

# MC100EPT25

## Product Preview

### Differential LVECL/ECL to LVTTTL Translator

The MC100EPT25 is a Differential LVECL/ECL to LVTTTL translator. This device requires +3.3V, -3.3V to -5.2V, and ground. The small outline 8-lead SOIC package and the single gate of the EPT25 make it ideal for applications which require the translation of a clock or data signal.

The VBB output allows the EPT25 to also be used in a single-ended input mode. In this mode the VBB output is tied to the D input for a non-inverting buffer or the  $\bar{D}$  input for an inverting buffer. If used, the VBB pin should be bypassed to ground via a 0.01mF capacitor.

- 1.5ns Typical Propagation Delay
- 275MHz Fmax (Clock bit stream, not pseudo-random)
- Differential LVECL/ECL inputs
- Small Outline SOIC Package
- 24mA TTL outputs
- Flow Through Pinouts
- Internal Input Resistors: Pulldown on D, Pulldown and Pullup on  $\bar{D}$
- Q Output will default LOW with inputs open or at GND
- ESD Protection: >4000V HBM, >200V MM
- VBB Output
- New Differential Input Common Mode Range
- 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 = 111 devices

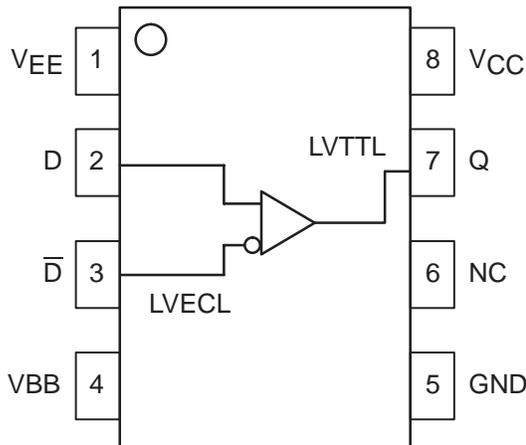


Figure 1. 8-Lead Pinout (Top View) and Logic Diagram

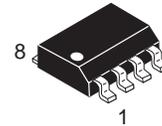
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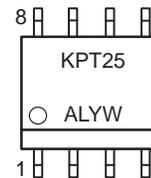
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SO-8  
D SUFFIX  
CASE 751

#### 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	LVTTTL Output
D, $\bar{D}$	Differential LVECL Input Pair
VCC	Positive Supply
VBB	Output Reference Voltage
GND	Ground
VEE	Negative Supply

#### ORDERING INFORMATION

Device	Package	Shipping
MC100EPT25D	SOIC	98 Units/Rail
MC100EPT25DR2	SOIC	2500 Tape & Reel

# MC100EPT25

## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
$V_{CC}$	Power Supply (Referenced to GND, $V_{EE} = -3.3V$ )	0 to 3.8	VDC
$V_{EE}$	Power Supply (Referenced to GND, $V_{CC} = +3.3V$ )	-6.0 to 0	VDC
$V_I$	Input Voltage ( $V_I$ not more positive than GND)	0 to 3.8	VDC
$I_{out}$	Output Current Continuous Surge	50 100	mA
$I_{BB}$	$V_{BB}$ Sink/Source Current†	± 0.5	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.

† Use for inputs of same package only.

## DC CHARACTERISTICS, ECL/LVECL ( $V_{CC} = +3.3V$ ; $V_{EE} = -5.5V$ to $-3.0V$ , GND = 0V)

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Power Supply Current (Note 1.)					20					mA
$V_{IH}$	Input HIGH Voltage Single Ended (Note 4.)	-1165		-880	-1165		-880	-1165		-880	mV
$V_{IL}$	Input LOW Voltage Single Ended (Note 4.)	-1810		-1475	-1810		-1475	-1810		-1475	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Note 3.)	$V_{EE}+2.0$		0.0	$V_{EE}+2.0$		0.0	$V_{EE}+2.0$		0.0	V
$I_{IH}$	Input HIGH Current			150			150			150	μA
$I_{IL}$	Input LOW Current	$\frac{D}{\bar{D}}$	0.5 -150		0.5 -150			0.5 -150			μA

NOTE: 100EP 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.

1. ( $V_{CC} = +3.3V$ , GND = 0V,  $V_{EE} = -3.3V$ ), all other pins floating.
2. All loading with 500 ohms to GND,  $C_L = 20pF$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ , max varies 1:1 with  $V_{CC}$ .
4. Input and output parameters vary 1:1 with  $V_{CC}$ .

## MC100EPT25

**TTL OUTPUT DC CHARACTERISTICS** ( $V_{CC} = 3.3V \pm 0.3V$ ;  $GND = 0V$ ;  $V_{EE} = -3.3V \pm 0.3V$ ;  $T_A = -40^{\circ}C$  to  $85^{\circ}C$ )

Symbol	Characteristic	Min	Typ	Max	Unit
$I_{CCH}$	Power Supply Current (Outputs set to HIGH)		12		mA
$I_{CCL}$	Power Supply Current (Outputs set to LOW)		18		mA
$V_{OH}$	Output HIGH Voltage ( $I_{OH} = -3.0mA$ ) (Note 5.)	2.4			V
$V_{OL}$	Output LOW Voltage ( $I_{OL} = 24mA$ ) (Note 5.)			0.5	V
$I_{OS}$	Output Short Circuit Current	-130		-80	mA
$V_{BB}$	Output Voltage Reference		-1410		mV

NOTE: 100EP 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.

5. All loading with 500 ohms to GND,  $CL = 20pF$ .

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

Symbol	Characteristic	$-40^{\circ}C$			$25^{\circ}C$			$85^{\circ}C$			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{max}$	Maximum Toggle Frequency	275			275			275			MHz
$t_{PLH}$ , $t_{PHL}$	Propagation Delay to Output Differential					1.5					ns
$t_{SK+ +}$ $t_{SK- -}$ $t_{SKPP}$	Output-to-Output Skew++ Output-to-Output Skew-- Part-to-Part Skew (Note 6.)		60 25 500			60 25 500			60 25 500		ps
$t_{JITTER}$	Cycle-to-Cycle Jitter		TBD			TBD			TBD		ps
$V_{PP}$	Input Voltage Swing (Differential) (Note 7.)	100	800	1200	100	800	1200	100	800	1200	mV
$t_r$ $t_f$	Output Rise/Fall Times (0.8 – 2.0V) Q, $\bar{Q}$					600					ps

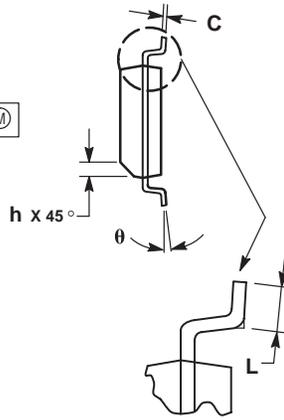
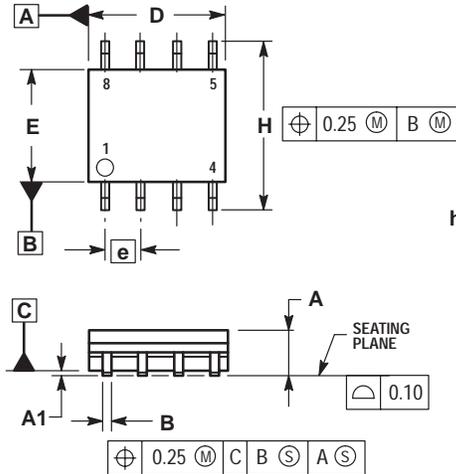
6. Skews are measured between outputs under identical conditions.

7. 200mV input guarantees full logic swing at the output.

# MC100EPT25

## 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
θ	0°	7°

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