

100LVEL11

3.3V ECL 1:2 Differential Fanout Buffer

General Description

The 100LVEL11 is a low voltage 1:2 differential fanout buffer. One differential input signal is fanned out to two identical differential outputs. By supplying a constant reference level to one input pin a single ended input condition is created.

With inputs Open or both inputs at V_{EE} , the differential Q outputs default LOW and \bar{Q} outputs default HIGH.

The 100 series is temperature compensated.

Features

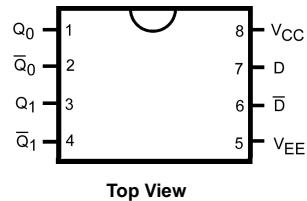
- Typical propagation delay of 330 ps
- Typical I_{EE} of 24 mA
- Typical skew of 5 ps between outputs
- Internal pull-down resistors on D
- Fairchild MSOP-8 package is a drop-in replacement to ON TSSOP-8
- Meets or exceeds JEDEC specification EIA/JESD78 IC latch-up tests
- Moisture Sensitivity Level 1
- ESD Performance:
Human Body Model > 2000V
Machine Model > 200V

Ordering Code:

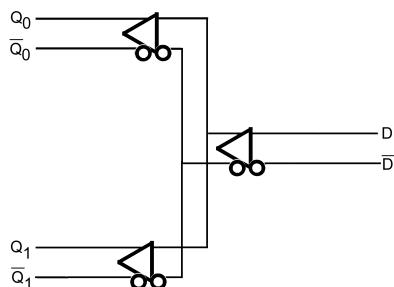
Order Number	Package Number	Product Code Top Mark	Package Description
100LVEL11M	M08A	KVL11	8-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
100LVEL11M8 (Preliminary)	MA08D	KV11	8-Lead Molded Small Outline Package (MSOP), JEDEC MO-187, 3.0mm Wide

Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

Connection Diagram



Logic Diagram



Pin Descriptions

Pin Name	Description
$Q_0, \bar{Q}_0, Q_1, \bar{Q}_1$	ECL Data Outputs
D, \bar{D}	ECL Data Inputs
V_{CC}	Positive Supply
V_{EE}	Negative Supply

100LVEL11

Absolute Maximum Ratings ^(Note 1)			Recommended Operating Conditions								
PECL Supply Voltage (V_{CC})	$V_{EE} = 0V$	0.0V to +8.0V	PECL Power Supply Operating ($V_{EE} = 0V$)					$V_{CC} = 3.0V$ to 3.8V			
NECL Supply Voltage (V_{EE})	$V_{CC} = 0V$	0.0V to -8.0V	NECL Power Supply Operating ($V_{CC} = 0V$)					$V_{EE} = -3.8V$ to -3.0V			
PECL DC Input Voltage (V_I)	$V_{EE} = 0V$	0.0V to +6.0V	Free Air Operating Temperature (T_A)					-40°C to +85°C			
NECL DC Input Voltage (V_I)	$V_{CC} = 0V$	0.0V to -6.0V	Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum rating. The "Recommended Operating Conditions" table will define the conditions for actual device operation.								
DC Output Current (I_{OUT})											
Continuous		50 mA									
Surge		100 mA									
Storage Temperature (T_{STG})		-65°C to +150°C									
LVPECL DC Electrical Characteristics $V_{CC} = 3.3V$; $V_{EE} = 0.0V$ (Note 2)											
Symbol	Parameter	-40°C			25°C			85°C			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current	24	28		24	28		25	30	mA	
V_{OH}	Output HIGH Voltage (Note 3)	2215	2295	2420	2275	2345	2420	2275	2345	2420	mV
V_{OL}	Output LOW Voltage (Note 3)	1470	1605	1745	1490	1595	1680	1490	1595	1680	mV
V_{IH}	Input HIGH Voltage (Single Ended)	2135		2420	2135		2420	2135		2420	mV
V_{IL}	Input LOW Voltage (Single Ended)	1490		1825	1490		1825	1490		1825	mV
V_{IHCMR}	Input HIGH Voltage Common Mode Range (Differential) (Note 4)										
	$V_{PP} < 500mV$	1.2		3.1	1.1		3.1	1.1		3.1	V
	$V_{PP} \geq 500mV$	1.4		3.1	1.3		3.1	1.3		3.1	
I_{IH}	Input HIGH Current (Note 5)		150			150			150		μA
I_{IL}	Input LOW Current (Note 5)	D	0.5		0.5		0.5		0.5		μA
		D	-600		-600		-600		-600		

Note 2: Input and output parameters vary 1 to 1 with V_{CC} . V_{EE} can vary $\pm 0.3V$.**Note 3:** Outputs are terminated through a 50Ω Resistor to $V_{CC} - 2.0V$.**Note 4:** V_{IHCMR} minimum varies 1 to 1 with V_{EE} . V_{IHCMR} maximum varies 1-to-1 with V_{CC} . The V_{IHCMR} range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{PPMIN} and 1V.**Note 5:** Absolute value of the input HIGH and LOW current should not exceed the absolute value of the stated Min or Max specification.**Note:** Devices are designed to meet the DC specifications after thermal equilibrium has been established. Circuit is tested with air flow greater than 500LPM maintained.

LVNECL DC Electrical Characteristics $V_{CC} = 0.0V$; $V_{EE} = -3.3V$ (Note 6)

Symbol	Parameter	-40°C			25°C			85°C			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current	24	28		24	28		25	30		mA
V_{OH}	Output HIGH Voltage (Note 7)	-1085	-1005	-880	-1025	-955	-880	-1025	-955	-880	mV
V_{OL}	Output LOW Voltage (Note 7)	-1830	-1695	-1555	-1810	-1705	-1620	-1810	-1705	-1620	mV
V_{IH}	Input HIGH Voltage (Single Ended)	-1165		-880	-1165		-880	-1165		-880	mV
V_{IL}	Input LOW Voltage (Single Ended)	-1810		-1475	-1810		-1475	-1810		-1475	mV
V_{IHCMR}	Input HIGH Voltage Common Mode Range (Differential) (Note 8)										
	$V_{PP} < 500\text{mV}$	-2.1	-0.2	-2.2	-0.2	-2.2	-0.2				V
	$V_{PP} \geq 500\text{mV}$	-1.9	-0.2	-2.0	-0.2	-2.0	-0.2				
I_{IH}	Input HIGH Current (Note 9)		150			150			150		μA
I_{IL}	Input LOW Current (Note 9)	D	0.5		0.5		0.5		0.5		μA
		\bar{D}	-600		-600		-600		-600		

Note 6: Input and output parameters vary 1 to 1 with V_{CC} . V_{EE} can vary $\pm 0.3\text{V}$.

Note 7: Outputs are terminated through a 50Ω Resistor to $V_{CC} - 2.0\text{V}$.

Note 8: V_{IHCMR} minimum varies 1-to-1 with V_{EE} ; V_{IHCMR} maximum varies 1 to 1 with V_{CC} . The V_{IHCMR} range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{PPMIN} and 1V .

Note 9: Absolute value of the input HIGH and LOW current should not exceed the absolute value of the stated Min or Max specification.

Note: Devices are designed to meet the DC specifications after thermal equilibrium has been established. Circuit is tested with air flow greater than 500LFPM maintained.

AC Electrical Characteristics $V_{CC} = 3.3\text{V}$; $V_{EE} = 0.0\text{V}$ or $V_{CC} = 0.0\text{V}$; $V_{EE} = -3.3\text{V}$ (Note 10)(Note 11)

Symbol	Parameter	-40°C			25°C			85°C			Units	Figure Number
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
f_{MAX}	Maximum Toggle Frequency	1			1			1			GHz	
t_{PLH}, t_{PHL}	Propagation Delay to Output	215	385	405	235	330	405	250	435		ps	Figure 1
t_{SKEW}	Within Device Skew (Note 12)	5	20		5	20		5	20		ps	
	Duty Cycle Skew (Note 13)	5	20		5	20		5	20			
t_{JITTER}	Cycle-to-Cycle Jitter	TBD			TBD			TBD				
V_{PP}	Input Swing	200	1000	200	1000	200	1000	200	1000		mV	Figure 1
t_r, t_f	Output Rise Times Q (20% to 80%)	120	320	120	320	120	320	120	320		ps	Figure 2

Note 10: V_{EE} can vary $\pm 0.3\text{V}$.

Note 11: Measured using a 750 mV input swing centered at $V_{CC} - 1.32\text{V}$; 50% duty cycle clock source; $t_r = t_f = 250\text{ ps}$ (20% - 80%) at $f_{IN} = 1\text{ MHz}$. All loading with 50Ω to $V_{CC} - 2.0\text{V}$.

Note 12: Within-device skew defined as identical transitions on similar paths through a device.

Note 13: Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device under identical conditions.

Switching Waveforms

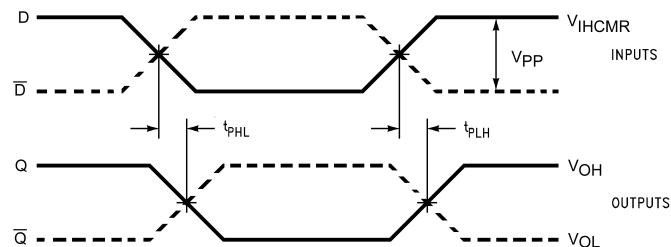


FIGURE 1. Differential to Differential Propagation Delay

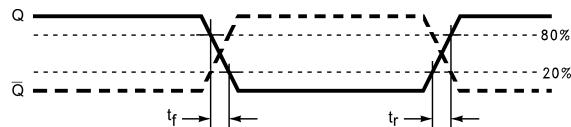
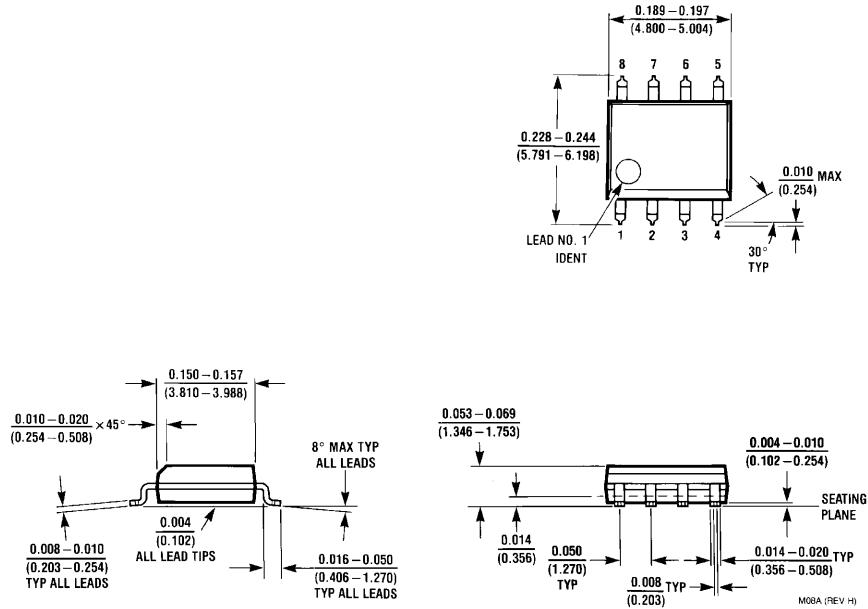
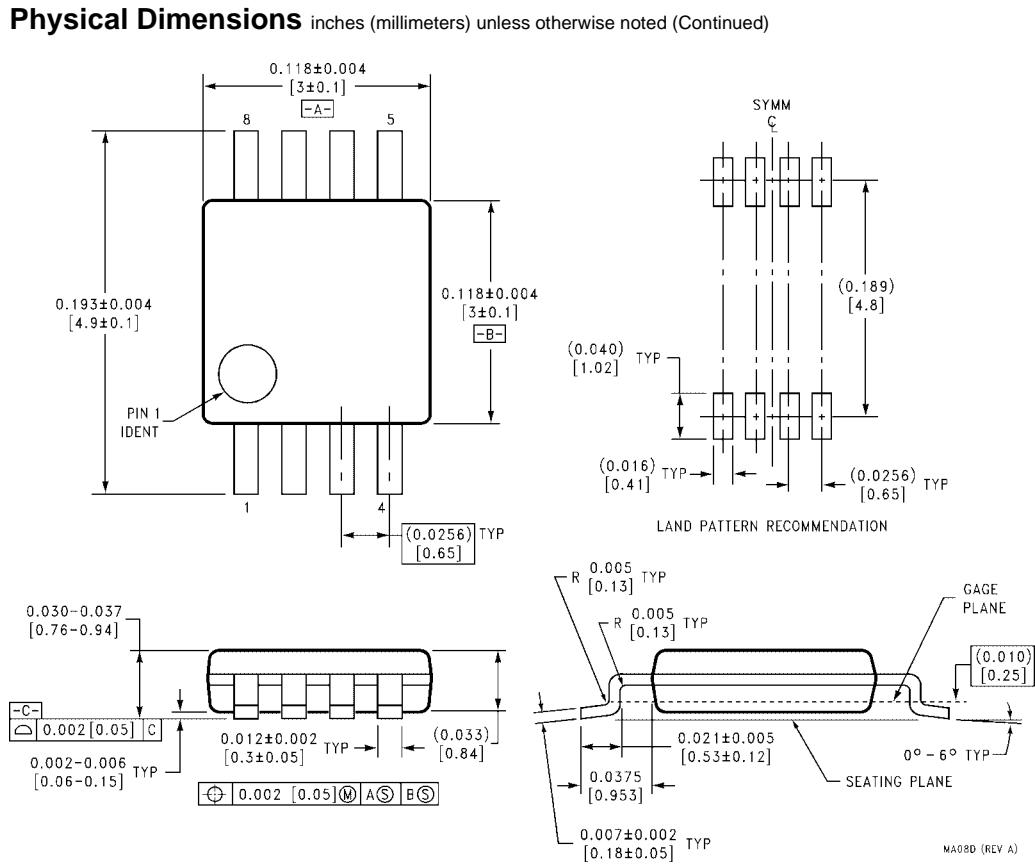


FIGURE 2. Differential Output Edge Rates

Physical Dimensions inches (millimeters) unless otherwise noted

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