5V Dual TTL to Differential PECL Translator

The MC10ELT/100ELT22 is a dual TTL to differential PECL translator. Because PECL (Positive ECL) levels are used only +5 V and ground are required. The small outline 8-lead package and the low skew, dual gate design of the ELT22 makes it ideal for applications which require the translation of a clock and a data signal.

- 1.2 ns Typical Propagation Delay
- < 300 ps Typical Output to Output Skew
- PNP TTL Inputs for Minimal Loading
- Flow Through Pinouts
- Operating Range: $V_{CC} = 4.75 \text{ V}$ to 5.25 V with GND = 0 V
- No Internal Input Pulldown Resistors

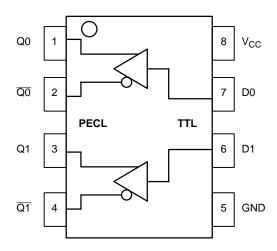


Figure 1. Logic Diagram and Pinout Assignment

PIN DESCRIPTION

PIN	FUNCTION
Qn, Qn	PECL Differential Outputs*
Dn	TTL Inputs
V _{CC}	Positive Supply
GND	Ground

^{*} Output state undetermined when inputs are open.



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MARKING DIAGRAMS*



CASE 751











H = MC10L = Wafer Lot K = MC100Y = YearW = Work Week A = Assembly Location

ORDERING INFORMATION

Device	Package	Shipping**
MC10ELT22D	SO-8	98 Units/Rail
MC10ELT22DR2	SO-8	2500 Tape & Reel
MC100ELT22D	SO-8	98 Units/Rail
MC100ELT22DR2	SO-8	2500 Tape & Reel
MC10ELT22DT	TSSOP-8	98 Units/Rail
MC10ELT22DTR2	TSSOP-8	2500 Tape & Reel
MC100ELT22DT	TSSOP-8	98 Units/Rail
MC100ELT22DTR2	TSSOP-8	2500 Tape & Reel

^{**}For additional tape and reel information, see Brochure BRD8011/D.

^{*}For additional information, see Application Note AND8002/D.

ATTRIBUTES

Character	Value				
Internal Input Pulldown Resistor	N/A				
Internal Input Pullup Resistor		N/A			
ESD Protection	Human Body Model Machine Model	> 2 KV > 200 V			
Moisture Sensitivity, Indefinite Tin	ne Out of Drypack (Note 1)	Level 1			
Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in			
Transistor Count		51			
Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test					

^{1.} For additional information, see Application Note AND8003/D.

MAXIMUM RATINGS (Note 2)

Symbol	Parameter	Condition 1	Condition 2	Rating	Units
V _{CC}	Positive Power Supply	GND = 0 V		7	V
V _{IN}	Input Voltage	GND = 0 V	$V_{I} \leq V_{CC}$	7	V
l _{out}	Output Current	Continuous Surge		50 100	mA mA
T _A	Operating Temperature Range			-40 to +85	°C
T _{stg}	Storage Temperature Range			-65 to +150	°C
θ_{JA}	Thermal Resistance (Junction-to-Ambient)	0 LFPM 500 LFPM	8 SOIC 8 SOIC	190 130	°C/W
θ_{JC}	Thermal Resistance (Junction-to-Case)	Standard Board	8 SOIC	41 to 44	°C/W
θ_{JA}	Thermal Resistance (Junction-to-Ambient)	0 LFPM 500 LFPM	8 TSSOP 8 TSSOP	185 140	°C/W
θJC	Thermal Resistance (Junction-to-Case)	Standard Board	8 TSSOP	41 to 44 ± 5%	°C/W
T _{sol}	Wave Solder	<2 to 3 sec @ 248°C		265	°C

^{2.} Maximum Ratings are those values beyond which device damage may occur.

10ELT SERIES PECL DC CHARACTERISTICS V_{CC} = 5.0 V; GND = 0.0 V (Note 3)

			-40 °C			25°C			85°C		
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
Icc	Power Supply Current			22			22			22	mA
V _{OH}	Output HIGH Voltage (Note 4)	3920	4010	4110	4020	4105	4190	4090	4185	4280	mV
V _{OL}	Output LOW Voltage (Note 4)	3050	3200	3350	3050	3210	3370	3050	3227	3405	mV

NOTE: Devices 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 air flow greater than 500 lfpm is maintained.

- 3. Output parameters vary 1:1 with V $_{CC}$. V $_{CC}$ can vary \pm 0.25 V. 4. Outputs are terminated through a 50 ohm resistor to V $_{CC}$ 2 volts.

100ELT SERIES PECL DC CHARACTERISTICS $V_{CC} = 5.0 \text{ V}$; GND = 0.0 V (Note 5)

			-40 °C		25°C		85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
I _{CC}	Power Supply Current			22			22			22	mA
V _{OH}	Output HIGH Voltage (Note 6)	3915	3995	4120	3975	4045	4120	3975	4050	4120	mV
V _{OL}	Output LOW Voltage (Note 6)	3170	3305	3445	3190	3295	3380	3190	3295	3380	mV

NOTE: Devices 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 air flow greater than 500 lfpm is maintained.

- 5. Output parameters vary 1:1 with V_{CC} . V_{CC} can vary \pm 0.25 V.
- 6. Outputs are terminated through a 50 ohm resistor to V_{CC} 2 volts.

TTL INPUT DC CHARACTERISTICS V_{CC} = 4.75 V to 5.25 V; T_A = -40°C to 85°C

Symbol	Characteristic	Condition	Min	Тур	Max	Unit
I _{IH}	Input HIGH Current	V _{IN} = 2.7 V			20	μΑ
I _{IHH}	Input HIGH Current	V _{IN} = 7.0 V			100	μΑ
I _{IL}	Input LOW Current	V _{IN} = 0.5 V			-0.6	mA
V _{IK}	Input Clamp Diode Voltage	I _{IN} = -18 mA			-1.2	V
V _{IH}	Input HIGH Voltage		2.0			V
V _{IL}	Input LOW Voltage				0.8	V

AC CHARACTERISTICS V_{CC} = 4.75 V to 5.25 V; GND= 0.0 V

			-40 °C			25°C			85°C		
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
f _{MAX}	Maximum Input Frequency					500					MHz
t _{PLH}	Propagation Delay (Note 7) 1.5 V to 50%	0.6		1.2	0.9	1.2	1.5	0.6		1.35	ns
t _{PHL}	Propagation Delay (Note 7) 1.5 V to 50%	0.4		1.0	0.5	0.8	1.1	0.7		1.30	ns
t _{skew}	Within-Device Skew (Note 8) Device-to-Device Skew (Note 9)		50 300	100 600		50 300	100 600		50 350	100 750	ps
t _{JITTER}	Random Clock Jitter (RMS)					0.5					ps
t _r /t _f	Output Rise/Fall Time (20-80%)	0.4		1.6	0.4		1.6	0.4		1.6	ns

- 7. Specifications for standard TTL input signal.
- 8. Skew is measured between outputs under identical transitions and conditions on any one device.
- 9. Device-to-Device Skew for identical transitions at identical $V_{\mbox{\footnotesize{CC}}}$ levels.

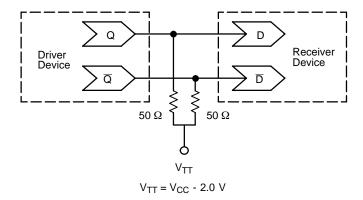


Figure 2. Typical Termination for Output Driver and Device Evaluation (See Application Note AND8020 - Termination of ECL Logic Devices.)

Resource Reference of Application Notes

AN1404 - ECLinPS Circuit Performance at Non-Standard V_{IH} Levels

AN1405 - ECL Clock Distribution Techniques

AN1406 - Designing with PECL (ECL at +5.0 V)

AN1503 - ECLinPS I/O SPICE Modeling Kit

AN1504 - Metastability and the ECLinPS Family

AN1560 - Low Voltage ECLinPS SPICE Modeling Kit

AN1568 - Interfacing Between LVDS and ECL

AN1596 - ECLinPS Lite Translator ELT Family SPICE I/O Model Kit

AN1650 - Using Wire-OR Ties in ECLinPS Designs

AND8001 - The ECL Translator Guide

AND8001 - Odd Number Counters Design

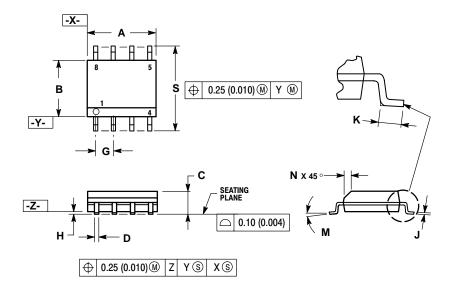
AND8002 - Marking and Date Codes

AND8020 - Termination of ECL Logic Devices

AND8090 - AC Characteristics of ECL Devices

PACKAGE DIMENSIONS

SO-8 **D SUFFIX** PLASTIC SOIC PACKAGE CASE 751-07 **ISSUE AA**



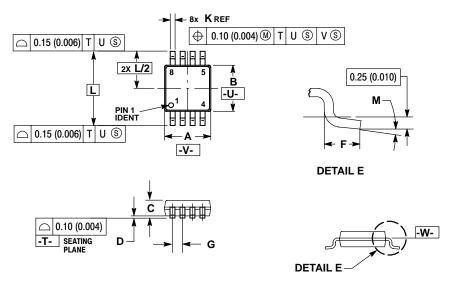
NOTES:

- IOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI
 Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSION A AND B DO NOT INCLUDE MOLD
- PROTRUSION.
 4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER
- 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.
 6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

	MILLIN	IETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
Α	4.80	5.00	0.189	0.197	
В	3.80	4.00	0.150	0.157	
С	1.35	1.75	0.053	0.069	
D	0.33	0.51	0.013	0.020	
G	1.27	7 BSC	0.050 BSC		
Н	0.10	0.25	0.004	0.010	
J	0.19	0.25	0.007	0.010	
K	0.40	1.27	0.016	0.050	
M	0 °	8 °	0 °	8 °	
N	0.25	0.50	0.010	0.020	
S	5.80	6.20	0.228	0.244	

PACKAGE DIMENSIONS

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



- DIMENSIONS AND TOLERANCING PER ASME Y14.5M, 1994
- CONTROLLING DIMENSION: MILLIMETER.
- 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. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION.
- INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
- TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
 DIMENSION A AND B ARE TO BE
- DETERMINED AT DATUM PLANE -W-.

	MILLIN	IETERS	INCHES			
DIM	MIN	MAX	MIN	MAX		
Α	2.90	3.10	0.114	0.122		
В	2.90	3.10	0.114	0.122		
С	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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