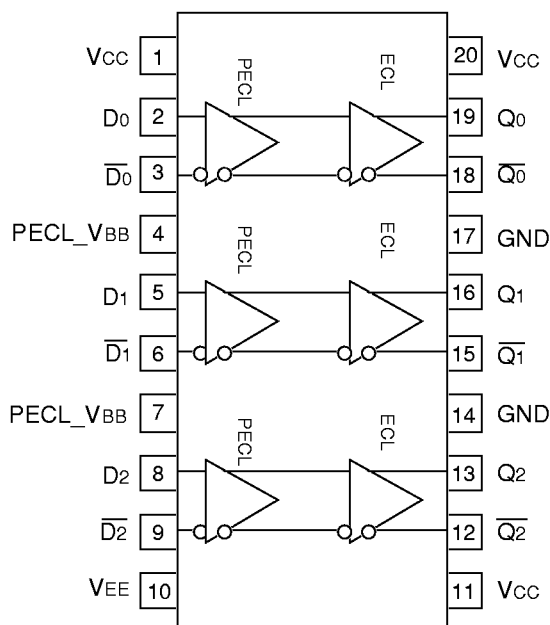


FEATURES

- 3.3V and -5V power supply
- 620ps propagation delay
- Fully differential design
- Supports low voltage operation
- ESD protection of 2000V
- 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

| 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 ⁽¹⁾ | 2.135 | — | 2.420 | 2.135 | — | 2.420 | 2.135 | 2.350 | 2.420 | 2.135 | — | 2.420 | V |
| VIL | Input LOW Voltage ⁽¹⁾ | 1.490 | — | 1.825 | 1.490 | — | 1.825 | 1.490 | — | 1.825 | 1.490 | — | 1.825 | V |
| IiH | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | — | — | 150 | μA |
| IiL | Input LOW Current $\frac{Dn}{Dn}$ | 0.5 -600 | — — | — — | 0.5 -600 | — — | — — | 0.5 -600 | — — | — — | 0.5 -600 | — — | — — | μA |
| VBB | Output Reference ⁽¹⁾ | 1.920 | — | 2.040 | 1.920 | — | 2.040 | 1.920 | — | 2.040 | 1.920 | — | 2.040 | V |
| ICC | Power Supply Current | — | — | 10 | — | — | 10 | — | 6.0 | 10 | — | — | 10 | mA |

NOTES:

1. These levels are for Vcc = 3.3V. Level specifications will vary 1:1 with Vcc.

ECL/LVECL 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. | |
| VEE | Power Supply ECL Voltage | -4.2 | — | -5.5 | -4.2 | — | -5.5 | -4.2 | — | -5.5 | -4.2 | — | -5.5 | V |
| | LVECL | -3.0 | — | -3.8 | -3.0 | — | -3.8 | -3.0 | — | -3.8 | -3.0 | — | -3.8 | |
| VOH | Output HIGH Voltage | -1085 | — | -880 | -1025 | — | -880 | -1025 | -955 | -880 | -1025 | — | -880 | mV |
| VOL | Output LOW Voltage | -1830 | — | -1555 | -1810 | — | -1620 | -1810 | -1705 | -1620 | -1810 | — | -1620 | mV |
| IEE | Power Supply Current | — | — | 28 | — | — | 28 | — | 22 | 28 | — | — | 30 | mA |

AC ELECTRICAL CHARACTERISTICS

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} | Propagation Delay Diff. | 490 | 590 | 690 | 510 | 610 | 710 | 520 | 620 | 720 | 560 | 660 | 760 | ps |
| t_{PHL} | D to Q S.E. | 440 | 590 | 740 | 460 | 610 | 760 | 470 | 620 | 770 | 510 | 660 | 810 | |
| t_{skew} | Within-Device Skew ⁽¹⁾ | | | | | | | | | | | | | ps |
| | Output-to-Output | — | 40 | 100 | — | 40 | 100 | — | 40 | 100 | — | 40 | 100 | |
| | Part-to-Part (Diff.) | — | — | 200 | — | — | 200 | — | — | 200 | — | — | 200 | |
| | Duty Cycle (Diff.) | — | 25 | — | — | 25 | — | — | 25 | — | — | 25 | — | |
| V_{PP} | Minimum Input Swing ⁽²⁾ | 150 | — | — | 150 | — | — | 150 | — | — | 150 | — | — | mV |
| V_{CMR} | Common Mode Range ⁽³⁾ | | | | | | | | | | | | | V |
| | $V_{PP} < 500mV$ | 1.3 | — | $V_{CC}-0.2$ | 1.2 | — | $V_{CC}-0.2$ | 1.2 | — | $V_{CC}-0.2$ | 1.2 | — | $V_{CC}-0.2$ | |
| | $V_{PP} > 500mV$ | 1.5 | — | $V_{CC}-0.2$ | 1.4 | — | $V_{CC}-0.2$ | 1.4 | — | $V_{CC}-0.2$ | 1.4 | — | $V_{CC}-0.2$ | |
| t_r | Output Rise/Fall Times Q (20% to 80%) | 320 | 400 | 580 | 320 | 400 | 580 | 320 | 400 | 580 | 320 | 400 | 580 | ps |
| t_f | | | | | | | | | | | | | | |

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.

PRODUCT ORDERING CODE

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

20 LEAD PLASTIC SOIC (Z20-1)

FILE/REV #: PD0028A03

PD/0028/ASCORP

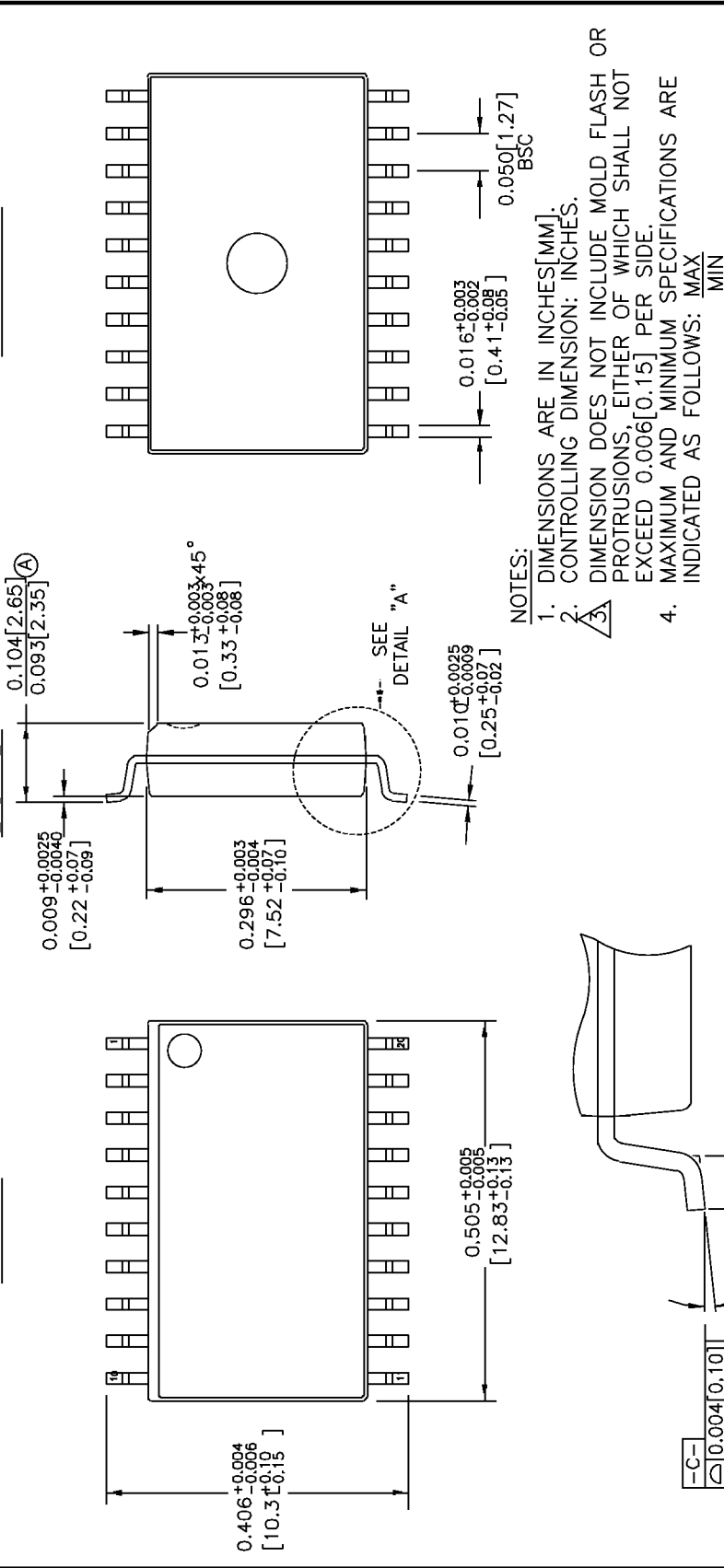
PAGE 1 OF 1

| REV. | REVISION DESCRIPTION | DATE |
|------|--|----------|
| D1 | CONVERT TO DESIGNER VERSION 4.0 FORMAT | 12/31/93 |
| 02 | CONVERT DWG. TO AUTOCAD REL. 12. REFERENCE AMKOR DWG. NO. 00020 REV. 07. MAKE (A) SAME AS JEDEC. | 02/28/96 |
| 03 | CONVERT DWG. TO AUTOCAD REL. 13 AND ONE PAGE DOC. 02/09/98 | |

TOP VIEW

END VIEW

BOTTOM VIEW



| APPROVALS | DATE | APPROVALS | DATE | SIZE | PACKAGE OUTLINE |
|---------------------------------|----------|---------------------------------------|------|------|-----------------------------------|
| ORIGINATOR: ERMIN G. URRUTIA | 02/23/98 | QUALITY: MARSHALL WILDER | | A | 20 LEAD PLASTIC SOIC (.300" WIDE) |
| CHK'D: WON CHANG | | DOCUMENT CONTROL: BRIAN SANFILIPPO | | | |
| RELEASE DATE: | | | | | |

3950 SCOTT BOULEVARD
SANTA CLARA, CA 95054
TEL: 408-980-9191
FAX: 408-567-7878

SCALE IN/A
REVISION 03

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