

# MC10EPT20

## LVTTL/LVCMOS to Differential LVPECL Translator

The MC10EPT20 is a LVTTL/LVCMOS to differential LVPECL translator. Because LVPECL (Positive ECL) levels are used only +3.3V and ground are required. The small outline 8-lead SOIC package and the single gate of the EPT20 makes it ideal for those applications where space, performance, and low power are at a premium.

- 390ps Typical Propagation Delay
- High Bandwidth to 1.0 GHz Typical
- Differential LVPECL Outputs
- Small Outline SOIC Package
- PNP LVTTL Inputs for Minimal Loading
- V<sub>CC</sub> Range of 3.0V to 3.6V
- ESD Protection: >1.5KV HBM, >200V MM
- Q Output will default HIGH with inputs open
- Moisture Sensitivity Level 1, Indefinite Time Out of Drypack.  
For Additional Information, See Application Note AND8003/D
- Flammability Rating: UL-94 code V-0 @ 1/8",  
Oxygen Index 28 to 34
- Transistor Count = 150 devices

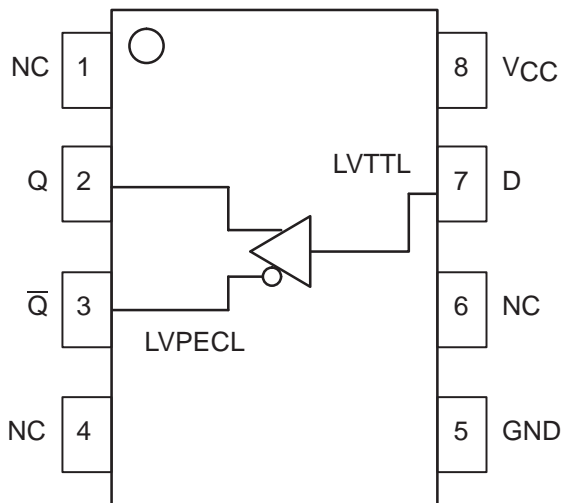
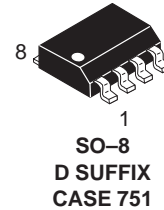


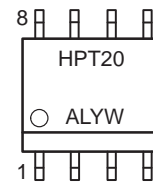
Figure 1. 8-Lead Pinout (Top View) and Logic Diagram



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### MARKING DIAGRAM



A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week

\*For additional information, see Application Note AND8002/D

PIN DESCRIPTION	
PIN	FUNCTION
Q, $\bar{Q}$	Differential LVPECL Outputs
D	LVTTL Input
V <sub>CC</sub>	Positive Supply
GND	Ground

### ORDERING INFORMATION

Device	Package	Shipping
MC10EPT20D	SOIC	98 Units/Rail
MC10EPT20DR2	SOIC	2500 Tape & Reel

# MC10EPT20

## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
$V_{CC}$	Power Supply	6.0 to 0	VDC
$V_I$	Input Voltage ( $V_I$ not more positive than $V_{CC}$ )	6.0 to 0	VDC
$I_{out}$	Output Current Continuous Surge	50 100	mA
$T_A$	Operating Temperature Range	-40 to +85	°C
$T_{stg}$	Storage Temperature	-65 to +150	°C
$\theta_{JA}$	Thermal Resistance (Junction-to-Ambient) Still Air 500lfpm	190 130	°C/W
$\theta_{JC}$	Thermal Resistance (Junction-to-Case)	41 to 44 ± 5%	°C/W
$T_{sol}$	Solder Temperature (<2 to 3 Seconds: 245°C desired)	265	°C

\* Maximum Ratings are those values beyond which damage to the device may occur.

## LVTTTL INPUT DC CHARACTERISTICS ( $V_{CC} = 3.3V \pm 0.3V$ ; GND = 0V; $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ )

Symbol	Characteristic	Min	Typ	Max	Unit
$I_{IH}$	Input HIGH Current ( $V_{in} = 2.7V$ )			20	$\mu\text{A}$
$I_{IHH}$	Input HIGH Current MAX ( $V_{in} = 6.0V$ )			100	$\mu\text{A}$
$I_{IL}$	Input LOW Current ( $V_{in} = 0.5V$ )			-0.6	mA
$V_{IK}$	Input Clamp Voltage ( $I_{in} = -18\text{mA}$ )			-1.2	V
$V_{IH}$	Input HIGH Voltage	2.0			V
$V_{IL}$	Input LOW Voltage			0.8	V

## LVPECL OUTPUT DC CHARACTERISTICS ( $V_{CC} = 3.3V \pm 0.3V$ ; GND = 0V) (Note 3.)

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{CC}$	Power Supply Current HIGH (Note 1.)	15	23	31	15	23	31	15	23	31	mA
$V_{OH}$	Output HIGH Voltage (Note 3.)	2165	2310	2415	2230	2355	2480	2290	2375	2540	mV
$V_{OL}$	Output LOW Voltage (Note 3.)	1365	1550	1615	1430	1570	1680	1490	1580	1740	mV

NOTE: 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained.

- $V_{CC} = 3.3V$ , GND = 0V, all other pins floating.
- All loading with 50 ohms to  $V_{CC}$ -2.0 volts.
- Output parameters vary 1:1 with  $V_{CC}$ .

## AC CHARACTERISTICS ( $V_{CC} = 3.3V \pm 0.3V$ ; GND = 0V)

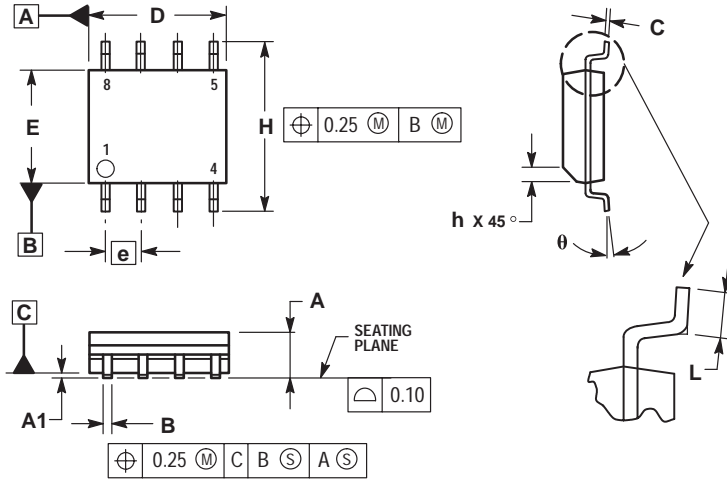
Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{max}$	Maximum Toggle Frequency (Note 4.)		1000			1000			1000		MHz
$t_{PLH}$ , $t_{PHL}$	Propagation Delay to Output Differential	150	350	600	150	370	600	150	380	600	ps
$t_{JITTER}$	Cycle-to-Cycle Jitter		TBD			TBD			TBD		ps
$t_r$ $t_f$	Output Rise/Fall Times (20% - 80%) Q, $\bar{Q}$	50	100	180	60	120	200	70	140	220	ps

- $F_{max}$  guaranteed for functionality only.  $V_{OL}$  and  $V_{OH}$  levels are guaranteed at DC only.

# MC10EPT20

## PACKAGE DIMENSIONS

SO-8  
D SUFFIX  
PLASTIC SOIC PACKAGE  
CASE 751-06  
ISSUE T




NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETER.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
theta	0°	7°

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