

# MC10H350

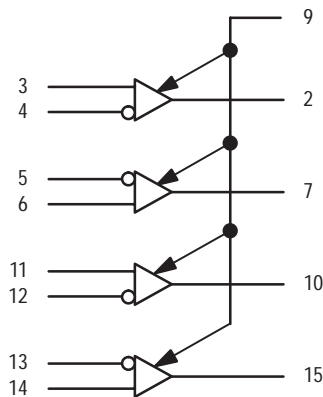
## PECL\* to TTL Translator (+5 Vdc Power Supply Only)

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<sub>CC</sub> power pins are not connected internally and thus isolate the noisy TTL V<sub>CC</sub> runs from the relatively quiet ECL V<sub>CC</sub> 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.

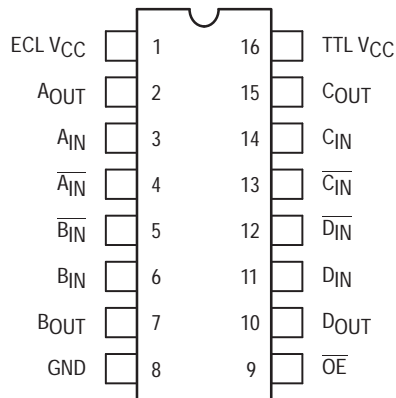
- Propagation Delay, 3.5 ns Typical
- MECL 10K-Compatible

### LOGIC DIAGRAM



V<sub>CC</sub> (+5.0 VDC) = PINS 1 AND 16  
GND = PIN 8

### DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package.

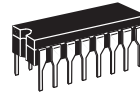
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



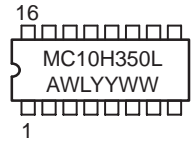
ON Semiconductor

<http://onsemi.com>

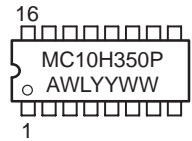
### MARKING DIAGRAMS



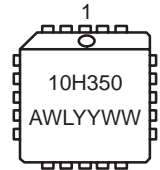
CDIP-16  
L SUFFIX  
CASE 620



PDIP-16  
P SUFFIX  
CASE 648



PLCC-20  
FN SUFFIX  
CASE 775



A = Assembly Location  
WL = Wafer Lot  
YY = Year  
WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
MC10H350L	CDIP-16	25 Units/Rail
MC10H350P	PDIP-16	25 Units/Rail
MC10H350FN	PLCC-20	46 Units/Rail

# MC10H350

## MAXIMUM RATINGS

Symbol	Characteristic	Rating	Unit
V <sub>CC</sub>	Power Supply (V <sub>EE</sub> = Gnd)	7.0	Vdc
T <sub>A</sub>	Operating Temperature Range	0 to +75	°C
T <sub>stg</sub>	Storage Temperature Range	-55 to +150 -55 to +165	°C °C

## ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 5.0 V ±5%) (See Note 1.)

Symbol	Characteristic	T <sub>A</sub> = 0°C to 75°C		Unit	
		Min	Max		
I <sub>CC</sub>	Power Supply Current	TTL	20	mA	
		ECL	12		
I <sub>IH</sub> I <sub>INH</sub>	Input Current High	Pin 9	20	μA	
		Others	50		
I <sub>IL</sub> I <sub>INL</sub>	Input Current Low	Pin 9	-0.6	mA	
		Others	50		
V <sub>IH</sub>	Input Voltage High	Pin 9	2.0	Vdc	
V <sub>IL</sub>	Input Voltage Low	Pin 9	-	0.8	Vdc
V <sub>DIFF</sub>	Differential Input Voltage (Note 1.)	Pins 3-6, 11-14 (1)	350	-	mV
V <sub>CM</sub>	Voltage Common Mode	Pins 3-6, 11-14	2.8	V <sub>CC</sub>	Vdc
V <sub>OH</sub>	Output Voltage High I <sub>OH</sub> = 3.0 mA		2.7	-	Vdc
V <sub>OL</sub>	Output Voltage Low I <sub>OL</sub> = 20 mA		-	0.5	Vdc
I <sub>OS</sub>	Short Circuit Current V <sub>OUT</sub> = 0 V		-60	-150	mA
I <sub>OZH</sub>	Output Disable Current High V <sub>OUT</sub> = 2.7 V		-	50	μA
I <sub>OZL</sub>	Output Disable Current Low V <sub>OUT</sub> = 0.5 V		-	-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<sub>BB</sub>) 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<sub>CC</sub> 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

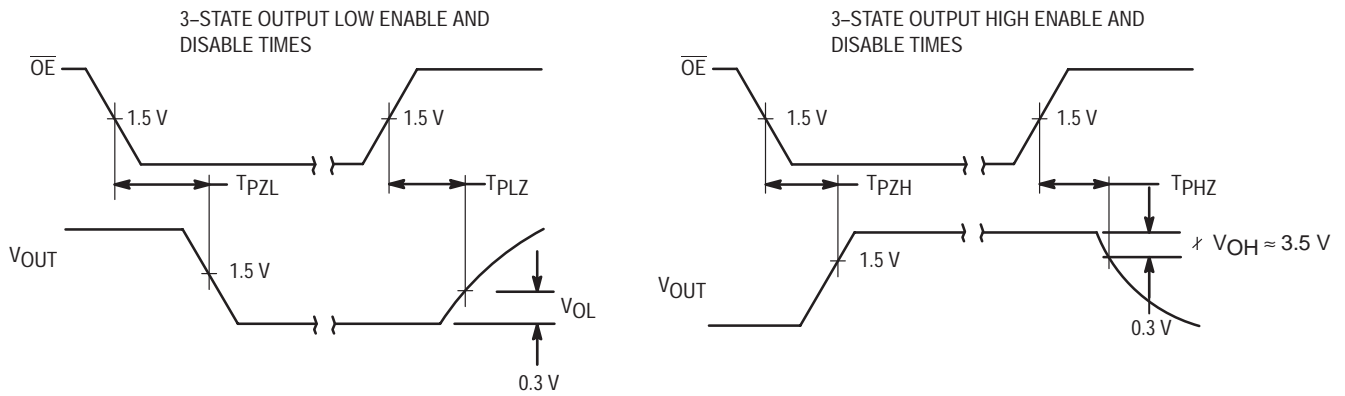
## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5.0 \text{ V} \pm 5\%$ ) (See Notes 1 & 4)

Symbol	Characteristic	$T_A = 0^\circ\text{C to } 75^\circ\text{C}$		Unit
		Min	Max	

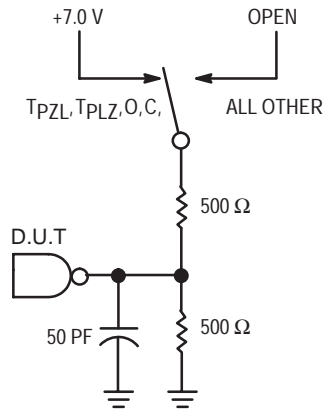
### AC PARAMETERS ( $C_L = 50 \text{ pF}$ ) ( $V_{CC} = 5.0 \pm 5\%$ ) ( $T_A = 0^\circ\text{C to } 75^\circ\text{C}$ )

$t_{pd}$	Propagation Delay Data (50% to 1.5V)	1.5	5.0	ns
$t_r$	Rise Time (Note 4.)	0.3	1.6	ns
$t_f$	Fall Time (Note 4.)	0.3	1.6	ns
$t_{pdLZ}$ $t_{pdHZ}$	Output Disable Time	2.0	6.0	ns
$t_{pdZL}$ $t_{pdZH}$	Output Enable Time	2.0	8.0	ns

### 3-STATE SWITCHING WAVEFORMS



### TEST LOAD



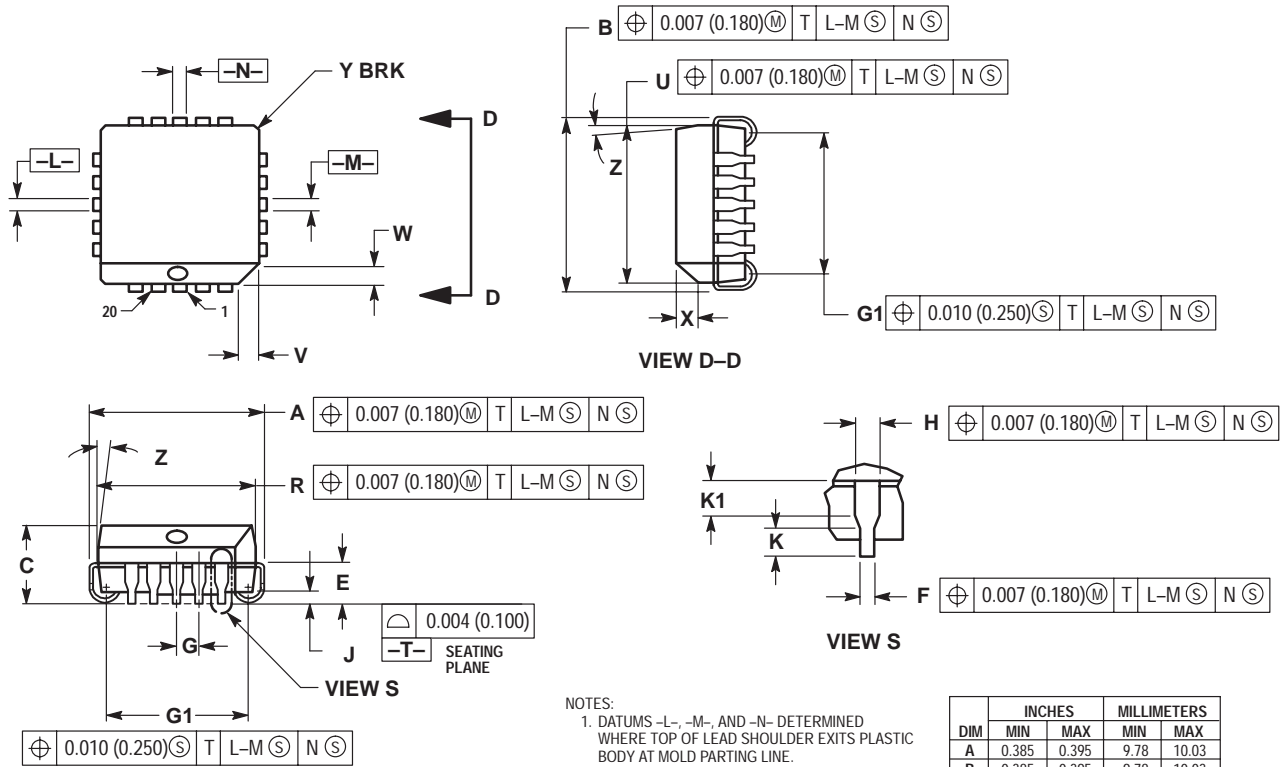
\*INCLUDES JIG AND PROBE CAPACITANCE

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

# MC10H350

## PACKAGE DIMENSIONS

PLCC-20  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 775-02  
ISSUE C



### NOTES:

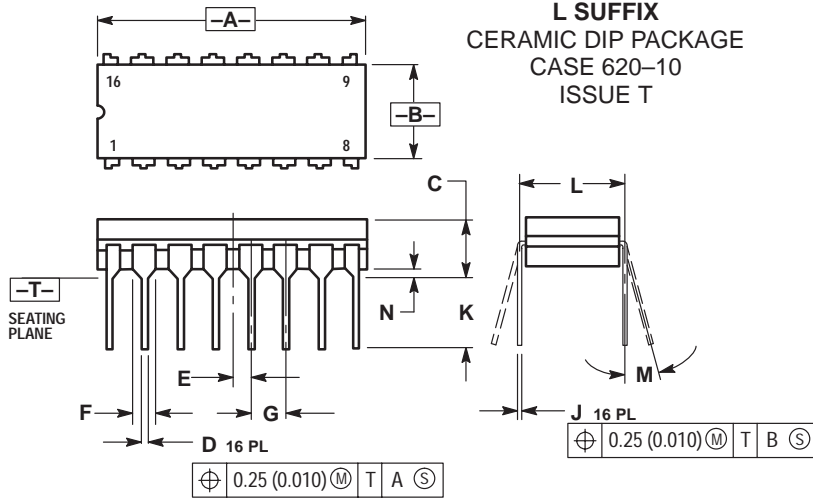
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING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

# MC10H350

## PACKAGE DIMENSIONS

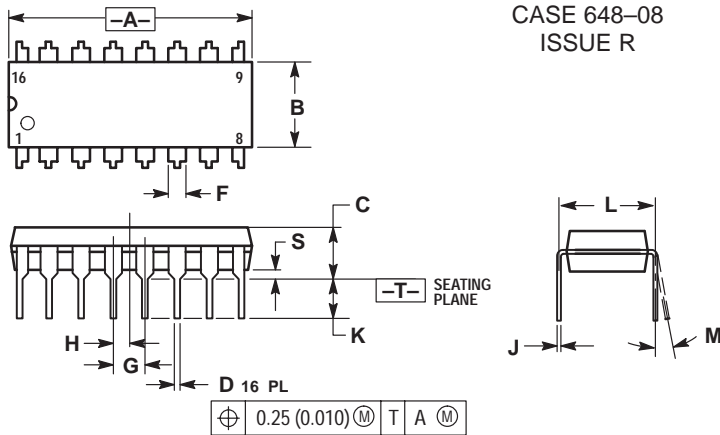
### CDIP-16 L SUFFIX CERAMIC DIP PACKAGE CASE 620-10 ISSUE T



- 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

### PDIP-16 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

**Notes**

**Notes**

**ON Semiconductor** and  are trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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 special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC 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 SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

## PUBLICATION ORDERING INFORMATION

### North America Literature Fulfillment:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** ONlit@hibbertco.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada

**EUROPE:** LDC for ON Semiconductor – European Support

**German Phone:** (+1) 303-308-7140 (M-F 2:30pm to 5:00pm Munich Time)  
**Email:** ONlit-german@hibbertco.com  
**French Phone:** (+1) 303-308-7141 (M-F 2:30pm to 5:00pm Toulouse Time)  
**Email:** ONlit-french@hibbertco.com  
**English Phone:** (+1) 303-308-7142 (M-F 1:30pm to 5:00pm UK Time)  
**Email:** ONlit@hibbertco.com

**ASIA/PACIFIC:** LDC for ON Semiconductor – Asia Support

**Phone:** 303-675-2121 (Tue-Fri 9:00am to 1:00pm, Hong Kong Time)  
Toll Free from Hong Kong 800-4422-3781  
**Email:** ONlit-asia@hibbertco.com

**JAPAN:** ON Semiconductor, Japan Customer Focus Center  
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-8549

**Phone:** 81-3-5740-2745  
**Email:** r14525@onsemi.com

**Fax Response Line:** 303-675-2167  
800-344-3810 Toll Free USA/Canada

**ON Semiconductor Website:** <http://onsemi.com>

For additional information, please contact your local  
Sales Representative.