

PECL* to TTL Translator (+5 Vdc Power Supply Only)

The MC10H350 is a member of Motorola's 10H family of high performance ECL logic. It consists of 4 translators with differential inputs and TTL outputs. The 3-state outputs can be disabled by applying a HIGH TTL logic level on the common OE input.

The MC10H350 is designed to be used primarily in systems incorporating both ECL and TTL logic operating off a common power supply. The separate V_{CC} power pins are not connected internally and thus isolate the noisy TTL V_{CC} runs from the relatively quiet ECL V_{CC} runs on the printed circuit board. The differential inputs allow the H350 to be used as an inverting or noninverting translator, or a differential line receiver. The H350 can also drive CMOS with the addition of a pullup resistor.

- Propagation Delay, 3.5 ns Typical
- MECL 10K-Compatible

MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Power Supply ($V_{EE} = \text{Gnd}$)	V_{CC}	7.0	Vdc
Operating Temperature Range	T_A	0 to +75	°C
Storage Temperature Range — Plastic	T_{stg}	-55 to +150	°C
— Ceramic		-55 to +165	°C

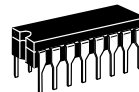
ELECTRICAL CHARACTERISTICS ($V_{CC} = 5.0 \text{ V} \pm 5\%$) (See Note 1)

Characteristic	Symbol	$T_A = 0^\circ\text{C to } 75^\circ\text{C}$		Unit
		Min	Max	
Power Supply Current	TTL I_{CC} ECL	— —	20 12	mA
Input Current High	Pin 9 I_{IH} Others I_{INH}	— —	20 50	μA
Input Current Low	Pin 9 I_{IL} Others I_{INL}	— —	-0.6 50	mA μA
Input Voltage High	Pin 9 V_{IH}	2.0	—	Vdc
Input Voltage Low	Pin 9 V_{IL}	—	0.8	Vdc
Differential Input Voltage (1) Pins 3-6, 11-14 (1)	V_{DIFF}	350	—	mV
Voltage Common Mode Pins 3-6, 11-14	V_{CM}	2.8	V_{CC}	Vdc
Output Voltage High $I_{OH} = 3.0 \text{ mA}$	V_{OH}	2.7	—	Vdc
Output Voltage Low $I_{OL} = 20 \text{ mA}$	V_{OL}	—	0.5	Vdc
Short Circuit Current $V_{OUT} = 0 \text{ V}$	I_{OS}	-60	-150	mA
Output Disable Current High $V_{OUT} = 2.7 \text{ V}$	I_{OZH}	—	50	μA
Output Disable Current Low $V_{OUT} = 0.5 \text{ V}$	I_{OZL}	—	-50	μA

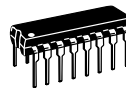
- (1) Common mode input voltage to pins 3-4, 5-6, 11-12, 13-14 must be between the values of 2.8 V and 5.0 V. This common mode input voltage range includes the differential input swing.
- (2) For single ended use, apply 3.75 V (V_{BB}) to either input depending on output polarity required. Signal level range to other input is 3.3 V to 4.2 V.
- (3) Any unused gates should have the inverting inputs tied to V_{CC} and the non-inverting inputs tied to ground to prevent output glitching.
- (4) 1.0 V to 2.0 V w/50 pF into 500 ohms.

*Positive Emitter Coupled Logic

MC10H350



L SUFFIX
CERAMIC PACKAGE
CASE 620-10

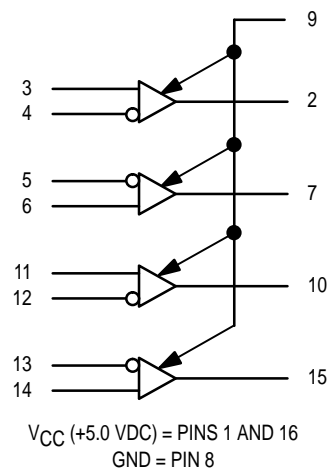


P SUFFIX
PLASTIC PACKAGE
CASE 648-08

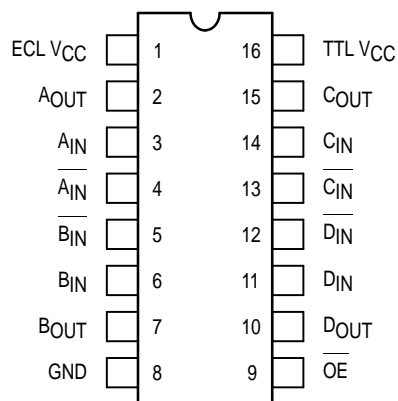


FN SUFFIX
PLCC
CASE 775-02

LOGIC DIAGRAM



DIP PIN ASSIGNMENT



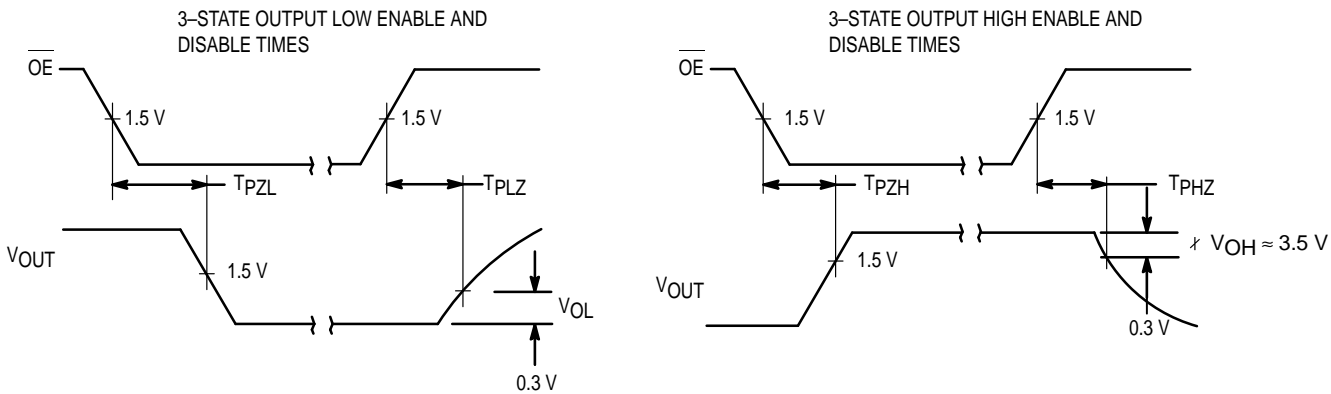
Pin assignment is for Dual-in-Line Package.
For PLCC pin assignment, see the Pin Conversion
Tables on page 6-11 of the Motorola MECL Data
Book (DL122/D).



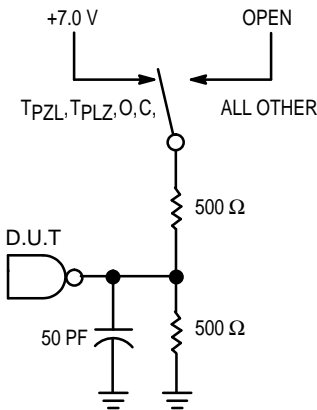
ELECTRICAL CHARACTERISTICS (V_{CC} = 5.0 V ±5%) (See Notes 1 & 4)

Characteristic	Symbol	T _A = 0°C to 75°C		Unit
		Min	Max	
AC PARAMETERS (C _L = 50 pF) (V _{CC} = 5.0 ± 5%) (T _A = 0°C to 75°C)				
Propagation Delay Data	t _{pd}	1.5	5.0	ns
Rise Time	t _r	0.3	1.6	ns
Fall Time	t _f	0.3	1.6	ns
Output Disable Time	t _{pdLZ}	2.0	6.0	ns
	t _{pdHZ}	2.0	6.0	
Output Enable Time	t _{pdZL}	2.0	8.0	ns
	t _{pdZH}	2.0	8.0	

3-STATE SWITCHING WAVEFORMS



TEST LOAD

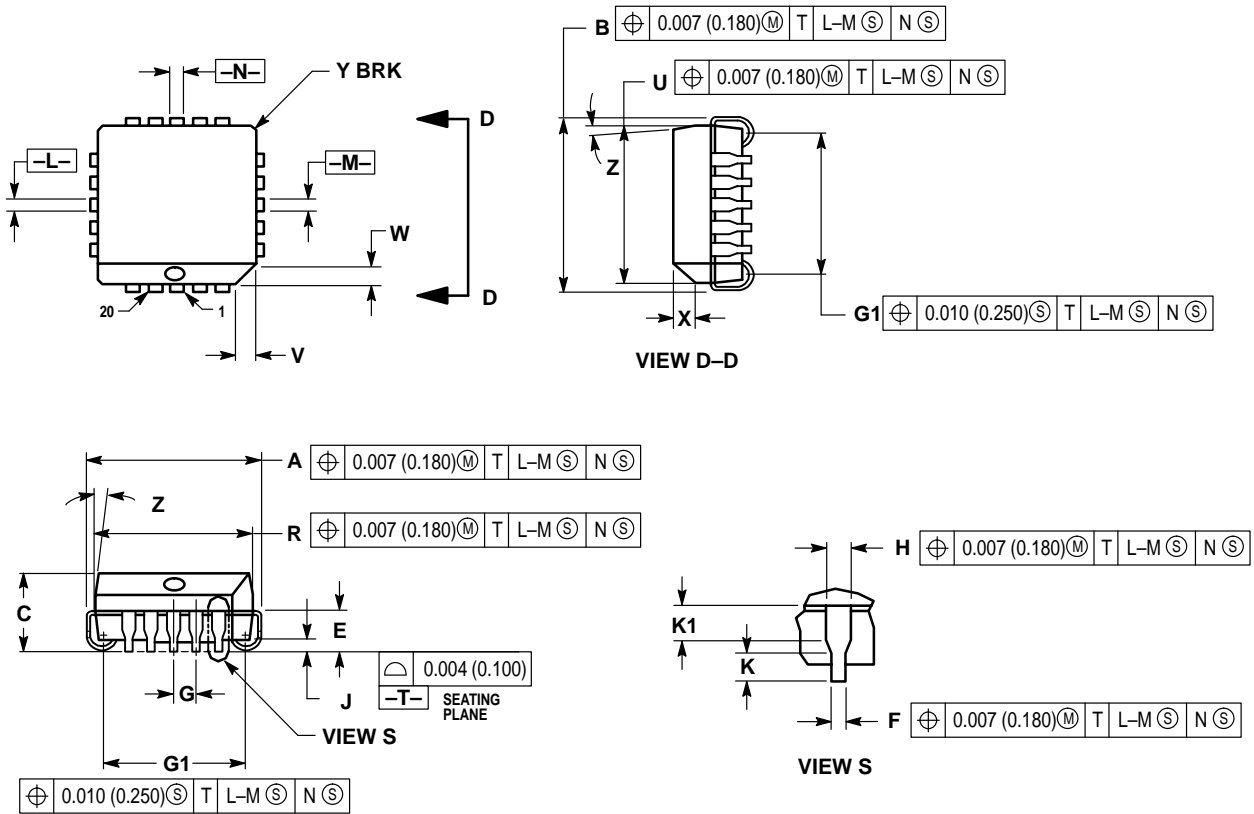


*INCLUDES JIG AND PROBE CAPACITANCE

Application Note: Pin 9 is an OE and the 10H350 is disabled when OE is at V_{IH} or higher.

OUTLINE DIMENSIONS

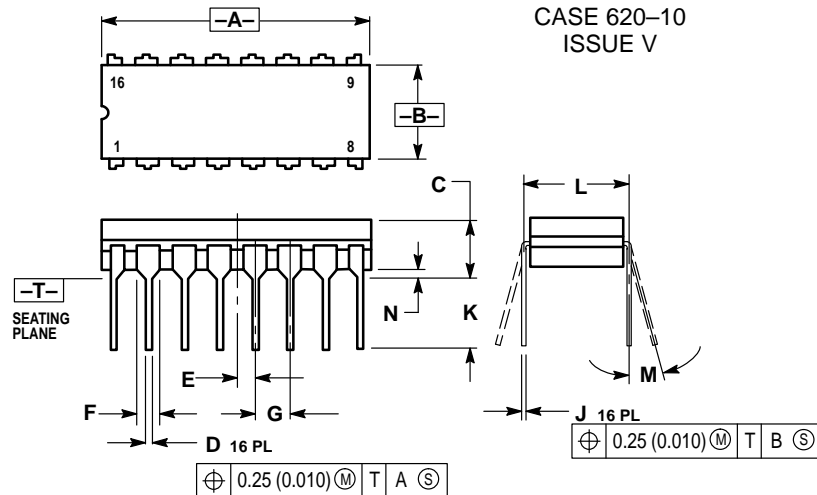
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775-02
ISSUE C



- 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).

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	0.019	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	—

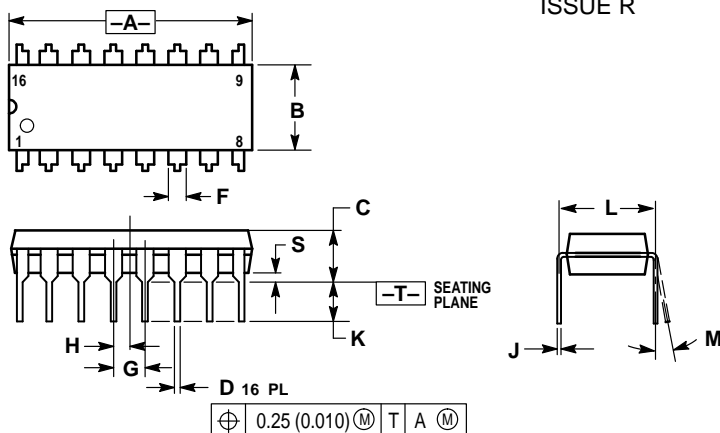
OUTLINE DIMENSIONS

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.


DIM	INCHES		MILLIMETERS	
	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.

DIM	INCHES		MILLIMETERS	
	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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

MFAX: RMFA00@email.sps.mot.com – TOUCHTONE 602-244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

