Product Preview

Triple PECL to ECL Translator

MC100LVEL91
MC100EL91

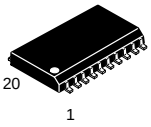
The MC100LVEL/EL91 is a triple PECL to ECL translator. The device receives either standard or low voltage differential PECL signals and translates them to either standard or low voltage differential ECL output signals. The LVEL device can handle the low voltage signals while the EL device is designed for the standard signals. It is possible to have low voltage signals on one side and standard signals on the other if the LVEL91 is used.

- 550ps Propagation Delays
- Fully Differential Design
- Supports both Standard and Low Voltage Operation
- 20–lead SOIC Packaging

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 D input. The active signal would then drive the D input. When used the V_{BB} output should be bypassed to ground via a 0.01µF capacitor. The V_{BB} output is designed to act as the switching reference for the EL91 under single ended input switching conditions, as aresult this pin can only source/sink up to 0.5mA of current.

To accomplish the level translation the EL/LVEL91 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 plain. Both V_{EE} and V_{CC} should be bypassed to ground via 0.01µF capacitors.

Under open input conditions, the 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.

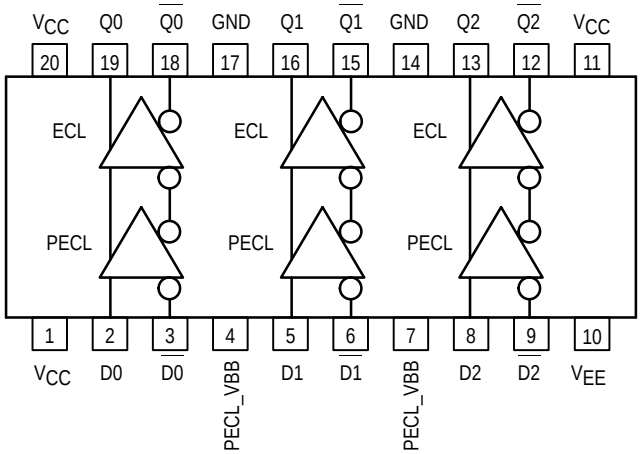


DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D-04

PIN NAMES

Pins	Function
Dn	PECL Inputs
Qn	ECL Outputs
PECL_V_{BB}	PECL Reference Voltage Output

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



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MOTOROLA

LVPECL 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	3.0	5.25	3.0	5.25	3.0	3.3	5.25	3.0	5.25	V	
I_{IH}	Input HIGH Current		150		150			150		150	µA	
I_{IL}	Input LOW Current	0.5		0.5		0.5			0.5		µA	
V_{IH}	Input HIGH Voltage[1]	2.135	2.420	2.135	2.420	2.135		2.420	2.135	2.420	V	V_{CC} = 3.3V
V_{IL}	Input LOW Voltage[1]	1.49	1.825	1.49	1.825	1.49		1.825	1.49	1.825	V	V_{CC} = 3.3V
V_{BB}	Reference Output[1]	1.92	2.04	1.92	2.04	1.92		2.04	1.92	2.04	V	V_{CC} = 3.3V
I_{GND}	Power Supply Curremt						6.0				mA	

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

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	4.75	5.25	4.75	5.25	4.75	5.0	5.25	4.75	5.25	V	
I_{IH}	Input HIGH Current		150		150			150		150	µA	
I_{IL}	Input LOW Current	0.5		0.5		0.5			0.5		µA	
V_{IH}	Input HIGH Voltage[1]	3.835	4.120	3.835	4.12	3.835		4.12	3.835	4.120	V	V_{CC} = 5.0V
V_{IL}	Input LOW Voltage[1]	3.19	3.525	3.19	3.525	3.19		3.525	3.19	3.525	V	V_{CC} = 5.0V
V_{BB}	Reference Output[1]	3.62	3.74	3.62	3.74	3.62		3.74	3.62	3.75	V	V_{CC} = 5.0V
I_{GND}	Power Supply Curremt						6.0				mA	

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

ECL/LVECL 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_{EE}	Power Supply Voltage EL91 LVEL91	–4.2 –3.0	–5.5 –5.5	–4.2 –3.0	–5.5 –5.5	–4.2 –3.0		–5.5 –5.5	–4.2 –3.0	–5.5 –5.5	V	
V_{OH}	Output HIGH Voltage	–1085	–880	–1025	–880	–1025	–955	–880	–1025	–880	mV	
V_{OL}	Output LOW Volrage	–1830	–1555	–1810	–1620	–1810	–1705	–1620	–1810	–1620	mV	
I_{EE}	Power Supply Current						22				mA	

MC100LVEL91
AC CHARACTERISTICS (V_{EE} = –3.0V to –3.8V; V_{CC} = 3.0V to 3.8V)

		–40°C			0°C			25°C			85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
t_{PLH} t_{PHL}	Propagation Delay Diff D to Q S.E.		550 550			550 550			550 550			550 550		ps
t_{SKEW}	Skew Output–to–Output[1] Part–to–Part (Diff)[1] Duty Cycle (Diff)[2]		75 200 25			75 200 25			75 200 25			75 200 25		ps
V_{PP}	Minimum Input Swing[3]	150			150			150			150			mV
V_{CMR}	Common Mode Range[4] V_{PP} < 500mV V_{PP} ≥ 500mV	 –2.0 –1.8		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)		400			400			400			400		ps

1. Skews are valid across specified voltage range, part–to–part skew is for a given temperature.
2. Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device.
3. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈40.
4. 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.

MC100EL91
AC CHARACTERISTICS (V_{EE} = –4.20V to –5.5V; V_{CC} = 4.75V to 5.25V)

		–40°C			0°C			25°C			85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
t_{PLH} t_{PHL}	Propagation Delay Diff D to Q S.E.		550 550			550 550			550 550			550 550		ps
t_{SKEW}	Skew Output–to–Output[1] Part–to–Part (Diff)[1] Duty Cycle (Diff)[2]		75 200 25			75 200 25			75 200 25			75 200 25		ps
V_{PP}	Minimum Input Swing[3]	150			150			150			150			mV
V_{CMR}	Common Mode Range[4] V_{PP} < 500mV V_{PP} ≥ 500mV	 –3.2 –3.0		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)		400			400			400			400		ps

1. Skews are valid across specified voltage range, part–to–part skew is for a given temperature.
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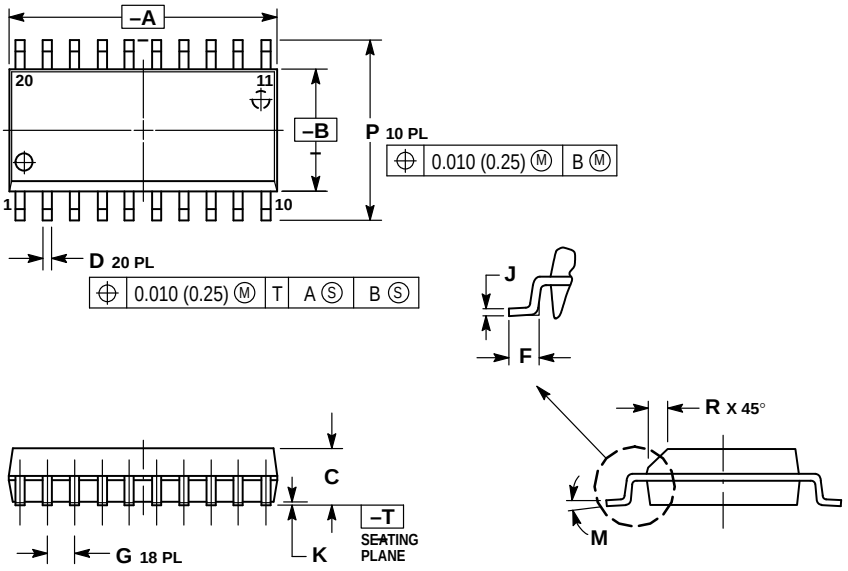
OUTLINE DIMENSIONS

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.

	MILLIMETERS		INCHES	
DIM	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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