.548	2.786	2.782	2.647	ns
	12mA	GCLK	t _{co}	3.480	3.798	5.601	5.805	6.363	6.226	6.617	5.908	6.529	6.369	6.697	ns
		GCLK PLL	t _{co}	1.579	1.770	2.338	2.430	2.668	2.731	2.650	2.544	2.782	2.778	2.643	ns

Table 1-95. EP3SL340 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.480	3.797	5.589	5.790	6.347	6.210	6.601	5.893	6.512	6.351	6.679	ns
		GCLK PLL	t _{co}	1.579	1.769	2.326	2.415	2.652	2.716	2.634	2.529	2.765	2.760	2.626	ns
	16mA	GCLK	t _{co}	3.479	3.797	5.597	5.800	6.359	6.222	6.613	5.903	6.525	6.364	6.692	ns
		GCLK PLL	t _{co}	1.578	1.769	2.334	2.425	2.664	2.723	2.646	2.539	2.778	2.773	2.639	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.510	3.831	5.637	5.840	6.397	6.260	6.651	5.943	6.563	6.402	6.730	ns
		GCLK PLL	t _{co}	1.609	1.803	2.374	2.465	2.702	2.758	2.684	2.579	2.816	2.811	2.677	ns
	6mA	GCLK	t _{co}	3.495	3.815	5.623	5.827	6.385	6.248	6.639	5.930	6.552	6.391	6.719	ns
		GCLK PLL	t _{co}	1.594	1.787	2.360	2.452	2.690	2.754	2.672	2.566	2.805	2.800	2.666	ns
	8mA	GCLK	t _{co}	3.482	3.800	5.603	5.806	6.365	6.228	6.619	5.910	6.531	6.370	6.698	ns
		GCLK PLL	t _{co}	1.581	1.772	2.340	2.431	2.670	2.736	2.652	2.546	2.784	2.779	2.645	ns
	10mA	GCLK	t _{co}	3.482	3.801	5.604	5.808	6.368	6.231	6.622	5.912	6.534	6.373	6.701	ns
		GCLK PLL	t _{co}	1.581	1.773	2.341	2.433	2.673	2.747	2.655	2.548	2.787	2.782	2.648	ns
	12mA	GCLK	t _{co}	3.478	3.796	5.597	5.801	6.360	6.223	6.614	5.904	6.526	6.365	6.693	ns
		GCLK PLL	t _{co}	1.577	1.768	2.334	2.426	2.665	2.739	2.647	2.540	2.779	2.774	2.640	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.496	3.813	5.605	5.806	6.362	6.225	6.616	5.908	6.527	6.366	6.694	ns
		GCLK PLL	t _{co}	1.595	1.785	2.342	2.431	2.667	2.727	2.649	2.544	2.780	2.775	2.641	ns
	16mA	GCLK	t _{co}	3.495	3.813	5.609	5.811	6.368	6.231	6.622	5.913	6.533	6.372	6.700	ns
		GCLK PLL	t _{co}	1.594	1.785	2.346	2.436	2.673	2.745	2.655	2.549	2.786	2.781	2.647	ns

Table 1-95. EP3SL340 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.482	3.799	5.593	5.795	6.352	6.215	6.606	5.897	6.517	6.356	6.684	ns
		GCLK PLL	t _{co}	1.581	1.771	2.330	2.420	2.657	2.727	2.639	2.533	2.770	2.765	2.631	ns
	6mA	GCLK	t _{co}	3.477	3.794	5.587	5.789	6.346	6.209	6.600	5.891	6.511	6.350	6.678	ns
		GCLK PLL	t _{co}	1.576	1.766	2.324	2.414	2.651	2.716	2.633	2.527	2.764	2.759	2.625	ns
	8mA	GCLK	t _{co}	3.479	3.797	5.592	5.794	6.352	6.215	6.606	5.897	6.517	6.357	6.685	ns
		GCLK PLL	t _{co}	1.578	1.769	2.329	2.419	2.657	2.737	2.639	2.533	2.770	2.765	2.631	ns
	10mA	GCLK	t _{co}	3.478	3.795	5.585	5.787	6.344	6.207	6.598	5.889	6.508	6.348	6.676	ns
		GCLK PLL	t _{co}	1.577	1.767	2.322	2.412	2.649	2.718	2.631	2.525	2.761	2.756	2.622	ns
	12mA	GCLK	t _{co}	3.497	3.814	5.607	5.808	6.365	6.228	6.619	5.911	6.529	6.369	6.697	ns
		GCLK PLL	t _{co}	1.596	1.786	2.344	2.433	2.670	2.732	2.652	2.547	2.782	2.777	2.643	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.492	3.810	5.605	5.807	6.364	6.227	6.618	5.910	6.529	6.368	6.696	ns
		GCLK PLL	t _{co}	1.591	1.782	2.342	2.432	2.669	2.739	2.651	2.546	2.782	2.777	2.643	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.491	3.809	5.606	5.808	6.365	6.228	6.619	5.911	6.530	6.369	6.697	ns
		GCLK PLL	t _{co}	1.590	1.781	2.343	2.433	2.670	2.740	2.652	2.547	2.783	2.778	2.644	ns
	6mA	GCLK	t _{co}	3.482	3.799	5.593	5.796	6.353	6.216	6.607	5.898	6.518	6.357	6.685	ns
		GCLK PLL	t _{co}	1.581	1.771	2.330	2.421	2.658	2.727	2.640	2.534	2.771	2.766	2.632	ns
	8mA	GCLK	t _{co}	3.483	3.801	5.599	5.802	6.361	6.224	6.615	5.905	6.526	6.366	6.694	ns
		GCLK PLL	t _{co}	1.582	1.773	2.336	2.427	2.666	2.742	2.648	2.541	2.779	2.774	2.640	ns
	10mA	GCLK	t _{co}	3.505	3.826	5.627	5.829	6.387	6.250	6.641	5.933	6.553	6.393	6.721	ns
		GCLK PLL	t _{co}	1.604	1.798	2.364	2.454	2.692	2.760	2.674	2.569	2.806	2.801	2.667	ns
	12mA	GCLK	t _{co}	3.495	3.814	5.615	5.818	6.376	6.239	6.630	5.921	6.542	6.381	6.709	ns
		GCLK PLL	t _{co}	1.594	1.786	2.352	2.443	2.681	2.750	2.663	2.557	2.795	2.790	2.656	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.493	3.812	5.613	5.816	6.374	6.237	6.628	5.920	6.541	6.380	6.708	ns
		GCLK PLL	t _{co}	1.592	1.784	2.350	2.441	2.679	2.755	2.661	2.556	2.794	2.789	2.655	ns

Table 1-95. EP3SL340 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.491	3.810	5.612	5.816	6.374	6.237	6.628	5.919	6.541	6.380	6.708	ns
		GCLK PLL	t_{co}	1.590	1.782	2.349	2.441	2.679	2.757	2.661	2.555	2.794	2.788	2.655	ns
	6mA	GCLK	t_{co}	3.487	3.806	5.605	5.809	6.367	6.230	6.621	5.912	6.533	6.373	6.701	ns
		GCLK PLL	t_{co}	1.586	1.778	2.342	2.434	2.672	2.748	2.654	2.548	2.786	2.781	2.647	ns
	8mA	GCLK	t_{co}	3.564	3.881	5.623	5.817	6.364	6.227	6.618	5.920	6.531	6.370	6.698	ns
		GCLK PLL	t_{co}	1.663	1.853	2.360	2.442	2.669	2.724	2.651	2.556	2.784	2.780	2.645	ns
	10mA	GCLK	t_{co}	3.564	3.881	5.623	5.817	6.364	6.227	6.618	5.920	6.531	6.370	6.698	ns
		GCLK PLL	t_{co}	1.663	1.853	2.360	2.442	2.669	2.724	2.651	2.556	2.784	2.780	2.645	ns
	12mA	GCLK	t_{co}	3.593	3.920	5.689	5.892	6.444	6.307	6.698	5.998	6.612	6.451	6.779	ns
		GCLK PLL	t_{co}	1.692	1.892	2.426	2.517	2.749	2.744	2.731	2.634	2.865	2.862	2.726	ns
1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.514	3.831	5.585	5.780	6.327	6.190	6.581	5.882	6.492	6.331	6.659	ns
		GCLK PLL	t_{co}	1.613	1.803	2.322	2.405	2.632	2.627	2.614	2.518	2.745	2.742	2.606	ns
3.0-V PCI	—	GCLK	t_{co}	3.484	3.799	5.518	5.710	6.257	6.120	6.511	5.812	6.425	6.264	6.592	ns
		GCLK PLL	t_{co}	1.583	1.771	2.255	2.335	2.562	2.557	2.544	2.448	2.678	2.674	2.539	ns
3.0-V PCI-X	—	GCLK	t_{co}	3.470	3.785	5.497	5.687	6.229	6.092	6.483	5.786	6.391	6.231	6.559	ns
		GCLK PLL	t_{co}	1.569	1.757	2.234	2.312	2.534	2.529	2.516	2.422	2.644	2.640	2.505	ns

Table 1-96 specifies EP3SL340 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1-96. EP3SL340 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.479	3.781	5.469	5.657	6.238	6.095	6.481	5.741	6.370	6.120	6.565	ns
		GCLK PLL	t _{co}	1.562	1.782	2.243	2.285	2.559	2.570	2.578	2.386	2.666	2.671	2.594	ns
	8mA	GCLK	t _{co}	3.413	3.681	5.339	5.519	6.093	5.950	6.336	5.628	6.221	6.005	6.416	ns
		GCLK PLL	t _{co}	1.496	1.677	2.113	2.174	2.414	2.425	2.433	2.273	2.517	2.522	2.445	ns
	12mA	GCLK	t _{co}	3.334	3.592	5.220	5.398	5.965	5.822	6.208	5.529	6.089	5.905	6.284	ns
		GCLK PLL	t _{co}	1.417	1.575	1.994	2.074	2.286	2.297	2.305	2.174	2.385	2.390	2.313	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.481	3.785	5.477	5.662	6.242	6.099	6.485	5.749	6.374	6.132	6.569	ns
		GCLK PLL	t _{co}	1.564	1.786	2.251	2.291	2.563	2.574	2.582	2.394	2.670	2.675	2.598	ns
	8mA	GCLK	t _{co}	3.338	3.596	5.226	5.413	5.971	5.828	6.214	5.541	6.096	5.914	6.291	ns
		GCLK PLL	t _{co}	1.421	1.579	2.000	2.089	2.292	2.303	2.311	2.186	2.392	2.397	2.320	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.440	3.727	5.421	5.610	6.194	6.051	6.437	5.709	6.328	6.086	6.523	ns
		GCLK PLL	t _{co}	1.523	1.728	2.195	2.254	2.515	2.526	2.534	2.354	2.624	2.629	2.552	ns
	8mA	GCLK	t _{co}	3.339	3.601	5.269	5.451	6.030	5.887	6.273	5.567	6.164	5.940	6.358	ns
		GCLK PLL	t _{co}	1.422	1.601	2.043	2.112	2.351	2.362	2.370	2.212	2.460	2.464	2.387	ns
	12mA	GCLK	t _{co}	3.302	3.563	5.188	5.371	5.942	5.799	6.185	5.499	6.071	5.867	6.265	ns
		GCLK PLL	t _{co}	1.385	1.550	1.961	2.047	2.263	2.274	2.282	2.144	2.367	2.371	2.294	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.361	3.646	5.316	5.503	6.084	5.941	6.327	5.600	6.217	5.976	6.411	ns
		GCLK PLL	t _{co}	1.444	1.647	2.090	2.147	2.405	2.416	2.424	2.245	2.513	2.517	2.440	ns
	8mA	GCLK	t _{co}	3.289	3.547	5.161	5.342	5.903	5.760	6.146	5.469	6.031	5.838	6.225	ns
		GCLK PLL	t _{co}	1.372	1.530	1.926	2.018	2.224	2.235	2.243	2.114	2.327	2.331	2.254	ns
2.5 V	4mA	GCLK	t _{co}	3.466	3.763	5.554	5.764	6.366	6.223	6.609	5.841	6.507	6.238	6.701	ns
		GCLK PLL	t _{co}	1.549	1.764	2.328	2.380	2.687	2.698	2.706	2.486	2.803	2.807	2.730	ns
	8mA	GCLK	t _{co}	3.381	3.665	5.399	5.601	6.196	6.053	6.439	5.704	6.333	6.093	6.527	ns
		GCLK PLL	t _{co}	1.464	1.666	2.173	2.245	2.517	2.528	2.536	2.349	2.629	2.633	2.556	ns
	12mA	GCLK	t _{co}	3.324	3.603	5.288	5.483	6.070	5.927	6.313	5.615	6.203	5.999	6.397	ns
		GCLK PLL	t _{co}	1.407	1.589	2.062	2.159	2.391	2.402	2.410	2.260	2.499	2.503	2.426	ns

Table 1-96. EP3SL340 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.692	3.942	5.817	6.193	6.841	6.698	7.084	6.248	6.991	6.682	7.186	ns
		GCLK PLL	t _{co}	1.785	1.925	2.574	2.860	3.162	3.173	3.192	2.985	3.287	3.292	3.203	ns
	4mA	GCLK	t _{co}	3.519	3.756	5.527	5.824	6.436	6.293	6.679	5.922	6.585	6.320	6.779	ns
		GCLK PLL	t _{co}	1.562	1.739	2.284	2.491	2.757	2.768	2.787	2.620	2.881	2.885	2.796	ns
	6mA	GCLK	t _{co}	3.444	3.674	5.427	5.674	6.277	6.134	6.520	5.808	6.412	6.215	6.607	ns
		GCLK PLL	t _{co}	1.495	1.657	2.184	2.341	2.598	2.609	2.628	2.452	2.708	2.713	2.624	ns
	8mA	GCLK	t _{co}	3.426	3.654	5.370	5.595	6.180	6.037	6.423	5.752	6.318	6.143	6.513	ns
		GCLK PLL	t _{co}	1.469	1.637	2.127	2.259	2.501	2.512	2.531	2.361	2.614	2.619	2.530	ns
1.5 V	2mA	GCLK	t _{co}	3.634	3.885	5.745	6.106	6.769	6.626	7.012	6.169	6.915	6.617	7.110	ns
		GCLK PLL	t _{co}	1.696	1.868	2.502	2.773	3.090	3.101	3.120	2.892	3.211	3.216	3.127	ns
	4mA	GCLK	t _{co}	3.442	3.671	5.423	5.669	6.278	6.135	6.521	5.805	6.411	6.216	6.606	ns
		GCLK PLL	t _{co}	1.485	1.654	2.180	2.336	2.599	2.610	2.629	2.446	2.707	2.712	2.623	ns
	6mA	GCLK	t _{co}	3.415	3.645	5.355	5.587	6.172	6.029	6.415	5.745	6.306	6.143	6.501	ns
		GCLK PLL	t _{co}	1.458	1.628	2.112	2.251	2.493	2.504	2.523	2.354	2.602	2.607	2.518	ns
	8mA	GCLK	t _{co}	3.396	3.634	5.338	5.562	6.153	6.010	6.396	5.721	6.284	6.124	6.479	ns
		GCLK PLL	t _{co}	1.439	1.617	2.095	2.226	2.474	2.485	2.504	2.330	2.580	2.585	2.496	ns
1.2 V	2mA	GCLK	t _{co}	3.564	3.798	5.666	6.020	6.694	6.551	6.937	6.100	6.831	6.548	7.026	ns
		GCLK PLL	t _{co}	1.639	1.781	2.423	2.687	3.015	3.026	3.045	2.804	3.127	3.132	3.043	ns
	4mA	GCLK	t _{co}	3.447	3.675	5.440	5.697	6.319	6.176	6.562	5.834	6.453	6.260	6.648	ns
		GCLK PLL	t _{co}	1.490	1.658	2.197	2.364	2.640	2.651	2.670	2.471	2.749	2.754	2.665	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.328	3.591	5.278	5.474	6.038	5.895	6.281	5.602	6.165	5.985	6.360	ns
		GCLK PLL	t _{co}	1.411	1.575	2.039	2.150	2.359	2.370	2.378	2.247	2.461	2.466	2.389	ns
	12mA	GCLK	t _{co}	3.323	3.587	5.275	5.472	6.030	5.887	6.273	5.601	6.158	5.984	6.353	ns
		GCLK PLL	t _{co}	1.406	1.570	2.032	2.148	2.351	2.362	2.370	2.246	2.454	2.459	2.382	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.314	3.576	5.260	5.456	6.003	5.860	6.246	5.584	6.131	5.966	6.326	ns
		GCLK PLL	t _{co}	1.397	1.559	2.017	2.132	2.324	2.335	2.343	2.229	2.427	2.432	2.355	ns

Table 1-96. EP3SL340 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.375	3.598	5.289	5.499	6.054	5.911	6.297	5.651	6.181	6.034	6.376	ns
		GCLK PLL	t _{co}	1.418	1.581	2.046	2.163	2.375	2.386	2.405	2.260	2.477	2.482	2.393	ns
	6mA	GCLK	t _{co}	3.370	3.593	5.287	5.498	6.052	5.909	6.295	5.649	6.179	6.032	6.374	ns
		GCLK PLL	t _{co}	1.413	1.576	2.044	2.162	2.373	2.384	2.403	2.258	2.475	2.480	2.391	ns
	8mA	GCLK	t _{co}	3.359	3.582	5.277	5.488	6.035	5.895	6.278	5.640	6.163	6.023	6.358	ns
		GCLK PLL	t _{co}	1.402	1.565	2.034	2.152	2.356	2.367	2.386	2.249	2.459	2.464	2.375	ns
	10mA	GCLK	t _{co}	3.348	3.571	5.264	5.475	6.020	5.882	6.263	5.628	6.148	6.011	6.343	ns
		GCLK PLL	t _{co}	1.391	1.554	2.021	2.139	2.341	2.352	2.371	2.237	2.444	2.449	2.360	ns
	12mA	GCLK	t _{co}	3.348	3.570	5.264	5.475	6.019	5.882	6.262	5.627	6.147	6.011	6.342	ns
		GCLK PLL	t _{co}	1.391	1.553	2.021	2.139	2.340	2.351	2.370	2.236	2.443	2.448	2.359	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.356	3.577	5.263	5.472	6.013	5.877	6.256	5.623	6.140	6.005	6.335	ns
		GCLK PLL	t _{co}	1.399	1.560	2.020	2.136	2.334	2.345	2.364	2.232	2.436	2.441	2.352	ns
	16mA	GCLK	t _{co}	3.357	3.580	5.269	5.480	6.015	5.887	6.258	5.632	6.144	6.016	6.339	ns
		GCLK PLL	t _{co}	1.400	1.563	2.026	2.144	2.336	2.347	2.366	2.241	2.440	2.445	2.356	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.378	3.601	5.298	5.510	6.071	5.928	6.314	5.661	6.197	6.046	6.392	ns
		GCLK PLL	t _{co}	1.421	1.584	2.055	2.174	2.392	2.403	2.422	2.270	2.493	2.498	2.409	ns
	6mA	GCLK	t _{co}	3.364	3.587	5.287	5.500	6.054	5.911	6.297	5.652	6.181	6.037	6.376	ns
		GCLK PLL	t _{co}	1.407	1.570	2.044	2.164	2.375	2.386	2.405	2.261	2.477	2.482	2.393	ns
	8mA	GCLK	t _{co}	3.353	3.575	5.274	5.487	6.036	5.896	6.279	5.639	6.164	6.024	6.359	ns
		GCLK PLL	t _{co}	1.396	1.558	2.031	2.151	2.357	2.368	2.387	2.248	2.460	2.465	2.376	ns

Table 1-96. EP3SL340 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.363	3.583	5.262	5.470	6.016	5.875	6.259	5.622	6.143	6.002	6.338	ns
		GCLK PLL	t _{co}	1.406	1.566	2.019	2.134	2.337	2.348	2.367	2.231	2.439	2.444	2.355	ns
	6mA	GCLK	t _{co}	3.356	3.577	5.260	5.469	6.008	5.874	6.251	5.621	6.136	6.002	6.331	ns
		GCLK PLL	t _{co}	1.399	1.560	2.017	2.133	2.329	2.340	2.359	2.230	2.432	2.437	2.348	ns
	8mA	GCLK	t _{co}	3.347	3.569	5.253	5.462	6.000	5.867	6.243	5.614	6.128	5.995	6.323	ns
		GCLK PLL	t _{co}	1.390	1.552	2.010	2.126	2.321	2.332	2.351	2.223	2.424	2.429	2.340	ns
	10mA	GCLK	t _{co}	3.350	3.571	5.256	5.465	6.003	5.871	6.246	5.617	6.131	5.998	6.326	ns
		GCLK PLL	t _{co}	1.393	1.554	2.013	2.129	2.324	2.335	2.354	2.226	2.427	2.432	2.343	ns
	12mA	GCLK	t _{co}	3.346	3.568	5.258	5.468	6.003	5.874	6.246	5.620	6.132	6.003	6.327	ns
		GCLK PLL	t _{co}	1.389	1.551	2.015	2.132	2.324	2.335	2.354	2.229	2.428	2.433	2.344	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.354	3.576	5.256	5.465	5.994	5.870	6.237	5.616	6.121	5.997	6.316	ns
		GCLK PLL	t _{co}	1.397	1.559	2.013	2.129	2.315	2.326	2.345	2.225	2.417	2.422	2.333	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.369	3.589	5.271	5.480	6.031	5.888	6.274	5.631	6.157	6.013	6.352	ns
		GCLK PLL	t _{co}	1.412	1.572	2.028	2.144	2.352	2.363	2.382	2.240	2.453	2.458	2.369	ns
	6mA	GCLK	t _{co}	3.363	3.584	5.272	5.482	6.027	5.888	6.270	5.633	6.154	6.016	6.349	ns
		GCLK PLL	t _{co}	1.406	1.567	2.029	2.146	2.348	2.359	2.378	2.242	2.450	2.455	2.366	ns
	8mA	GCLK	t _{co}	3.359	3.580	5.267	5.477	6.021	5.883	6.264	5.628	6.148	6.010	6.343	ns
		GCLK PLL	t _{co}	1.402	1.563	2.024	2.141	2.342	2.353	2.372	2.237	2.444	2.449	2.360	ns
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.371	3.591	5.284	5.496	6.049	5.906	6.292	5.647	6.174	6.032	6.369	ns
		GCLK PLL	t _{co}	1.414	1.574	2.041	2.160	2.370	2.381	2.400	2.256	2.470	2.475	2.386	ns
	6mA	GCLK	t _{co}	3.362	3.583	5.275	5.487	6.037	5.896	6.280	5.638	6.163	6.023	6.358	ns
		GCLK PLL	t _{co}	1.405	1.566	2.032	2.151	2.358	2.369	2.388	2.247	2.459	2.464	2.375	ns
	8mA	GCLK	t _{co}	3.361	3.583	5.282	5.495	6.043	5.905	6.286	5.647	6.170	6.033	6.365	ns
		GCLK PLL	t _{co}	1.404	1.566	2.039	2.159	2.364	2.375	2.394	2.256	2.466	2.471	2.382	ns
3.0-V PCI	—	GCLK	t _{co}	3.434	3.697	5.330	5.520	6.047	5.904	6.299	5.650	6.177	6.027	6.372	ns
		GCLK PLL	t _{co}	1.517	1.680	2.087	2.196	2.378	2.386	2.387	2.295	2.482	2.493	2.401	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.434	3.697	5.330	5.520	6.047	5.904	6.299	5.650	6.177	6.027	6.372	ns
		GCLK PLL	t _{co}	1.517	1.680	2.087	2.196	2.378	2.386	2.387	2.295	2.482	2.493	2.401	ns

Table 1-97 through Table 1-100 show the maximum I/O timing parameters for EP3SL340 devices for differential I/O standards.

Table 1-97 specifies EP3SL340 column pins input timing parameters for differential I/O standards.

Table 1-97. EP3SL340 Column Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	
LVDS	GCLK	t_{su}	-1.278	-1.335	-1.674	-1.607	-1.788	-1.721	-2.204	-1.580	-2.013	-1.689	-2.242	ns
		t_h	1.414	1.489	1.926	1.873	2.080	2.002	2.485	1.857	2.327	1.981	2.527	ns
	GCLK PLL	t_{su}	0.857	0.885	1.872	2.050	2.211	2.107	1.975	2.104	2.409	2.165	2.031	ns
		t_h	-0.582	-0.589	-1.382	-1.537	-1.640	-1.565	-1.423	-1.579	-1.804	-1.612	-1.474	ns
MINI-LVDS	GCLK	t_{su}	-1.278	-1.335	-1.674	-1.607	-1.788	-1.721	-2.204	-1.580	-2.013	-1.689	-2.242	ns
		t_h	1.414	1.489	1.926	1.873	2.080	2.002	2.485	1.857	2.327	1.981	2.527	ns
	GCLK PLL	t_{su}	0.857	0.885	1.872	2.050	2.211	2.107	1.975	2.104	2.409	2.165	2.031	ns
		t_h	-0.582	-0.589	-1.382	-1.537	-1.640	-1.565	-1.423	-1.579	-1.804	-1.612	-1.474	ns
RSDS	GCLK	t_{su}	-1.278	-1.335	-1.674	-1.607	-1.788	-1.721	-2.204	-1.580	-2.013	-1.689	-2.242	ns
		t_h	1.414	1.489	1.926	1.873	2.080	2.002	2.485	1.857	2.327	1.981	2.527	ns
	GCLK PLL	t_{su}	0.857	0.885	1.872	2.050	2.211	2.107	1.975	2.104	2.409	2.165	2.031	ns
		t_h	-0.582	-0.589	-1.382	-1.537	-1.640	-1.565	-1.423	-1.579	-1.804	-1.612	-1.474	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{su}	-1.094	-1.158	-1.787	-1.806	-1.947	-1.875	-2.353	-1.815	-1.953	-1.887	-2.396	ns
		t_h	1.223	1.304	2.006	2.032	2.193	2.110	2.589	2.050	2.208	2.131	2.636	ns
	GCLK PLL	t_{su}	1.041	1.062	1.759	1.851	2.052	1.953	1.826	1.869	2.073	1.967	1.877	ns
		t_h	-0.773	-0.774	-1.302	-1.378	-1.527	-1.457	-1.319	-1.386	-1.537	-1.462	-1.365	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{su}	-1.094	-1.158	-1.787	-1.806	-1.947	-1.875	-2.353	-1.815	-1.953	-1.887	-2.396	ns
		t_h	1.223	1.304	2.006	2.032	2.193	2.110	2.589	2.050	2.208	2.131	2.636	ns
	GCLK PLL	t_{su}	1.041	1.062	1.759	1.851	2.052	1.953	1.826	1.869	2.073	1.967	1.877	ns
		t_h	-0.773	-0.774	-1.302	-1.378	-1.527	-1.457	-1.319	-1.386	-1.537	-1.462	-1.365	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-1.102	-1.170	-1.797	-1.817	-1.963	-1.891	-2.369	-1.826	-1.968	-1.902	-2.411	ns
		t_h	1.231	1.316	2.016	2.043	2.209	2.126	2.605	2.061	2.223	2.146	2.651	ns
	GCLK PLL	t_{su}	1.033	1.050	1.749	1.840	2.036	1.937	1.810	1.858	2.058	1.952	1.862	ns
		t_h	-0.765	-0.762	-1.292	-1.367	-1.511	-1.441	-1.303	-1.375	-1.522	-1.447	-1.350	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-1.102	-1.170	-1.797	-1.817	-1.963	-1.891	-2.369	-1.826	-1.968	-1.902	-2.411	ns
		t_h	1.231	1.316	2.016	2.043	2.209	2.126	2.605	2.061	2.223	2.146	2.651	ns
	GCLK PLL	t_{su}	1.033	1.050	1.749	1.840	2.036	1.937	1.810	1.858	2.058	1.952	1.862	ns
		t_h	-0.765	-0.762	-1.292	-1.367	-1.511	-1.441	-1.303	-1.375	-1.522	-1.447	-1.350	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-1.114	-1.181	-1.806	-1.828	-1.982	-1.910	-2.388	-1.837	-1.986	-1.920	-2.429	ns
		t_h	1.243	1.327	2.025	2.054	2.228	2.145	2.624	2.072	2.241	2.164	2.669	ns
	GCLK PLL	t_{su}	1.021	1.039	1.740	1.829	2.017	1.918	1.791	1.847	2.040	1.934	1.844	ns
		t_h	-0.753	-0.751	-1.283	-1.356	-1.492	-1.422	-1.284	-1.364	-1.504	-1.429	-1.332	ns

Table 1-97. EP3SL340 Column Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-1.114	-1.181	-1.806	-1.828	-1.982	-1.910	-2.388	-1.837	-1.986	-1.920	-2.429	ns
		t _h	1.243	1.327	2.025	2.054	2.228	2.145	2.624	2.072	2.241	2.164	2.669	ns
	GCLK PLL	t _{su}	1.021	1.039	1.740	1.829	2.017	1.918	1.791	1.847	2.040	1.934	1.844	ns
		t _h	-0.753	-0.751	-1.283	-1.356	-1.492	-1.422	-1.284	-1.364	-1.504	-1.429	-1.332	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-1.102	-1.170	-1.797	-1.817	-1.963	-1.891	-2.369	-1.826	-1.968	-1.902	-2.411	ns
		t _h	1.231	1.316	2.016	2.043	2.209	2.126	2.605	2.061	2.223	2.146	2.651	ns
	GCLK PLL	t _{su}	1.033	1.050	1.749	1.840	2.036	1.937	1.810	1.858	2.058	1.952	1.862	ns
		t _h	-0.765	-0.762	-1.292	-1.367	-1.511	-1.441	-1.303	-1.375	-1.522	-1.447	-1.350	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-1.102	-1.170	-1.797	-1.817	-1.963	-1.891	-2.369	-1.826	-1.968	-1.902	-2.411	ns
		t _h	1.231	1.316	2.016	2.043	2.209	2.126	2.605	2.061	2.223	2.146	2.651	ns
	GCLK PLL	t _{su}	1.033	1.050	1.749	1.840	2.036	1.937	1.810	1.858	2.058	1.952	1.862	ns
		t _h	-0.765	-0.762	-1.292	-1.367	-1.511	-1.441	-1.303	-1.375	-1.522	-1.447	-1.350	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-1.114	-1.181	-1.806	-1.828	-1.982	-1.910	-2.388	-1.837	-1.986	-1.920	-2.429	ns
		t _h	1.243	1.327	2.025	2.054	2.228	2.145	2.624	2.072	2.241	2.164	2.669	ns
	GCLK PLL	t _{su}	1.021	1.039	1.740	1.829	2.017	1.918	1.791	1.847	2.040	1.934	1.844	ns
		t _h	-0.753	-0.751	-1.283	-1.356	-1.492	-1.422	-1.284	-1.364	-1.504	-1.429	-1.332	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-1.114	-1.181	-1.806	-1.828	-1.982	-1.910	-2.388	-1.837	-1.986	-1.920	-2.429	ns
		t _h	1.243	1.327	2.025	2.054	2.228	2.145	2.624	2.072	2.241	2.164	2.669	ns
	GCLK PLL	t _{su}	1.021	1.039	1.740	1.829	2.017	1.918	1.791	1.847	2.040	1.934	1.844	ns
		t _h	-0.753	-0.751	-1.283	-1.356	-1.492	-1.422	-1.284	-1.364	-1.504	-1.429	-1.332	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-1.121	-1.187	-1.818	-1.833	-1.982	-1.912	-2.387	-1.841	-1.981	-1.918	-2.425	ns
		t _h	1.250	1.333	2.038	2.062	2.231	2.148	2.628	2.079	2.241	2.163	2.670	ns
	GCLK PLL	t _{su}	1.014	1.033	1.728	1.824	2.017	1.916	1.792	1.843	2.045	1.936	1.848	ns
		t _h	-0.746	-0.745	-1.270	-1.348	-1.489	-1.419	-1.280	-1.357	-1.504	-1.430	-1.331	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-1.121	-1.187	-1.818	-1.833	-1.982	-1.912	-2.387	-1.841	-1.981	-1.918	-2.425	ns
		t _h	1.250	1.333	2.038	2.062	2.231	2.148	2.628	2.079	2.241	2.163	2.670	ns
	GCLK PLL	t _{su}	1.014	1.033	1.728	1.824	2.017	1.916	1.792	1.843	2.045	1.936	1.848	ns
		t _h	-0.746	-0.745	-1.270	-1.348	-1.489	-1.419	-1.280	-1.357	-1.504	-1.430	-1.331	ns

Table 1-98 specifies EP3SL340 row pins input timing parameters for differential I/O standards.

Table 1-98. EP3SL340 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 1.1V$	$V_{CC1} = 0.9V$	
LVDS	GCLK	t_{su}	-1.246	-1.308	-1.577	-1.488	-1.656	-1.595	-2.046	-1.456	-1.615	-1.558	-2.087	ns
		t_h	1.380	1.458	1.832	1.758	1.950	1.878	2.332	1.738	1.920	1.853	2.374	ns
	GCLK PLL	t_{su}	0.822	0.846	1.911	2.121	2.309	2.193	2.091	2.181	2.377	2.260	2.149	ns
		t_h	-0.548	-0.552	-1.422	-1.604	-1.736	-1.650	-1.536	-1.651	-1.790	-1.702	-1.588	ns
MINI-LVDS	GCLK	t_{su}	-1.246	-1.308	-1.577	-1.488	-1.656	-1.595	-2.046	-1.456	-1.615	-1.558	-2.087	ns
		t_h	1.380	1.458	1.832	1.758	1.950	1.878	2.332	1.738	1.920	1.853	2.374	ns
	GCLK PLL	t_{su}	0.822	0.846	1.911	2.121	2.309	2.193	2.091	2.181	2.377	2.260	2.149	ns
		t_h	-0.548	-0.552	-1.422	-1.604	-1.736	-1.650	-1.536	-1.651	-1.790	-1.702	-1.588	ns
RSDS	GCLK	t_{su}	-1.246	-1.308	-1.577	-1.488	-1.656	-1.595	-2.046	-1.456	-1.615	-1.558	-2.087	ns
		t_h	1.380	1.458	1.832	1.758	1.950	1.878	2.332	1.738	1.920	1.853	2.374	ns
	GCLK PLL	t_{su}	0.822	0.846	1.911	2.121	2.309	2.193	2.091	2.181	2.377	2.260	2.149	ns
		t_h	-0.548	-0.552	-1.422	-1.604	-1.736	-1.650	-1.536	-1.651	-1.790	-1.702	-1.588	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{su}	-1.051	-1.123	-1.707	-1.717	-1.845	-1.779	-2.225	-1.727	-1.852	-1.790	-2.271	ns
		t_h	1.178	1.264	1.926	1.941	2.090	2.013	2.462	1.960	2.105	2.033	2.509	ns
	GCLK PLL	t_{su}	1.007	1.021	1.776	1.887	2.110	1.999	1.902	1.904	2.130	2.018	1.955	ns
		t_h	-0.740	-0.736	-1.321	-1.415	-1.586	-1.505	-1.396	-1.423	-1.595	-1.512	-1.443	ns
	GCLK	t_{su}	-1.051	-1.123	-1.707	-1.717	-1.845	-1.779	-2.225	-1.727	-1.852	-1.790	-2.271	ns
		t_h	1.178	1.264	1.926	1.941	2.090	2.013	2.462	1.960	2.105	2.033	2.509	ns
	GCLK PLL	t_{su}	1.007	1.021	1.776	1.887	2.110	1.999	1.902	1.904	2.130	2.018	1.955	ns
		t_h	-0.740	-0.736	-1.321	-1.415	-1.586	-1.505	-1.396	-1.423	-1.595	-1.512	-1.443	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_h	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{su}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_h	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
	GCLK	t_{su}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_h	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{su}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_h	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_h	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{su}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_h	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns

Table 1-98. EP3SL340 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t_{SU}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_H	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{SU}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_H	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t_{SU}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_H	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{SU}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_H	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t_{SU}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_H	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{SU}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_H	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t_{SU}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_H	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{SU}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_H	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t_{SU}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_H	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{SU}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_H	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t_{SU}	-1.083	-1.156	-1.739	-1.748	-1.886	-1.821	-2.265	-1.754	-1.886	-1.826	-2.306	ns
		t_H	1.210	1.297	1.959	1.975	2.134	2.057	2.507	1.990	2.144	2.071	2.549	ns
	GCLK PLL	t_{SU}	0.985	0.998	1.749	1.861	2.075	1.963	1.867	1.883	2.101	1.987	1.925	ns
		t_H	-0.718	-0.713	-1.295	-1.387	-1.548	-1.467	-1.357	-1.399	-1.563	-1.480	-1.409	ns
	GCLK	t_{SU}	-1.083	-1.156	-1.739	-1.748	-1.886	-1.821	-2.265	-1.754	-1.886	-1.826	-2.306	ns
		t_H	1.210	1.297	1.959	1.975	2.134	2.057	2.507	1.990	2.144	2.071	2.549	ns
	GCLK PLL	t_{SU}	0.985	0.998	1.749	1.861	2.075	1.963	1.867	1.883	2.101	1.987	1.925	ns
		t_H	-0.718	-0.713	-1.295	-1.387	-1.548	-1.467	-1.357	-1.399	-1.563	-1.480	-1.409	ns

Table 1-99 specifies EP3SL340 Column Pins Output Timing parameters for differential I/O standards.

Table 1-99. EP3SL340 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.438	3.700	5.415	5.607	6.143	5.991	6.399	5.739	6.274	6.122	6.475	ns
		GCLK PLL	t _{co}	1.427	1.606	2.089	2.181	2.406	2.407	2.475	2.287	2.511	2.514	2.459	ns
LVDS_E_3R	—	GCLK	t _{co}	3.434	3.703	5.462	5.662	6.205	6.053	6.461	5.798	6.340	6.188	6.541	ns
		GCLK PLL	t _{co}	1.423	1.609	2.136	2.236	2.468	2.469	2.537	2.346	2.577	2.580	2.525	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.438	3.700	5.415	5.607	6.143	5.991	6.399	5.739	6.274	6.122	6.475	ns
		GCLK PLL	t _{co}	1.427	1.606	2.089	2.181	2.406	2.407	2.475	2.287	2.511	2.514	2.459	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.434	3.703	5.462	5.662	6.205	6.053	6.461	5.798	6.340	6.188	6.541	ns
		GCLK PLL	t _{co}	1.423	1.609	2.136	2.236	2.468	2.469	2.537	2.346	2.577	2.580	2.525	ns
RSDS_E_1R	—	GCLK	t _{co}	3.438	3.700	5.415	5.607	6.143	5.991	6.399	5.739	6.274	6.122	6.475	ns
		GCLK PLL	t _{co}	1.427	1.606	2.089	2.181	2.406	2.407	2.475	2.287	2.511	2.514	2.459	ns
RSDS_E_3R	—	GCLK	t _{co}	3.434	3.703	5.462	5.662	6.205	6.053	6.461	5.798	6.340	6.188	6.541	ns
		GCLK PLL	t _{co}	1.423	1.609	2.136	2.236	2.468	2.469	2.537	2.346	2.577	2.580	2.525	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.465	3.733	5.486	5.685	6.227	6.075	6.483	5.819	6.360	6.208	6.561	ns
		GCLK PLL	t _{co}	1.454	1.639	2.160	2.259	2.490	2.491	2.559	2.367	2.597	2.600	2.545	ns
	6mA	GCLK	t _{co}	3.455	3.723	5.476	5.674	6.217	6.065	6.473	5.808	6.350	6.198	6.551	ns
		GCLK PLL	t _{co}	1.444	1.629	2.150	2.248	2.480	2.481	2.549	2.356	2.587	2.590	2.535	ns
	8mA	GCLK	t _{co}	3.455	3.723	5.479	5.678	6.221	6.069	6.477	5.813	6.355	6.203	6.556	ns
		GCLK PLL	t _{co}	1.444	1.629	2.153	2.252	2.484	2.485	2.553	2.361	2.592	2.595	2.540	ns
	10mA	GCLK	t _{co}	3.448	3.717	5.472	5.672	6.215	6.063	6.471	5.806	6.349	6.197	6.550	ns
		GCLK PLL	t _{co}	1.437	1.623	2.146	2.246	2.478	2.479	2.547	2.354	2.586	2.589	2.534	ns
	12mA	GCLK	t _{co}	3.447	3.715	5.469	5.669	6.212	6.060	6.468	5.803	6.345	6.193	6.546	ns
		GCLK PLL	t _{co}	1.436	1.621	2.143	2.243	2.475	2.476	2.544	2.351	2.582	2.585	2.530	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.469	3.737	5.490	5.689	6.231	6.079	6.487	5.823	6.365	6.213	6.566	ns
		GCLK PLL	t _{co}	1.458	1.643	2.164	2.263	2.494	2.495	2.563	2.371	2.602	2.605	2.550	ns

Table 1-99. EP3SL340 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.459	3.726	5.469	5.666	6.206	6.054	6.462	5.799	6.338	6.186	6.539	ns
		GCLK PLL	t _{co}	1.448	1.632	2.143	2.240	2.469	2.470	2.538	2.347	2.575	2.578	2.523	ns
	6mA	GCLK	t _{co}	3.454	3.722	5.469	5.666	6.207	6.055	6.463	5.800	6.340	6.188	6.541	ns
		GCLK PLL	t _{co}	1.443	1.628	2.143	2.240	2.470	2.471	2.539	2.348	2.577	2.580	2.525	ns
	8mA	GCLK	t _{co}	3.452	3.720	5.468	5.665	6.205	6.053	6.461	5.799	6.339	6.187	6.540	ns
		GCLK PLL	t _{co}	1.441	1.626	2.142	2.239	2.468	2.469	2.537	2.347	2.576	2.579	2.524	ns
	10mA	GCLK	t _{co}	3.444	3.711	5.458	5.655	6.196	6.044	6.452	5.789	6.329	6.177	6.530	ns
		GCLK PLL	t _{co}	1.433	1.617	2.132	2.229	2.459	2.460	2.528	2.337	2.566	2.569	2.514	ns
	12mA	GCLK	t _{co}	3.445	3.713	5.464	5.662	6.204	6.052	6.460	5.797	6.338	6.186	6.539	ns
		GCLK PLL	t _{co}	1.434	1.619	2.138	2.236	2.467	2.468	2.536	2.345	2.575	2.578	2.523	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.444	3.710	5.447	5.643	6.182	6.030	6.438	5.776	6.314	6.162	6.515	ns
		GCLK PLL	t _{co}	1.433	1.616	2.121	2.217	2.445	2.446	2.514	2.324	2.551	2.554	2.499	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.456	3.723	5.465	5.661	6.200	6.048	6.456	5.795	6.333	6.181	6.534	ns
		GCLK PLL	t _{co}	1.445	1.629	2.139	2.235	2.463	2.464	2.532	2.343	2.570	2.573	2.518	ns
	6mA	GCLK	t _{co}	3.452	3.720	5.466	5.663	6.204	6.052	6.460	5.797	6.337	6.185	6.538	ns
		GCLK PLL	t _{co}	1.441	1.626	2.140	2.237	2.467	2.468	2.536	2.345	2.574	2.577	2.522	ns
	8mA	GCLK	t _{co}	3.442	3.709	5.455	5.652	6.192	6.040	6.448	5.786	6.325	6.173	6.526	ns
		GCLK PLL	t _{co}	1.431	1.615	2.129	2.226	2.455	2.456	2.524	2.334	2.562	2.565	2.510	ns
	10mA	GCLK	t _{co}	3.440	3.707	5.453	5.649	6.190	6.038	6.446	5.784	6.323	6.171	6.524	ns
		GCLK PLL	t _{co}	1.429	1.613	2.127	2.223	2.453	2.454	2.522	2.332	2.560	2.563	2.508	ns
	12mA	GCLK	t _{co}	3.440	3.708	5.456	5.654	6.195	6.043	6.451	5.788	6.329	6.177	6.530	ns
		GCLK PLL	t _{co}	1.429	1.614	2.130	2.228	2.458	2.459	2.527	2.336	2.566	2.569	2.514	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.444	3.711	5.453	5.649	6.189	6.037	6.445	5.783	6.322	6.170	6.523	ns
		GCLK PLL	t _{co}	1.433	1.617	2.127	2.223	2.452	2.453	2.521	2.331	2.559	2.562	2.507	ns

Table 1-99. EP3SL340 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.470	3.740	5.498	5.697	6.239	6.087	6.495	5.831	6.372	6.220	6.573	ns
		GCLK PLL	t _{co}	1.459	1.646	2.172	2.271	2.502	2.503	2.571	2.379	2.609	2.612	2.557	ns
	6mA	GCLK	t _{co}	3.456	3.726	5.486	5.686	6.229	6.077	6.485	5.821	6.363	6.211	6.564	ns
		GCLK PLL	t _{co}	1.445	1.632	2.160	2.260	2.492	2.493	2.561	2.369	2.600	2.603	2.548	ns
	8mA	GCLK	t _{co}	3.444	3.713	5.469	5.668	6.211	6.059	6.467	5.803	6.345	6.193	6.546	ns
		GCLK PLL	t _{co}	1.433	1.619	2.143	2.242	2.474	2.475	2.543	2.351	2.582	2.585	2.530	ns
	10mA	GCLK	t _{co}	3.444	3.713	5.472	5.672	6.215	6.063	6.471	5.807	6.350	6.198	6.551	ns
		GCLK PLL	t _{co}	1.433	1.619	2.146	2.246	2.478	2.479	2.547	2.355	2.587	2.590	2.535	ns
	12mA	GCLK	t _{co}	3.440	3.709	5.465	5.664	6.208	6.056	6.464	5.800	6.342	6.190	6.543	ns
		GCLK PLL	t _{co}	1.429	1.615	2.139	2.238	2.471	2.472	2.540	2.348	2.579	2.582	2.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.444	3.711	5.458	5.655	6.196	6.044	6.452	5.789	6.329	6.177	6.530	ns
		GCLK PLL	t _{co}	1.433	1.617	2.132	2.229	2.459	2.460	2.528	2.337	2.566	2.569	2.514	ns
	16mA	GCLK	t _{co}	3.445	3.713	5.466	5.665	6.207	6.055	6.463	5.799	6.341	6.189	6.542	ns
		GCLK PLL	t _{co}	1.434	1.619	2.140	2.239	2.470	2.471	2.539	2.347	2.578	2.581	2.526	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.473	3.743	5.497	5.695	6.237	6.085	6.493	5.830	6.370	6.218	6.571	ns
		GCLK PLL	t _{co}	1.462	1.649	2.171	2.269	2.500	2.501	2.569	2.378	2.607	2.610	2.555	ns
	6mA	GCLK	t _{co}	3.462	3.731	5.485	5.683	6.225	6.073	6.481	5.818	6.358	6.206	6.559	ns
		GCLK PLL	t _{co}	1.451	1.637	2.159	2.257	2.488	2.489	2.557	2.366	2.595	2.598	2.543	ns
	8mA	GCLK	t _{co}	3.457	3.727	5.485	5.684	6.226	6.074	6.482	5.819	6.360	6.208	6.561	ns
		GCLK PLL	t _{co}	1.446	1.633	2.159	2.258	2.489	2.490	2.558	2.367	2.597	2.600	2.545	ns
	10mA	GCLK	t _{co}	3.443	3.712	5.467	5.665	6.207	6.055	6.463	5.800	6.342	6.190	6.543	ns
		GCLK PLL	t _{co}	1.432	1.618	2.141	2.239	2.470	2.471	2.539	2.348	2.579	2.582	2.527	ns
	12mA	GCLK	t _{co}	3.441	3.710	5.465	5.663	6.205	6.053	6.461	5.798	6.339	6.187	6.540	ns
		GCLK PLL	t _{co}	1.430	1.616	2.139	2.237	2.468	2.469	2.537	2.346	2.576	2.579	2.524	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.445	3.712	5.457	5.653	6.193	6.041	6.449	5.787	6.326	6.174	6.527	ns
		GCLK PLL	t _{co}	1.434	1.618	2.131	2.227	2.456	2.457	2.525	2.335	2.563	2.566	2.511	ns
	16mA	GCLK	t _{co}	3.445	3.713	5.465	5.663	6.205	6.053	6.461	5.798	6.339	6.187	6.540	ns
		GCLK PLL	t _{co}	1.434	1.619	2.139	2.237	2.468	2.469	2.537	2.346	2.576	2.579	2.524	ns

Table 1-99. EP3SL340 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.461	3.730	5.481	5.678	6.219	6.067	6.475	5.813	6.352	6.200	6.553	ns
		GCLK PLL	t _{co}	1.450	1.636	2.155	2.252	2.482	2.483	2.551	2.361	2.589	2.592	2.537	ns
	10mA	GCLK	t _{co}	3.461	3.730	5.481	5.678	6.219	6.067	6.475	5.813	6.352	6.200	6.553	ns
		GCLK PLL	t _{co}	1.450	1.636	2.155	2.252	2.482	2.483	2.551	2.361	2.589	2.592	2.537	ns
	12mA	GCLK	t _{co}	3.451	3.720	5.471	5.668	6.209	6.057	6.465	5.803	6.343	6.191	6.544	ns
		GCLK PLL	t _{co}	1.440	1.626	2.145	2.242	2.472	2.473	2.541	2.351	2.580	2.583	2.528	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.444	3.712	5.457	5.653	6.193	6.041	6.449	5.787	6.326	6.174	6.527	ns
		GCLK PLL	t _{co}	1.433	1.618	2.131	2.227	2.456	2.457	2.525	2.335	2.563	2.566	2.511	ns

Table 1-100 specifies EP3SL340 Row Pins Output Timing parameters for differential I/O standards.

Table 1-100. EP3SL340 Row Pins output Timing Parameters (Part 1 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	3.022	3.234	4.714	4.872	5.362	5.217	5.602	4.981	5.467	5.326	5.662	ns
		GCLK PLL	t _{co}	1.063	1.193	1.445	1.501	1.678	1.690	1.735	1.583	1.761	1.772	1.704	ns
LVDS_E_1R	—	GCLK	t _{co}	3.414	3.678	5.396	5.588	6.125	5.972	6.349	5.722	6.255	6.105	6.425	ns
		GCLK PLL	t _{co}	1.455	1.637	2.127	2.217	2.441	2.445	2.482	2.324	2.549	2.551	2.467	ns
LVDS_E_3R	—	GCLK	t _{co}	3.396	3.668	5.434	5.634	6.179	6.026	6.403	5.773	6.316	6.166	6.486	ns
		GCLK PLL	t _{co}	1.437	1.627	2.165	2.263	2.495	2.499	2.536	2.375	2.610	2.612	2.528	ns
MINI-LVDS	—	GCLK	t _{co}	3.022	3.234	4.714	4.872	5.362	5.217	5.602	4.981	5.467	5.326	5.662	ns
		GCLK PLL	t _{co}	1.063	1.193	1.445	1.501	1.678	1.690	1.735	1.583	1.761	1.772	1.704	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.414	3.678	5.396	5.588	6.125	5.972	6.349	5.722	6.255	6.105	6.425	ns
		GCLK PLL	t _{co}	1.455	1.637	2.127	2.217	2.441	2.445	2.482	2.324	2.549	2.551	2.467	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.396	3.668	5.434	5.634	6.179	6.026	6.403	5.773	6.316	6.166	6.486	ns
		GCLK PLL	t _{co}	1.437	1.627	2.165	2.263	2.495	2.499	2.536	2.375	2.610	2.612	2.528	ns
RSDS	—	GCLK	t _{co}	3.022	3.234	4.714	4.872	5.362	5.217	5.602	4.981	5.467	5.326	5.662	ns
		GCLK PLL	t _{co}	1.063	1.193	1.445	1.501	1.678	1.690	1.735	1.583	1.761	1.772	1.704	ns
RSDS_E_1R	—	GCLK	t _{co}	3.414	3.678	5.396	5.588	6.125	5.972	6.349	5.722	6.255	6.105	6.425	ns
		GCLK PLL	t _{co}	1.455	1.637	2.127	2.217	2.441	2.445	2.482	2.324	2.549	2.551	2.467	ns
RSDS_E_3R	—	GCLK	t _{co}	3.396	3.668	5.434	5.634	6.179	6.026	6.403	5.773	6.316	6.166	6.486	ns
		GCLK PLL	t _{co}	1.437	1.627	2.165	2.263	2.495	2.499	2.536	2.375	2.610	2.612	2.528	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.440	3.711	5.470	5.668	6.212	6.059	6.436	5.806	6.345	6.195	6.515	ns
		GCLK PLL	t _{co}	1.491	1.680	2.211	2.307	2.538	2.542	2.579	2.418	2.649	2.651	2.567	ns
	6mA	GCLK	t _{co}	3.426	3.697	5.457	5.655	6.199	6.046	6.423	5.792	6.332	6.182	6.502	ns
		GCLK PLL	t _{co}	1.477	1.666	2.198	2.294	2.525	2.529	2.566	2.404	2.636	2.638	2.554	ns
	8mA	GCLK	t _{co}	3.422	3.693	5.455	5.655	6.200	6.047	6.424	5.792	6.334	6.184	6.504	ns
		GCLK PLL	t _{co}	1.473	1.662	2.196	2.294	2.526	2.530	2.567	2.404	2.638	2.640	2.556	ns

Table 1–100. EP3SL340 Row Pins output Timing Parameters (Part 2 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t_{CO}	3.438	3.708	5.456	5.652	6.194	6.041	6.418	5.789	6.327	6.177	6.497	ns
		GCLK PLL	t_{CO}	1.489	1.677	2.197	2.291	2.520	2.524	2.561	2.401	2.631	2.633	2.549	ns
	6mA	GCLK	t_{CO}	3.427	3.698	5.452	5.648	6.191	6.038	6.415	5.786	6.324	6.174	6.494	ns
		GCLK PLL	t_{CO}	1.478	1.667	2.193	2.287	2.517	2.521	2.558	2.398	2.628	2.630	2.546	ns
	8mA	GCLK	t_{CO}	3.424	3.695	5.450	5.646	6.189	6.036	6.413	5.784	6.323	6.173	6.493	ns
		GCLK PLL	t_{CO}	1.475	1.664	2.191	2.285	2.515	2.519	2.556	2.396	2.627	2.629	2.545	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t_{CO}	3.435	3.705	5.451	5.647	6.188	6.035	6.412	5.784	6.321	6.171	6.491	ns
		GCLK PLL	t_{CO}	1.486	1.674	2.192	2.286	2.514	2.518	2.555	2.396	2.625	2.627	2.543	ns
	6mA	GCLK	t_{CO}	3.425	3.696	5.449	5.645	6.187	6.034	6.411	5.783	6.321	6.171	6.491	ns
		GCLK PLL	t_{CO}	1.476	1.665	2.190	2.284	2.513	2.517	2.554	2.395	2.625	2.627	2.543	ns
	8mA	GCLK	t_{CO}	3.411	3.682	5.434	5.630	6.173	6.020	6.397	5.768	6.306	6.156	6.476	ns
		GCLK PLL	t_{CO}	1.462	1.651	2.175	2.269	2.499	2.503	2.540	2.380	2.610	2.612	2.528	ns
	10mA	GCLK	t_{CO}	3.408	3.678	5.430	5.626	6.169	6.016	6.393	5.764	6.302	6.152	6.472	ns
		GCLK PLL	t_{CO}	1.459	1.647	2.171	2.265	2.495	2.499	2.536	2.376	2.606	2.608	2.524	ns
	12mA	GCLK	t_{CO}	3.405	3.676	5.431	5.629	6.172	6.019	6.396	5.767	6.306	6.156	6.476	ns
		GCLK PLL	t_{CO}	1.456	1.645	2.172	2.268	2.498	2.502	2.539	2.379	2.610	2.612	2.528	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t_{CO}	3.406	3.676	5.421	5.617	6.159	6.006	6.383	5.754	6.292	6.142	6.462	ns
		GCLK PLL	t_{CO}	1.457	1.645	2.162	2.256	2.485	2.489	2.526	2.366	2.596	2.598	2.514	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t_{CO}	3.455	3.729	5.492	5.690	6.235	6.082	6.459	5.828	6.368	6.218	6.538	ns
		GCLK PLL	t_{CO}	1.506	1.698	2.233	2.329	2.561	2.565	2.602	2.440	2.672	2.674	2.590	ns
	6mA	GCLK	t_{CO}	3.431	3.705	5.474	5.673	6.218	6.065	6.442	5.811	6.353	6.203	6.523	ns
		GCLK PLL	t_{CO}	1.482	1.674	2.215	2.312	2.544	2.548	2.585	2.423	2.657	2.659	2.575	ns
	8mA	GCLK	t_{CO}	3.414	3.686	5.452	5.651	6.196	6.043	6.420	5.789	6.331	6.181	6.501	ns
		GCLK PLL	t_{CO}	1.465	1.655	2.193	2.290	2.522	2.526	2.563	2.401	2.635	2.637	2.553	ns

Table 1-100. EP3SL340 Row Pins output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.459	3.732	5.492	5.690	6.234	6.081	6.458	5.828	6.368	6.218	6.538	ns
		GCLK PLL	t _{co}	1.510	1.701	2.233	2.329	2.560	2.564	2.601	2.440	2.672	2.674	2.590	ns
	6mA	GCLK	t _{co}	3.444	3.717	5.478	5.675	6.219	6.066	6.443	5.813	6.353	6.203	6.523	ns
		GCLK PLL	t _{co}	1.495	1.686	2.219	2.314	2.545	2.549	2.586	2.425	2.657	2.659	2.575	ns
	8mA	GCLK	t _{co}	3.433	3.706	5.473	5.672	6.216	6.063	6.440	5.810	6.351	6.201	6.521	ns
		GCLK PLL	t _{co}	1.484	1.675	2.214	2.311	2.542	2.546	2.583	2.422	2.655	2.657	2.573	ns
	10mA	GCLK	t _{co}	3.413	3.686	5.450	5.648	6.193	6.040	6.417	5.787	6.327	6.177	6.497	ns
		GCLK PLL	t _{co}	1.464	1.655	2.191	2.287	2.519	2.523	2.560	2.399	2.631	2.633	2.549	ns
	12mA	GCLK	t _{co}	3.410	3.682	5.446	5.645	6.189	6.036	6.413	5.783	6.324	6.174	6.494	ns
		GCLK PLL	t _{co}	1.461	1.651	2.187	2.284	2.515	2.519	2.556	2.395	2.628	2.630	2.546	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.415	3.686	5.437	5.633	6.175	6.022	6.399	5.770	6.308	6.158	6.478	ns
		GCLK PLL	t _{co}	1.466	1.655	2.178	2.272	2.501	2.505	2.542	2.382	2.612	2.614	2.530	ns
	16mA	GCLK	t _{co}	3.408	3.679	5.436	5.634	6.178	6.025	6.402	5.773	6.313	6.163	6.483	ns
		GCLK PLL	t _{co}	1.459	1.648	2.177	2.273	2.504	2.508	2.545	2.385	2.617	2.619	2.535	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.446	3.718	5.474	5.671	6.214	6.061	6.438	5.809	6.348	6.198	6.518	ns
		GCLK PLL	t _{co}	1.487	1.677	2.205	2.300	2.530	2.534	2.571	2.411	2.642	2.644	2.560	ns
	12mA	GCLK	t _{co}	3.428	3.701	5.459	5.656	6.199	6.046	6.423	5.794	6.333	6.183	6.503	ns
		GCLK PLL	t _{co}	1.469	1.660	2.190	2.285	2.515	2.519	2.556	2.396	2.627	2.629	2.545	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.414	3.685	5.436	5.632	6.174	6.021	6.398	5.770	6.308	6.158	6.478	ns
		GCLK PLL	t _{co}	1.455	1.644	2.167	2.261	2.490	2.494	2.531	2.372	2.602	2.604	2.520	ns

Table 1-101 and Table 1-102 show EP3SL340 regional (RCLK) clock adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-101 specifies EP3SL340 Column Pin delay adders when using the regional clock.

Table 1-101. EP3SL340 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.318	0.171	0.255	0.247	0.257	0.244	0.369	0.37	0.253	0.232	0.336	ns
RCLK PLL input adder	2.716	2.739	4.379	4.508	4.926	4.717	5.376	4.508	4.94	4.89	5.434	ns
RCLK output adder	-0.341	-0.107	-0.18	-0.169	-0.171	-0.167	-0.362	-0.03	-0.043	-0.034	-0.287	ns
RCLK PLL output adder	-2.36	-2.128	-3.344	-3.384	-3.571	-3.487	-3.545	-3.246	-3.636	-3.357	-3.544	ns

Table 1-102 specifies EP3SL340 Row Pin delay adders when using the regional clock.

Table 1-102. EP3SL340 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.075	0.079	0.133	0.124	0.125	0.124	0.307	0.117	0.116	0.117	0.31	ns
RCLK PLL input adder	0.157	0.151	0.262	0.274	0.306	0.288	0.464	0.268	0.291	0.278	0.46	ns
RCLK output adder	-0.052	-0.066	-0.107	-0.098	-0.127	-0.129	-0.282	-0.082	-0.118	-0.085	-0.285	ns
RCLK PLL output adder	-0.157	-0.139	-0.232	-0.248	-0.272	-0.259	-0.422	-0.252	-0.256	-0.244	-0.444	ns

EP3SE50 I/O Timing Parameters

Table 1-103 through Table 1-106 show the maximum I/O timing parameters for EP3SE50 devices for single-ended I/O standards.

Table 1-103 specifies EP3SE50 column pins input timing parameters for single-ended I/O standards.

Table 1-103. EP3SE50 Column Pins Input Timing Parameters (Part 1 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTL	GCLK	t_{su}	-0.911	-0.933	-1.342	-1.477	-1.720	-1.659	-1.949	-1.491	-1.718	-1.662	-1.976	ns
		t_h	1.025	1.062	1.524	1.682	1.947	1.872	2.165	1.705	1.955	1.884	2.193	ns
	GCLK PLL	t_{su}	0.664	0.680	1.158	1.326	1.384	1.294	1.304	1.324	1.397	1.302	1.361	ns
		t_h	-0.421	-0.422	-0.773	-0.891	-0.897	-0.838	-0.836	-0.880	-0.901	-0.838	-0.890	ns
3.3-V LVCMOS	GCLK	t_{su}	-0.911	-0.933	-1.342	-1.477	-1.720	-1.659	-1.949	-1.491	-1.718	-1.662	-1.976	ns
		t_h	1.025	1.062	1.524	1.682	1.947	1.872	2.165	1.705	1.955	1.884	2.193	ns
	GCLK PLL	t_{su}	0.664	0.680	1.158	1.326	1.384	1.294	1.304	1.324	1.397	1.302	1.361	ns
		t_h	-0.421	-0.422	-0.773	-0.891	-0.897	-0.838	-0.836	-0.880	-0.901	-0.838	-0.890	ns

Table 1-103. EP3SE50 Column Pins Input Timing Parameters (Part 2 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVTTTL	GCLK	t _{SU}	-0.917	-0.944	-1.341	-1.479	-1.719	-1.658	-1.948	-1.491	-1.723	-1.667	-1.981	ns
		t _H	1.031	1.073	1.523	1.684	1.946	1.871	2.164	1.705	1.960	1.889	2.198	ns
	GCLK PLL	t _{SU}	0.658	0.669	1.159	1.324	1.385	1.295	1.305	1.324	1.392	1.297	1.356	ns
		t _H	-0.415	-0.411	-0.774	-0.889	-0.898	-0.839	-0.837	-0.880	-0.896	-0.833	-0.885	ns
3.0-V LVCMOS	GCLK	t _{SU}	-0.917	-0.944	-1.341	-1.479	-1.719	-1.658	-1.948	-1.491	-1.723	-1.667	-1.981	ns
		t _H	1.031	1.073	1.523	1.684	1.946	1.871	2.164	1.705	1.960	1.889	2.198	ns
	GCLK PLL	t _{SU}	0.658	0.669	1.159	1.324	1.385	1.295	1.305	1.324	1.392	1.297	1.356	ns
		t _H	-0.415	-0.411	-0.774	-0.889	-0.898	-0.839	-0.837	-0.880	-0.896	-0.833	-0.885	ns
2.5 V	GCLK	t _{SU}	-0.907	-0.939	-1.350	-1.491	-1.738	-1.677	-1.967	-1.501	-1.734	-1.678	-1.992	ns
		t _H	1.021	1.068	1.532	1.696	1.965	1.890	2.183	1.715	1.971	1.900	2.209	ns
	GCLK PLL	t _{SU}	0.668	0.674	1.150	1.312	1.366	1.276	1.286	1.314	1.381	1.286	1.345	ns
		t _H	-0.425	-0.416	-0.765	-0.877	-0.879	-0.820	-0.818	-0.870	-0.885	-0.822	-0.874	ns
1.8 V	GCLK	t _{SU}	-0.925	-0.961	-1.390	-1.527	-1.736	-1.675	-1.965	-1.535	-1.737	-1.681	-1.995	ns
		t _H	1.041	1.092	1.572	1.732	1.963	1.888	2.181	1.749	1.974	1.903	2.212	ns
	GCLK PLL	t _{SU}	0.650	0.652	1.110	1.276	1.368	1.278	1.288	1.280	1.378	1.283	1.342	ns
		t _H	-0.405	-0.392	-0.725	-0.841	-0.881	-0.822	-0.820	-0.836	-0.882	-0.819	-0.871	ns
1.5 V	GCLK	t _{SU}	-0.918	-0.951	-1.367	-1.495	-1.666	-1.605	-1.895	-1.504	-1.671	-1.615	-1.929	ns
		t _H	1.034	1.082	1.549	1.700	1.893	1.818	2.111	1.718	1.908	1.837	2.146	ns
	GCLK PLL	t _{SU}	0.657	0.662	1.133	1.308	1.438	1.348	1.358	1.311	1.444	1.349	1.408	ns
		t _H	-0.412	-0.402	-0.748	-0.873	-0.951	-0.892	-0.890	-0.867	-0.948	-0.885	-0.937	ns
1.2 V	GCLK	t _{SU}	-0.858	-0.899	-1.290	-1.396	-1.510	-1.449	-1.739	-1.408	-1.518	-1.462	-1.776	ns
		t _H	0.974	1.030	1.472	1.601	1.737	1.662	1.955	1.622	1.755	1.684	1.993	ns
	GCLK PLL	t _{SU}	0.717	0.714	1.210	1.407	1.594	1.504	1.514	1.407	1.597	1.502	1.561	ns
		t _H	-0.472	-0.454	-0.825	-0.972	-1.107	-1.048	-1.046	-0.963	-1.101	-1.038	-1.090	ns
SSTL-2 CLASS I	GCLK	t _{SU}	-0.839	-0.870	-1.262	-1.380	-1.512	-1.451	-1.741	-1.387	-1.514	-1.458	-1.772	ns
		t _H	0.955	1.001	1.444	1.585	1.739	1.664	1.957	1.601	1.751	1.680	1.989	ns
	GCLK PLL	t _{SU}	0.736	0.743	1.238	1.423	1.592	1.502	1.512	1.428	1.601	1.506	1.565	ns
		t _H	-0.491	-0.483	-0.853	-0.988	-1.105	-1.046	-1.044	-0.984	-1.105	-1.042	-1.094	ns
SSTL-2 CLASS II	GCLK	t _{SU}	-0.839	-0.870	-1.262	-1.380	-1.512	-1.451	-1.741	-1.387	-1.514	-1.458	-1.772	ns
		t _H	0.955	1.001	1.444	1.585	1.739	1.664	1.957	1.601	1.751	1.680	1.989	ns
	GCLK PLL	t _{SU}	0.736	0.743	1.238	1.423	1.592	1.502	1.512	1.428	1.601	1.506	1.565	ns
		t _H	-0.491	-0.483	-0.853	-0.988	-1.105	-1.046	-1.044	-0.984	-1.105	-1.042	-1.094	ns
SSTL-18 CLASS I	GCLK	t _{SU}	-0.832	-0.864	-1.249	-1.372	-1.509	-1.446	-1.739	-1.380	-1.515	-1.457	-1.773	ns
		t _H	0.948	0.995	1.431	1.574	1.733	1.658	1.950	1.591	1.748	1.678	1.985	ns
	GCLK PLL	t _{SU}	0.743	0.749	1.251	1.431	1.595	1.507	1.514	1.435	1.600	1.507	1.564	ns
		t _H	-0.498	-0.489	-0.866	-0.999	-1.111	-1.052	-1.051	-0.994	-1.108	-1.044	-1.098	ns

Table 1–103. EP3SE50 Column Pins Input Timing Parameters (Part 3 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	GCLK	t _{su}	-0.832	-0.864	-1.249	-1.372	-1.509	-1.446	-1.739	-1.380	-1.515	-1.457	-1.773	ns
		t _h	0.948	0.995	1.431	1.574	1.733	1.658	1.950	1.591	1.748	1.678	1.985	ns
	GCLK PLL	t _{su}	0.743	0.749	1.251	1.431	1.595	1.507	1.514	1.435	1.600	1.507	1.564	ns
		t _h	-0.498	-0.489	-0.866	-0.999	-1.111	-1.052	-1.051	-0.994	-1.108	-1.044	-1.098	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.820	-0.853	-1.238	-1.361	-1.490	-1.427	-1.720	-1.369	-1.497	-1.439	-1.755	ns
		t _h	0.936	0.984	1.419	1.563	1.714	1.639	1.931	1.580	1.730	1.660	1.967	ns
	GCLK PLL	t _{su}	0.755	0.760	1.262	1.442	1.614	1.526	1.533	1.446	1.618	1.525	1.582	ns
		t _h	-0.510	-0.500	-0.878	-1.010	-1.130	-1.071	-1.070	-1.005	-1.126	-1.062	-1.116	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.820	-0.853	-1.238	-1.361	-1.490	-1.427	-1.720	-1.369	-1.497	-1.439	-1.755	ns
		t _h	0.936	0.984	1.419	1.563	1.714	1.639	1.931	1.580	1.730	1.660	1.967	ns
	GCLK PLL	t _{su}	0.755	0.760	1.262	1.442	1.614	1.526	1.533	1.446	1.618	1.525	1.582	ns
		t _h	-0.510	-0.500	-0.878	-1.010	-1.130	-1.071	-1.070	-1.005	-1.126	-1.062	-1.116	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.832	-0.864	-1.249	-1.372	-1.509	-1.446	-1.739	-1.380	-1.515	-1.457	-1.773	ns
		t _h	0.948	0.995	1.431	1.574	1.733	1.658	1.950	1.591	1.748	1.678	1.985	ns
	GCLK PLL	t _{su}	0.743	0.749	1.251	1.431	1.595	1.507	1.514	1.435	1.600	1.507	1.564	ns
		t _h	-0.498	-0.489	-0.866	-0.999	-1.111	-1.052	-1.051	-0.994	-1.108	-1.044	-1.098	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.832	-0.864	-1.249	-1.372	-1.509	-1.446	-1.739	-1.380	-1.515	-1.457	-1.773	ns
		t _h	0.948	0.995	1.431	1.574	1.733	1.658	1.950	1.591	1.748	1.678	1.985	ns
	GCLK PLL	t _{su}	0.743	0.749	1.251	1.431	1.595	1.507	1.514	1.435	1.600	1.507	1.564	ns
		t _h	-0.498	-0.489	-0.866	-0.999	-1.111	-1.052	-1.051	-0.994	-1.108	-1.044	-1.098	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.820	-0.853	-1.238	-1.361	-1.490	-1.427	-1.720	-1.369	-1.497	-1.439	-1.755	ns
		t _h	0.936	0.984	1.419	1.563	1.714	1.639	1.931	1.580	1.730	1.660	1.967	ns
	GCLK PLL	t _{su}	0.755	0.760	1.262	1.442	1.614	1.526	1.533	1.446	1.618	1.525	1.582	ns
		t _h	-0.510	-0.500	-0.878	-1.010	-1.130	-1.071	-1.070	-1.005	-1.126	-1.062	-1.116	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.820	-0.853	-1.238	-1.361	-1.490	-1.427	-1.720	-1.369	-1.497	-1.439	-1.755	ns
		t _h	0.936	0.984	1.419	1.563	1.714	1.639	1.931	1.580	1.730	1.660	1.967	ns
	GCLK PLL	t _{su}	0.755	0.760	1.262	1.442	1.614	1.526	1.533	1.446	1.618	1.525	1.582	ns
		t _h	-0.510	-0.500	-0.878	-1.010	-1.130	-1.071	-1.070	-1.005	-1.126	-1.062	-1.116	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.812	-0.841	-1.228	-1.350	-1.474	-1.411	-1.704	-1.358	-1.482	-1.424	-1.740	ns
		t _h	0.928	0.972	1.409	1.552	1.698	1.623	1.915	1.569	1.715	1.645	1.952	ns
	GCLK PLL	t _{su}	0.763	0.772	1.272	1.453	1.630	1.542	1.549	1.457	1.633	1.540	1.597	ns
		t _h	-0.518	-0.512	-0.888	-1.021	-1.146	-1.087	-1.086	-1.016	-1.141	-1.077	-1.131	ns
3.0-V PCI	GCLK	t _{su}	-0.812	-0.841	-1.228	-1.350	-1.474	-1.411	-1.704	-1.358	-1.482	-1.424	-1.740	ns
		t _h	0.928	0.972	1.409	1.552	1.698	1.623	1.915	1.569	1.715	1.645	1.952	ns
	GCLK PLL	t _{su}	0.763	0.772	1.272	1.453	1.630	1.542	1.549	1.457	1.633	1.540	1.597	ns
		t _h	-0.518	-0.512	-0.888	-1.021	-1.146	-1.087	-1.086	-1.016	-1.141	-1.077	-1.131	ns

Table 1-103. EP3SE50 Column Pins Input Timing Parameters (Part 4 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V PCI-X	GCLK	t _{su}	-0.917	-0.944	-1.341	-1.479	-1.719	-1.658	-1.948	-1.491	-1.723	-1.667	-1.981	ns
		t _h	1.031	1.073	1.523	1.684	1.946	1.871	2.164	1.705	1.960	1.889	2.198	ns
	GCLK PLL	t _{su}	0.658	0.669	1.159	1.324	1.385	1.295	1.305	1.324	1.392	1.297	1.356	ns
		t _h	-0.415	-0.411	-0.774	-0.889	-0.898	-0.839	-0.837	-0.880	-0.896	-0.833	-0.885	ns

Table 1-104 specifies EP3SE50 row pins input timing parameters for single-ended I/O standards.

Table 1-104. EP3SE50 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.896	-0.926	-1.311	-1.433	-1.658	-1.605	-1.896	-1.451	-1.663	-1.612	-1.927	ns
		t _h	1.009	1.052	1.494	1.640	1.888	1.819	2.111	1.667	1.903	1.836	2.144	ns
	GCLK PLL	t _{su}	0.952	0.960	1.597	1.816	1.931	1.813	1.843	1.809	1.936	1.818	1.895	ns
		t _h	-0.703	-0.700	-1.199	-1.367	-1.429	-1.343	-1.366	-1.351	-1.425	-1.339	-1.415	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.896	-0.926	-1.311	-1.433	-1.658	-1.605	-1.896	-1.451	-1.663	-1.612	-1.927	ns
		t _h	1.009	1.052	1.494	1.640	1.888	1.819	2.111	1.667	1.903	1.836	2.144	ns
	GCLK PLL	t _{su}	0.952	0.960	1.597	1.816	1.931	1.813	1.843	1.809	1.936	1.818	1.895	ns
		t _h	-0.703	-0.700	-1.199	-1.367	-1.429	-1.343	-1.366	-1.351	-1.425	-1.339	-1.415	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.902	-0.937	-1.308	-1.434	-1.661	-1.608	-1.899	-1.450	-1.668	-1.617	-1.932	ns
		t _h	1.015	1.063	1.491	1.641	1.891	1.822	2.114	1.666	1.908	1.841	2.149	ns
	GCLK PLL	t _{su}	0.946	0.949	1.600	1.815	1.928	1.810	1.840	1.810	1.931	1.813	1.890	ns
		t _h	-0.697	-0.689	-1.202	-1.366	-1.426	-1.340	-1.363	-1.352	-1.420	-1.334	-1.410	ns
3.0-V LVCMOS	GCLK	t _{su}	-0.902	-0.937	-1.308	-1.434	-1.661	-1.608	-1.899	-1.450	-1.668	-1.617	-1.932	ns
		t _h	1.015	1.063	1.491	1.641	1.891	1.822	2.114	1.666	1.908	1.841	2.149	ns
	GCLK PLL	t _{su}	0.946	0.949	1.600	1.815	1.928	1.810	1.840	1.810	1.931	1.813	1.890	ns
		t _h	-0.697	-0.689	-1.202	-1.366	-1.426	-1.340	-1.363	-1.352	-1.420	-1.334	-1.410	ns
2.5 V	GCLK	t _{su}	-0.890	-0.930	-1.317	-1.447	-1.676	-1.623	-1.914	-1.459	-1.678	-1.627	-1.942	ns
		t _h	1.003	1.056	1.500	1.654	1.906	1.837	2.129	1.675	1.918	1.851	2.159	ns
	GCLK PLL	t _{su}	0.958	0.956	1.591	1.802	1.913	1.795	1.825	1.801	1.921	1.803	1.880	ns
		t _h	-0.709	-0.696	-1.193	-1.353	-1.411	-1.325	-1.348	-1.343	-1.410	-1.324	-1.400	ns
1.8 V	GCLK	t _{su}	-0.869	-0.907	-1.272	-1.388	-1.573	-1.523	-1.797	-1.395	-1.573	-1.526	-1.829	ns
		t _h	0.986	1.035	1.458	1.596	1.807	1.742	2.015	1.614	1.817	1.754	2.048	ns
	GCLK PLL	t _{su}	0.890	0.886	1.510	1.730	1.876	1.758	1.788	1.729	1.881	1.762	1.840	ns
		t _h	-0.640	-0.623	-1.112	-1.280	-1.373	-1.287	-1.309	-1.271	-1.369	-1.282	-1.358	ns

Table 1–104. EP3SE50 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	GCLK	t _{su}	-0.859	-0.896	-1.248	-1.356	-1.505	-1.455	-1.729	-1.364	-1.508	-1.461	-1.764	ns
		t _h	0.976	1.024	1.434	1.564	1.739	1.674	1.947	1.583	1.752	1.689	1.983	ns
	GCLK PLL	t _{su}	0.900	0.897	1.534	1.762	1.944	1.826	1.856	1.760	1.946	1.827	1.905	ns
		t _h	-0.650	-0.634	-1.136	-1.312	-1.441	-1.355	-1.377	-1.302	-1.434	-1.347	-1.423	ns
1.2 V	GCLK	t _{su}	-0.799	-0.843	-1.169	-1.255	-1.346	-1.296	-1.570	-1.268	-1.353	-1.306	-1.609	ns
		t _h	0.916	0.971	1.355	1.463	1.580	1.515	1.788	1.487	1.597	1.534	1.828	ns
	GCLK PLL	t _{su}	0.960	0.950	1.613	1.863	2.103	1.985	2.015	1.856	2.101	1.982	2.060	ns
		t _h	-0.710	-0.687	-1.215	-1.413	-1.600	-1.514	-1.536	-1.398	-1.589	-1.502	-1.578	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.833	-0.872	-1.231	-1.338	-1.456	-1.403	-1.694	-1.347	-1.461	-1.410	-1.725	ns
		t _h	0.947	0.999	1.414	1.545	1.686	1.617	1.909	1.563	1.701	1.634	1.942	ns
	GCLK PLL	t _{su}	1.015	1.014	1.677	1.911	2.133	2.015	2.045	1.913	2.138	2.020	2.097	ns
		t _h	-0.765	-0.753	-1.279	-1.462	-1.631	-1.545	-1.568	-1.455	-1.627	-1.541	-1.617	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.833	-0.872	-1.231	-1.338	-1.456	-1.403	-1.694	-1.347	-1.461	-1.410	-1.725	ns
		t _h	0.947	0.999	1.414	1.545	1.686	1.617	1.909	1.563	1.701	1.634	1.942	ns
	GCLK PLL	t _{su}	1.015	1.014	1.677	1.911	2.133	2.015	2.045	1.913	2.138	2.020	2.097	ns
		t _h	-0.765	-0.753	-1.279	-1.462	-1.631	-1.545	-1.568	-1.455	-1.627	-1.541	-1.617	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.773	-0.808	-1.131	-1.230	-1.344	-1.293	-1.568	-1.239	-1.349	-1.300	-1.604	ns
		t _h	0.890	0.936	1.317	1.436	1.575	1.510	1.782	1.455	1.590	1.527	1.819	ns
	GCLK PLL	t _{su}	0.986	0.985	1.651	1.890	2.108	1.991	2.019	1.888	2.108	1.990	2.067	ns
		t _h	-0.736	-0.722	-1.253	-1.442	-1.607	-1.521	-1.544	-1.432	-1.599	-1.511	-1.589	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.773	-0.808	-1.131	-1.230	-1.344	-1.293	-1.568	-1.239	-1.349	-1.300	-1.604	ns
		t _h	0.890	0.936	1.317	1.436	1.575	1.510	1.782	1.455	1.590	1.527	1.819	ns
	GCLK PLL	t _{su}	0.986	0.985	1.651	1.890	2.108	1.991	2.019	1.888	2.108	1.990	2.067	ns
		t _h	-0.736	-0.722	-1.253	-1.442	-1.607	-1.521	-1.544	-1.432	-1.599	-1.511	-1.589	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.759	-0.796	-1.118	-1.220	-1.326	-1.275	-1.550	-1.228	-1.332	-1.283	-1.587	ns
		t _h	0.876	0.924	1.305	1.426	1.557	1.492	1.764	1.444	1.573	1.510	1.802	ns
	GCLK PLL	t _{su}	1.000	0.997	1.666	1.900	2.126	2.009	2.037	1.899	2.125	2.007	2.084	ns
		t _h	-0.750	-0.734	-1.267	-1.452	-1.625	-1.539	-1.562	-1.443	-1.616	-1.528	-1.606	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.773	-0.808	-1.131	-1.230	-1.344	-1.293	-1.568	-1.239	-1.349	-1.300	-1.604	ns
		t _h	0.890	0.936	1.317	1.436	1.575	1.510	1.782	1.455	1.590	1.527	1.819	ns
	GCLK PLL	t _{su}	0.986	0.985	1.651	1.890	2.108	1.991	2.019	1.888	2.108	1.990	2.067	ns
		t _h	-0.736	-0.722	-1.253	-1.442	-1.607	-1.521	-1.544	-1.432	-1.599	-1.511	-1.589	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.773	-0.808	-1.131	-1.230	-1.344	-1.293	-1.568	-1.239	-1.349	-1.300	-1.604	ns
		t _h	0.890	0.936	1.317	1.436	1.575	1.510	1.782	1.455	1.590	1.527	1.819	ns
	GCLK PLL	t _{su}	0.986	0.985	1.651	1.890	2.108	1.991	2.019	1.888	2.108	1.990	2.067	ns
		t _h	-0.736	-0.722	-1.253	-1.442	-1.607	-1.521	-1.544	-1.432	-1.599	-1.511	-1.589	ns

Table 1-104. EP3SE50 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
1.5-V HSTL CLASS I	GCLK	t_{su}	-0.759	-0.796	-1.118	-1.220	-1.326	-1.275	-1.550	-1.228	-1.332	-1.283	-1.587	ns
		t_h	0.876	0.924	1.305	1.426	1.557	1.492	1.764	1.444	1.573	1.510	1.802	ns
	GCLK PLL	t_{su}	1.000	0.997	1.666	1.900	2.126	2.009	2.037	1.899	2.125	2.007	2.084	ns
		t_h	-0.750	-0.734	-1.267	-1.452	-1.625	-1.539	-1.562	-1.443	-1.616	-1.528	-1.606	ns
1.5-V HSTL CLASS II	GCLK	t_{su}	-0.759	-0.796	-1.118	-1.220	-1.326	-1.275	-1.550	-1.228	-1.332	-1.283	-1.587	ns
		t_h	0.876	0.924	1.305	1.426	1.557	1.492	1.764	1.444	1.573	1.510	1.802	ns
	GCLK PLL	t_{su}	1.000	0.997	1.666	1.900	2.126	2.009	2.037	1.899	2.125	2.007	2.084	ns
		t_h	-0.750	-0.734	-1.267	-1.452	-1.625	-1.539	-1.562	-1.443	-1.616	-1.528	-1.606	ns
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.750	-0.784	-1.109	-1.210	-1.310	-1.259	-1.534	-1.219	-1.316	-1.267	-1.571	ns
		t_h	0.867	0.912	1.296	1.416	1.541	1.476	1.748	1.435	1.557	1.494	1.786	ns
	GCLK PLL	t_{su}	1.009	1.009	1.675	1.910	2.142	2.025	2.053	1.908	2.141	2.023	2.100	ns
		t_h	-0.759	-0.746	-1.276	-1.462	-1.641	-1.555	-1.578	-1.452	-1.632	-1.544	-1.622	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.750	-0.784	-1.109	-1.210	-1.310	-1.259	-1.534	-1.219	-1.316	-1.267	-1.571	ns
		t_h	0.867	0.912	1.296	1.416	1.541	1.476	1.748	1.435	1.557	1.494	1.786	ns
	GCLK PLL	t_{su}	1.009	1.009	1.675	1.910	2.142	2.025	2.053	1.908	2.141	2.023	2.100	ns
		t_h	-0.759	-0.746	-1.276	-1.462	-1.641	-1.555	-1.578	-1.452	-1.632	-1.544	-1.622	ns
3.0-V PCI	GCLK	t_{su}	-0.902	-0.937	-1.308	-1.434	-1.661	-1.608	-1.899	-1.450	-1.668	-1.617	-1.932	ns
		t_h	1.015	1.063	1.491	1.641	1.891	1.822	2.114	1.666	1.908	1.841	2.149	ns
	GCLK PLL	t_{su}	0.946	0.949	1.600	1.815	1.928	1.810	1.840	1.810	1.931	1.813	1.890	ns
		t_h	-0.697	-0.689	-1.202	-1.366	-1.426	-1.340	-1.363	-1.352	-1.420	-1.334	-1.410	ns
3.0-V PCI-X	GCLK	t_{su}	-0.902	-0.937	-1.308	-1.434	-1.661	-1.608	-1.899	-1.450	-1.668	-1.617	-1.932	ns
		t_h	1.015	1.063	1.491	1.641	1.891	1.822	2.114	1.666	1.908	1.841	2.149	ns
	GCLK PLL	t_{su}	0.946	0.949	1.600	1.815	1.928	1.810	1.840	1.810	1.931	1.813	1.890	ns
		t_h	-0.697	-0.689	-1.202	-1.366	-1.426	-1.340	-1.363	-1.352	-1.420	-1.334	-1.410	ns

Table 1–105 specifies EP3SE50 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–105. EP3SE50 Column Pins output Timing Parameters (Part 1 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.092	3.314	4.588	4.978	5.471	5.338	5.574	5.100	5.594	5.461	5.645	ns
		GCLK PLL	t _{co}	1.609	1.791	2.258	2.371	2.595	2.594	2.538	2.481	2.704	2.707	2.528	ns
	8mA	GCLK	t _{co}	3.014	3.225	4.485	4.867	5.354	5.221	5.457	4.985	5.474	5.341	5.525	ns
		GCLK PLL	t _{co}	1.530	1.702	2.154	2.259	2.478	2.477	2.421	2.365	2.584	2.587	2.408	ns
	12mA	GCLK	t _{co}	2.983	3.192	4.418	4.796	5.284	5.151	5.387	4.915	5.406	5.273	5.457	ns
		GCLK PLL	t _{co}	1.500	1.670	2.087	2.189	2.408	2.407	2.351	2.295	2.517	2.520	2.341	ns
	16mA	GCLK	t _{co}	2.969	3.177	4.397	4.772	5.256	5.123	5.359	4.887	5.372	5.239	5.423	ns
		GCLK PLL	t _{co}	1.486	1.656	2.066	2.166	2.380	2.379	2.323	2.269	2.483	2.486	2.307	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.030	3.247	4.516	4.896	5.384	5.251	5.487	5.015	5.506	5.373	5.557	ns
		GCLK PLL	t _{co}	1.546	1.724	2.185	2.288	2.507	2.506	2.450	2.395	2.616	2.619	2.440	ns
	8mA	GCLK	t _{co}	2.958	3.169	4.393	4.769	5.252	5.119	5.355	4.884	5.368	5.235	5.419	ns
		GCLK PLL	t _{co}	1.475	1.647	2.063	2.162	2.376	2.375	2.319	2.265	2.479	2.482	2.303	ns
	12mA	GCLK	t _{co}	2.934	3.141	4.364	4.742	5.226	5.093	5.329	4.856	5.342	5.209	5.393	ns
		GCLK PLL	t _{co}	1.451	1.619	2.034	2.135	2.351	2.350	2.294	2.238	2.454	2.457	2.278	ns
	16mA	GCLK	t _{co}	2.928	3.134	4.355	4.733	5.217	5.084	5.320	4.847	5.332	5.199	5.383	ns
		GCLK PLL	t _{co}	1.444	1.612	2.026	2.126	2.342	2.341	2.285	2.228	2.444	2.447	2.268	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.089	3.323	4.622	5.015	5.530	5.397	5.633	5.139	5.635	5.502	5.686	ns
		GCLK PLL	t _{co}	1.606	1.800	2.292	2.407	2.634	2.633	2.577	2.519	2.746	2.749	2.570	ns
	8mA	GCLK	t _{co}	3.024	3.238	4.519	4.904	5.436	5.303	5.539	5.025	5.517	5.384	5.568	ns
		GCLK PLL	t _{co}	1.539	1.715	2.188	2.295	2.518	2.517	2.461	2.405	2.627	2.630	2.451	ns
	12mA	GCLK	t _{co}	2.985	3.200	4.450	4.831	5.372	5.239	5.475	4.950	5.440	5.307	5.491	ns
		GCLK PLL	t _{co}	1.501	1.678	2.120	2.224	2.444	2.443	2.387	2.331	2.551	2.554	2.375	ns
	16mA	GCLK	t _{co}	2.962	3.173	4.415	4.793	5.349	5.216	5.452	4.910	5.397	5.264	5.448	ns
		GCLK PLL	t _{co}	1.479	1.651	2.085	2.185	2.402	2.401	2.345	2.291	2.508	2.511	2.332	ns

Table 1-105. EP3SE50 Column Pins output Timing Parameters (Part 2 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.045	3.262	4.553	4.937	5.472	5.339	5.575	5.058	5.553	5.420	5.604	ns
		GCLK PLL	t _{co}	1.561	1.740	2.222	2.329	2.553	2.552	2.496	2.439	2.664	2.667	2.488	ns
	8mA	GCLK	t _{co}	2.971	3.183	4.429	4.807	5.362	5.229	5.465	4.925	5.413	5.280	5.464	ns
		GCLK PLL	t _{co}	1.488	1.661	2.098	2.200	2.418	2.417	2.361	2.306	2.524	2.527	2.348	ns
	12mA	GCLK	t _{co}	2.947	3.155	4.389	4.767	5.328	5.195	5.431	4.885	5.372	5.239	5.423	ns
		GCLK PLL	t _{co}	1.464	1.632	2.059	2.160	2.377	2.376	2.320	2.266	2.483	2.486	2.307	ns
	16mA	GCLK	t _{co}	2.947	3.154	4.380	4.758	5.336	5.203	5.439	4.874	5.359	5.226	5.410	ns
		GCLK PLL	t _{co}	1.464	1.632	2.051	2.151	2.367	2.366	2.310	2.255	2.471	2.474	2.295	ns
2.5 V	4mA	GCLK	t _{co}	3.148	3.377	4.759	5.162	5.680	5.547	5.783	5.290	5.807	5.674	5.858	ns
		GCLK PLL	t _{co}	1.665	1.855	2.429	2.556	2.800	2.799	2.743	2.672	2.919	2.922	2.743	ns
	8mA	GCLK	t _{co}	3.066	3.285	4.640	5.037	5.556	5.423	5.659	5.163	5.672	5.539	5.723	ns
		GCLK PLL	t _{co}	1.582	1.762	2.310	2.430	2.668	2.667	2.611	2.544	2.783	2.786	2.607	ns
	12mA	GCLK	t _{co}	3.010	3.240	4.548	4.941	5.478	5.345	5.581	5.065	5.570	5.437	5.621	ns
		GCLK PLL	t _{co}	1.526	1.718	2.218	2.334	2.568	2.567	2.511	2.446	2.681	2.684	2.505	ns
	16mA	GCLK	t _{co}	2.976	3.194	4.514	4.904	5.421	5.288	5.524	5.025	5.526	5.393	5.577	ns
		GCLK PLL	t _{co}	1.493	1.672	2.184	2.297	2.527	2.526	2.470	2.406	2.637	2.640	2.461	ns
1.8 V	2mA	GCLK	t _{co}	3.263	3.506	4.954	5.373	5.898	5.765	6.001	5.511	6.035	5.902	6.086	ns
		GCLK PLL	t _{co}	1.779	1.983	2.623	2.765	3.018	3.017	2.961	2.890	3.145	3.148	2.969	ns
	4mA	GCLK	t _{co}	3.165	3.395	4.802	5.214	5.746	5.613	5.849	5.351	5.869	5.736	5.920	ns
		GCLK PLL	t _{co}	1.681	1.872	2.471	2.607	2.857	2.856	2.800	2.731	2.979	2.982	2.803	ns
	6mA	GCLK	t _{co}	3.082	3.307	4.674	5.075	5.605	5.472	5.708	5.205	5.720	5.587	5.771	ns
		GCLK PLL	t _{co}	1.599	1.785	2.344	2.469	2.713	2.712	2.656	2.587	2.831	2.834	2.655	ns
	8mA	GCLK	t _{co}	3.057	3.274	4.614	5.010	5.526	5.393	5.629	5.135	5.640	5.507	5.691	ns
		GCLK PLL	t _{co}	1.573	1.752	2.284	2.403	2.638	2.637	2.581	2.516	2.751	2.754	2.575	ns
	10mA	GCLK	t _{co}	2.986	3.210	4.526	4.916	5.444	5.311	5.547	5.038	5.539	5.406	5.590	ns
		GCLK PLL	t _{co}	1.502	1.688	2.196	2.309	2.539	2.538	2.482	2.419	2.650	2.653	2.474	ns
	12mA	GCLK	t _{co}	2.981	3.201	4.520	4.910	5.438	5.305	5.541	5.031	5.532	5.399	5.583	ns
		GCLK PLL	t _{co}	1.497	1.678	2.190	2.303	2.532	2.531	2.475	2.412	2.643	2.646	2.467	ns

Table 1–105. EP3SE50 Column Pins output Timing Parameters (Part 3 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.203	3.473	4.893	5.301	5.837	5.704	5.940	5.440	5.968	5.835	6.019	ns
		GCLK PLL	t _{co}	1.719	1.950	2.562	2.692	2.946	2.945	2.889	2.820	3.078	3.081	2.902	ns
	4mA	GCLK	t _{co}	3.071	3.291	4.648	5.044	5.568	5.435	5.671	5.171	5.680	5.547	5.731	ns
		GCLK PLL	t _{co}	1.588	1.769	2.318	2.438	2.675	2.674	2.618	2.552	2.791	2.794	2.615	ns
	6mA	GCLK	t _{co}	3.027	3.254	4.568	4.965	5.506	5.373	5.609	5.091	5.597	5.464	5.648	ns
		GCLK PLL	t _{co}	1.543	1.732	2.238	2.358	2.595	2.594	2.538	2.472	2.708	2.711	2.532	ns
	8mA	GCLK	t _{co}	3.016	3.248	4.562	4.957	5.499	5.366	5.602	5.084	5.589	5.456	5.640	ns
		GCLK PLL	t _{co}	1.532	1.726	2.232	2.350	2.586	2.585	2.529	2.465	2.701	2.704	2.525	ns
	10mA	GCLK	t _{co}	2.980	3.198	4.514	4.904	5.440	5.307	5.543	5.025	5.525	5.392	5.576	ns
		GCLK PLL	t _{co}	1.497	1.675	2.184	2.297	2.525	2.524	2.468	2.406	2.636	2.639	2.460	ns
	12mA	GCLK	t _{co}	2.976	3.191	4.493	4.882	5.437	5.304	5.540	5.004	5.503	5.370	5.554	ns
		GCLK PLL	t _{co}	1.493	1.668	2.163	2.276	2.505	2.504	2.448	2.385	2.614	2.617	2.438	ns
1.2 V	2mA	GCLK	t _{co}	3.183	3.416	4.847	5.254	5.783	5.650	5.886	5.387	5.903	5.770	5.954	ns
		GCLK PLL	t _{co}	1.699	1.893	2.516	2.646	2.889	2.888	2.832	2.767	3.012	3.015	2.836	ns
	4mA	GCLK	t _{co}	3.060	3.280	4.627	5.021	5.559	5.426	5.662	5.147	5.652	5.519	5.703	ns
		GCLK PLL	t _{co}	1.576	1.758	2.297	2.415	2.649	2.648	2.592	2.528	2.763	2.766	2.587	ns
	6mA	GCLK	t _{co}	3.006	3.239	4.551	4.945	5.505	5.372	5.608	5.072	5.579	5.446	5.630	ns
		GCLK PLL	t _{co}	1.523	1.717	2.221	2.338	2.575	2.574	2.518	2.453	2.691	2.694	2.515	ns
	8mA	GCLK	t _{co}	2.986	3.205	4.512	4.902	5.470	5.337	5.573	5.023	5.523	5.390	5.574	ns
		GCLK PLL	t _{co}	1.503	1.683	2.182	2.295	2.525	2.524	2.468	2.404	2.634	2.637	2.458	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.000	3.213	4.519	4.909	5.462	5.329	5.565	5.027	5.527	5.394	5.578	ns
		GCLK PLL	t _{co}	1.516	1.691	2.190	2.303	2.533	2.532	2.476	2.409	2.639	2.642	2.463	ns
	10mA	GCLK	t _{co}	3.003	3.216	4.523	4.913	5.468	5.335	5.571	5.031	5.531	5.398	5.582	ns
		GCLK PLL	t _{co}	1.519	1.694	2.194	2.307	2.537	2.536	2.480	2.413	2.643	2.646	2.467	ns
	12mA	GCLK	t _{co}	2.984	3.196	4.501	4.892	5.441	5.308	5.544	5.010	5.509	5.376	5.560	ns
		GCLK PLL	t _{co}	1.501	1.674	2.172	2.285	2.515	2.514	2.458	2.392	2.621	2.624	2.445	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	2.979	3.189	4.486	4.875	5.439	5.306	5.542	4.993	5.491	5.358	5.542	ns
		GCLK PLL	t _{co}	1.496	1.667	2.157	2.269	2.498	2.497	2.441	2.375	2.603	2.606	2.427	ns

Table 1-105. EP3SE50 Column Pins output Timing Parameters (Part 4 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.018	3.233	4.542	4.932	5.492	5.359	5.595	5.051	5.550	5.417	5.601	ns
		GCLK PLL	t _{co}	1.534	1.711	2.213	2.326	2.556	2.555	2.499	2.433	2.663	2.666	2.487	ns
	6mA	GCLK	t _{co}	2.999	3.213	4.520	4.910	5.468	5.335	5.571	5.029	5.528	5.395	5.579	ns
		GCLK PLL	t _{co}	1.515	1.690	2.191	2.304	2.534	2.533	2.477	2.411	2.640	2.643	2.464	ns
	8mA	GCLK	t _{co}	3.000	3.215	4.528	4.919	5.488	5.355	5.591	5.039	5.539	5.406	5.590	ns
		GCLK PLL	t _{co}	1.516	1.693	2.199	2.313	2.544	2.543	2.487	2.421	2.651	2.654	2.475	ns
	10mA	GCLK	t _{co}	2.983	3.195	4.504	4.894	5.463	5.330	5.566	5.013	5.514	5.381	5.565	ns
		GCLK PLL	t _{co}	1.499	1.673	2.174	2.288	2.519	2.518	2.462	2.395	2.625	2.628	2.449	ns
	12mA	GCLK	t _{co}	2.979	3.192	4.500	4.890	5.458	5.325	5.561	5.009	5.510	5.377	5.561	ns
		GCLK PLL	t _{co}	1.496	1.669	2.170	2.284	2.514	2.513	2.457	2.391	2.621	2.624	2.445	ns
SSTL-18 CLASS II	8mA	GCLK	t _{co}	2.979	3.190	4.487	4.876	5.443	5.310	5.546	4.994	5.492	5.359	5.543	ns
		GCLK PLL	t _{co}	1.496	1.668	2.158	2.269	2.498	2.497	2.441	2.376	2.604	2.607	2.428	ns
	16mA	GCLK	t _{co}	2.978	3.190	4.495	4.886	5.450	5.317	5.553	5.004	5.505	5.372	5.556	ns
		GCLK PLL	t _{co}	1.495	1.668	2.166	2.279	2.510	2.509	2.453	2.386	2.617	2.620	2.441	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.009	3.224	4.534	4.924	5.485	5.352	5.588	5.044	5.543	5.410	5.594	ns
		GCLK PLL	t _{co}	1.526	1.702	2.206	2.319	2.548	2.547	2.491	2.426	2.655	2.658	2.479	ns
	6mA	GCLK	t _{co}	2.994	3.208	4.521	4.912	5.481	5.348	5.584	5.032	5.532	5.399	5.583	ns
		GCLK PLL	t _{co}	1.511	1.686	2.192	2.306	2.536	2.535	2.479	2.413	2.644	2.647	2.468	ns
	8mA	GCLK	t _{co}	2.981	3.194	4.501	4.892	5.463	5.330	5.566	5.011	5.511	5.378	5.562	ns
		GCLK PLL	t _{co}	1.498	1.671	2.172	2.285	2.516	2.515	2.459	2.393	2.623	2.626	2.447	ns
	10mA	GCLK	t _{co}	2.981	3.194	4.502	4.893	5.474	5.341	5.577	5.013	5.514	5.381	5.565	ns
		GCLK PLL	t _{co}	1.498	1.672	2.173	2.287	2.519	2.518	2.462	2.395	2.626	2.629	2.450	ns
	12mA	GCLK	t _{co}	2.977	3.189	4.495	4.886	5.466	5.333	5.569	5.005	5.506	5.373	5.557	ns
		GCLK PLL	t _{co}	1.494	1.667	2.166	2.280	2.511	2.510	2.454	2.387	2.618	2.621	2.442	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	2.995	3.206	4.502	4.891	5.454	5.321	5.557	5.009	5.507	5.374	5.558	ns
		GCLK PLL	t _{co}	1.512	1.684	2.174	2.285	2.513	2.512	2.456	2.391	2.619	2.622	2.443	ns
	16mA	GCLK	t _{co}	2.994	3.206	4.507	4.896	5.472	5.339	5.575	5.015	5.513	5.380	5.564	ns
		GCLK PLL	t _{co}	1.511	1.684	2.178	2.290	2.519	2.518	2.462	2.396	2.625	2.628	2.449	ns

Table 1–105. EP3SE50 Column Pins output Timing Parameters (Part 5 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	2.981	3.192	4.491	4.880	5.454	5.321	5.557	4.998	5.497	5.364	5.548	ns
		GCLK PLL	t _{co}	1.498	1.670	2.162	2.274	2.503	2.502	2.446	2.380	2.609	2.612	2.433	ns
	6mA	GCLK	t _{co}	2.976	3.187	4.485	4.874	5.443	5.310	5.546	4.992	5.491	5.358	5.542	ns
		GCLK PLL	t _{co}	1.493	1.665	2.156	2.268	2.497	2.496	2.440	2.374	2.603	2.606	2.427	ns
	8mA	GCLK	t _{co}	2.978	3.190	4.490	4.880	5.464	5.331	5.567	4.998	5.497	5.364	5.548	ns
		GCLK PLL	t _{co}	1.495	1.668	2.161	2.273	2.503	2.502	2.446	2.380	2.609	2.612	2.433	ns
	10mA	GCLK	t _{co}	2.978	3.188	4.483	4.872	5.445	5.312	5.548	4.990	5.488	5.355	5.539	ns
		GCLK PLL	t _{co}	1.494	1.666	2.154	2.266	2.495	2.494	2.438	2.372	2.600	2.603	2.424	ns
	12mA	GCLK	t _{co}	2.996	3.207	4.505	4.893	5.459	5.326	5.562	5.011	5.509	5.376	5.560	ns
		GCLK PLL	t _{co}	1.513	1.685	2.176	2.287	2.516	2.515	2.459	2.394	2.621	2.624	2.445	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	2.991	3.203	4.503	4.892	5.466	5.333	5.569	5.011	5.509	5.376	5.560	ns
		GCLK PLL	t _{co}	1.508	1.681	2.174	2.286	2.515	2.514	2.458	2.393	2.621	2.624	2.445	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	2.990	3.203	4.504	4.893	5.467	5.334	5.570	5.012	5.510	5.377	5.561	ns
		GCLK PLL	t _{co}	1.507	1.680	2.175	2.287	2.516	2.515	2.459	2.394	2.622	2.625	2.446	ns
	6mA	GCLK	t _{co}	2.981	3.192	4.491	4.881	5.454	5.321	5.557	4.999	5.498	5.365	5.549	ns
		GCLK PLL	t _{co}	1.498	1.670	2.162	2.275	2.504	2.503	2.447	2.381	2.610	2.613	2.434	ns
	8mA	GCLK	t _{co}	2.983	3.195	4.497	4.887	5.469	5.336	5.572	5.006	5.506	5.373	5.557	ns
		GCLK PLL	t _{co}	1.499	1.672	2.168	2.281	2.512	2.511	2.455	2.388	2.618	2.621	2.442	ns
	10mA	GCLK	t _{co}	3.004	3.219	4.525	4.915	5.487	5.354	5.590	5.034	5.533	5.400	5.584	ns
		GCLK PLL	t _{co}	1.521	1.697	2.196	2.308	2.538	2.537	2.481	2.416	2.645	2.648	2.469	ns
	12mA	GCLK	t _{co}	2.994	3.207	4.513	4.903	5.477	5.344	5.580	5.022	5.522	5.389	5.573	ns
		GCLK PLL	t _{co}	1.511	1.685	2.184	2.297	2.527	2.526	2.470	2.404	2.634	2.637	2.458	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	2.992	3.206	4.511	4.902	5.482	5.349	5.585	5.021	5.521	5.388	5.572	ns
		GCLK PLL	t _{co}	1.509	1.683	2.182	2.295	2.525	2.524	2.468	2.403	2.633	2.636	2.457	ns

Table 1-105. EP3SE50 Column Pins output Timing Parameters (Part 6 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	2.990	3.203	4.509	4.901	5.484	5.351	5.587	5.020	5.520	5.387	5.571	ns
		GCLK PLL	t _{co}	1.507	1.681	2.181	2.295	2.525	2.524	2.468	2.402	2.633	2.636	2.457	ns
	6mA	GCLK	t _{co}	2.986	3.199	4.503	4.894	5.475	5.342	5.578	5.013	5.513	5.380	5.564	ns
		GCLK PLL	t _{co}	1.503	1.677	2.174	2.288	2.518	2.517	2.461	2.395	2.625	2.628	2.449	ns
	8mA	GCLK	t _{co}	3.063	3.274	4.522	4.903	5.451	5.318	5.554	5.022	5.512	5.379	5.563	ns
		GCLK PLL	t _{co}	1.580	1.752	2.192	2.296	2.515	2.514	2.458	2.403	2.623	2.626	2.447	ns
	10mA	GCLK	t _{co}	3.063	3.274	4.522	4.903	5.451	5.318	5.554	5.022	5.512	5.379	5.563	ns
		GCLK PLL	t _{co}	1.580	1.752	2.192	2.296	2.515	2.514	2.458	2.403	2.623	2.626	2.447	ns
	12mA	GCLK	t _{co}	3.092	3.314	4.588	4.978	5.471	5.338	5.574	5.100	5.594	5.461	5.645	ns
		GCLK PLL	t _{co}	1.609	1.791	2.258	2.371	2.595	2.594	2.538	2.481	2.704	2.707	2.528	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.014	3.225	4.485	4.867	5.354	5.221	5.457	4.985	5.474	5.341	5.525	ns
		GCLK PLL	t _{co}	1.530	1.702	2.154	2.259	2.478	2.477	2.421	2.365	2.584	2.587	2.408	ns
3.0-V PCI	—	GCLK	t _{co}	2.983	3.192	4.418	4.796	5.284	5.151	5.387	4.915	5.406	5.273	5.457	ns
		GCLK PLL	t _{co}	1.500	1.670	2.087	2.189	2.408	2.407	2.351	2.295	2.517	2.520	2.341	ns
3.0-V PCI-X	—	GCLK	t _{co}	2.969	3.177	4.397	4.772	5.256	5.123	5.359	4.887	5.372	5.239	5.423	ns
		GCLK PLL	t _{co}	1.486	1.656	2.066	2.166	2.380	2.379	2.323	2.269	2.483	2.486	2.307	ns

Table 1-106 specifies EP3SE50 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1-106. EP3SE50 Row Pins output Timing Parameters (Part 1 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTL	4mA	GCLK	t _{co}	3.161	3.395	4.722	5.117	5.622	5.486	5.755	5.247	5.754	5.618	5.832	ns
		GCLK PLL	t _{co}	1.488	1.692	2.101	2.185	2.381	2.400	2.349	2.304	2.505	2.523	2.344	ns
	8mA	GCLK	t _{co}	3.095	3.324	4.612	5.005	5.508	5.372	5.611	5.134	5.638	5.502	5.683	ns
		GCLK PLL	t _{co}	1.395	1.587	1.971	2.047	2.237	2.256	2.205	2.163	2.356	2.374	2.195	ns
	12mA	GCLK	t _{co}	3.016	3.235	4.506	4.905	5.412	5.276	5.483	5.035	5.539	5.403	5.551	ns
		GCLK PLL	t _{co}	1.314	1.493	1.852	1.924	2.109	2.128	2.077	2.036	2.224	2.242	2.063	ns

Table 1–106. EP3SE50 Row Pins output Timing Parameters (Part 2 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.163	3.402	4.726	5.122	5.631	5.495	5.760	5.255	5.766	5.630	5.837	ns
		GCLK PLL	t _{co}	1.498	1.696	2.109	2.190	2.386	2.405	2.354	2.310	2.510	2.528	2.349	ns
	8mA	GCLK	t _{co}	3.020	3.239	4.517	4.920	5.422	5.286	5.489	5.047	5.548	5.412	5.558	ns
		GCLK PLL	t _{co}	1.318	1.497	1.858	1.930	2.115	2.134	2.083	2.042	2.231	2.249	2.070	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.122	3.356	4.689	5.085	5.588	5.452	5.712	5.215	5.720	5.584	5.790	ns
		GCLK PLL	t _{co}	1.442	1.638	2.053	2.138	2.338	2.357	2.306	2.261	2.463	2.481	2.302	ns
	8mA	GCLK	t _{co}	3.021	3.244	4.552	4.943	5.443	5.307	5.548	5.073	5.575	5.438	5.625	ns
		GCLK PLL	t _{co}	1.319	1.511	1.900	1.979	2.174	2.193	2.142	2.099	2.299	2.316	2.137	ns
	12mA	GCLK	t _{co}	2.984	3.206	4.492	4.878	5.373	5.237	5.460	5.005	5.501	5.365	5.532	ns
		GCLK PLL	t _{co}	1.282	1.464	1.818	1.896	2.086	2.105	2.054	2.013	2.206	2.223	2.044	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.043	3.268	4.587	4.978	5.479	5.343	5.601	5.107	5.611	5.474	5.678	ns
		GCLK PLL	t _{co}	1.356	1.557	1.947	2.031	2.227	2.246	2.195	2.153	2.352	2.369	2.190	ns
	8mA	GCLK	t _{co}	2.971	3.190	4.464	4.849	5.345	5.209	5.421	4.975	5.473	5.336	5.492	ns
		GCLK PLL	t _{co}	1.269	1.448	1.783	1.857	2.047	2.066	2.015	1.973	2.166	2.183	2.004	ns
2.5 V	4mA	GCLK	t _{co}	3.148	3.393	4.797	5.211	5.733	5.597	5.884	5.347	5.872	5.736	5.968	ns
		GCLK PLL	t _{co}	1.468	1.674	2.185	2.292	2.510	2.529	2.478	2.421	2.642	2.659	2.480	ns
	8mA	GCLK	t _{co}	3.063	3.290	4.673	5.076	5.591	5.455	5.714	5.210	5.728	5.591	5.794	ns
		GCLK PLL	t _{co}	1.361	1.575	2.030	2.129	2.340	2.359	2.308	2.254	2.468	2.485	2.306	ns
	12mA	GCLK	t _{co}	3.006	3.246	4.589	4.990	5.500	5.364	5.588	5.121	5.633	5.497	5.664	ns
		GCLK PLL	t _{co}	1.312	1.504	1.919	2.010	2.214	2.233	2.182	2.131	2.338	2.355	2.176	ns
1.8 V	2mA	GCLK	t _{co}	3.405	3.663	5.253	5.717	6.292	6.156	6.368	5.867	6.444	6.308	6.461	ns
		GCLK PLL	t _{co}	1.650	1.863	2.459	2.597	2.849	2.868	2.787	2.729	2.984	3.002	2.793	ns
	4mA	GCLK	t _{co}	3.180	3.461	4.926	5.349	5.887	5.751	5.963	5.502	6.038	5.901	6.054	ns
		GCLK PLL	t _{co}	1.477	1.677	2.168	2.271	2.489	2.508	2.427	2.403	2.623	2.640	2.431	ns
	6mA	GCLK	t _{co}	3.115	3.359	4.773	5.199	5.728	5.592	5.804	5.334	5.865	5.729	5.882	ns
		GCLK PLL	t _{co}	1.402	1.595	2.069	2.166	2.388	2.407	2.326	2.289	2.517	2.535	2.326	ns
	8mA	GCLK	t _{co}	3.055	3.285	4.696	5.106	5.632	5.496	5.708	5.239	5.771	5.635	5.788	ns
		GCLK PLL	t _{co}	1.384	1.575	2.012	2.113	2.323	2.342	2.261	2.233	2.445	2.463	2.254	ns

Table 1–106. EP3SE50 Row Pins output Timing Parameters (Part 3 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.316	3.581	5.163	5.631	6.220	6.084	6.296	5.774	6.368	6.232	6.385	ns
		GCLK PLL	t _{co}	1.592	1.806	2.387	2.524	2.786	2.805	2.724	2.650	2.919	2.937	2.728	ns
	4mA	GCLK	t _{co}	3.074	3.324	4.758	5.194	5.729	5.593	5.805	5.328	5.864	5.728	5.881	ns
		GCLK PLL	t _{co}	1.400	1.592	2.065	2.166	2.392	2.411	2.330	2.286	2.518	2.536	2.327	ns
	6mA	GCLK	t _{co}	3.047	3.276	4.685	5.098	5.623	5.487	5.699	5.230	5.759	5.623	5.776	ns
		GCLK PLL	t _{co}	1.373	1.566	1.996	2.105	2.323	2.342	2.261	2.226	2.445	2.463	2.254	ns
	8mA	GCLK	t _{co}	3.038	3.267	4.663	5.080	5.604	5.468	5.680	5.212	5.737	5.601	5.754	ns
		GCLK PLL	t _{co}	1.354	1.555	1.980	2.081	2.304	2.323	2.242	2.202	2.426	2.444	2.235	ns
1.2 V	2mA	GCLK	t _{co}	3.259	3.506	5.073	5.545	6.145	6.009	6.221	5.686	6.284	6.148	6.301	ns
		GCLK PLL	t _{co}	1.522	1.719	2.308	2.456	2.725	2.744	2.663	2.582	2.850	2.868	2.659	ns
	4mA	GCLK	t _{co}	3.079	3.317	4.780	5.222	5.770	5.634	5.846	5.353	5.906	5.770	5.923	ns
		GCLK PLL	t _{co}	1.405	1.596	2.082	2.194	2.440	2.459	2.378	2.315	2.562	2.580	2.371	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.010	3.234	4.582	4.981	5.490	5.354	5.556	5.108	5.619	5.483	5.627	ns
		GCLK PLL	t _{co}	1.308	1.492	1.899	1.984	2.183	2.202	2.150	2.100	2.301	2.318	2.139	ns
	12mA	GCLK	t _{co}	3.005	3.230	4.579	4.979	5.488	5.352	5.548	5.107	5.618	5.482	5.620	ns
		GCLK PLL	t _{co}	1.303	1.488	1.896	1.982	2.181	2.200	2.142	2.099	2.300	2.317	2.132	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	2.996	3.219	4.564	4.963	5.471	5.335	5.521	5.090	5.600	5.464	5.593	ns
		GCLK PLL	t _{co}	1.294	1.477	1.881	1.966	2.164	2.183	2.115	2.082	2.282	2.299	2.105	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.016	3.241	4.591	4.993	5.505	5.369	5.581	5.120	5.634	5.498	5.651	ns
		GCLK PLL	t _{co}	1.333	1.519	1.931	2.017	2.218	2.237	2.156	2.132	2.336	2.354	2.145	ns
	6mA	GCLK	t _{co}	3.001	3.227	4.588	4.991	5.503	5.367	5.579	5.118	5.632	5.496	5.649	ns
		GCLK PLL	t _{co}	1.328	1.514	1.929	2.016	2.217	2.236	2.155	2.130	2.334	2.352	2.143	ns
	8mA	GCLK	t _{co}	2.990	3.215	4.571	4.974	5.486	5.350	5.562	5.101	5.616	5.480	5.633	ns
		GCLK PLL	t _{co}	1.317	1.503	1.919	2.006	2.207	2.226	2.145	2.121	2.325	2.343	2.134	ns
	10mA	GCLK	t _{co}	2.966	3.192	4.555	4.958	5.471	5.335	5.547	5.086	5.601	5.465	5.618	ns
		GCLK PLL	t _{co}	1.306	1.492	1.906	1.993	2.194	2.213	2.132	2.109	2.313	2.331	2.122	ns
	12mA	GCLK	t _{co}	2.966	3.191	4.554	4.957	5.470	5.334	5.546	5.085	5.600	5.464	5.617	ns
		GCLK PLL	t _{co}	1.306	1.491	1.906	1.993	2.194	2.213	2.132	2.108	2.313	2.331	2.122	ns

Table 1–106. EP3SE50 Row Pins output Timing Parameters (Part 4 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	2.976	3.200	4.552	4.953	5.464	5.328	5.540	5.080	5.593	5.457	5.610	ns
		GCLK PLL	t _{co}	1.314	1.498	1.905	1.990	2.189	2.208	2.127	2.104	2.307	2.325	2.116	ns
	16mA	GCLK	t _{co}	2.975	3.198	4.551	4.954	5.466	5.330	5.542	5.082	5.597	5.461	5.614	ns
		GCLK PLL	t _{co}	1.315	1.501	1.911	1.998	2.199	2.218	2.137	2.113	2.318	2.336	2.127	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.012	3.237	4.602	5.007	5.522	5.386	5.598	5.133	5.650	5.514	5.667	ns
		GCLK PLL	t _{co}	1.336	1.522	1.940	2.028	2.231	2.250	2.169	2.142	2.348	2.366	2.157	ns
	6mA	GCLK	t _{co}	2.989	3.215	4.584	4.990	5.505	5.369	5.581	5.117	5.634	5.498	5.651	ns
		GCLK PLL	t _{co}	1.322	1.508	1.929	2.018	2.221	2.240	2.159	2.133	2.339	2.357	2.148	ns
	8mA	GCLK	t _{co}	2.972	3.198	4.567	4.972	5.487	5.351	5.563	5.099	5.617	5.481	5.634	ns
		GCLK PLL	t _{co}	1.311	1.496	1.916	2.005	2.208	2.227	2.146	2.120	2.326	2.344	2.135	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	2.991	3.213	4.558	4.958	5.467	5.331	5.543	5.084	5.596	5.460	5.613	ns
		GCLK PLL	t _{co}	1.321	1.504	1.904	1.988	2.187	2.206	2.125	2.103	2.304	2.322	2.113	ns
	6mA	GCLK	t _{co}	2.979	3.201	4.549	4.950	5.459	5.323	5.535	5.076	5.589	5.453	5.606	ns
		GCLK PLL	t _{co}	1.314	1.498	1.902	1.987	2.186	2.205	2.124	2.102	2.304	2.322	2.113	ns
	8mA	GCLK	t _{co}	2.966	3.189	4.541	4.941	5.451	5.315	5.527	5.068	5.581	5.445	5.598	ns
		GCLK PLL	t _{co}	1.305	1.490	1.895	1.980	2.179	2.198	2.117	2.095	2.297	2.315	2.106	ns
	10mA	GCLK	t _{co}	2.968	3.191	4.543	4.944	5.454	5.318	5.530	5.071	5.584	5.448	5.601	ns
		GCLK PLL	t _{co}	1.308	1.492	1.898	1.983	2.183	2.202	2.121	2.098	2.300	2.318	2.109	ns
	12mA	GCLK	t _{co}	2.964	3.186	4.541	4.943	5.454	5.318	5.530	5.071	5.585	5.449	5.602	ns
		GCLK PLL	t _{co}	1.304	1.489	1.900	1.986	2.186	2.205	2.124	2.101	2.305	2.323	2.114	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	2.972	3.194	4.536	4.935	5.445	5.309	5.521	5.062	5.574	5.438	5.591	ns
		GCLK PLL	t _{co}	1.312	1.497	1.898	1.983	2.182	2.201	2.120	2.097	2.299	2.317	2.108	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	2.998	3.220	4.569	4.971	5.482	5.346	5.558	5.096	5.610	5.474	5.627	ns
		GCLK PLL	t _{co}	1.327	1.510	1.913	1.998	2.198	2.217	2.136	2.112	2.315	2.333	2.124	ns
	6mA	GCLK	t _{co}	2.986	3.210	4.565	4.967	5.478	5.342	5.554	5.093	5.607	5.471	5.624	ns
		GCLK PLL	t _{co}	1.321	1.505	1.914	2.000	2.200	2.219	2.138	2.114	2.318	2.336	2.127	ns
	8mA	GCLK	t _{co}	2.982	3.205	4.559	4.961	5.472	5.336	5.548	5.087	5.601	5.465	5.618	ns
		GCLK PLL	t _{co}	1.317	1.501	1.909	1.995	2.195	2.214	2.133	2.109	2.312	2.330	2.121	ns

Table 1-106. EP3SE50 Row Pins output Timing Parameters (Part 5 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	2.997	3.219	4.580	4.985	5.500	5.364	5.576	5.110	5.627	5.491	5.644	ns
		GCLK PLL	t _{co}	1.329	1.512	1.926	2.014	2.217	2.236	2.155	2.128	2.334	2.352	2.143	ns
	6mA	GCLK	t _{co}	2.985	3.207	4.569	4.973	5.488	5.352	5.564	5.099	5.616	5.480	5.633	ns
		GCLK PLL	t _{co}	1.320	1.504	1.917	2.005	2.208	2.227	2.146	2.119	2.325	2.343	2.134	ns
	8mA	GCLK	t _{co}	2.982	3.205	4.573	4.978	5.494	5.358	5.570	5.105	5.623	5.487	5.640	ns
		GCLK PLL	t _{co}	1.319	1.504	1.924	2.013	2.217	2.236	2.155	2.128	2.335	2.353	2.144	ns
3.0-V PCI	—	GCLK	t _{co}	3.116	3.340	4.634	5.027	5.530	5.394	5.578	5.156	5.661	5.525	5.651	ns
		GCLK PLL	t _{co}	1.414	1.598	1.951	2.030	2.223	2.242	2.160	2.148	2.343	2.360	2.151	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.116	3.340	4.634	5.027	5.530	5.394	5.578	5.156	5.661	5.525	5.651	ns
		GCLK PLL	t _{co}	1.414	1.598	1.951	2.030	2.223	2.242	2.160	2.148	2.343	2.360	2.151	ns

Table 1-117 through Table 1-110 show the maximum I/O timing parameters for EP3SE50 devices for differential I/O standards.

Table 1-107 specifies EP3SE50 column pins input timing parameters for differential I/O standards.

Table 1-107. EP3SE50 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	GCLK	t _{su}	-0.730	-0.751	-1.114	-1.228	-1.341	-1.284	-1.581	-1.230	-1.344	-1.290	-1.617	ns
		t _h	0.848	0.884	1.299	1.436	1.571	1.501	1.798	1.446	1.583	1.516	1.835	ns
	GCLK PLL	t _{su}	1.120	1.138	1.796	2.027	2.253	2.141	2.145	2.036	2.262	2.145	2.193	ns
		t _h	-0.867	-0.870	-1.397	-1.578	-1.752	-1.669	-1.666	-1.580	-1.754	-1.665	-1.710	ns
MINI-LVDS	GCLK	t _{su}	-0.730	-0.751	-1.114	-1.228	-1.341	-1.284	-1.581	-1.230	-1.344	-1.290	-1.617	ns
		t _h	0.848	0.884	1.299	1.436	1.571	1.501	1.798	1.446	1.583	1.516	1.835	ns
	GCLK PLL	t _{su}	1.120	1.138	1.796	2.027	2.253	2.141	2.145	2.036	2.262	2.145	2.193	ns
		t _h	-0.867	-0.870	-1.397	-1.578	-1.752	-1.669	-1.666	-1.580	-1.754	-1.665	-1.710	ns
RSDS	GCLK	t _{su}	-0.738	-0.763	-1.124	-1.239	-1.357	-1.300	-1.597	-1.241	-1.359	-1.305	-1.632	ns
		t _h	0.856	0.896	1.309	1.447	1.587	1.517	1.814	1.457	1.598	1.531	1.850	ns
	GCLK PLL	t _{su}	1.112	1.126	1.786	2.016	2.237	2.125	2.129	2.025	2.247	2.130	2.178	ns
		t _h	-0.859	-0.858	-1.387	-1.567	-1.736	-1.653	-1.650	-1.569	-1.739	-1.650	-1.695	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.738	-0.763	-1.124	-1.239	-1.357	-1.300	-1.597	-1.241	-1.359	-1.305	-1.632	ns
		t _h	0.856	0.896	1.309	1.447	1.587	1.517	1.814	1.457	1.598	1.531	1.850	ns
	GCLK PLL	t _{su}	1.112	1.126	1.786	2.016	2.237	2.125	2.129	2.025	2.247	2.130	2.178	ns
		t _h	-0.859	-0.858	-1.387	-1.567	-1.736	-1.653	-1.650	-1.569	-1.739	-1.650	-1.695	ns

Table 1-107. EP3SE50 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.750	-0.774	-1.133	-1.250	-1.376	-1.319	-1.616	-1.252	-1.377	-1.323	-1.650	ns
		t _h	0.868	0.907	1.319	1.458	1.606	1.536	1.833	1.468	1.616	1.549	1.868	ns
	GCLK PLL	t _{su}	1.100	1.115	1.777	2.005	2.218	2.106	2.110	2.014	2.229	2.112	2.160	ns
		t _h	-0.847	-0.847	-1.377	-1.556	-1.717	-1.634	-1.631	-1.558	-1.721	-1.632	-1.677	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.750	-0.774	-1.133	-1.250	-1.376	-1.319	-1.616	-1.252	-1.377	-1.323	-1.650	ns
		t _h	0.868	0.907	1.319	1.458	1.606	1.536	1.833	1.468	1.616	1.549	1.868	ns
	GCLK PLL	t _{su}	1.100	1.115	1.777	2.005	2.218	2.106	2.110	2.014	2.229	2.112	2.160	ns
		t _h	-0.847	-0.847	-1.377	-1.556	-1.717	-1.634	-1.631	-1.558	-1.721	-1.632	-1.677	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.738	-0.763	-1.124	-1.239	-1.357	-1.300	-1.597	-1.241	-1.359	-1.305	-1.632	ns
		t _h	0.856	0.896	1.309	1.447	1.587	1.517	1.814	1.457	1.598	1.531	1.850	ns
	GCLK PLL	t _{su}	1.112	1.126	1.786	2.016	2.237	2.125	2.129	2.025	2.247	2.130	2.178	ns
		t _h	-0.859	-0.858	-1.387	-1.567	-1.736	-1.653	-1.650	-1.569	-1.739	-1.650	-1.695	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.738	-0.763	-1.124	-1.239	-1.357	-1.300	-1.597	-1.241	-1.359	-1.305	-1.632	ns
		t _h	0.856	0.896	1.309	1.447	1.587	1.517	1.814	1.457	1.598	1.531	1.850	ns
	GCLK PLL	t _{su}	1.112	1.126	1.786	2.016	2.237	2.125	2.129	2.025	2.247	2.130	2.178	ns
		t _h	-0.859	-0.858	-1.387	-1.567	-1.736	-1.653	-1.650	-1.569	-1.739	-1.650	-1.695	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.750	-0.774	-1.133	-1.250	-1.376	-1.319	-1.616	-1.252	-1.377	-1.323	-1.650	ns
		t _h	0.868	0.907	1.319	1.458	1.606	1.536	1.833	1.468	1.616	1.549	1.868	ns
	GCLK PLL	t _{su}	1.100	1.115	1.777	2.005	2.218	2.106	2.110	2.014	2.229	2.112	2.160	ns
		t _h	-0.847	-0.847	-1.377	-1.556	-1.717	-1.634	-1.631	-1.558	-1.721	-1.632	-1.677	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.750	-0.774	-1.133	-1.250	-1.376	-1.319	-1.616	-1.252	-1.377	-1.323	-1.650	ns
		t _h	0.868	0.907	1.319	1.458	1.606	1.536	1.833	1.468	1.616	1.549	1.868	ns
	GCLK PLL	t _{su}	1.100	1.115	1.777	2.005	2.218	2.106	2.110	2.014	2.229	2.112	2.160	ns
		t _h	-0.847	-0.847	-1.377	-1.556	-1.717	-1.634	-1.631	-1.558	-1.721	-1.632	-1.677	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.757	-0.780	-1.145	-1.255	-1.376	-1.321	-1.615	-1.256	-1.372	-1.321	-1.646	ns
		t _h	0.875	0.913	1.332	1.466	1.609	1.539	1.837	1.475	1.616	1.548	1.869	ns
	GCLK PLL	t _{su}	1.093	1.109	1.765	2.000	2.218	2.104	2.111	2.010	2.234	2.114	2.164	ns
		t _h	-0.840	-0.841	-1.364	-1.548	-1.714	-1.631	-1.627	-1.551	-1.721	-1.633	-1.676	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.757	-0.780	-1.145	-1.255	-1.376	-1.321	-1.615	-1.256	-1.372	-1.321	-1.646	ns
		t _h	0.875	0.913	1.332	1.466	1.609	1.539	1.837	1.475	1.616	1.548	1.869	ns
	GCLK PLL	t _{su}	1.093	1.109	1.765	2.000	2.218	2.104	2.111	2.010	2.234	2.114	2.164	ns
		t _h	-0.840	-0.841	-1.364	-1.548	-1.714	-1.631	-1.627	-1.551	-1.721	-1.633	-1.676	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.730	-0.751	-1.114	-1.228	-1.341	-1.284	-1.581	-1.230	-1.344	-1.290	-1.617	ns
		t _h	0.848	0.884	1.299	1.436	1.571	1.501	1.798	1.446	1.583	1.516	1.835	ns
	GCLK PLL	t _{su}	1.120	1.138	1.796	2.027	2.253	2.141	2.145	2.036	2.262	2.145	2.193	ns
		t _h	-0.867	-0.870	-1.397	-1.578	-1.752	-1.669	-1.666	-1.580	-1.754	-1.665	-1.710	ns

Table 1-107. EP3SE50 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t_{SU}	-0.730	-0.751	-1.114	-1.228	-1.341	-1.284	-1.581	-1.230	-1.344	-1.290	-1.617	ns
		t_H	0.848	0.884	1.299	1.436	1.571	1.501	1.798	1.446	1.583	1.516	1.835	ns
	GCLK PLL	t_{SU}	1.120	1.138	1.796	2.027	2.253	2.141	2.145	2.036	2.262	2.145	2.193	ns
		t_H	-0.867	-0.870	-1.397	-1.578	-1.752	-1.669	-1.666	-1.580	-1.754	-1.665	-1.710	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t_{SU}	-0.738	-0.763	-1.124	-1.239	-1.357	-1.300	-1.597	-1.241	-1.359	-1.305	-1.632	ns
		t_H	0.856	0.896	1.309	1.447	1.587	1.517	1.814	1.457	1.598	1.531	1.850	ns
	GCLK PLL	t_{SU}	1.112	1.126	1.786	2.016	2.237	2.125	2.129	2.025	2.247	2.130	2.178	ns
		t_H	-0.859	-0.858	-1.387	-1.567	-1.736	-1.653	-1.650	-1.569	-1.739	-1.650	-1.695	ns

Table 1-108 specifies EP3SE50 row pins input timing parameters for differential I/O standards.

Table 1-108. EP3SE50 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{SU}	-0.925	-0.948	-1.004	-0.967	-1.102	-1.057	-1.337	-0.933	-1.060	-1.017	-1.369	ns
		t_H	1.048	1.086	1.223	1.219	1.381	1.322	1.601	1.199	1.353	1.296	1.634	ns
	GCLK PLL	t_{SU}	0.886	0.901	1.866	2.244	2.450	2.324	2.344	2.289	2.502	2.376	2.396	ns
		t_H	-0.626	-0.628	-1.432	-1.750	-1.897	-1.803	-1.817	-1.782	-1.937	-1.842	-1.867	ns
MINI-LVDS	GCLK	t_{SU}	-0.925	-0.948	-1.004	-0.967	-1.102	-1.057	-1.337	-0.933	-1.060	-1.017	-1.369	ns
		t_H	1.048	1.086	1.223	1.219	1.381	1.322	1.601	1.199	1.353	1.296	1.634	ns
	GCLK PLL	t_{SU}	0.886	0.901	1.866	2.244	2.450	2.324	2.344	2.289	2.502	2.376	2.396	ns
		t_H	-0.626	-0.628	-1.432	-1.750	-1.897	-1.803	-1.817	-1.782	-1.937	-1.842	-1.867	ns
RSDS	GCLK	t_{SU}	-0.925	-0.948	-1.004	-0.967	-1.102	-1.057	-1.337	-0.933	-1.060	-1.017	-1.369	ns
		t_H	1.048	1.086	1.223	1.219	1.381	1.322	1.601	1.199	1.353	1.296	1.634	ns
	GCLK PLL	t_{SU}	0.886	0.901	1.866	2.244	2.450	2.324	2.344	2.289	2.502	2.376	2.396	ns
		t_H	-0.626	-0.628	-1.432	-1.750	-1.897	-1.803	-1.817	-1.782	-1.937	-1.842	-1.867	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{SU}	-0.740	-0.773	-1.101	-1.201	-1.301	-1.251	-1.526	-1.210	-1.307	-1.259	-1.563	ns
		t_H	0.856	0.902	1.288	1.408	1.531	1.467	1.741	1.427	1.548	1.486	1.779	ns
	GCLK PLL	t_{SU}	1.081	1.086	1.779	2.020	2.261	2.140	2.165	2.022	2.265	2.144	2.212	ns
		t_H	-0.828	-0.822	-1.377	-1.571	-1.757	-1.668	-1.687	-1.564	-1.752	-1.662	-1.732	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{SU}	-0.740	-0.773	-1.101	-1.201	-1.301	-1.251	-1.526	-1.210	-1.307	-1.259	-1.563	ns
		t_H	0.856	0.902	1.288	1.408	1.531	1.467	1.741	1.427	1.548	1.486	1.779	ns
	GCLK PLL	t_{SU}	1.081	1.086	1.779	2.020	2.261	2.140	2.165	2.022	2.265	2.144	2.212	ns
		t_H	-0.828	-0.822	-1.377	-1.571	-1.757	-1.668	-1.687	-1.564	-1.752	-1.662	-1.732	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{SU}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_H	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{SU}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_H	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{SU}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_H	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{SU}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_H	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{SU}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t_H	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t_{SU}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t_H	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns

Table 1-108. EP3SE50 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t _h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t _{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t _h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t _h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t _{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t _h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t _h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t _{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t _h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t _h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t _{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t _h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t _h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t _{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t _h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.762	-0.796	-1.128	-1.227	-1.336	-1.287	-1.561	-1.231	-1.336	-1.290	-1.593	ns
		t _h	0.878	0.925	1.314	1.436	1.569	1.505	1.780	1.451	1.580	1.518	1.813	ns
	GCLK PLL	t _{su}	1.049	1.053	1.742	1.984	2.216	2.094	2.120	1.991	2.226	2.103	2.172	ns
		t _h	-0.796	-0.789	-1.341	-1.533	-1.709	-1.620	-1.638	-1.530	-1.710	-1.620	-1.688	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.762	-0.796	-1.128	-1.227	-1.336	-1.287	-1.561	-1.231	-1.336	-1.290	-1.593	ns
		t _h	0.878	0.925	1.314	1.436	1.569	1.505	1.780	1.451	1.580	1.518	1.813	ns
	GCLK PLL	t _{su}	1.049	1.053	1.742	1.984	2.216	2.094	2.120	1.991	2.226	2.103	2.172	ns
		t _h	-0.796	-0.789	-1.341	-1.533	-1.709	-1.620	-1.638	-1.530	-1.710	-1.620	-1.688	ns

Table 1-109 specifies EP3SE50 Column Pins Output Timing parameters for differential I/O standards.

Table 1-109. EP3SE50 Column Pins Output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS_E_1R	—	GCLK	t_{co}	3.049	3.267	4.596	4.998	5.509	5.368	5.597	5.124	5.636	5.496	5.663	ns
		GCLK PLL	t_{co}	1.335	1.514	1.903	1.989	2.191	2.203	2.139	2.102	2.305	2.320	2.125	ns
LVDS_E_3R	—	GCLK	t_{co}	3.045	3.270	4.643	5.053	5.571	5.430	5.659	5.183	5.702	5.562	5.729	ns
		GCLK PLL	t_{co}	1.331	1.517	1.950	2.044	2.253	2.265	2.201	2.161	2.371	2.386	2.191	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.049	3.267	4.596	4.998	5.509	5.368	5.597	5.124	5.636	5.496	5.663	ns
		GCLK PLL	t_{co}	1.335	1.514	1.903	1.989	2.191	2.203	2.139	2.102	2.305	2.320	2.125	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.045	3.270	4.643	5.053	5.571	5.430	5.659	5.183	5.702	5.562	5.729	ns
		GCLK PLL	t_{co}	1.331	1.517	1.950	2.044	2.253	2.265	2.201	2.161	2.371	2.386	2.191	ns
RSDS_E_1R	—	GCLK	t_{co}	3.049	3.267	4.596	4.998	5.509	5.368	5.597	5.124	5.636	5.496	5.663	ns
		GCLK PLL	t_{co}	1.335	1.514	1.903	1.989	2.191	2.203	2.139	2.102	2.305	2.320	2.125	ns
RSDS_E_3R	—	GCLK	t_{co}	3.045	3.270	4.643	5.053	5.571	5.430	5.659	5.183	5.702	5.562	5.729	ns
		GCLK PLL	t_{co}	1.331	1.517	1.950	2.044	2.253	2.265	2.201	2.161	2.371	2.386	2.191	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.076	3.300	4.667	5.076	5.593	5.452	5.681	5.204	5.722	5.582	5.749	ns
		GCLK PLL	t_{co}	1.362	1.547	1.974	2.067	2.275	2.287	2.223	2.182	2.391	2.406	2.211	ns
	6mA	GCLK	t_{co}	3.066	3.290	4.657	5.065	5.583	5.442	5.671	5.193	5.712	5.572	5.739	ns
		GCLK PLL	t_{co}	1.352	1.537	1.964	2.056	2.265	2.277	2.213	2.171	2.381	2.396	2.201	ns
	8mA	GCLK	t_{co}	3.066	3.290	4.660	5.069	5.587	5.446	5.675	5.198	5.717	5.577	5.744	ns
		GCLK PLL	t_{co}	1.352	1.537	1.967	2.060	2.269	2.281	2.217	2.176	2.386	2.401	2.206	ns
	10mA	GCLK	t_{co}	3.059	3.284	4.653	5.063	5.581	5.440	5.669	5.191	5.711	5.571	5.738	ns
		GCLK PLL	t_{co}	1.345	1.531	1.960	2.054	2.263	2.275	2.211	2.169	2.380	2.395	2.200	ns
	12mA	GCLK	t_{co}	3.058	3.282	4.650	5.060	5.578	5.437	5.666	5.188	5.707	5.567	5.734	ns
		GCLK PLL	t_{co}	1.344	1.529	1.957	2.051	2.260	2.272	2.208	2.166	2.376	2.391	2.196	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.080	3.304	4.671	5.080	5.597	5.456	5.685	5.208	5.727	5.587	5.754	ns
		GCLK PLL	t_{co}	1.366	1.551	1.978	2.071	2.279	2.291	2.227	2.186	2.396	2.411	2.216	ns

Table 1-109. EP3SE50 Column Pins Output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.070	3.293	4.650	5.057	5.572	5.431	5.660	5.184	5.700	5.560	5.727	ns
		GCLK PLL	t _{co}	1.356	1.540	1.957	2.048	2.254	2.266	2.202	2.162	2.369	2.384	2.189	ns
	6mA	GCLK	t _{co}	3.065	3.289	4.650	5.057	5.573	5.432	5.661	5.185	5.702	5.562	5.729	ns
		GCLK PLL	t _{co}	1.351	1.536	1.957	2.048	2.255	2.267	2.203	2.163	2.371	2.386	2.191	ns
	8mA	GCLK	t _{co}	3.063	3.287	4.649	5.056	5.571	5.430	5.659	5.184	5.701	5.561	5.728	ns
		GCLK PLL	t _{co}	1.349	1.534	1.956	2.047	2.253	2.265	2.201	2.162	2.370	2.385	2.190	ns
	10mA	GCLK	t _{co}	3.055	3.278	4.639	5.046	5.562	5.421	5.650	5.174	5.691	5.551	5.718	ns
		GCLK PLL	t _{co}	1.341	1.525	1.946	2.037	2.244	2.256	2.192	2.152	2.360	2.375	2.180	ns
	12mA	GCLK	t _{co}	3.056	3.280	4.645	5.053	5.570	5.429	5.658	5.182	5.700	5.560	5.727	ns
		GCLK PLL	t _{co}	1.342	1.527	1.952	2.044	2.252	2.264	2.200	2.160	2.369	2.384	2.189	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.055	3.277	4.628	5.034	5.548	5.407	5.636	5.161	5.676	5.536	5.703	ns
		GCLK PLL	t _{co}	1.341	1.524	1.935	2.025	2.230	2.242	2.178	2.139	2.345	2.360	2.165	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.067	3.290	4.646	5.052	5.566	5.425	5.654	5.180	5.695	5.555	5.722	ns
		GCLK PLL	t _{co}	1.353	1.537	1.953	2.043	2.248	2.260	2.196	2.158	2.364	2.379	2.184	ns
	6mA	GCLK	t _{co}	3.063	3.287	4.647	5.054	5.570	5.429	5.658	5.182	5.699	5.559	5.726	ns
		GCLK PLL	t _{co}	1.349	1.534	1.954	2.045	2.252	2.264	2.200	2.160	2.368	2.383	2.188	ns
	8mA	GCLK	t _{co}	3.053	3.276	4.636	5.043	5.558	5.417	5.646	5.171	5.687	5.547	5.714	ns
		GCLK PLL	t _{co}	1.339	1.523	1.943	2.034	2.240	2.252	2.188	2.149	2.356	2.371	2.176	ns
	10mA	GCLK	t _{co}	3.051	3.274	4.634	5.040	5.556	5.415	5.644	5.169	5.685	5.545	5.712	ns
		GCLK PLL	t _{co}	1.337	1.521	1.941	2.031	2.238	2.250	2.186	2.147	2.354	2.369	2.174	ns
	12mA	GCLK	t _{co}	3.051	3.275	4.637	5.045	5.561	5.420	5.649	5.173	5.691	5.551	5.718	ns
		GCLK PLL	t _{co}	1.337	1.522	1.944	2.036	2.243	2.255	2.191	2.151	2.360	2.375	2.180	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.055	3.278	4.634	5.040	5.555	5.414	5.643	5.168	5.684	5.544	5.711	ns
		GCLK PLL	t _{co}	1.341	1.525	1.941	2.031	2.237	2.249	2.185	2.146	2.353	2.368	2.173	ns

Table 1-109. EP3SE50 Column Pins Output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.081	3.307	4.679	5.088	5.605	5.464	5.693	5.216	5.734	5.594	5.761	ns
		GCLK PLL	t _{co}	1.367	1.554	1.986	2.079	2.287	2.299	2.235	2.194	2.403	2.418	2.223	ns
	6mA	GCLK	t _{co}	3.067	3.293	4.667	5.077	5.595	5.454	5.683	5.206	5.725	5.585	5.752	ns
		GCLK PLL	t _{co}	1.353	1.540	1.974	2.068	2.277	2.289	2.225	2.184	2.394	2.409	2.214	ns
	8mA	GCLK	t _{co}	3.055	3.280	4.650	5.059	5.577	5.436	5.665	5.188	5.707	5.567	5.734	ns
		GCLK PLL	t _{co}	1.341	1.527	1.957	2.050	2.259	2.271	2.207	2.166	2.376	2.391	2.196	ns
	10mA	GCLK	t _{co}	3.055	3.280	4.653	5.063	5.581	5.440	5.669	5.192	5.712	5.572	5.739	ns
		GCLK PLL	t _{co}	1.341	1.527	1.960	2.054	2.263	2.275	2.211	2.170	2.381	2.396	2.201	ns
	12mA	GCLK	t _{co}	3.051	3.276	4.646	5.055	5.574	5.433	5.662	5.185	5.704	5.564	5.731	ns
		GCLK PLL	t _{co}	1.337	1.523	1.953	2.046	2.256	2.268	2.204	2.163	2.373	2.388	2.193	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.055	3.278	4.639	5.046	5.562	5.421	5.650	5.174	5.691	5.551	5.718	ns
		GCLK PLL	t _{co}	1.341	1.525	1.946	2.037	2.244	2.256	2.192	2.152	2.360	2.375	2.180	ns
	16mA	GCLK	t _{co}	3.056	3.280	4.647	5.056	5.573	5.432	5.661	5.184	5.703	5.563	5.730	ns
		GCLK PLL	t _{co}	1.342	1.527	1.954	2.047	2.255	2.267	2.203	2.162	2.372	2.387	2.192	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.084	3.310	4.678	5.086	5.603	5.462	5.691	5.215	5.732	5.592	5.759	ns
		GCLK PLL	t _{co}	1.370	1.557	1.985	2.077	2.285	2.297	2.233	2.193	2.401	2.416	2.221	ns
	6mA	GCLK	t _{co}	3.073	3.298	4.666	5.074	5.591	5.450	5.679	5.203	5.720	5.580	5.747	ns
		GCLK PLL	t _{co}	1.359	1.545	1.973	2.065	2.273	2.285	2.221	2.181	2.389	2.404	2.209	ns
	8mA	GCLK	t _{co}	3.068	3.294	4.666	5.075	5.592	5.451	5.680	5.204	5.722	5.582	5.749	ns
		GCLK PLL	t _{co}	1.354	1.541	1.973	2.066	2.274	2.286	2.222	2.182	2.391	2.406	2.211	ns
	10mA	GCLK	t _{co}	3.054	3.279	4.648	5.056	5.573	5.432	5.661	5.185	5.704	5.564	5.731	ns
		GCLK PLL	t _{co}	1.340	1.526	1.955	2.047	2.255	2.267	2.203	2.163	2.373	2.388	2.193	ns
	12mA	GCLK	t _{co}	3.052	3.277	4.646	5.054	5.571	5.430	5.659	5.183	5.701	5.561	5.728	ns
		GCLK PLL	t _{co}	1.338	1.524	1.953	2.045	2.253	2.265	2.201	2.161	2.370	2.385	2.190	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.056	3.279	4.638	5.044	5.559	5.418	5.647	5.172	5.688	5.548	5.715	ns
		GCLK PLL	t _{co}	1.342	1.526	1.945	2.035	2.241	2.253	2.189	2.150	2.357	2.372	2.177	ns
	16mA	GCLK	t _{co}	3.056	3.280	4.646	5.054	5.571	5.430	5.659	5.183	5.701	5.561	5.728	ns
		GCLK PLL	t _{co}	1.342	1.527	1.953	2.045	2.253	2.265	2.201	2.161	2.370	2.385	2.190	ns

Table 1-109. EP3SE50 Column Pins Output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.072	3.297	4.662	5.069	5.585	5.444	5.673	5.198	5.714	5.574	5.741	ns
		GCLK PLL	t _{co}	1.358	1.544	1.969	2.060	2.267	2.279	2.215	2.176	2.383	2.398	2.203	ns
	10mA	GCLK	t _{co}	3.072	3.297	4.662	5.069	5.585	5.444	5.673	5.198	5.714	5.574	5.741	ns
		GCLK PLL	t _{co}	1.358	1.544	1.969	2.060	2.267	2.279	2.215	2.176	2.383	2.398	2.203	ns
	12mA	GCLK	t _{co}	3.062	3.287	4.652	5.059	5.575	5.434	5.663	5.188	5.705	5.565	5.732	ns
		GCLK PLL	t _{co}	1.348	1.534	1.959	2.050	2.257	2.269	2.205	2.166	2.374	2.389	2.194	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.055	3.279	4.638	5.044	5.559	5.418	5.647	5.172	5.688	5.548	5.715	ns
		GCLK PLL	t _{co}	1.341	1.526	1.945	2.035	2.241	2.253	2.189	2.150	2.357	2.372	2.177	ns

Table 1-110 specifies EP3SE50 Row Pins Output Timing parameters for differential I/O standards.

Table 1-110. EP3SE50 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	2.671	2.845	3.986	4.355	4.833	4.698	4.909	4.463	4.943	4.807	4.960	ns
		GCLK PLL	t _{co}	1.003	1.137	1.339	1.394	1.563	1.582	1.501	1.491	1.661	1.679	1.470	ns
LVDS_E_1R	—	GCLK	t _{co}	3.049	3.275	4.633	5.042	5.560	5.418	5.621	5.174	5.696	5.551	5.688	ns
		GCLK PLL	t _{co}	1.381	1.567	1.986	2.081	2.290	2.302	2.213	2.202	2.414	2.423	2.198	ns
LVDS_E_3R	—	GCLK	t _{co}	3.031	3.265	4.671	5.088	5.614	5.472	5.675	5.225	5.757	5.612	5.749	ns
		GCLK PLL	t _{co}	1.363	1.557	2.024	2.127	2.344	2.356	2.267	2.253	2.475	2.484	2.259	ns
MINI-LVDS	—	GCLK	t _{co}	2.671	2.845	3.986	4.355	4.833	4.698	4.909	4.463	4.943	4.807	4.960	ns
		GCLK PLL	t _{co}	1.003	1.137	1.339	1.394	1.563	1.582	1.501	1.491	1.661	1.679	1.470	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.049	3.275	4.633	5.042	5.560	5.418	5.621	5.174	5.696	5.551	5.688	ns
		GCLK PLL	t _{co}	1.381	1.567	1.986	2.081	2.290	2.302	2.213	2.202	2.414	2.423	2.198	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.031	3.265	4.671	5.088	5.614	5.472	5.675	5.225	5.757	5.612	5.749	ns
		GCLK PLL	t _{co}	1.363	1.557	2.024	2.127	2.344	2.356	2.267	2.253	2.475	2.484	2.259	ns
RSDS	—	GCLK	t _{co}	2.671	2.845	3.986	4.355	4.833	4.698	4.909	4.463	4.943	4.807	4.960	ns
		GCLK PLL	t _{co}	1.003	1.137	1.339	1.394	1.563	1.582	1.501	1.491	1.661	1.679	1.470	ns

Table 1-110. EP3SE50 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.049	3.275	4.633	5.042	5.560	5.418	5.621	5.174	5.696	5.551	5.688	ns
		GCLK PLL	t _{co}	1.381	1.567	1.986	2.081	2.290	2.302	2.213	2.202	2.414	2.423	2.198	ns
RSDS_E_3R	—	GCLK	t _{co}	3.031	3.265	4.671	5.088	5.614	5.472	5.675	5.225	5.757	5.612	5.749	ns
		GCLK PLL	t _{co}	1.363	1.557	2.024	2.127	2.344	2.356	2.267	2.253	2.475	2.484	2.259	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.085	3.318	4.717	5.132	5.657	5.515	5.718	5.268	5.796	5.651	5.788	ns
		GCLK PLL	t _{co}	1.407	1.600	2.060	2.161	2.377	2.389	2.300	2.286	2.504	2.513	2.288	ns
	6mA	GCLK	t _{co}	3.071	3.304	4.704	5.119	5.644	5.502	5.705	5.254	5.783	5.638	5.775	ns
		GCLK PLL	t _{co}	1.393	1.586	2.047	2.148	2.364	2.376	2.287	2.272	2.491	2.500	2.275	ns
	8mA	GCLK	t _{co}	3.067	3.300	4.702	5.119	5.645	5.503	5.706	5.254	5.785	5.640	5.777	ns
		GCLK PLL	t _{co}	1.389	1.582	2.045	2.148	2.365	2.377	2.288	2.272	2.493	2.502	2.277	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.083	3.315	4.703	5.116	5.639	5.497	5.700	5.251	5.778	5.633	5.770	ns
		GCLK PLL	t _{co}	1.405	1.597	2.046	2.145	2.359	2.371	2.282	2.269	2.486	2.495	2.270	ns
	6mA	GCLK	t _{co}	3.072	3.305	4.699	5.112	5.636	5.494	5.697	5.248	5.775	5.630	5.767	ns
		GCLK PLL	t _{co}	1.394	1.587	2.042	2.141	2.356	2.368	2.279	2.266	2.483	2.492	2.267	ns
	8mA	GCLK	t _{co}	3.069	3.302	4.697	5.110	5.634	5.492	5.695	5.246	5.774	5.629	5.766	ns
		GCLK PLL	t _{co}	1.391	1.584	2.040	2.139	2.354	2.366	2.277	2.264	2.482	2.491	2.266	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.080	3.312	4.698	5.111	5.633	5.491	5.694	5.245	5.772	5.627	5.764	ns
		GCLK PLL	t _{co}	1.402	1.594	2.041	2.140	2.353	2.365	2.276	2.263	2.480	2.489	2.264	ns
	6mA	GCLK	t _{co}	3.070	3.303	4.696	5.109	5.632	5.490	5.693	5.245	5.772	5.627	5.764	ns
		GCLK PLL	t _{co}	1.392	1.585	2.039	2.138	2.352	2.364	2.275	2.263	2.480	2.489	2.264	ns
	8mA	GCLK	t _{co}	3.056	3.289	4.681	5.094	5.618	5.476	5.679	5.230	5.757	5.612	5.749	ns
		GCLK PLL	t _{co}	1.378	1.571	2.024	2.123	2.338	2.350	2.261	2.248	2.465	2.474	2.249	ns
	10mA	GCLK	t _{co}	3.053	3.285	4.677	5.090	5.614	5.472	5.675	5.226	5.753	5.608	5.745	ns
		GCLK PLL	t _{co}	1.375	1.567	2.020	2.119	2.334	2.346	2.257	2.244	2.461	2.470	2.245	ns
	12mA	GCLK	t _{co}	3.050	3.283	4.678	5.093	5.617	5.475	5.678	5.229	5.757	5.612	5.749	ns
		GCLK PLL	t _{co}	1.372	1.565	2.021	2.122	2.337	2.349	2.260	2.247	2.465	2.474	2.249	ns

Table 1-110. EP3SE50 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.051	3.283	4.668	5.081	5.604	5.462	5.665	5.216	5.743	5.598	5.735	ns
		GCLK PLL	t _{co}	1.373	1.565	2.011	2.110	2.324	2.336	2.247	2.234	2.451	2.460	2.235	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.100	3.336	4.739	5.154	5.680	5.538	5.741	5.290	5.819	5.674	5.811	ns
		GCLK PLL	t _{co}	1.422	1.618	2.082	2.183	2.400	2.412	2.323	2.308	2.527	2.536	2.311	ns
	6mA	GCLK	t _{co}	3.076	3.312	4.721	5.137	5.663	5.521	5.724	5.273	5.804	5.659	5.796	ns
		GCLK PLL	t _{co}	1.398	1.594	2.064	2.166	2.383	2.395	2.306	2.291	2.512	2.521	2.296	ns
	8mA	GCLK	t _{co}	3.058	3.293	4.699	5.115	5.641	5.499	5.702	5.251	5.782	5.637	5.774	ns
		GCLK PLL	t _{co}	1.380	1.575	2.042	2.144	2.361	2.373	2.284	2.269	2.490	2.499	2.274	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.104	3.339	4.739	5.154	5.679	5.537	5.740	5.290	5.819	5.674	5.811	ns
		GCLK PLL	t _{co}	1.426	1.621	2.082	2.183	2.399	2.411	2.322	2.308	2.527	2.536	2.311	ns
	6mA	GCLK	t _{co}	3.089	3.324	4.725	5.139	5.664	5.522	5.725	5.275	5.804	5.659	5.796	ns
		GCLK PLL	t _{co}	1.411	1.606	2.068	2.168	2.384	2.396	2.307	2.293	2.512	2.521	2.296	ns
	8mA	GCLK	t _{co}	3.078	3.313	4.720	5.136	5.661	5.519	5.722	5.272	5.802	5.657	5.794	ns
		GCLK PLL	t _{co}	1.400	1.595	2.063	2.165	2.381	2.393	2.304	2.290	2.510	2.519	2.294	ns
	10mA	GCLK	t _{co}	3.058	3.293	4.697	5.112	5.638	5.496	5.699	5.249	5.778	5.633	5.770	ns
		GCLK PLL	t _{co}	1.380	1.575	2.040	2.141	2.358	2.370	2.281	2.267	2.486	2.495	2.270	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.060	3.293	4.684	5.097	5.620	5.478	5.681	5.232	5.759	5.614	5.751	ns
		GCLK PLL	t _{co}	1.382	1.575	2.027	2.126	2.340	2.352	2.263	2.250	2.467	2.476	2.251	ns
	16mA	GCLK	t _{co}	3.053	3.286	4.683	5.098	5.623	5.481	5.684	5.235	5.764	5.619	5.756	ns
		GCLK PLL	t _{co}	1.375	1.568	2.026	2.127	2.343	2.355	2.266	2.253	2.472	2.481	2.256	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.081	3.315	4.711	5.125	5.649	5.507	5.710	5.261	5.789	5.644	5.781	ns
		GCLK PLL	t _{co}	1.413	1.607	2.064	2.164	2.379	2.391	2.302	2.289	2.507	2.516	2.291	ns
	12mA	GCLK	t _{co}	3.063	3.298	4.696	5.110	5.634	5.492	5.695	5.246	5.774	5.629	5.766	ns
		GCLK PLL	t _{co}	1.395	1.590	2.049	2.149	2.364	2.376	2.287	2.274	2.492	2.501	2.276	ns

Table 1–110. EP3SE50 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{CO}	3.049	3.282	4.673	5.086	5.609	5.467	5.670	5.222	5.749	5.604	5.741	ns
		GCLK PLL	t_{CO}	1.381	1.574	2.026	2.125	2.339	2.351	2.262	2.250	2.467	2.476	2.251	ns

Table 1–111 and Table 1–112 show EP3SE50 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1–111 specifies EP3SE50 Column Pin delay adders when using the regional clock in Stratix III devices.

Table 1–111. EP3SE50 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.152	0.164	0.22	0.237	0.25	0.244	0.31	0.24	0.254	0.246	0.312	ns
RCLK PLL input adder	-0.001	-0.001	-0.003	-0.004	-0.004	-0.004	-0.006	-0.003	-0.004	-0.004	-0.006	ns
RCLK output adder	-0.116	-0.119	-0.134	-0.136	-0.17	-0.171	-0.249	-0.131	-0.13	-0.13	-0.216	ns
RCLK PLL output adder	1.647	1.684	2.61	2.926	3.238	3.084	3.298	2.943	3.254	3.098	3.374	ns

Table 1–112 specifies EP3SE50 Row Pin delay adders when using the regional clock in Stratix III devices.

Table 1–112. EP3SE50 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.113	0.125	0.182	0.197	0.212	0.205	0.274	0.201	0.215	0.21	0.275	ns
RCLK PLL input adder	0.13	0.14	0.213	0.241	0.267	0.255	0.385	0.244	0.27	0.256	0.386	ns
RCLK output adder	-0.116	-0.129	-0.186	-0.202	-0.218	-0.209	-0.28	-0.206	-0.221	-0.214	-0.283	ns
RCLK PLL output adder	-0.137	-0.143	-0.193	-0.214	-0.236	-0.225	-0.295	-0.215	-0.237	-0.226	-0.297	ns

EP3SE80 I/O Timing Parameters

Table 1-113 through Table 1-116 show the maximum I/O timing parameters for EP3SE80 devices for single-ended I/O standards.

Table 1-113 specifies EP3SE80 column pins input timing parameters for single-ended I/O standards.

Table 1-113. EP3SE80 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-1.122	-1.177	-1.686	-1.840	-2.102	-2.031	-2.409	-1.864	-2.110	-2.042	-2.443	ns
		t _h	1.249	1.323	1.893	2.074	2.356	2.268	2.655	2.108	2.374	2.291	2.689	ns
	GCLK PLL	t _{su}	0.716	0.735	1.226	1.399	1.461	1.368	1.385	1.396	1.473	1.377	1.441	ns
		t _h	-0.451	-0.450	-0.803	-0.925	-0.933	-0.872	-0.872	-0.912	-0.935	-0.871	-0.925	ns
3.3-V LVCMOS	GCLK	t _{su}	-1.122	-1.177	-1.686	-1.840	-2.102	-2.031	-2.409	-1.864	-2.110	-2.042	-2.443	ns
		t _h	1.249	1.323	1.893	2.074	2.356	2.268	2.655	2.108	2.374	2.291	2.689	ns
	GCLK PLL	t _{su}	0.716	0.735	1.226	1.399	1.461	1.368	1.385	1.396	1.473	1.377	1.441	ns
		t _h	-0.451	-0.450	-0.803	-0.925	-0.933	-0.872	-0.872	-0.912	-0.935	-0.871	-0.925	ns
3.0-V LVTTTL	GCLK	t _{su}	-1.128	-1.188	-1.685	-1.842	-2.101	-2.030	-2.408	-1.864	-2.115	-2.047	-2.448	ns
		t _h	1.255	1.334	1.892	2.076	2.355	2.267	2.654	2.108	2.379	2.296	2.694	ns
	GCLK PLL	t _{su}	0.710	0.724	1.227	1.397	1.462	1.369	1.386	1.396	1.468	1.372	1.436	ns
		t _h	-0.445	-0.439	-0.804	-0.923	-0.934	-0.873	-0.873	-0.912	-0.930	-0.866	-0.920	ns
3.0-V LVCMOS	GCLK	t _{su}	-1.128	-1.188	-1.685	-1.842	-2.101	-2.030	-2.408	-1.864	-2.115	-2.047	-2.448	ns
		t _h	1.255	1.334	1.892	2.076	2.355	2.267	2.654	2.108	2.379	2.296	2.694	ns
	GCLK PLL	t _{su}	0.710	0.724	1.227	1.397	1.462	1.369	1.386	1.396	1.468	1.372	1.436	ns
		t _h	-0.445	-0.439	-0.804	-0.923	-0.934	-0.873	-0.873	-0.912	-0.930	-0.866	-0.920	ns
2.5 V	GCLK	t _{su}	-1.118	-1.183	-1.694	-1.854	-2.120	-2.049	-2.427	-1.874	-2.126	-2.058	-2.459	ns
		t _h	1.245	1.329	1.901	2.088	2.374	2.286	2.673	2.118	2.390	2.307	2.705	ns
	GCLK PLL	t _{su}	0.720	0.729	1.218	1.385	1.443	1.350	1.367	1.386	1.457	1.361	1.425	ns
		t _h	-0.455	-0.444	-0.795	-0.911	-0.915	-0.854	-0.854	-0.902	-0.919	-0.855	-0.909	ns
1.8 V	GCLK	t _{su}	-1.136	-1.205	-1.734	-1.890	-2.118	-2.047	-2.425	-1.908	-2.129	-2.061	-2.462	ns
		t _h	1.265	1.353	1.941	2.124	2.372	2.284	2.671	2.152	2.393	2.310	2.708	ns
	GCLK PLL	t _{su}	0.702	0.707	1.178	1.349	1.445	1.352	1.369	1.352	1.454	1.358	1.422	ns
		t _h	-0.435	-0.420	-0.755	-0.875	-0.917	-0.856	-0.856	-0.868	-0.916	-0.852	-0.906	ns
1.5 V	GCLK	t _{su}	-1.129	-1.195	-1.711	-1.858	-2.048	-1.977	-2.355	-1.877	-2.063	-1.995	-2.396	ns
		t _h	1.258	1.343	1.918	2.092	2.302	2.214	2.601	2.121	2.327	2.244	2.642	ns
	GCLK PLL	t _{su}	0.709	0.717	1.201	1.381	1.515	1.422	1.439	1.383	1.520	1.424	1.488	ns
		t _h	-0.442	-0.430	-0.778	-0.907	-0.987	-0.926	-0.926	-0.899	-0.982	-0.918	-0.972	ns
1.2 V	GCLK	t _{su}	-1.069	-1.143	-1.634	-1.759	-1.892	-1.821	-2.199	-1.781	-1.910	-1.842	-2.243	ns
		t _h	1.198	1.291	1.841	1.993	2.146	2.058	2.445	2.025	2.174	2.091	2.489	ns
	GCLK PLL	t _{su}	0.769	0.769	1.278	1.480	1.671	1.578	1.595	1.479	1.673	1.577	1.641	ns
		t _h	-0.502	-0.482	-0.855	-1.006	-1.143	-1.082	-1.082	-0.995	-1.135	-1.071	-1.125	ns

Table 1-113. EP3SE80 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-1.050	-1.114	-1.606	-1.743	-1.894	-1.823	-2.201	-1.760	-1.906	-1.838	-2.239	ns
		t _h	1.179	1.262	1.813	1.977	2.148	2.060	2.447	2.004	2.170	2.087	2.485	ns
	GCLK PLL	t _{su}	0.788	0.798	1.306	1.496	1.669	1.576	1.593	1.500	1.677	1.581	1.645	ns
		t _h	-0.521	-0.511	-0.883	-1.022	-1.141	-1.080	-1.080	-1.016	-1.139	-1.075	-1.129	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.050	-1.114	-1.606	-1.743	-1.894	-1.823	-2.201	-1.760	-1.906	-1.838	-2.239	ns
		t _h	1.179	1.262	1.813	1.977	2.148	2.060	2.447	2.004	2.170	2.087	2.485	ns
	GCLK PLL	t _{su}	0.788	0.798	1.306	1.496	1.669	1.576	1.593	1.500	1.677	1.581	1.645	ns
		t _h	-0.521	-0.511	-0.883	-1.022	-1.141	-1.080	-1.080	-1.016	-1.139	-1.075	-1.129	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.043	-1.108	-1.593	-1.735	-1.891	-1.818	-2.199	-1.753	-1.907	-1.837	-2.240	ns
		t _h	1.172	1.256	1.800	1.966	2.142	2.054	2.440	1.994	2.167	2.085	2.481	ns
	GCLK PLL	t _{su}	0.795	0.804	1.319	1.504	1.672	1.581	1.595	1.507	1.676	1.582	1.644	ns
		t _h	-0.528	-0.517	-0.896	-1.033	-1.147	-1.086	-1.087	-1.026	-1.142	-1.077	-1.133	ns
SSTL-18 CLASS II	GCLK	t _{su}	-1.043	-1.108	-1.593	-1.735	-1.891	-1.818	-2.199	-1.753	-1.907	-1.837	-2.240	ns
		t _h	1.172	1.256	1.800	1.966	2.142	2.054	2.440	1.994	2.167	2.085	2.481	ns
	GCLK PLL	t _{su}	0.795	0.804	1.319	1.504	1.672	1.581	1.595	1.507	1.676	1.582	1.644	ns
		t _h	-0.528	-0.517	-0.896	-1.033	-1.147	-1.086	-1.087	-1.026	-1.142	-1.077	-1.133	ns
SSTL-15 CLASS I	GCLK	t _{su}	-1.031	-1.097	-1.582	-1.724	-1.872	-1.799	-2.180	-1.742	-1.889	-1.819	-2.222	ns
		t _h	1.160	1.245	1.788	1.955	2.123	2.035	2.421	1.983	2.149	2.067	2.463	ns
	GCLK PLL	t _{su}	0.807	0.815	1.330	1.515	1.691	1.600	1.614	1.518	1.694	1.600	1.662	ns
		t _h	-0.540	-0.528	-0.908	-1.044	-1.166	-1.105	-1.106	-1.037	-1.160	-1.095	-1.151	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.031	-1.097	-1.582	-1.724	-1.872	-1.799	-2.180	-1.742	-1.889	-1.819	-2.222	ns
		t _h	1.160	1.245	1.788	1.955	2.123	2.035	2.421	1.983	2.149	2.067	2.463	ns
	GCLK PLL	t _{su}	0.807	0.815	1.330	1.515	1.691	1.600	1.614	1.518	1.694	1.600	1.662	ns
		t _h	-0.540	-0.528	-0.908	-1.044	-1.166	-1.105	-1.106	-1.037	-1.160	-1.095	-1.151	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.043	-1.108	-1.593	-1.735	-1.891	-1.818	-2.199	-1.753	-1.907	-1.837	-2.240	ns
		t _h	1.172	1.256	1.800	1.966	2.142	2.054	2.440	1.994	2.167	2.085	2.481	ns
	GCLK PLL	t _{su}	0.795	0.804	1.319	1.504	1.672	1.581	1.595	1.507	1.676	1.582	1.644	ns
		t _h	-0.528	-0.517	-0.896	-1.033	-1.147	-1.086	-1.087	-1.026	-1.142	-1.077	-1.133	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.043	-1.108	-1.593	-1.735	-1.891	-1.818	-2.199	-1.753	-1.907	-1.837	-2.240	ns
		t _h	1.172	1.256	1.800	1.966	2.142	2.054	2.440	1.994	2.167	2.085	2.481	ns
	GCLK PLL	t _{su}	0.795	0.804	1.319	1.504	1.672	1.581	1.595	1.507	1.676	1.582	1.644	ns
		t _h	-0.528	-0.517	-0.896	-1.033	-1.147	-1.086	-1.087	-1.026	-1.142	-1.077	-1.133	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.031	-1.097	-1.582	-1.724	-1.872	-1.799	-2.180	-1.742	-1.889	-1.819	-2.222	ns
		t _h	1.160	1.245	1.788	1.955	2.123	2.035	2.421	1.983	2.149	2.067	2.463	ns
	GCLK PLL	t _{su}	0.807	0.815	1.330	1.515	1.691	1.600	1.614	1.518	1.694	1.600	1.662	ns
		t _h	-0.540	-0.528	-0.908	-1.044	-1.166	-1.105	-1.106	-1.037	-1.160	-1.095	-1.151	ns

Table 1-113. EP3SE80 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.031	-1.097	-1.582	-1.724	-1.872	-1.799	-2.180	-1.742	-1.889	-1.819	-2.222	ns
		t _h	1.160	1.245	1.788	1.955	2.123	2.035	2.421	1.983	2.149	2.067	2.463	ns
	GCLK PLL	t _{su}	0.807	0.815	1.330	1.515	1.691	1.600	1.614	1.518	1.694	1.600	1.662	ns
		t _h	-0.540	-0.528	-0.908	-1.044	-1.166	-1.105	-1.106	-1.037	-1.160	-1.095	-1.151	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.023	-1.085	-1.572	-1.713	-1.856	-1.783	-2.164	-1.731	-1.874	-1.804	-2.207	ns
		t _h	1.152	1.233	1.778	1.944	2.107	2.019	2.405	1.972	2.134	2.052	2.448	ns
	GCLK PLL	t _{su}	0.815	0.827	1.340	1.526	1.707	1.616	1.630	1.529	1.709	1.615	1.677	ns
		t _h	-0.548	-0.540	-0.918	-1.055	-1.182	-1.121	-1.122	-1.048	-1.175	-1.110	-1.166	ns
3.0-V PCI	GCLK	t _{su}	-1.023	-1.085	-1.572	-1.713	-1.856	-1.783	-2.164	-1.731	-1.874	-1.804	-2.207	ns
		t _h	1.152	1.233	1.778	1.944	2.107	2.019	2.405	1.972	2.134	2.052	2.448	ns
	GCLK PLL	t _{su}	0.815	0.827	1.340	1.526	1.707	1.616	1.630	1.529	1.709	1.615	1.677	ns
		t _h	-0.548	-0.540	-0.918	-1.055	-1.182	-1.121	-1.122	-1.048	-1.175	-1.110	-1.166	ns
3.0-V PCI-X	GCLK	t _{su}	-1.128	-1.188	-1.685	-1.842	-2.101	-2.030	-2.408	-1.864	-2.115	-2.047	-2.448	ns
		t _h	1.255	1.334	1.892	2.076	2.355	2.267	2.654	2.108	2.379	2.296	2.694	ns
	GCLK PLL	t _{su}	0.710	0.724	1.227	1.397	1.462	1.369	1.386	1.396	1.468	1.372	1.436	ns
		t _h	-0.445	-0.439	-0.804	-0.923	-0.934	-0.873	-0.873	-0.912	-0.930	-0.866	-0.920	ns

Table 1-114 specifies EP3SE80 row pins input timing parameters for single-ended I/O standards.

Table 1-114. EP3SE80 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-0.922	-0.964	-1.369	-1.481	-1.595	-1.647	-1.890	-1.492	-1.697	-1.649	-1.929	ns
		t _h	1.045	1.103	1.566	1.703	1.842	1.878	2.128	1.725	1.950	1.890	2.168	ns
	GCLK PLL	t _{su}	1.087	1.110	1.770	2.000	1.985	2.004	1.799	2.012	2.003	2.024	1.850	ns
		t _h	-0.825	-0.830	-1.353	-1.532	-1.470	-1.513	-1.300	-1.533	-1.477	-1.523	-1.349	ns
3.3-V LVCMOS	GCLK	t _{su}	-0.922	-0.964	-1.369	-1.481	-1.595	-1.647	-1.890	-1.492	-1.697	-1.649	-1.929	ns
		t _h	1.045	1.103	1.566	1.703	1.842	1.878	2.128	1.725	1.950	1.890	2.168	ns
	GCLK PLL	t _{su}	1.087	1.110	1.770	2.000	1.985	2.004	1.799	2.012	2.003	2.024	1.850	ns
		t _h	-0.825	-0.830	-1.353	-1.532	-1.470	-1.513	-1.300	-1.533	-1.477	-1.523	-1.349	ns
3.0-V LVTTTL	GCLK	t _{su}	-0.928	-0.975	-1.366	-1.482	-1.598	-1.650	-1.893	-1.491	-1.702	-1.654	-1.934	ns
		t _h	1.051	1.114	1.563	1.704	1.845	1.881	2.131	1.724	1.955	1.895	2.173	ns
	GCLK PLL	t _{su}	1.081	1.099	1.773	1.999	1.982	2.001	1.796	2.013	1.998	2.019	1.845	ns
		t _h	-0.819	-0.819	-1.356	-1.531	-1.467	-1.510	-1.297	-1.534	-1.472	-1.518	-1.344	ns

Table 1–114. EP3SE80 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
3.0-V LVCMOS	GCLK	t _{su}	-0.928	-0.975	-1.366	-1.482	-1.598	-1.650	-1.893	-1.491	-1.702	-1.654	-1.934	ns
		t _h	1.051	1.114	1.563	1.704	1.845	1.881	2.131	1.724	1.955	1.895	2.173	ns
	GCLK PLL	t _{su}	1.081	1.099	1.773	1.999	1.982	2.001	1.796	2.013	1.998	2.019	1.845	ns
		t _h	-0.819	-0.819	-1.356	-1.531	-1.467	-1.510	-1.297	-1.534	-1.472	-1.518	-1.344	ns
2.5 V	GCLK	t _{su}	-0.916	-0.968	-1.375	-1.495	-1.613	-1.665	-1.908	-1.500	-1.712	-1.664	-1.944	ns
		t _h	1.039	1.107	1.572	1.717	1.860	1.896	2.146	1.733	1.965	1.905	2.183	ns
	GCLK PLL	t _{su}	1.093	1.106	1.764	1.986	1.967	1.986	1.781	2.004	1.988	2.009	1.835	ns
		t _h	-0.831	-0.826	-1.347	-1.518	-1.452	-1.495	-1.282	-1.525	-1.462	-1.508	-1.334	ns
1.8 V	GCLK	t _{su}	-0.973	-1.027	-1.441	-1.555	-1.741	-1.689	-1.906	-1.560	-1.739	-1.691	-1.945	ns
		t _h	1.097	1.167	1.638	1.777	1.984	1.920	2.144	1.792	1.992	1.931	2.184	ns
	GCLK PLL	t _{su}	0.974	0.984	1.606	1.824	1.969	1.854	1.783	1.837	1.987	1.870	1.834	ns
		t _h	-0.714	-0.705	-1.192	-1.359	-1.454	-1.366	-1.284	-1.362	-1.461	-1.373	-1.333	ns
1.5 V	GCLK	t _{su}	-0.963	-1.016	-1.417	-1.523	-1.673	-1.621	-1.838	-1.529	-1.674	-1.626	-1.880	ns
		t _h	1.087	1.156	1.614	1.745	1.916	1.852	2.076	1.761	1.927	1.866	2.119	ns
	GCLK PLL	t _{su}	0.984	0.995	1.630	1.856	2.037	1.922	1.851	1.868	2.052	1.935	1.899	ns
		t _h	-0.724	-0.716	-1.216	-1.391	-1.522	-1.434	-1.352	-1.393	-1.526	-1.438	-1.398	ns
1.2 V	GCLK	t _{su}	-0.903	-0.963	-1.338	-1.422	-1.514	-1.462	-1.679	-1.433	-1.519	-1.471	-1.725	ns
		t _h	1.027	1.103	1.535	1.644	1.757	1.693	1.917	1.665	1.772	1.711	1.964	ns
	GCLK PLL	t _{su}	1.044	1.048	1.709	1.957	2.196	2.081	2.010	1.964	2.207	2.090	2.054	ns
		t _h	-0.784	-0.769	-1.295	-1.492	-1.681	-1.593	-1.511	-1.489	-1.681	-1.593	-1.553	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.859	-0.910	-1.289	-1.386	-1.393	-1.445	-1.688	-1.388	-1.495	-1.447	-1.727	ns
		t _h	0.983	1.050	1.486	1.608	1.640	1.676	1.926	1.621	1.748	1.688	1.966	ns
	GCLK PLL	t _{su}	1.151	1.165	1.850	2.095	2.187	2.206	2.001	2.116	2.205	2.226	2.052	ns
		t _h	-0.888	-0.884	-1.433	-1.627	-1.672	-1.715	-1.502	-1.637	-1.679	-1.725	-1.551	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.859	-0.910	-1.289	-1.386	-1.393	-1.445	-1.688	-1.388	-1.495	-1.447	-1.727	ns
		t _h	0.983	1.050	1.486	1.608	1.640	1.676	1.926	1.621	1.748	1.688	1.966	ns
	GCLK PLL	t _{su}	1.151	1.165	1.850	2.095	2.187	2.206	2.001	2.116	2.205	2.226	2.052	ns
		t _h	-0.888	-0.884	-1.433	-1.627	-1.672	-1.715	-1.502	-1.637	-1.679	-1.725	-1.551	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.877	-0.928	-1.300	-1.395	-1.509	-1.456	-1.677	-1.401	-1.512	-1.463	-1.720	ns
		t _h	1.001	1.068	1.497	1.615	1.750	1.686	1.911	1.631	1.762	1.702	1.955	ns
	GCLK PLL	t _{su}	1.070	1.083	1.747	1.984	2.201	2.087	2.014	1.996	2.214	2.098	2.061	ns
		t _h	-0.810	-0.804	-1.333	-1.521	-1.688	-1.600	-1.519	-1.523	-1.691	-1.602	-1.564	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.877	-0.928	-1.300	-1.395	-1.509	-1.456	-1.677	-1.401	-1.512	-1.463	-1.720	ns
		t _h	1.001	1.068	1.497	1.615	1.750	1.686	1.911	1.631	1.762	1.702	1.955	ns
	GCLK PLL	t _{su}	1.070	1.083	1.747	1.984	2.201	2.087	2.014	1.996	2.214	2.098	2.061	ns
		t _h	-0.810	-0.804	-1.333	-1.521	-1.688	-1.600	-1.519	-1.523	-1.691	-1.602	-1.564	ns

Table 1-114. EP3SE80 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-15 CLASS I	GCLK	t _{su}	-0.863	-0.916	-1.285	-1.385	-1.491	-1.438	-1.659	-1.390	-1.495	-1.446	-1.703	ns
		t _h	0.987	1.056	1.483	1.605	1.732	1.668	1.893	1.620	1.745	1.685	1.938	ns
	GCLK PLL	t _{su}	1.084	1.095	1.762	1.994	2.219	2.105	2.032	2.007	2.231	2.115	2.078	ns
		t _h	-0.824	-0.816	-1.347	-1.531	-1.706	-1.618	-1.537	-1.534	-1.708	-1.619	-1.581	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.877	-0.928	-1.300	-1.395	-1.509	-1.456	-1.677	-1.401	-1.512	-1.463	-1.720	ns
		t _h	1.001	1.068	1.497	1.615	1.750	1.686	1.911	1.631	1.762	1.702	1.955	ns
	GCLK PLL	t _{su}	1.070	1.083	1.747	1.984	2.201	2.087	2.014	1.996	2.214	2.098	2.061	ns
		t _h	-0.810	-0.804	-1.333	-1.521	-1.688	-1.600	-1.519	-1.523	-1.691	-1.602	-1.564	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.877	-0.928	-1.300	-1.395	-1.509	-1.456	-1.677	-1.401	-1.512	-1.463	-1.720	ns
		t _h	1.001	1.068	1.497	1.615	1.750	1.686	1.911	1.631	1.762	1.702	1.955	ns
	GCLK PLL	t _{su}	1.070	1.083	1.747	1.984	2.201	2.087	2.014	1.996	2.214	2.098	2.061	ns
		t _h	-0.810	-0.804	-1.333	-1.521	-1.688	-1.600	-1.519	-1.523	-1.691	-1.602	-1.564	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-0.863	-0.916	-1.285	-1.385	-1.491	-1.438	-1.659	-1.390	-1.495	-1.446	-1.703	ns
		t _h	0.987	1.056	1.483	1.605	1.732	1.668	1.893	1.620	1.745	1.685	1.938	ns
	GCLK PLL	t _{su}	1.084	1.095	1.762	1.994	2.219	2.105	2.032	2.007	2.231	2.115	2.078	ns
		t _h	-0.824	-0.816	-1.347	-1.531	-1.706	-1.618	-1.537	-1.534	-1.708	-1.619	-1.581	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-0.863	-0.916	-1.285	-1.385	-1.491	-1.438	-1.659	-1.390	-1.495	-1.446	-1.703	ns
		t _h	0.987	1.056	1.483	1.605	1.732	1.668	1.893	1.620	1.745	1.685	1.938	ns
	GCLK PLL	t _{su}	1.084	1.095	1.762	1.994	2.219	2.105	2.032	2.007	2.231	2.115	2.078	ns
		t _h	-0.824	-0.816	-1.347	-1.531	-1.706	-1.618	-1.537	-1.534	-1.708	-1.619	-1.581	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-0.854	-0.904	-1.276	-1.375	-1.475	-1.422	-1.643	-1.381	-1.479	-1.430	-1.687	ns
		t _h	0.978	1.044	1.474	1.595	1.716	1.652	1.877	1.611	1.729	1.669	1.922	ns
	GCLK PLL	t _{su}	1.093	1.107	1.771	2.004	2.235	2.121	2.048	2.016	2.247	2.131	2.094	ns
		t _h	-0.833	-0.828	-1.356	-1.541	-1.722	-1.634	-1.553	-1.543	-1.724	-1.635	-1.597	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-0.854	-0.904	-1.276	-1.375	-1.475	-1.422	-1.643	-1.381	-1.479	-1.430	-1.687	ns
		t _h	0.978	1.044	1.474	1.595	1.716	1.652	1.877	1.611	1.729	1.669	1.922	ns
	GCLK PLL	t _{su}	1.093	1.107	1.771	2.004	2.235	2.121	2.048	2.016	2.247	2.131	2.094	ns
		t _h	-0.833	-0.828	-1.356	-1.541	-1.722	-1.634	-1.553	-1.543	-1.724	-1.635	-1.597	ns
3.0-V PCI	GCLK	t _{su}	-0.928	-0.975	-1.366	-1.482	-1.598	-1.650	-1.893	-1.491	-1.702	-1.654	-1.934	ns
		t _h	1.051	1.114	1.563	1.704	1.845	1.881	2.131	1.724	1.955	1.895	2.173	ns
	GCLK PLL	t _{su}	1.081	1.099	1.773	1.999	1.982	2.001	1.796	2.013	1.998	2.019	1.845	ns
		t _h	-0.819	-0.819	-1.356	-1.531	-1.467	-1.510	-1.297	-1.534	-1.472	-1.518	-1.344	ns
3.0-V PCI-X	GCLK	t _{su}	-0.928	-0.975	-1.366	-1.482	-1.598	-1.650	-1.893	-1.491	-1.702	-1.654	-1.934	ns
		t _h	1.051	1.114	1.563	1.704	1.845	1.881	2.131	1.724	1.955	1.895	2.173	ns
	GCLK PLL	t _{su}	1.081	1.099	1.773	1.999	1.982	2.001	1.796	2.013	1.998	2.019	1.845	ns
		t _h	-0.819	-0.819	-1.356	-1.531	-1.467	-1.510	-1.297	-1.534	-1.472	-1.518	-1.344	ns

Table 1–115 specifies EP3SE80 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–115. EP3SE80 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.333	3.617	5.038	5.451	5.972	5.826	6.157	5.587	6.111	5.967	6.240	ns
		GCLK PLL	t _{co}	1.573	1.758	2.222	2.334	2.556	2.558	2.503	2.446	2.669	2.671	2.493	ns
	8mA	GCLK	t _{co}	3.243	3.494	4.871	5.284	5.804	5.658	5.989	5.418	5.938	5.794	6.067	ns
		GCLK PLL	t _{co}	1.494	1.669	2.119	2.222	2.439	2.441	2.386	2.330	2.549	2.551	2.373	ns
	12mA	GCLK	t _{co}	3.213	3.459	4.797	5.199	5.704	5.558	5.889	5.328	5.835	5.691	5.965	ns
		GCLK PLL	t _{co}	1.465	1.637	2.052	2.152	2.369	2.371	2.316	2.260	2.482	2.484	2.306	ns
	16mA	GCLK	t _{co}	3.199	3.445	4.776	5.176	5.675	5.527	5.859	5.302	5.801	5.657	5.931	ns
		GCLK PLL	t _{co}	1.451	1.623	2.031	2.129	2.341	2.343	2.288	2.234	2.449	2.451	2.273	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.275	3.526	4.929	5.334	5.850	5.704	6.035	5.466	5.986	5.842	6.115	ns
		GCLK PLL	t _{co}	1.511	1.691	2.149	2.251	2.468	2.470	2.415	2.360	2.581	2.583	2.405	ns
	8mA	GCLK	t _{co}	3.188	3.436	4.773	5.172	5.671	5.523	5.855	5.298	5.797	5.653	5.927	ns
		GCLK PLL	t _{co}	1.440	1.614	2.027	2.125	2.337	2.339	2.284	2.230	2.444	2.446	2.268	ns
	12mA	GCLK	t _{co}	3.164	3.408	4.744	5.145	5.646	5.498	5.830	5.271	5.772	5.628	5.902	ns
		GCLK PLL	t _{co}	1.415	1.586	1.998	2.098	2.312	2.314	2.259	2.203	2.419	2.421	2.243	ns
	16mA	GCLK	t _{co}	3.157	3.401	4.736	5.136	5.637	5.489	5.821	5.261	5.762	5.618	5.892	ns
		GCLK PLL	t _{co}	1.408	1.579	1.990	2.089	2.303	2.305	2.250	2.194	2.410	2.412	2.234	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.338	3.628	5.079	5.494	6.032	5.886	6.217	5.630	6.160	6.016	6.289	ns
		GCLK PLL	t _{co}	1.571	1.767	2.256	2.370	2.595	2.597	2.542	2.485	2.711	2.713	2.535	ns
	8mA	GCLK	t _{co}	3.252	3.506	4.911	5.326	5.879	5.733	6.064	5.463	5.987	5.843	6.116	ns
		GCLK PLL	t _{co}	1.504	1.682	2.152	2.259	2.479	2.481	2.426	2.370	2.593	2.595	2.417	ns
	12mA	GCLK	t _{co}	3.214	3.467	4.830	5.234	5.777	5.631	5.962	5.364	5.874	5.730	6.003	ns
		GCLK PLL	t _{co}	1.466	1.645	2.084	2.187	2.405	2.407	2.352	2.296	2.517	2.519	2.341	ns
	16mA	GCLK	t _{co}	3.192	3.440	4.795	5.195	5.727	5.581	5.912	5.324	5.826	5.682	5.956	ns
		GCLK PLL	t _{co}	1.444	1.618	2.049	2.148	2.363	2.365	2.310	2.256	2.473	2.475	2.297	ns

Table 1-115. EP3SE80 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.286	3.544	4.969	5.379	5.933	5.787	6.118	5.514	6.040	5.896	6.169	ns
		GCLK PLL	t _{co}	1.525	1.707	2.186	2.292	2.514	2.516	2.461	2.404	2.629	2.631	2.453	ns
	8mA	GCLK	t _{co}	3.201	3.450	4.808	5.210	5.751	5.605	5.936	5.339	5.842	5.698	5.972	ns
		GCLK PLL	t _{co}	1.453	1.628	2.063	2.163	2.379	2.381	2.326	2.271	2.490	2.492	2.314	ns
	12mA	GCLK	t _{co}	3.177	3.421	4.769	5.170	5.680	5.534	5.865	5.299	5.801	5.657	5.931	ns
		GCLK PLL	t _{co}	1.429	1.599	2.023	2.124	2.338	2.340	2.285	2.231	2.448	2.450	2.272	ns
	16mA	GCLK	t _{co}	3.177	3.421	4.761	5.161	5.681	5.535	5.866	5.288	5.789	5.645	5.919	ns
		GCLK PLL	t _{co}	1.429	1.599	2.015	2.114	2.328	2.330	2.275	2.220	2.436	2.438	2.260	ns
2.5 V	4mA	GCLK	t _{co}	3.405	3.691	5.223	5.658	6.215	6.069	6.400	5.805	6.365	6.221	6.494	ns
		GCLK PLL	t _{co}	1.629	1.822	2.393	2.519	2.761	2.763	2.708	2.637	2.884	2.886	2.708	ns
	8mA	GCLK	t _{co}	3.298	3.566	5.050	5.474	6.018	5.872	6.203	5.613	6.155	6.011	6.284	ns
		GCLK PLL	t _{co}	1.546	1.729	2.274	2.393	2.629	2.631	2.576	2.509	2.748	2.750	2.572	ns
	12mA	GCLK	t _{co}	3.239	3.507	4.928	5.344	5.878	5.732	6.063	5.479	6.005	5.861	6.134	ns
		GCLK PLL	t _{co}	1.491	1.685	2.182	2.297	2.529	2.531	2.476	2.411	2.646	2.648	2.470	ns
	16mA	GCLK	t _{co}	3.206	3.461	4.894	5.307	5.828	5.682	6.013	5.439	5.955	5.811	6.085	ns
		GCLK PLL	t _{co}	1.457	1.639	2.148	2.260	2.488	2.490	2.435	2.372	2.602	2.604	2.426	ns

Table 1–115. EP3SE80 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.582	3.873	5.517	5.976	6.542	6.396	6.727	6.137	6.700	6.556	6.829	ns
		GCLK PLL	t _{co}	1.743	1.950	2.588	2.728	2.979	2.981	2.926	2.855	3.110	3.112	2.934	ns
	4mA	GCLK	t _{co}	3.437	3.713	5.301	5.735	6.292	6.146	6.477	5.884	6.443	6.299	6.572	ns
		GCLK PLL	t _{co}	1.645	1.839	2.436	2.570	2.818	2.820	2.765	2.696	2.944	2.946	2.768	ns
	6mA	GCLK	t _{co}	3.335	3.595	5.100	5.530	6.088	5.942	6.273	5.677	6.224	6.080	6.353	ns
		GCLK PLL	t _{co}	1.563	1.752	2.309	2.432	2.674	2.676	2.621	2.552	2.797	2.799	2.621	ns
	8mA	GCLK	t _{co}	3.286	3.541	5.004	5.434	5.978	5.832	6.163	5.573	6.109	5.965	6.238	ns
		GCLK PLL	t _{co}	1.538	1.719	2.248	2.366	2.599	2.601	2.546	2.481	2.716	2.718	2.540	ns
	10mA	GCLK	t _{co}	3.215	3.477	4.906	5.319	5.848	5.702	6.033	5.452	5.968	5.824	6.098	ns
		GCLK PLL	t _{co}	1.467	1.655	2.160	2.272	2.500	2.502	2.447	2.384	2.615	2.617	2.439	ns
	12mA	GCLK	t _{co}	3.210	3.467	4.900	5.313	5.843	5.697	6.028	5.445	5.961	5.817	6.091	ns
		GCLK PLL	t _{co}	1.462	1.645	2.154	2.266	2.493	2.495	2.440	2.377	2.608	2.610	2.432	ns
1.5 V	2mA	GCLK	t _{co}	3.500	3.822	5.432	5.873	6.430	6.284	6.615	6.026	6.587	6.443	6.716	ns
		GCLK PLL	t _{co}	1.684	1.917	2.526	2.655	2.907	2.909	2.854	2.785	3.043	3.045	2.867	ns
	4mA	GCLK	t _{co}	3.301	3.573	5.059	5.482	6.027	5.881	6.212	5.622	6.162	6.018	6.291	ns
		GCLK PLL	t _{co}	1.552	1.736	2.283	2.401	2.636	2.638	2.583	2.517	2.757	2.759	2.581	ns
	6mA	GCLK	t _{co}	3.256	3.521	4.948	5.368	5.920	5.774	6.105	5.505	6.035	5.891	6.164	ns
		GCLK PLL	t _{co}	1.508	1.699	2.202	2.321	2.556	2.558	2.503	2.437	2.674	2.676	2.498	ns
	8mA	GCLK	t _{co}	3.245	3.515	4.942	5.360	5.905	5.759	6.090	5.498	6.022	5.878	6.151	ns
		GCLK PLL	t _{co}	1.496	1.693	2.196	2.314	2.547	2.549	2.494	2.430	2.666	2.668	2.490	ns
	10mA	GCLK	t _{co}	3.210	3.464	4.894	5.307	5.835	5.689	6.020	5.439	5.954	5.810	6.084	ns
		GCLK PLL	t _{co}	1.461	1.642	2.148	2.260	2.486	2.488	2.433	2.371	2.601	2.603	2.425	ns
	12mA	GCLK	t _{co}	3.206	3.457	4.873	5.286	5.811	5.665	5.996	5.418	5.932	5.788	6.062	ns
		GCLK PLL	t _{co}	1.457	1.635	2.128	2.239	2.466	2.468	2.413	2.350	2.580	2.582	2.404	ns

Table 1-115. EP3SE80 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.464	3.744	5.345	5.777	6.354	6.208	6.539	5.937	6.499	6.355	6.628	ns
		GCLK PLL	t _{co}	1.663	1.860	2.480	2.609	2.850	2.852	2.797	2.732	2.977	2.979	2.801	ns
	4mA	GCLK	t _{co}	3.289	3.547	5.016	5.443	5.997	5.851	6.182	5.583	6.118	5.974	6.247	ns
		GCLK PLL	t _{co}	1.541	1.725	2.261	2.378	2.610	2.612	2.557	2.493	2.729	2.731	2.553	ns
	6mA	GCLK	t _{co}	3.236	3.506	4.931	5.348	5.896	5.750	6.081	5.486	6.009	5.865	6.139	ns
		GCLK PLL	t _{co}	1.488	1.684	2.185	2.301	2.536	2.538	2.483	2.418	2.656	2.658	2.480	ns
	8mA	GCLK	t _{co}	3.216	3.472	4.892	5.305	5.846	5.700	6.031	5.437	5.952	5.808	6.082	ns
		GCLK PLL	t _{co}	1.467	1.650	2.146	2.258	2.486	2.488	2.433	2.369	2.599	2.601	2.423	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.229	3.480	4.900	5.313	5.859	5.713	6.044	5.442	5.957	5.813	6.087	ns
		GCLK PLL	t _{co}	1.481	1.658	2.154	2.266	2.494	2.496	2.441	2.375	2.604	2.606	2.428	ns
	10mA	GCLK	t _{co}	3.232	3.483	4.904	5.317	5.867	5.721	6.052	5.446	5.961	5.817	6.091	ns
		GCLK PLL	t _{co}	1.484	1.661	2.158	2.270	2.498	2.500	2.445	2.378	2.608	2.610	2.432	ns
	12mA	GCLK	t _{co}	3.214	3.463	4.882	5.295	5.825	5.679	6.010	5.425	5.939	5.795	6.069	ns
		GCLK PLL	t _{co}	1.465	1.641	2.137	2.248	2.476	2.478	2.423	2.357	2.586	2.588	2.410	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.209	3.456	4.867	5.279	5.806	5.660	5.991	5.408	5.921	5.777	6.051	ns
		GCLK PLL	t _{co}	1.460	1.634	2.122	2.232	2.459	2.461	2.406	2.340	2.569	2.571	2.393	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.247	3.500	4.923	5.336	5.889	5.743	6.074	5.466	5.981	5.837	6.111	ns
		GCLK PLL	t _{co}	1.499	1.678	2.177	2.289	2.517	2.519	2.464	2.398	2.628	2.630	2.452	ns
	6mA	GCLK	t _{co}	3.228	3.479	4.901	5.314	5.854	5.708	6.039	5.444	5.958	5.814	6.088	ns
		GCLK PLL	t _{co}	1.480	1.657	2.155	2.267	2.495	2.497	2.442	2.376	2.605	2.607	2.429	ns
	8mA	GCLK	t _{co}	3.229	3.482	4.909	5.323	5.871	5.725	6.056	5.454	5.969	5.825	6.099	ns
		GCLK PLL	t _{co}	1.481	1.660	2.163	2.276	2.505	2.507	2.452	2.386	2.616	2.618	2.440	ns
	10mA	GCLK	t _{co}	3.212	3.462	4.884	5.298	5.831	5.685	6.016	5.428	5.943	5.799	6.073	ns
		GCLK PLL	t _{co}	1.464	1.640	2.139	2.251	2.480	2.482	2.427	2.360	2.591	2.593	2.415	ns
	12mA	GCLK	t _{co}	3.209	3.458	4.880	5.294	5.823	5.677	6.008	5.424	5.939	5.795	6.069	ns
		GCLK PLL	t _{co}	1.460	1.636	2.135	2.247	2.475	2.477	2.422	2.356	2.587	2.589	2.411	ns

Table 1–115. EP3SE80 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.209	3.457	4.868	5.279	5.805	5.659	5.990	5.409	5.922	5.778	6.052	ns
		GCLK PLL	t _{co}	1.461	1.635	2.122	2.233	2.459	2.461	2.406	2.341	2.569	2.571	2.393	ns
	16mA	GCLK	t _{co}	3.208	3.457	4.876	5.289	5.805	5.657	5.989	5.419	5.935	5.791	6.065	ns
		GCLK PLL	t _{co}	1.460	1.635	2.130	2.243	2.471	2.473	2.418	2.351	2.582	2.584	2.406	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.239	3.491	4.916	5.329	5.870	5.724	6.055	5.459	5.973	5.829	6.103	ns
		GCLK PLL	t _{co}	1.490	1.669	2.170	2.282	2.509	2.511	2.456	2.391	2.620	2.622	2.444	ns
	6mA	GCLK	t _{co}	3.224	3.475	4.902	5.316	5.854	5.708	6.039	5.446	5.962	5.818	6.092	ns
		GCLK PLL	t _{co}	1.475	1.653	2.156	2.269	2.497	2.499	2.444	2.378	2.609	2.611	2.433	ns
	8mA	GCLK	t _{co}	3.211	3.460	4.882	5.295	5.826	5.680	6.011	5.426	5.941	5.797	6.071	ns
		GCLK PLL	t _{co}	1.462	1.638	2.136	2.248	2.477	2.479	2.424	2.358	2.588	2.590	2.412	ns
	10mA	GCLK	t _{co}	3.211	3.461	4.883	5.297	5.831	5.685	6.016	5.428	5.944	5.800	6.074	ns
		GCLK PLL	t _{co}	1.463	1.639	2.137	2.250	2.480	2.482	2.427	2.360	2.591	2.593	2.415	ns
	12mA	GCLK	t _{co}	3.207	3.456	4.876	5.290	5.820	5.674	6.005	5.420	5.936	5.792	6.066	ns
		GCLK PLL	t _{co}	1.458	1.634	2.130	2.243	2.472	2.474	2.419	2.352	2.583	2.585	2.407	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.225	3.473	4.884	5.295	5.828	5.682	6.013	5.424	5.937	5.793	6.067	ns
		GCLK PLL	t _{co}	1.476	1.651	2.138	2.248	2.474	2.476	2.421	2.356	2.584	2.586	2.408	ns
	16mA	GCLK	t _{co}	3.224	3.473	4.888	5.300	5.843	5.697	6.028	5.429	5.943	5.799	6.073	ns
		GCLK PLL	t _{co}	1.475	1.651	2.142	2.253	2.480	2.482	2.427	2.361	2.590	2.592	2.414	ns

Table 1-115. EP3SE80 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =1.1V	V _{CC1} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.211	3.459	4.872	5.284	5.816	5.670	6.001	5.413	5.927	5.783	6.057	ns
		GCLK PLL	t _{co}	1.462	1.637	2.126	2.237	2.464	2.466	2.411	2.345	2.574	2.576	2.398	ns
	6mA	GCLK	t _{co}	3.206	3.454	4.866	5.278	5.801	5.655	5.986	5.407	5.921	5.777	6.051	ns
		GCLK PLL	t _{co}	1.458	1.632	2.120	2.231	2.458	2.460	2.405	2.339	2.568	2.570	2.392	ns
	8mA	GCLK	t _{co}	3.208	3.457	4.871	5.283	5.818	5.672	6.003	5.413	5.927	5.783	6.057	ns
		GCLK PLL	t _{co}	1.460	1.635	2.125	2.236	2.464	2.466	2.411	2.345	2.575	2.577	2.399	ns
	10mA	GCLK	t _{co}	3.207	3.455	4.864	5.276	5.791	5.645	5.976	5.405	5.918	5.774	6.048	ns
		GCLK PLL	t _{co}	1.459	1.633	2.118	2.229	2.456	2.458	2.403	2.337	2.566	2.568	2.390	ns
	12mA	GCLK	t _{co}	3.226	3.474	4.886	5.297	5.828	5.682	6.013	5.427	5.939	5.795	6.069	ns
		GCLK PLL	t _{co}	1.477	1.652	2.140	2.250	2.477	2.479	2.424	2.359	2.587	2.589	2.411	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.221	3.470	4.884	5.296	5.831	5.685	6.016	5.426	5.939	5.795	6.069	ns
		GCLK PLL	t _{co}	1.472	1.648	2.138	2.249	2.476	2.478	2.423	2.358	2.586	2.588	2.410	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.220	3.469	4.885	5.297	5.832	5.686	6.017	5.427	5.940	5.796	6.070	ns
		GCLK PLL	t _{co}	1.472	1.647	2.139	2.250	2.477	2.479	2.424	2.359	2.587	2.589	2.411	ns
	6mA	GCLK	t _{co}	3.211	3.459	4.872	5.285	5.813	5.667	5.998	5.414	5.928	5.784	6.058	ns
		GCLK PLL	t _{co}	1.462	1.637	2.127	2.238	2.465	2.467	2.412	2.346	2.575	2.577	2.399	ns
	8mA	GCLK	t _{co}	3.212	3.461	4.878	5.291	5.823	5.677	6.008	5.421	5.936	5.792	6.066	ns
		GCLK PLL	t _{co}	1.464	1.639	2.132	2.245	2.473	2.475	2.420	2.353	2.584	2.586	2.408	ns
	10mA	GCLK	t _{co}	3.234	3.486	4.906	5.318	5.853	5.707	6.038	5.449	5.963	5.819	6.093	ns
		GCLK PLL	t _{co}	1.486	1.664	2.160	2.272	2.499	2.501	2.446	2.381	2.611	2.613	2.435	ns
	12mA	GCLK	t _{co}	3.224	3.474	4.894	5.307	5.839	5.693	6.024	5.437	5.952	5.808	6.082	ns
		GCLK PLL	t _{co}	1.475	1.652	2.148	2.260	2.488	2.490	2.435	2.369	2.599	2.601	2.423	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.222	3.472	4.892	5.305	5.838	5.692	6.023	5.436	5.951	5.807	6.081	ns
		GCLK PLL	t _{co}	1.474	1.650	2.146	2.258	2.486	2.488	2.433	2.368	2.598	2.600	2.422	ns

Table 1–115. EP3SE80 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.220	3.470	4.891	5.305	5.836	5.690	6.021	5.435	5.951	5.807	6.081	ns
		GCLK PLL	t _{co}	1.471	1.648	2.145	2.258	2.486	2.488	2.433	2.367	2.598	2.600	2.422	ns
	6mA	GCLK	t _{co}	3.216	3.466	4.884	5.298	5.826	5.680	6.011	5.428	5.943	5.799	6.073	ns
		GCLK PLL	t _{co}	1.467	1.644	2.139	2.251	2.479	2.481	2.426	2.360	2.591	2.593	2.415	ns
	8mA	GCLK	t _{co}	3.293	3.541	4.902	5.306	5.810	5.662	5.994	5.436	5.941	5.797	6.071	ns
		GCLK PLL	t _{co}	1.544	1.719	2.156	2.259	2.476	2.478	2.423	2.368	2.588	2.590	2.412	ns
	10mA	GCLK	t _{co}	3.293	3.541	4.902	5.306	5.810	5.662	5.994	5.436	5.941	5.797	6.071	ns
		GCLK PLL	t _{co}	1.544	1.719	2.156	2.259	2.476	2.478	2.423	2.368	2.588	2.590	2.412	ns
	12mA	GCLK	t _{co}	3.333	3.617	5.038	5.451	5.972	5.826	6.157	5.587	6.111	5.967	6.240	ns
		GCLK PLL	t _{co}	1.573	1.758	2.222	2.334	2.556	2.558	2.503	2.446	2.669	2.671	2.493	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.243	3.494	4.871	5.284	5.804	5.658	5.989	5.418	5.938	5.794	6.067	ns
		GCLK PLL	t _{co}	1.494	1.669	2.119	2.222	2.439	2.441	2.386	2.330	2.549	2.551	2.373	ns
3.0-V PCI	—	GCLK	t _{co}	3.213	3.459	4.797	5.199	5.704	5.558	5.889	5.328	5.835	5.691	5.965	ns
		GCLK PLL	t _{co}	1.465	1.637	2.052	2.152	2.369	2.371	2.316	2.260	2.482	2.484	2.306	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.199	3.445	4.776	5.176	5.675	5.527	5.859	5.302	5.801	5.657	5.931	ns
		GCLK PLL	t _{co}	1.451	1.623	2.031	2.129	2.341	2.343	2.288	2.234	2.449	2.451	2.273	ns

Table 1–116 specifies EP3SE80 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1–116. EP3SE80 Row Pins output Timing Parameters (Part 1 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.238	3.493	4.856	5.245	5.757	5.609	5.907	5.368	5.891	5.735	5.990	ns
		GCLK PLL	t _{co}	1.439	1.634	2.039	2.121	2.343	2.334	2.309	2.226	2.430	2.441	2.301	ns
	8mA	GCLK	t _{co}	3.156	3.399	4.726	5.107	5.612	5.464	5.762	5.227	5.742	5.586	5.841	ns
		GCLK PLL	t _{co}	1.346	1.529	1.909	1.983	2.198	2.189	2.195	2.085	2.281	2.292	2.186	ns
	12mA	GCLK	t _{co}	3.077	3.310	4.607	4.984	5.484	5.348	5.634	5.107	5.610	5.468	5.709	ns
		GCLK PLL	t _{co}	1.247	1.423	1.790	1.860	2.070	2.061	2.099	1.958	2.149	2.160	2.086	ns

Table 1-116. EP3SE80 Row Pins output Timing Parameters (Part 2 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.248	3.497	4.864	5.250	5.761	5.613	5.911	5.374	5.895	5.739	5.994	ns
		GCLK PLL	t _{co}	1.449	1.638	2.047	2.126	2.347	2.338	2.318	2.232	2.434	2.445	2.313	ns
	8mA	GCLK	t _{co}	3.081	3.314	4.613	4.999	5.490	5.358	5.640	5.119	5.617	5.477	5.716	ns
		GCLK PLL	t _{co}	1.251	1.429	1.796	1.866	2.076	2.067	2.109	1.964	2.156	2.167	2.095	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.192	3.439	4.808	5.198	5.713	5.565	5.863	5.325	5.849	5.693	5.948	ns
		GCLK PLL	t _{co}	1.393	1.580	1.991	2.074	2.299	2.290	2.275	2.183	2.388	2.399	2.267	ns
	8mA	GCLK	t _{co}	3.082	3.319	4.655	5.039	5.549	5.401	5.699	5.163	5.685	5.528	5.783	ns
		GCLK PLL	t _{co}	1.268	1.453	1.838	1.915	2.135	2.126	2.130	2.021	2.224	2.234	2.121	ns
	12mA	GCLK	t _{co}	3.045	3.281	4.582	4.957	5.461	5.313	5.611	5.077	5.592	5.435	5.690	ns
		GCLK PLL	t _{co}	1.229	1.402	1.756	1.832	2.047	2.038	2.060	1.935	2.131	2.141	2.048	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.106	3.358	4.702	5.091	5.603	5.455	5.753	5.217	5.738	5.581	5.836	ns
		GCLK PLL	t _{co}	1.307	1.499	1.885	1.967	2.189	2.180	2.166	2.075	2.277	2.287	2.157	ns
	8mA	GCLK	t _{co}	3.032	3.265	4.554	4.928	5.422	5.281	5.572	5.047	5.552	5.401	5.650	ns
		GCLK PLL	t _{co}	1.207	1.380	1.721	1.793	2.008	1.999	2.032	1.895	2.091	2.101	2.019	ns
2.5 V	4mA	GCLK	t _{co}	3.218	3.475	4.940	5.352	5.885	5.737	6.035	5.485	6.028	5.871	6.126	ns
		GCLK PLL	t _{co}	1.419	1.616	2.123	2.228	2.471	2.462	2.420	2.343	2.567	2.577	2.419	ns
	8mA	GCLK	t _{co}	3.124	3.377	4.785	5.189	5.715	5.567	5.865	5.318	5.854	5.697	5.952	ns
		GCLK PLL	t _{co}	1.309	1.518	1.968	2.065	2.301	2.292	2.278	2.176	2.393	2.403	2.274	ns
	12mA	GCLK	t _{co}	3.067	3.321	4.679	5.070	5.589	5.441	5.739	5.195	5.724	5.567	5.822	ns
		GCLK PLL	t _{co}	1.263	1.441	1.857	1.946	2.175	2.166	2.187	2.053	2.263	2.273	2.180	ns
1.8 V	2mA	GCLK	t _{co}	3.451	3.722	5.326	5.781	6.360	6.212	6.510	5.922	6.504	6.356	6.611	ns
		GCLK PLL	t _{co}	1.652	1.862	2.507	2.657	2.761	2.937	2.944	2.780	2.883	3.062	2.957	ns
	4mA	GCLK	t _{co}	3.229	3.520	4.999	5.412	5.955	5.807	6.105	5.557	6.098	5.949	6.204	ns
		GCLK PLL	t _{co}	1.427	1.660	2.180	2.288	2.401	2.532	2.539	2.415	2.522	2.655	2.550	ns
	6mA	GCLK	t _{co}	3.161	3.418	4.846	5.262	5.796	5.648	5.946	5.389	5.925	5.777	6.032	ns
		GCLK PLL	t _{co}	1.362	1.558	2.027	2.138	2.301	2.373	2.380	2.247	2.416	2.483	2.378	ns
	8mA	GCLK	t _{co}	3.136	3.379	4.770	5.176	5.699	5.552	5.849	5.300	5.831	5.683	5.938	ns
		GCLK PLL	t _{co}	1.315	1.497	1.950	2.044	2.235	2.276	2.297	2.152	2.344	2.389	2.290	ns

Table 1–116. EP3SE80 Row Pins output Timing Parameters (Part 3 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.362	3.640	5.236	5.694	6.288	6.140	6.438	5.829	6.428	6.280	6.535	ns
		GCLK PLL	t _{co}	1.563	1.780	2.417	2.570	2.698	2.865	2.872	2.687	2.818	2.986	2.881	ns
	4mA	GCLK	t _{co}	3.152	3.396	4.831	5.257	5.797	5.649	5.947	5.383	5.924	5.776	6.031	ns
		GCLK PLL	t _{co}	1.331	1.522	2.012	2.133	2.304	2.374	2.381	2.241	2.417	2.482	2.377	ns
	6mA	GCLK	t _{co}	3.125	3.370	4.758	5.168	5.691	5.552	5.841	5.293	5.819	5.677	5.926	ns
		GCLK PLL	t _{co}	1.304	1.488	1.939	2.037	2.235	2.268	2.297	2.143	2.344	2.377	2.290	ns
	8mA	GCLK	t _{co}	3.106	3.359	4.738	5.143	5.672	5.533	5.822	5.269	5.797	5.658	5.904	ns
		GCLK PLL	t _{co}	1.285	1.477	1.917	2.019	2.216	2.249	2.278	2.125	2.325	2.355	2.271	ns
1.2 V	2mA	GCLK	t _{co}	3.305	3.565	5.146	5.608	6.213	6.065	6.363	5.741	6.344	6.196	6.451	ns
		GCLK PLL	t _{co}	1.506	1.705	2.327	2.484	2.637	2.790	2.797	2.599	2.749	2.902	2.797	ns
	4mA	GCLK	t _{co}	3.157	3.400	4.853	5.285	5.838	5.690	5.988	5.408	5.966	5.818	6.073	ns
		GCLK PLL	t _{co}	1.336	1.518	2.034	2.161	2.352	2.415	2.422	2.266	2.461	2.524	2.419	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.071	3.309	4.672	5.060	5.557	5.426	5.707	5.180	5.686	5.548	5.785	ns
		GCLK PLL	t _{co}	1.248	1.427	1.835	1.918	2.143	2.134	2.177	2.020	2.225	2.236	2.166	ns
	12mA	GCLK	t _{co}	3.066	3.305	4.669	5.058	5.549	5.424	5.699	5.179	5.679	5.547	5.778	ns
		GCLK PLL	t _{co}	1.236	1.415	1.827	1.910	2.135	2.126	2.175	2.012	2.218	2.229	2.165	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.057	3.294	4.654	5.042	5.522	5.407	5.672	5.162	5.652	5.529	5.751	ns
		GCLK PLL	t _{co}	1.220	1.397	1.802	1.885	2.108	2.099	2.158	1.986	2.191	2.202	2.147	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.085	3.323	4.689	5.080	5.578	5.447	5.724	5.199	5.698	5.568	5.802	ns
		GCLK PLL	t _{co}	1.264	1.441	1.849	1.934	2.130	2.151	2.192	2.035	2.235	2.254	2.181	ns
	6mA	GCLK	t _{co}	3.080	3.318	4.687	5.079	5.577	5.446	5.723	5.197	5.696	5.566	5.800	ns
		GCLK PLL	t _{co}	1.259	1.436	1.847	1.933	2.129	2.150	2.191	2.033	2.233	2.252	2.179	ns
	8mA	GCLK	t _{co}	3.069	3.307	4.677	5.069	5.567	5.436	5.713	5.188	5.687	5.557	5.791	ns
		GCLK PLL	t _{co}	1.248	1.425	1.837	1.923	2.119	2.140	2.181	2.024	2.224	2.243	2.170	ns
	10mA	GCLK	t _{co}	3.058	3.296	4.664	5.056	5.554	5.423	5.700	5.176	5.675	5.545	5.779	ns
		GCLK PLL	t _{co}	1.237	1.414	1.824	1.910	2.106	2.127	2.168	2.012	2.212	2.231	2.158	ns
	12mA	GCLK	t _{co}	3.058	3.295	4.664	5.056	5.554	5.423	5.700	5.175	5.675	5.545	5.779	ns
		GCLK PLL	t _{co}	1.237	1.413	1.824	1.910	2.106	2.127	2.168	2.011	2.212	2.231	2.158	ns

Table 1-116. EP3SE80 Row Pins output Timing Parameters (Part 4 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.066	3.302	4.663	5.053	5.549	5.418	5.695	5.171	5.669	5.539	5.773	ns
		GCLK PLL	t _{co}	1.245	1.420	1.823	1.907	2.101	2.122	2.163	2.007	2.206	2.225	2.152	ns
	16mA	GCLK	t _{co}	3.067	3.305	4.669	5.061	5.559	5.428	5.705	5.180	5.680	5.550	5.784	ns
		GCLK PLL	t _{co}	1.246	1.423	1.829	1.915	2.111	2.132	2.173	2.016	2.217	2.236	2.163	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.088	3.326	4.698	5.091	5.591	5.460	5.740	5.209	5.710	5.580	5.817	ns
		GCLK PLL	t _{co}	1.267	1.444	1.858	1.946	2.143	2.167	2.205	2.046	2.247	2.268	2.193	ns
	6mA	GCLK	t _{co}	3.074	3.312	4.687	5.081	5.581	5.450	5.727	5.200	5.701	5.571	5.805	ns
		GCLK PLL	t _{co}	1.253	1.430	1.847	1.935	2.133	2.154	2.195	2.036	2.238	2.257	2.184	ns
	8mA	GCLK	t _{co}	3.063	3.300	4.674	5.068	5.568	5.437	5.714	5.187	5.688	5.558	5.792	ns
		GCLK PLL	t _{co}	1.242	1.418	1.834	1.922	2.120	2.141	2.182	2.023	2.225	2.244	2.171	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.073	3.308	4.662	5.051	5.547	5.416	5.693	5.170	5.666	5.536	5.770	ns
		GCLK PLL	t _{co}	1.252	1.426	1.822	1.905	2.099	2.120	2.161	2.006	2.203	2.222	2.149	ns
	6mA	GCLK	t _{co}	3.066	3.302	4.660	5.050	5.546	5.415	5.692	5.169	5.666	5.536	5.770	ns
		GCLK PLL	t _{co}	1.245	1.420	1.820	1.904	2.098	2.119	2.160	2.005	2.203	2.222	2.149	ns
	8mA	GCLK	t _{co}	3.057	3.294	4.653	5.043	5.539	5.408	5.685	5.162	5.659	5.529	5.763	ns
		GCLK PLL	t _{co}	1.236	1.412	1.813	1.897	2.091	2.112	2.153	1.998	2.196	2.215	2.142	ns
	10mA	GCLK	t _{co}	3.060	3.296	4.656	5.046	5.543	5.412	5.689	5.165	5.662	5.532	5.766	ns
		GCLK PLL	t _{co}	1.239	1.414	1.816	1.900	2.095	2.116	2.157	2.001	2.199	2.218	2.145	ns
	12mA	GCLK	t _{co}	3.056	3.293	4.658	5.049	5.546	5.415	5.692	5.168	5.667	5.537	5.771	ns
		GCLK PLL	t _{co}	1.235	1.411	1.818	1.903	2.098	2.119	2.160	2.004	2.204	2.223	2.150	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.064	3.301	4.656	5.046	5.542	5.411	5.688	5.164	5.661	5.531	5.765	ns
		GCLK PLL	t _{co}	1.243	1.419	1.816	1.900	2.094	2.115	2.156	2.000	2.198	2.217	2.144	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.079	3.314	4.671	5.061	5.558	5.427	5.704	5.179	5.677	5.547	5.781	ns
		GCLK PLL	t _{co}	1.258	1.432	1.831	1.915	2.110	2.131	2.172	2.015	2.214	2.233	2.160	ns
	6mA	GCLK	t _{co}	3.073	3.309	4.672	5.063	5.560	5.429	5.706	5.181	5.680	5.550	5.784	ns
		GCLK PLL	t _{co}	1.252	1.427	1.832	1.917	2.112	2.133	2.174	2.017	2.217	2.236	2.163	ns
	8mA	GCLK	t _{co}	3.069	3.305	4.667	5.058	5.555	5.424	5.701	5.176	5.674	5.544	5.778	ns
		GCLK PLL	t _{co}	1.248	1.423	1.827	1.912	2.107	2.128	2.169	2.012	2.211	2.230	2.157	ns

Table 1–116. EP3SE80 Row Pins output Timing Parameters (Part 5 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.081	3.316	4.684	5.077	5.577	5.446	5.723	5.195	5.696	5.566	5.800	ns
		GCLK PLL	t _{co}	1.260	1.434	1.844	1.931	2.129	2.150	2.191	2.031	2.233	2.252	2.179	ns
	6mA	GCLK	t _{co}	3.072	3.308	4.675	5.068	5.568	5.437	5.714	5.186	5.687	5.557	5.791	ns
		GCLK PLL	t _{co}	1.251	1.426	1.835	1.922	2.120	2.141	2.182	2.022	2.224	2.243	2.170	ns
	8mA	GCLK	t _{co}	3.071	3.308	4.682	5.076	5.577	5.446	5.723	5.195	5.697	5.567	5.801	ns
		GCLK PLL	t _{co}	1.250	1.426	1.842	1.930	2.129	2.150	2.191	2.031	2.234	2.253	2.180	ns
3.0-V PCI	—	GCLK	t _{co}	3.177	3.415	4.724	5.106	5.581	5.466	5.731	5.228	5.698	5.590	5.810	ns
		GCLK PLL	t _{co}	1.333	1.510	1.860	1.936	2.152	2.143	2.217	2.038	2.252	2.248	2.208	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.177	3.415	4.724	5.106	5.581	5.466	5.731	5.228	5.698	5.590	5.810	ns
		GCLK PLL	t _{co}	1.333	1.510	1.860	1.936	2.152	2.143	2.217	2.038	2.252	2.248	2.208	ns

Table 1–117 through Table 1–120 show the maximum I/O timing parameters for EP3SE80 devices for differential I/O standards.

Table 1–117 specifies EP3SE80 column pins input timing parameters for differential I/O standards.

Table 1–117. EP3SE80 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
MINI-LVDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
RSDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.813	-0.852	-1.258	-1.368	-1.483	-1.423	-1.794	-1.368	-1.482	-1.428	-1.837	ns
		t _h	0.942	0.999	1.460	1.595	1.731	1.659	2.031	1.604	1.739	1.674	2.075	ns
	GCLK PLL	t _{su}	1.144	1.171	1.802	2.025	2.242	2.134	2.045	2.042	2.260	2.147	2.091	ns
		t _h	-0.882	-0.886	-1.383	-1.555	-1.721	-1.641	-1.544	-1.563	-1.729	-1.645	-1.588	ns

Table 1-117. EP3SE80 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{su}	-0.813	-0.852	-1.258	-1.368	-1.483	-1.423	-1.794	-1.368	-1.482	-1.428	-1.837	ns
		t_h	0.942	0.999	1.460	1.595	1.731	1.659	2.031	1.604	1.739	1.674	2.075	ns
	GCLK PLL	t_{su}	1.144	1.171	1.802	2.025	2.242	2.134	2.045	2.042	2.260	2.147	2.091	ns
		t_h	-0.882	-0.886	-1.383	-1.555	-1.721	-1.641	-1.544	-1.563	-1.729	-1.645	-1.588	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t_h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t_{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t_h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t_h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t_{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t_h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t_h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t_{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t_h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t_{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t_h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t_{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t_h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t_{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t_h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t_{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t_h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t_{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t_h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t_{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t_h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t_{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t_h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t_{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t_h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t_{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t_h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t_{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t_h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns

Table 1-117. EP3SE80 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t_{su}	-0.840	-0.881	-1.289	-1.395	-1.518	-1.460	-1.828	-1.394	-1.510	-1.459	-1.866	ns
		t_h	0.969	1.028	1.493	1.625	1.769	1.697	2.070	1.633	1.772	1.706	2.109	ns
	GCLK PLL	t_{su}	1.117	1.142	1.771	1.998	2.207	2.097	2.011	2.016	2.232	2.116	2.062	ns
		t_h	-0.855	-0.857	-1.350	-1.525	-1.683	-1.603	-1.505	-1.534	-1.696	-1.613	-1.554	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t_{su}	-0.840	-0.881	-1.289	-1.395	-1.518	-1.460	-1.828	-1.394	-1.510	-1.459	-1.866	ns
		t_h	0.969	1.028	1.493	1.625	1.769	1.697	2.070	1.633	1.772	1.706	2.109	ns
	GCLK PLL	t_{su}	1.117	1.142	1.771	1.998	2.207	2.097	2.011	2.016	2.232	2.116	2.062	ns
		t_h	-0.855	-0.857	-1.350	-1.525	-1.683	-1.603	-1.505	-1.534	-1.696	-1.613	-1.554	ns

Table 1-118 specifies EP3SE80 row pins input timing parameters for differential I/O standards.

Table 1-118. EP3SE80 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{SU}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_{H}	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{SU}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_{H}	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
MINI-LVDS	GCLK	t_{SU}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_{H}	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{SU}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_{H}	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
RSDS	GCLK	t_{SU}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_{H}	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{SU}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_{H}	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{SU}	-0.749	-0.794	-1.145	-1.244	-1.343	-1.291	-1.633	-1.246	-1.344	-1.293	-1.677	ns
		t_{H}	0.875	0.936	1.345	1.468	1.587	1.524	1.867	1.479	1.597	1.535	1.912	ns
	GCLK PLL	t_{SU}	1.156	1.174	1.864	2.104	2.344	2.224	2.163	2.120	2.362	2.240	2.210	ns
		t_{H}	-0.893	-0.894	-1.447	-1.639	-1.828	-1.736	-1.666	-1.644	-1.834	-1.741	-1.709	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{SU}	-0.749	-0.794	-1.145	-1.244	-1.343	-1.291	-1.633	-1.246	-1.344	-1.293	-1.677	ns
		t_{H}	0.875	0.936	1.345	1.468	1.587	1.524	1.867	1.479	1.597	1.535	1.912	ns
	GCLK PLL	t_{SU}	1.156	1.174	1.864	2.104	2.344	2.224	2.163	2.120	2.362	2.240	2.210	ns
		t_{H}	-0.893	-0.894	-1.447	-1.639	-1.828	-1.736	-1.666	-1.644	-1.834	-1.741	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{SU}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t_{H}	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t_{SU}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t_{H}	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{SU}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t_{H}	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t_{SU}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t_{H}	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{SU}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t_{H}	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t_{SU}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t_{H}	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns

Table 1-118. EP3SE80 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t _h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t _{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t _h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t _h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t _{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t _h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.781	-0.827	-1.178	-1.275	-1.384	-1.333	-1.673	-1.273	-1.378	-1.329	-1.712	ns
		t _h	0.907	0.969	1.379	1.502	1.631	1.568	1.912	1.509	1.636	1.573	1.952	ns
	GCLK PLL	t _{su}	1.124	1.141	1.827	2.068	2.299	2.178	2.118	2.089	2.323	2.199	2.170	ns
		t _h	-0.861	-0.861	-1.411	-1.601	-1.780	-1.688	-1.617	-1.610	-1.792	-1.699	-1.665	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.781	-0.827	-1.178	-1.275	-1.384	-1.333	-1.673	-1.273	-1.378	-1.329	-1.712	ns
		t _h	0.907	0.969	1.379	1.502	1.631	1.568	1.912	1.509	1.636	1.573	1.952	ns
	GCLK PLL	t _{su}	1.124	1.141	1.827	2.068	2.299	2.178	2.118	2.089	2.323	2.199	2.170	ns
		t _h	-0.861	-0.861	-1.411	-1.601	-1.780	-1.688	-1.617	-1.610	-1.792	-1.699	-1.665	ns

Table 1-119 specifies EP3SE80 Column Pins Output Timing parameters for differential I/O standards.

Table 1-119. EP3SE80 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS_E_1R	—	GCLK	t_{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t_{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
LVDS_E_3R	—	GCLK	t_{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t_{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t_{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t_{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
RSDS_E_1R	—	GCLK	t_{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t_{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
RSDS_E_3R	—	GCLK	t_{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t_{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.179	3.420	4.828	5.233	5.750	5.610	5.910	5.358	5.875	5.736	5.985	ns
		GCLK PLL	t_{co}	1.355	1.535	1.984	2.084	2.298	2.309	2.335	2.190	2.407	2.417	2.323	ns
	6mA	GCLK	t_{co}	3.169	3.410	4.818	5.222	5.740	5.600	5.900	5.347	5.865	5.726	5.975	ns
		GCLK PLL	t_{co}	1.345	1.525	1.974	2.073	2.288	2.299	2.325	2.179	2.397	2.407	2.313	ns
	8mA	GCLK	t_{co}	3.169	3.410	4.821	5.226	5.744	5.604	5.904	5.352	5.870	5.731	5.980	ns
		GCLK PLL	t_{co}	1.345	1.525	1.977	2.077	2.292	2.303	2.329	2.184	2.402	2.412	2.318	ns
	10mA	GCLK	t_{co}	3.162	3.404	4.814	5.220	5.738	5.598	5.898	5.345	5.864	5.725	5.974	ns
		GCLK PLL	t_{co}	1.338	1.519	1.970	2.071	2.286	2.297	2.323	2.177	2.396	2.406	2.312	ns
	12mA	GCLK	t_{co}	3.161	3.402	4.811	5.217	5.735	5.595	5.895	5.342	5.860	5.721	5.970	ns
		GCLK PLL	t_{co}	1.337	1.517	1.967	2.068	2.283	2.294	2.320	2.174	2.392	2.402	2.308	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.183	3.424	4.832	5.237	5.754	5.614	5.914	5.362	5.880	5.741	5.990	ns
		GCLK PLL	t_{co}	1.359	1.539	1.988	2.088	2.302	2.313	2.339	2.194	2.412	2.422	2.328	ns

Table 1-119. EP3SE80 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.173	3.413	4.811	5.214	5.729	5.589	5.889	5.338	5.853	5.714	5.963	ns
		GCLK PLL	t _{co}	1.349	1.528	1.967	2.065	2.277	2.288	2.314	2.170	2.385	2.395	2.301	ns
	6mA	GCLK	t _{co}	3.168	3.409	4.811	5.214	5.730	5.590	5.890	5.339	5.855	5.716	5.965	ns
		GCLK PLL	t _{co}	1.344	1.524	1.967	2.065	2.278	2.289	2.315	2.171	2.387	2.397	2.303	ns
	8mA	GCLK	t _{co}	3.166	3.407	4.810	5.213	5.728	5.588	5.888	5.338	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.342	1.522	1.966	2.064	2.276	2.287	2.313	2.170	2.386	2.396	2.302	ns
	10mA	GCLK	t _{co}	3.158	3.398	4.800	5.203	5.719	5.579	5.879	5.328	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.334	1.513	1.956	2.054	2.267	2.278	2.304	2.160	2.376	2.386	2.292	ns
	12mA	GCLK	t _{co}	3.159	3.400	4.806	5.210	5.727	5.587	5.887	5.336	5.853	5.714	5.963	ns
		GCLK PLL	t _{co}	1.335	1.515	1.962	2.061	2.275	2.286	2.312	2.168	2.385	2.395	2.301	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.158	3.397	4.789	5.191	5.705	5.565	5.865	5.315	5.829	5.690	5.939	ns
		GCLK PLL	t _{co}	1.334	1.512	1.945	2.042	2.253	2.264	2.290	2.147	2.361	2.371	2.277	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.170	3.410	4.807	5.209	5.723	5.583	5.883	5.334	5.848	5.709	5.958	ns
		GCLK PLL	t _{co}	1.346	1.525	1.963	2.060	2.271	2.282	2.308	2.166	2.380	2.390	2.296	ns
	6mA	GCLK	t _{co}	3.166	3.407	4.808	5.211	5.727	5.587	5.887	5.336	5.852	5.713	5.962	ns
		GCLK PLL	t _{co}	1.342	1.522	1.964	2.062	2.275	2.286	2.312	2.168	2.384	2.394	2.300	ns
	8mA	GCLK	t _{co}	3.156	3.396	4.797	5.200	5.715	5.575	5.875	5.325	5.840	5.701	5.950	ns
		GCLK PLL	t _{co}	1.332	1.511	1.953	2.051	2.263	2.274	2.300	2.157	2.372	2.382	2.288	ns
	10mA	GCLK	t _{co}	3.154	3.394	4.795	5.197	5.713	5.573	5.873	5.323	5.838	5.699	5.948	ns
		GCLK PLL	t _{co}	1.330	1.509	1.951	2.048	2.261	2.272	2.298	2.155	2.370	2.380	2.286	ns
	12mA	GCLK	t _{co}	3.154	3.395	4.798	5.202	5.718	5.578	5.878	5.327	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.330	1.510	1.954	2.053	2.266	2.277	2.303	2.159	2.376	2.386	2.292	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.158	3.398	4.795	5.197	5.712	5.572	5.872	5.322	5.837	5.698	5.947	ns
		GCLK PLL	t _{co}	1.334	1.513	1.951	2.048	2.260	2.271	2.297	2.154	2.369	2.379	2.285	ns

Table 1-119. EP3SE80 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.184	3.427	4.840	5.245	5.762	5.622	5.922	5.370	5.887	5.748	5.997	ns
		GCLK PLL	t _{co}	1.360	1.542	1.996	2.096	2.310	2.321	2.347	2.202	2.419	2.429	2.335	ns
	6mA	GCLK	t _{co}	3.170	3.413	4.828	5.234	5.752	5.612	5.912	5.360	5.878	5.739	5.988	ns
		GCLK PLL	t _{co}	1.346	1.528	1.984	2.085	2.300	2.311	2.337	2.192	2.410	2.420	2.326	ns
	8mA	GCLK	t _{co}	3.158	3.400	4.811	5.216	5.734	5.594	5.894	5.342	5.860	5.721	5.970	ns
		GCLK PLL	t _{co}	1.334	1.515	1.967	2.067	2.282	2.293	2.319	2.174	2.392	2.402	2.308	ns
	10mA	GCLK	t _{co}	3.158	3.400	4.814	5.220	5.738	5.598	5.898	5.346	5.865	5.726	5.975	ns
		GCLK PLL	t _{co}	1.334	1.515	1.970	2.071	2.286	2.297	2.323	2.178	2.397	2.407	2.313	ns
	12mA	GCLK	t _{co}	3.154	3.396	4.807	5.212	5.731	5.591	5.891	5.339	5.857	5.718	5.967	ns
		GCLK PLL	t _{co}	1.330	1.511	1.963	2.063	2.279	2.290	2.316	2.171	2.389	2.399	2.305	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.158	3.398	4.800	5.203	5.719	5.579	5.879	5.328	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.334	1.513	1.956	2.054	2.267	2.278	2.304	2.160	2.376	2.386	2.292	ns
	16mA	GCLK	t _{co}	3.159	3.400	4.808	5.213	5.730	5.590	5.890	5.338	5.856	5.717	5.966	ns
		GCLK PLL	t _{co}	1.335	1.515	1.964	2.064	2.278	2.289	2.315	2.170	2.388	2.398	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.187	3.430	4.839	5.243	5.760	5.620	5.920	5.369	5.885	5.746	5.995	ns
		GCLK PLL	t _{co}	1.363	1.545	1.995	2.094	2.308	2.319	2.345	2.201	2.417	2.427	2.333	ns
	6mA	GCLK	t _{co}	3.176	3.418	4.827	5.231	5.748	5.608	5.908	5.357	5.873	5.734	5.983	ns
		GCLK PLL	t _{co}	1.352	1.533	1.983	2.082	2.296	2.307	2.333	2.189	2.405	2.415	2.321	ns
	8mA	GCLK	t _{co}	3.171	3.414	4.827	5.232	5.749	5.609	5.909	5.358	5.875	5.736	5.985	ns
		GCLK PLL	t _{co}	1.347	1.529	1.983	2.083	2.297	2.308	2.334	2.190	2.407	2.417	2.323	ns
	10mA	GCLK	t _{co}	3.157	3.399	4.809	5.213	5.730	5.590	5.890	5.339	5.857	5.718	5.967	ns
		GCLK PLL	t _{co}	1.333	1.514	1.965	2.064	2.278	2.289	2.315	2.171	2.389	2.399	2.305	ns
	12mA	GCLK	t _{co}	3.155	3.397	4.807	5.211	5.728	5.588	5.888	5.337	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.331	1.512	1.963	2.062	2.276	2.287	2.313	2.169	2.386	2.396	2.302	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.159	3.399	4.799	5.201	5.716	5.576	5.876	5.326	5.841	5.702	5.951	ns
		GCLK PLL	t _{co}	1.335	1.514	1.955	2.052	2.264	2.275	2.301	2.158	2.373	2.383	2.289	ns
	16mA	GCLK	t _{co}	3.159	3.400	4.807	5.211	5.728	5.588	5.888	5.337	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.335	1.515	1.963	2.062	2.276	2.287	2.313	2.169	2.386	2.396	2.302	ns

Table 1–119. EP3SE80 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t_{co}	3.175	3.417	4.823	5.226	5.742	5.602	5.902	5.352	5.867	5.728	5.977	ns
		GCLK PLL	t_{co}	1.351	1.532	1.979	2.077	2.290	2.301	2.327	2.184	2.399	2.409	2.315	ns
	10mA	GCLK	t_{co}	3.175	3.417	4.823	5.226	5.742	5.602	5.902	5.352	5.867	5.728	5.977	ns
		GCLK PLL	t_{co}	1.351	1.532	1.979	2.077	2.290	2.301	2.327	2.184	2.399	2.409	2.315	ns
	12mA	GCLK	t_{co}	3.165	3.407	4.813	5.216	5.732	5.592	5.892	5.342	5.858	5.719	5.968	ns
		GCLK PLL	t_{co}	1.341	1.522	1.969	2.067	2.280	2.291	2.317	2.174	2.390	2.400	2.306	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{co}	3.158	3.399	4.799	5.201	5.716	5.576	5.876	5.326	5.841	5.702	5.951	ns
		GCLK PLL	t_{co}	1.334	1.514	1.955	2.052	2.264	2.275	2.301	2.158	2.373	2.383	2.289	ns

Table 1–120 specifies EP3SE80 Row Pins Output Timing parameters for differential I/O standards.

Table 1–120. EP3SE80 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	—	GCLK	t_{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t_{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns
LVDS_E_1R	—	GCLK	t_{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t_{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
LVDS_E_3R	—	GCLK	t_{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t_{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
MINI-LVDS	—	GCLK	t_{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t_{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t_{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t_{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
RSDS	—	GCLK	t_{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t_{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns

Table 1-120. EP3SE80 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t _{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
RSDS_E_3R	—	GCLK	t _{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t _{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.162	3.409	4.828	5.236	5.751	5.613	5.884	5.365	5.880	5.742	5.961	ns
		GCLK PLL	t _{co}	1.359	1.544	2.004	2.106	2.318	2.332	2.330	2.217	2.433	2.442	2.319	ns
	6mA	GCLK	t _{co}	3.148	3.395	4.815	5.223	5.738	5.600	5.871	5.351	5.867	5.729	5.948	ns
		GCLK PLL	t _{co}	1.345	1.530	1.991	2.093	2.305	2.319	2.317	2.203	2.420	2.429	2.306	ns
	8mA	GCLK	t _{co}	3.144	3.391	4.813	5.223	5.739	5.601	5.872	5.351	5.869	5.731	5.950	ns
		GCLK PLL	t _{co}	1.341	1.526	1.989	2.093	2.306	2.320	2.318	2.203	2.422	2.431	2.308	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.160	3.406	4.814	5.220	5.733	5.595	5.866	5.348	5.862	5.724	5.943	ns
		GCLK PLL	t _{co}	1.357	1.541	1.990	2.090	2.300	2.314	2.312	2.200	2.415	2.424	2.301	ns
	6mA	GCLK	t _{co}	3.149	3.396	4.810	5.216	5.730	5.592	5.863	5.345	5.859	5.721	5.940	ns
		GCLK PLL	t _{co}	1.346	1.531	1.986	2.086	2.297	2.311	2.309	2.197	2.412	2.421	2.298	ns
	8mA	GCLK	t _{co}	3.146	3.393	4.808	5.214	5.728	5.590	5.861	5.343	5.858	5.720	5.939	ns
		GCLK PLL	t _{co}	1.343	1.528	1.984	2.084	2.295	2.309	2.307	2.195	2.411	2.420	2.297	ns

Table 1–120. EP3SE80 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 1.1V	V _{CC1} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.157	3.403	4.809	5.215	5.727	5.589	5.860	5.343	5.856	5.718	5.937	ns
		GCLK PLL	t _{co}	1.354	1.538	1.985	2.085	2.294	2.308	2.306	2.195	2.409	2.418	2.295	ns
	6mA	GCLK	t _{co}	3.147	3.394	4.807	5.213	5.726	5.588	5.859	5.342	5.856	5.718	5.937	ns
		GCLK PLL	t _{co}	1.344	1.529	1.983	2.083	2.293	2.307	2.305	2.194	2.409	2.418	2.295	ns
	8mA	GCLK	t _{co}	3.133	3.380	4.792	5.198	5.712	5.574	5.845	5.327	5.841	5.703	5.922	ns
		GCLK PLL	t _{co}	1.330	1.515	1.968	2.068	2.279	2.293	2.291	2.179	2.394	2.403	2.280	ns
	10mA	GCLK	t _{co}	3.130	3.376	4.788	5.194	5.708	5.570	5.841	5.323	5.837	5.699	5.918	ns
		GCLK PLL	t _{co}	1.327	1.511	1.964	2.064	2.275	2.289	2.287	2.175	2.390	2.399	2.276	ns
	12mA	GCLK	t _{co}	3.127	3.374	4.789	5.197	5.711	5.573	5.844	5.326	5.841	5.703	5.922	ns
		GCLK PLL	t _{co}	1.324	1.509	1.965	2.067	2.278	2.292	2.290	2.178	2.394	2.403	2.280	ns
	16mA	GCLK	t _{co}	3.128	3.374	4.779	5.185	5.698	5.560	5.831	5.313	5.827	5.689	5.908	ns
		GCLK PLL	t _{co}	1.325	1.509	1.955	2.055	2.265	2.279	2.277	2.165	2.380	2.389	2.266	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.177	3.427	4.850	5.258	5.774	5.636	5.907	5.387	5.903	5.765	5.984	ns
		GCLK PLL	t _{co}	1.374	1.562	2.026	2.128	2.341	2.355	2.353	2.239	2.456	2.465	2.342	ns
	6mA	GCLK	t _{co}	3.153	3.403	4.832	5.241	5.757	5.619	5.890	5.370	5.888	5.750	5.969	ns
		GCLK PLL	t _{co}	1.350	1.538	2.008	2.111	2.324	2.338	2.336	2.222	2.441	2.450	2.327	ns
	8mA	GCLK	t _{co}	3.136	3.384	4.810	5.219	5.735	5.597	5.868	5.348	5.866	5.728	5.947	ns
		GCLK PLL	t _{co}	1.333	1.519	1.986	2.089	2.302	2.316	2.314	2.200	2.419	2.428	2.305	ns

Table 1-120. EP3SE80 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CC} =1.1V	V _{CC} =1.1V	V _{CC} =1.1V	V _{CC} =1.1V	V _{CC} =0.9V	V _{CC} =1.1V	V _{CC} =1.1V	V _{CC} =1.1V	V _{CC} =0.9V	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.181	3.430	4.850	5.258	5.773	5.635	5.906	5.387	5.903	5.765	5.984	ns
		GCLK PLL	t _{co}	1.378	1.565	2.026	2.128	2.340	2.354	2.352	2.239	2.456	2.465	2.342	ns
	6mA	GCLK	t _{co}	3.166	3.415	4.836	5.243	5.758	5.620	5.891	5.372	5.888	5.750	5.969	ns
		GCLK PLL	t _{co}	1.363	1.550	2.012	2.113	2.325	2.339	2.337	2.224	2.441	2.450	2.327	ns
	8mA	GCLK	t _{co}	3.155	3.404	4.831	5.240	5.755	5.617	5.888	5.369	5.886	5.748	5.967	ns
		GCLK PLL	t _{co}	1.352	1.539	2.007	2.110	2.322	2.336	2.334	2.221	2.439	2.448	2.325	ns
	10mA	GCLK	t _{co}	3.135	3.384	4.808	5.216	5.732	5.594	5.865	5.346	5.862	5.724	5.943	ns
		GCLK PLL	t _{co}	1.332	1.519	1.984	2.086	2.299	2.313	2.311	2.198	2.415	2.424	2.301	ns
	12mA	GCLK	t _{co}	3.132	3.380	4.804	5.213	5.728	5.590	5.861	5.342	5.859	5.721	5.940	ns
		GCLK PLL	t _{co}	1.329	1.515	1.980	2.083	2.295	2.309	2.307	2.194	2.412	2.421	2.298	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.137	3.384	4.795	5.201	5.714	5.576	5.847	5.329	5.843	5.705	5.924	ns
		GCLK PLL	t _{co}	1.334	1.519	1.971	2.071	2.281	2.295	2.293	2.181	2.396	2.405	2.282	ns
	16mA	GCLK	t _{co}	3.130	3.377	4.794	5.202	5.717	5.579	5.850	5.332	5.848	5.710	5.929	ns
		GCLK PLL	t _{co}	1.327	1.512	1.970	2.072	2.284	2.298	2.296	2.184	2.401	2.410	2.287	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.168	3.416	4.832	5.239	5.753	5.615	5.886	5.368	5.883	5.745	5.964	ns
		GCLK PLL	t _{co}	1.365	1.551	2.008	2.109	2.320	2.334	2.332	2.220	2.436	2.445	2.322	ns
	12mA	GCLK	t _{co}	3.150	3.399	4.817	5.224	5.738	5.600	5.871	5.353	5.868	5.730	5.949	ns
		GCLK PLL	t _{co}	1.347	1.534	1.993	2.094	2.305	2.319	2.317	2.205	2.421	2.430	2.307	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.136	3.383	4.794	5.200	5.713	5.575	5.846	5.329	5.843	5.705	5.924	ns
		GCLK PLL	t _{co}	1.333	1.518	1.970	2.070	2.280	2.294	2.292	2.181	2.396	2.405	2.282	ns

Table 1-121 and Table 1-122 show EP3SE80 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-121 specifies EP3SE80 Column Pin delay adders when using the regional clock.

Table 1-121. EP3SE80 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.251	0.187	0.308	0.239	0.389	0.103	0.176	0.199	0.102	0.099	0.172	ns
RCLK PLL input adder	1.895	1.982	2.923	3.16	3.601	4.28	4.913	3.261	4.491	4.295	4.833	ns
RCLK output adder	-0.069	0.253	0.551	0.865	0.693	-0.059	-0.119	1.06	0.135	0.066	-0.046	ns
RCLK PLL output adder	-1.545	-1.367	-1.715	-1.587	-1.976	-3.145	-3.116	-1.541	-3.343	-3.027	-3.123	ns

Table 1-122 specifies EP3SE80 Row Pin delay adders when using the regional clock.

Table 1-122. EP3SE80 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.014	0.014	0.018	0.005	-0.022	0.0	0.052	-0.004	-0.014	-0.008	0.056	ns
RCLK PLL input adder	0.116	0.122	0.192	0.206	0.231	0.217	0.367	0.198	0.223	0.21	0.371	ns
RCLK output adder	0.004	0.003	0.029	0.042	0.056	0.039	-0.021	0.047	0.061	0.049	-0.025	ns
RCLK PLL output adder	-0.089	-0.089	-0.145	-0.161	-0.197	-0.169	-0.332	-0.151	-0.186	-0.157	-0.333	ns

EP3SE110 I/O Timing Parameters

Table 1-123 through Table 1-126 show the maximum I/O timing parameters for EP3SE110 for single-ended I/O standards.

Table 1-123 specifies EP3SE110 column pins input timing parameters for single-ended I/O standards.

Table 1-123. EP3SE110 Column Pins Input Timing Parameters (Part 1 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-1.058	-1.105	-1.586	-1.732	-1.990	-1.922	-2.307	-1.750	-1.992	-1.928	-2.340	ns
		t_h	1.189	1.254	1.799	1.971	2.252	2.168	2.560	1.998	2.264	2.184	2.595	ns
	GCLK PLL	t_{su}	0.711	0.730	1.221	1.394	1.456	1.363	1.379	1.392	1.467	1.372	1.436	ns
		t_h	-0.447	-0.446	-0.799	-0.921	-0.929	-0.868	-0.867	-0.908	-0.930	-0.867	-0.920	ns
3.3-V LVCMOS	GCLK	t_{su}	-1.058	-1.105	-1.586	-1.732	-1.990	-1.922	-2.307	-1.750	-1.992	-1.928	-2.340	ns
		t_h	1.189	1.254	1.799	1.971	2.252	2.168	2.560	1.998	2.264	2.184	2.595	ns
	GCLK PLL	t_{su}	0.711	0.730	1.221	1.394	1.456	1.363	1.379	1.392	1.467	1.372	1.436	ns
		t_h	-0.447	-0.446	-0.799	-0.921	-0.929	-0.868	-0.867	-0.908	-0.930	-0.867	-0.920	ns

Table 1-123. EP3SE110 Column Pins Input Timing Parameters (Part 2 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVTTTL	GCLK	t _{su}	-1.064	-1.116	-1.585	-1.734	-1.989	-1.921	-2.306	-1.750	-1.997	-1.933	-2.345	ns
		t _h	1.195	1.265	1.798	1.973	2.251	2.167	2.559	1.998	2.269	2.189	2.600	ns
	GCLK PLL	t _{su}	0.705	0.719	1.222	1.392	1.457	1.364	1.380	1.392	1.462	1.367	1.431	ns
		t _h	-0.441	-0.435	-0.800	-0.919	-0.930	-0.869	-0.868	-0.908	-0.925	-0.862	-0.915	ns
3.0-V LVCMOS	GCLK	t _{su}	-1.064	-1.116	-1.585	-1.734	-1.989	-1.921	-2.306	-1.750	-1.997	-1.933	-2.345	ns
		t _h	1.195	1.265	1.798	1.973	2.251	2.167	2.559	1.998	2.269	2.189	2.600	ns
	GCLK PLL	t _{su}	0.705	0.719	1.222	1.392	1.457	1.364	1.380	1.392	1.462	1.367	1.431	ns
		t _h	-0.441	-0.435	-0.800	-0.919	-0.930	-0.869	-0.868	-0.908	-0.925	-0.862	-0.915	ns
2.5 V	GCLK	t _{su}	-1.054	-1.111	-1.594	-1.746	-2.008	-1.940	-2.325	-1.760	-2.008	-1.944	-2.356	ns
		t _h	1.185	1.260	1.807	1.985	2.270	2.186	2.578	2.008	2.280	2.200	2.611	ns
	GCLK PLL	t _{su}	0.715	0.724	1.213	1.380	1.438	1.345	1.361	1.382	1.451	1.356	1.420	ns
		t _h	-0.451	-0.440	-0.791	-0.907	-0.911	-0.850	-0.849	-0.898	-0.914	-0.851	-0.904	ns
1.8 V	GCLK	t _{su}	-1.070	-1.131	-1.634	-1.782	-2.006	-1.938	-2.323	-1.794	-2.011	-1.947	-2.359	ns
		t _h	1.203	1.282	1.847	2.021	2.268	2.184	2.576	2.042	2.283	2.203	2.614	ns
	GCLK PLL	t _{su}	0.697	0.702	1.173	1.344	1.440	1.347	1.363	1.348	1.448	1.353	1.417	ns
		t _h	-0.431	-0.416	-0.751	-0.871	-0.913	-0.852	-0.851	-0.864	-0.911	-0.848	-0.901	ns
1.5 V	GCLK	t _{su}	-1.063	-1.121	-1.611	-1.750	-1.936	-1.868	-2.253	-1.763	-1.945	-1.881	-2.293	ns
		t _h	1.196	1.272	1.824	1.989	2.198	2.114	2.506	2.011	2.217	2.137	2.548	ns
	GCLK PLL	t _{su}	0.704	0.712	1.196	1.376	1.510	1.417	1.433	1.379	1.514	1.419	1.483	ns
		t _h	-0.438	-0.426	-0.774	-0.903	-0.983	-0.922	-0.921	-0.895	-0.977	-0.914	-0.967	ns
1.2 V	GCLK	t _{su}	-1.003	-1.069	-1.534	-1.651	-1.780	-1.712	-2.097	-1.667	-1.792	-1.728	-2.140	ns
		t _h	1.136	1.220	1.747	1.890	2.042	1.958	2.350	1.915	2.064	1.984	2.395	ns
	GCLK PLL	t _{su}	0.764	0.764	1.273	1.475	1.666	1.573	1.589	1.475	1.667	1.572	1.636	ns
		t _h	-0.498	-0.478	-0.851	-1.002	-1.139	-1.078	-1.077	-0.991	-1.130	-1.067	-1.120	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.984	-1.040	-1.506	-1.635	-1.782	-1.714	-2.099	-1.646	-1.788	-1.724	-2.136	ns
		t _h	1.117	1.191	1.719	1.874	2.044	1.960	2.352	1.894	2.060	1.980	2.391	ns
	GCLK PLL	t _{su}	0.783	0.793	1.301	1.491	1.664	1.571	1.587	1.496	1.671	1.576	1.640	ns
		t _h	-0.517	-0.507	-0.879	-1.018	-1.137	-1.076	-1.075	-1.012	-1.134	-1.071	-1.124	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.984	-1.040	-1.506	-1.635	-1.782	-1.714	-2.099	-1.646	-1.788	-1.724	-2.136	ns
		t _h	1.117	1.191	1.719	1.874	2.044	1.960	2.352	1.894	2.060	1.980	2.391	ns
	GCLK PLL	t _{su}	0.783	0.793	1.301	1.491	1.664	1.571	1.587	1.496	1.671	1.576	1.640	ns
		t _h	-0.517	-0.507	-0.879	-1.018	-1.137	-1.076	-1.075	-1.012	-1.134	-1.071	-1.124	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.977	-1.034	-1.494	-1.630	-1.782	-1.712	-2.100	-1.642	-1.793	-1.726	-2.140	ns
		t _h	1.110	1.185	1.706	1.866	2.041	1.957	2.348	1.887	2.060	1.981	2.390	ns
	GCLK PLL	t _{su}	0.790	0.799	1.314	1.499	1.667	1.576	1.589	1.503	1.670	1.577	1.639	ns
		t _h	-0.524	-0.513	-0.892	-1.029	-1.143	-1.082	-1.082	-1.022	-1.137	-1.073	-1.128	ns

Table 1-123. EP3SE110 Column Pins Input Timing Parameters (Part 3 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
SSTL-18 CLASS II	GCLK	t_{su}	-0.977	-1.034	-1.494	-1.630	-1.782	-1.712	-2.100	-1.642	-1.793	-1.726	-2.140	ns
		t_h	1.110	1.185	1.706	1.866	2.041	1.957	2.348	1.887	2.060	1.981	2.390	ns
	GCLK PLL	t_{su}	0.790	0.799	1.314	1.499	1.667	1.576	1.589	1.503	1.670	1.577	1.639	ns
		t_h	-0.524	-0.513	-0.892	-1.029	-1.143	-1.082	-1.082	-1.022	-1.137	-1.073	-1.128	ns
SSTL-15 CLASS I	GCLK	t_{su}	-0.965	-1.023	-1.485	-1.619	-1.763	-1.693	-2.081	-1.631	-1.775	-1.708	-2.122	ns
		t_h	1.098	1.174	1.696	1.855	2.022	1.938	2.329	1.876	2.042	1.963	2.372	ns
	GCLK PLL	t_{su}	0.802	0.810	1.325	1.510	1.686	1.595	1.608	1.514	1.688	1.595	1.657	ns
		t_h	-0.536	-0.524	-0.904	-1.040	-1.162	-1.101	-1.101	-1.033	-1.155	-1.091	-1.146	ns
1.8-V HSTL CLASS I	GCLK	t_{su}	-0.965	-1.023	-1.485	-1.619	-1.763	-1.693	-2.081	-1.631	-1.775	-1.708	-2.122	ns
		t_h	1.098	1.174	1.696	1.855	2.022	1.938	2.329	1.876	2.042	1.963	2.372	ns
	GCLK PLL	t_{su}	0.802	0.810	1.325	1.510	1.686	1.595	1.608	1.514	1.688	1.595	1.657	ns
		t_h	-0.536	-0.524	-0.904	-1.040	-1.162	-1.101	-1.101	-1.033	-1.155	-1.091	-1.146	ns
1.8-V HSTL CLASS II	GCLK	t_{su}	-0.977	-1.034	-1.494	-1.630	-1.782	-1.712	-2.100	-1.642	-1.793	-1.726	-2.140	ns
		t_h	1.110	1.185	1.706	1.866	2.041	1.957	2.348	1.887	2.060	1.981	2.390	ns
	GCLK PLL	t_{su}	0.790	0.799	1.314	1.499	1.667	1.576	1.589	1.503	1.670	1.577	1.639	ns
		t_h	-0.524	-0.513	-0.892	-1.029	-1.143	-1.082	-1.082	-1.022	-1.137	-1.073	-1.128	ns
1.5-V HSTL CLASS I	GCLK	t_{su}	-0.977	-1.034	-1.494	-1.630	-1.782	-1.712	-2.100	-1.642	-1.793	-1.726	-2.140	ns
		t_h	1.110	1.185	1.706	1.866	2.041	1.957	2.348	1.887	2.060	1.981	2.390	ns
	GCLK PLL	t_{su}	0.790	0.799	1.314	1.499	1.667	1.576	1.589	1.503	1.670	1.577	1.639	ns
		t_h	-0.524	-0.513	-0.892	-1.029	-1.143	-1.082	-1.082	-1.022	-1.137	-1.073	-1.128	ns
1.5-V HSTL CLASS II	GCLK	t_{su}	-0.965	-1.023	-1.485	-1.619	-1.763	-1.693	-2.081	-1.631	-1.775	-1.708	-2.122	ns
		t_h	1.098	1.174	1.696	1.855	2.022	1.938	2.329	1.876	2.042	1.963	2.372	ns
	GCLK PLL	t_{su}	0.802	0.810	1.325	1.510	1.686	1.595	1.608	1.514	1.688	1.595	1.657	ns
		t_h	-0.536	-0.524	-0.904	-1.040	-1.162	-1.101	-1.101	-1.033	-1.155	-1.091	-1.146	ns
1.2-V HSTL CLASS I	GCLK	t_{su}	-0.965	-1.023	-1.485	-1.619	-1.763	-1.693	-2.081	-1.631	-1.775	-1.708	-2.122	ns
		t_h	1.098	1.174	1.696	1.855	2.022	1.938	2.329	1.876	2.042	1.963	2.372	ns
	GCLK PLL	t_{su}	0.802	0.810	1.325	1.510	1.686	1.595	1.608	1.514	1.688	1.595	1.657	ns
		t_h	-0.536	-0.524	-0.904	-1.040	-1.162	-1.101	-1.101	-1.033	-1.155	-1.091	-1.146	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	-0.957	-1.011	-1.475	-1.608	-1.747	-1.677	-2.065	-1.620	-1.760	-1.693	-2.107	ns
		t_h	1.090	1.162	1.686	1.844	2.006	1.922	2.313	1.865	2.027	1.948	2.357	ns
	GCLK PLL	t_{su}	0.810	0.822	1.335	1.521	1.702	1.611	1.624	1.525	1.703	1.610	1.672	ns
		t_h	-0.544	-0.536	-0.914	-1.051	-1.178	-1.117	-1.117	-1.044	-1.170	-1.106	-1.161	ns
3.0-V PCI	GCLK	t_{su}	-0.957	-1.011	-1.475	-1.608	-1.747	-1.677	-2.065	-1.620	-1.760	-1.693	-2.107	ns
		t_h	1.090	1.162	1.686	1.844	2.006	1.922	2.313	1.865	2.027	1.948	2.357	ns
	GCLK PLL	t_{su}	0.810	0.822	1.335	1.521	1.702	1.611	1.624	1.525	1.703	1.610	1.672	ns
		t_h	-0.544	-0.536	-0.914	-1.051	-1.178	-1.117	-1.117	-1.044	-1.170	-1.106	-1.161	ns

Table 1-123. EP3SE110 Column Pins Input Timing Parameters (Part 4 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V PCI-X	GCLK	t _{SU}	-1.064	-1.116	-1.585	-1.734	-1.989	-1.921	-2.306	-1.750	-1.997	-1.933	-2.345	ns
		t _H	1.195	1.265	1.798	1.973	2.251	2.167	2.559	1.998	2.269	2.189	2.600	ns
	GCLK PLL	t _{SU}	0.705	0.719	1.222	1.392	1.457	1.364	1.380	1.392	1.462	1.367	1.431	ns
		t _H	-0.441	-0.435	-0.800	-0.919	-0.930	-0.869	-0.868	-0.908	-0.925	-0.862	-0.915	ns

Table 1-124 specifies EP3SE110 row pins input timing parameters for single-ended I/O standards.

Table 1-124. EP3SE110 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{SU}	-0.917	-0.960	-1.364	-1.476	-1.736	-1.642	-2.026	-1.488	-1.737	-1.683	-2.064	ns
		t _H	1.041	1.099	1.561	1.698	1.978	1.873	2.261	1.720	1.989	1.922	2.300	ns
	GCLK PLL	t _{SU}	1.022	1.000	1.632	1.851	1.964	1.893	1.808	1.901	1.982	1.864	1.859	ns
		t _H	-0.762	-0.722	-1.218	-1.386	-1.449	-1.406	-1.309	-1.426	-1.456	-1.368	-1.357	ns
3.3-V LVCMOS	GCLK	t _{SU}	-0.917	-0.960	-1.364	-1.476	-1.736	-1.642	-2.026	-1.488	-1.737	-1.683	-2.064	ns
		t _H	1.041	1.099	1.561	1.698	1.978	1.873	2.261	1.720	1.989	1.922	2.300	ns
	GCLK PLL	t _{SU}	1.022	1.000	1.632	1.851	1.964	1.893	1.808	1.901	1.982	1.864	1.859	ns
		t _H	-0.762	-0.722	-1.218	-1.386	-1.449	-1.406	-1.309	-1.426	-1.456	-1.368	-1.357	ns
3.0-V LVTTTL	GCLK	t _{SU}	-0.923	-0.971	-1.361	-1.477	-1.739	-1.645	-2.029	-1.487	-1.742	-1.688	-2.069	ns
		t _H	1.047	1.110	1.558	1.699	1.981	1.876	2.264	1.719	1.994	1.927	2.305	ns
	GCLK PLL	t _{SU}	1.016	0.989	1.635	1.850	1.961	1.890	1.805	1.902	1.977	1.859	1.854	ns
		t _H	-0.756	-0.711	-1.221	-1.385	-1.446	-1.403	-1.306	-1.427	-1.451	-1.363	-1.352	ns
3.0-V LVCMOS	GCLK	t _{SU}	-0.923	-0.971	-1.361	-1.477	-1.739	-1.645	-2.029	-1.487	-1.742	-1.688	-2.069	ns
		t _H	1.047	1.110	1.558	1.699	1.981	1.876	2.264	1.719	1.994	1.927	2.305	ns
	GCLK PLL	t _{SU}	1.016	0.989	1.635	1.850	1.961	1.890	1.805	1.902	1.977	1.859	1.854	ns
		t _H	-0.756	-0.711	-1.221	-1.385	-1.446	-1.403	-1.306	-1.427	-1.451	-1.363	-1.352	ns
2.5 V	GCLK	t _{SU}	-0.911	-0.964	-1.370	-1.490	-1.754	-1.660	-2.044	-1.496	-1.752	-1.698	-2.079	ns
		t _H	1.035	1.103	1.567	1.712	1.996	1.891	2.279	1.728	2.004	1.937	2.315	ns
	GCLK PLL	t _{SU}	1.028	0.996	1.626	1.837	1.946	1.875	1.790	1.893	1.967	1.849	1.844	ns
		t _H	-0.768	-0.718	-1.212	-1.372	-1.431	-1.388	-1.291	-1.418	-1.441	-1.353	-1.342	ns
1.8 V	GCLK	t _{SU}	-0.987	-1.042	-1.456	-1.570	-1.756	-1.705	-2.042	-1.576	-1.754	-1.707	-2.080	ns
		t _H	1.112	1.182	1.653	1.793	1.999	1.936	2.277	1.808	2.007	1.948	2.316	ns
	GCLK PLL	t _{SU}	1.040	1.054	1.703	1.929	1.948	1.963	1.900	1.946	1.966	1.848	1.952	ns
		t _H	-0.777	-0.773	-1.286	-1.461	-1.433	-1.472	-1.399	-1.468	-1.440	-1.352	-1.447	ns

Table 1–124. EP3SE110 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	GCLK	t _{su}	-0.977	-1.031	-1.432	-1.538	-1.688	-1.637	-1.974	-1.545	-1.689	-1.642	-2.015	ns
		t _h	1.102	1.171	1.629	1.761	1.931	1.868	2.209	1.777	1.942	1.883	2.251	ns
	GCLK PLL	t _{su}	1.050	1.065	1.727	1.961	2.016	2.031	1.968	1.977	2.031	1.913	2.017	ns
		t _h	-0.787	-0.784	-1.310	-1.493	-1.501	-1.540	-1.467	-1.499	-1.505	-1.417	-1.512	ns
1.2 V	GCLK	t _{su}	-0.917	-0.978	-1.353	-1.437	-1.529	-1.478	-1.815	-1.449	-1.534	-1.487	-1.860	ns
		t _h	1.042	1.118	1.550	1.660	1.772	1.709	2.050	1.681	1.787	1.728	2.096	ns
	GCLK PLL	t _{su}	1.110	1.118	1.806	2.062	2.175	2.190	2.127	2.073	2.186	2.068	2.172	ns
		t _h	-0.847	-0.837	-1.389	-1.594	-1.660	-1.699	-1.626	-1.595	-1.660	-1.572	-1.667	ns
SSTL-2 CLASS I	GCLK	t _{su}	-0.854	-0.906	-1.284	-1.381	-1.534	-1.440	-1.824	-1.384	-1.535	-1.481	-1.862	ns
		t _h	0.979	1.046	1.481	1.603	1.776	1.671	2.059	1.616	1.787	1.720	2.098	ns
	GCLK PLL	t _{su}	1.085	1.054	1.712	1.946	2.166	2.095	2.010	2.005	2.184	2.066	2.061	ns
		t _h	-0.824	-0.775	-1.298	-1.481	-1.651	-1.608	-1.511	-1.530	-1.658	-1.570	-1.559	ns
SSTL-2 CLASS II	GCLK	t _{su}	-0.854	-0.906	-1.284	-1.381	-1.534	-1.440	-1.824	-1.384	-1.535	-1.481	-1.862	ns
		t _h	0.979	1.046	1.481	1.603	1.776	1.671	2.059	1.616	1.787	1.720	2.098	ns
	GCLK PLL	t _{su}	1.085	1.054	1.712	1.946	2.166	2.095	2.010	2.005	2.184	2.066	2.061	ns
		t _h	-0.824	-0.775	-1.298	-1.481	-1.651	-1.608	-1.511	-1.530	-1.658	-1.570	-1.559	ns
SSTL-18 CLASS I	GCLK	t _{su}	-0.891	-0.943	-1.315	-1.410	-1.524	-1.472	-1.811	-1.417	-1.530	-1.479	-1.853	ns
		t _h	1.016	1.083	1.512	1.631	1.765	1.702	2.042	1.647	1.778	1.719	2.085	ns
	GCLK PLL	t _{su}	1.136	1.153	1.844	2.087	2.180	2.193	2.129	2.102	2.193	2.076	2.177	ns
		t _h	-0.873	-0.872	-1.427	-1.621	-1.667	-1.704	-1.632	-1.627	-1.670	-1.581	-1.676	ns
SSTL-18 CLASS II	GCLK	t _{su}	-0.891	-0.943	-1.315	-1.410	-1.524	-1.472	-1.811	-1.417	-1.530	-1.479	-1.853	ns
		t _h	1.016	1.083	1.512	1.631	1.765	1.702	2.042	1.647	1.778	1.719	2.085	ns
	GCLK PLL	t _{su}	1.136	1.153	1.844	2.087	2.180	2.193	2.129	2.102	2.193	2.076	2.177	ns
		t _h	-0.873	-0.872	-1.427	-1.621	-1.667	-1.704	-1.632	-1.627	-1.670	-1.581	-1.676	ns
SSTL-15 CLASS I	GCLK	t _{su}	-0.877	-0.931	-1.300	-1.400	-1.506	-1.454	-1.793	-1.406	-1.513	-1.462	-1.836	ns
		t _h	1.002	1.071	1.498	1.621	1.747	1.684	2.024	1.636	1.761	1.702	2.068	ns
	GCLK PLL	t _{su}	1.150	1.165	1.857	2.097	2.198	2.211	2.147	2.113	2.210	2.093	2.194	ns
		t _h	-0.887	-0.884	-1.439	-1.631	-1.685	-1.722	-1.650	-1.638	-1.687	-1.598	-1.693	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-0.891	-0.943	-1.315	-1.410	-1.524	-1.472	-1.811	-1.417	-1.530	-1.479	-1.853	ns
		t _h	1.016	1.083	1.512	1.631	1.765	1.702	2.042	1.647	1.778	1.719	2.085	ns
	GCLK PLL	t _{su}	1.136	1.153	1.844	2.087	2.180	2.193	2.129	2.102	2.193	2.076	2.177	ns
		t _h	-0.873	-0.872	-1.427	-1.621	-1.667	-1.704	-1.632	-1.627	-1.670	-1.581	-1.676	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-0.891	-0.943	-1.315	-1.410	-1.524	-1.472	-1.811	-1.417	-1.530	-1.479	-1.853	ns
		t _h	1.016	1.083	1.512	1.631	1.765	1.702	2.042	1.647	1.778	1.719	2.085	ns
	GCLK PLL	t _{su}	1.136	1.153	1.844	2.087	2.180	2.193	2.129	2.102	2.193	2.076	2.177	ns
		t _h	-0.873	-0.872	-1.427	-1.621	-1.667	-1.704	-1.632	-1.627	-1.670	-1.581	-1.676	ns

Table 1-124. EP3SE110 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
1.5-V HSTL CLASS I	GCLK	t _{SU}	-0.877	-0.931	-1.300	-1.400	-1.506	-1.454	-1.793	-1.406	-1.513	-1.462	-1.836	ns
		t _H	1.002	1.071	1.498	1.621	1.747	1.684	2.024	1.636	1.761	1.702	2.068	ns
	GCLK PLL	t _{SU}	1.150	1.165	1.857	2.097	2.198	2.211	2.147	2.113	2.210	2.093	2.194	ns
		t _H	-0.887	-0.884	-1.439	-1.631	-1.685	-1.722	-1.650	-1.638	-1.687	-1.598	-1.693	ns
1.5-V HSTL CLASS II	GCLK	t _{SU}	-0.877	-0.931	-1.300	-1.400	-1.506	-1.454	-1.793	-1.406	-1.513	-1.462	-1.836	ns
		t _H	1.002	1.071	1.498	1.621	1.747	1.684	2.024	1.636	1.761	1.702	2.068	ns
	GCLK PLL	t _{SU}	1.150	1.165	1.857	2.097	2.198	2.211	2.147	2.113	2.210	2.093	2.194	ns
		t _H	-0.887	-0.884	-1.439	-1.631	-1.685	-1.722	-1.650	-1.638	-1.687	-1.598	-1.693	ns
1.2-V HSTL CLASS I	GCLK	t _{SU}	-0.868	-0.919	-1.291	-1.390	-1.490	-1.438	-1.777	-1.397	-1.497	-1.446	-1.820	ns
		t _H	0.993	1.059	1.489	1.611	1.731	1.668	2.008	1.627	1.745	1.686	2.052	ns
	GCLK PLL	t _{SU}	1.159	1.177	1.866	2.107	2.214	2.227	2.163	2.122	2.226	2.109	2.210	ns
		t _H	-0.896	-0.896	-1.448	-1.641	-1.701	-1.738	-1.666	-1.647	-1.703	-1.614	-1.709	ns
1.2-V HSTL CLASS II	GCLK	t _{SU}	-0.868	-0.919	-1.291	-1.390	-1.490	-1.438	-1.777	-1.397	-1.497	-1.446	-1.820	ns
		t _H	0.993	1.059	1.489	1.611	1.731	1.668	2.008	1.627	1.745	1.686	2.052	ns
	GCLK PLL	t _{SU}	1.159	1.177	1.866	2.107	2.214	2.227	2.163	2.122	2.226	2.109	2.210	ns
		t _H	-0.896	-0.896	-1.448	-1.641	-1.701	-1.738	-1.666	-1.647	-1.703	-1.614	-1.709	ns
3.0-V PCI	GCLK	t _{SU}	-0.923	-0.971	-1.361	-1.477	-1.739	-1.645	-2.029	-1.487	-1.742	-1.688	-2.069	ns
		t _H	1.047	1.110	1.558	1.699	1.981	1.876	2.264	1.719	1.994	1.927	2.305	ns
	GCLK PLL	t _{SU}	1.016	0.989	1.635	1.850	1.961	1.890	1.805	1.902	1.977	1.859	1.854	ns
		t _H	-0.756	-0.711	-1.221	-1.385	-1.446	-1.403	-1.306	-1.427	-1.451	-1.363	-1.352	ns
3.0-V PCI-X	GCLK	t _{SU}	-0.923	-0.971	-1.361	-1.477	-1.739	-1.645	-2.029	-1.487	-1.742	-1.688	-2.069	ns
		t _H	1.047	1.110	1.558	1.699	1.981	1.876	2.264	1.719	1.994	1.927	2.305	ns
	GCLK PLL	t _{SU}	1.016	0.989	1.635	1.850	1.961	1.890	1.805	1.902	1.977	1.859	1.854	ns
		t _H	-0.756	-0.711	-1.221	-1.385	-1.446	-1.403	-1.306	-1.427	-1.451	-1.363	-1.352	ns

Table 1–125 specifies EP3SE110 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1–125. EP3SE110 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.367	3.653	5.079	5.492	6.016	5.868	6.200	5.630	6.154	6.010	6.284	ns
		GCLK PLL	t _{co}	1.573	1.759	2.224	2.334	2.556	2.558	2.503	2.446	2.669	2.671	2.493	ns
	8mA	GCLK	t _{co}	3.262	3.530	4.912	5.325	5.848	5.700	6.032	5.461	5.981	5.837	6.111	ns
		GCLK PLL	t _{co}	1.494	1.670	2.121	2.222	2.439	2.441	2.386	2.330	2.549	2.551	2.373	ns
	12mA	GCLK	t _{co}	3.202	3.451	4.832	5.234	5.748	5.600	5.932	5.363	5.876	5.732	6.006	ns
		GCLK PLL	t _{co}	1.465	1.638	2.054	2.152	2.369	2.371	2.316	2.260	2.482	2.484	2.306	ns
	16mA	GCLK	t _{co}	3.181	3.426	4.776	5.184	5.705	5.557	5.889	5.317	5.835	5.691	5.965	ns
		GCLK PLL	t _{co}	1.451	1.624	2.033	2.129	2.341	2.343	2.288	2.234	2.449	2.451	2.273	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.309	3.562	4.970	5.375	5.894	5.746	6.078	5.509	6.029	5.885	6.159	ns
		GCLK PLL	t _{co}	1.511	1.692	2.151	2.251	2.468	2.470	2.415	2.360	2.581	2.583	2.405	ns
	8mA	GCLK	t _{co}	3.177	3.422	4.769	5.174	5.696	5.548	5.880	5.308	5.828	5.684	5.958	ns
		GCLK PLL	t _{co}	1.440	1.615	2.029	2.125	2.337	2.339	2.284	2.230	2.444	2.446	2.268	ns
	12mA	GCLK	t _{co}	3.135	3.383	4.727	5.126	5.637	5.489	5.821	5.254	5.765	5.621	5.895	ns
		GCLK PLL	t _{co}	1.415	1.587	2.000	2.098	2.312	2.314	2.259	2.203	2.419	2.421	2.243	ns
	16mA	GCLK	t _{co}	3.122	3.370	4.706	5.105	5.616	5.468	5.800	5.231	5.741	5.597	5.871	ns
		GCLK PLL	t _{co}	1.408	1.580	1.992	2.089	2.303	2.305	2.250	2.194	2.410	2.412	2.234	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.372	3.664	5.120	5.535	6.076	5.928	6.260	5.673	6.203	6.059	6.333	ns
		GCLK PLL	t _{co}	1.571	1.768	2.258	2.370	2.595	2.597	2.542	2.485	2.711	2.713	2.535	ns
	8mA	GCLK	t _{co}	3.268	3.542	4.952	5.367	5.923	5.775	6.107	5.506	6.030	5.886	6.160	ns
		GCLK PLL	t _{co}	1.504	1.683	2.154	2.259	2.479	2.481	2.426	2.370	2.593	2.595	2.417	ns
	12mA	GCLK	t _{co}	3.216	3.467	4.863	5.268	5.821	5.673	6.005	5.400	5.917	5.773	6.047	ns
		GCLK PLL	t _{co}	1.466	1.646	2.086	2.187	2.405	2.407	2.352	2.296	2.517	2.519	2.341	ns
	16mA	GCLK	t _{co}	3.180	3.430	4.793	5.197	5.771	5.623	5.955	5.330	5.847	5.703	5.977	ns
		GCLK PLL	t _{co}	1.444	1.619	2.051	2.148	2.363	2.365	2.310	2.256	2.473	2.475	2.297	ns

Table 1–125. EP3SE110 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.320	3.580	5.010	5.420	5.977	5.829	6.161	5.557	6.083	5.939	6.213	ns
		GCLK PLL	t _{co}	1.525	1.708	2.188	2.292	2.514	2.516	2.461	2.404	2.629	2.631	2.453	ns
	8mA	GCLK	t _{co}	3.194	3.443	4.815	5.221	5.795	5.647	5.979	5.355	5.872	5.728	6.002	ns
		GCLK PLL	t _{co}	1.453	1.629	2.065	2.163	2.379	2.381	2.326	2.271	2.490	2.492	2.314	ns
	12mA	GCLK	t _{co}	3.144	3.393	4.761	5.163	5.724	5.576	5.908	5.294	5.807	5.663	5.937	ns
		GCLK PLL	t _{co}	1.429	1.600	2.025	2.124	2.338	2.340	2.285	2.231	2.448	2.450	2.272	ns
	16mA	GCLK	t _{co}	3.138	3.384	4.733	5.133	5.725	5.577	5.909	5.263	5.776	5.632	5.906	ns
		GCLK PLL	t _{co}	1.429	1.600	2.017	2.114	2.328	2.330	2.275	2.220	2.436	2.438	2.260	ns
2.5 V	4mA	GCLK	t _{co}	3.439	3.727	5.264	5.699	6.259	6.111	6.443	5.848	6.408	6.264	6.538	ns
		GCLK PLL	t _{co}	1.629	1.823	2.395	2.519	2.761	2.763	2.708	2.637	2.884	2.886	2.708	ns
	8mA	GCLK	t _{co}	3.332	3.602	5.091	5.515	6.062	5.914	6.246	5.656	6.198	6.054	6.328	ns
		GCLK PLL	t _{co}	1.546	1.730	2.276	2.393	2.629	2.631	2.576	2.509	2.748	2.750	2.572	ns
	12mA	GCLK	t _{co}	3.248	3.502	4.962	5.379	5.922	5.774	6.106	5.516	6.048	5.904	6.178	ns
		GCLK PLL	t _{co}	1.491	1.686	2.184	2.297	2.529	2.531	2.476	2.411	2.646	2.648	2.470	ns
	16mA	GCLK	t _{co}	3.220	3.475	4.894	5.312	5.872	5.724	6.056	5.450	5.984	5.840	6.114	ns
		GCLK PLL	t _{co}	1.457	1.640	2.150	2.260	2.488	2.490	2.435	2.372	2.602	2.604	2.426	ns

Table 1–125. EP3SE110 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.616	3.909	5.558	6.017	6.586	6.438	6.770	6.180	6.743	6.599	6.873	ns
		GCLK PLL	t _{co}	1.743	1.951	2.590	2.728	2.979	2.981	2.926	2.855	3.110	3.112	2.934	ns
	4mA	GCLK	t _{co}	3.471	3.749	5.342	5.776	6.336	6.188	6.520	5.927	6.486	6.342	6.616	ns
		GCLK PLL	t _{co}	1.645	1.840	2.438	2.570	2.818	2.820	2.765	2.696	2.944	2.946	2.768	ns
	6mA	GCLK	t _{co}	3.369	3.631	5.141	5.571	6.132	5.984	6.316	5.720	6.267	6.123	6.397	ns
		GCLK PLL	t _{co}	1.563	1.753	2.311	2.432	2.674	2.676	2.621	2.552	2.797	2.799	2.621	ns
	8mA	GCLK	t _{co}	3.286	3.577	5.045	5.475	6.022	5.874	6.206	5.616	6.152	6.008	6.282	ns
		GCLK PLL	t _{co}	1.538	1.720	2.250	2.366	2.599	2.601	2.546	2.481	2.716	2.718	2.540	ns
	10mA	GCLK	t _{co}	3.232	3.486	4.918	5.339	5.892	5.744	6.076	5.477	6.008	5.864	6.138	ns
		GCLK PLL	t _{co}	1.467	1.656	2.162	2.272	2.500	2.502	2.447	2.384	2.615	2.617	2.439	ns
	12mA	GCLK	t _{co}	3.226	3.481	4.905	5.325	5.887	5.739	6.071	5.464	5.996	5.852	6.126	ns
		GCLK PLL	t _{co}	1.462	1.646	2.156	2.266	2.493	2.495	2.440	2.377	2.608	2.610	2.432	ns
1.5 V	2mA	GCLK	t _{co}	3.534	3.858	5.473	5.914	6.474	6.326	6.658	6.069	6.630	6.486	6.760	ns
		GCLK PLL	t _{co}	1.684	1.918	2.528	2.655	2.907	2.909	2.854	2.785	3.043	3.045	2.867	ns
	4mA	GCLK	t _{co}	3.335	3.609	5.100	5.523	6.071	5.923	6.255	5.665	6.205	6.061	6.335	ns
		GCLK PLL	t _{co}	1.552	1.737	2.285	2.401	2.636	2.638	2.583	2.517	2.757	2.759	2.581	ns
	6mA	GCLK	t _{co}	3.260	3.517	4.986	5.403	5.964	5.816	6.148	5.542	6.078	5.934	6.208	ns
		GCLK PLL	t _{co}	1.508	1.700	2.204	2.321	2.556	2.558	2.503	2.437	2.674	2.676	2.498	ns
	8mA	GCLK	t _{co}	3.254	3.510	4.977	5.393	5.949	5.801	6.133	5.532	6.065	5.921	6.195	ns
		GCLK PLL	t _{co}	1.496	1.694	2.198	2.314	2.547	2.549	2.494	2.430	2.666	2.668	2.490	ns
	10mA	GCLK	t _{co}	3.213	3.474	4.892	5.310	5.879	5.731	6.063	5.448	5.981	5.837	6.111	ns
		GCLK PLL	t _{co}	1.461	1.643	2.150	2.260	2.486	2.488	2.433	2.371	2.601	2.603	2.425	ns
	12mA	GCLK	t _{co}	3.176	3.438	4.864	5.276	5.855	5.707	6.039	5.410	5.938	5.794	6.068	ns
		GCLK PLL	t _{co}	1.457	1.636	2.130	2.239	2.466	2.468	2.413	2.350	2.580	2.582	2.404	ns

Table 1-125. EP3SE110 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.498	3.780	5.386	5.818	6.398	6.250	6.582	5.980	6.542	6.398	6.672	ns
		GCLK PLL	t _{co}	1.663	1.861	2.482	2.609	2.850	2.852	2.797	2.732	2.977	2.979	2.801	ns
	4mA	GCLK	t _{co}	3.288	3.573	5.057	5.484	6.041	5.893	6.225	5.626	6.161	6.017	6.291	ns
		GCLK PLL	t _{co}	1.541	1.726	2.263	2.378	2.610	2.612	2.557	2.493	2.729	2.731	2.553	ns
	6mA	GCLK	t _{co}	3.246	3.502	4.964	5.378	5.940	5.792	6.124	5.515	6.045	5.901	6.175	ns
		GCLK PLL	t _{co}	1.488	1.685	2.187	2.301	2.536	2.538	2.483	2.418	2.656	2.658	2.480	ns
	8mA	GCLK	t _{co}	3.197	3.462	4.879	5.293	5.890	5.742	6.074	5.431	5.964	5.820	6.094	ns
		GCLK PLL	t _{co}	1.467	1.651	2.148	2.258	2.486	2.488	2.433	2.369	2.599	2.601	2.423	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.233	3.484	4.908	5.322	5.903	5.755	6.087	5.453	5.979	5.835	6.109	ns
		GCLK PLL	t _{co}	1.481	1.659	2.156	2.266	2.494	2.496	2.441	2.375	2.604	2.606	2.428	ns
	10mA	GCLK	t _{co}	3.237	3.489	4.914	5.327	5.911	5.763	6.095	5.459	5.985	5.841	6.115	ns
		GCLK PLL	t _{co}	1.484	1.662	2.160	2.270	2.498	2.500	2.445	2.378	2.608	2.610	2.432	ns
	12mA	GCLK	t _{co}	3.205	3.457	4.880	5.293	5.869	5.721	6.053	5.424	5.951	5.807	6.081	ns
		GCLK PLL	t _{co}	1.465	1.642	2.139	2.248	2.476	2.478	2.423	2.357	2.586	2.588	2.410	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.189	3.437	4.853	5.264	5.850	5.702	6.034	5.395	5.920	5.776	6.050	ns
		GCLK PLL	t _{co}	1.460	1.635	2.124	2.232	2.459	2.461	2.406	2.340	2.569	2.571	2.393	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.255	3.508	4.935	5.348	5.933	5.785	6.117	5.480	6.006	5.862	6.136	ns
		GCLK PLL	t _{co}	1.499	1.679	2.179	2.289	2.517	2.519	2.464	2.398	2.628	2.630	2.452	ns
	6mA	GCLK	t _{co}	3.228	3.480	4.905	5.317	5.898	5.750	6.082	5.449	5.975	5.831	6.105	ns
		GCLK PLL	t _{co}	1.480	1.658	2.157	2.267	2.495	2.497	2.442	2.376	2.605	2.607	2.429	ns
	8mA	GCLK	t _{co}	3.225	3.479	4.912	5.326	5.915	5.767	6.099	5.458	5.986	5.842	6.116	ns
		GCLK PLL	t _{co}	1.481	1.661	2.165	2.276	2.505	2.507	2.452	2.386	2.616	2.618	2.440	ns
	10mA	GCLK	t _{co}	3.195	3.447	4.876	5.290	5.875	5.727	6.059	5.422	5.948	5.804	6.078	ns
		GCLK PLL	t _{co}	1.464	1.641	2.141	2.251	2.480	2.482	2.427	2.360	2.591	2.593	2.415	ns
	12mA	GCLK	t _{co}	3.188	3.440	4.869	5.283	5.867	5.719	6.051	5.415	5.942	5.798	6.072	ns
		GCLK PLL	t _{co}	1.460	1.637	2.137	2.247	2.475	2.477	2.422	2.356	2.587	2.589	2.411	ns

Table 1–125. EP3SE110 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.187	3.436	4.850	5.261	5.849	5.701	6.033	5.392	5.916	5.772	6.046	ns
		GCLK PLL	t _{co}	1.461	1.636	2.124	2.233	2.459	2.461	2.406	2.341	2.569	2.571	2.393	ns
	16mA	GCLK	t _{co}	3.174	3.423	4.846	5.259	5.845	5.697	6.029	5.390	5.917	5.773	6.047	ns
		GCLK PLL	t _{co}	1.460	1.636	2.132	2.243	2.471	2.473	2.418	2.351	2.582	2.584	2.406	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.241	3.495	4.921	5.333	5.914	5.766	6.098	5.465	5.990	5.846	6.120	ns
		GCLK PLL	t _{co}	1.490	1.670	2.172	2.282	2.509	2.511	2.456	2.391	2.620	2.622	2.444	ns
	6mA	GCLK	t _{co}	3.212	3.466	4.898	5.311	5.898	5.750	6.082	5.444	5.970	5.826	6.100	ns
		GCLK PLL	t _{co}	1.475	1.654	2.158	2.269	2.497	2.499	2.444	2.378	2.609	2.611	2.433	ns
	8mA	GCLK	t _{co}	3.188	3.440	4.868	5.281	5.870	5.722	6.054	5.414	5.940	5.796	6.070	ns
		GCLK PLL	t _{co}	1.462	1.639	2.138	2.248	2.477	2.479	2.424	2.358	2.588	2.590	2.412	ns
	10mA	GCLK	t _{co}	3.181	3.433	4.861	5.275	5.875	5.727	6.059	5.408	5.935	5.791	6.065	ns
		GCLK PLL	t _{co}	1.463	1.640	2.139	2.250	2.480	2.482	2.427	2.360	2.591	2.593	2.415	ns
	12mA	GCLK	t _{co}	3.174	3.425	4.851	5.265	5.864	5.716	6.048	5.397	5.924	5.780	6.054	ns
		GCLK PLL	t _{co}	1.458	1.635	2.132	2.243	2.472	2.474	2.419	2.352	2.583	2.585	2.407	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.218	3.467	4.878	5.288	5.872	5.724	6.056	5.418	5.942	5.798	6.072	ns
		GCLK PLL	t _{co}	1.476	1.652	2.140	2.248	2.474	2.476	2.421	2.356	2.584	2.586	2.408	ns
	16mA	GCLK	t _{co}	3.211	3.462	4.880	5.292	5.887	5.739	6.071	5.423	5.948	5.804	6.078	ns
		GCLK PLL	t _{co}	1.475	1.652	2.144	2.253	2.480	2.482	2.427	2.361	2.590	2.592	2.414	ns

Table 1-125. EP3SE110 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.189	3.439	4.855	5.267	5.860	5.712	6.044	5.398	5.923	5.779	6.053	ns
		GCLK PLL	t _{co}	1.462	1.638	2.128	2.237	2.464	2.466	2.411	2.345	2.574	2.576	2.398	ns
	6mA	GCLK	t _{co}	3.180	3.429	4.844	5.256	5.845	5.697	6.029	5.387	5.912	5.768	6.042	ns
		GCLK PLL	t _{co}	1.458	1.633	2.122	2.231	2.458	2.460	2.405	2.339	2.568	2.570	2.392	ns
	8mA	GCLK	t _{co}	3.178	3.428	4.847	5.259	5.862	5.714	6.046	5.390	5.916	5.772	6.046	ns
		GCLK PLL	t _{co}	1.460	1.636	2.127	2.236	2.464	2.466	2.411	2.345	2.575	2.577	2.399	ns
	10mA	GCLK	t _{co}	3.171	3.419	4.829	5.240	5.835	5.687	6.019	5.370	5.894	5.750	6.024	ns
		GCLK PLL	t _{co}	1.459	1.634	2.120	2.229	2.456	2.458	2.403	2.337	2.566	2.568	2.390	ns
	12mA	GCLK	t _{co}	3.215	3.465	4.877	5.287	5.872	5.724	6.056	5.418	5.941	5.797	6.071	ns
		GCLK PLL	t _{co}	1.477	1.653	2.142	2.250	2.477	2.479	2.424	2.359	2.587	2.589	2.411	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.204	3.454	4.871	5.282	5.875	5.727	6.059	5.413	5.937	5.793	6.067	ns
		GCLK PLL	t _{co}	1.472	1.649	2.140	2.249	2.476	2.478	2.423	2.358	2.586	2.588	2.410	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.202	3.453	4.871	5.283	5.876	5.728	6.060	5.414	5.938	5.794	6.068	ns
		GCLK PLL	t _{co}	1.472	1.648	2.141	2.250	2.477	2.479	2.424	2.359	2.587	2.589	2.411	ns
	6mA	GCLK	t _{co}	3.185	3.435	4.852	5.263	5.857	5.709	6.041	5.394	5.919	5.775	6.049	ns
		GCLK PLL	t _{co}	1.462	1.638	2.129	2.238	2.465	2.467	2.412	2.346	2.575	2.577	2.399	ns
	8mA	GCLK	t _{co}	3.182	3.432	4.852	5.265	5.867	5.719	6.051	5.396	5.922	5.778	6.052	ns
		GCLK PLL	t _{co}	1.464	1.640	2.134	2.245	2.473	2.475	2.420	2.353	2.584	2.586	2.408	ns
	10mA	GCLK	t _{co}	3.218	3.472	4.893	5.304	5.897	5.749	6.081	5.437	5.960	5.816	6.090	ns
		GCLK PLL	t _{co}	1.486	1.665	2.162	2.272	2.499	2.501	2.446	2.381	2.611	2.613	2.435	ns
	12mA	GCLK	t _{co}	3.201	3.453	4.875	5.287	5.883	5.735	6.067	5.419	5.944	5.800	6.074	ns
		GCLK PLL	t _{co}	1.475	1.653	2.150	2.260	2.488	2.490	2.435	2.369	2.599	2.601	2.423	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.192	3.444	4.866	5.279	5.882	5.734	6.066	5.411	5.937	5.793	6.067	ns
		GCLK PLL	t _{co}	1.474	1.651	2.148	2.258	2.486	2.488	2.433	2.368	2.598	2.600	2.422	ns

Table 1–125. EP3SE110 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		UnitS
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.186	3.437	4.861	5.274	5.880	5.732	6.064	5.406	5.933	5.789	6.063	ns
		GCLK PLL	t _{co}	1.471	1.649	2.147	2.258	2.486	2.488	2.433	2.367	2.598	2.600	2.422	ns
	6mA	GCLK	t _{co}	3.181	3.432	4.853	5.267	5.870	5.722	6.054	5.398	5.925	5.781	6.055	ns
		GCLK PLL	t _{co}	1.467	1.645	2.141	2.251	2.479	2.481	2.426	2.360	2.591	2.593	2.415	ns
	8mA	GCLK	t _{co}	3.259	3.507	4.867	5.270	5.839	5.691	6.023	5.401	5.916	5.772	6.046	ns
		GCLK PLL	t _{co}	1.544	1.720	2.158	2.259	2.476	2.478	2.423	2.368	2.588	2.590	2.412	ns
	10mA	GCLK	t _{co}	3.259	3.507	4.867	5.270	5.839	5.691	6.023	5.401	5.916	5.772	6.046	ns
		GCLK PLL	t _{co}	1.544	1.720	2.158	2.259	2.476	2.478	2.423	2.368	2.588	2.590	2.412	ns
	12mA	GCLK	t _{co}	3.367	3.653	5.079	5.492	6.016	5.868	6.200	5.630	6.154	6.010	6.284	ns
		GCLK PLL	t _{co}	1.573	1.759	2.224	2.334	2.556	2.558	2.503	2.446	2.669	2.671	2.493	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.262	3.530	4.912	5.325	5.848	5.700	6.032	5.461	5.981	5.837	6.111	ns
		GCLK PLL	t _{co}	1.494	1.670	2.121	2.222	2.439	2.441	2.386	2.330	2.549	2.551	2.373	ns
3.0-V PCI	—	GCLK	t _{co}	3.202	3.451	4.832	5.234	5.748	5.600	5.932	5.363	5.876	5.732	6.006	ns
		GCLK PLL	t _{co}	1.465	1.638	2.054	2.152	2.369	2.371	2.316	2.260	2.482	2.484	2.306	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.181	3.426	4.776	5.184	5.705	5.557	5.889	5.317	5.835	5.691	5.965	ns
		GCLK PLL	t _{co}	1.451	1.624	2.033	2.129	2.341	2.343	2.288	2.234	2.449	2.451	2.273	ns

Table 1–126 specifies EP3SE110 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1–126. EP3SE110 Row Pins output Timing Parameters (Part 1 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.208	3.456	4.797	5.180	5.703	5.543	5.850	5.304	5.827	5.696	5.930	ns
		GCLK PLL	t _{co}	1.452	1.625	2.008	2.086	2.326	2.346	2.347	2.239	2.435	2.455	2.342	ns
	8mA	GCLK	t _{co}	3.142	3.385	4.687	5.069	5.589	5.429	5.736	5.191	5.712	5.581	5.815	ns
		GCLK PLL	t _{co}	1.359	1.554	1.898	1.975	2.181	2.201	2.202	2.098	2.286	2.306	2.193	ns
	12mA	GCLK	t _{co}	3.063	3.296	4.581	4.969	5.493	5.333	5.640	5.092	5.612	5.481	5.715	ns
		GCLK PLL	t _{co}	1.260	1.465	1.792	1.875	2.053	2.073	2.074	1.971	2.154	2.174	2.061	ns

Table 1–126. EP3SE110 Row Pins output Timing Parameters (Part 2 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.210	3.463	4.801	5.186	5.712	5.552	5.859	5.312	5.839	5.708	5.942	ns
		GCLK PLL	t _{co}	1.462	1.632	2.012	2.092	2.330	2.350	2.351	2.245	2.439	2.459	2.346	ns
	8mA	GCLK	t _{co}	3.067	3.300	4.592	4.984	5.503	5.343	5.650	5.104	5.621	5.490	5.724	ns
		GCLK PLL	t _{co}	1.264	1.469	1.803	1.890	2.059	2.079	2.080	1.977	2.161	2.181	2.068	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.169	3.417	4.764	5.149	5.669	5.509	5.816	5.272	5.793	5.662	5.896	ns
		GCLK PLL	t _{co}	1.406	1.586	1.975	2.055	2.282	2.302	2.303	2.196	2.393	2.413	2.300	ns
	8mA	GCLK	t _{co}	3.068	3.305	4.627	5.007	5.524	5.364	5.671	5.130	5.648	5.516	5.750	ns
		GCLK PLL	t _{co}	1.281	1.474	1.838	1.913	2.118	2.138	2.139	2.034	2.229	2.248	2.135	ns
	12mA	GCLK	t _{co}	3.031	3.267	4.567	4.942	5.454	5.294	5.601	5.062	5.574	5.443	5.677	ns
		GCLK PLL	t _{co}	1.242	1.436	1.778	1.848	2.030	2.050	2.051	1.948	2.136	2.155	2.042	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.090	3.329	4.662	5.042	5.560	5.400	5.707	5.163	5.684	5.552	5.786	ns
		GCLK PLL	t _{co}	1.320	1.498	1.873	1.948	2.172	2.192	2.193	2.088	2.282	2.301	2.188	ns
	8mA	GCLK	t _{co}	3.018	3.251	4.539	4.913	5.426	5.266	5.573	5.032	5.546	5.414	5.648	ns
		GCLK PLL	t _{co}	1.220	1.420	1.750	1.819	1.991	2.011	2.012	1.908	2.096	2.115	2.002	ns
2.5 V	4mA	GCLK	t _{co}	3.195	3.454	4.872	5.275	5.814	5.654	5.961	5.404	5.945	5.814	6.048	ns
		GCLK PLL	t _{co}	1.432	1.623	2.083	2.181	2.454	2.474	2.475	2.356	2.572	2.591	2.478	ns
	8mA	GCLK	t _{co}	3.110	3.351	4.748	5.140	5.672	5.512	5.819	5.267	5.801	5.669	5.903	ns
		GCLK PLL	t _{co}	1.322	1.520	1.959	2.046	2.284	2.304	2.305	2.189	2.398	2.417	2.304	ns
	12mA	GCLK	t _{co}	3.053	3.307	4.664	5.054	5.581	5.421	5.728	5.178	5.706	5.575	5.809	ns
		GCLK PLL	t _{co}	1.276	1.476	1.875	1.960	2.158	2.178	2.179	2.066	2.268	2.287	2.174	ns
1.8 V	2mA	GCLK	t _{co}	3.458	3.730	5.334	5.790	6.350	6.220	6.500	5.931	6.493	6.365	6.600	ns
		GCLK PLL	t _{co}	1.663	1.874	2.520	2.669	2.929	2.949	2.954	2.792	3.056	3.075	2.967	ns
	4mA	GCLK	t _{co}	3.233	3.528	5.007	5.421	5.945	5.815	6.095	5.566	6.087	5.958	6.193	ns
		GCLK PLL	t _{co}	1.438	1.672	2.193	2.300	2.524	2.544	2.549	2.427	2.650	2.668	2.560	ns
	6mA	GCLK	t _{co}	3.168	3.426	4.854	5.271	5.786	5.656	5.936	5.398	5.914	5.786	6.021	ns
		GCLK PLL	t _{co}	1.373	1.570	2.040	2.150	2.365	2.385	2.390	2.259	2.477	2.496	2.388	ns
	8mA	GCLK	t _{co}	3.108	3.352	4.777	5.177	5.691	5.559	5.839	5.303	5.820	5.692	5.927	ns
		GCLK PLL	t _{co}	1.313	1.496	1.963	2.056	2.268	2.288	2.293	2.164	2.383	2.402	2.294	ns

Table 1–126. EP3SE110 Row Pins output Timing Parameters (Part 3 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.369	3.648	5.244	5.703	6.278	6.148	6.428	5.838	6.417	6.289	6.524	ns
		GCLK PLL	t _{co}	1.574	1.792	2.430	2.582	2.857	2.877	2.882	2.699	2.980	2.999	2.891	ns
	4mA	GCLK	t _{co}	3.127	3.390	4.839	5.266	5.787	5.657	5.937	5.392	5.913	5.785	6.020	ns
		GCLK PLL	t _{co}	1.332	1.534	2.025	2.145	2.366	2.386	2.391	2.253	2.476	2.495	2.387	ns
	6mA	GCLK	t _{co}	3.100	3.343	4.766	5.170	5.691	5.551	5.834	5.294	5.816	5.685	5.916	ns
		GCLK PLL	t _{co}	1.305	1.487	1.952	2.049	2.260	2.280	2.285	2.155	2.371	2.390	2.282	ns
	8mA	GCLK	t _{co}	3.091	3.334	4.744	5.152	5.672	5.532	5.815	5.276	5.797	5.666	5.897	ns
		GCLK PLL	t _{co}	1.296	1.478	1.930	2.031	2.241	2.261	2.266	2.137	2.349	2.368	2.260	ns
1.2 V	2mA	GCLK	t _{co}	3.312	3.573	5.154	5.617	6.203	6.073	6.353	5.750	6.333	6.205	6.440	ns
		GCLK PLL	t _{co}	1.517	1.717	2.340	2.496	2.782	2.802	2.807	2.611	2.896	2.915	2.807	ns
	4mA	GCLK	t _{co}	3.132	3.384	4.861	5.294	5.828	5.698	5.978	5.417	5.955	5.827	6.062	ns
		GCLK PLL	t _{co}	1.337	1.528	2.047	2.173	2.407	2.427	2.432	2.278	2.518	2.537	2.429	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.057	3.295	4.657	5.045	5.571	5.411	5.718	5.165	5.692	5.561	5.795	ns
		GCLK PLL	t _{co}	1.261	1.464	1.868	1.951	2.126	2.146	2.147	2.033	2.230	2.250	2.137	ns
	12mA	GCLK	t _{co}	3.052	3.291	4.654	5.043	5.569	5.409	5.716	5.164	5.691	5.560	5.794	ns
		GCLK PLL	t _{co}	1.249	1.460	1.865	1.949	2.118	2.138	2.139	2.025	2.223	2.243	2.130	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.043	3.280	4.639	5.027	5.552	5.392	5.699	5.147	5.673	5.542	5.776	ns
		GCLK PLL	t _{co}	1.234	1.449	1.850	1.933	2.097	2.111	2.112	1.999	2.202	2.221	2.103	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.069	3.308	4.672	5.065	5.586	5.433	5.729	5.184	5.707	5.576	5.807	ns
		GCLK PLL	t _{co}	1.274	1.452	1.858	1.944	2.142	2.162	2.167	2.045	2.246	2.265	2.157	ns
	6mA	GCLK	t _{co}	3.054	3.294	4.669	5.063	5.585	5.431	5.728	5.182	5.705	5.574	5.805	ns
		GCLK PLL	t _{co}	1.259	1.438	1.855	1.942	2.140	2.160	2.165	2.043	2.244	2.263	2.155	ns
	8mA	GCLK	t _{co}	3.043	3.282	4.652	5.046	5.575	5.414	5.718	5.165	5.696	5.565	5.796	ns
		GCLK PLL	t _{co}	1.248	1.426	1.838	1.925	2.123	2.143	2.148	2.026	2.228	2.247	2.139	ns
	10mA	GCLK	t _{co}	3.030	3.267	4.636	5.030	5.562	5.399	5.705	5.150	5.684	5.553	5.784	ns
		GCLK PLL	t _{co}	1.228	1.404	1.822	1.909	2.108	2.128	2.133	2.011	2.213	2.232	2.124	ns
	12mA	GCLK	t _{co}	3.030	3.266	4.635	5.029	5.562	5.398	5.705	5.149	5.684	5.553	5.784	ns
		GCLK PLL	t _{co}	1.228	1.403	1.821	1.908	2.107	2.127	2.132	2.010	2.213	2.232	2.123	ns

Table 1-126. EP3SE110 Row Pins output Timing Parameters (Part 4 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.038	3.273	4.633	5.025	5.557	5.392	5.700	5.144	5.678	5.547	5.778	ns
		GCLK PLL	t _{co}	1.236	1.411	1.819	1.904	2.102	2.121	2.126	2.005	2.207	2.226	2.116	ns
	16mA	GCLK	t _{co}	3.039	3.276	4.639	5.031	5.567	5.400	5.710	5.150	5.689	5.558	5.789	ns
		GCLK PLL	t _{co}	1.237	1.413	1.818	1.905	2.112	2.123	2.128	2.007	2.218	2.237	2.120	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.065	3.304	4.683	5.079	5.599	5.450	5.742	5.197	5.719	5.588	5.819	ns
		GCLK PLL	t _{co}	1.270	1.448	1.869	1.958	2.159	2.179	2.184	2.058	2.262	2.281	2.173	ns
	6mA	GCLK	t _{co}	3.046	3.283	4.665	5.062	5.589	5.433	5.732	5.181	5.710	5.579	5.810	ns
		GCLK PLL	t _{co}	1.247	1.426	1.851	1.941	2.142	2.162	2.167	2.042	2.246	2.265	2.157	ns
	8mA	GCLK	t _{co}	3.035	3.271	4.648	5.044	5.576	5.415	5.719	5.163	5.697	5.566	5.797	ns
		GCLK PLL	t _{co}	1.233	1.409	1.834	1.923	2.124	2.144	2.149	2.024	2.229	2.248	2.140	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.045	3.280	4.639	5.030	5.555	5.395	5.698	5.148	5.675	5.544	5.775	ns
		GCLK PLL	t _{co}	1.249	1.424	1.825	1.909	2.104	2.124	2.129	2.009	2.208	2.227	2.119	ns
	6mA	GCLK	t _{co}	3.038	3.273	4.630	5.022	5.554	5.387	5.697	5.140	5.675	5.544	5.775	ns
		GCLK PLL	t _{co}	1.237	1.412	1.816	1.901	2.099	2.116	2.121	2.001	2.204	2.223	2.112	ns
	8mA	GCLK	t _{co}	3.029	3.265	4.623	5.013	5.547	5.380	5.690	5.132	5.668	5.537	5.768	ns
		GCLK PLL	t _{co}	1.227	1.402	1.807	1.892	2.092	2.108	2.113	1.993	2.197	2.216	2.104	ns
	10mA	GCLK	t _{co}	3.032	3.267	4.626	5.016	5.551	5.384	5.694	5.135	5.671	5.540	5.771	ns
		GCLK PLL	t _{co}	1.230	1.404	1.810	1.895	2.096	2.111	2.116	1.996	2.200	2.219	2.107	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.028	3.264	4.628	5.019	5.554	5.387	5.697	5.138	5.676	5.545	5.776	ns
		GCLK PLL	t _{co}	1.226	1.401	1.808	1.894	2.099	2.111	2.116	1.996	2.205	2.224	2.108	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.036	3.272	4.626	5.016	5.550	5.383	5.693	5.134	5.670	5.539	5.770	ns
		GCLK PLL	t _{co}	1.234	1.409	1.805	1.890	2.095	2.106	2.107	1.991	2.199	2.218	2.097	ns
	6mA	GCLK	t _{co}	3.051	3.287	4.650	5.043	5.566	5.410	5.709	5.160	5.686	5.555	5.786	ns
		GCLK PLL	t _{co}	1.256	1.431	1.836	1.922	2.119	2.139	2.144	2.021	2.222	2.241	2.133	ns
	8mA	GCLK	t _{co}	3.045	3.280	4.646	5.039	5.568	5.406	5.711	5.157	5.689	5.558	5.789	ns
		GCLK PLL	t _{co}	1.244	1.421	1.832	1.918	2.115	2.135	2.140	2.018	2.219	2.238	2.130	ns
1.5-V HSTL CLASS I	8mA	GCLK	t _{co}	3.041	3.276	4.640	5.033	5.563	5.400	5.706	5.151	5.683	5.552	5.783	ns
		GCLK PLL	t _{co}	1.240	1.416	1.826	1.912	2.109	2.129	2.134	2.012	2.213	2.232	2.124	ns

Table 1–126. EP3SE110 Row Pins output Timing Parameters (Part 5 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.053	3.287	4.661	5.057	5.585	5.428	5.728	5.174	5.705	5.574	5.805	ns
		GCLK PLL	t _{co}	1.255	1.430	1.847	1.936	2.137	2.157	2.162	2.035	2.239	2.258	2.150	ns
	6mA	GCLK	t _{co}	3.044	3.279	4.650	5.045	5.576	5.416	5.719	5.163	5.696	5.565	5.796	ns
		GCLK PLL	t _{co}	1.243	1.418	1.836	1.924	2.125	2.145	2.150	2.024	2.228	2.247	2.139	ns
	8mA	GCLK	t _{co}	3.043	3.279	4.654	5.050	5.585	5.422	5.728	5.169	5.706	5.575	5.806	ns
		GCLK PLL	t _{co}	1.241	1.416	1.840	1.929	2.131	2.151	2.156	2.030	2.235	2.254	2.146	ns
3.0-V PCI	—	GCLK	t _{co}	3.163	3.401	4.709	5.091	5.611	5.451	5.758	5.213	5.734	5.603	5.837	ns
		GCLK PLL	t _{co}	1.354	1.570	1.920	1.997	2.156	2.167	2.156	2.061	2.263	2.282	2.149	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.163	3.401	4.709	5.091	5.611	5.451	5.758	5.213	5.734	5.603	5.837	ns
		GCLK PLL	t _{co}	1.354	1.570	1.920	1.997	2.156	2.167	2.156	2.061	2.263	2.282	2.149	ns

Table 1–127 through Table 1–130 show the maximum I/O timing parameters for EP3SE110 devices for differential I/O standards.

Table 1–127 specifies EP3SE110 column pins input timing parameters for differential I/O standards.

Table 1–127. EP3SE110 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
MINI-LVDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
RSDS	GCLK	t _{su}	-0.997	-1.029	-1.181	-1.169	-1.324	-1.269	-1.645	-1.133	-1.542	-1.230	-1.683	ns
		t _h	1.133	1.184	1.415	1.436	1.618	1.551	1.927	1.411	1.858	1.524	1.966	ns
	GCLK PLL	t _{su}	0.960	0.994	1.879	2.224	2.401	2.288	2.194	2.277	2.567	2.345	2.245	ns
		t _h	-0.691	-0.701	-1.428	-1.714	-1.834	-1.749	-1.648	-1.756	-1.968	-1.795	-1.697	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-0.813	-0.852	-1.258	-1.368	-1.483	-1.423	-1.794	-1.368	-1.482	-1.428	-1.837	ns
		t _h	0.942	0.999	1.460	1.595	1.731	1.659	2.031	1.604	1.739	1.674	2.075	ns
	GCLK PLL	t _{su}	1.144	1.171	1.802	2.025	2.242	2.134	2.045	2.042	2.260	2.147	2.091	ns
		t _h	-0.882	-0.886	-1.383	-1.555	-1.721	-1.641	-1.544	-1.563	-1.729	-1.645	-1.588	ns

Table 1-127. EP3SE110 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{su}	-0.813	-0.852	-1.258	-1.368	-1.483	-1.423	-1.794	-1.368	-1.482	-1.428	-1.837	ns
		t _h	0.942	0.999	1.460	1.595	1.731	1.659	2.031	1.604	1.739	1.674	2.075	ns
	GCLK PLL	t _{su}	1.144	1.171	1.802	2.025	2.242	2.134	2.045	2.042	2.260	2.147	2.091	ns
		t _h	-0.882	-0.886	-1.383	-1.555	-1.721	-1.641	-1.544	-1.563	-1.729	-1.645	-1.588	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t _h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t _{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t _h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t _h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t _{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t _h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t _h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t _{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t _h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t _h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t _{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t _h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t _h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t _{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t _h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.821	-0.864	-1.268	-1.379	-1.499	-1.439	-1.810	-1.379	-1.497	-1.443	-1.852	ns
		t _h	0.950	1.011	1.470	1.606	1.747	1.675	2.047	1.615	1.754	1.689	2.090	ns
	GCLK PLL	t _{su}	1.136	1.159	1.792	2.014	2.226	2.118	2.029	2.031	2.245	2.132	2.076	ns
		t _h	-0.874	-0.874	-1.373	-1.544	-1.705	-1.625	-1.528	-1.552	-1.714	-1.630	-1.573	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t _h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t _{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t _h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.833	-0.875	-1.277	-1.390	-1.518	-1.458	-1.829	-1.390	-1.515	-1.461	-1.870	ns
		t _h	0.962	1.022	1.480	1.617	1.766	1.694	2.066	1.626	1.772	1.707	2.108	ns
	GCLK PLL	t _{su}	1.124	1.148	1.783	2.003	2.207	2.099	2.010	2.020	2.227	2.114	2.058	ns
		t _h	-0.862	-0.863	-1.363	-1.533	-1.686	-1.606	-1.509	-1.541	-1.696	-1.612	-1.555	ns

Table 1-127. EP3SE110 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{SU}	-0.840	-0.881	-1.289	-1.395	-1.518	-1.460	-1.828	-1.394	-1.510	-1.459	-1.866	ns
		t _H	0.969	1.028	1.493	1.625	1.769	1.697	2.070	1.633	1.772	1.706	2.109	ns
	GCLK PLL	t _{SU}	1.117	1.142	1.771	1.998	2.207	2.097	2.011	2.016	2.232	2.116	2.062	ns
		t _H	-0.855	-0.857	-1.350	-1.525	-1.683	-1.603	-1.505	-1.534	-1.696	-1.613	-1.554	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{SU}	-0.840	-0.881	-1.289	-1.395	-1.518	-1.460	-1.828	-1.394	-1.510	-1.459	-1.866	ns
		t _H	0.969	1.028	1.493	1.625	1.769	1.697	2.070	1.633	1.772	1.706	2.109	ns
	GCLK PLL	t _{SU}	1.117	1.142	1.771	1.998	2.207	2.097	2.011	2.016	2.232	2.116	2.062	ns
		t _H	-0.855	-0.857	-1.350	-1.525	-1.683	-1.603	-1.505	-1.534	-1.696	-1.613	-1.554	ns

Table 1-128 specifies EP3SE110 row pins input timing parameters for differential I/O standards

Table 1-128. EP3SE110 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{su}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_h	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{su}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_h	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
MINI-LVDS	GCLK	t_{su}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_h	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{su}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_h	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
RSDS	GCLK	t_{su}	-0.944	-0.979	-1.054	-1.015	-1.154	-1.107	-1.454	-0.975	-1.107	-1.061	-1.493	ns
		t_h	1.077	1.130	1.288	1.285	1.447	1.389	1.737	1.257	1.412	1.355	1.777	ns
	GCLK PLL	t_{su}	0.961	0.989	1.951	2.328	2.533	2.408	2.342	2.387	2.599	2.472	2.394	ns
		t_h	-0.691	-0.700	-1.502	-1.818	-1.968	-1.871	-1.796	-1.862	-2.019	-1.921	-1.844	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{su}	-0.749	-0.794	-1.145	-1.244	-1.343	-1.291	-1.633	-1.246	-1.344	-1.293	-1.677	ns
		t_h	0.875	0.936	1.345	1.468	1.587	1.524	1.867	1.479	1.597	1.535	1.912	ns
	GCLK PLL	t_{su}	1.156	1.174	1.864	2.104	2.344	2.224	2.163	2.120	2.362	2.240	2.210	ns
		t_h	-0.893	-0.894	-1.447	-1.639	-1.828	-1.736	-1.666	-1.644	-1.834	-1.741	-1.709	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{su}	-0.749	-0.794	-1.145	-1.244	-1.343	-1.291	-1.633	-1.246	-1.344	-1.293	-1.677	ns
		t_h	0.875	0.936	1.345	1.468	1.587	1.524	1.867	1.479	1.597	1.535	1.912	ns
	GCLK PLL	t_{su}	1.156	1.174	1.864	2.104	2.344	2.224	2.163	2.120	2.362	2.240	2.210	ns
		t_h	-0.893	-0.894	-1.447	-1.639	-1.828	-1.736	-1.666	-1.644	-1.834	-1.741	-1.709	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t_h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t_{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t_h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t_h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t_{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t_h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t_h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t_{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t_h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns

Table 1–128. EP3SE110 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t _h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t _{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t _h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-0.758	-0.806	-1.154	-1.254	-1.359	-1.307	-1.649	-1.255	-1.360	-1.309	-1.693	ns
		t _h	0.884	0.948	1.354	1.478	1.603	1.540	1.883	1.488	1.613	1.551	1.928	ns
	GCLK PLL	t _{su}	1.147	1.162	1.855	2.094	2.328	2.208	2.147	2.111	2.346	2.224	2.194	ns
		t _h	-0.884	-0.882	-1.438	-1.629	-1.812	-1.720	-1.650	-1.635	-1.818	-1.725	-1.693	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-0.772	-0.818	-1.163	-1.264	-1.377	-1.325	-1.667	-1.266	-1.377	-1.326	-1.710	ns
		t _h	0.898	0.960	1.364	1.488	1.621	1.558	1.901	1.499	1.630	1.568	1.945	ns
	GCLK PLL	t _{su}	1.133	1.150	1.842	2.084	2.310	2.190	2.129	2.100	2.329	2.207	2.177	ns
		t _h	-0.870	-0.870	-1.426	-1.619	-1.794	-1.702	-1.632	-1.624	-1.801	-1.708	-1.676	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-0.781	-0.827	-1.178	-1.275	-1.384	-1.333	-1.673	-1.273	-1.378	-1.329	-1.712	ns
		t _h	0.907	0.969	1.379	1.502	1.631	1.568	1.912	1.509	1.636	1.573	1.952	ns
	GCLK PLL	t _{su}	1.124	1.141	1.827	2.068	2.299	2.178	2.118	2.089	2.323	2.199	2.170	ns
		t _h	-0.861	-0.861	-1.411	-1.601	-1.780	-1.688	-1.617	-1.610	-1.792	-1.699	-1.665	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-0.781	-0.827	-1.178	-1.275	-1.384	-1.333	-1.673	-1.273	-1.378	-1.329	-1.712	ns
		t _h	0.907	0.969	1.379	1.502	1.631	1.568	1.912	1.509	1.636	1.573	1.952	ns
	GCLK PLL	t _{su}	1.124	1.141	1.827	2.068	2.299	2.178	2.118	2.089	2.323	2.199	2.170	ns
		t _h	-0.861	-0.861	-1.411	-1.601	-1.780	-1.688	-1.617	-1.610	-1.792	-1.699	-1.665	ns

Table 1-129 specifies EP3SE110 Column Pins Output Timing parameters for differential I/O standards.

Table 1-129. EP3SE110 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =1.1V	V _{ccl} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t _{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
LVDS_E_3R	—	GCLK	t _{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t _{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t _{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t _{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
RSDS_E_1R	—	GCLK	t _{co}	3.152	3.387	4.757	5.155	5.666	5.526	5.826	5.278	5.789	5.650	5.899	ns
		GCLK PLL	t _{co}	1.328	1.502	1.913	2.006	2.214	2.225	2.251	2.110	2.321	2.331	2.237	ns
RSDS_E_3R	—	GCLK	t _{co}	3.148	3.390	4.804	5.210	5.728	5.588	5.888	5.337	5.855	5.716	5.965	ns
		GCLK PLL	t _{co}	1.324	1.505	1.960	2.061	2.276	2.287	2.313	2.169	2.387	2.397	2.303	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.179	3.420	4.828	5.233	5.750	5.610	5.910	5.358	5.875	5.736	5.985	ns
		GCLK PLL	t _{co}	1.355	1.535	1.984	2.084	2.298	2.309	2.335	2.190	2.407	2.417	2.323	ns
	6mA	GCLK	t _{co}	3.169	3.410	4.818	5.222	5.740	5.600	5.900	5.347	5.865	5.726	5.975	ns
		GCLK PLL	t _{co}	1.345	1.525	1.974	2.073	2.288	2.299	2.325	2.179	2.397	2.407	2.313	ns
	8mA	GCLK	t _{co}	3.169	3.410	4.821	5.226	5.744	5.604	5.904	5.352	5.870	5.731	5.980	ns
		GCLK PLL	t _{co}	1.345	1.525	1.977	2.077	2.292	2.303	2.329	2.184	2.402	2.412	2.318	ns
	10mA	GCLK	t _{co}	3.162	3.404	4.814	5.220	5.738	5.598	5.898	5.345	5.864	5.725	5.974	ns
		GCLK PLL	t _{co}	1.338	1.519	1.970	2.071	2.286	2.297	2.323	2.177	2.396	2.406	2.312	ns
	12mA	GCLK	t _{co}	3.161	3.402	4.811	5.217	5.735	5.595	5.895	5.342	5.860	5.721	5.970	ns
		GCLK PLL	t _{co}	1.337	1.517	1.967	2.068	2.283	2.294	2.320	2.174	2.392	2.402	2.308	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.183	3.424	4.832	5.237	5.754	5.614	5.914	5.362	5.880	5.741	5.990	ns
		GCLK PLL	t _{co}	1.359	1.539	1.988	2.088	2.302	2.313	2.339	2.194	2.412	2.422	2.328	ns

Table 1-129. EP3SE110 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.173	3.413	4.811	5.214	5.729	5.589	5.889	5.338	5.853	5.714	5.963	ns
		GCLK PLL	t _{co}	1.349	1.528	1.967	2.065	2.277	2.288	2.314	2.170	2.385	2.395	2.301	ns
	6mA	GCLK	t _{co}	3.168	3.409	4.811	5.214	5.730	5.590	5.890	5.339	5.855	5.716	5.965	ns
		GCLK PLL	t _{co}	1.344	1.524	1.967	2.065	2.278	2.289	2.315	2.171	2.387	2.397	2.303	ns
	8mA	GCLK	t _{co}	3.166	3.407	4.810	5.213	5.728	5.588	5.888	5.338	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.342	1.522	1.966	2.064	2.276	2.287	2.313	2.170	2.386	2.396	2.302	ns
	10mA	GCLK	t _{co}	3.158	3.398	4.800	5.203	5.719	5.579	5.879	5.328	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.334	1.513	1.956	2.054	2.267	2.278	2.304	2.160	2.376	2.386	2.292	ns
	12mA	GCLK	t _{co}	3.159	3.400	4.806	5.210	5.727	5.587	5.887	5.336	5.853	5.714	5.963	ns
		GCLK PLL	t _{co}	1.335	1.515	1.962	2.061	2.275	2.286	2.312	2.168	2.385	2.395	2.301	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.158	3.397	4.789	5.191	5.705	5.565	5.865	5.315	5.829	5.690	5.939	ns
		GCLK PLL	t _{co}	1.334	1.512	1.945	2.042	2.253	2.264	2.290	2.147	2.361	2.371	2.277	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.170	3.410	4.807	5.209	5.723	5.583	5.883	5.334	5.848	5.709	5.958	ns
		GCLK PLL	t _{co}	1.346	1.525	1.963	2.060	2.271	2.282	2.308	2.166	2.380	2.390	2.296	ns
	6mA	GCLK	t _{co}	3.166	3.407	4.808	5.211	5.727	5.587	5.887	5.336	5.852	5.713	5.962	ns
		GCLK PLL	t _{co}	1.342	1.522	1.964	2.062	2.275	2.286	2.312	2.168	2.384	2.394	2.300	ns
	8mA	GCLK	t _{co}	3.156	3.396	4.797	5.200	5.715	5.575	5.875	5.325	5.840	5.701	5.950	ns
		GCLK PLL	t _{co}	1.332	1.511	1.953	2.051	2.263	2.274	2.300	2.157	2.372	2.382	2.288	ns
	10mA	GCLK	t _{co}	3.154	3.394	4.795	5.197	5.713	5.573	5.873	5.323	5.838	5.699	5.948	ns
		GCLK PLL	t _{co}	1.330	1.509	1.951	2.048	2.261	2.272	2.298	2.155	2.370	2.380	2.286	ns
	12mA	GCLK	t _{co}	3.154	3.395	4.798	5.202	5.718	5.578	5.878	5.327	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.330	1.510	1.954	2.053	2.266	2.277	2.303	2.159	2.376	2.386	2.292	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.158	3.398	4.795	5.197	5.712	5.572	5.872	5.322	5.837	5.698	5.947	ns
		GCLK PLL	t _{co}	1.334	1.513	1.951	2.048	2.260	2.271	2.297	2.154	2.369	2.379	2.285	ns

Table 1-129. EP3SE110 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.184	3.427	4.840	5.245	5.762	5.622	5.922	5.370	5.887	5.748	5.997	ns
		GCLK PLL	t _{co}	1.360	1.542	1.996	2.096	2.310	2.321	2.347	2.202	2.419	2.429	2.335	ns
	6mA	GCLK	t _{co}	3.170	3.413	4.828	5.234	5.752	5.612	5.912	5.360	5.878	5.739	5.988	ns
		GCLK PLL	t _{co}	1.346	1.528	1.984	2.085	2.300	2.311	2.337	2.192	2.410	2.420	2.326	ns
	8mA	GCLK	t _{co}	3.158	3.400	4.811	5.216	5.734	5.594	5.894	5.342	5.860	5.721	5.970	ns
		GCLK PLL	t _{co}	1.334	1.515	1.967	2.067	2.282	2.293	2.319	2.174	2.392	2.402	2.308	ns
	10mA	GCLK	t _{co}	3.158	3.400	4.814	5.220	5.738	5.598	5.898	5.346	5.865	5.726	5.975	ns
		GCLK PLL	t _{co}	1.334	1.515	1.970	2.071	2.286	2.297	2.323	2.178	2.397	2.407	2.313	ns
	12mA	GCLK	t _{co}	3.154	3.396	4.807	5.212	5.731	5.591	5.891	5.339	5.857	5.718	5.967	ns
		GCLK PLL	t _{co}	1.330	1.511	1.963	2.063	2.279	2.290	2.316	2.171	2.389	2.399	2.305	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.158	3.398	4.800	5.203	5.719	5.579	5.879	5.328	5.844	5.705	5.954	ns
		GCLK PLL	t _{co}	1.334	1.513	1.956	2.054	2.267	2.278	2.304	2.160	2.376	2.386	2.292	ns
	16mA	GCLK	t _{co}	3.159	3.400	4.808	5.213	5.730	5.590	5.890	5.338	5.856	5.717	5.966	ns
		GCLK PLL	t _{co}	1.335	1.515	1.964	2.064	2.278	2.289	2.315	2.170	2.388	2.398	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.187	3.430	4.839	5.243	5.760	5.620	5.920	5.369	5.885	5.746	5.995	ns
		GCLK PLL	t _{co}	1.363	1.545	1.995	2.094	2.308	2.319	2.345	2.201	2.417	2.427	2.333	ns
	6mA	GCLK	t _{co}	3.176	3.418	4.827	5.231	5.748	5.608	5.908	5.357	5.873	5.734	5.983	ns
		GCLK PLL	t _{co}	1.352	1.533	1.983	2.082	2.296	2.307	2.333	2.189	2.405	2.415	2.321	ns
	8mA	GCLK	t _{co}	3.171	3.414	4.827	5.232	5.749	5.609	5.909	5.358	5.875	5.736	5.985	ns
		GCLK PLL	t _{co}	1.347	1.529	1.983	2.083	2.297	2.308	2.334	2.190	2.407	2.417	2.323	ns
	10mA	GCLK	t _{co}	3.157	3.399	4.809	5.213	5.730	5.590	5.890	5.339	5.857	5.718	5.967	ns
		GCLK PLL	t _{co}	1.333	1.514	1.965	2.064	2.278	2.289	2.315	2.171	2.389	2.399	2.305	ns
	12mA	GCLK	t _{co}	3.155	3.397	4.807	5.211	5.728	5.588	5.888	5.337	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.331	1.512	1.963	2.062	2.276	2.287	2.313	2.169	2.386	2.396	2.302	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.159	3.399	4.799	5.201	5.716	5.576	5.876	5.326	5.841	5.702	5.951	ns
		GCLK PLL	t _{co}	1.335	1.514	1.955	2.052	2.264	2.275	2.301	2.158	2.373	2.383	2.289	ns
	16mA	GCLK	t _{co}	3.159	3.400	4.807	5.211	5.728	5.588	5.888	5.337	5.854	5.715	5.964	ns
		GCLK PLL	t _{co}	1.335	1.515	1.963	2.062	2.276	2.287	2.313	2.169	2.386	2.396	2.302	ns

Table 1–129. EP3SE110 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.175	3.417	4.823	5.226	5.742	5.602	5.902	5.352	5.867	5.728	5.977	ns
		GCLK PLL	t _{co}	1.351	1.532	1.979	2.077	2.290	2.301	2.327	2.184	2.399	2.409	2.315	ns
	10mA	GCLK	t _{co}	3.175	3.417	4.823	5.226	5.742	5.602	5.902	5.352	5.867	5.728	5.977	ns
		GCLK PLL	t _{co}	1.351	1.532	1.979	2.077	2.290	2.301	2.327	2.184	2.399	2.409	2.315	ns
	12mA	GCLK	t _{co}	3.165	3.407	4.813	5.216	5.732	5.592	5.892	5.342	5.858	5.719	5.968	ns
		GCLK PLL	t _{co}	1.341	1.522	1.969	2.067	2.280	2.291	2.317	2.174	2.390	2.400	2.306	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.158	3.399	4.799	5.201	5.716	5.576	5.876	5.326	5.841	5.702	5.951	ns
		GCLK PLL	t _{co}	1.334	1.514	1.955	2.052	2.264	2.275	2.301	2.158	2.373	2.383	2.289	ns

Table 1–130 specifies EP3SE110 Row Pins Output Timing parameters for differential I/O standards.

Table 1–130. EP3SE110 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t _{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns
LVDS_E_1R	—	GCLK	t _{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t _{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
LVDS_E_3R	—	GCLK	t _{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t _{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
MINI-LVDS	—	GCLK	t _{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t _{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t _{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t _{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
RSDS	—	GCLK	t _{co}	2.744	2.932	4.083	4.440	4.901	4.771	5.049	4.540	5.002	4.873	5.107	ns
		GCLK PLL	t _{co}	0.931	1.057	1.249	1.300	1.458	1.480	1.486	1.382	1.545	1.563	1.456	ns

Table 1-130. EP3SE110 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.136	3.376	4.754	5.156	5.664	5.526	5.797	5.281	5.790	5.652	5.871	ns
		GCLK PLL	t _{co}	1.333	1.511	1.930	2.026	2.231	2.245	2.243	2.133	2.343	2.352	2.229	ns
RSDS_E_3R	—	GCLK	t _{co}	3.118	3.366	4.792	5.202	5.718	5.580	5.851	5.332	5.851	5.713	5.932	ns
		GCLK PLL	t _{co}	1.315	1.501	1.968	2.072	2.285	2.299	2.297	2.184	2.404	2.413	2.290	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.162	3.409	4.828	5.236	5.751	5.613	5.884	5.365	5.880	5.742	5.961	ns
		GCLK PLL	t _{co}	1.359	1.544	2.004	2.106	2.318	2.332	2.330	2.217	2.433	2.442	2.319	ns
	6mA	GCLK	t _{co}	3.148	3.395	4.815	5.223	5.738	5.600	5.871	5.351	5.867	5.729	5.948	ns
		GCLK PLL	t _{co}	1.345	1.530	1.991	2.093	2.305	2.319	2.317	2.203	2.420	2.429	2.306	ns
	8mA	GCLK	t _{co}	3.144	3.391	4.813	5.223	5.739	5.601	5.872	5.351	5.869	5.731	5.950	ns
		GCLK PLL	t _{co}	1.341	1.526	1.989	2.093	2.306	2.320	2.318	2.203	2.422	2.431	2.308	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.160	3.406	4.814	5.220	5.733	5.595	5.866	5.348	5.862	5.724	5.943	ns
		GCLK PLL	t _{co}	1.357	1.541	1.990	2.090	2.300	2.314	2.312	2.200	2.415	2.424	2.301	ns
	6mA	GCLK	t _{co}	3.149	3.396	4.810	5.216	5.730	5.592	5.863	5.345	5.859	5.721	5.940	ns
		GCLK PLL	t _{co}	1.346	1.531	1.986	2.086	2.297	2.311	2.309	2.197	2.412	2.421	2.298	ns
	8mA	GCLK	t _{co}	3.146	3.393	4.808	5.214	5.728	5.590	5.861	5.343	5.858	5.720	5.939	ns
		GCLK PLL	t _{co}	1.343	1.528	1.984	2.084	2.295	2.309	2.307	2.195	2.411	2.420	2.297	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.157	3.403	4.809	5.215	5.727	5.589	5.860	5.343	5.856	5.718	5.937	ns
		GCLK PLL	t _{co}	1.354	1.538	1.985	2.085	2.294	2.308	2.306	2.195	2.409	2.418	2.295	ns
	6mA	GCLK	t _{co}	3.147	3.394	4.807	5.213	5.726	5.588	5.859	5.342	5.856	5.718	5.937	ns
		GCLK PLL	t _{co}	1.344	1.529	1.983	2.083	2.293	2.307	2.305	2.194	2.409	2.418	2.295	ns
	8mA	GCLK	t _{co}	3.133	3.380	4.792	5.198	5.712	5.574	5.845	5.327	5.841	5.703	5.922	ns
		GCLK PLL	t _{co}	1.330	1.515	1.968	2.068	2.279	2.293	2.291	2.179	2.394	2.403	2.280	ns
	10mA	GCLK	t _{co}	3.130	3.376	4.788	5.194	5.708	5.570	5.841	5.323	5.837	5.699	5.918	ns
		GCLK PLL	t _{co}	1.327	1.511	1.964	2.064	2.275	2.289	2.287	2.175	2.390	2.399	2.276	ns
	12mA	GCLK	t _{co}	3.127	3.374	4.789	5.197	5.711	5.573	5.844	5.326	5.841	5.703	5.922	ns
		GCLK PLL	t _{co}	1.324	1.509	1.965	2.067	2.278	2.292	2.290	2.178	2.394	2.403	2.280	ns

Table 1-130. EP3SE110 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.128	3.374	4.779	5.185	5.698	5.560	5.831	5.313	5.827	5.689	5.908	ns
		GCLK PLL	t _{co}	1.325	1.509	1.955	2.055	2.265	2.279	2.277	2.165	2.380	2.389	2.266	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.177	3.427	4.850	5.258	5.774	5.636	5.907	5.387	5.903	5.765	5.984	ns
		GCLK PLL	t _{co}	1.374	1.562	2.026	2.128	2.341	2.355	2.353	2.239	2.456	2.465	2.342	ns
	6mA	GCLK	t _{co}	3.153	3.403	4.832	5.241	5.757	5.619	5.890	5.370	5.888	5.750	5.969	ns
		GCLK PLL	t _{co}	1.350	1.538	2.008	2.111	2.324	2.338	2.336	2.222	2.441	2.450	2.327	ns
	8mA	GCLK	t _{co}	3.136	3.384	4.810	5.219	5.735	5.597	5.868	5.348	5.866	5.728	5.947	ns
		GCLK PLL	t _{co}	1.333	1.519	1.986	2.089	2.302	2.316	2.314	2.200	2.419	2.428	2.305	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.181	3.430	4.850	5.258	5.773	5.635	5.906	5.387	5.903	5.765	5.984	ns
		GCLK PLL	t _{co}	1.378	1.565	2.026	2.128	2.340	2.354	2.352	2.239	2.456	2.465	2.342	ns
	6mA	GCLK	t _{co}	3.166	3.415	4.836	5.243	5.758	5.620	5.891	5.372	5.888	5.750	5.969	ns
		GCLK PLL	t _{co}	1.363	1.550	2.012	2.113	2.325	2.339	2.337	2.224	2.441	2.450	2.327	ns
	8mA	GCLK	t _{co}	3.155	3.404	4.831	5.240	5.755	5.617	5.888	5.369	5.886	5.748	5.967	ns
		GCLK PLL	t _{co}	1.352	1.539	2.007	2.110	2.322	2.336	2.334	2.221	2.439	2.448	2.325	ns
	10mA	GCLK	t _{co}	3.135	3.384	4.808	5.216	5.732	5.594	5.865	5.346	5.862	5.724	5.943	ns
		GCLK PLL	t _{co}	1.332	1.519	1.984	2.086	2.299	2.313	2.311	2.198	2.415	2.424	2.301	ns
	12mA	GCLK	t _{co}	3.132	3.380	4.804	5.213	5.728	5.590	5.861	5.342	5.859	5.721	5.940	ns
		GCLK PLL	t _{co}	1.329	1.515	1.980	2.083	2.295	2.309	2.307	2.194	2.412	2.421	2.298	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.137	3.384	4.795	5.201	5.714	5.576	5.847	5.329	5.843	5.705	5.924	ns
		GCLK PLL	t _{co}	1.334	1.519	1.971	2.071	2.281	2.295	2.293	2.181	2.396	2.405	2.282	ns
	16mA	GCLK	t _{co}	3.130	3.377	4.794	5.202	5.717	5.579	5.850	5.332	5.848	5.710	5.929	ns
		GCLK PLL	t _{co}	1.327	1.512	1.970	2.072	2.284	2.298	2.296	2.184	2.401	2.410	2.287	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.168	3.416	4.832	5.239	5.753	5.615	5.886	5.368	5.883	5.745	5.964	ns
		GCLK PLL	t _{co}	1.365	1.551	2.008	2.109	2.320	2.334	2.332	2.220	2.436	2.445	2.322	ns
	12mA	GCLK	t _{co}	3.150	3.399	4.817	5.224	5.738	5.600	5.871	5.353	5.868	5.730	5.949	ns
		GCLK PLL	t _{co}	1.347	1.534	1.993	2.094	2.305	2.319	2.317	2.205	2.421	2.430	2.307	ns

Table 1-130. EP3SE110 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{co}	3.136	3.383	4.794	5.200	5.713	5.575	5.846	5.329	5.843	5.705	5.924	ns
		GCLK PLL	t_{co}	1.333	1.518	1.970	2.070	2.280	2.294	2.292	2.181	2.396	2.405	2.282	ns

Table 1-131 and Table 1-132 show EP3SE110 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1-131 specifies EP3SE110 Column Pin delay adders when using the regional clock.

Table 1-131. EP3SE110 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	0.111	0.14	0.19	0.103	0.105	0.103	0.177	0.085	0.101	0.098	0.146	ns
RCLK PLL input adder	2.506	2.513	3.782	4.081	4.579	4.381	4.923	4.222	4.603	4.401	4.984	ns
RCLK output adder	-0.281	-0.062	-0.079	-0.074	-0.074	-0.072	-0.128	0.056	0.051	0.054	-0.055	ns
RCLK PLL output adder	-2.121	-1.833	-2.75	-2.908	-3.127	-3.057	-3.165	-2.959	-3.157	-2.903	-3.172	ns

Table 1-132 specifies EP3SE110 Row Pin delay adders when using the regional clock.

Table 1-132. EP3SE110 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
RCLK input adder	-0.003	-0.002	0.001	-0.012	-0.01	-0.017	0.078	-0.02	-0.02	-0.016	0.08	ns
RCLK PLL input adder	0.116	0.122	0.192	0.212	0.227	0.217	0.375	0.198	0.219	0.209	0.379	ns
RCLK output adder	0.02	0.019	0.027	0.041	0.044	0.048	-0.038	0.051	0.057	0.051	-0.04	ns
RCLK PLL output adder	-0.103	-0.105	-0.162	-0.179	-0.194	-0.185	-0.322	-0.167	-0.183	-0.175	-0.324	ns

EP3SE260 I/O Timing Parameters

Table 1-133 through Table 1-137 show the maximum I/O timing parameters for EP3SE260 devices for single-ended I/O standards.

Table 1-133 specifies EP3SE260 column pins input timing parameters for single-ended I/O standards.

Table 1-133. EP3SE260 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
3.3-V LVTTTL	GCLK	t_{su}	-1.329	-1.318	-2.028	-2.073	-2.419	-2.337	-2.790	-2.185	-2.453	-2.376	-2.824	ns
		t_h	1.461	1.469	2.259	2.313	2.679	2.583	3.042	2.432	2.723	2.632	3.077	ns
	GCLK PLL	t_{su}	0.738	0.744	1.309	1.392	1.407	1.317	1.438	1.452	1.420	1.326	1.491	ns
		t_h	-0.467	-0.454	-0.843	-0.909	-0.869	-0.810	-0.909	-0.955	-0.871	-0.809	-0.957	ns
3.3-V LVCMOS	GCLK	t_{su}	-1.329	-1.318	-2.028	-2.073	-2.419	-2.337	-2.790	-2.185	-2.453	-2.376	-2.824	ns
		t_h	1.461	1.469	2.259	2.313	2.679	2.583	3.042	2.432	2.723	2.632	3.077	ns
	GCLK PLL	t_{su}	0.738	0.744	1.309	1.392	1.407	1.317	1.438	1.452	1.420	1.326	1.491	ns
		t_h	-0.467	-0.454	-0.843	-0.909	-0.869	-0.810	-0.909	-0.955	-0.871	-0.809	-0.957	ns
3.0-V LVTTTL	GCLK	t_{su}	-1.335	-1.329	-2.027	-2.075	-2.418	-2.336	-2.789	-2.185	-2.458	-2.381	-2.829	ns
		t_h	1.467	1.480	2.258	2.315	2.678	2.582	3.041	2.432	2.728	2.637	3.082	ns
	GCLK PLL	t_{su}	0.732	0.733	1.310	1.390	1.408	1.318	1.439	1.452	1.415	1.321	1.486	ns
		t_h	-0.461	-0.443	-0.844	-0.907	-0.870	-0.811	-0.910	-0.955	-0.866	-0.804	-0.952	ns
3.0-V LVCMOS	GCLK	t_{su}	-1.335	-1.329	-2.027	-2.075	-2.418	-2.336	-2.789	-2.185	-2.458	-2.381	-2.829	ns
		t_h	1.467	1.480	2.258	2.315	2.678	2.582	3.041	2.432	2.728	2.637	3.082	ns
	GCLK PLL	t_{su}	0.732	0.733	1.310	1.390	1.408	1.318	1.439	1.452	1.415	1.321	1.486	ns
		t_h	-0.461	-0.443	-0.844	-0.907	-0.870	-0.811	-0.910	-0.955	-0.866	-0.804	-0.952	ns
2.5 V	GCLK	t_{su}	-1.325	-1.324	-2.036	-2.087	-2.437	-2.355	-2.808	-2.195	-2.469	-2.392	-2.840	ns
		t_h	1.457	1.475	2.267	2.327	2.697	2.601	3.060	2.442	2.739	2.648	3.093	ns
	GCLK PLL	t_{su}	0.742	0.738	1.301	1.378	1.389	1.299	1.420	1.442	1.404	1.310	1.475	ns
		t_h	-0.471	-0.448	-0.835	-0.895	-0.851	-0.792	-0.891	-0.945	-0.855	-0.793	-0.941	ns
1.8 V	GCLK	t_{su}	-1.343	-1.346	-2.076	-2.123	-2.435	-2.353	-2.806	-2.229	-2.472	-2.395	-2.843	ns
		t_h	1.477	1.499	2.307	2.363	2.695	2.599	3.058	2.476	2.742	2.651	3.096	ns
	GCLK PLL	t_{su}	0.726	0.716	1.261	1.342	1.391	1.301	1.422	1.408	1.401	1.307	1.472	ns
		t_h	-0.453	-0.424	-0.795	-0.859	-0.853	-0.794	-0.893	-0.911	-0.852	-0.790	-0.938	ns
1.5 V	GCLK	t_{su}	-1.336	-1.336	-2.053	-2.091	-2.365	-2.283	-2.736	-2.198	-2.406	-2.329	-2.777	ns
		t_h	1.470	1.489	2.284	2.331	2.625	2.529	2.988	2.445	2.676	2.585	3.030	ns
	GCLK PLL	t_{su}	0.733	0.726	1.284	1.374	1.461	1.371	1.492	1.439	1.467	1.373	1.538	ns
		t_h	-0.460	-0.434	-0.818	-0.891	-0.923	-0.864	-0.963	-0.942	-0.918	-0.856	-1.004	ns
1.2 V	GCLK	t_{su}	-1.276	-1.284	-1.976	-1.992	-2.209	-2.127	-2.580	-2.102	-2.253	-2.176	-2.624	ns
		t_h	1.410	1.437	2.207	2.232	2.469	2.373	2.832	2.349	2.523	2.432	2.877	ns
	GCLK PLL	t_{su}	0.793	0.778	1.361	1.473	1.617	1.527	1.648	1.535	1.620	1.526	1.691	ns
		t_h	-0.520	-0.486	-0.895	-0.990	-1.079	-1.020	-1.119	-1.038	-1.071	-1.009	-1.157	ns

Table 1-133. EP3SE260 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-2 CLASS I	GCLK	t _{su}	-1.257	-1.255	-1.948	-1.976	-2.211	-2.129	-2.582	-2.081	-2.249	-2.172	-2.620	ns
		t _h	1.391	1.408	2.179	2.216	2.471	2.375	2.834	2.328	2.519	2.428	2.873	ns
	GCLK PLL	t _{su}	0.812	0.807	1.389	1.489	1.615	1.525	1.646	1.556	1.624	1.530	1.695	ns
		t _h	-0.539	-0.515	-0.923	-1.006	-1.077	-1.018	-1.117	-1.059	-1.075	-1.013	-1.161	ns
SSTL-2 CLASS II	GCLK	t _{su}	-1.257	-1.255	-1.948	-1.976	-2.211	-2.129	-2.582	-2.081	-2.249	-2.172	-2.620	ns
		t _h	1.391	1.408	2.179	2.216	2.471	2.375	2.834	2.328	2.519	2.428	2.873	ns
	GCLK PLL	t _{su}	0.812	0.807	1.389	1.489	1.615	1.525	1.646	1.556	1.624	1.530	1.695	ns
		t _h	-0.539	-0.515	-0.923	-1.006	-1.077	-1.018	-1.117	-1.059	-1.075	-1.013	-1.161	ns
SSTL-18 CLASS I	GCLK	t _{su}	-1.250	-1.249	-1.935	-1.968	-2.208	-2.124	-2.580	-2.074	-2.250	-2.171	-2.621	ns
		t _h	1.384	1.402	2.166	2.205	2.465	2.369	2.827	2.318	2.516	2.426	2.869	ns
	GCLK PLL	t _{su}	0.819	0.813	1.402	1.497	1.618	1.530	1.645	1.560	1.623	1.531	1.691	ns
		t _h	-0.546	-0.521	-0.936	-1.017	-1.083	-1.024	-1.121	-1.066	-1.078	-1.015	-1.162	ns
SSTL-18 CLASS II	GCLK	t _{su}	-1.250	-1.249	-1.935	-1.968	-2.208	-2.124	-2.580	-2.074	-2.250	-2.171	-2.621	ns
		t _h	1.384	1.402	2.166	2.205	2.465	2.369	2.827	2.318	2.516	2.426	2.869	ns
	GCLK PLL	t _{su}	0.819	0.813	1.402	1.497	1.618	1.530	1.645	1.560	1.623	1.531	1.691	ns
		t _h	-0.546	-0.521	-0.936	-1.017	-1.083	-1.024	-1.121	-1.066	-1.078	-1.015	-1.162	ns
SSTL-15 CLASS I	GCLK	t _{su}	-1.238	-1.238	-1.924	-1.957	-2.189	-2.105	-2.561	-2.063	-2.232	-2.153	-2.603	ns
		t _h	1.372	1.391	2.154	2.194	2.446	2.350	2.808	2.307	2.498	2.408	2.851	ns
	GCLK PLL	t _{su}	0.831	0.824	1.413	1.508	1.637	1.549	1.664	1.571	1.641	1.549	1.709	ns
		t _h	-0.558	-0.532	-0.948	-1.028	-1.102	-1.043	-1.140	-1.077	-1.096	-1.033	-1.180	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.238	-1.238	-1.924	-1.957	-2.189	-2.105	-2.561	-2.063	-2.232	-2.153	-2.603	ns
		t _h	1.372	1.391	2.154	2.194	2.446	2.350	2.808	2.307	2.498	2.408	2.851	ns
	GCLK PLL	t _{su}	0.831	0.824	1.413	1.508	1.637	1.549	1.664	1.571	1.641	1.549	1.709	ns
		t _h	-0.558	-0.532	-0.948	-1.028	-1.102	-1.043	-1.140	-1.077	-1.096	-1.033	-1.180	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.250	-1.249	-1.935	-1.968	-2.208	-2.124	-2.580	-2.074	-2.250	-2.171	-2.621	ns
		t _h	1.384	1.402	2.166	2.205	2.465	2.369	2.827	2.318	2.516	2.426	2.869	ns
	GCLK PLL	t _{su}	0.819	0.813	1.402	1.497	1.618	1.530	1.645	1.560	1.623	1.531	1.691	ns
		t _h	-0.546	-0.521	-0.936	-1.017	-1.083	-1.024	-1.121	-1.066	-1.078	-1.015	-1.162	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.250	-1.249	-1.935	-1.968	-2.208	-2.124	-2.580	-2.074	-2.250	-2.171	-2.621	ns
		t _h	1.384	1.402	2.166	2.205	2.465	2.369	2.827	2.318	2.516	2.426	2.869	ns
	GCLK PLL	t _{su}	0.819	0.813	1.402	1.497	1.618	1.530	1.645	1.560	1.623	1.531	1.691	ns
		t _h	-0.546	-0.521	-0.936	-1.017	-1.083	-1.024	-1.121	-1.066	-1.078	-1.015	-1.162	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.238	-1.238	-1.924	-1.957	-2.189	-2.105	-2.561	-2.063	-2.232	-2.153	-2.603	ns
		t _h	1.372	1.391	2.154	2.194	2.446	2.350	2.808	2.307	2.498	2.408	2.851	ns
	GCLK PLL	t _{su}	0.831	0.824	1.413	1.508	1.637	1.549	1.664	1.571	1.641	1.549	1.709	ns
		t _h	-0.558	-0.532	-0.948	-1.028	-1.102	-1.043	-1.140	-1.077	-1.096	-1.033	-1.180	ns

Table 1-133. EP3SE260 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.238	-1.238	-1.924	-1.957	-2.189	-2.105	-2.561	-2.063	-2.232	-2.153	-2.603	ns
		t _h	1.372	1.391	2.154	2.194	2.446	2.350	2.808	2.307	2.498	2.408	2.851	ns
	GCLK PLL	t _{su}	0.831	0.824	1.413	1.508	1.637	1.549	1.664	1.571	1.641	1.549	1.709	ns
		t _h	-0.558	-0.532	-0.948	-1.028	-1.102	-1.043	-1.140	-1.077	-1.096	-1.033	-1.180	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.230	-1.226	-1.914	-1.946	-2.173	-2.089	-2.545	-2.052	-2.217	-2.138	-2.588	ns
		t _h	1.364	1.379	2.144	2.183	2.430	2.334	2.792	2.296	2.483	2.393	2.836	ns
	GCLK PLL	t _{su}	0.839	0.836	1.423	1.519	1.653	1.565	1.680	1.582	1.656	1.564	1.724	ns
		t _h	-0.566	-0.544	-0.958	-1.039	-1.118	-1.059	-1.156	-1.088	-1.111	-1.048	-1.195	ns
3.0-V PCI	GCLK	t _{su}	-1.230	-1.226	-1.914	-1.946	-2.173	-2.089	-2.545	-2.052	-2.217	-2.138	-2.588	ns
		t _h	1.364	1.379	2.144	2.183	2.430	2.334	2.792	2.296	2.483	2.393	2.836	ns
	GCLK PLL	t _{su}	0.839	0.836	1.423	1.519	1.653	1.565	1.680	1.582	1.656	1.564	1.724	ns
		t _h	-0.566	-0.544	-0.958	-1.039	-1.118	-1.059	-1.156	-1.088	-1.111	-1.048	-1.195	ns
3.0-V PCI-X	GCLK	t _{su}	-1.335	-1.329	-2.027	-2.075	-2.418	-2.336	-2.789	-2.185	-2.458	-2.381	-2.829	ns
		t _h	1.467	1.480	2.258	2.315	2.678	2.582	3.041	2.432	2.728	2.637	3.082	ns
	GCLK PLL	t _{su}	0.732	0.733	1.310	1.390	1.408	1.318	1.439	1.452	1.415	1.321	1.486	ns
		t _h	-0.461	-0.443	-0.844	-0.907	-0.870	-0.811	-0.910	-0.955	-0.866	-0.804	-0.952	ns

Table 1-134 specifies EP3SE260 row pins input timing parameters for single-ended I/O standards.

Table 1-134. EP3SE260 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	GCLK	t _{su}	-1.219	-1.374	-2.059	-1.988	-2.283	-2.177	-2.643	-2.003	-2.382	-2.177	-2.643	ns
		t _h	1.355	1.524	2.293	2.233	2.553	2.431	2.902	2.260	2.659	2.431	2.902	ns
	GCLK PLL	t _{su}	0.983	0.983	1.749	1.864	1.862	1.767	1.884	1.864	1.883	1.767	1.884	ns
		t _h	-0.704	-0.685	-1.268	-1.363	-1.309	-1.247	-1.343	-1.352	-1.318	-1.247	-1.343	ns
3.3-V LVCMOS	GCLK	t _{su}	-1.219	-1.374	-2.059	-1.988	-2.283	-2.177	-2.643	-2.003	-2.382	-2.177	-2.643	ns
		t _h	1.355	1.524	2.293	2.233	2.553	2.431	2.902	2.260	2.659	2.431	2.902	ns
	GCLK PLL	t _{su}	0.983	0.983	1.749	1.864	1.862	1.767	1.884	1.864	1.883	1.767	1.884	ns
		t _h	-0.704	-0.685	-1.268	-1.363	-1.309	-1.247	-1.343	-1.352	-1.318	-1.247	-1.343	ns
3.0-V LVTTTL	GCLK	t _{su}	-1.225	-1.385	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
		t _h	1.361	1.535	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
	GCLK PLL	t _{su}	0.977	0.972	1.752	1.863	1.859	1.764	1.881	1.865	1.878	1.764	1.881	ns
		t _h	-0.698	-0.674	-1.271	-1.362	-1.306	-1.244	-1.340	-1.353	-1.313	-1.244	-1.340	ns

Table 1-134. EP3SE260 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVCMOS	GCLK	t _{SU}	-1.225	-1.385	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
		t _H	1.361	1.535	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
	GCLK PLL	t _{SU}	0.977	0.972	1.752	1.863	1.859	1.764	1.881	1.865	1.878	1.764	1.881	ns
		t _H	-0.698	-0.674	-1.271	-1.362	-1.306	-1.244	-1.340	-1.353	-1.313	-1.244	-1.340	ns
2.5 V	GCLK	t _{SU}	-1.213	-1.378	-2.065	-2.002	-2.301	-2.195	-2.661	-2.011	-2.397	-2.195	-2.661	ns
		t _H	1.349	1.528	2.299	2.247	2.571	2.449	2.920	2.268	2.674	2.449	2.920	ns
	GCLK PLL	t _{SU}	0.989	0.979	1.743	1.850	1.844	1.749	1.866	1.856	1.868	1.749	1.866	ns
		t _H	-0.710	-0.681	-1.262	-1.349	-1.291	-1.229	-1.325	-1.344	-1.303	-1.229	-1.325	ns
1.8 V	GCLK	t _{SU}	-1.283	-1.435	-2.130	-2.167	-2.360	-2.314	-2.765	-2.088	-2.409	-2.314	-2.765	ns
		t _H	1.421	1.586	2.364	2.410	2.627	2.565	3.018	2.344	2.687	2.565	3.018	ns
	GCLK PLL	t _{SU}	0.968	0.896	1.617	1.714	1.860	1.741	1.759	1.830	1.861	1.741	1.759	ns
		t _H	-0.688	-0.599	-1.139	-1.216	-1.307	-1.221	-1.223	-1.318	-1.296	-1.221	-1.223	ns
1.5 V	GCLK	t _{SU}	-1.273	-1.424	-2.106	-2.135	-2.292	-2.246	-2.697	-2.057	-2.344	-2.246	-2.697	ns
		t _H	1.411	1.575	2.340	2.378	2.559	2.497	2.950	2.313	2.622	2.497	2.950	ns
	GCLK PLL	t _{SU}	0.978	0.907	1.641	1.746	1.928	1.809	1.827	1.861	1.926	1.809	1.827	ns
		t _H	-0.698	-0.610	-1.163	-1.248	-1.375	-1.289	-1.291	-1.349	-1.361	-1.289	-1.291	ns
1.2 V	GCLK	t _{SU}	-1.213	-1.371	-2.027	-2.034	-2.133	-2.087	-2.538	-1.961	-2.189	-2.087	-2.538	ns
		t _H	1.351	1.522	2.261	2.277	2.400	2.338	2.791	2.217	2.467	2.338	2.791	ns
	GCLK PLL	t _{SU}	1.038	0.960	1.720	1.847	2.087	1.968	1.986	1.957	2.081	1.968	1.986	ns
		t _H	-0.758	-0.663	-1.242	-1.349	-1.534	-1.448	-1.450	-1.445	-1.516	-1.448	-1.450	ns
SSTL-2 CLASS I	GCLK	t _{SU}	-1.155	-1.320	-1.979	-1.893	-2.081	-1.975	-2.441	-1.899	-2.180	-1.975	-2.441	ns
		t _H	1.292	1.471	2.213	2.138	2.351	2.229	2.700	2.156	2.457	2.229	2.700	ns
	GCLK PLL	t _{SU}	1.047	1.038	1.829	1.959	2.064	1.969	2.086	1.968	2.085	1.969	2.086	ns
		t _H	-0.767	-0.739	-1.348	-1.458	-1.511	-1.449	-1.545	-1.456	-1.520	-1.449	-1.545	ns
SSTL-2 CLASS II	GCLK	t _{SU}	-1.155	-1.320	-1.979	-1.893	-2.081	-1.975	-2.441	-1.899	-2.180	-1.975	-2.441	ns
		t _H	1.292	1.471	2.213	2.138	2.351	2.229	2.700	2.156	2.457	2.229	2.700	ns
	GCLK PLL	t _{SU}	1.047	1.038	1.829	1.959	2.064	1.969	2.086	1.968	2.085	1.969	2.086	ns
		t _H	-0.767	-0.739	-1.348	-1.458	-1.511	-1.449	-1.545	-1.456	-1.520	-1.449	-1.545	ns
SSTL-18 CLASS I	GCLK	t _{SU}	-1.187	-1.336	-1.989	-2.007	-2.128	-2.081	-2.534	-1.932	-2.182	-2.081	-2.534	ns
		t _H	1.325	1.487	2.223	2.248	2.393	2.331	2.783	2.185	2.457	2.331	2.783	ns
	GCLK PLL	t _{SU}	1.064	0.995	1.758	1.874	2.092	1.974	1.990	1.986	2.088	1.974	1.990	ns
		t _H	-0.784	-0.698	-1.280	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns
SSTL-18 CLASS II	GCLK	t _{SU}	-1.187	-1.336	-1.989	-2.007	-2.128	-2.081	-2.534	-1.932	-2.182	-2.081	-2.534	ns
		t _H	1.325	1.487	2.223	2.248	2.393	2.331	2.783	2.185	2.457	2.331	2.783	ns
	GCLK PLL	t _{SU}	1.064	0.995	1.758	1.874	2.092	1.974	1.990	1.986	2.088	1.974	1.990	ns
		t _H	-0.784	-0.698	-1.280	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns

Table 1-134. EP3SE260 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
SSTL-15 CLASS I	GCLK	t _{su}	-1.173	-1.324	-1.974	-1.997	-2.110	-2.063	-2.516	-1.921	-2.165	-2.063	-2.516	ns
		t _h	1.311	1.475	2.209	2.238	2.375	2.313	2.765	2.174	2.440	2.313	2.765	ns
	GCLK PLL	t _{su}	1.078	1.007	1.773	1.884	2.110	1.992	2.008	1.997	2.105	1.992	2.008	ns
		t _h	-0.798	-0.710	-1.294	-1.388	-1.559	-1.473	-1.476	-1.488	-1.543	-1.473	-1.476	ns
1.8-V HSTL CLASS I	GCLK	t _{su}	-1.187	-1.336	-1.989	-2.007	-2.128	-2.081	-2.534	-1.932	-2.182	-2.081	-2.534	ns
		t _h	1.325	1.487	2.223	2.248	2.393	2.331	2.783	2.185	2.457	2.331	2.783	ns
	GCLK PLL	t _{su}	1.064	0.995	1.758	1.874	2.092	1.974	1.990	1.986	2.088	1.974	1.990	ns
		t _h	-0.784	-0.698	-1.280	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns
1.8-V HSTL CLASS II	GCLK	t _{su}	-1.187	-1.336	-1.989	-2.007	-2.128	-2.081	-2.534	-1.932	-2.182	-2.081	-2.534	ns
		t _h	1.325	1.487	2.223	2.248	2.393	2.331	2.783	2.185	2.457	2.331	2.783	ns
	GCLK PLL	t _{su}	1.064	0.995	1.758	1.874	2.092	1.974	1.990	1.986	2.088	1.974	1.990	ns
		t _h	-0.784	-0.698	-1.280	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns
1.5-V HSTL CLASS I	GCLK	t _{su}	-1.173	-1.324	-1.974	-1.997	-2.110	-2.063	-2.516	-1.921	-2.165	-2.063	-2.516	ns
		t _h	1.311	1.475	2.209	2.238	2.375	2.313	2.765	2.174	2.440	2.313	2.765	ns
	GCLK PLL	t _{su}	1.078	1.007	1.773	1.884	2.110	1.992	2.008	1.997	2.105	1.992	2.008	ns
		t _h	-0.798	-0.710	-1.294	-1.388	-1.559	-1.473	-1.476	-1.488	-1.543	-1.473	-1.476	ns
1.5-V HSTL CLASS II	GCLK	t _{su}	-1.173	-1.324	-1.974	-1.997	-2.110	-2.063	-2.516	-1.921	-2.165	-2.063	-2.516	ns
		t _h	1.311	1.475	2.209	2.238	2.375	2.313	2.765	2.174	2.440	2.313	2.765	ns
	GCLK PLL	t _{su}	1.078	1.007	1.773	1.884	2.110	1.992	2.008	1.997	2.105	1.992	2.008	ns
		t _h	-0.798	-0.710	-1.294	-1.388	-1.559	-1.473	-1.476	-1.488	-1.543	-1.473	-1.476	ns
1.2-V HSTL CLASS I	GCLK	t _{su}	-1.164	-1.312	-1.965	-1.987	-2.094	-2.047	-2.500	-1.912	-2.149	-2.047	-2.500	ns
		t _h	1.302	1.463	2.200	2.228	2.359	2.297	2.749	2.165	2.424	2.297	2.749	ns
	GCLK PLL	t _{su}	1.087	1.019	1.782	1.894	2.126	2.008	2.024	2.006	2.121	2.008	2.024	ns
		t _h	-0.807	-0.722	-1.303	-1.398	-1.575	-1.489	-1.492	-1.497	-1.559	-1.489	-1.492	ns
1.2-V HSTL CLASS II	GCLK	t _{su}	-1.164	-1.312	-1.965	-1.987	-2.094	-2.047	-2.500	-1.912	-2.149	-2.047	-2.500	ns
		t _h	1.302	1.463	2.200	2.228	2.359	2.297	2.749	2.165	2.424	2.297	2.749	ns
	GCLK PLL	t _{su}	1.087	1.019	1.782	1.894	2.126	2.008	2.024	2.006	2.121	2.008	2.024	ns
		t _h	-0.807	-0.722	-1.303	-1.398	-1.575	-1.489	-1.492	-1.497	-1.559	-1.489	-1.492	ns
3.0-V PCI	GCLK	t _{su}	-1.225	-1.385	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
		t _h	1.361	1.535	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
	GCLK PLL	t _{su}	0.977	0.972	1.752	1.863	1.859	1.764	1.881	1.865	1.878	1.764	1.881	ns
		t _h	-0.698	-0.674	-1.271	-1.362	-1.306	-1.244	-1.340	-1.353	-1.313	-1.244	-1.340	ns
3.0-V PCI-X	GCLK	t _{su}	-1.225	-1.385	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
		t _h	1.361	1.535	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
	GCLK PLL	t _{su}	0.977	0.972	1.752	1.863	1.859	1.764	1.881	1.865	1.878	1.764	1.881	ns
		t _h	-0.698	-0.674	-1.271	-1.362	-1.306	-1.244	-1.340	-1.353	-1.313	-1.244	-1.340	ns

Table 1-135 specifies EP3SE260 Column Pins Output Timing parameters for single-ended I/O standards.

Table 1-135. EP3SE260 Column Pins output Timing Parameters (Part 1 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.472	3.750	5.438	5.642	6.327	6.171	6.415	5.777	6.468	6.317	6.508	ns
		GCLK PLL	t _{co}	1.719	1.820	2.330	2.414	2.798	2.798	2.620	2.685	2.916	2.918	2.742	ns
	8mA	GCLK	t _{co}	3.393	3.661	5.335	5.530	6.159	6.003	6.298	5.661	6.295	6.144	6.388	ns
		GCLK PLL	t _{co}	1.614	1.731	2.226	2.302	2.630	2.630	2.503	2.516	2.743	2.745	2.569	ns
	12mA	GCLK	t _{co}	3.364	3.629	5.268	5.460	6.059	5.903	6.228	5.591	6.190	6.039	6.321	ns
		GCLK PLL	t _{co}	1.554	1.699	2.159	2.232	2.530	2.530	2.433	2.418	2.638	2.640	2.464	ns
	16mA	GCLK	t _{co}	3.350	3.615	5.247	5.437	6.016	5.860	6.200	5.565	6.149	5.998	6.287	ns
		GCLK PLL	t _{co}	1.533	1.685	2.138	2.209	2.487	2.487	2.405	2.372	2.597	2.599	2.423	ns
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.410	3.683	5.365	5.559	6.205	6.049	6.327	5.691	6.343	6.192	6.420	ns
		GCLK PLL	t _{co}	1.661	1.753	2.257	2.331	2.676	2.676	2.532	2.564	2.791	2.793	2.617	ns
	8mA	GCLK	t _{co}	3.339	3.606	5.243	5.433	6.007	5.851	6.196	5.561	6.142	5.991	6.283	ns
		GCLK PLL	t _{co}	1.529	1.676	2.135	2.205	2.478	2.478	2.401	2.363	2.590	2.592	2.416	ns
	12mA	GCLK	t _{co}	3.314	3.578	5.214	5.406	5.948	5.792	6.171	5.534	6.079	5.928	6.258	ns
		GCLK PLL	t _{co}	1.487	1.648	2.106	2.178	2.419	2.419	2.376	2.309	2.527	2.529	2.357	ns
	16mA	GCLK	t _{co}	3.307	3.571	5.206	5.397	5.927	5.771	6.162	5.525	6.055	5.904	6.248	ns
		GCLK PLL	t _{co}	1.474	1.641	2.098	2.169	2.398	2.398	2.367	2.286	2.503	2.505	2.348	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.470	3.759	5.472	5.678	6.387	6.231	6.454	5.816	6.517	6.366	6.550	ns
		GCLK PLL	t _{co}	1.724	1.829	2.364	2.450	2.858	2.858	2.659	2.728	2.965	2.967	2.791	ns
	8mA	GCLK	t _{co}	3.403	3.674	5.368	5.567	6.234	6.078	6.338	5.701	6.344	6.193	6.431	ns
		GCLK PLL	t _{co}	1.620	1.744	2.260	2.338	2.705	2.705	2.543	2.561	2.792	2.794	2.618	ns
	12mA	GCLK	t _{co}	3.365	3.637	5.300	5.495	6.132	5.976	6.264	5.627	6.231	6.080	6.355	ns
		GCLK PLL	t _{co}	1.568	1.707	2.192	2.267	2.603	2.603	2.469	2.455	2.679	2.681	2.505	ns
	16mA	GCLK	t _{co}	3.343	3.610	5.265	5.456	6.082	5.926	6.222	5.587	6.161	6.010	6.312	ns
		GCLK PLL	t _{co}	1.532	1.680	2.157	2.228	2.553	2.553	2.427	2.385	2.609	2.611	2.435	ns

Table 1-135. EP3SE260 Column Pins output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.0-V LVC MOS	4mA	GCLK	t _{co}	3.424	3.699	5.402	5.600	6.288	6.132	6.373	5.735	6.397	6.246	6.468	ns
		GCLK PLL	t _{co}	1.672	1.769	2.294	2.372	2.759	2.759	2.578	2.612	2.845	2.847	2.671	ns
	8mA	GCLK	t _{co}	3.352	3.620	5.279	5.471	6.106	5.950	6.238	5.602	6.186	6.035	6.328	ns
		GCLK PLL	t _{co}	1.546	1.690	2.170	2.243	2.577	2.577	2.443	2.410	2.634	2.636	2.460	ns
	12mA	GCLK	t _{co}	3.328	3.591	5.239	5.432	6.035	5.879	6.197	5.562	6.121	5.970	6.287	ns
		GCLK PLL	t _{co}	1.496	1.661	2.131	2.203	2.506	2.506	2.402	2.349	2.569	2.571	2.395	ns
	16mA	GCLK	t _{co}	3.328	3.591	5.231	5.422	6.036	5.880	6.187	5.551	6.090	5.939	6.275	ns
		GCLK PLL	t _{co}	1.491	1.661	2.123	2.194	2.507	2.507	2.392	2.318	2.538	2.540	2.374	ns
2.5 V	4mA	GCLK	t _{co}	3.528	3.814	5.609	5.827	6.570	6.414	6.620	5.968	6.722	6.571	6.723	ns
		GCLK PLL	t _{co}	1.791	1.884	2.501	2.599	3.041	3.041	2.825	2.903	3.170	3.172	2.996	ns
	8mA	GCLK	t _{co}	3.445	3.721	5.490	5.701	6.373	6.217	6.488	5.840	6.512	6.361	6.587	ns
		GCLK PLL	t _{co}	1.684	1.791	2.382	2.473	2.844	2.844	2.693	2.711	2.960	2.962	2.786	ns
	12mA	GCLK	t _{co}	3.390	3.677	5.398	5.605	6.233	6.077	6.388	5.742	6.362	6.211	6.485	ns
		GCLK PLL	t _{co}	1.600	1.747	2.290	2.377	2.704	2.704	2.593	2.571	2.810	2.812	2.636	ns
	16mA	GCLK	t _{co}	3.356	3.631	5.364	5.568	6.183	6.027	6.347	5.703	6.298	6.147	6.441	ns
		GCLK PLL	t _{co}	1.572	1.701	2.256	2.340	2.654	2.654	2.552	2.505	2.746	2.748	2.572	ns

Table 1-135. EP3SE260 Column Pins output Timing Parameters (Part 3 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8 V	2mA	GCLK	t _{co}	3.642	3.942	5.804	6.036	6.897	6.741	6.838	6.186	7.057	6.906	6.949	ns
		GCLK PLL	t _{co}	1.968	2.012	2.695	2.808	3.368	3.368	3.043	3.235	3.505	3.507	3.331	ns
	4mA	GCLK	t _{co}	3.544	3.831	5.652	5.878	6.647	6.491	6.677	6.027	6.800	6.649	6.783	ns
		GCLK PLL	t _{co}	1.823	1.901	2.543	2.650	3.118	3.118	2.882	2.982	3.248	3.250	3.074	ns
	6mA	GCLK	t _{co}	3.462	3.744	5.525	5.740	6.443	6.287	6.533	5.883	6.581	6.430	6.635	ns
		GCLK PLL	t _{co}	1.721	1.814	2.416	2.512	2.914	2.914	2.738	2.775	3.029	3.031	2.855	ns
	8mA	GCLK	t _{co}	3.437	3.711	5.464	5.674	6.333	6.177	6.458	5.812	6.466	6.315	6.555	ns
		GCLK PLL	t _{co}	1.638	1.781	2.356	2.446	2.804	2.804	2.663	2.671	2.914	2.916	2.740	ns
	10mA	GCLK	t _{co}	3.366	3.647	5.376	5.580	6.203	6.047	6.359	5.715	6.322	6.171	6.454	ns
		GCLK PLL	t _{co}	1.584	1.717	2.268	2.352	2.674	2.674	2.564	2.532	2.770	2.772	2.596	ns
	12mA	GCLK	t _{co}	3.361	3.637	5.370	5.574	6.198	6.042	6.352	5.708	6.310	6.159	6.447	ns
		GCLK PLL	t _{co}	1.578	1.707	2.262	2.346	2.669	2.669	2.557	2.519	2.758	2.760	2.584	ns
1.5 V	2mA	GCLK	t _{co}	3.583	3.909	5.742	5.963	6.785	6.629	6.766	6.116	6.944	6.793	6.882	ns
		GCLK PLL	t _{co}	1.886	1.979	2.634	2.735	3.256	3.256	2.971	3.124	3.392	3.394	3.218	ns
	4mA	GCLK	t _{co}	3.451	3.728	5.499	5.709	6.382	6.226	6.495	5.848	6.519	6.368	6.595	ns
		GCLK PLL	t _{co}	1.687	1.798	2.390	2.481	2.853	2.853	2.700	2.720	2.967	2.969	2.793	ns
	6mA	GCLK	t _{co}	3.407	3.691	5.418	5.629	6.275	6.119	6.415	5.768	6.392	6.241	6.512	ns
		GCLK PLL	t _{co}	1.612	1.761	2.310	2.401	2.746	2.746	2.620	2.597	2.840	2.842	2.666	ns
	8mA	GCLK	t _{co}	3.395	3.685	5.412	5.622	6.260	6.104	6.406	5.761	6.379	6.228	6.505	ns
		GCLK PLL	t _{co}	1.606	1.755	2.304	2.393	2.731	2.731	2.611	2.587	2.827	2.829	2.653	ns
	10mA	GCLK	t _{co}	3.360	3.634	5.364	5.568	6.190	6.034	6.345	5.702	6.295	6.144	6.440	ns
		GCLK PLL	t _{co}	1.565	1.704	2.256	2.340	2.661	2.661	2.550	2.503	2.743	2.745	2.569	ns
	12mA	GCLK	t _{co}	3.356	3.627	5.344	5.547	6.166	6.010	6.325	5.681	6.252	6.101	6.418	ns
		GCLK PLL	t _{co}	1.528	1.697	2.235	2.319	2.637	2.637	2.530	2.465	2.700	2.702	2.526	ns

Table 1-135. EP3SE260 Column Pins output Timing Parameters (Part 4 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2 V	2mA	GCLK	t _{co}	3.562	3.852	5.696	5.917	6.709	6.553	6.709	6.063	6.856	6.705	6.816	ns
		GCLK PLL	t _{co}	1.850	1.922	2.588	2.689	3.180	3.180	2.914	3.035	3.304	3.306	3.130	ns
	4mA	GCLK	t _{co}	3.440	3.717	5.477	5.686	6.352	6.196	6.469	5.824	6.475	6.324	6.567	ns
		GCLK PLL	t _{co}	1.640	1.787	2.369	2.458	2.823	2.823	2.674	2.681	2.923	2.925	2.749	ns
	6mA	GCLK	t _{co}	3.387	3.676	5.401	5.609	6.251	6.095	6.395	5.749	6.359	6.208	6.495	ns
		GCLK PLL	t _{co}	1.598	1.746	2.293	2.381	2.722	2.722	2.600	2.570	2.807	2.809	2.633	ns
	8mA	GCLK	t _{co}	3.366	3.642	5.362	5.566	6.201	6.045	6.345	5.700	6.278	6.127	6.438	ns
		GCLK PLL	t _{co}	1.549	1.712	2.254	2.338	2.672	2.672	2.550	2.486	2.726	2.728	2.552	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.380	3.650	5.370	5.574	6.214	6.058	6.353	5.706	6.293	6.142	6.443	ns
		GCLK PLL	t _{co}	1.585	1.720	2.262	2.346	2.685	2.685	2.558	2.508	2.741	2.743	2.567	ns
	10mA	GCLK	t _{co}	3.383	3.653	5.374	5.578	6.222	6.066	6.357	5.709	6.299	6.148	6.447	ns
		GCLK PLL	t _{co}	1.589	1.723	2.266	2.350	2.693	2.693	2.562	2.514	2.747	2.749	2.573	ns
	12mA	GCLK	t _{co}	3.364	3.633	5.353	5.556	6.180	6.024	6.335	5.688	6.265	6.114	6.425	ns
		GCLK PLL	t _{co}	1.557	1.703	2.244	2.328	2.651	2.651	2.540	2.479	2.713	2.715	2.539	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.359	3.626	5.338	5.540	6.161	6.005	6.318	5.671	6.234	6.083	6.407	ns
		GCLK PLL	t _{co}	1.541	1.696	2.229	2.312	2.632	2.632	2.523	2.450	2.682	2.684	2.508	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.398	3.670	5.393	5.597	6.244	6.088	6.376	5.729	6.320	6.169	6.467	ns
		GCLK PLL	t _{co}	1.607	1.740	2.285	2.369	2.715	2.715	2.581	2.535	2.768	2.770	2.594	ns
	6mA	GCLK	t _{co}	3.379	3.649	5.371	5.575	6.209	6.053	6.354	5.707	6.289	6.138	6.444	ns
		GCLK PLL	t _{co}	1.580	1.719	2.263	2.347	2.680	2.680	2.559	2.504	2.737	2.739	2.563	ns
	8mA	GCLK	t _{co}	3.380	3.652	5.379	5.584	6.226	6.070	6.364	5.717	6.300	6.149	6.455	ns
		GCLK PLL	t _{co}	1.577	1.722	2.271	2.356	2.697	2.697	2.569	2.513	2.748	2.750	2.574	ns
	10mA	GCLK	t _{co}	3.363	3.632	5.355	5.559	6.186	6.030	6.339	5.691	6.262	6.111	6.429	ns
		GCLK PLL	t _{co}	1.547	1.702	2.246	2.331	2.657	2.657	2.544	2.477	2.710	2.712	2.536	ns
	12mA	GCLK	t _{co}	3.359	3.628	5.351	5.555	6.178	6.022	6.334	5.687	6.256	6.105	6.425	ns
		GCLK PLL	t _{co}	1.540	1.698	2.242	2.327	2.649	2.649	2.539	2.470	2.704	2.706	2.530	ns

Table 1-135. EP3SE260 Column Pins output Timing Parameters (Part 5 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.360	3.627	5.338	5.541	6.160	6.004	6.318	5.672	6.230	6.079	6.408	ns
		GCLK PLL	t _{co}	1.539	1.697	2.230	2.312	2.631	2.631	2.523	2.447	2.678	2.680	2.507	ns
	16mA	GCLK	t _{co}	3.359	3.627	5.346	5.551	6.156	6.000	6.330	5.682	6.231	6.080	6.421	ns
		GCLK PLL	t _{co}	1.526	1.697	2.238	2.322	2.627	2.627	2.535	2.445	2.679	2.681	2.520	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.389	3.661	5.386	5.590	6.225	6.069	6.368	5.722	6.304	6.153	6.459	ns
		GCLK PLL	t _{co}	1.593	1.731	2.278	2.362	2.696	2.696	2.573	2.520	2.752	2.754	2.578	ns
	6mA	GCLK	t _{co}	3.374	3.645	5.372	5.577	6.209	6.053	6.356	5.709	6.284	6.133	6.448	ns
		GCLK PLL	t _{co}	1.564	1.715	2.264	2.349	2.680	2.680	2.561	2.499	2.732	2.734	2.558	ns
	8mA	GCLK	t _{co}	3.361	3.630	5.352	5.556	6.181	6.025	6.336	5.689	6.254	6.103	6.427	ns
		GCLK PLL	t _{co}	1.540	1.700	2.244	2.328	2.652	2.652	2.541	2.469	2.702	2.704	2.528	ns
	10mA	GCLK	t _{co}	3.362	3.631	5.353	5.558	6.186	6.030	6.339	5.691	6.249	6.098	6.430	ns
		GCLK PLL	t _{co}	1.533	1.701	2.245	2.330	2.657	2.657	2.544	2.463	2.697	2.699	2.529	ns
	12mA	GCLK	t _{co}	3.357	3.626	5.346	5.551	6.175	6.019	6.331	5.683	6.238	6.087	6.422	ns
		GCLK PLL	t _{co}	1.526	1.696	2.238	2.323	2.646	2.646	2.536	2.452	2.686	2.688	2.521	ns
SSTL-15 CLASS II	8mA	GCLK	t _{co}	3.375	3.643	5.354	5.556	6.183	6.027	6.333	5.687	6.256	6.105	6.423	ns
		GCLK PLL	t _{co}	1.570	1.713	2.246	2.328	2.654	2.654	2.538	2.473	2.704	2.706	2.530	ns
	16mA	GCLK	t _{co}	3.374	3.643	5.358	5.561	6.198	6.042	6.339	5.692	6.262	6.111	6.429	ns
		GCLK PLL	t _{co}	1.563	1.713	2.250	2.333	2.669	2.669	2.544	2.478	2.710	2.712	2.536	ns

Table 1–135. EP3SE260 Column Pins output Timing Parameters (Part 6 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.361	3.629	5.342	5.545	6.171	6.015	6.323	5.676	6.237	6.086	6.413	ns
		GCLK PLL	t _{co}	1.541	1.699	2.234	2.317	2.642	2.642	2.528	2.453	2.685	2.687	2.512	ns
	6mA	GCLK	t _{co}	3.357	3.624	5.336	5.539	6.156	6.000	6.317	5.670	6.226	6.075	6.407	ns
		GCLK PLL	t _{co}	1.532	1.694	2.228	2.311	2.627	2.627	2.522	2.442	2.674	2.676	2.506	ns
	8mA	GCLK	t _{co}	3.359	3.627	5.341	5.544	6.173	6.017	6.323	5.676	6.230	6.079	6.413	ns
		GCLK PLL	t _{co}	1.530	1.697	2.233	2.316	2.644	2.644	2.528	2.445	2.678	2.680	2.513	ns
	10mA	GCLK	t _{co}	3.358	3.625	5.334	5.537	6.146	5.990	6.315	5.668	6.210	6.057	6.404	ns
		GCLK PLL	t _{co}	1.523	1.695	2.226	2.309	2.617	2.617	2.520	2.425	2.656	2.658	2.504	ns
	12mA	GCLK	t _{co}	3.376	3.644	5.356	5.558	6.183	6.027	6.336	5.690	6.255	6.104	6.425	ns
		GCLK PLL	t _{co}	1.567	1.714	2.248	2.330	2.654	2.654	2.541	2.473	2.703	2.705	2.529	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.371	3.640	5.354	5.557	6.186	6.030	6.335	5.689	6.251	6.100	6.425	ns
		GCLK PLL	t _{co}	1.556	1.710	2.246	2.329	2.657	2.657	2.540	2.468	2.699	2.701	2.525	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.371	3.639	5.355	5.558	6.187	6.031	6.336	5.690	6.252	6.101	6.426	ns
		GCLK PLL	t _{co}	1.554	1.709	2.247	2.330	2.658	2.658	2.541	2.469	2.700	2.702	2.526	ns
	6mA	GCLK	t _{co}	3.361	3.629	5.343	5.546	6.168	6.012	6.324	5.677	6.233	6.082	6.414	ns
		GCLK PLL	t _{co}	1.537	1.699	2.234	2.318	2.639	2.639	2.529	2.449	2.681	2.683	2.513	ns
	8mA	GCLK	t _{co}	3.363	3.631	5.348	5.553	6.178	6.022	6.332	5.684	6.236	6.085	6.422	ns
		GCLK PLL	t _{co}	1.534	1.701	2.240	2.324	2.649	2.649	2.537	2.451	2.684	2.686	2.522	ns
	10mA	GCLK	t _{co}	3.385	3.656	5.376	5.580	6.208	6.052	6.358	5.712	6.274	6.123	6.449	ns
		GCLK PLL	t _{co}	1.570	1.726	2.268	2.351	2.679	2.679	2.563	2.492	2.722	2.724	2.549	ns
	12mA	GCLK	t _{co}	3.374	3.644	5.364	5.568	6.194	6.038	6.347	5.700	6.258	6.107	6.438	ns
		GCLK PLL	t _{co}	1.553	1.714	2.256	2.340	2.665	2.665	2.552	2.474	2.706	2.708	2.537	ns
1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.373	3.642	5.362	5.566	6.193	6.037	6.345	5.699	6.251	6.100	6.437	ns
		GCLK PLL	t _{co}	1.544	1.712	2.254	2.338	2.664	2.664	2.550	2.466	2.699	2.701	2.536	ns

Table 1–135. EP3SE260 Column Pins output Timing Parameters (Part 7 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.370	3.640	5.361	5.566	6.191	6.035	6.345	5.698	6.247	6.096	6.437	ns
		GCLK PLL	t _{co}	1.538	1.710	2.253	2.338	2.662	2.662	2.550	2.461	2.695	2.697	2.536	ns
	6mA	GCLK	t _{co}	3.366	3.636	5.355	5.559	6.181	6.025	6.338	5.691	6.239	6.088	6.429	ns
		GCLK PLL	t _{co}	1.533	1.706	2.246	2.331	2.652	2.652	2.543	2.453	2.687	2.689	2.529	ns
	8mA	GCLK	t _{co}	3.443	3.711	5.372	5.567	6.150	5.994	6.335	5.699	6.232	6.079	6.427	ns
		GCLK PLL	t _{co}	1.611	1.781	2.264	2.339	2.621	2.621	2.540	2.456	2.678	2.680	2.526	ns
	10mA	GCLK	t _{co}	3.443	3.711	5.372	5.567	6.150	5.994	6.335	5.699	6.232	6.079	6.427	ns
		GCLK PLL	t _{co}	1.611	1.781	2.264	2.339	2.621	2.621	2.540	2.456	2.678	2.680	2.526	ns
	12mA	GCLK	t _{co}	3.472	3.750	5.438	5.642	6.327	6.171	6.415	5.777	6.468	6.317	6.508	ns
		GCLK PLL	t _{co}	1.719	1.820	2.330	2.414	2.798	2.798	2.620	2.685	2.916	2.918	2.742	ns
1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.393	3.661	5.335	5.530	6.159	6.003	6.298	5.661	6.295	6.144	6.388	ns
		GCLK PLL	t _{co}	1.614	1.731	2.226	2.302	2.630	2.630	2.503	2.516	2.743	2.745	2.569	ns
3.0-V PCI	—	GCLK	t _{co}	3.364	3.629	5.268	5.460	6.059	5.903	6.228	5.591	6.190	6.039	6.321	ns
		GCLK PLL	t _{co}	1.554	1.699	2.159	2.232	2.530	2.530	2.433	2.418	2.638	2.640	2.464	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.350	3.615	5.247	5.437	6.016	5.860	6.200	5.565	6.149	5.998	6.287	ns
		GCLK PLL	t _{co}	1.533	1.685	2.138	2.209	2.487	2.487	2.405	2.372	2.597	2.599	2.423	ns

Table 1–136 specifies EP3SE260 Row Pins Output Timing parameters for single-ended I/O standards.

Table 1–136. EP3SE260 Row Pins output Timing Parameters (Part 1 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVTTTL	4mA	GCLK	t _{co}	3.648	3.902	5.663	5.865	6.484	6.256	6.709	6.063	6.530	6.256	6.709	ns
		GCLK PLL	t _{co}	1.582	1.785	2.228	2.322	2.505	2.489	2.454	2.441	2.632	2.489	2.454	ns
	8mA	GCLK	t _{co}	3.555	3.797	5.533	5.727	6.340	6.112	6.565	5.922	6.414	6.112	6.565	ns
		GCLK PLL	t _{co}	1.489	1.680	2.098	2.184	2.361	2.346	2.310	2.300	2.483	2.346	2.310	ns
	12mA	GCLK	t _{co}	3.456	3.707	5.414	5.604	6.212	5.995	6.446	5.795	6.315	5.995	6.446	ns
		GCLK PLL	t _{co}	1.390	1.574	1.979	2.061	2.233	2.250	2.182	2.173	2.354	2.250	2.182	ns

Table 1–136. EP3SE260 Row Pins output Timing Parameters (Part 2 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
3.3-V LVCMOS	4mA	GCLK	t _{co}	3.658	3.906	5.671	5.870	6.489	6.261	6.714	6.069	6.542	6.261	6.714	ns
		GCLK PLL	t _{co}	1.592	1.789	2.236	2.327	2.510	2.494	2.459	2.447	2.637	2.494	2.459	ns
	8mA	GCLK	t _{co}	3.460	3.711	5.420	5.616	6.218	6.005	6.456	5.801	6.324	6.005	6.456	ns
		GCLK PLL	t _{co}	1.394	1.580	1.985	2.067	2.239	2.260	2.188	2.179	2.363	2.260	2.188	ns
3.0-V LVTTTL	4mA	GCLK	t _{co}	3.602	3.848	5.615	5.818	6.441	6.213	6.666	6.020	6.496	6.213	6.666	ns
		GCLK PLL	t _{co}	1.536	1.731	2.180	2.275	2.462	2.446	2.411	2.398	2.590	2.446	2.411	ns
	8mA	GCLK	t _{co}	3.477	3.721	5.463	5.659	6.277	6.049	6.502	5.858	6.351	6.049	6.502	ns
		GCLK PLL	t _{co}	1.411	1.604	2.028	2.116	2.298	2.282	2.247	2.236	2.426	2.282	2.247	ns
	12mA	GCLK	t _{co}	3.438	3.678	5.381	5.576	6.189	5.961	6.414	5.772	6.277	5.961	6.414	ns
		GCLK PLL	t _{co}	1.372	1.553	1.946	2.033	2.210	2.211	2.159	2.150	2.333	2.211	2.159	ns
3.0-V LVCMOS	4mA	GCLK	t _{co}	3.516	3.767	5.510	5.711	6.330	6.102	6.555	5.912	6.387	6.102	6.555	ns
		GCLK PLL	t _{co}	1.450	1.650	2.075	2.168	2.351	2.335	2.300	2.290	2.479	2.335	2.300	ns
	8mA	GCLK	t _{co}	3.416	3.662	5.351	5.545	6.150	5.928	6.379	5.732	6.249	5.928	6.379	ns
		GCLK PLL	t _{co}	1.350	1.531	1.911	1.994	2.171	2.183	2.120	2.110	2.293	2.183	2.120	ns
2.5 V	4mA	GCLK	t _{co}	3.628	3.884	5.748	5.972	6.613	6.385	6.838	6.180	6.648	6.385	6.838	ns
		GCLK PLL	t _{co}	1.562	1.767	2.313	2.429	2.634	2.618	2.583	2.558	2.769	2.618	2.583	ns
	8mA	GCLK	t _{co}	3.518	3.785	5.593	5.809	6.443	6.215	6.668	6.013	6.504	6.215	6.668	ns
		GCLK PLL	t _{co}	1.452	1.668	2.158	2.266	2.464	2.448	2.413	2.391	2.595	2.448	2.413	ns
	12mA	GCLK	t _{co}	3.472	3.718	5.482	5.690	6.317	6.089	6.542	5.890	6.409	6.089	6.542	ns
		GCLK PLL	t _{co}	1.406	1.592	2.047	2.147	2.338	2.338	2.287	2.268	2.465	2.338	2.287	ns
1.8 V	2mA	GCLK	t _{co}	3.886	4.170	6.174	6.450	7.088	6.750	7.260	6.640	7.070	6.750	7.260	ns
		GCLK PLL	t _{co}	1.787	2.014	2.698	2.822	3.109	3.100	3.058	2.988	3.253	3.100	3.058	ns
	4mA	GCLK	t _{co}	3.661	3.968	5.848	6.082	6.683	6.390	6.855	6.275	6.709	6.390	6.855	ns
		GCLK PLL	t _{co}	1.562	1.812	2.372	2.454	2.704	2.695	2.653	2.623	2.847	2.695	2.653	ns
	6mA	GCLK	t _{co}	3.596	3.866	5.694	5.932	6.524	6.289	6.709	6.107	6.603	6.289	6.709	ns
		GCLK PLL	t _{co}	1.497	1.710	2.218	2.304	2.545	2.536	2.494	2.455	2.674	2.536	2.494	ns
	8mA	GCLK	t _{co}	3.536	3.792	5.617	5.839	6.428	6.224	6.644	6.012	6.531	6.224	6.644	ns
		GCLK PLL	t _{co}	1.437	1.649	2.141	2.227	2.449	2.440	2.398	2.360	2.580	2.440	2.398	ns

Table 1-136. EP3SE260 Row Pins output Timing Parameters (Part 3 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.5 V	2mA	GCLK	t _{co}	3.797	4.088	6.084	6.364	7.016	6.687	7.188	6.547	7.005	6.687	7.188	ns
		GCLK PLL	t _{co}	1.698	1.932	2.608	2.736	3.037	3.028	2.986	2.895	3.177	3.028	2.986	ns
	4mA	GCLK	t _{co}	3.555	3.831	5.679	5.927	6.525	6.293	6.713	6.101	6.604	6.293	6.713	ns
		GCLK PLL	t _{co}	1.456	1.675	2.203	2.299	2.546	2.537	2.495	2.449	2.673	2.537	2.495	ns
	6mA	GCLK	t _{co}	3.528	3.783	5.606	5.831	6.419	6.224	6.644	6.003	6.531	6.224	6.644	ns
		GCLK PLL	t _{co}	1.429	1.640	2.130	2.219	2.440	2.431	2.389	2.351	2.568	2.431	2.389	ns
	8mA	GCLK	t _{co}	3.519	3.774	5.584	5.813	6.400	6.205	6.625	5.985	6.512	6.205	6.625	ns
		GCLK PLL	t _{co}	1.420	1.629	2.108	2.195	2.421	2.412	2.370	2.333	2.549	2.412	2.370	ns
1.2 V	2mA	GCLK	t _{co}	3.740	4.013	5.994	6.278	6.941	6.626	7.113	6.459	6.936	6.626	7.113	ns
		GCLK PLL	t _{co}	1.641	1.857	2.518	2.650	2.962	2.953	2.911	2.807	3.093	2.953	2.911	ns
	4mA	GCLK	t _{co}	3.560	3.824	5.701	5.955	6.566	6.341	6.761	6.126	6.648	6.341	6.761	ns
		GCLK PLL	t _{co}	1.461	1.670	2.225	2.327	2.587	2.578	2.536	2.474	2.715	2.578	2.536	ns
SSTL-2 CLASS I	8mA	GCLK	t _{co}	3.457	3.706	5.468	5.677	6.285	6.073	6.524	5.857	6.395	6.073	6.524	ns
		GCLK PLL	t _{co}	1.391	1.578	2.024	2.119	2.306	2.328	2.255	2.235	2.434	2.328	2.255	ns
	12mA	GCLK	t _{co}	3.445	3.702	5.465	5.675	6.277	6.071	6.522	5.849	6.394	6.071	6.522	ns
		GCLK PLL	t _{co}	1.379	1.566	2.016	2.111	2.301	2.326	2.247	2.227	2.433	2.326	2.247	ns
SSTL-2 CLASS II	16mA	GCLK	t _{co}	3.429	3.691	5.450	5.659	6.250	6.054	6.505	5.823	6.376	6.054	6.505	ns
		GCLK PLL	t _{co}	1.363	1.548	1.991	2.086	2.284	2.309	2.220	2.201	2.415	2.309	2.220	ns
SSTL-18 CLASS I	4mA	GCLK	t _{co}	3.497	3.748	5.512	5.726	6.301	6.119	6.539	5.893	6.422	6.119	6.539	ns
		GCLK PLL	t _{co}	1.398	1.593	2.041	2.131	2.324	2.313	2.271	2.241	2.459	2.313	2.271	ns
	6mA	GCLK	t _{co}	3.482	3.734	5.509	5.724	6.299	6.118	6.538	5.891	6.420	6.118	6.538	ns
		GCLK PLL	t _{co}	1.383	1.588	2.039	2.130	2.323	2.311	2.269	2.239	2.457	2.311	2.269	ns
	8mA	GCLK	t _{co}	3.471	3.722	5.492	5.707	6.282	6.108	6.528	5.874	6.411	6.108	6.528	ns
		GCLK PLL	t _{co}	1.372	1.577	2.029	2.120	2.313	2.294	2.252	2.222	2.448	2.294	2.252	ns
	10mA	GCLK	t _{co}	3.447	3.699	5.476	5.691	6.267	6.095	6.515	5.859	6.399	6.095	6.515	ns
		GCLK PLL	t _{co}	1.348	1.566	2.016	2.107	2.300	2.279	2.237	2.207	2.436	2.279	2.237	ns
	12mA	GCLK	t _{co}	3.447	3.698	5.475	5.690	6.266	6.095	6.515	5.858	6.399	6.095	6.515	ns
		GCLK PLL	t _{co}	1.348	1.565	2.016	2.107	2.300	2.278	2.236	2.206	2.436	2.278	2.236	ns

Table 1-136. EP3SE260 Row Pins output Timing Parameters (Part 4 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
SSTL-18 CLASS II	8mA	GCLK	t _{co}	3.457	3.707	5.473	5.686	6.260	6.090	6.510	5.853	6.393	6.090	6.510	ns
		GCLK PLL	t _{co}	1.358	1.572	2.015	2.104	2.295	2.272	2.230	2.201	2.430	2.272	2.230	ns
	16mA	GCLK	t _{co}	3.451	3.702	5.472	5.687	6.262	6.100	6.520	5.855	6.404	6.100	6.520	ns
		GCLK PLL	t _{co}	1.352	1.575	2.021	2.112	2.305	2.274	2.233	2.203	2.441	2.274	2.233	ns
SSTL-15 CLASS I	4mA	GCLK	t _{co}	3.493	3.744	5.523	5.740	6.318	6.132	6.552	5.906	6.434	6.132	6.552	ns
		GCLK PLL	t _{co}	1.394	1.596	2.050	2.142	2.339	2.330	2.288	2.254	2.471	2.330	2.288	ns
	6mA	GCLK	t _{co}	3.470	3.722	5.505	5.723	6.301	6.122	6.542	5.890	6.425	6.122	6.542	ns
		GCLK PLL	t _{co}	1.371	1.582	2.039	2.132	2.327	2.313	2.271	2.238	2.462	2.313	2.271	ns
	8mA	GCLK	t _{co}	3.453	3.705	5.488	5.705	6.283	6.109	6.529	5.872	6.412	6.109	6.529	ns
		GCLK PLL	t _{co}	1.354	1.570	2.026	2.119	2.314	2.295	2.253	2.220	2.449	2.295	2.253	ns
1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.472	3.720	5.479	5.691	6.263	6.088	6.508	5.857	6.390	6.088	6.508	ns
		GCLK PLL	t _{co}	1.373	1.578	2.014	2.102	2.293	2.275	2.233	2.205	2.427	2.275	2.233	ns
	6mA	GCLK	t _{co}	3.460	3.708	5.470	5.683	6.255	6.087	6.507	5.849	6.390	6.087	6.507	ns
		GCLK PLL	t _{co}	1.361	1.572	2.012	2.101	2.292	2.267	2.225	2.197	2.427	2.267	2.225	ns
	8mA	GCLK	t _{co}	3.447	3.696	5.462	5.674	6.247	6.080	6.500	5.841	6.383	6.080	6.500	ns
		GCLK PLL	t _{co}	1.348	1.564	2.005	2.094	2.285	2.259	2.217	2.189	2.420	2.259	2.217	ns
	10mA	GCLK	t _{co}	3.449	3.698	5.464	5.677	6.250	6.084	6.504	5.844	6.386	6.084	6.504	ns
		GCLK PLL	t _{co}	1.350	1.566	2.008	2.097	2.289	2.262	2.220	2.192	2.423	2.262	2.220	ns
	12mA	GCLK	t _{co}	3.442	3.693	5.462	5.676	6.250	6.087	6.507	5.844	6.391	6.087	6.507	ns
		GCLK PLL	t _{co}	1.343	1.563	2.010	2.100	2.292	2.262	2.220	2.192	2.428	2.262	2.220	ns
1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.448	3.697	5.457	5.668	6.241	6.083	6.503	5.835	6.385	6.083	6.503	ns
		GCLK PLL	t _{co}	1.349	1.571	2.008	2.097	2.288	2.253	2.216	2.183	2.422	2.253	2.216	ns
1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.479	3.727	5.490	5.704	6.278	6.099	6.519	5.869	6.401	6.099	6.519	ns
		GCLK PLL	t _{co}	1.380	1.584	2.023	2.112	2.304	2.290	2.248	2.217	2.438	2.290	2.248	ns
	6mA	GCLK	t _{co}	3.467	3.717	5.486	5.700	6.274	6.101	6.521	5.866	6.404	6.101	6.521	ns
		GCLK PLL	t _{co}	1.368	1.579	2.024	2.114	2.306	2.286	2.244	2.214	2.441	2.286	2.244	ns
	8mA	GCLK	t _{co}	3.463	3.712	5.480	5.694	6.268	6.096	6.516	5.860	6.398	6.096	6.516	ns
		GCLK PLL	t _{co}	1.364	1.575	2.019	2.109	2.301	2.280	2.238	2.208	2.435	2.280	2.238	ns

Table 1-136. EP3SE260 Row Pins output Timing Parameters (Part 5 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.478	3.726	5.501	5.718	6.296	6.118	6.538	5.883	6.420	6.118	6.538	ns
		GCLK PLL	t _{co}	1.379	1.586	2.036	2.128	2.323	2.308	2.266	2.231	2.457	2.308	2.266	ns
	6mA	GCLK	t _{co}	3.466	3.714	5.490	5.706	6.284	6.109	6.529	5.872	6.411	6.109	6.529	ns
		GCLK PLL	t _{co}	1.367	1.578	2.027	2.119	2.314	2.296	2.254	2.220	2.448	2.296	2.254	ns
	8mA	GCLK	t _{co}	3.463	3.712	5.494	5.711	6.290	6.118	6.538	5.878	6.421	6.118	6.538	ns
		GCLK PLL	t _{co}	1.364	1.578	2.034	2.127	2.323	2.302	2.260	2.226	2.458	2.302	2.260	ns
3.0-V PCI	—	GCLK	t _{co}	3.542	3.812	5.520	5.723	6.294	6.113	6.564	5.875	6.437	6.113	6.564	ns
		GCLK PLL	t _{co}	1.476	1.661	2.049	2.137	2.343	2.368	2.264	2.253	2.476	2.368	2.264	ns
3.0-V PCI-X	—	GCLK	t _{co}	3.542	3.812	5.520	5.723	6.294	6.113	6.564	5.875	6.437	6.113	6.564	ns
		GCLK PLL	t _{co}	1.476	1.661	2.049	2.137	2.343	2.368	2.264	2.253	2.476	2.368	2.264	ns

Table 1-137 through Table 1-140 show the maximum I/O timing parameters for EP3SE260 devices for differential I/O standards.

Table 1-137 specifies EP3SE260 column pins input timing parameters for differential I/O standards.

Table 1-137. EP3SE260 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	GCLK	t _{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
MINI-LVDS	GCLK	t _{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
RSDS	GCLK	t _{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t _{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns

Table 1-137. EP3SE260 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t _{SU}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _H	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{SU}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _H	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t _{SU}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _H	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{SU}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _H	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t _{SU}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _H	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{SU}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _H	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t _{SU}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _H	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{SU}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _H	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{SU}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _H	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{SU}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _H	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{SU}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t _H	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t _{SU}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t _H	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{SU}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t _H	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t _{SU}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t _H	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{SU}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t _H	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t _{SU}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t _H	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{SU}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _H	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{SU}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _H	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns

Table 1-137. EP3SE260 Column Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t _h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t _{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t _h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t _h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t _{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t _h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns

Table 1-138 specifies EP3SE260 row pins input timing parameters for differential I/O standards.

Table 1-138. EP3SE260 Row Pins Input Timing Parameters (Part 1 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
LVDS	GCLK	t_{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t_H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t_{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t_H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
MINI-LVDS	GCLK	t_{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t_H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t_{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t_H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
RSDS	GCLK	t_{SU}	-1.332	-1.401	-1.719	-1.648	-1.841	-1.769	-2.221	-1.630	-1.815	-1.769	-2.221	ns
		t_H	1.476	1.563	1.994	1.939	2.157	2.071	2.526	1.934	2.145	2.071	2.526	ns
	GCLK PLL	t_{SU}	0.869	0.886	1.991	2.205	2.405	2.282	2.297	2.252	2.458	2.282	2.297	ns
		t_H	-0.581	-0.578	-1.475	-1.662	-1.803	-1.711	-1.711	-1.692	-1.839	-1.711	-1.711	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	GCLK	t_{SU}	-1.137	-1.216	-1.849	-1.877	-2.030	-1.953	-2.400	-1.901	-2.052	-1.953	-2.400	ns
		t_H	1.274	1.369	2.088	2.122	2.297	2.206	2.656	2.156	2.330	2.206	2.656	ns
	GCLK PLL	t_{SU}	1.064	1.071	1.866	1.981	2.216	2.098	2.118	1.985	2.221	2.098	2.118	ns
		t_H	-0.783	-0.772	-1.384	-1.483	-1.663	-1.576	-1.581	-1.474	-1.654	-1.576	-1.581	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{SU}	-1.137	-1.216	-1.849	-1.877	-2.030	-1.953	-2.400	-1.901	-2.052	-1.953	-2.400	ns
		t_H	1.274	1.369	2.088	2.122	2.297	2.206	2.656	2.156	2.330	2.206	2.656	ns
	GCLK PLL	t_{SU}	1.064	1.071	1.866	1.981	2.216	2.098	2.118	1.985	2.221	2.098	2.118	ns
		t_H	-0.783	-0.772	-1.384	-1.483	-1.663	-1.576	-1.581	-1.474	-1.654	-1.576	-1.581	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t_H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t_{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t_H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{SU}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t_H	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t_{SU}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t_H	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{SU}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t_H	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t_{SU}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t_H	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns

Table 1-138. EP3SE260 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t _{su}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _h	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{su}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _h	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t _{su}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _h	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{su}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _h	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t _{su}	-1.146	-1.228	-1.858	-1.887	-2.046	-1.969	-2.416	-1.910	-2.068	-1.969	-2.416	ns
		t _h	1.283	1.381	2.097	2.132	2.313	2.222	2.672	2.165	2.346	2.222	2.672	ns
	GCLK PLL	t _{su}	1.055	1.059	1.857	1.971	2.200	2.082	2.102	1.976	2.205	2.082	2.102	ns
		t _h	-0.774	-0.760	-1.375	-1.473	-1.647	-1.560	-1.565	-1.465	-1.638	-1.560	-1.565	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t _{su}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _h	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{su}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _h	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t _{su}	-1.160	-1.240	-1.867	-1.897	-2.064	-1.987	-2.434	-1.921	-2.085	-1.987	-2.434	ns
		t _h	1.297	1.393	2.106	2.142	2.331	2.240	2.690	2.176	2.363	2.240	2.690	ns
	GCLK PLL	t _{su}	1.041	1.047	1.844	1.961	2.182	2.064	2.084	1.965	2.188	2.064	2.084	ns
		t _h	-0.760	-0.748	-1.363	-1.463	-1.629	-1.542	-1.547	-1.454	-1.621	-1.542	-1.547	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t _{su}	-1.169	-1.249	-1.881	-1.908	-2.071	-1.995	-2.440	-1.928	-2.086	-1.995	-2.440	ns
		t _h	1.306	1.402	2.121	2.156	2.341	2.250	2.701	2.186	2.369	2.250	2.701	ns
	GCLK PLL	t _{su}	1.032	1.038	1.829	1.945	2.171	2.052	2.073	1.954	2.182	2.052	2.073	ns
		t _h	-0.751	-0.739	-1.348	-1.445	-1.615	-1.528	-1.532	-1.440	-1.612	-1.528	-1.532	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	GCLK	t _{su}	-1.169	-1.249	-1.881	-1.908	-2.071	-1.995	-2.440	-1.928	-2.086	-1.995	-2.440	ns
		t _h	1.306	1.402	2.121	2.156	2.341	2.250	2.701	2.186	2.369	2.250	2.701	ns
	GCLK PLL	t _{su}	1.032	1.038	1.829	1.945	2.171	2.052	2.073	1.954	2.182	2.052	2.073	ns
		t _h	-0.751	-0.739	-1.348	-1.445	-1.615	-1.528	-1.532	-1.440	-1.612	-1.528	-1.532	ns

Table 1-139 specifies EP3SE260 Column Pins Output Timing parameters for differential I/O standards.

Table 1-139. EP3SE260 Column Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
LVDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
RSDS_E_1R	—	GCLK	t _{co}	3.460	3.730	5.480	5.686	6.242	6.079	6.486	5.828	6.383	6.079	6.486	ns
		GCLK PLL	t _{co}	1.374	1.562	1.992	2.073	2.282	2.291	2.242	2.188	2.399	2.291	2.242	ns
RSDS_E_3R	—	GCLK	t _{co}	3.456	3.733	5.527	5.741	6.304	6.141	6.548	5.887	6.449	6.141	6.548	ns
		GCLK PLL	t _{co}	1.370	1.565	2.039	2.128	2.344	2.353	2.304	2.247	2.465	2.353	2.304	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.487	3.763	5.551	5.764	6.326	6.163	6.570	5.908	6.469	6.163	6.570	ns
		GCLK PLL	t _{co}	1.401	1.595	2.063	2.151	2.366	2.375	2.326	2.268	2.485	2.375	2.326	ns
	6mA	GCLK	t _{co}	3.477	3.753	5.541	5.753	6.316	6.153	6.560	5.897	6.459	6.153	6.560	ns
		GCLK PLL	t _{co}	1.391	1.585	2.053	2.140	2.356	2.365	2.316	2.257	2.475	2.365	2.316	ns
	8mA	GCLK	t _{co}	3.477	3.753	5.544	5.757	6.320	6.157	6.564	5.902	6.464	6.157	6.564	ns
		GCLK PLL	t _{co}	1.391	1.585	2.056	2.144	2.360	2.369	2.320	2.262	2.480	2.369	2.320	ns
	10mA	GCLK	t _{co}	3.470	3.747	5.537	5.751	6.314	6.151	6.558	5.895	6.458	6.151	6.558	ns
		GCLK PLL	t _{co}	1.384	1.579	2.049	2.138	2.354	2.363	2.314	2.255	2.474	2.363	2.314	ns
	12mA	GCLK	t _{co}	3.469	3.745	5.534	5.748	6.311	6.148	6.555	5.892	6.454	6.148	6.555	ns
		GCLK PLL	t _{co}	1.383	1.577	2.046	2.135	2.351	2.360	2.311	2.252	2.470	2.360	2.311	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t _{co}	3.491	3.767	5.555	5.768	6.330	6.167	6.574	5.912	6.474	6.167	6.574	ns
		GCLK PLL	t _{co}	1.405	1.599	2.067	2.155	2.370	2.379	2.330	2.272	2.490	2.379	2.330	ns

Table 1-139. EP3SE260 Column Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.481	3.756	5.534	5.745	6.305	6.142	6.549	5.888	6.447	6.142	6.549	ns
		GCLK PLL	t _{co}	1.395	1.588	2.046	2.132	2.345	2.354	2.305	2.248	2.463	2.354	2.305	ns
	6mA	GCLK	t _{co}	3.476	3.752	5.534	5.745	6.306	6.143	6.550	5.889	6.449	6.143	6.550	ns
		GCLK PLL	t _{co}	1.390	1.584	2.046	2.132	2.346	2.355	2.306	2.249	2.465	2.355	2.306	ns
	8mA	GCLK	t _{co}	3.474	3.750	5.533	5.744	6.304	6.141	6.548	5.888	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.388	1.582	2.045	2.131	2.344	2.353	2.304	2.248	2.464	2.353	2.304	ns
	10mA	GCLK	t _{co}	3.466	3.741	5.523	5.734	6.295	6.132	6.539	5.878	6.438	6.132	6.539	ns
		GCLK PLL	t _{co}	1.380	1.573	2.035	2.121	2.335	2.344	2.295	2.238	2.454	2.344	2.295	ns
	12mA	GCLK	t _{co}	3.467	3.743	5.529	5.741	6.303	6.140	6.547	5.886	6.447	6.140	6.547	ns
		GCLK PLL	t _{co}	1.381	1.575	2.041	2.128	2.343	2.352	2.303	2.246	2.463	2.352	2.303	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.740	5.512	5.722	6.281	6.118	6.525	5.865	6.423	6.118	6.525	ns
		GCLK PLL	t _{co}	1.380	1.572	2.024	2.109	2.321	2.330	2.281	2.225	2.439	2.330	2.281	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.478	3.753	5.530	5.740	6.299	6.136	6.543	5.884	6.442	6.136	6.543	ns
		GCLK PLL	t _{co}	1.392	1.585	2.042	2.127	2.339	2.348	2.299	2.244	2.458	2.348	2.299	ns
	6mA	GCLK	t _{co}	3.474	3.750	5.531	5.742	6.303	6.140	6.547	5.886	6.446	6.140	6.547	ns
		GCLK PLL	t _{co}	1.388	1.582	2.043	2.129	2.343	2.352	2.303	2.246	2.462	2.352	2.303	ns
	8mA	GCLK	t _{co}	3.464	3.739	5.520	5.731	6.291	6.128	6.535	5.875	6.434	6.128	6.535	ns
		GCLK PLL	t _{co}	1.378	1.571	2.032	2.118	2.331	2.340	2.291	2.235	2.450	2.340	2.291	ns
	10mA	GCLK	t _{co}	3.462	3.737	5.518	5.728	6.289	6.126	6.533	5.873	6.432	6.126	6.533	ns
		GCLK PLL	t _{co}	1.376	1.569	2.030	2.115	2.329	2.338	2.289	2.233	2.448	2.338	2.289	ns
	12mA	GCLK	t _{co}	3.462	3.738	5.521	5.733	6.294	6.131	6.538	5.877	6.438	6.131	6.538	ns
		GCLK PLL	t _{co}	1.376	1.570	2.033	2.120	2.334	2.343	2.294	2.237	2.454	2.343	2.294	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.741	5.518	5.728	6.288	6.125	6.532	5.872	6.431	6.125	6.532	ns
		GCLK PLL	t _{co}	1.380	1.573	2.030	2.115	2.328	2.337	2.288	2.232	2.447	2.337	2.288	ns

Table 1-139. EP3SE260 Column Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.492	3.770	5.563	5.776	6.338	6.175	6.582	5.920	6.481	6.175	6.582	ns
		GCLK PLL	t _{co}	1.406	1.602	2.075	2.163	2.378	2.387	2.338	2.280	2.497	2.387	2.338	ns
	6mA	GCLK	t _{co}	3.478	3.756	5.551	5.765	6.328	6.165	6.572	5.910	6.472	6.165	6.572	ns
		GCLK PLL	t _{co}	1.392	1.588	2.063	2.152	2.368	2.377	2.328	2.270	2.488	2.377	2.328	ns
	8mA	GCLK	t _{co}	3.466	3.743	5.534	5.747	6.310	6.147	6.554	5.892	6.454	6.147	6.554	ns
		GCLK PLL	t _{co}	1.380	1.575	2.046	2.134	2.350	2.359	2.310	2.252	2.470	2.359	2.310	ns
	10mA	GCLK	t _{co}	3.466	3.743	5.537	5.751	6.314	6.151	6.558	5.896	6.459	6.151	6.558	ns
		GCLK PLL	t _{co}	1.380	1.575	2.049	2.138	2.354	2.363	2.314	2.256	2.475	2.363	2.314	ns
	12mA	GCLK	t _{co}	3.462	3.739	5.530	5.743	6.307	6.144	6.551	5.889	6.451	6.144	6.551	ns
		GCLK PLL	t _{co}	1.376	1.571	2.042	2.130	2.347	2.356	2.307	2.249	2.467	2.356	2.307	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	8mA	GCLK	t _{co}	3.466	3.741	5.523	5.734	6.295	6.132	6.539	5.878	6.438	6.132	6.539	ns
		GCLK PLL	t _{co}	1.380	1.573	2.035	2.121	2.335	2.344	2.295	2.238	2.454	2.344	2.295	ns
	16mA	GCLK	t _{co}	3.467	3.743	5.531	5.744	6.306	6.143	6.550	5.888	6.450	6.143	6.550	ns
		GCLK PLL	t _{co}	1.381	1.575	2.043	2.131	2.346	2.355	2.306	2.248	2.466	2.355	2.306	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.495	3.773	5.562	5.774	6.336	6.173	6.580	5.919	6.479	6.173	6.580	ns
		GCLK PLL	t _{co}	1.409	1.605	2.074	2.161	2.376	2.385	2.336	2.279	2.495	2.385	2.336	ns
	6mA	GCLK	t _{co}	3.484	3.761	5.550	5.762	6.324	6.161	6.568	5.907	6.467	6.161	6.568	ns
		GCLK PLL	t _{co}	1.398	1.593	2.062	2.149	2.364	2.373	2.324	2.267	2.483	2.373	2.324	ns
	8mA	GCLK	t _{co}	3.479	3.757	5.550	5.763	6.325	6.162	6.569	5.908	6.469	6.162	6.569	ns
		GCLK PLL	t _{co}	1.393	1.589	2.062	2.150	2.365	2.374	2.325	2.268	2.485	2.374	2.325	ns
	10mA	GCLK	t _{co}	3.465	3.742	5.532	5.744	6.306	6.143	6.550	5.889	6.451	6.143	6.550	ns
		GCLK PLL	t _{co}	1.379	1.574	2.044	2.131	2.346	2.355	2.306	2.249	2.467	2.355	2.306	ns
	12mA	GCLK	t _{co}	3.463	3.740	5.530	5.742	6.304	6.141	6.548	5.887	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.377	1.572	2.042	2.129	2.344	2.353	2.304	2.247	2.464	2.353	2.304	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.467	3.742	5.522	5.732	6.292	6.129	6.536	5.876	6.435	6.129	6.536	ns
		GCLK PLL	t _{co}	1.381	1.574	2.034	2.119	2.332	2.341	2.292	2.236	2.451	2.341	2.292	ns
	16mA	GCLK	t _{co}	3.467	3.743	5.530	5.742	6.304	6.141	6.548	5.887	6.448	6.141	6.548	ns
		GCLK PLL	t _{co}	1.381	1.575	2.042	2.129	2.344	2.353	2.304	2.247	2.464	2.353	2.304	ns

Table 1-139. EP3SE260 Column Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.483	3.760	5.546	5.757	6.318	6.155	6.562	5.902	6.461	6.155	6.562	ns
		GCLK PLL	t _{co}	1.397	1.592	2.058	2.144	2.358	2.367	2.318	2.262	2.477	2.367	2.318	ns
	10mA	GCLK	t _{co}	3.483	3.760	5.546	5.757	6.318	6.155	6.562	5.902	6.461	6.155	6.562	ns
		GCLK PLL	t _{co}	1.397	1.592	2.058	2.144	2.358	2.367	2.318	2.262	2.477	2.367	2.318	ns
	12mA	GCLK	t _{co}	3.473	3.750	5.536	5.747	6.308	6.145	6.552	5.892	6.452	6.145	6.552	ns
		GCLK PLL	t _{co}	1.387	1.582	2.048	2.134	2.348	2.357	2.308	2.252	2.468	2.357	2.308	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.466	3.742	5.522	5.732	6.292	6.129	6.536	5.876	6.435	6.129	6.536	ns
		GCLK PLL	t _{co}	1.380	1.574	2.034	2.119	2.332	2.341	2.292	2.236	2.451	2.341	2.292	ns

Table 1-140 specifies EP3SE260 Row Pins Output Timing parameters for differential I/O standards.

Table 1-140. EP3SE260 Row Pins output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
LVDS	—	GCLK	t _{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t _{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns
LVDS_E_1R	—	GCLK	t _{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t _{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
LVDS_E_3R	—	GCLK	t _{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t _{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
MINI-LVDS	—	GCLK	t _{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t _{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns
MINI-LVDS_E_1R	—	GCLK	t _{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t _{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
MINI-LVDS_E_3R	—	GCLK	t _{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t _{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
RSDS	—	GCLK	t _{co}	3.149	3.372	4.930	5.111	5.636	5.477	5.864	5.235	5.760	5.477	5.864	ns
		GCLK PLL	t _{co}	1.067	1.206	1.444	1.503	1.675	1.692	1.626	1.599	1.774	1.692	1.626	ns

Table 1-140. EP3SE260 Row Pins output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RSDS_E_1R	—	GCLK	t _{co}	3.527	3.802	5.588	5.798	6.363	6.197	6.576	5.946	6.513	6.197	6.576	ns
		GCLK PLL	t _{co}	1.445	1.636	2.102	2.190	2.402	2.412	2.338	2.310	2.527	2.412	2.338	ns
RSDS_E_3R	—	GCLK	t _{co}	3.509	3.792	5.626	5.844	6.417	6.251	6.630	5.997	6.574	6.251	6.630	ns
		GCLK PLL	t _{co}	1.427	1.626	2.140	2.236	2.456	2.466	2.392	2.361	2.588	2.466	2.392	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t _{co}	3.553	3.835	5.662	5.878	6.450	6.284	6.663	6.030	6.603	6.284	6.663	ns
		GCLK PLL	t _{co}	1.481	1.679	2.186	2.280	2.499	2.509	2.435	2.404	2.627	2.509	2.435	ns
	6mA	GCLK	t _{co}	3.539	3.821	5.649	5.865	6.437	6.271	6.650	6.016	6.590	6.271	6.650	ns
		GCLK PLL	t _{co}	1.467	1.665	2.173	2.267	2.486	2.496	2.422	2.390	2.614	2.496	2.422	ns
	8mA	GCLK	t _{co}	3.535	3.817	5.647	5.865	6.438	6.272	6.651	6.016	6.592	6.272	6.651	ns
		GCLK PLL	t _{co}	1.463	1.661	2.171	2.267	2.487	2.497	2.423	2.390	2.616	2.497	2.423	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t _{co}	3.551	3.832	5.648	5.862	6.432	6.266	6.645	6.013	6.585	6.266	6.645	ns
		GCLK PLL	t _{co}	1.479	1.676	2.172	2.264	2.481	2.491	2.417	2.387	2.609	2.491	2.417	ns
	6mA	GCLK	t _{co}	3.540	3.822	5.644	5.858	6.429	6.263	6.642	6.010	6.582	6.263	6.642	ns
		GCLK PLL	t _{co}	1.468	1.666	2.168	2.260	2.478	2.488	2.414	2.384	2.606	2.488	2.414	ns
	8mA	GCLK	t _{co}	3.537	3.819	5.642	5.856	6.427	6.261	6.640	6.008	6.581	6.261	6.640	ns
		GCLK PLL	t _{co}	1.465	1.663	2.166	2.258	2.476	2.486	2.412	2.382	2.605	2.486	2.412	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t _{co}	3.548	3.829	5.643	5.857	6.426	6.260	6.639	6.007	6.579	6.260	6.639	ns
		GCLK PLL	t _{co}	1.476	1.673	2.167	2.259	2.475	2.485	2.411	2.381	2.603	2.485	2.411	ns
	6mA	GCLK	t _{co}	3.538	3.820	5.641	5.855	6.425	6.259	6.638	6.007	6.579	6.259	6.638	ns
		GCLK PLL	t _{co}	1.466	1.664	2.165	2.257	2.474	2.484	2.410	2.381	2.603	2.484	2.410	ns
	8mA	GCLK	t _{co}	3.524	3.806	5.626	5.840	6.411	6.245	6.624	5.992	6.564	6.245	6.624	ns
		GCLK PLL	t _{co}	1.452	1.650	2.150	2.242	2.460	2.470	2.396	2.366	2.588	2.470	2.396	ns
	10mA	GCLK	t _{co}	3.521	3.802	5.622	5.836	6.407	6.241	6.620	5.988	6.560	6.241	6.620	ns
		GCLK PLL	t _{co}	1.449	1.646	2.146	2.238	2.456	2.466	2.392	2.362	2.584	2.466	2.392	ns
	12mA	GCLK	t _{co}	3.518	3.800	5.623	5.839	6.410	6.244	6.623	5.991	6.564	6.244	6.623	ns
		GCLK PLL	t _{co}	1.446	1.644	2.147	2.241	2.459	2.469	2.395	2.365	2.588	2.469	2.395	ns

Table 1-140. EP3SE260 Row Pins output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 1.8-V HSTL CLASS II	16mA	GCLK	t _{co}	3.519	3.800	5.613	5.827	6.397	6.231	6.610	5.978	6.550	6.231	6.610	ns
		GCLK PLL	t _{co}	1.447	1.644	2.137	2.229	2.446	2.456	2.382	2.352	2.574	2.456	2.382	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	4mA	GCLK	t _{co}	3.568	3.853	5.684	5.900	6.473	6.307	6.686	6.052	6.626	6.307	6.686	ns
		GCLK PLL	t _{co}	1.496	1.697	2.208	2.302	2.522	2.532	2.458	2.426	2.650	2.532	2.458	ns
	6mA	GCLK	t _{co}	3.544	3.829	5.666	5.883	6.456	6.290	6.669	6.035	6.611	6.290	6.669	ns
		GCLK PLL	t _{co}	1.472	1.673	2.190	2.285	2.505	2.515	2.441	2.409	2.635	2.515	2.441	ns
	8mA	GCLK	t _{co}	3.526	3.810	5.644	5.861	6.434	6.268	6.647	6.013	6.589	6.268	6.647	ns
		GCLK PLL	t _{co}	1.454	1.654	2.168	2.263	2.483	2.493	2.419	2.387	2.613	2.493	2.419	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t _{co}	3.572	3.856	5.684	5.900	6.472	6.306	6.685	6.052	6.626	6.306	6.685	ns
		GCLK PLL	t _{co}	1.500	1.700	2.208	2.302	2.521	2.531	2.457	2.426	2.650	2.531	2.457	ns
	6mA	GCLK	t _{co}	3.557	3.841	5.670	5.885	6.457	6.291	6.670	6.037	6.611	6.291	6.670	ns
		GCLK PLL	t _{co}	1.485	1.685	2.194	2.287	2.506	2.516	2.442	2.411	2.635	2.516	2.442	ns
	8mA	GCLK	t _{co}	3.546	3.830	5.665	5.882	6.454	6.288	6.667	6.034	6.609	6.288	6.667	ns
		GCLK PLL	t _{co}	1.474	1.674	2.189	2.284	2.503	2.513	2.439	2.408	2.633	2.513	2.439	ns
	10mA	GCLK	t _{co}	3.526	3.810	5.642	5.858	6.431	6.265	6.644	6.011	6.585	6.265	6.644	ns
		GCLK PLL	t _{co}	1.454	1.654	2.166	2.260	2.480	2.490	2.416	2.385	2.609	2.490	2.416	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t _{co}	3.528	3.810	5.629	5.843	6.413	6.247	6.626	5.994	6.566	6.247	6.626	ns
		GCLK PLL	t _{co}	1.456	1.654	2.153	2.245	2.462	2.472	2.398	2.368	2.590	2.472	2.398	ns
	16mA	GCLK	t _{co}	3.521	3.803	5.628	5.844	6.416	6.250	6.629	5.997	6.571	6.250	6.629	ns
		GCLK PLL	t _{co}	1.449	1.647	2.152	2.246	2.465	2.475	2.401	2.371	2.595	2.475	2.401	ns

Table 1–140. EP3SE260 Row Pins output Timing Parameters (Part 4 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t _{co}	3.559	3.842	5.666	5.881	6.452	6.286	6.665	6.033	6.606	6.286	6.665	ns
		GCLK PLL	t _{co}	1.477	1.676	2.180	2.273	2.491	2.501	2.427	2.397	2.620	2.501	2.427	ns
	12mA	GCLK	t _{co}	3.541	3.825	5.651	5.866	6.437	6.271	6.650	6.018	6.591	6.271	6.650	ns
		GCLK PLL	t _{co}	1.459	1.659	2.165	2.258	2.476	2.486	2.412	2.382	2.605	2.486	2.412	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t _{co}	3.527	3.809	5.628	5.842	6.412	6.246	6.625	5.994	6.566	6.246	6.625	ns
		GCLK PLL	t _{co}	1.445	1.643	2.142	2.234	2.451	2.461	2.387	2.358	2.580	2.461	2.387	ns

Table 1–141 and Table 1–142 show EP3SE260 regional clock (RCLK) adder values that should be added to GCLK values. These adder values are used to determine I/O timing when I/O pin is driven using regional clock. This applies for all I/O standards supported by Stratix III devices.

Table 1–141 specifies EP3SE260 Column Pin delay adders when using the regional clock.

Table 1–141. EP3SE260 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RCLK input adder	0.233	0.311	0.488	0.489	0.45	0.439	0.515	0.416	0.458	0.439	0.515	ns
RCLK PLL input adder	-0.036	0.028	0.059	0.06	0.113	0.11	-0.005	-0.038	0.121	0.11	-0.005	ns
RCLK output adder	-0.204	-0.237	-0.334	-0.331	-0.413	-0.405	-0.44	-0.32	-0.371	-0.405	-0.44	ns
RCLK PLL output adder	1.899	1.965	3.193	3.323	3.677	3.512	3.802	3.346	3.705	3.512	3.802	ns

Table 1–142 specifies EP3SE260 Row Pin delay adders when using the regional clock in Stratix III devices.

Table 1–142. EP3SE260 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =1.1V	V _{CCL} =0.9V	
RCLK input adder	0.244	0.293	0.438	0.412	0.471	0.427	0.577	0.421	0.452	0.427	0.577	ns
RCLK PLL input adder	0.124	0.134	0.21	0.215	0.234	0.228	0.297	0.217	0.239	0.228	0.297	ns
RCLK output adder	-0.256	-0.289	-0.418	-0.424	-0.484	-0.438	-0.591	-0.443	-0.464	-0.438	-0.591	ns
RCLK PLL output adder	-0.134	-0.147	-0.228	-0.233	-0.254	-0.261	-0.322	-0.236	-0.262	-0.261	-0.322	ns

Dedicated Clock Pin Timing

Table 1–143 to Table 1–203 show clock pin timing for Stratix III devices when the clock is driven by global clock, regional clock, periphery clock and a PLL.

Table 1-143 describes Stratix III clock timing parameters.

Table 1-143. Stratix III Clock Timing Parameters

Symbol	Parameter
t_{CIN}	Delay from clock pad to I/O input register
t_{COUT}	Delay from clock pad to I/O output register
t_{PLLCIN}	Delay from PLL <i>inclk</i> pad to I/O input register
$t_{PLLCOUT}$	Delay from PLL <i>inclk</i> pad to I/O output register

EP3SL50 Clock Timing Parameters

Table 1-144 and Table 1-145 show the global clock timing parameters for EP3SL50 devices.

Table 1-144. EP3SL50 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.736	1.737	2.436	2.691	3.056	2.925	3.433	2.691	3.056	2.925	3.433	ns
t_{COUT}	1.736	1.737	2.436	2.691	3.056	2.925	3.433	2.691	3.056	2.925	3.433	ns
t_{PLLCIN}	-0.018	-0.026	-0.261	-0.312	-0.251	-0.230	-0.011	-0.312	0.161	-0.230	-0.011	ns
$t_{PLLCOUT}$	-0.018	-0.026	-0.261	-0.312	-0.251	-0.230	-0.011	-0.312	0.161	-0.230	-0.011	ns

Table 1-145. EP3SL50 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.732	1.843	2.527	2.758	3.099	2.997	3.227	2.811	3.146	3.055	3.260	ns
t_{COUT}	1.650	1.752	2.385	2.595	2.918	2.826	3.068	2.641	2.957	2.876	3.101	ns
t_{PLLCIN}	0.048	0.116	-0.142	-0.216	-0.181	-0.136	-0.188	-0.173	0.265	-0.087	-0.230	ns
$t_{PLLCOUT}$	-0.034	0.025	-0.284	-0.379	-0.362	-0.307	-0.347	-0.343	0.076	-0.266	-0.389	ns

Table 1-146 and Table 1-147 show the regional clock timing parameters for EP3SL50 devices.

Table 1-146. EP3SL50 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.689	1.669	2.371	2.645	3.004	2.719	3.136	2.645	3.009	2.719	3.136	ns
t_{COUT}	1.689	1.669	2.371	2.645	3.004	2.719	3.136	2.645	3.009	2.719	3.136	ns
t_{PLLCIN}	-0.019	-0.025	-0.264	-0.315	-0.256	-0.236	-0.017	-0.315	0.224	-0.236	-0.017	ns
$t_{PLLCOUT}$	-0.019	-0.025	-0.264	-0.315	-0.256	-0.236	-0.017	-0.315	0.224	-0.236	-0.017	ns

Table 1–147. EP3SL50 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.636	1.729	2.356	2.567	2.894	2.800	2.964	2.622	2.941	2.853	2.997	ns
t _{COUT}	1.554	1.638	2.214	2.404	2.713	2.629	2.805	2.452	2.752	2.674	2.838	ns
t _{PLLCIN}	0.018	0.084	-0.178	-0.255	-0.222	-0.169	-0.226	-0.203	0.298	-0.123	-0.272	ns
t _{PLLCOUT}	-0.064	-0.007	-0.320	-0.418	-0.403	-0.340	-0.385	-0.373	0.109	-0.302	-0.431	ns

Table 1–148 and Table 1–149 show the periphery clock timing parameters for EP3SL50 devices.

Table 1–148. EP3SL50 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.468	1.469	2.143	2.418	2.797	2.668	3.219	2.418	2.801	2.668	3.219	ns
t _{COUT}	1.468	1.469	2.143	2.418	2.797	2.668	3.219	2.418	2.801	2.668	3.219	ns
t _{PLLCIN}	-0.081	-0.081	-0.327	-0.383	-0.334	-0.310	-0.105	-0.383	0.273	-0.310	-0.105	ns
t _{PLLCOUT}	-0.081	-0.081	-0.327	-0.383	-0.334	-0.310	-0.105	-0.383	0.273	-0.310	-0.105	ns

Table 1–149. EP3SL50 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.482	1.556	2.223	2.488	2.859	2.740	3.034	2.539	2.897	2.785	3.056	ns
t _{COUT}	1.400	1.465	2.078	2.325	2.678	2.569	2.875	2.369	2.708	2.606	2.897	ns
t _{PLLCIN}	-0.014	0.042	-0.222	-0.299	-0.278	-0.224	-0.295	-0.256	0.368	-0.177	-0.257	ns
t _{PLLCOUT}	-0.096	-0.049	-0.364	-0.462	-0.459	-0.395	-0.454	-0.426	0.179	-0.356	-0.416	ns

EP3SL70 Clock Timing Parameters

Table 1–150 and Table 1–151 show the global clock timing specifications for EP3SL70 devices.

Table 1–150. EP3SL70 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.749	1.735	2.434	2.702	3.056	2.950	3.403	2.702	3.056	2.950	3.403	ns
t _{COUT}	1.749	1.735	2.434	2.702	3.056	2.950	3.403	2.702	3.056	2.950	3.403	ns
t _{PLLCIN}	-0.012	-0.021	-0.255	-0.306	-0.251	-0.203	-0.044	-0.306	0.161	-0.203	-0.044	ns
t _{PLLCOUT}	-0.012	-0.021	-0.255	-0.306	-0.251	-0.203	-0.044	-0.306	0.161	-0.203	-0.044	ns

Table 1-151. EP3SL70 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.732	1.840	2.524	2.758	3.083	2.986	3.227	2.811	3.157	3.042	3.260	ns
t _{COUT}	1.650	1.749	2.382	2.595	2.902	2.815	3.068	2.641	2.968	2.863	3.101	ns
t _{PLLCIN}	0.051	0.115	-0.144	-0.219	-0.193	-0.144	-0.188	-0.170	0.275	-0.097	-0.234	ns
t _{PLLCOUT}	-0.031	0.024	-0.286	-0.382	-0.374	-0.315	-0.347	-0.340	0.086	-0.276	-0.393	ns

Table 1-152 and Table 1-153 show the regional clock timing parameters for EP3SL70 devices.

Table 1-152. EP3SL70 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.689	1.689	2.388	2.649	3.004	2.723	3.132	2.649	3.014	2.723	3.132	ns
t _{COUT}	1.689	1.689	2.388	2.649	3.004	2.723	3.132	2.649	3.014	2.723	3.132	ns
t _{PLLCIN}	-0.011	-0.022	-0.261	-0.308	-0.256	-0.207	-0.054	-0.308	0.224	-0.207	-0.054	ns
t _{PLLCOUT}	-0.011	-0.022	-0.261	-0.308	-0.256	-0.207	-0.054	-0.308	0.224	-0.207	-0.054	ns

Table 1-153. EP3SL70 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.637	1.726	2.353	2.566	2.885	2.786	2.964	2.625	2.948	2.839	3.001	ns
t _{COUT}	1.555	1.635	2.211	2.403	2.704	2.615	2.805	2.455	2.759	2.660	2.842	ns
t _{PLLCIN}	0.018	0.085	-0.176	-0.252	-0.230	-0.180	-0.226	-0.203	0.307	-0.139	-0.272	ns
t _{PLLCOUT}	-0.064	-0.006	-0.318	-0.415	-0.411	-0.351	-0.385	-0.373	0.118	-0.318	-0.431	ns

Table 1-154 and Table 1-155 show the periphery clock timing parameters for EP3SL70 devices.

Table 1-154. EP3SL70 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.465	1.468	2.142	2.410	2.792	2.673	3.220	2.410	2.802	2.673	3.220	ns
t _{COUT}	1.465	1.468	2.142	2.410	2.792	2.673	3.220	2.410	2.802	2.673	3.220	ns
t _{PLLCIN}	-0.068	-0.083	-0.330	-0.370	-0.334	-0.288	-0.133	-0.370	0.273	-0.288	-0.133	ns
t _{PLLCOUT}	-0.068	-0.083	-0.330	-0.370	-0.334	-0.288	-0.133	-0.370	0.273	-0.288	-0.133	ns

Table 1–155. EP3SL70 Row Pin Peripheral Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.482	1.558	2.227	2.488	2.851	2.727	3.031	2.539	2.905	2.777	3.056	ns
t _{COUT}	1.400	1.467	2.082	2.325	2.670	2.556	2.872	2.369	2.716	2.598	2.897	ns
t _{PLLCIN}	-0.019	0.039	-0.225	-0.302	-0.291	-0.235	-0.295	-0.261	0.376	-0.188	-0.257	ns
t _{PLLCOUT}	-0.101	-0.052	-0.367	-0.465	-0.472	-0.406	-0.454	-0.431	0.187	-0.367	-0.416	ns

EP3SL110 Clock Timing Parameters

Table 1–156 and Table 1–157 show the global clock timing parameters for EP3SL110 devices.

Table 1–156. EP3SL110 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.909	1.907	2.674	2.936	3.285	3.182	3.700	2.936	3.285	3.182	3.700	ns
t _{COUT}	1.909	1.907	2.674	2.936	3.285	3.182	3.700	2.936	3.285	3.182	3.700	ns
t _{PLLCIN}	-0.048	-0.050	-0.274	-0.330	-0.290	-0.251	-0.032	-0.330	-0.290	-0.251	-0.032	ns
t _{PLLCOUT}	-0.048	-0.050	-0.274	-0.330	-0.290	-0.251	-0.032	-0.330	-0.290	-0.251	-0.032	ns

Table 1–157. EP3SL110 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Unit
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.882	2.014	2.754	2.975	3.344	3.221	3.511	3.062	3.413	3.287	3.551	ns
t _{COUT}	1.800	1.923	2.612	2.812	3.163	3.050	3.352	2.892	3.224	3.108	3.392	ns
t _{PLLCIN}	-0.002	0.059	-0.202	-0.271	-0.231	-0.184	-0.212	-0.219	-0.184	-0.138	-0.260	ns
t _{PLLCOUT}	-0.084	-0.032	-0.347	-0.434	-0.412	-0.355	-0.371	-0.389	-0.373	-0.317	-0.419	ns

Table 1–158 and Table 1–159 show the regional clock timing parameters for EP3SL110 devices.

Table 1–158. EP3SL110 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.689	1.687	2.360	2.600	2.924	2.836	3.241	2.600	2.924	2.836	3.241	ns
t _{COUT}	1.689	1.687	2.360	2.600	2.924	2.836	3.241	2.600	2.924	2.836	3.241	ns
t _{PLLCIN}	-0.036	-0.038	-0.262	-0.317	-0.278	-0.239	-0.020	-0.317	-0.278	-0.239	-0.020	ns
t _{PLLCOUT}	-0.036	-0.038	-0.262	-0.317	-0.278	-0.239	-0.020	-0.317	-0.278	-0.239	-0.020	ns

Table 1-159. EP3SL110 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.684	1.792	2.440	2.644	2.985	2.879	3.044	2.720	3.044	2.938	3.083	ns
t_{COUT}	1.602	1.701	2.298	2.481	2.804	2.708	2.885	2.550	2.855	2.759	2.924	ns
t_{PLLCIN}	0.008	0.071	-0.189	-0.276	-0.218	-0.188	-0.214	-0.209	-0.174	-0.141	-0.263	ns
$t_{PLLCOUT}$	-0.074	-0.020	-0.334	-0.439	-0.399	-0.359	-0.373	-0.379	-0.363	-0.320	-0.422	ns

Table 1-160 and Table 1-161 show the periphery clock timing parameters for EP3SL110 devices.

Table 1-160. EP3SL110 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.541	1.538	2.257	2.539	2.931	2.810	3.345	2.539	2.931	2.810	3.345	ns
t_{COUT}	1.541	1.538	2.257	2.539	2.931	2.810	3.345	2.539	2.931	2.810	3.345	ns
t_{PLLCIN}	-0.029	-0.031	-0.253	-0.310	-0.276	-0.222	-0.020	-0.310	-0.276	-0.222	-0.020	ns
$t_{PLLCOUT}$	-0.029	-0.031	-0.253	-0.310	-0.276	-0.222	-0.020	-0.310	-0.276	-0.222	-0.020	ns

Table 1-161. EP3SL110 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.430	1.503	2.156	2.416	2.783	2.665	2.926	2.465	2.828	2.711	2.951	ns
t_{COUT}	1.348	1.412	2.011	2.253	2.602	2.494	2.767	2.295	2.639	2.532	2.792	ns
t_{PLLCIN}	0.015	0.072	-0.188	-0.267	-0.219	-0.180	-0.214	-0.206	-0.170	-0.133	-0.263	ns
$t_{PLLCOUT}$	-0.067	-0.019	-0.333	-0.430	-0.400	-0.351	-0.373	-0.376	-0.359	-0.312	-0.422	ns

EP3SL150 Clock Timing Parameters

Table 1-162 and Table 1-163 show the global clock timing parameters for EP3SL150 devices.

Table 1-162. EP3SL150 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Unit
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.898	1.926	2.692	2.920	3.294	3.170	3.719	2.920	3.294	3.170	3.719	ns
t_{COUT}	1.898	1.926	2.692	2.920	3.294	3.170	3.719	2.920	3.294	3.170	3.719	ns
t_{PLLCIN}	-0.054	-0.028	-0.252	-0.342	-0.296	-0.239	-0.018	-0.342	-0.296	-0.239	-0.018	ns
$t_{PLLCOUT}$	-0.054	-0.028	-0.252	-0.342	-0.296	-0.239	-0.018	-0.342	-0.296	-0.239	-0.018	ns

Table 1-163. EP3SL150 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.868	2.010	2.750	2.982	3.347	3.224	3.506	3.048	3.400	3.293	3.549	ns
t _{COUT}	1.786	1.919	2.608	2.819	3.166	3.053	3.347	2.878	3.211	3.114	3.390	ns
t _{PLLCIN}	0.007	0.059	-0.202	-0.255	-0.231	-0.184	-0.214	-0.210	-0.173	-0.122	-0.249	ns
t _{PLLCOUT}	-0.075	-0.032	-0.347	-0.418	-0.412	-0.355	-0.373	-0.380	-0.362	-0.301	-0.408	ns

Table 1-164 and Table 1-165 show the regional clock timing parameters for EP3SL150 devices.

Table 1-164. EP3SL150 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.683	1.701	2.375	2.595	2.936	2.833	3.255	2.595	2.936	2.833	3.255	ns
t _{COUT}	1.683	1.701	2.375	2.595	2.936	2.833	3.255	2.595	2.936	2.833	3.255	ns
t _{PLLCIN}	-0.043	-0.016	-0.240	-0.329	-0.284	-0.227	-0.005	-0.329	-0.284	-0.227	-0.005	ns
t _{PLLCOUT}	-0.043	-0.016	-0.240	-0.329	-0.284	-0.227	-0.005	-0.329	-0.284	-0.227	-0.005	ns

Table 1-165. EP3SL150 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.683	1.793	2.441	2.659	2.987	2.875	3.042	2.719	3.047	2.951	3.096	ns
t _{COUT}	1.601	1.702	2.299	2.496	2.806	2.704	2.883	2.549	2.858	2.772	2.937	ns
t _{PLLCIN}	-0.007	0.068	-0.192	-0.269	-0.221	-0.188	-0.211	-0.226	-0.186	-0.135	-0.260	ns
t _{PLLCOUT}	-0.089	-0.023	-0.337	-0.432	-0.402	-0.359	-0.370	-0.396	-0.375	-0.314	-0.419	ns

Table 1-166 and Table 1-167 show the periphery clock timing parameters for EP3SL150 devices.

Table 1-166. EP3SL150 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.537	1.550	2.268	2.535	2.929	2.812	3.354	2.535	2.929	2.812	3.354	ns
t _{COUT}	1.537	1.550	2.268	2.535	2.929	2.812	3.354	2.535	2.929	2.812	3.354	ns
t _{PLLCIN}	-0.040	-0.012	-0.235	-0.326	-0.267	-0.234	0.002	-0.326	-0.267	-0.234	0.002	ns
t _{PLLCOUT}	-0.040	-0.012	-0.235	-0.326	-0.267	-0.234	0.002	-0.326	-0.267	-0.234	0.002	ns

Table 1-167. EP3SL150 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.438	1.505	2.159	2.429	2.783	2.657	2.934	2.475	2.838	2.725	2.972	ns
t_{COUT}	1.356	1.414	2.014	2.266	2.602	2.486	2.775	2.305	2.649	2.546	2.813	ns
t_{PLLCIN}	0.002	0.076	-0.183	-0.266	-0.217	-0.185	-0.206	-0.220	-0.182	-0.132	-0.260	ns
$t_{PLLCOUT}$	-0.080	-0.015	-0.328	-0.429	-0.398	-0.356	-0.365	-0.390	-0.371	-0.311	-0.419	ns

EP3SL200 Clock Timing Parameters

Table 1-168 and Table 1-169 show the global clock timing parameters for EP3SL200 devices.

Table 1-168. EP3SL200 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Unit
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	2.237	2.264	3.331	3.416	3.842	3.686	4.345	3.416	3.834	3.686	4.345	ns
t_{COUT}	2.237	2.264	3.331	3.416	3.842	3.686	4.345	3.416	3.834	3.686	4.345	ns
t_{PLLCIN}	0.032	0.060	-0.177	-0.219	-0.137	-0.122	0.088	-0.219	0.287	-0.122	0.088	ns
$t_{PLLCOUT}$	0.032	0.060	-0.177	-0.219	-0.137	-0.122	0.088	-0.219	0.287	-0.122	0.088	ns

Table 1-169. EP3SL200 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	2.208	2.371	3.453	3.526	3.900	3.747	4.190	3.601	3.977	3.747	4.190	ns
t_{COUT}	2.126	2.280	3.301	3.366	3.719	3.576	4.031	3.433	3.788	3.576	4.031	ns
t_{PLLCIN}	0.102	0.174	-0.085	-0.115	-0.076	-0.043	-0.063	-0.067	0.409	-0.043	-0.063	ns
$t_{PLLCOUT}$	0.020	0.083	-0.237	-0.278	-0.257	-0.214	-0.222	-0.237	0.220	-0.214	-0.222	ns

Table 1-170 and Table 1-171 show the regional clock timing parameters for EP3SL200.

Table 1-170. EP3SL200 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	2.006	2.035	3.020	3.113	3.494	3.213	3.743	3.113	3.531	3.213	3.743	ns
t_{COUT}	2.006	2.035	3.020	3.113	3.494	3.213	3.743	3.113	3.531	3.213	3.743	ns
t_{PLLCIN}	0.059	0.086	-0.150	-0.191	-0.109	-0.094	0.116	-0.191	0.291	-0.094	0.116	ns
$t_{PLLCOUT}$	0.059	0.086	-0.150	-0.191	-0.109	-0.094	0.116	-0.191	0.291	-0.094	0.116	ns

Table 1–171. EP3SL200 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.937	2.065	3.000	3.070	3.414	3.275	3.597	3.139	3.479	3.275	3.597	ns
t _{COUT}	1.855	1.974	2.848	2.910	3.233	3.104	3.438	2.971	3.290	3.104	3.438	ns
t _{PLLCIN}	0.126	0.197	-0.059	-0.091	-0.051	-0.036	-0.041	-0.043	0.410	-0.036	-0.041	ns
t _{PLLCOUT}	0.044	0.106	-0.211	-0.254	-0.232	-0.207	-0.200	-0.213	0.221	-0.207	-0.200	ns

Table 1–172 and Table 1–173 show the periphery clock timing parameters for EP3SL200 devices.

Table 1–172. EP3SL200 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.720	1.712	2.615	2.776	3.177	3.044	3.660	2.776	3.177	3.044	3.660	ns
t _{COUT}	1.720	1.712	2.615	2.776	3.177	3.044	3.660	2.776	3.177	3.044	3.660	ns
t _{PLLCIN}	0.037	0.064	-0.173	-0.213	-0.135	-0.118	0.090	-0.213	0.292	-0.118	0.090	ns
t _{PLLCOUT}	0.037	0.064	-0.173	-0.213	-0.135	-0.118	0.090	-0.213	0.292	-0.118	0.090	ns

Table 1–173. EP3SL200 Row Pin Periphery Clock Timing Specifications -

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.501	1.575	2.380	2.518	2.892	2.761	3.077	2.567	2.938	2.761	3.077	ns
t _{COUT}	1.419	1.484	2.225	2.355	2.711	2.590	2.918	2.397	2.749	2.590	2.918	ns
t _{PLLCIN}	0.105	0.174	-0.081	-0.118	-0.077	-0.061	-0.063	-0.067	0.411	-0.061	-0.063	ns
t _{PLLCOUT}	0.023	0.083	-0.233	-0.281	-0.258	-0.232	-0.222	-0.237	0.222	-0.232	-0.222	ns

EP3SL340 Clock Timing Parameters

Table 1–174 and Table 1–175 show the global clock timing parameters for EP3SL340 devices.

Table 1–174. EP3SL340 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.357	2.331	3.440	3.566	3.938	3.807	4.482	3.566	3.938	3.807	4.482	ns
t _{COUT}	2.357	2.331	3.440	3.566	3.938	3.807	4.482	3.566	3.938	3.807	4.482	ns
t _{PLLCIN}	0.091	0.058	-0.165	-0.152	-0.140	-0.096	0.111	-0.152	-0.140	-0.096	0.111	ns
t _{PLLCOUT}	0.091	0.058	-0.165	-0.152	-0.140	-0.096	0.111	-0.152	-0.140	-0.096	0.111	ns

Table 1-175. EP3SL340 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.293	2.479	3.608	3.630	4.020	3.880	4.324	3.746	4.099	3.977	4.369	ns
t _{COUT}	2.211	2.388	3.456	3.470	3.839	3.709	4.165	3.578	3.910	3.798	4.210	ns
t _{PLLCIN}	0.121	0.210	-0.034	-0.098	-0.045	-0.001	-0.042	-0.031	0.005	0.051	-0.083	ns
t _{PLLCOUT}	0.039	0.119	-0.186	-0.261	-0.226	-0.172	-0.201	-0.201	-0.184	-0.128	-0.242	ns

Table 1-176 and Table 1-177 show the regional clock timing parameters for EP3SL340 devices.

Table 1-176. EP3SL340 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.031	2.013	2.958	3.073	3.435	3.308	3.803	3.073	3.435	3.308	3.803	ns
t _{COUT}	2.031	2.013	2.958	3.073	3.435	3.308	3.803	3.073	3.435	3.308	3.803	ns
t _{PLLCIN}	0.127	0.094	-0.128	-0.116	-0.104	-0.061	0.148	-0.116	-0.104	-0.061	0.148	ns
t _{PLLCOUT}	0.127	0.094	-0.128	-0.116	-0.104	-0.061	0.148	-0.116	-0.104	-0.061	0.148	ns

Table 1-177. EP3SL340 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.998	2.161	3.129	3.149	3.501	3.376	3.648	3.242	3.570	3.463	3.707	ns
t _{COUT}	1.916	2.070	2.977	2.989	3.320	3.205	3.492	3.074	3.381	3.284	3.551	ns
t _{PLLCIN}	0.157	0.248	0.006	-0.069	-0.009	0.017	-0.011	0.003	0.039	0.093	-0.057	ns
t _{PLLCOUT}	0.075	0.157	-0.146	-0.232	-0.190	-0.154	-0.170	-0.167	-0.150	-0.086	-0.216	ns

Table 1-178 and Table 1-179 show the periphery clock timing parameters for EP3SL340 devices.

Table 1-178. EP3SL340 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.778	1.760	2.687	2.847	3.240	3.099	3.718	2.847	3.240	3.099	3.718	ns
t _{COUT}	1.778	1.760	2.687	2.847	3.240	3.099	3.718	2.847	3.240	3.099	3.718	ns
t _{PLLCIN}	0.086	0.061	-0.164	-0.161	-0.140	-0.097	0.101	-0.161	-0.140	-0.097	0.101	ns
t _{PLLCOUT}	0.086	0.061	-0.164	-0.161	-0.140	-0.097	0.101	-0.161	-0.140	-0.097	0.101	ns

Table 1–179. EP3SL340 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.524	1.616	2.435	2.567	2.958	2.823	3.141	2.605	3.002	2.861	3.165	ns
t _{COUT}	1.442	1.525	2.280	2.404	2.777	2.652	2.982	2.435	2.813	2.682	3.006	ns
t _{PLLCIN}	0.116	0.211	-0.039	-0.116	-0.055	-0.030	-0.051	-0.040	-0.006	0.050	-0.098	ns
t _{PLLCOUT}	0.034	0.120	-0.191	-0.279	-0.236	-0.201	-0.210	-0.210	-0.195	-0.129	-0.257	ns

EP3SE50 Clock Timing Parameters

Table 1–180 and Table 1–181 show the global clock timing parameters for EP3SE50 devices.

Table 1–180. EP3SE50 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.786	1.789	2.495	2.748	3.111	2.993	3.489	2.748	3.105	2.993	3.489	ns
t _{COUT}	1.786	1.789	2.495	2.748	3.111	2.993	3.489	2.748	3.105	2.993	3.489	ns
t _{PLLCIN}	0.023	0.027	-0.204	-0.268	-0.226	-0.180	0.025	-0.268	0.249	-0.180	0.025	ns
t _{PLLCOUT}	0.083	0.103	-0.068	-0.131	-0.226	-0.010	0.025	-0.131	0.249	-0.010	0.025	ns

Table 1–181. EP3SE50 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.739	1.849	2.536	2.769	3.112	3.010	3.250	2.830	3.171	3.069	3.276	ns
t _{COUT}	1.657	1.758	2.394	2.606	2.931	2.839	3.091	2.660	2.982	2.890	3.117	ns
t _{PLLCIN}	0.044	0.117	-0.143	-0.220	-0.183	-0.135	-0.189	-0.171	0.345	-0.088	-0.242	ns
t _{PLLCOUT}	-0.038	0.026	-0.285	-0.383	-0.364	-0.306	-0.348	-0.341	0.156	-0.267	-0.401	ns

Table 1–182 and Table 1–183 show the regional clock timing parameters for EP3SE50 devices.

Table 1–182. EP3SE50 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.711	1.721	2.429	2.679	3.053	2.767	3.191	2.679	3.053	2.767	3.191	ns
t _{COUT}	1.711	1.721	2.429	2.679	3.053	2.767	3.191	2.679	3.053	2.767	3.191	ns
t _{PLLCIN}	0.034	0.038	-0.193	-0.255	-0.212	-0.168	0.040	-0.255	0.263	-0.168	0.040	ns
t _{PLLCOUT}	0.106	0.102	-0.074	-0.101	-0.212	-0.168	0.040	-0.101	0.263	-0.168	0.040	ns

Table 1-183. EP3SE50 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.640	1.732	2.361	2.580	2.905	2.810	2.977	2.636	2.960	2.868	3.003	ns
t _{COUT}	1.558	1.641	2.219	2.417	2.724	2.639	2.818	2.466	2.771	2.689	2.844	ns
t _{PLLCIN}	0.020	0.091	-0.168	-0.241	-0.208	-0.155	-0.210	-0.191	0.321	-0.108	-0.264	ns
t _{PLLCOUT}	-0.062	0.000	-0.310	-0.404	-0.389	-0.326	-0.369	-0.361	0.132	-0.287	-0.423	ns

Table 1-184 and Table 1-185 show the periphery clock timing parameters for EP3SE50 devices.

Table 1-184. EP3SE50 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.472	1.481	2.155	2.417	2.825	2.681	3.247	2.417	2.819	2.681	3.247	ns
t _{COUT}	1.472	1.481	2.155	2.417	2.825	2.681	3.247	2.417	2.819	2.681	3.247	ns
t _{PLLCIN}	-0.047	-0.044	-0.288	-0.347	-0.302	-0.266	-0.079	-0.347	0.300	-0.266	-0.079	ns
t _{PLLCOUT}	-0.047	-0.044	-0.288	-0.347	-0.302	-0.266	-0.079	-0.347	0.300	-0.266	-0.079	ns

Table 1-185. EP3SE50 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.467	1.543	2.208	2.472	2.843	2.729	3.012	2.521	2.891	2.771	3.028	ns
t _{COUT}	1.385	1.452	2.063	2.309	2.662	2.558	2.853	2.351	2.702	2.592	2.869	ns
t _{PLLCIN}	-0.021	0.036	-0.231	-0.307	-0.282	-0.230	-0.301	-0.262	0.372	-0.184	-0.361	ns
t _{PLLCOUT}	-0.103	-0.055	-0.373	-0.470	-0.463	-0.401	-0.460	-0.432	0.183	-0.363	-0.520	ns

EP3SE80 Clock Timing Parameters

Table 1-186 and Table 1-187 show the global clock timing parameters for EP3SE80 devices.

Table 1-186. EP3SE80 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.037	2.059	2.879	3.127	3.524	3.430	3.989	3.127	3.524	3.430	3.989	ns
t _{COUT}	2.037	2.059	2.879	3.127	3.524	3.430	3.989	3.127	3.524	3.430	3.989	ns
t _{PLLCIN}	-0.024	-0.007	-0.235	-0.315	-0.292	-0.199	-0.042	-0.315	-0.292	-0.199	-0.042	ns
t _{PLLCOUT}	-0.024	-0.007	-0.235	-0.315	-0.292	-0.199	-0.042	-0.315	-0.292	-0.199	-0.042	ns

Table 1–187. EP3SE80 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.994	2.143	2.942	3.188	3.552	3.446	3.769	3.258	3.633	3.515	3.813	ns
t _{COUT}	1.912	2.052	2.800	3.025	3.371	3.275	3.610	3.089	3.444	3.336	3.654	ns
t _{PLLCIN}	0.020	0.086	-0.177	-0.249	-0.221	-0.171	-0.221	-0.199	-0.173	-0.121	-0.266	ns
t _{PLLCOUT}	-0.062	-0.005	-0.319	-0.412	-0.402	-0.342	-0.380	-0.369	-0.362	-0.300	-0.425	ns

Table 1–188 and Table 1–189 show the regional clock timing parameters for EP3SE80 devices.

Table 1–188. EP3SE80 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.828	1.849	2.578	2.811	3.171	3.087	3.547	2.811	3.171	3.087	3.547	ns
t _{COUT}	1.828	1.849	2.578	2.811	3.171	3.087	3.547	2.811	3.171	3.087	3.547	ns
t _{PLLCIN}	-0.013	0.004	-0.224	-0.303	-0.280	-0.187	-0.030	-0.303	-0.280	-0.187	-0.030	ns
t _{PLLCOUT}	-0.013	0.004	-0.224	-0.303	-0.280	-0.187	-0.030	-0.303	-0.280	-0.187	-0.030	ns

Table 1–189. EP3SE80 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.812	1.928	2.638	2.874	3.205	3.107	3.332	2.938	3.277	3.169	3.373	ns
t _{COUT}	1.730	1.837	2.496	2.711	3.024	2.936	3.173	2.768	3.088	2.990	3.214	ns
t _{PLLCIN}	0.010	0.087	-0.176	-0.259	-0.231	-0.167	-0.229	-0.210	-0.169	-0.118	-0.275	ns
t _{PLLCOUT}	-0.072	-0.004	-0.318	-0.422	-0.412	-0.338	-0.388	-0.380	-0.358	-0.297	-0.434	ns

Table 1–190 and Table 1–191 show the periphery clock timing parameters for EP3SE80 devices.

Table 1–190. EP3SE80 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.564	1.585	2.309	2.566	2.962	2.838	3.377	2.566	2.962	2.838	3.377	ns
t _{COUT}	1.564	1.584	2.308	2.566	2.962	2.844	3.377	2.566	2.962	2.844	3.377	ns
t _{PLLCIN}	-0.028	-0.006	-0.234	-0.327	-0.270	-0.193	-0.018	-0.327	-0.270	-0.193	-0.018	ns
t _{PLLCOUT}	-0.028	-0.006	-0.234	-0.327	-0.270	-0.193	-0.018	-0.327	-0.270	-0.193	-0.018	ns

Table 1–191. EP3SE80 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.441	1.503	2.156	2.429	2.776	2.665	2.934	2.477	2.828	2.711	2.959	ns
t _{COUT}	1.359	1.412	2.011	2.266	2.595	2.494	2.775	2.307	2.639	2.532	2.800	ns
t _{PLLCIN}	0.004	0.077	-0.186	-0.268	-0.243	-0.177	-0.238	-0.219	-0.177	-0.128	-0.287	ns
t _{PLLCOUT}	-0.078	-0.014	-0.328	-0.431	-0.424	-0.348	-0.397	-0.389	-0.366	-0.307	-0.446	ns

EP3SE110 Clock Timing Parameters

Table 1–192 and Table 1–193 show the global clock timing parameters for EP3SE110 devices.

Table 1–192. EP3SE110 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.046	2.046	2.868	3.144	3.524	3.429	3.989	3.144	3.524	3.429	3.989	ns
t _{COUT}	2.046	2.046	2.868	3.144	3.524	3.429	3.989	3.144	3.524	3.429	3.989	ns
t _{PLLCIN}	-0.020	-0.034	-0.265	-0.311	-0.267	-0.198	-0.034	-0.311	-0.267	-0.198	-0.034	ns
t _{PLLCOUT}	-0.020	-0.034	-0.265	-0.311	-0.267	-0.198	-0.034	-0.311	-0.267	-0.198	-0.034	ns

Table 1–193. EP3SE110 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.985	2.130	2.928	3.183	3.546	3.437	3.772	3.250	3.615	3.507	3.815	ns
t _{COUT}	1.903	2.039	2.786	3.020	3.365	3.266	3.613	3.082	3.426	3.328	3.656	ns
t _{PLLCIN}	0.012	0.084	-0.180	-0.253	-0.223	-0.173	-0.223	-0.207	-0.173	-0.123	-0.267	ns
t _{PLLCOUT}	-0.070	-0.007	-0.322	-0.416	-0.404	-0.344	-0.382	-0.377	-0.362	-0.302	-0.426	ns

Table 1–194 and Table 1–195 show the regional clock timing parameters for EP3SE110 devices.

Table 1–194. EP3SE110 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.828	1.849	2.578	2.811	3.155	3.082	3.560	2.811	3.155	3.082	3.560	ns
t _{COUT}	1.828	1.849	2.578	2.811	3.155	3.082	3.560	2.811	3.155	3.082	3.560	ns
t _{PLLCIN}	-0.008	-0.022	-0.254	-0.299	-0.255	-0.186	-0.021	-0.299	-0.255	-0.186	-0.021	ns
t _{PLLCOUT}	-0.008	-0.022	-0.254	-0.299	-0.255	-0.186	-0.021	-0.299	-0.255	-0.186	-0.021	ns

Table 1–195. EP3SE110 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.798	1.924	2.631	2.860	3.204	3.101	3.332	2.920	3.268	3.163	3.373	ns
t_{COUT}	1.716	1.833	2.489	2.697	3.023	2.930	3.173	2.750	3.079	2.984	3.214	ns
t_{PLLCIN}	0.001	0.076	-0.188	-0.262	-0.231	-0.184	-0.229	-0.218	-0.180	-0.134	-0.277	ns
$t_{PLLCOUT}$	-0.081	-0.015	-0.330	-0.425	-0.412	-0.355	-0.388	-0.388	-0.369	-0.313	-0.436	ns

Table 1–196 and Table 1–197 show the periphery clock timing parameters for EP3SE110 devices.

Table 1–196. EP3SE110 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.564	1.585	2.309	2.566	2.951	2.843	3.398	2.566	2.951	2.843	3.398	ns
t_{COUT}	1.564	1.584	2.308	2.566	2.951	2.843	3.398	2.566	2.951	2.843	3.398	ns
t_{PLLCIN}	-0.019	-0.019	-0.245	-0.310	-0.267	-0.194	-0.018	-0.310	-0.267	-0.194	-0.018	ns
$t_{PLLCOUT}$	-0.019	-0.019	-0.245	-0.310	-0.267	-0.194	-0.018	-0.310	-0.267	-0.194	-0.018	ns

Table 1–197. EP3SE110 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	1.423	1.502	2.156	2.411	2.781	2.659	2.934	2.455	2.826	2.704	2.949	ns
t_{COUT}	1.341	1.411	2.011	2.248	2.600	2.488	2.775	2.285	2.637	2.525	2.790	ns
t_{PLLCIN}	0.001	0.069	-0.195	-0.271	-0.241	-0.188	-0.238	-0.222	-0.190	-0.139	-0.288	ns
$t_{PLLCOUT}$	-0.081	-0.022	-0.337	-0.434	-0.422	-0.359	-0.397	-0.392	-0.379	-0.318	-0.447	ns

EP3SE260 Clock Timing Parameters

Table 1–198 and Table 1–199 show the global clock timing parameters for EP3SE260 devices.

Table 1–198. EP3SE260 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=1.1V$	$V_{CCL}=0.9V$	
t_{CIN}	2.237	2.237	3.302	3.416	3.837	3.683	4.331	3.416	3.837	3.683	4.331	ns
t_{COUT}	2.237	2.237	3.302	3.416	3.837	3.683	4.331	3.416	3.837	3.683	4.331	ns
t_{PLLCIN}	0.040	0.040	-0.199	-0.211	-0.135	-0.127	0.074	-0.211	0.296	-0.127	0.074	ns
$t_{PLLCOUT}$	0.040	0.040	-0.199	-0.211	-0.135	-0.127	0.074	-0.211	0.296	-0.127	0.074	ns

Table 1-199. EP3SE260 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	2.171	2.374	3.458	3.526	3.868	3.768	4.184	3.564	3.943	3.768	4.184	ns
t _{COUT}	2.089	2.283	3.306	3.366	3.687	3.597	4.025	3.396	3.754	3.597	4.025	ns
t _{PLLCIN}	0.091	0.172	-0.087	-0.116	-0.085	-0.031	-0.071	-0.077	0.399	-0.031	-0.071	ns
t _{PLLCOUT}	0.009	0.081	-0.239	-0.279	-0.266	-0.202	-0.230	-0.247	0.210	-0.202	-0.230	ns

Table 1-200 and Table 1-201 show the regional clock timing parameters for EP3SE260 devices.

Table 1-200. EP3SE260 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.930	2.003	2.983	2.955	3.531	3.209	3.736	2.955	3.531	3.209	3.736	ns
t _{COUT}	1.930	2.003	2.983	2.955	3.531	3.209	3.736	2.955	3.531	3.209	3.736	ns
t _{PLLCIN}	0.061	0.066	-0.172	-0.191	-0.109	-0.091	0.102	-0.191	0.302	-0.091	0.102	ns
t _{PLLCOUT}	0.061	0.066	-0.172	-0.191	-0.109	-0.091	0.102	-0.191	0.302	-0.091	0.102	ns

Table 1-201. EP3SE260 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.903	2.065	3.000	3.070	3.388	3.294	3.593	3.103	3.457	3.294	3.593	ns
t _{COUT}	1.821	1.974	2.848	2.910	3.207	3.123	3.434	2.935	3.268	3.123	3.434	ns
t _{PLLCIN}	0.088	0.199	-0.056	-0.091	-0.081	-0.009	-0.049	-0.078	0.379	-0.009	-0.049	ns
t _{PLLCOUT}	0.006	0.108	-0.208	-0.254	-0.262	-0.180	-0.208	-0.248	0.190	-0.180	-0.208	ns

Table 1-202 and Table 1-203 show the periphery clock timing parameters for EP3SE260 devices

Table 1-202. EP3SE260 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 1.1V	V _{CCL} = 0.9V	
t _{CIN}	1.709	1.716	2.620	2.765	3.177	3.039	3.668	2.765	3.177	3.039	3.668	ns
t _{COUT}	1.709	1.716	2.620	2.765	3.177	3.039	3.668	2.765	3.177	3.039	3.668	ns
t _{PLLCIN}	0.037	0.037	-0.202	-0.213	-0.140	-0.119	0.075	-0.213	0.293	-0.119	0.075	ns
t _{PLLCOUT}	0.037	0.037	-0.202	-0.213	-0.140	-0.119	0.075	-0.213	0.293	-0.119	0.075	ns

Table 1–203. EP3SE260 Row Pin Peripheral Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=1.1V$	$V_{CC1}=0.9V$	
t_{CIN}	1.495	1.574	2.378	2.518	2.878	2.776	3.072	2.555	2.926	2.776	3.072	ns
t_{COUT}	1.413	1.483	2.223	2.355	2.697	2.605	2.913	2.385	2.737	2.605	2.913	ns
t_{PLLCIN}	0.065	0.172	-0.084	-0.118	-0.103	-0.033	-0.071	-0.103	0.384	-0.033	-0.071	ns
$t_{PLLCOUT}$	-0.017	0.081	-0.236	-0.281	-0.284	-0.204	-0.230	-0.273	0.195	-0.204	-0.230	ns

Glossary

The following table shows the glossary for this chapter.

Table 1.

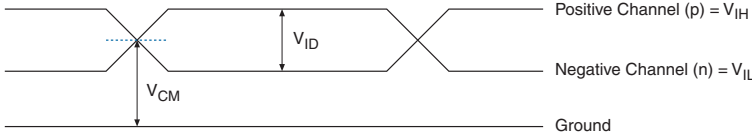
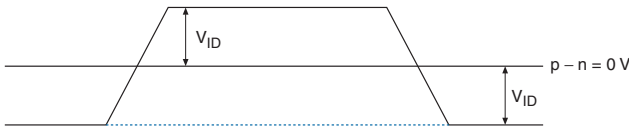
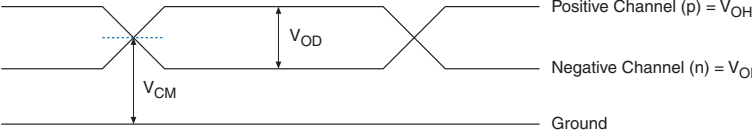
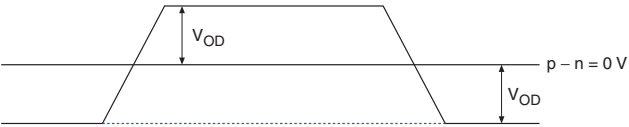
Glossary Table (Part 1 of 4)		
Letter	Subject	Definitions
A	—	—
B	—	—
C	—	—
D	Differential I/O Standards	Receiver Input Waveforms  Single-Ended Waveform Positive Channel (p) = V_{IH} Negative Channel (n) = V_{IL} Ground Differential Voltage: V_{ID} Common-Mode Voltage: V_{CM} Differential Waveform  Differential Voltage: V_{ID} Common-Mode Voltage: $p - n = 0V$ Transmitter Output Waveforms  Single-Ended Waveform Positive Channel (p) = V_{OH} Negative Channel (n) = V_{OL} Ground Differential Voltage: V_{OD} Common-Mode Voltage: V_{CM} Differential Waveform  Differential Voltage: V_{OD} Common-Mode Voltage: $p - n = 0V$

Table 1.

Glossary Table (Part 2 of 4)		
Letter	Subject	Definitions
E	—	—
F	f_{HSCLK}	HIGH-SPEED I/O Block: High-speed receiver/transmitter input and output clock frequency.
	f_{HSDR}	HIGH-SPEED I/O Block: Maximum/minimum LVDS data transfer rate ($f_{\text{HSDR}} = 1/\text{TUI}$), non-DPA.
	f_{HSDRDPA}	HIGH-SPEED I/O Block: Maximum/minimum LVDS data transfer rate ($f_{\text{HSDRDPA}} = 1/\text{TUI}$), DPA.
G	—	—
H	—	—
I	—	—
J	J	HIGH-SPEED I/O Block: Deserialization factor (width of parallel data bus).
	JTAG Timing Specifications	JTAG Timing Specifications are in the following figure:
K	—	—
L	—	—
M	—	—
N	—	—
O	—	—
P	PLL Specifications	The block diagram shown in the following figure highlights the PLL Specification parameters: Diagram of PLL Specifications (1) Note: (1) CoreClock can only be fed by dedicated clock input pins or PLL outputs.
Q	—	—

Table 1.

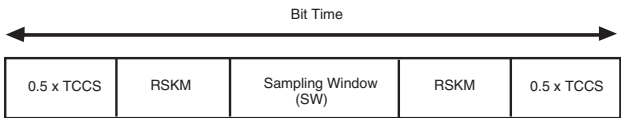
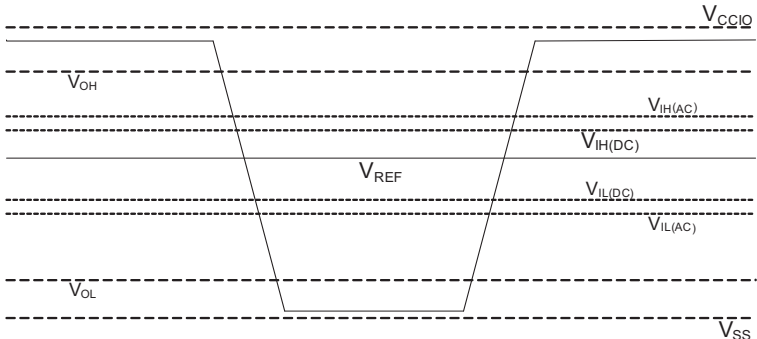
Glossary Table (Part 3 of 4)		
Letter	Subject	Definitions
R	R_L	Receiver differential input discrete resistor (external to Stratix III device).
S	SW (sampling window)	The period of time during which the data must be valid in order to capture it correctly. The setup and hold times determine the ideal strobe position within the sampling window (the following figure): Timing Diagram 
	Single-ended Voltage Referenced I/O Standard	The JEDEC standard for SSTI and HSTL I/O standards defines both the AC and DC input signal values. The AC values indicate the voltage levels at which the receiver must meet its timing specifications. The DC values indicate the voltage levels at which the final logic state of the receiver is unambiguously defined. Once the receiver input has crossed the AC value, the receiver will change to the new logic state. The new logic state will be maintained as long as the input stays beyond the DC threshold. This approach is intended to provide predictable receiver timing in the presence of input waveform ringing (The following figure): Single-Ended Voltage Referenced I/O Standard 
T	t_c	High-speed receiver/transmitter input and output clock period.
	TCCS (channel-to-channel-skew)	The timing difference between the fastest and the slowest output edges, including t_{co} variation and clock skew, across channels driven by the same PLL. The clock is included in the TCCS measurement (refer to the <i>Timing Diagram</i> figure under S in this table)
	t_{DUTY}	HIGH-SPEED I/O Block: Duty cycle on high-speed transmitter output clock. Timing Unit Interval (TUI) The timing budget allowed for skew, propagation delays, and data sampling window. (TUI = $1/(\text{Receiver Input Clock Frequency Multiplication Factor}) = t_c/w$)
	t_{FALL}	Signal High-to-low transition time (80-20%)
	t_{INCCJ}	Cycle-to-cycle jitter tolerance on PLL clock input
	t_{OUTPJ_IO}	Period jitter on general purpose I/O driven by a PLL
	t_{OUTPJ_DC}	Period jitter on dedicated clock output driven by a PLL
	t_{RISE}	Signal Low-to-high transition time (20-80%)
U	—	—

Table 1.

Glossary Table (Part 4 of 4)		
Letter	Subject	Definitions
V	$V_{CM(DC)}$	DC Common Mode Input Voltage.
	V_{ICM}	Input Common Mode Voltage: The common mode of the differential signal at the receiver.
	V_{ID}	Input differential Voltage Swing: The difference in voltage between the positive and complementary conductors of a differential transmission at the receiver.
	$V_{DIF(AC)}$	AC differential Input Voltage: Minimum AC input differential voltage required for switching.
	$V_{DIF(DC)}$	DC differential Input Voltage: Minimum DC input differential voltage required for switching.
	V_{IH}	Voltage Input High: The minimum positive voltage applied to the input that will be accepted by the device as a logic high.
	$V_{IH(AC)}$	High-level AC input voltage
	$V_{IH(DC)}$	High-level DC input voltage
	V_{IL}	Voltage Input Low: The maximum positive voltage applied to the input that will be accepted by the device as a logic low.
	$V_{IL(AC)}$	Low-level AC input voltage
	$V_{IL(DC)}$	Low-level DC input voltage
	V_{OCM}	Output Common Mode Voltage: The common mode of the differential signal at the transmitter.
	V_{OD}	Output differential Voltage Swing: The difference in voltage between the positive and complementary conductors of a differential transmission at the transmitter.
	V_{OH}	Voltage Output High: The maximum positive voltage from an output which the device considers will be accepted as the minimum positive high level.
	V_{OL}	Voltage Output Low: The maximum positive voltage from an output which the device considers will be accepted as the maximum positive low level.
	$V_{X(AC)}$	AC differential Input cross point Voltage: The voltage at which the differential input signals must cross.
	$V_{SWING(AC)}$	AC differential Input Voltage: AC Input differential voltage required for switching.
	$V_{SWING(DC)}$	DC differential Input Voltage: DC Input differential voltage required for switching.
	V_{IN}	DC input voltage.
	$V_{OX(AC)}$	AC differential Output cross point Voltage: The voltage at which the differential output signals must cross.
	V_{REF}	Reference voltage for SSTL and HSTL I/O Standards.
	V_{TT}	Termination voltage for SSTL and HSTL I/O Standards.
W	W	HIGH-SPEED I/O BLOCK: Clock Boost Factor
X	—	—
Y	—	—
Z	—	—

Chapter Revision History

Table 1-204 shows the revision history for this document.

Table 1-204. Chapter Revision History (Part 1 of 2)

Date and Revision	Changes Made	Summary of Changes
July 2009, version 2.1	- Updated Table 1-43, Table 1-44, Table 1-45, Table 1-49, Table 1-50, Table 1-53, Table 1-54, Table 1-55, Table 1-59, Table 1-60, Table 1-63, Table 1-65, Table 1-73, Table 1-75, Table 1-83, Table 1-84, Table 1-85, Table 1-89, Table 1-90, Table 1-93, Table 1-95, Table 1-103, Table 1-104, Table 1-105, Table 1-109, Table 1-110, Table 1-113, Table 1-115, Table 1-123, Table 1-125, Table 1-133, Table 1-134, Table 1-135, Table 1-139, and Table 1-140. - Updated “Glossary” section.	—
May 2009, version 2.0	- Updated Table 1-1, Table 1-7, Table 1-9, Table 1-18, Table 1-21, Table 1-22, Table 1-23, Table 1-25, Table 1-26, Table 1-30, Table 1-31, Table 1-32, Table 1-35, Table 1-37, Table 1-43, Table 1-45, Table 1-53, Table 1-55, Table 1-63, Table 1-65, Table 1-73, Table 1-75, Table 1-83, Table 1-85, Table 1-93, Table 1-95, Table 1-103, Table 1-105, Table 1-113, Table 1-115, Table 1-123, Table 1-125, Table 1-133, and Table 1-135. - Updated Equation 1-1.	—
February 2009, version 1.9	- Updated “Programmable IOE Delay”, “PLL Specifications”, “DSP Block Specifications”, “TriMatrix Memory Block Specifications”, “External Memory Interface Specifications”, and “High-Speed I/O Specifications” sections. - Updated all Timing Information Tables in “User I/O Pin Timing” and “Dedicated Clock Pin Timing” sections. - Removed “Referenced Documents” and “Maximum Input and Output Toggle Rate” sections.	—
October 2008, version 1.8	- Updated “Operating Conditions”. - Added “Bus Hold Specifications”. - Updated Table 1-3, Table 1-6, Table 1-7, Table 1-11, and Table 1-14. - Updated Table 1-17 to Table 1-25. - Updated Table 1-39 to Table 1-47. - Updated Table 1-50 to Table 1-210. - Added (Note 3) to Table 1-11. - Added (Note 1) to Table 1-14. - Added (Note 6) to Table 1-17. - Added (Note 1) to Table 1-47. - Added Table 1-26. - Added Figure 1-2.	—

Table 1-204. Chapter Revision History (Part 2 of 2)

Date and Revision	Changes Made	Summary of Changes
July 2008, version 1.7	■ Updated “Operating Conditions” introduction section. ■ Updated Table 1-3, Table 1-7, Table 1-8, Table 1-19, Table 1-21, Table 1-22, Table 1-25, Table 1-26, Table 1-28, Table 1-29, Table 1-30, Table 1-31, Table 1-32, Table 1-33, Table 1-35, and Table 1-48. ■ Updated “PLL Specifications” introduction section. ■ Updated “I/O Timing Measurement Methodology” section. ■ Updated Figure 1-5, Figure 1-6, and Figure 1-7.	—
May 2008, version 1.6	■ Updated all tables for timing section. ■ Added “Internal Weak Pull-Up Resistor” section. ■ Removed “Stratix III Temperature Sensing Diode Specifications” section. ■ Added Figure 1-6 and Figure 1-7. ■ Added derating factors Table 1-45 and Table 1-46.	Text, Table, and Figure updates.
November 2007, version 1.5	■ Updated Table 1-90 to Table 1-109. ■ Updated Table 1-140 to Table 1-149. ■ Updated Table 1-175 to Table 1-180. ■ Updated Table 1-181 to Table 1-186. ■ Updated Table 1-205 to Table 1-210.	—
October 2007, version 1.4	■ Updated I/O Timing ■ Added new device packages for EP3SL50, EP3SL110, EP3SE80.	—
May 2007, version 1.3	Added new contact information table to the About this Handbook section.	—
May 2007, version 1.2	Updated Table 1-44 through Table 1-205.	—
March 2007, version 1.1	Added I/O Timing section	—
November 2006, version 1.0	Initial Release	—