



**THE DATASHEET OF  
MC10H125FNG**



# MC10H125

## Quad MECL-to-TTL Translator

### Description

The MC10H125 is a quad translator for interfacing data and control signals between the MECL section and saturated logic section of digital systems. The 10H part is a functional/pinout duplication of the standard MECL 10K™ family part, with 100% improvement in propagation delay, and no increase in power-supply current.

Outputs of unused translators will go to low state when their inputs are left open.

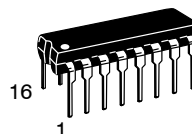
### Features

- Propagation Delay, 2.5 ns Typical
- Voltage Compensated
- Improved Noise Margin 150 mV  
(Over Operating Voltage and Temperature Range)
- MECL 10K Compatible
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

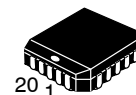


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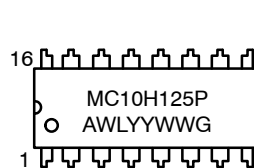


**PDIP-16**  
**P SUFFIX**  
**CASE 648-08**

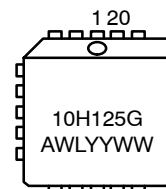


**PLLC-20**  
**FN SUFFIX**  
**CASE 775-02**

### MARKING DIAGRAMS\*



**PDIP-16**



**PLLC-20**

A = Assembly Location  
WL, L = Wafer Lot  
YY, Y = Year  
WW, W = Work Week  
G = Pb-Free Package

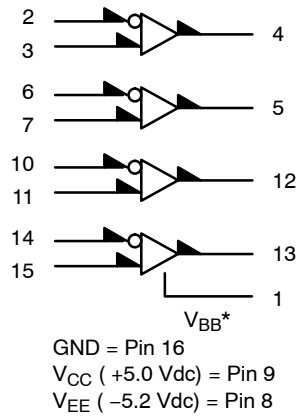
\*For additional marking information, refer to Application Note [AND8002/D](#).

### ORDERING INFORMATION

Device	Package	Shipping†
MC10H125FNG	PLLC-20 (Pb-Free)	46 Units / Tube
MC10H125FNR2G	PLLC-20 (Pb-Free)	500 Tape & Reel
MC10H125PG	PDIP-16 (Pb-Free)	25 Units / Tube

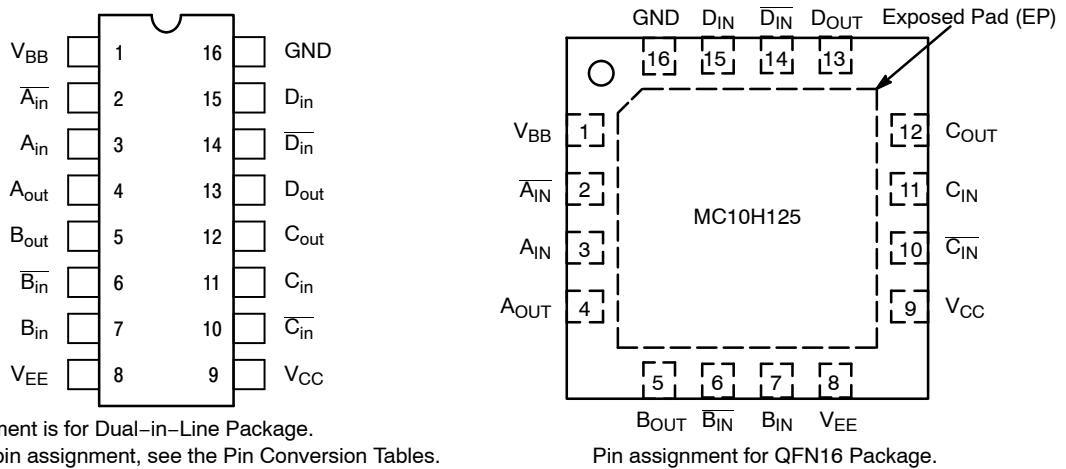
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

# MC10H125



\* $V_{BB}$  to be used to supply bias to the MC10H125 only and bypassed (when used) with 0.01  $\mu$ F to 0.1  $\mu$ F capacitor to ground (0 V).  $V_{BB}$  can source < 1.0 mA.

**Figure 1. Logic Diagram**



**Figure 2. Pin Assignment**

**Table 1. DIP CONVERSION TABLES**

**16-Pin DIL to 20-Pin PLCC**

16 PIN DIL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
20 PIN PLCC	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20				

**20-Pin DIL to 20-Pin PLCC**

20 PIN DIL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
20 PIN PLCC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

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**Table 2. MAXIMUM RATINGS**

Symbol	Characteristic	Rating	Unit
V <sub>EE</sub>	Power Supply (V <sub>CC</sub> = 5.0 V)	-8.0 to 0	Vdc
V <sub>CC</sub>	Power Supply (V <sub>EE</sub> = -5.2 V)	0 to +7.0	Vdc
V <sub>I</sub>	Input Voltage (V <sub>CC</sub> = 5.0 V)	0 to V <sub>EE</sub>	Vdc
T <sub>A</sub>	Operating Temperature Range	0 to +75	°C
T <sub>stg</sub>	Storage Temperature Range - Plastic - Ceramic	-55 to +150 -55 to +165	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

**Table 3. ELECTRICAL CHARACTERISTICS** (V<sub>EE</sub> = -5.2 V +5%; V<sub>CC</sub> = 5.0 V + 5.0 %) (Note 2)

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
I <sub>E</sub>	Negative Power Supply Drain Current	-	44	-	40	-	44	mA
I <sub>CCH</sub>	Positive Power Supply Drain Current	-	63	-	63	-	63	mA
I <sub>CCL</sub>		-	40	-	40	-	40	mA
I <sub>inH</sub>	Input Current	-	225	-	145	-	145	μA
I <sub>CBO</sub>	Input Leakage Current	-	1.5	-	1.0	-	1.0	μA
V <sub>OH</sub>	High Output Voltage I <sub>OH</sub> = -1.0 mA	2.5	-	2.5	-	2.5	-	Vdc
V <sub>OL</sub>	Low Output Voltage I <sub>OL</sub> = +20 mA	-	0.5	-	0.5	-	0.5	Vdc
V <sub>IH</sub>	High Input Voltage (Note 1)	-1.17	-0.84	-1.13	-0.81	-1.07	-0.735	Vdc
V <sub>IL</sub>	Low Input Voltage (Note 1)	-1.95	-1.48	-1.95	-1.48	-1.95	-1.45	Vdc
I <sub>OS</sub>	Short Circuit Current	60	150	60	150	50	150	mA
V <sub>BB</sub>	Reference Voltage	-1.38	-1.27	-1.35	-1.25	-1.31	-1.19	Vdc
V <sub>CMR</sub>	Common Mode Range (Note 3)	-	-	-2.85 to +0.3				V
		<b>Typical</b>						
V <sub>PP</sub>	Input Sensitivity (Note 4)	150						mV

1. When V<sub>BB</sub> is used as the reference voltage.
2. Each MECL 10H™ series circuit has been designed to meet the specifications shown in the test 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 linear fpm is maintained.
3. Differential input not to exceed 1.0 Vdc.
4. 150 mV<sub>p-p</sub> differential input required to obtain full logic swing on output.

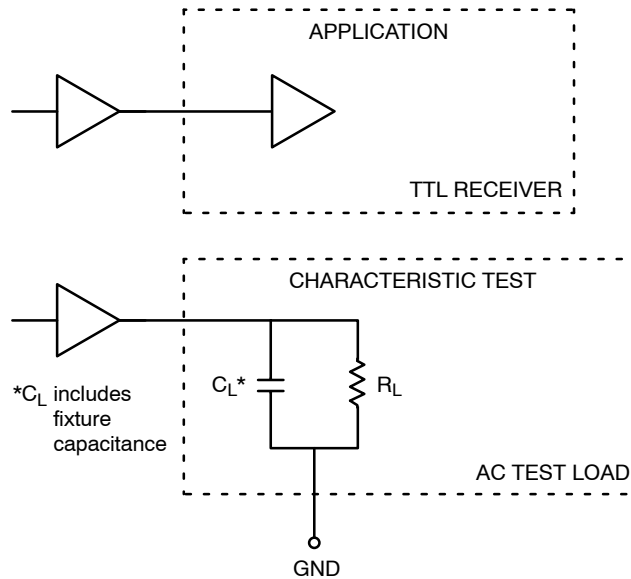
# MC10H125

**Table 4. AC CHARACTERISTICS**

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
$t_{pd}$	Propagation Delay	0.8	3.3	0.85	3.35	0.9	3.4	ns
$t_r$	Rise Time (Note 1)	0.3	1.2	0.3	1.2	0.3	1.2	ns
$t_f$	Fall Time (Note 1)	0.3	1.2	0.3	1.2	0.3	1.2	ns

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

1. Output Voltage = 1.0 V to 2.0 V.  $R_L = 500 \Omega$  to GND and  $C_L = 25$  pF to GND. Refer to Figure 1.



**Figure 1. TTL Output Loading Used for Device Evaluation**

## APPLICATION INFORMATION

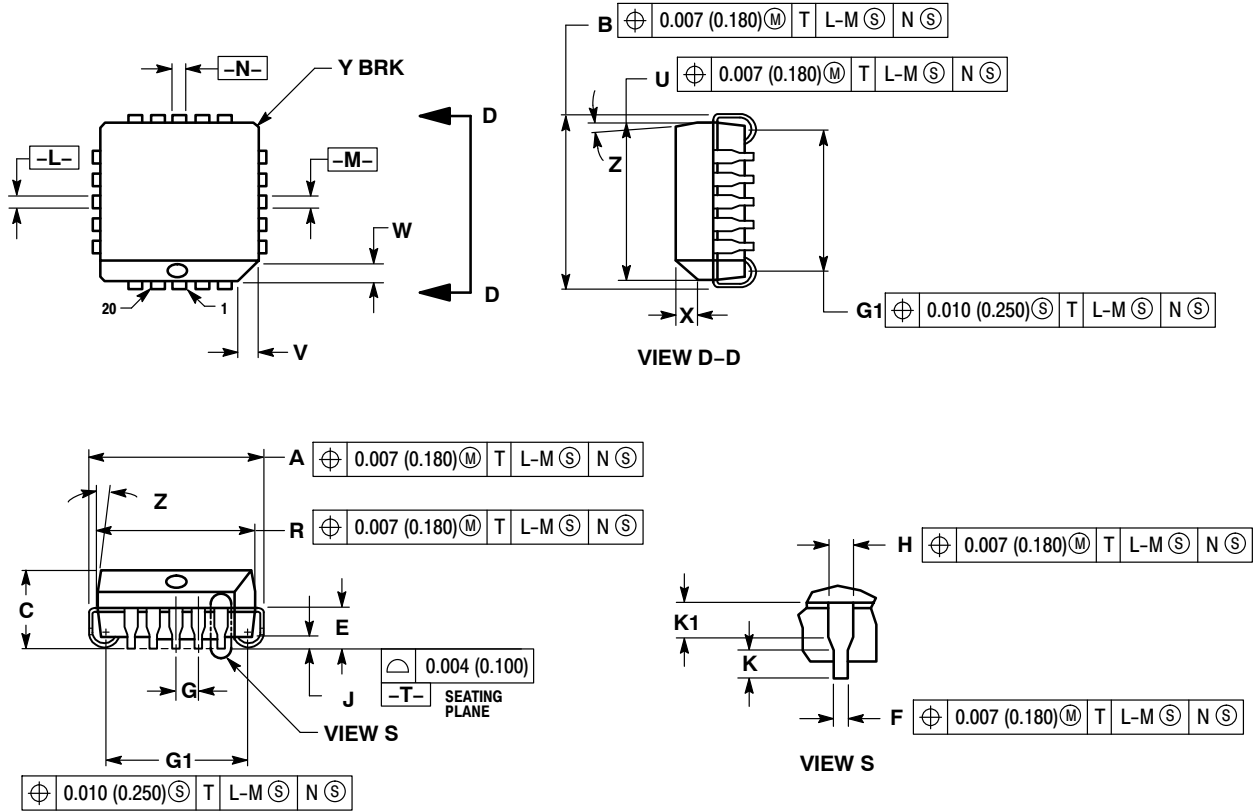
The MC10H125 incorporates differential inputs and Schottky TTL “totem pole” outputs. Differential inputs allow for use as an inverting/non-inverting translator or as a differential line receiver. The  $V_{BB}$  reference voltage is available on Pin 1 for use in single-ended input biasing. The outputs of the MC10H125 go to a low-logic level whenever the inputs are left floating, and a high-logic output level is achieved with a minimum input level of  $150 \text{ mV}_{p-p}$ .

An advantage of this device is that MECL-level information can be received, via balanced twisted pair lines, in the TTL equipment. This isolates the MECL-logic from the noisy TTL environment. Power supply requirements are ground, +5.0 V and -5.2 V.

# MC10H125

## PACKAGE DIMENSIONS

20 LEAD PLLC  
FN SUFFIX  
CASE 775-02  
ISSUE F



**NOTES:**

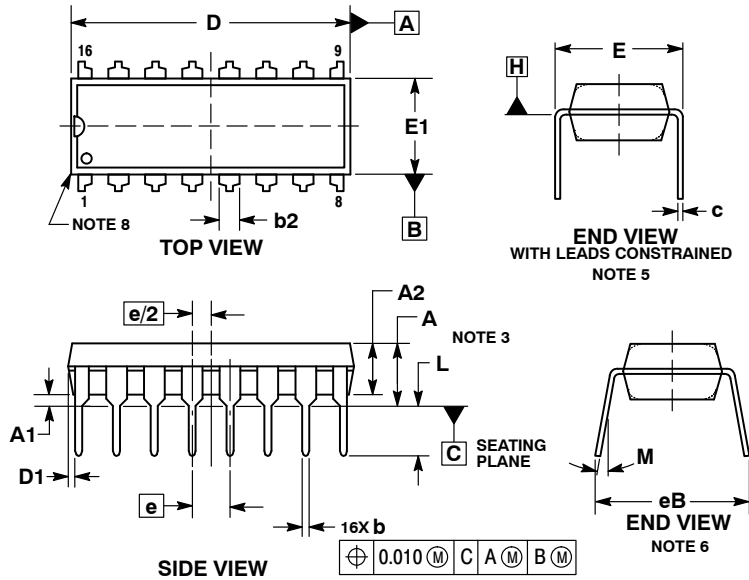
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
2. DIMENSIONS IN INCHES.
3. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
4. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
5. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
6. DIMENSIONS IN THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.385	0.395	9.78	10.03
B	0.385	0.395	9.78	10.03
C	0.165	0.180	4.20	4.57
E	0.090	0.110	2.29	2.79
F	0.013	0.021	0.33	0.53
G	0.050 BSC		1.27 BSC	
H	0.026	0.032	0.66	0.81
J	0.020	----	0.51	----
K	0.025	----	0.64	----
R	0.350	0.356	8.89	9.04
U	0.350	0.356	8.89	9.04
V	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
X	0.042	0.056	1.07	1.42
Y	----	0.020	----	0.50
Z	2° 10°		2° 10°	
G1	0.310	0.330	7.88	8.38
K1	0.040	----	1.02	----

# MC10H125

## PACKAGE DIMENSIONS

PDIP-16  
P SUFFIX  
CASE 648-08  
ISSUE V



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSIONS A, A1 AND L ARE MEASURED WITH THE PACKAGE SEATED IN JEDEC SEATING PLANE GAUGE GS-3.
4. DIMENSIONS D, D1 AND E1 DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS ARE NOT TO EXCEED 0.10 INCH.
5. DIMENSION E IS MEASURED AT A POINT 0.015 BELOW DATUM PLANE H WITH THE LEADS CONSTRAINED PERPENDICULAR TO DATUM C.
6. DIMENSION eB IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
7. DATUM PLANE H IS COINCIDENT WITH THE BOTTOM OF THE LEADS, WHERE THE LEADS EXIT THE BODY.
8. PACKAGE CONTOUR IS OPTIONAL (ROUNDED OR SQUARE CORNERS).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	----	0.210	----	5.33
A1	0.015	----	0.38	----
A2	0.115	0.195	2.92	4.95
b	0.014	0.022	0.35	0.56
b2	0.060 TYP		1.52 TYP	
C	0.008	0.014	0.20	0.36
D	0.735	0.775	18.67	19.69
D1	0.005	----	0.13	----
E	0.300	0.325	7.62	8.26
E1	0.240	0.280	6.10	7.11
e	0.100 BSC		2.54 BSC	
eB	----	0.430	----	10.92
L	0.115	0.150	2.92	3.81
M	----	10°	----	10°

### STYLE 1:

- PIN 1. CATHODE
- 2. CATHODE
- 3. CATHODE
- 4. CATHODE
- 5. CATHODE
- 6. CATHODE
- 7. CATHODE
- 8. CATHODE
- 9. ANODE
- 10. ANODE
- 11. ANODE
- 12. ANODE
- 13. ANODE
- 14. ANODE
- 15. ANODE
- 16. ANODE

### STYLE 2:

- PIN 1. COMMON DRAIN
- 2. COMMON DRAIN
- 3. COMMON DRAIN
- 4. COMMON DRAIN
- 5. COMMON DRAIN
- 6. COMMON DRAIN
- 7. COMMON DRAIN
- 8. COMMON DRAIN
- 9. GATE
- 10. SOURCE
- 11. GATE
- 12. SOURCE
- 13. GATE
- 14. SOURCE
- 15. GATE
- 16. SOURCE

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