

Triple PECL to LVPECL Translator

The MC100LVEL92 is a triple PECL to LVPECL translator. The device receives standard PECL signals and translates them to differential LVPECL output signals.

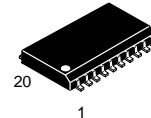
- 500ps Propagation Delays
- Fully Differential Design
- 20-Lead SOIC Package
- 5V and 3.3V Supplies Required
- >1500V ESD

A PECL V_{BB} output is provided for interfacing single ended PECL signals at the inputs. If a single ended PECL input is to be used the PECL V_{BB} output should be connected to the D input and the active signal will drive the D input. When used the PECL V_{BB} should be bypassed to ground via a 0.01 μ f capacitor. The PECL V_{BB} is designed to act as a switching reference for the MC100LVEL92 under single ended input conditions, as a result the pin can only source/sink 0.5mA of current.

To accomplish the PECL to LVPECL level translation, the MC100LVEL92 requires three power rails. The V_{CC} supply is to be connected to the standard PECL supply, the LVCC supply is to be connected to the LVPECL supply, and Ground is connected to the system ground plane. Both the V_{CC} and LVCC should be bypassed to ground with a 0.01 μ f capacitor.

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

MC100LVEL92

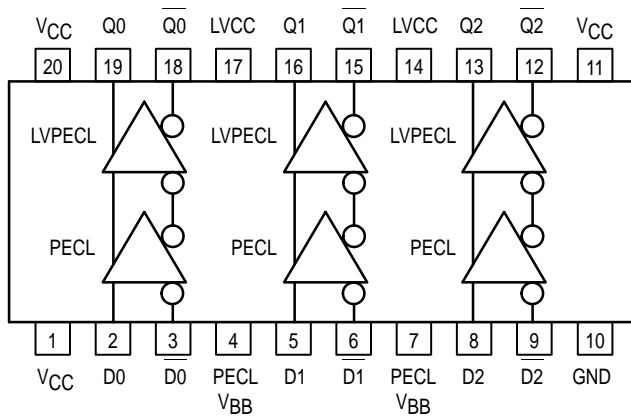


DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D-04

PIN NAMES

| Pins | Function |
|----------|-------------------------------|
| Dn | PECL Inputs |
| Qn | LVPECL Outputs |
| V_{BB} | PECL Reference Voltage Output |
| LVCC | V_{CC} for LVPECL Output |
| V_{CC} | V_{CC} for PECL Inputs |
| GND | Common Ground Rail |

Logic Diagram and Pinout: 20-Lead SOIC (Top View)



MC100LVEL92

PECL INPUT DC CHARACTERISTICS

| Symbol | Characteristic | -40°C | | 0°C | | 25°C | | | 85°C | | Unit | Condition |
|------------------|---|-------------|------|-------------|------|-------------|-----|------|-------------|------|------|------------------------|
| | | Min | Max | Min | Max | Min | Typ | Max | Min | Max | | |
| V _{CC} | Power Supply Voltage | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 | | 5.5 | 4.5 | 5.5 | V | |
| I _{IH} | Input HIGH Current | | 150 | | 150 | | | 150 | | 150 | μA | |
| I _{IL} | Input LOW Current D _n D _n | 0.5 -600 | | 0.5 -600 | | 0.5 -600 | | | 0.5 -600 | | μA | |
| V _{PP} | Minimum Peak-to-Peak Input ¹ | 150 | | 150 | | 150 | | | 150 | | mV | |
| V _{IH} | Input HIGH Voltage ² | 3835 | 4120 | 3835 | 4120 | 3835 | | 4120 | 3835 | 4120 | mV | V _{CC} = 5.0V |
| V _{IL} | Input LOW Voltage ² | 3190 | 3515 | 3190 | 3525 | 3190 | | 3525 | 3190 | 3525 | mV | V _{CC} = 5.0V |
| V _{BB} | Reference Output ² | 3620 | 3740 | 3620 | 3740 | 3620 | | 3740 | 3620 | 3740 | mV | V _{CC} = 5.0V |
| I _{VCC} | Power Supply Current | | 12 | | 12 | | 8.0 | 12 | | 12 | mA | |

- 150mV input guarantees full logic swing at the output.
- DC levels vary 1:1 with V_{CC}.

LVPECL OUTPUT DC CHARACTERISTICS

| Symbol | Characteristic | -40°C | | 0°C | | 25°C | | | 85°C | | Unit | Condition |
|------------------|----------------------------------|-------|-------|-------|------|-------|------|------|-------|------|------|------------------------|
| | | Min | Max | Min | Max | Min | Typ | Max | Min | 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 _{OH} | Output HIGH Voltage ³ | 2.215 | 2.42 | 2.275 | 2.42 | 2.275 | 2.35 | 2.42 | 2.275 | 2.42 | V | V _{CC} = 3.3V |
| V _{OL} | Output LOW Voltage ³ | 1.47 | 1.745 | 1.49 | 1.68 | 1.49 | 1.60 | 1.68 | 1.49 | 1.68 | V | V _{CC} = 3.3V |
| I _{GND} | Power Supply Current | | 20 | | 20 | | 15 | 20 | | 21 | mA | |

- DC levels will vary 1:1 with V_{CC}.

MC100LVEL92

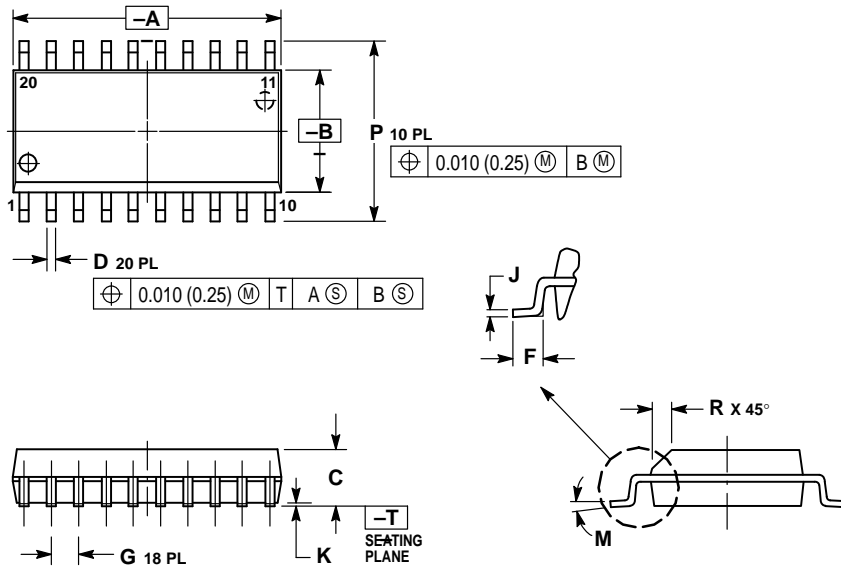
AC CHARACTERISTICS (LV_{CC} = 3.0V to 3.8V; V_{CC} = 4.5V to 5.5V)

| Symbol | Characteristic | -40°C | | | 0°C | | | 25°C | | | 85°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 | 510 460 | 610 610 | 710 760 | 530 480 | 630 630 | 730 780 | ps |
| t _{SKEW} | Skew Output-to-Output ⁴ Part-to-Part (Diff) ⁴ Duty Cycle (Diff) ⁵ | | 20 20 25 | 100 200 | | 20 20 25 | 100 200 | | 20 20 25 | 100 200 | | 20 20 25 | 100 200 | ps |
| V _{PP} | Minimum Input Swing ⁶ | 150 | | | 150 | | | 150 | | | 150 | | | mV |
| V _{CMR} | Common Mode Range ⁷ V _{PP} < 500mV 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 |
| t _r t _f | Output Rise/Fall Times Q (20% - 80%) | 320 | | 580 | 320 | | 580 | 320 | | 580 | 320 | | 580 | ps |

- Skews are valid across specified voltage range, part-to-part skew is for a given temperature.
- Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device. Common Mode Range
- Minimum input swing for which AC parameters 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_{PPmin} and 1V.

OUTLINE DIMENSIONS

DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D-04
ISSUE E



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
 4. MAXIMUM MOLD PROTRUSION 0.150 (0.006) PER SIDE.
 5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 12.65 | 12.95 | 0.499 | 0.510 |
| B | 7.40 | 7.60 | 0.292 | 0.299 |
| C | 2.35 | 2.65 | 0.093 | 0.104 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.50 | 0.90 | 0.020 | 0.035 |
| G | 1.27 BSC | | 0.050 BSC | |
| J | 0.25 | 0.32 | 0.010 | 0.012 |
| K | 0.10 | 0.25 | 0.004 | 0.009 |
| M | 0° | 7° | 0° | 7° |
| P | 10.05 | 10.55 | 0.395 | 0.415 |
| R | 0.25 | 0.75 | 0.010 | 0.029 |

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