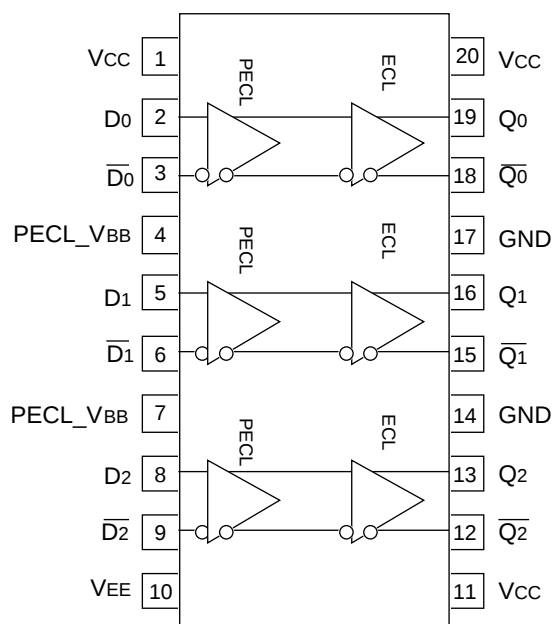


FEATURES

- 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 $0.01\mu\text{F}$ 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 $0.01\mu\text{F}$ 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_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⁽¹⁾

Symbol	Parameter	T _A = -40°C			T _A = 0°C			T _A = +25°C			T _A = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V _{CC}	Power Supply Voltage	3.0	—	3.8	3.0	—	3.8	3.0	3.3	3.8	3.0	—	3.8	V
V _{IH}	Input HIGH Voltage ⁽²⁾	2.135	—	2.420	2.135	—	2.420	2.135	2.350	2.420	2.135	—	2.420	V
V _{IL}	Input LOW Voltage ⁽²⁾	1.490	—	1.825	1.490	—	1.825	1.490	—	1.825	1.490	—	1.825	V
I _{IH}	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I _{IL}	Input LOW Current $\overline{\text{Dn}}$	0.5	—	—	0.5	—	—	0.5	—	—	0.5	—	—	μA
		-600	—	—	-600	—	—	-600	—	—	-600	—	—	
V _{BB}	Output Reference ⁽²⁾	1.920	—	2.040	1.920	—	2.040	1.920	—	2.040	1.920	—	2.040	V
I _{CC}	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_{CC} = 3.3V. Level specifications will vary 1:1 with V_{CC}.

ECL/LVECL OUTPUT DC ELECTRICAL CHARACTERISTICS⁽¹⁾

Symbol	Parameter	T _A = -40°C			T _A = 0°C			T _A = +25°C			T _A = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V _{EE}	Power Supply Voltage ECL 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 _{OH}	Output HIGH Voltage	-1085	—	-880	-1025	—	-880	-1025	-955	-880	-1025	—	-880	mV
V _{OL}	Output LOW Voltage	-1830	—	-1555	-1810	—	-1620	-1810	-1705	-1620	-1810	—	-1620	mV
I _{EE}	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⁽⁴⁾

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	$T_A = -40^{\circ}C$			$T_A = 0^{\circ}C$			$T_A = +25^{\circ}C$			$T_A = +85^{\circ}C$			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
t _{PLH} t _{PHL}	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 _{skew}	Within-Device Skew ⁽¹⁾ Output-to-Output Part-to-Part (Diff.) Duty Cycle (Diff.)	— — —	40 — 25	100 200 —	— — —	40 — 25	100 200 —	— — —	40 — 25	100 200 —	— — —	40 — 25	100 200 —	ps
V _{PP}	Minimum Input Swing ⁽²⁾	150	—	—	150	—	—	150	—	—	150	—	—	mV
V _{CMR}	Common Mode Range ⁽³⁾ 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 ~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.
- 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	Marking Code
SY100EL91LZC	Z20-1	Commercial	XEL91L
SY100EL91LZCTR*	Z20-1	Commercial	XEL91L

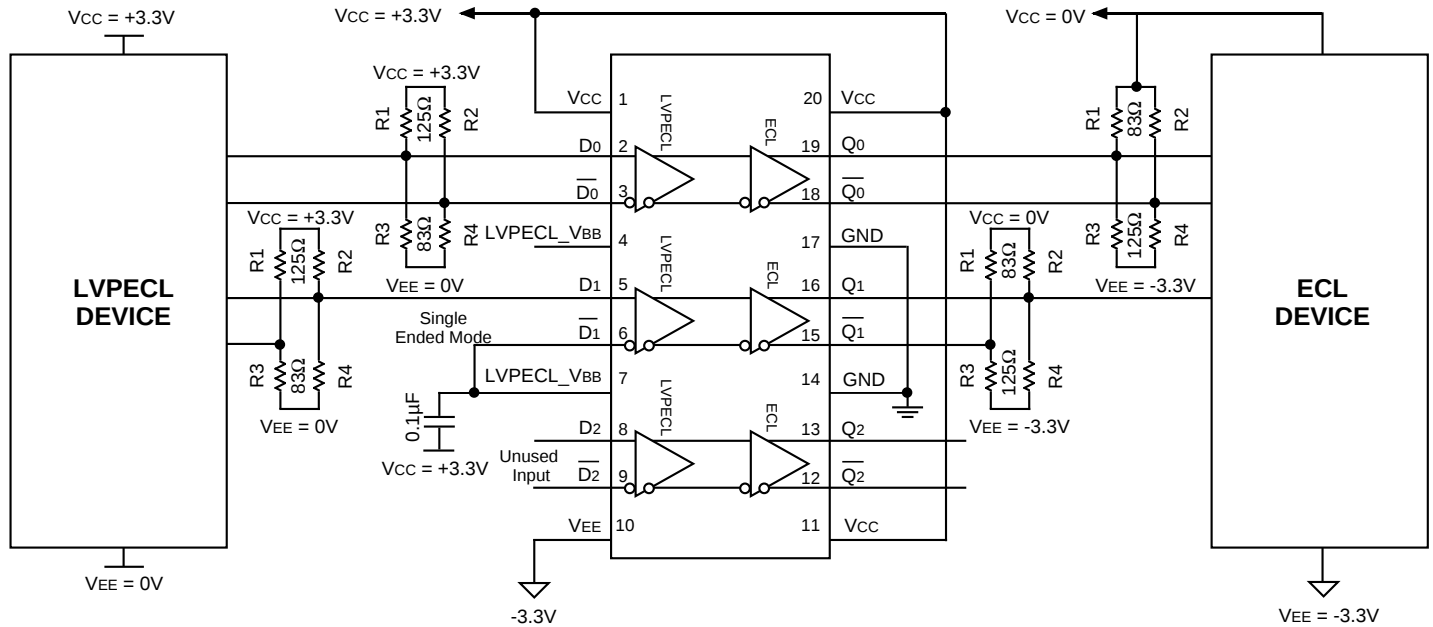
*Tape and Reel

Note 1. Recommended for new designs.

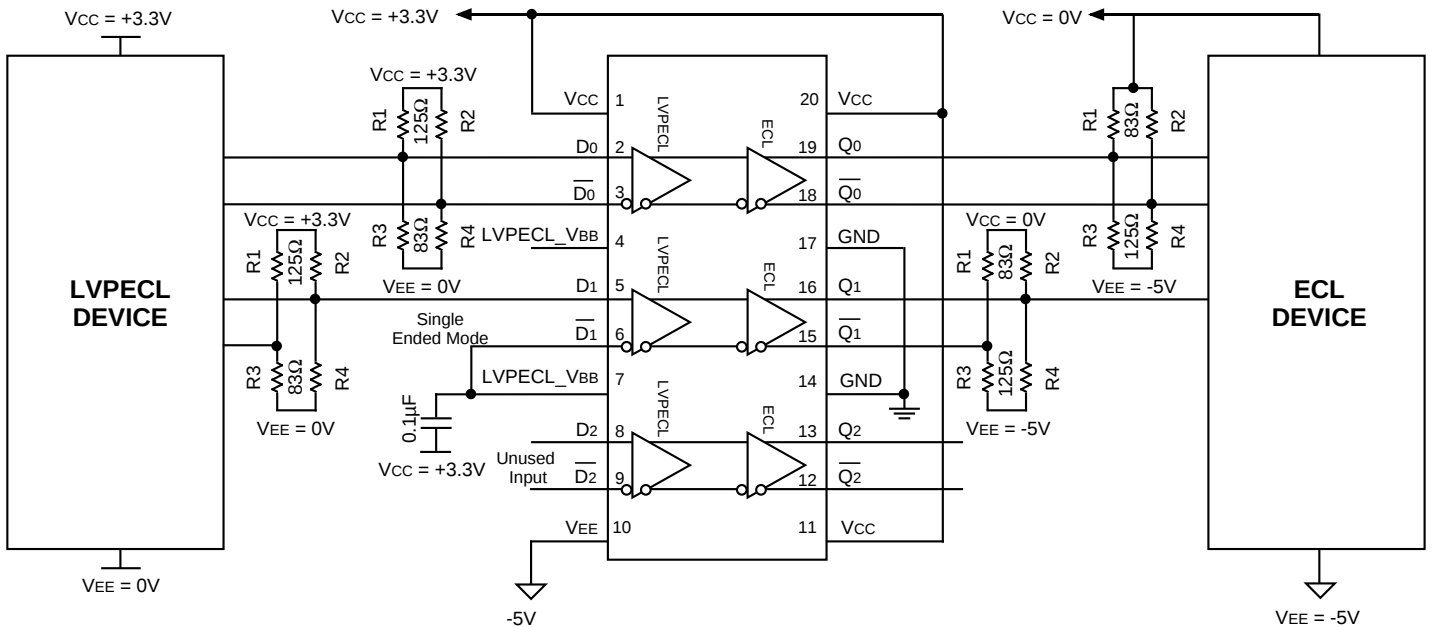
Ordering Code	Package Type	Operating Range	Marking Code
SY100EL91LZI ⁽¹⁾	Z20-1	Industrial	XEL91L
SY100EL91LZITR ⁽¹⁾ *	Z20-1	Industrial	XEL91L

*Tape and Reel

LVPECL-TO-ECL MODE CONFIGURATION



3.3V Configuration

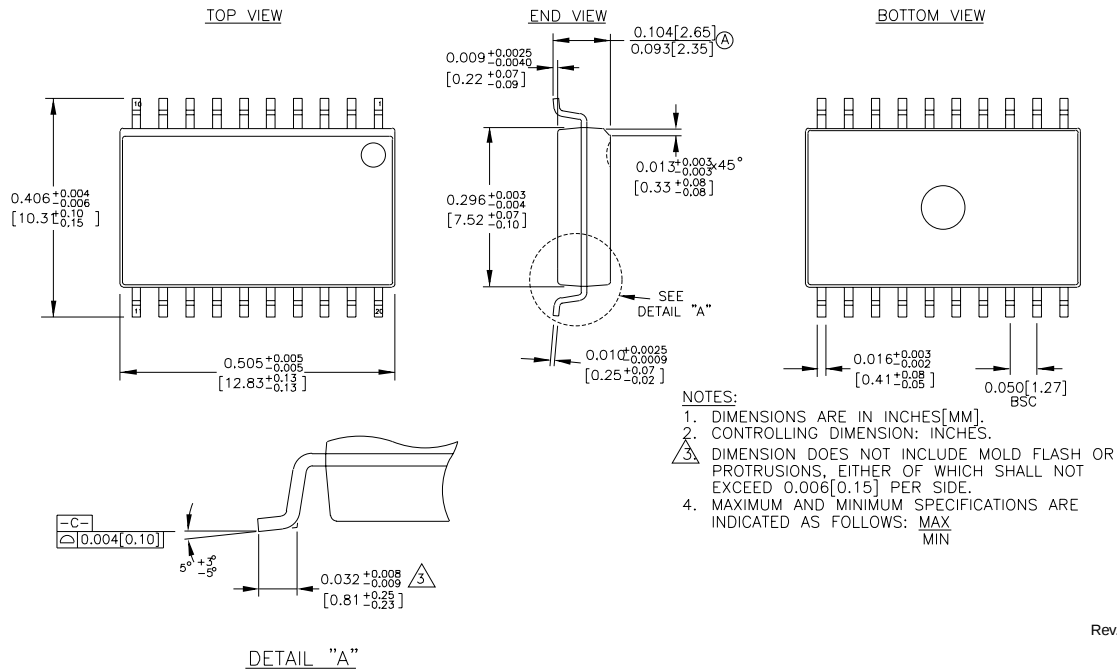


5.0V Configuration

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, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB <http://www.micrel.com>

The information furnished by Micrel in this datasheet is believed to be accurate and reliable. However, no responsibility is assumed by Micrel for its use. Micrel reserves the right to change circuitry and specifications at any time without notification to the customer.

Micrel Products are not designed or authorized for use as components in life support appliances, devices or systems where malfunction of a product can reasonably be expected to result in personal injury. Life support devices or systems are devices or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform can be reasonably expected to result in a significant injury to the user. A Purchaser's use or sale of Micrel Products for use in life support appliances, devices or systems is at Purchaser's own risk and Purchaser agrees to fully indemnify

Micrel for any damages resulting from such use or sale.

© 2003 Micrel, Incorporated.