

MC100EPT21

Differential LVPECL to LVTTTL Translator

The MC100EPT21 is a Differential LVPECL to LVTTTL translator. Because LVPECL (Positive ECL) levels are used only +3.3V and ground are required. The small outline 8-lead SOIC package makes the EPT21 ideal for applications which require the translation of a clock or data signal.

The VBB output allows the EPT21 to also be used in a single-ended input mode. In this mode the VBB output is tied to the $\overline{D0}$ input for a non-inverting buffer or the $D0$ input for an inverting buffer. If used, the VBB pin should be bypassed to ground via a 0.01 μ F capacitor.

- 1.4ns Typical Propagation Delay
- 275MHz Fmax (Clock bit stream, not pseudo-random)
- Differential LVPECL inputs
- Small Outline SOIC Package
- 24mA TTL outputs
- Flow Through Pinouts
- Internal Input Resistors: Pulldown on D, Pulldown and Pullup on \overline{D}
- Q Output will default LOW with inputs open or at GND
- ESD Protection: >1500V HBM, >100V 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 = 81 devices

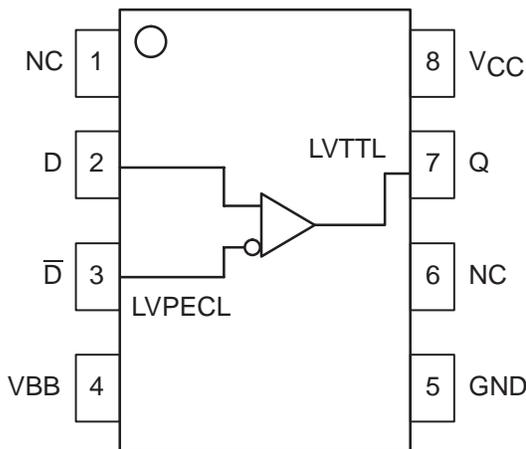


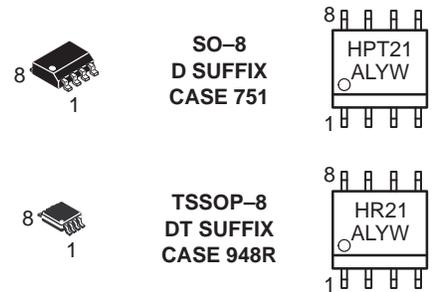
Figure 1. 8-Lead Pinout (Top View) and Logic Diagram



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MARKING DIAGRAMS*



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, \overline{D}	Differential LVPECL Input Pair
VCC	Positive Supply
VBB	Output Reference Voltage
GND	Ground

ORDERING INFORMATION

Device	Package	Shipping
MC100EPT21D	SO-8	98 Units / Rail
MC100EPT21DR2	SO-8	2500 / Reel
MC100EPT21DT	TSSOP-8	?? Units / Rail
MC100EPT21DTR2	TSSOP-8	2500 / Reel

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MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply (GND = 0V)	0 to 3.8	VDC
V_I	Input Voltage (GND = 0V, V_I not more positive than V_{CC})	0 to 3.8	VDC
I_{out}	Output Current	50 100	mA
	Continuous Surge		
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
θ_{JA}	Thermal Resistance (Junction-to-Ambient)	190 130	°C/W
	Still Air 500lfpm		
θ_{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 ($V_{CC} = 3.3V \pm 0.3V$; GND = 0V; $T_A = -40^\circ\text{C}$ to 85°C)

Symbol	Characteristic	Min	Typ	Max	Unit
I_{CCH}	Power Supply Current (Outputs set to HIGH)	5.0	12	20	mA
I_{CCL}	Power Supply Current (Outputs set to LOW)	8.0	18	26	mA
V_{IH}	Input HIGH Voltage ($V_{CC} = 3.3$) (Note 1.)	2135		2420	mV
V_{IL}	Input LOW Voltage ($V_{CC} = 3.3$) (Note 1.)	1490		1825	mV
I_{IH}	Input HIGH Current			150	μA
I_{IL}	Input LOW Current	$\frac{D}{D}$ -150		0.5	μA
V_{OH}	Output HIGH Voltage ($I_{OH} = -3.0\text{mA}$) (Note 2.)	2.4			V
V_{OL}	Output LOW Voltage ($I_{OL} = 24\text{mA}$) (Note 2.)			0.5	V
I_{OS}	Output Short Circuit Current	-130		-80	mA
V_{IHCMR}	Input HIGH Voltage Common Mode Range (Note 3.)	2.0		3.3	V
V_{BB}	Output Voltage Reference		2.0		V

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. All values vary 1:1 with V_{CC} .
2. All loading with 500 ohms to GND, $CL = 20\text{pF}$.
3. V_{IHCMR} min varies 1:1 with GND, max varies 1:1 with V_{CC} .

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

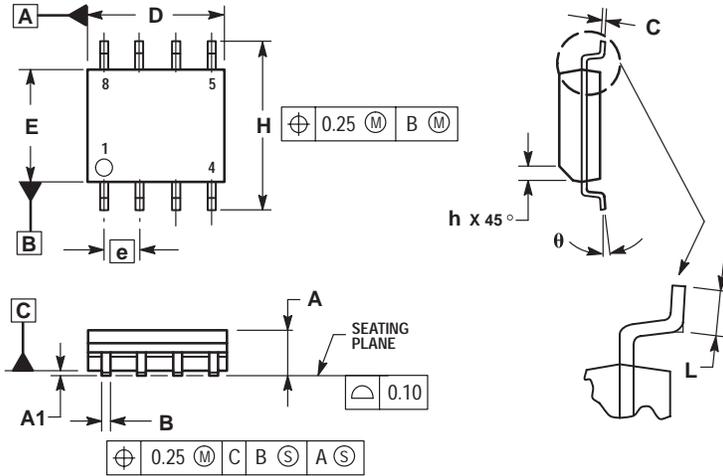
Symbol	Characteristic	-40°C			25°C			85°C			Unit	
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
f_{max}	Maximum Toggle Frequency (Note 4.)	275	350		275	350		275	350		MHz	
t_{PLH} , t_{PHL}	Propagation Delay to Output Differential (Note 5.)	1200	1450	1800	1200	1450	1800	1300	1450	1900	ps	
		1200	1400	1800	1200	1400	1800	1200	1400	1900		
t_{SK++} , t_{SK--} , t_{SKPP}	Output-to-Output Skew++ Output-to-Output Skew-- Part-to-Part Skew (Note 6.)		60			60			60		ps	
			25			25			25			
			500			500			500			
t_{JITTER}	Cycle-to-Cycle Jitter		TBD			TBD			TBD		ps	
V_{PP}	Input Voltage Swing (Diff.)	150	800	1200	150	800	1200	150	800	1200	mV	
t_r , t_f	Output Rise/Fall Times (0.8V – 2.0V)	Q, \bar{Q}	330	500	900	330	500	900	330	500	900	ps

4. F_{max} guaranteed for functionality only. V_{OL} and V_{OH} levels are guaranteed at DC only.
5. Reference ($V_{CC} = 3.3V \pm 5\%$, GND = 0V)
6. Skews are measured between outputs under identical transitions.

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PACKAGE DIMENSIONS

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



NOTES:

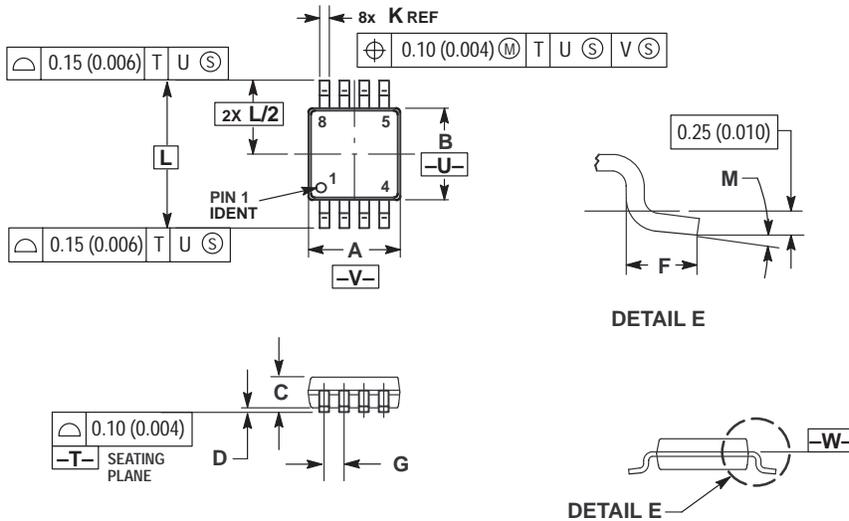
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETER.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B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

TSSOP-8
DT SUFFIX
PLASTIC TSSOP PACKAGE
CASE 948R-02
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.90	3.10	0.114	0.122
B	2.90	3.10	0.114	0.122
C	0.80	1.10	0.031	0.043
D	0.05	0.15	0.002	0.006
F	0.40	0.70	0.016	0.028
G	0.65 BSC		0.026 BSC	
K	0.25	0.40	0.010	0.016
L	4.90 BSC		0.193 BSC	
M	0°	6°	0°	6°

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