

FEATURES

- 3.3V and 5V power supply options
- 440ps propagation delay
- Separate and common select
- High bandwidth output transitions
- Internal 75K Ω input pull-down resistors
- Available in 20-pin SOIC package

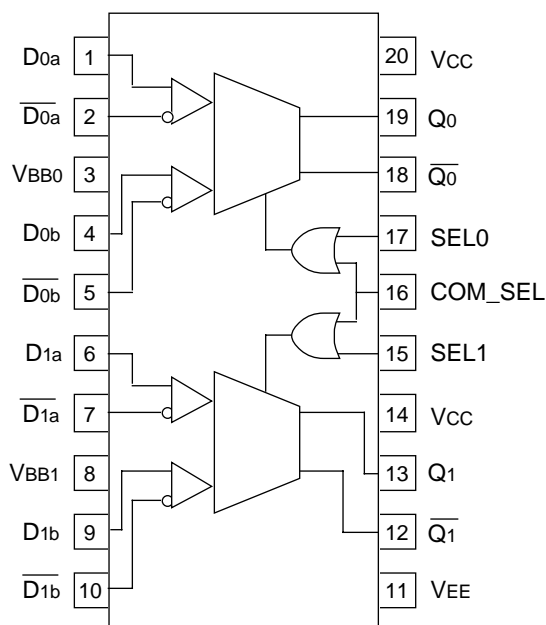
DESCRIPTION

The SY100EL56V is a dual, fully differential 2:1 multiplexer. The differential data path makes the device ideal for multiplexing low skew clock or other skew sensitive signals. Multiple V_{BB} pins are provided to ease AC coupling input signals.

The device features both individual and common select inputs to address both data path and random logic applications.

The differential inputs have special circuitry which ensures device stability under open input conditions. When both differential inputs are left open the D input will pull down to V_{EE} , the $/D$ input will bias around $V_{CC}/2$ forcing the Q output LOW.

PIN CONFIGURATION/BLOCK DIAGRAM



**SOIC
TOP VIEW**

TRUTH TABLE

SEL	Data
H	a
L	b

PIN NAMES

Pin	Function
D0a–D1a	Input Data a
D0b–D1b	Input Data b
SEL0–SEL1	Individual Select Input
COM_SEL	Common Select Input
Q0–Q1	True Outputs
/Q0–/Q1	Inverted Outputs

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Rating	Value	Unit
V_{CC}	Power Supply Voltage ($V_{EE} = 0$)	+6.0 to 0	V
V_{EE}	Power Supply Voltage ($V_{CC} = 0$)	-6.0 to 0	V
V_{IN}	Input Voltage ($V_{CC} = 0V$, V_{IN} not more negative than V_{EE}) Input Voltage ($V_{EE} = 0V$, V_{IN} not more positive than V_{CC})	-6.0 to 0 +6.0 to 0	V V
I_{OUT}	Output Current -Continuous -Surge	50 100	mA
T_A	Operating Temperature Range	-40 to +85	°C
T_{store}	Storage Temperature Range	-65 to +150	°C
θ_{JA}	Thermal Resistance (Junction-to-Ambient) -Still Air -500lfpm	160 109	°C/W °C/W
θ_{JC}	Thermal Resistance (Junction-to-Case)	39	°C/W
ESD	Mil Std. 883 Human Body Model, All Pins	>1.5k	V

Note 1. Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to ABSOLUTE MAXIMUM RATING conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS⁽¹⁾

$V_{EE} = V_{EE} \text{ (Min) to } V_{EE} \text{ (Max)}; V_{CC} = \text{GND}$

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
I_{EE}	Power Supply Current	—	20	24	—	20	24	—	20	24	—	20	24	mA
V_{BB}	Output Reference Voltage	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	V
I_{IH}	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I_{IL}	Input LOW Current	—	—	—	—	—	—	—	—	—	—	—	—	μA
		$\frac{D_n}{D_n}$	0.5	—	0.5	—	—	0.5	—	—	0.5	—	—	
$V_{PP}(\text{DC})$	Input Sensitivity ⁽²⁾	50	—	—	50	—	—	50	—	—	50	—	—	mV

Note 1. Parametric values specified at: 100EL56V Series: (-3.0V to -3.8V) or (-4.2V to -5.5V).

Note 2. Differential input voltage required to obtain a full ECL swing on the outputs.

AC ELECTRICAL CHARACTERISTICS

$V_{EE} = V_{EE} (\text{Min})$ to $V_{EE} (\text{Max})$; $V_{CC} = \text{GND}$

Symbol	Parameter	$T_A = -40^\circ\text{C}$			$T_A = 0^\circ\text{C}$			$T_A = +25^\circ\text{C}$			$T_A = +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
tPLH	Propagation D (Diff)	340	—	540	350	—	550	360	—	560	380	—	580	ps
tPHL	Delay D (SE)	290	—	590	300	—	600	310	—	610	330	—	630	
	to Output SEL	430	—	730	440	—	740	440	—	740	450	—	750	
	COM_SEL	430	—	730	440	—	740	440	—	740	450	—	750	
tsKEW	Within Device Skew ⁽¹⁾	—	40	80	—	40	80	—	40	80	—	40	80	ps
	Duty Cycle Skew ⁽²⁾	—	—	100	—	—	100	—	—	100	—	—	100	ps
VPP(AC)	Minimum Input Swing ⁽³⁾	150	—	1000	150	—	1000	150	—	1000	150	—	1000	mV
VCMR	Common Mode Range													V
	$V_{EE} = -3.0\text{V}$ to -3.8V ⁽⁴⁾													
	$V_{PP} < 500\text{mV}$	-2.0	—	-0.4	-2.1	—	-0.4	-2.1	—	-0.4	-2.1	—	-0.4	
	$V_{PP} \geq 500\text{mV}$	-1.8	—	-0.4	-1.9	—	-0.4	-1.9	—	-0.4	-1.9	—	-0.4	
	$V_{EE} = -4.2\text{V}$ to -5.5V ⁽⁵⁾													
	$V_{PP} < 500\text{mV}$	-3.2	—	-0.4	-3.3	—	-0.4	-3.3	—	-0.4	-3.3	—	-0.4	
	$V_{PP} \geq 500\text{mV}$	-3.0	—	-0.4	-3.1	—	-0.4	-3.1	—	-0.4	-3.1	—	-0.4	
tr	Output Rise/Fall Times Q	200	—	540	200	—	540	200	—	540	200	—	540	ps
tf	(20% – 80%)													

Note 1. Within device skew is defined as identical transitions on similar paths through a device.

Note 2. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.

Note 3. Minimum input swing for which AC parameters are guaranteed.

Note 4. The CMR 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 $V_{PP}(\text{min})$ and 1V. The lower end of the CMR range varies 1:1 with V_{EE} . The numbers in the spec table assume a nominal $V_{EE} = -3.3\text{V}$. Note for PECL operation, the $V_{CMR}(\text{min})$ will be fixed at $3.3\text{V} - |V_{CMR}(\text{min})|$.

Note 5. The CMR 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 $V_{PP}(\text{min})$ and 1V. The lower end of the CMR range varies 1:1 with V_{EE} . The numbers in the spec table assume a nominal $V_{EE} = -4.5\text{V}$. Note for PECL operation, the $V_{CMR}(\text{min})$ will be fixed at $5.0\text{V} - |V_{CMR}(\text{min})|$.

PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range	Marking Code
SY100EL56VZC	Z20-1	Commercial	XEL56V
SY100EL56VZCTR ⁽¹⁾	Z20-1	Commercial	XEL56V

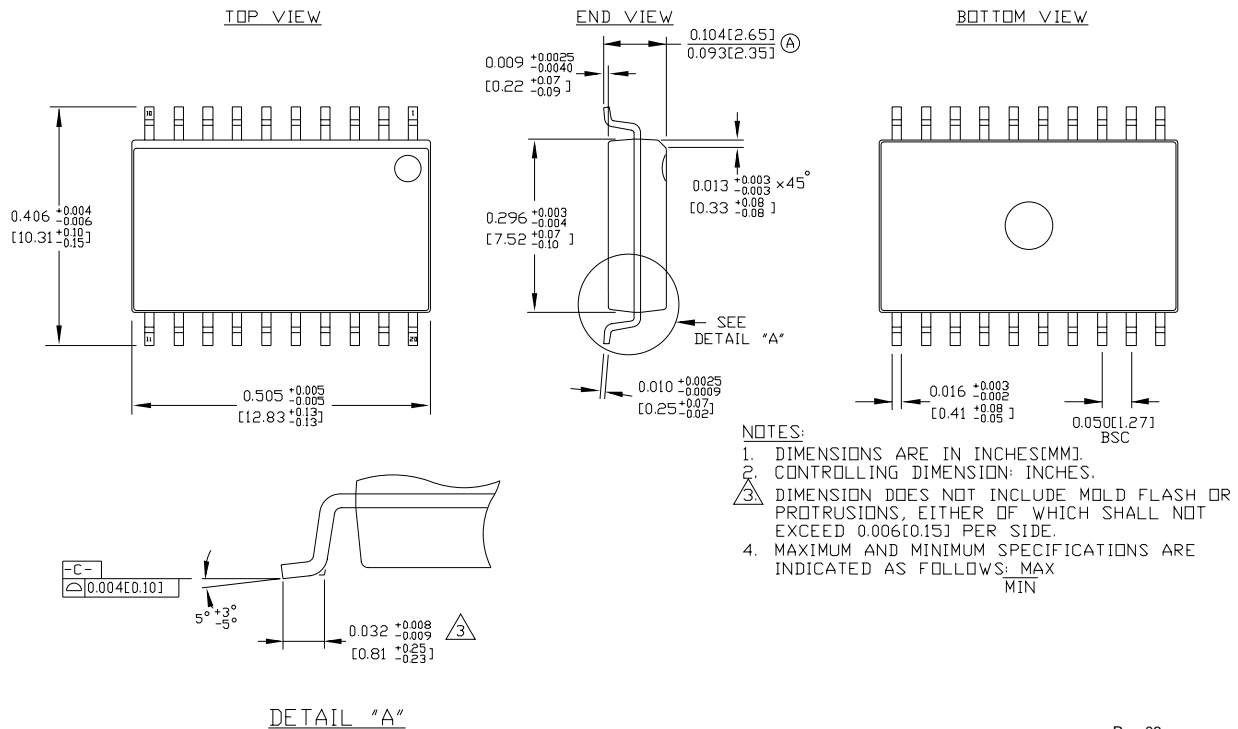
Ordering Code	Package Type	Operating Range	Marking Code
SY100EL56VZI ⁽²⁾	Z20-1	Industrial	XEL56V
SY100EL56VZITR ^(1,2)	Z20-1	Industrial	XEL56V

Note 1. Tape and Reel.

Note 2. Recommended for new designs.

PRODUCT/PROCESS INFORMATION

Process:	Bipolar
ESD Rating:	Per Mil Std. 883 Human Body Model, >1.5kV (all pins).

20 LEAD SOIC .300" WIDE (Z20-1)

Rev. 03

Package Notes:**Note 1.** Package meets Level 1 moisture sensitivity.**MICREL, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA**TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB <http://www.micrel.com>

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