

## 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.

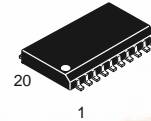
- 500ps Propagation Delays
- Fully Differential Design
- 20-Lead SOIC Package
- 5V and 3.3V Supplies Required
- >1500V ESD

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 $\mu$ 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 $\mu$ 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

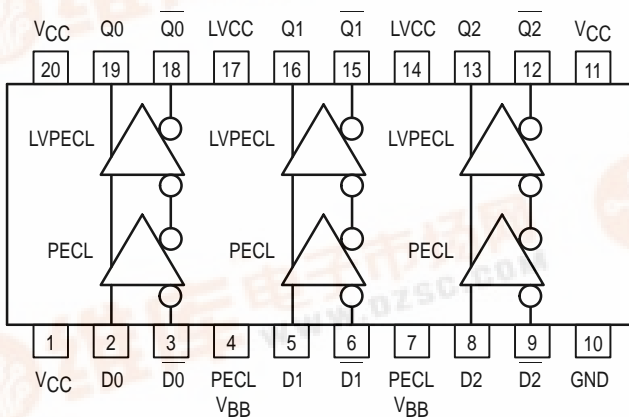


**DW SUFFIX**  
 PLASTIC SOIC PACKAGE  
 CASE 751D-04

### 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 <sub>CC</sub>	Power Supply Voltage	4.5	5.5	4.5	5.5	4.5		5.5	4.5	5.5	V	
I <sub>IH</sub>	Input HIGH Current		150		150			150		150	μA	
I <sub>IL</sub>	Input LOW Current Dn Dn	0.5 -600		0.5 -600		0.5 -600			0.5 -600		μA	
V <sub>PP</sub>	Minimum Peak-to-Peak Input <sup>1</sup>	150		150		150			150		mV	
V <sub>IH</sub>	Input HIGH Voltage <sup>2</sup>	3835	4120	3835	4120	3835		4120	3835	4120	mV	V <sub>CC</sub> = 5.0V
V <sub>IL</sub>	Input LOW Voltage <sup>2</sup>	3190	3515	3190	3525	3190		3525	3190	3525	mV	V <sub>CC</sub> = 5.0V
V <sub>BB</sub>	Reference Output <sup>2</sup>	3620	3740	3620	3740	3620		3740	3620	3740	mV	V <sub>CC</sub> = 5.0V
I <sub>VCC</sub>	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<sub>CC</sub>.

## 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 <sub>CC</sub>	Power Supply Voltage	3.0	3.8	3.0	3.8	3.0	3.3	3.8	3.0	3.8	V	
V <sub>OH</sub>	Output HIGH Voltage <sup>3</sup>	2.215	2.42	2.275	2.42	2.275	2.35	2.42	2.275	2.42	V	V <sub>CC</sub> = 3.3V
V <sub>OL</sub>	Output LOW Voltage <sup>3</sup>	1.47	1.745	1.49	1.68	1.49	1.60	1.68	1.49	1.68	V	V <sub>CC</sub> = 3.3V
I <sub>GND</sub>	Power Supply Current		20		20		15	20		21	mA	

- DC levels will vary 1:1 with V<sub>CC</sub>.

## MC100LVEL92

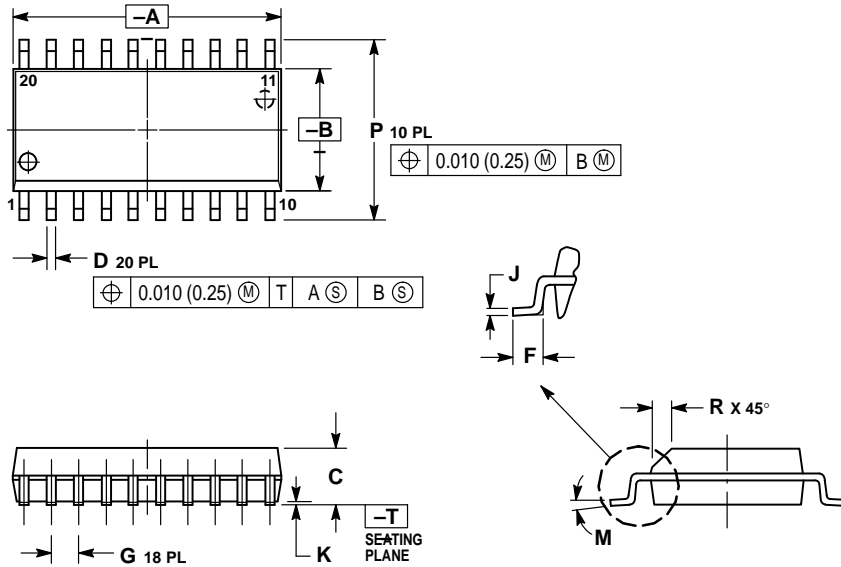
### AC CHARACTERISTICS (LV<sub>CC</sub> = 3.0V to 3.8V; V<sub>CC</sub> = 4.5V to 5.5V)

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
t <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	510 460	610 610	710 760	530 480	630 630	730 780	ps
t <sub>SKEW</sub>	Skew Output-to-Output <sup>4</sup> Part-to-Part (Diff) <sup>4</sup> Duty Cycle (Diff) <sup>5</sup>		20 20 25	100 200		20 20 25	100 200		20 20 25	100 200		20 20 25	100 200	ps
V <sub>PP</sub>	Minimum Input Swing <sup>6</sup>	150			150			150			150			mV
V <sub>CMR</sub>	Common Mode Range <sup>7</sup> 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
	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	V
t <sub>r</sub> t <sub>f</sub>	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<sub>ppmin</sub> 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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;  
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4-32-1,  
Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan. 81-3-5487-8488

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
– US & Canada ONLY 1-800-774-1848

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

INTERNET: <http://motorola.com/sps>