MOTOROLA
Semiconductor Components

Order Number: MC100EPT21/D
Rev. 0, 05/1999

MC100EPT21

SO–8, D SUFFIX
8–LEAD PLASTIC SOIC PACKAGE
CASE 751

ORDERING INFORMATION

MC100EPT21D SOIC

ECLinPS Plus™

Product Preview

Differential LVPECL to LVTTL Translator

PIN DESCRIPTION

PIN	FUNCTION
Q	LVTTL Output
D, $\overline{D}$	Diff LVPECL Input Pair
V_{CC}	Positive Supply
V_{BB}	Output Reference Voltage
GND	Ground

- 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
- ESD performance: Human Body model 2000V
- 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: >2KV HBM, >200V MM
- V_{BB} Output
- New Differential Input Common Mode Range
- Moisture Sensitivity Level 1, Indefinite Time Out of Drypack
- Flammability Rating: UL–94 code V–0 @ 1/8”, Oxygen Index 28 to 34
- Transistor Count = 81 devices

The MC100EPT21 is a Differential LVPECL to LVTTL 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 0.01µF capacitator.

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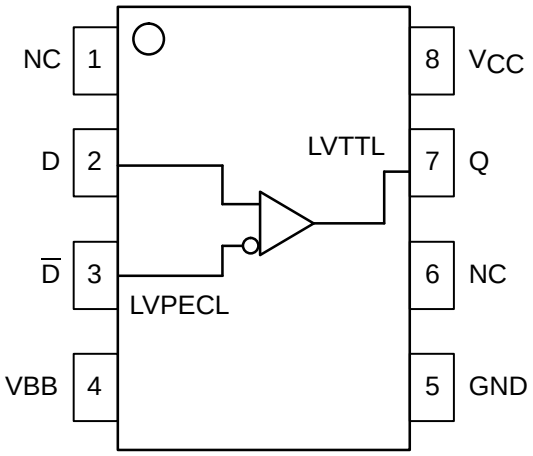


Figure 1. 8–Lead Pinout (Top View) **and Logic Diagram**

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 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
θ_{JA}	Thermal Resistance (Junction–to–Ambient) Still Air 500lfpm	190 130	°C/W
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 ± 0.3V; GND = 0V; T_A = –40°C to 85°C)

Symbol	Characteristic	Min	Typ	Max	Unit
I_{CCH}	Power Supply Current (Outputs set to HIGH)	TBD	20	TBD	mA
I_{CCL}	Power Supply Current (Outputs set to LOW)	TBD	28	TBD	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 D $\overline{D}$	0.5 –150			µA
V_{OH}	Output HIGH Voltage (I_{OH} = –3.0mA) (Note 2.)	2.4			V
V_{OL}	Output LOW Voltage (I_{OL} = 24mA) (Note 2.)			0.5	V
I_{OS}	Output Short Circuit Current	–80		–130	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 = 20pF.
3. V_{IHCMR} min varies 1:1 with GND, max varies 1:1 with V_{CC}.

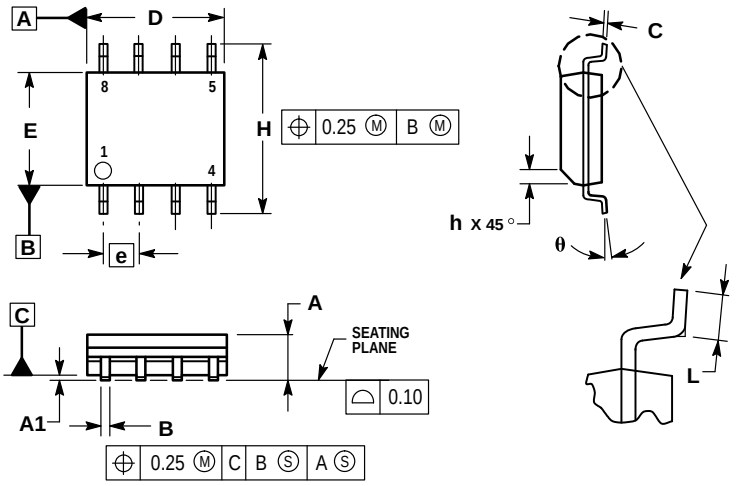
AC CHARACTERISTICS (V_{CC} = 3.3V ± 0.3V; GND = 0V)

		–40°C			25°C			85°C			
Symbol	Characteristic	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit
f_{max}	Maximum Toggle Frequency (Note 4.)		275			275			275		MHz
t_{PLH}, t_{PHL}	Propagation Delay to Output Differential		1450 1400			1450 1400			1450 1400		ps
t_{SK++} t_{SK--} t_{SKPP}	Output–to–Output Skew++ Output–to–Output Skew– – Part–to–Part Skew (Note 5.)		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 (Diff.)	150	800	1200	150	800	1200	150	800	1200	mV
t_r t_f	Output Rise/Fall Times (20% – 80%) Q, $\overline{Q}$		525 450			525 450			525 450		ps

4. F_{max} guaranteed for functionality only. V_{OL} and V_{OH} levels are guaranteed at DC only.
5. Skews are measured between outputs under identical transitions.

OUTLINE 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.

	MILLIMETERS	
DIM	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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