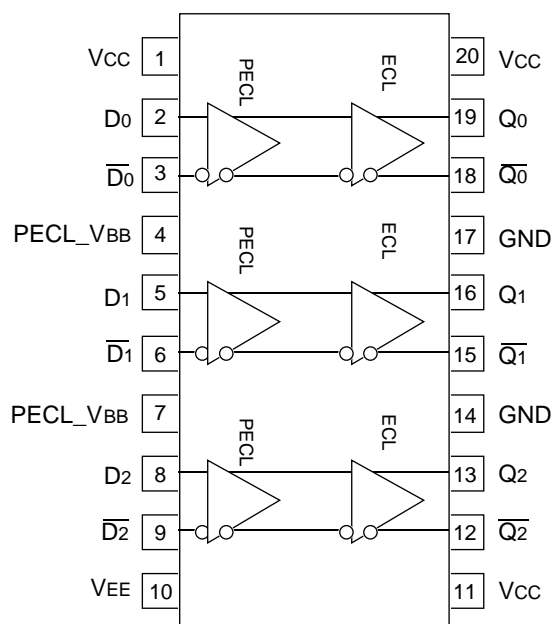


## FEATURES

- 3.3V power supply
- 620ps propagation delay
- Fully differential design
- Supports low voltage operation
- Available in 20-pin SOIC package

## PIN CONFIGURATION/BLOCK DIAGRAM



**SOIC  
TOP VIEW**

## DESCRIPTION

The SY100EL91L is a triple LVPECL-to-ECL or LVPECL-to-LVECL translator.

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  $0.01\mu F$  capacitor. The  $V_{BB}$  output is designed to act as the switching reference for the EL91L 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 EL91L 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  $0.01\mu F$  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
$D_n$	PECL Inputs
$Q_n$	ECL Outputs
PECL_VBB	PECL Reference Voltage Output

## FUNCTION TABLE

Function	Vcc	VEE
LVPECL-to-ECL	3.3V	-5.0V
LVPECL-to-LVECL	3.3V	-3.3V

### 3.3V LVPECL INPUT DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>

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	3.0	—	3.8	3.0	—	3.8	3.0	3.3	3.8	3.0	—	3.8	V
VIH	Input HIGH Voltage <sup>(2)</sup>	2.135	—	2.420	2.135	—	2.420	2.135	2.350	2.420	2.135	—	2.420	V
VIL	Input LOW Voltage <sup>(2)</sup>	1.490	—	1.825	1.490	—	1.825	1.490	—	1.825	1.490	—	1.825	V
I <sub>IH</sub>	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I <sub>IL</sub>	Input LOW Current $\overline{\text{Dn}}$	0.5	—	—	0.5	—	—	0.5	—	—	0.5	—	—	μA
		-600	—	—	-600	—	—	-600	—	—	-600	—	—	
V <sub>BB</sub>	Output Reference <sup>(2)</sup>	1.920	—	2.040	1.920	—	2.040	1.920	—	2.040	1.920	—	2.040	V
I <sub>CC</sub>	Power Supply Current	—	—	10	—	—	10	—	6.0	10	—	—	10	mA

**NOTES:**

1. Parametric values specified at: 3 volt Power Supply Range 100EL91L Series -3.0V to -3.8V.
2. These levels are for V<sub>CC</sub> = 3.3V. Level specifications will vary 1:1 with V<sub>CC</sub>.

### ECL/LVECL OUTPUT DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>

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 $\overline{\text{ECL}}$ Voltage $\overline{\text{LVECL}}$	-4.2	—	-5.5	-4.2	—	-5.5	-4.2	—	-5.5	-4.2	—	-5.5	V
		-3.0	—	-3.8	-3.0	—	-3.8	-3.0	—	-3.8	-3.0	—	-3.8	
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

**NOTE:**

1. Parametric values specified at: 3 volt Power Supply Range 100EL91L Series -3.0V to -3.8V.

**AC ELECTRICAL CHARACTERISTICS<sup>(4)</sup>**LVPECL:  $V_{CC} = +3.0V$  to  $+3.8V$ , ECL:  $V_{EE} = -4.2V$  to  $-5.5V$ , LVECL:  $V_{EE} = -3.0V$  to  $-3.8V$ 

Symbol	Parameter	T <sub>A</sub> = −40°C			T <sub>A</sub> = 0°C			T <sub>A</sub> = +25°C			T <sub>A</sub> = +85°C			Unit	
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay D to Q	Diff. S.E.	490 440	590 590	690 740	510 460	610 610	710 760	520 470	620 620	720 770	560 510	660 660	760 810	ps
t <sub>skew</sub>	Within-Device Skew <sup>(1)</sup>														
	Output-to-Output		—	40	100	—	40	100	—	40	100	—	40	100	ps
	Part-to-Part (Diff.)		—	—	200	—	—	200	—	—	200	—	—	200	
	Duty Cycle (Diff.)		—	25	—	—	25	—	—	25	—	—	25	—	
V <sub>PP</sub>	Minimum Input Swing <sup>(2)</sup>		150	—	—	150	—	—	150	—	—	150	—	—	mV
V <sub>CMR</sub>	Common Mode Range <sup>(3)</sup>														V
	V <sub>PP</sub> < 500mV		1.3	—	V <sub>CC</sub> −0.2	1.2	—	V <sub>CC</sub> −0.2	1.2	—	V <sub>CC</sub> −0.2	1.2	—	V <sub>CC</sub> −0.2	
	V <sub>PP</sub> > 500mV		1.5	—	V <sub>CC</sub> −0.2	1.4	—	V <sub>CC</sub> −0.2	1.4	—	V <sub>CC</sub> −0.2	1.4	—	V <sub>CC</sub> −0.2	
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Times Q (20% to 80%)		320	400	580	320	400	580	320	400	580	320	400	580	ps

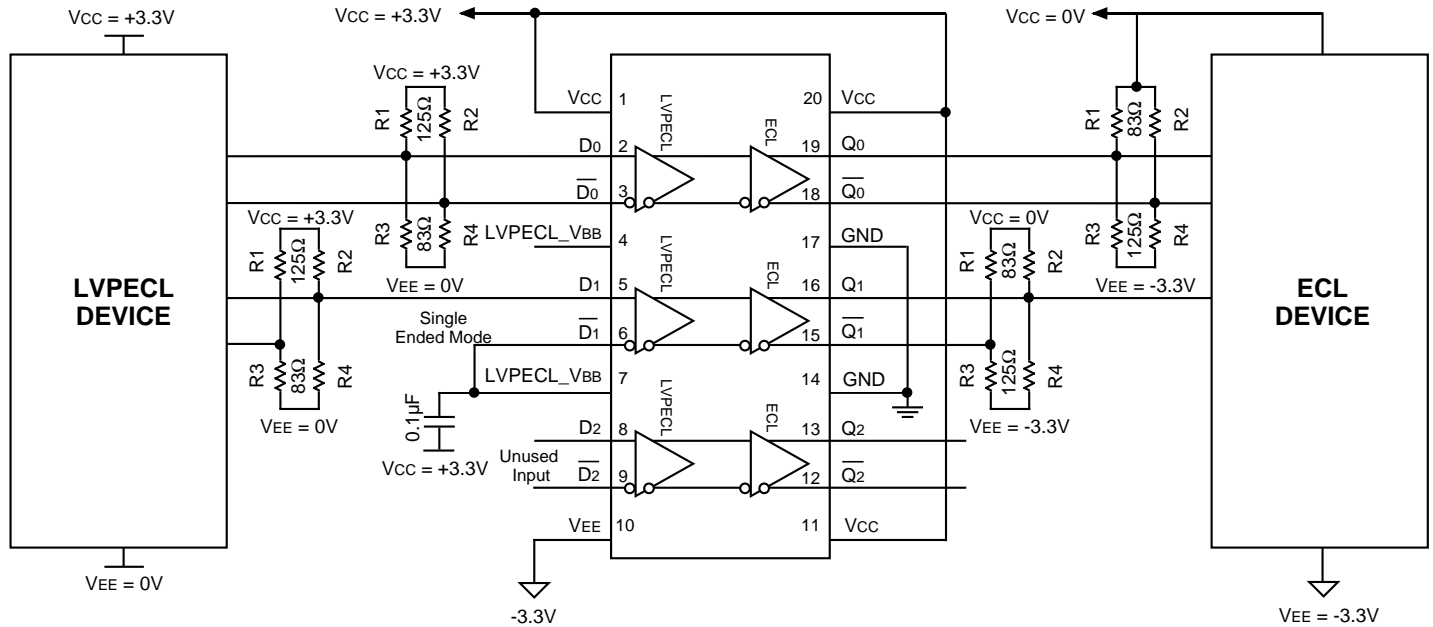
**NOTES:**

- Skew is measured between outputs under identical transitions.
- Minimum input swing for which AC parameters are guaranteed. The device has a DC gain of ~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<sub>PP</sub> min. and 1V.
- Parametric values specified at: 3 volt Power Supply Range 100EL91L Series -3.0V to -3.8V.

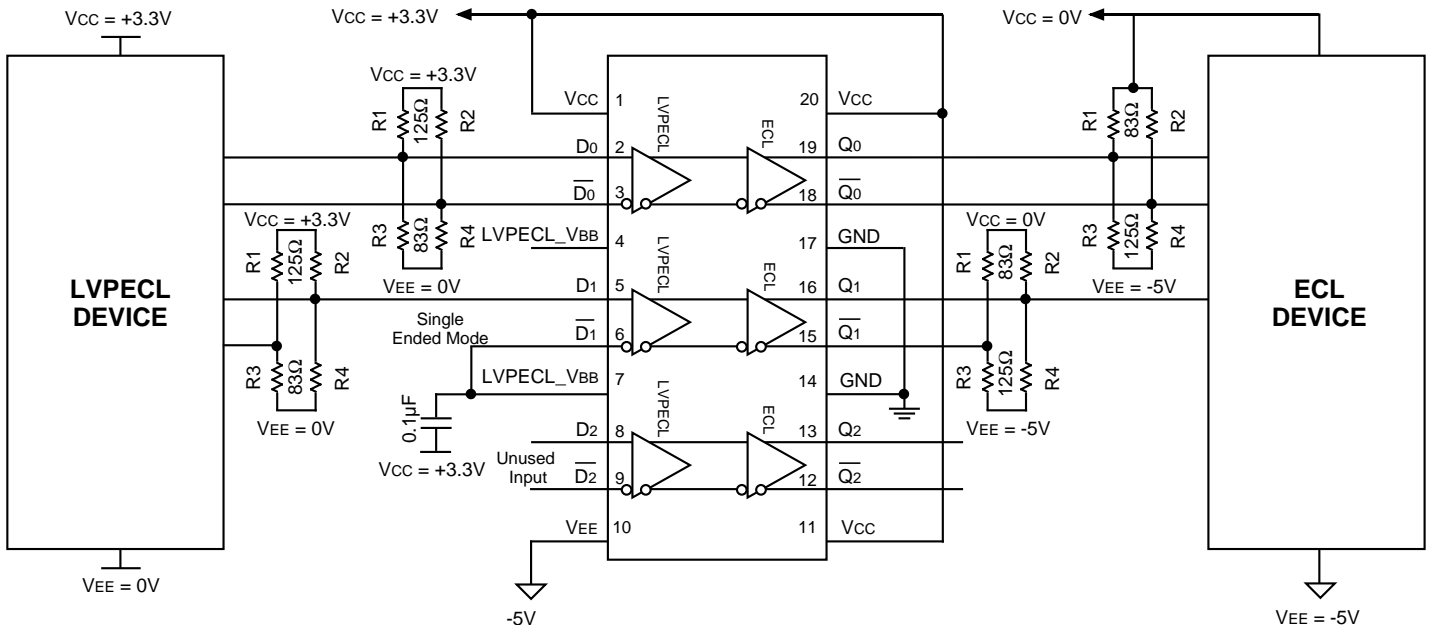
**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range
SY100EL91LZC	Z20-1	Commercial
SY100EL91LZCTR	Z20-1	Commercial

## LVPECL-TO-ECL MODE CONFIGURATION



3.3V Configuration

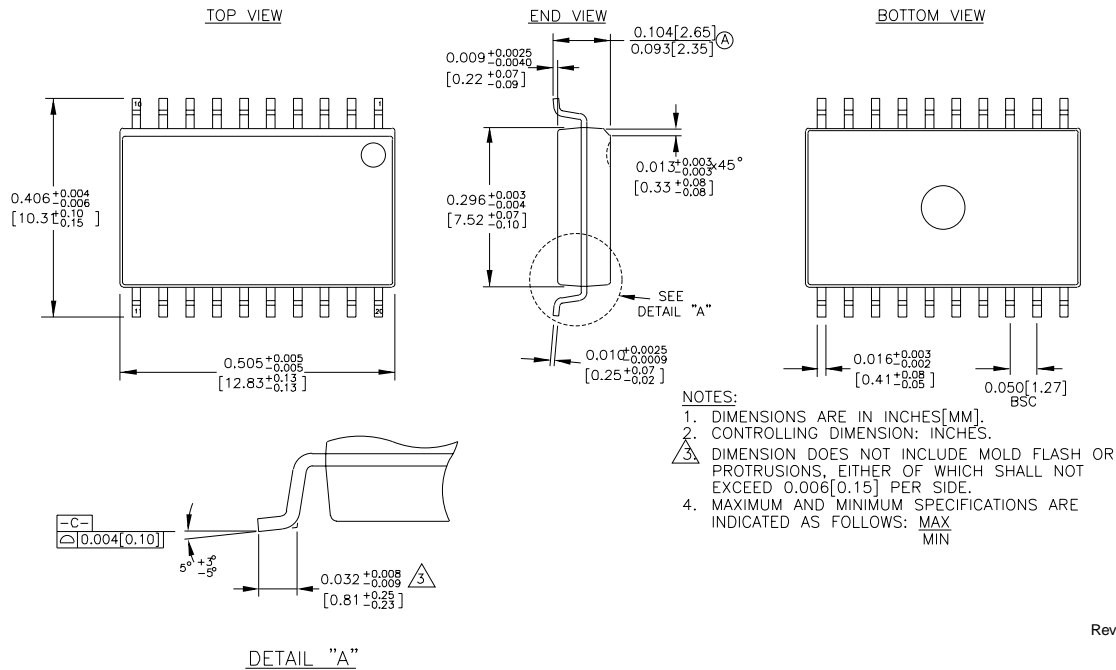


5.0V Configuration

### NOTES:

1. The schematic above demonstrates three different ways that all or any inputs of SY100EL91L can be used. The three modes or operation are: Differential LVPECL, Single-Ended LVPECL, and/or Open.
2. If D2 and  $\overline{D2}$  are used in differential mode, then the same scheme of D0 and  $\overline{D0}$  applies. If used in single-ended mode, then use the same scheme of D1 and  $\overline{D1}$ .

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



Rev. 03

**MICREL-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA**

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