

# Differential Receiver

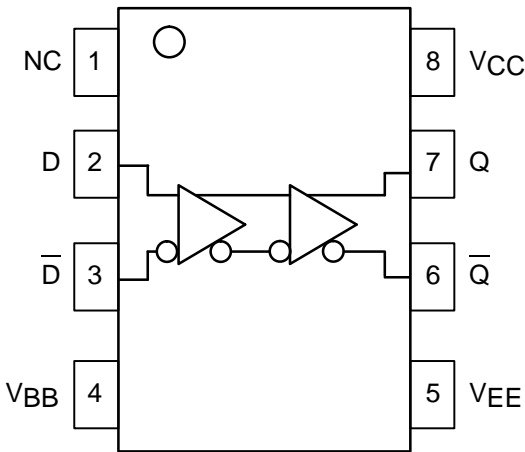
The MC100LVEL16 is a differential receiver. The device is functionally equivalent to the EL16 device, operating from a low voltage supply. The LVEL16 exhibits a wider CMR range than its EL16 counterpart. With output transition times and propagation delays comparable to the EL16 the LVEL16 is ideally suited for interfacing with high frequency sources at 3.3V supplies.

The LVEL16 provides a  $V_{BB}$  output for either single-ended use or as a DC bias for AC coupling to the device. The  $V_{BB}$  pin should be used only as a bias for the LVEL16 as its current sink/source capability is limited. Whenever used, the  $V_{BB}$  pin should be bypassed to ground via a 0.01 $\mu$ f capacitor.

Under open input conditions, the Q input will be pulled down to  $V_{EE}$  and the Q input will be biased to  $V_{CC}/2$ . This condition will force the Q output low.

- 300ps Propagation Delay
- High Bandwidth Output Transitions
- 75k $\Omega$  Internal Input Pulldown Resistors
- >2000V ESD Protection

## LOGIC DIAGRAM AND PINOUT ASSIGNMENT



# MC100LVEL16



**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751-05

## PIN DESCRIPTION

PIN	FUNCTION
D	Data Inputs
Q	Data Outputs
$V_{BB}$	Ref. Voltage Output



**DC CHARACTERISTICS** ( $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ;  $V_{CC} = \text{GND}$ )

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Power Supply Current		17	23		17	23		17	23		18	24	mA
$V_{BB}$	Output Reference Voltage	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	V
$V_{EE}$	Power Supply Voltage	-3.0	-3.3	-3.8	-3.0	-3.3	-3.8	-3.0	-3.3	-3.8	-3.0	-3.3	-3.8	V
$I_{IH}$	Input HIGH Current			150			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current CLK CLK	0.5 -600			0.5 -600			0.5 -600			0.5 -600			$\mu\text{A}$

**AC CHARACTERISTICS** ( $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ;  $V_{CC} = \text{GND}$ )

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 to Output (Diff) (SE)	150 100	275 275	400 450	215 165	290 290	365 415	225 175	300 300	375 425	240 190	315 315	390 440	ps
$t_{SKEW}$	Duty Cycle Skew <sup>1</sup> (Diff)		5	30		5	20		5	20		5	20	ps
$V_{PP}$	Minimum Input Swing <sup>2</sup>	150			150			150			150			mV
$V_{CMR}$	Common Mode Range <sup>3</sup> $V_{PP} < 500\text{mV}$ $V_{PP} \geq 500\text{mV}$	-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%)	120	220	320	120	220	320	120	220	320	120	220	320	ps

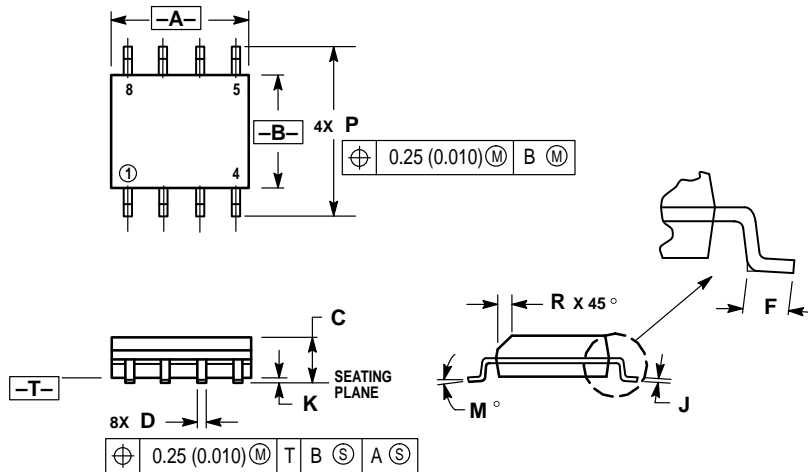
1. Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device.

2. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of  $\approx 40$ .

3. 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. The lower end of the CMR range varies 1:1 with  $V_{EE}$ . The numbers in the spec table assume a nominal  $V_{EE} = -3.3\text{V}$ . Note for PECL operation, the  $V_{CMR}(\text{min})$  will be fixed at  $3.3\text{V} - |V_{CMR}(\text{min})|$ .

## OUTLINE DIMENSIONS


**D SUFFIX**  
**PLASTIC SOIC PACKAGE**  
**CASE 751-05**  
**ISSUE M**



## 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 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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