

**FEATURES**

- 620ps typical propagation delay
- Fully differential design
- Supports standard operation
- Available in 20-pin SOIC package

**DESCRIPTION**

The SY100EL91 is a triple PECL-to-ECL translator. It receives standard voltage PECL signals and translates them to different ECL output signals.

A  $V_{BB}$  output is provided for interfacing with single ended PECL signals at the input. If a single ended input is to be used, the  $V_{BB}$  output should be connected to the  $\bar{D}$  input. The active signal would then drive the D input. When used, the  $V_{BB}$  output should be bypassed to ground via a  $0.01\mu\text{F}$  capacitor. The  $V_{BB}$  output is designed to act as the switching reference for the EL91 under single ended input switching conditions. As a result this pin can only source/sink up to 0.5mA of current.

To accomplish the level translation the EL91 requires three power rails. The  $V_{CC}$  supply should be connected to the positive supply, and the  $V_{EE}$  pin should be connected to the negative power supply. The GND pins as expected are connected to the system ground plane. Both  $V_{EE}$  and  $V_{CC}$  should be bypassed to ground via  $0.01\mu\text{F}$  capacitors.

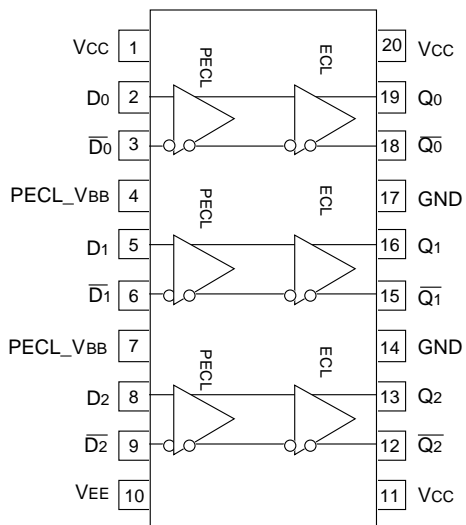
Under open input conditions, the  $\bar{D}$  input will be biased at  $V_{CC}/2$  and the D input will be pulled to GND. This condition will force the Q output to a LOW, ensuring stability.

**PIN NAMES**

Pin	Function
D <sub>n</sub>	PECL Inputs
Q <sub>n</sub>	ECL Outputs
PECL_V <sub>BB</sub>	PECL Reference Voltage Output

**PACKAGE/ORDERING INFORMATION**

**Ordering Information<sup>(1)</sup>**



**20-Pin Wide SOIC (Z20-1)**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100EL91ZC	Z20-1	Commercial	SY100EL91ZC	Sn-Pb
SY100EL91ZCTR <sup>(2)</sup>	Z20-1	Commercial	SY100EL91ZC	Sn-Pb
SY100EL91ZI	Z20-1	Industrial	SY100EL91ZI	Sn-Pb
SY100EL91ZITR <sup>(2)</sup>	Z20-1	Industrial	SY100EL91ZI	Sn-Pb
SY100EL91ZG <sup>(3)</sup>	Z20-1	Industrial	SY100EL91ZG with Pb-Free bar-line indicator	NiPdAu Pb-Free
SY100EL91ZGTR <sup>(2, 3)</sup>	Z20-1	Industrial	SY100EL91ZG with Pb-Free bar-line indicator	NiPdAu Pb-Free

**Notes:**

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

**PECL INPUT DC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
VCC	Power Supply Voltage	4.75	—	5.25	4.75	—	5.25	4.75	—	5.25	4.75	—	5.25	V
VIH	Input HIGH Voltage <sup>(1)</sup>	3.835	—	4.120	3.835	—	4.120	3.835	—	4.120	3.835	—	4.120	V
VIL	Input LOW Voltage <sup>(1)</sup>	3.190	—	3.525	3.190	—	3.525	3.190	—	3.525	3.190	—	3.525	V
I <sub>IH</sub>	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I <sub>IL</sub>	Input LOW Current $\frac{Dn}{Dn}$	0.5	—	—	0.5	—	—	0.5	—	—	0.5	—	—	μA
		-600	—	—	-600	—	—	-600	—	—	-600	—	—	
V <sub>BB</sub>	Output Reference <sup>(1)</sup>	3.620	—	3.740	3.620	—	3.740	3.620	—	3.740	3.620	—	3.740	V
I <sub>CC</sub>	Power Supply Current	—	—	11	—	—	11	—	6.0	11	—	—	11	mA

**Note:**

1. These values are for V<sub>CC</sub> = 5V. Level specifications will vary 1:1 with V<sub>CC</sub>.

**ECL OUTPUT DC ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>EE</sub>	Power Supply Voltage	-4.2	—	-5.5	-4.2	—	-5.5	-4.2	—	-5.5	-4.2	—	-5.5	V
V <sub>OH</sub>	Output HIGH Voltage	-1085	—	-880	-1025	—	-880	-1025	-955	-880	-1025	—	-880	mV
V <sub>OL</sub>	Output LOW Voltage	-1830	—	-1555	-1810	—	-1620	-1810	-1705	-1620	-1810	—	-1620	mV
I <sub>EE</sub>	Power Supply Current	—	—	28	—	—	28	—	22	28	—	—	30	mA

## AC ELECTRICAL CHARACTERISTICS

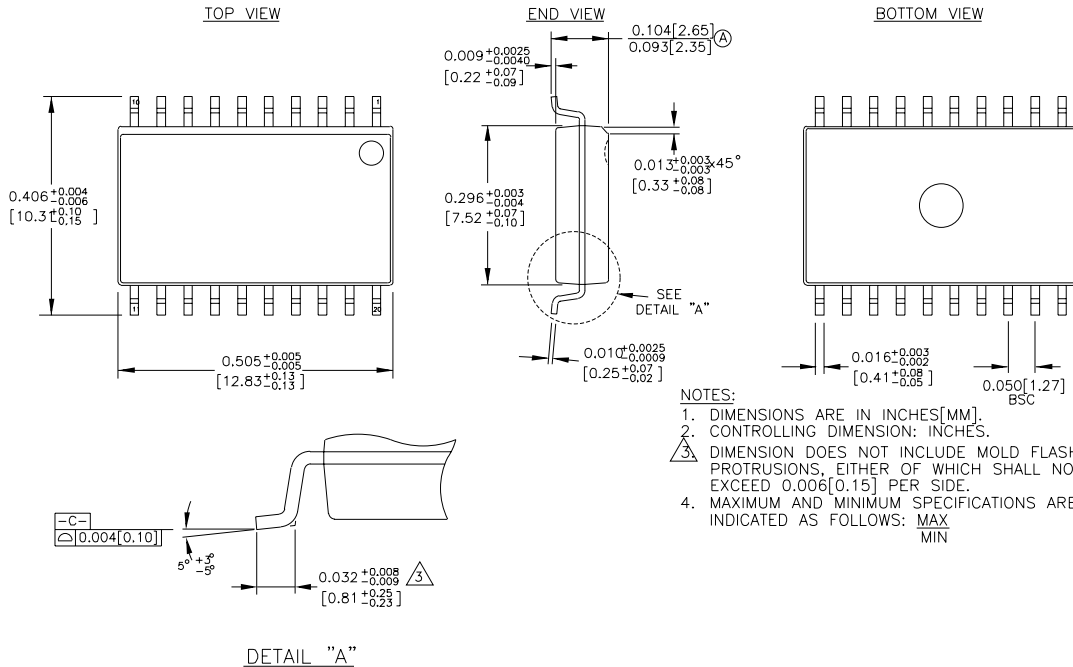
PECL:  $V_{CC} = +4.75V$  to  $+5.25V$ , ECL:  $V_{EE} = -4.2V$  to  $-5.5V$

Symbol	Parameter	$T_A = -40^\circ C$			$T_A = 0^\circ C$			$T_A = +25^\circ C$			$T_A = +85^\circ C$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
$t_{PD}$	Propagation Delay D to Q Diff. S.E.	520 470	620 620	720 770	520 470	620 620	720 770	520 470	620 620	720 770	550 500	650 650	750 800	ps
$t_{skew}$	Within-Device Skew <sup>(1)</sup> Output-to-Output Part-to-Part (Diff.) Duty Cycle (Diff.)	— — —	— — 25	100 200 —	— — —	— — 25	100 200 —	— — —	20 — 25	100 200 —	— — —	— — 25	100 200 —	ps
$V_{PP}$	Minimum Input Swing <sup>(2)</sup>	200	—	—	200	—	—	200	—	—	200	—	—	mV
$V_{CMR}$	Common Mode Range <sup>(3)</sup> $V_{PP} < 500mV$ $V_{PP} > 500mV$	1.3 1.5	— —	$V_{CC}-0.2$ $V_{CC}-0.2$	1.2 1.4	— —	$V_{CC}-0.2$ $V_{CC}-0.2$	1.2 1.4	— —	$V_{CC}-0.2$ $V_{CC}-0.2$	1.2 1.4	— —	$V_{CC}-0.2$ $V_{CC}-0.2$	V
$t_r$ $t_f$	Output Rise/Fall Times Q (20% to 80%)	320	400	580	320	400	580	320	400	580	320	400	580	ps

### Notes:

- Skew is measured between outputs under identical transitions.
- Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of  $\sim 40$ .
- 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  $V_{PP}$  min. and 1V.

**20-PIN SOIC .300" WIDE (Z20-1)**



Rev. 03

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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