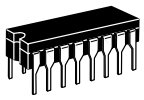
Quad MECL-to-TTL Translator

MC10H125

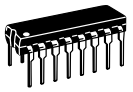
The MC10H125 is a quad translator for interfacing data and control signals between the MECL section and saturated logic section of digital systems. The 10H part is a functional/pinout duplication of the standard MECL 10K family part, with 100% improvement in propagation delay, and no increase in power–supply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

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

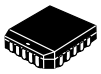
- Propagation Delay, 2.5 ns Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K–Compatible



L SUFFIX
CERAMIC PACKAGE
CASE 620–10



P SUFFIX
PLASTIC PACKAGE
CASE 648–08



FN SUFFIX
PLCC
CASE 775–02

MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Power Supply (V_{CC} = 5.0 V)	V_{EE}	–8.0 to 0	Vdc
Power Supply (V_{EE} = –5.2 V)	V_{CC}	0 to +7.0	Vdc
Input Voltage (V_{CC} = 5.0 V)	V_I	0 to V_{EE}	Vdc
Operating Temperature Range	T_A	0 to +75	°C
Storage Temperature Range — Plastic — Ceramic	T_{stg}	–55 to +150 –55 to +165	°C °C

ELECTRICAL CHARACTERISTICS (V_{EE} = –5.2 V ±5%; V_{CC} = 5.0 V ± 5.0 %) (See Note)

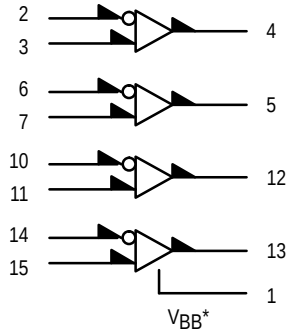
Characteristic	Symbol	0° Min	0° Max	25° Min	25° Max	75° Min	75° Max	Unit
Negative Power Supply Drain Current	I_E	—	44	—	40	—	44	mA
Positive Power Supply Drain Current	I_{CCH}	—	63	—	63	—	63	mA
	I_{CCL}	—	40	—	40	—	40	mA
Input Current	I_{inH}	—	225	—	145	—	145	µA
Input Leakage Current	I_{CBO}	—	1.5	—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

AC PARAMETERS

Propagation Delay	t_{pd}	0.8	3.3	0.85	3.35	0.9	3.4	ns
Rise Time(5)	t_r	0.3	1.2	0.3	1.2	0.3	1.2	ns
Fall Time(5)	t_f	0.3	1.2	0.3	1.2	0.3	1.2	ns

NOTES:
1. When V_{BB} 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_{p-p} differential input required to obtain full logic swing on output.
5. 1.0 V to 2.0 V w/25 pF into 500 Ω.

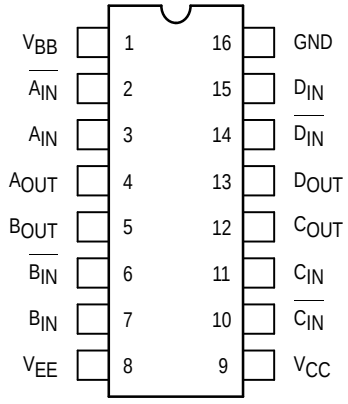
LOGIC DIAGRAM



GND = PIN 16
V_{CC} (+5.0 VDC)= PIN 9
V_{EE} (–5.2 VDC) = PIN 8

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

DIP PIN ASSIGNMENT



Pin assignment is for Dual–in–Line Package. For PLCC pin assignment, see the Pin Conversion Tables on page 6–11 of the Motorola MECL Data Book (DL122/D).

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MOTOROLA

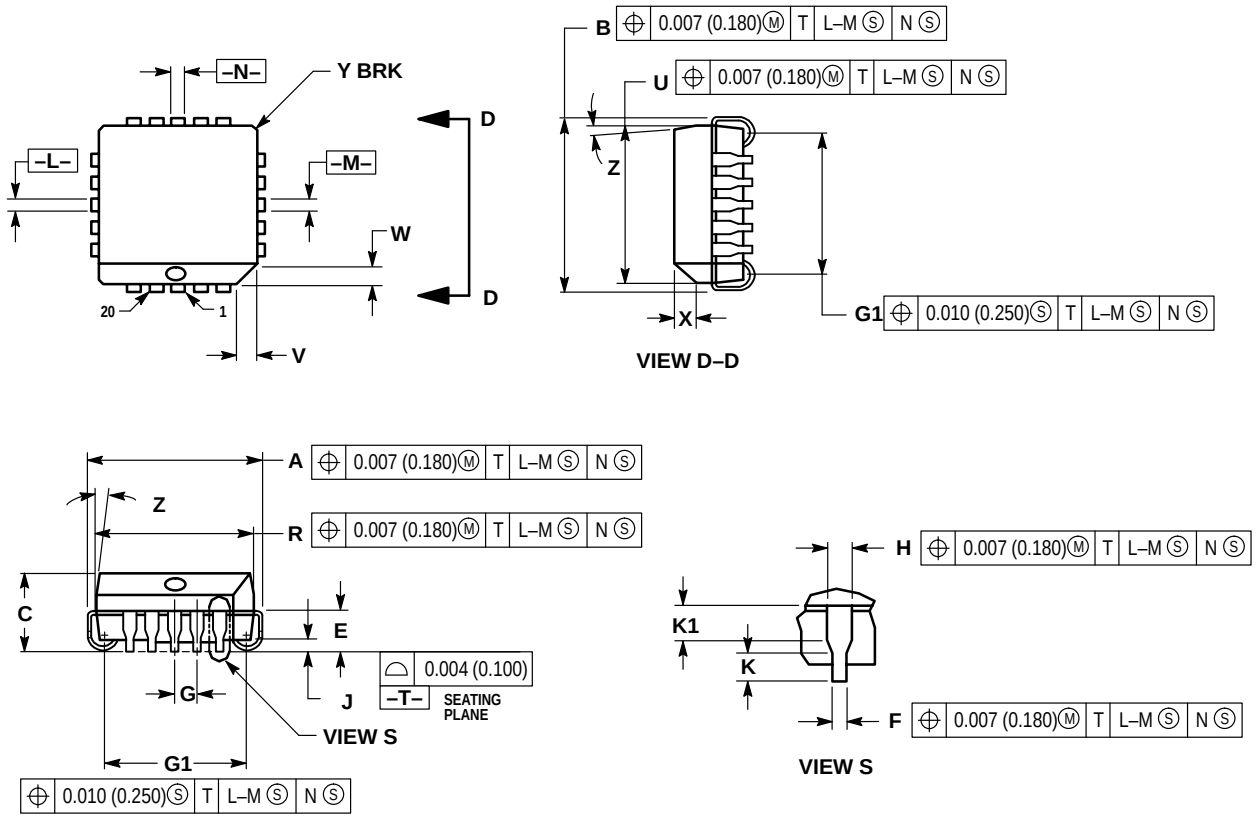
APPLICATION INFORMATION

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 $mV_{p–p}$.

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 volts and –5.2 volts.

OUTLINE DIMENSIONS

FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775–02
ISSUE C

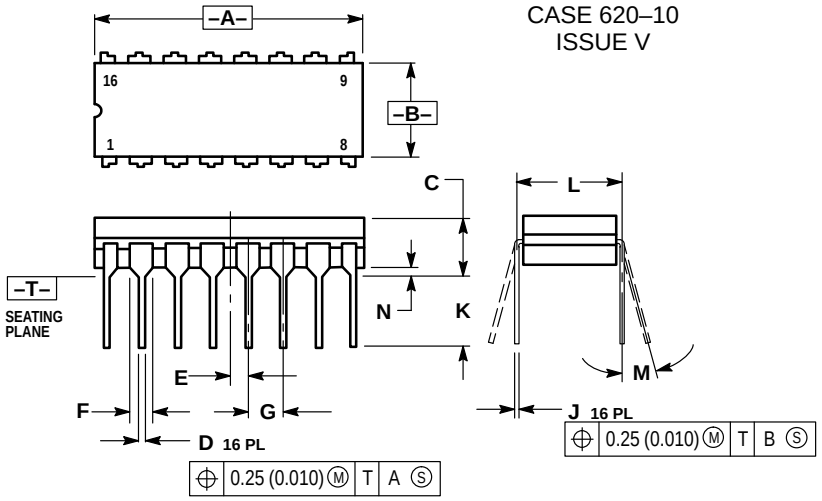


NOTES:
1. DATUMS –L–, –M–, AND –N– DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM –T–, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. 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).

	INCHES		MILLIMETERS	
DIM	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	0.019	0.33	0.48
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	—

OUTLINE DIMENSIONS

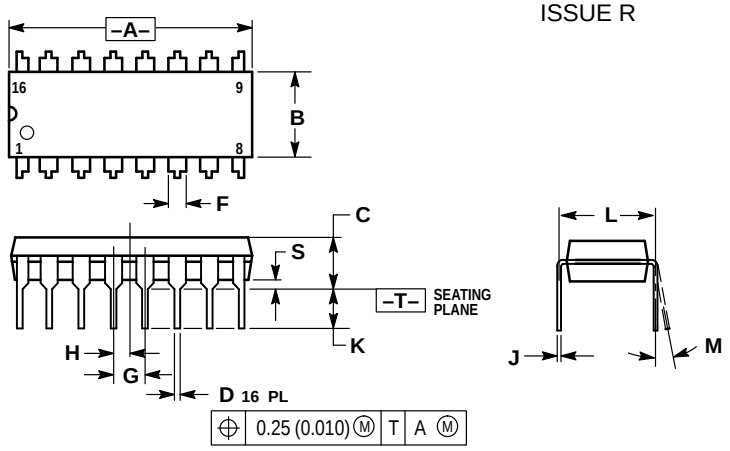
L SUFFIX
CERAMIC DIP PACKAGE
CASE 620–10
ISSUE V



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIMENSION F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.750	0.785	19.05	19.93
B	0.240	0.295	6.10	7.49
C	—	0.200	—	5.08
D	0.015	0.020	0.39	0.50
E	0.050 BSC		1.27 BSC	
F	0.055	0.065	1.40	1.65
G	0.100 BSC		2.54 BSC	
H	0.008	0.015	0.21	0.38
K	0.125	0.170	3.18	4.31
L	0.300 BSC		7.62 BSC	
M	0 °	15 °	0 °	15 °
N	0.020	0.040	0.51	1.01

P SUFFIX
PLASTIC DIP PACKAGE
CASE 648–08
ISSUE R



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0 °	10 °	0 °	10 °
S	0.020	0.040	0.51	1.01

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