

FEATURES

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

DESCRIPTION

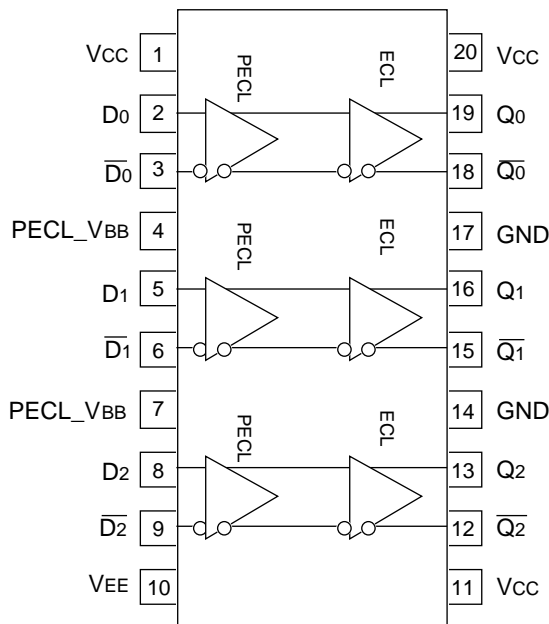
The SY100EL91L is a triple LVPECL-to-ECL or LVPECL-to-LVECL translator.

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 CONFIGURATION/BLOCK DIAGRAM



**SOIC
TOP VIEW**

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	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 ⁽²⁾	2.135	—	2.420	2.135	—	2.420	2.135	2.350	2.420	2.135	—	2.420	V
VIL	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{Dn} \overline{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	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 _{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 Diff. D to Q 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

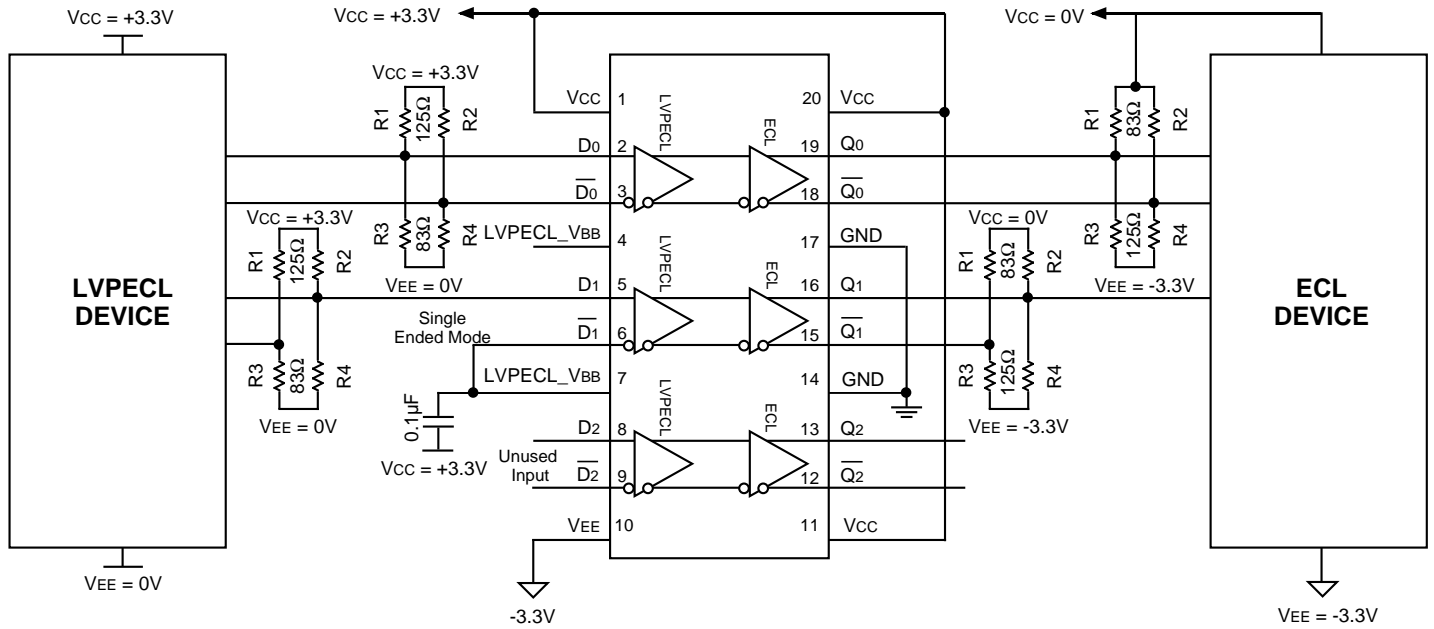
NOTES:

- 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.

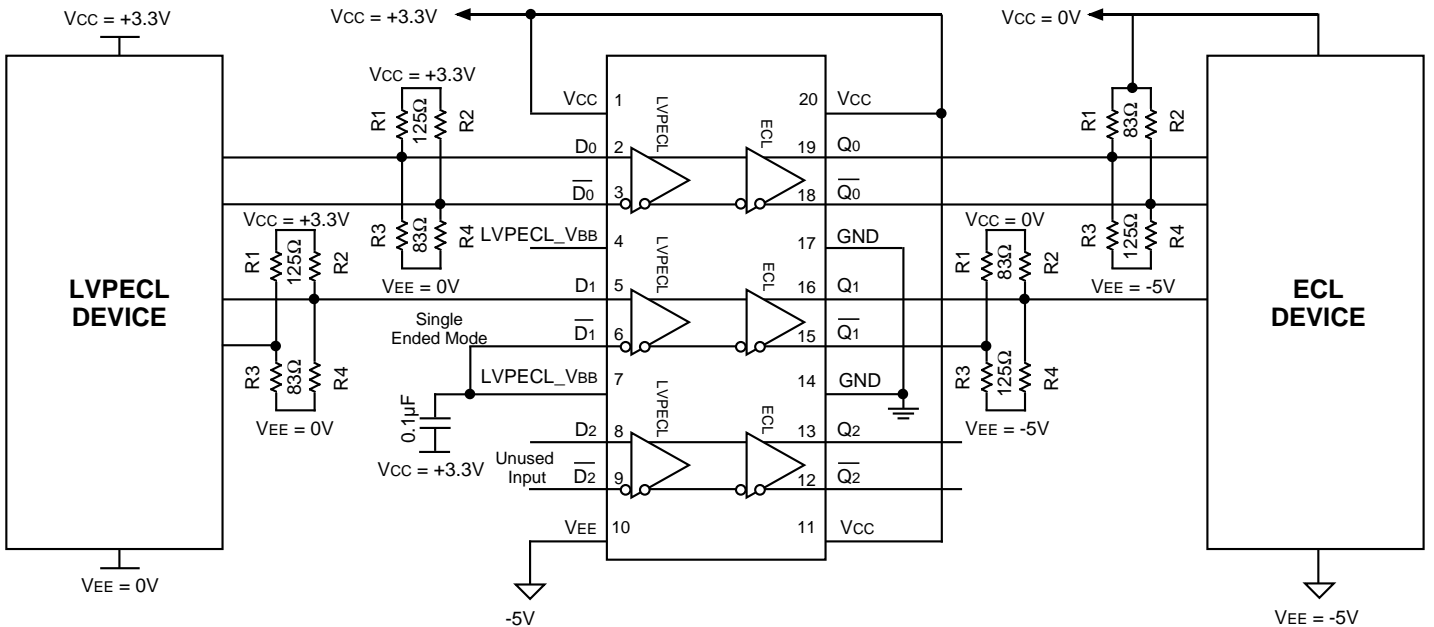
PRODUCT ORDERING CODE

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

LVPECL-TO-ECL MODE CONFIGURATION



3.3V Configuration

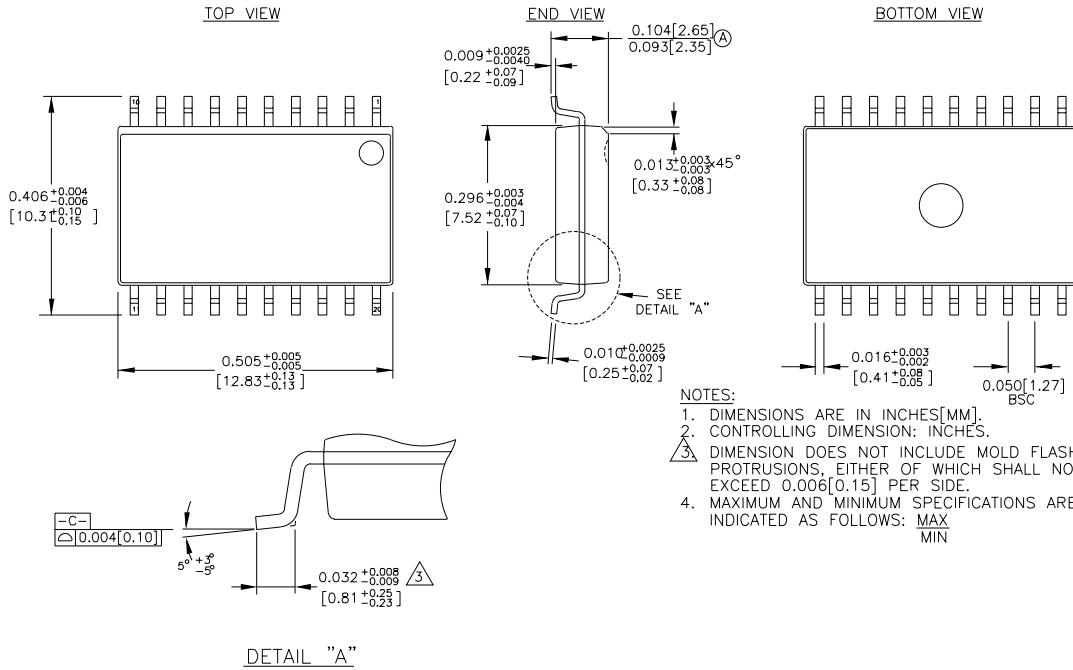


5.0V Configuration

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

TEL + 1 (408) 980-9191 FAX + 1 (408) 914-7878 WEB <http://www.micrel.com>

This information is believed to be accurate and reliable, however no responsibility is assumed by Micrel for its use nor for any infringement of patents or other rights of third parties resulting from its use. No license is granted by implication or otherwise under any patent or patent right of Micrel Inc.

© 2000 Micrel Incorporated