

MC10H350

PECL* to TTL Translator

(+5 Vdc Power Supply Only)

Description

The MC10H350 is a member of the 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 MC10H350 to be used as an inverting or noninverting translator, or a differential line receiver. The MC10H350 can also drive CMOS with the addition of a pullup resistor.

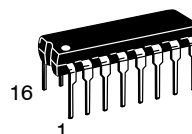
Features

- Propagation Delay, 3.5 ns Typical
- MECL 10K™ Compatible
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

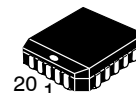


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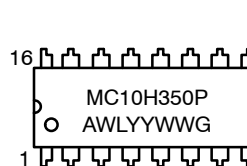


PDIP-16
P SUFFIX
CASE 648-08

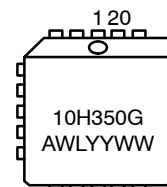


PLLC-20
FN SUFFIX
CASE 775-02

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† |
|---------------|----------------------|-----------------|
| MC10H350FNG | PLLC-20 (Pb-Free) | 46 Units / Tube |
| MC10H350FNR2G | PLLC-20 (Pb-Free) | 500 Tape & Reel |
| MC10H350PG | 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](#).

MC10H350

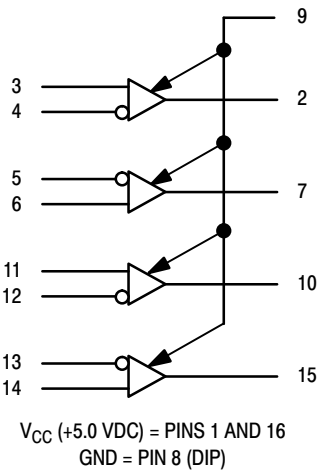


Figure 1. Logic Diagram

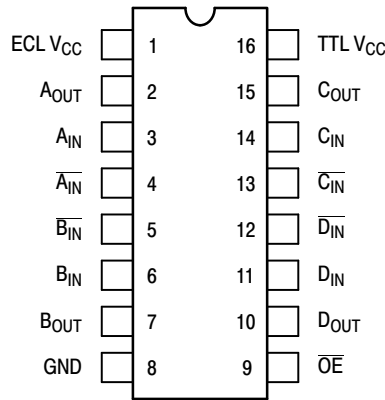


Figure 2. Dip Pin Assignment

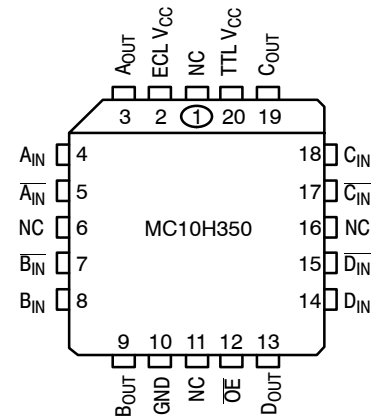


Figure 3. PLCC-20 Pin Assignment

Table 1. MAXIMUM RATINGS

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

MC10H350

Table 2. ELECTRICAL CHARACTERISTICS ($V_{CC} = 5.0 \text{ V} \pm 5\%$) (Note 1)

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

*Positive Emitter Coupled Logic

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 noninverting inputs tied to ground to prevent output glitching.

Table 3. AC PARAMETERS ($C_L = 50 \text{ pF}$) ($V_{CC} = 5.0 \pm 5\%$) ($T_A = 0^\circ\text{C to } 75^\circ\text{C}$)

| Symbol | Characteristic | $T_A = 0^\circ\text{C to } 75^\circ\text{C}$ | | Unit |
|--------------------------|---------------------------------------|--|------------|------|
| | | Min | Max | |
| t_{pd} | Propagation Delay Data (50% to 1.5 V) | 1.5 | 5.0 | ns |
| t_r | Rise Time (Note 1) | 0.3 | 1.6 | ns |
| t_f | Fall Time (Note 1) | 0.3 | 1.6 | ns |
| t_{pdLZ} t_{pdHZ} | Output Disable Time | 2.0 2.0 | 6.0 6.0 | ns |
| t_{pdZL} t_{pdZH} | Output Enable Time | 2.0 2.0 | 8.0 8.0 | 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 lfpm. 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. 1.0 V to 2.0 V w/50 pF into 500 Ω .

MC10H350

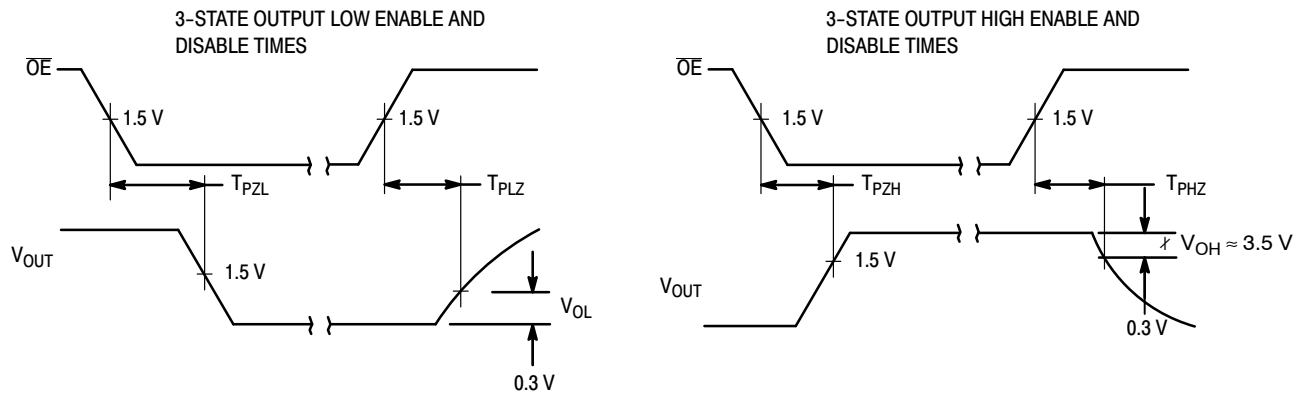
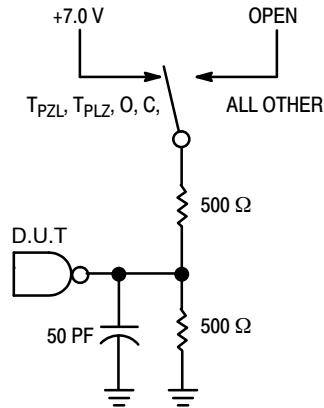


Figure 4. 3-State Switching Waveforms



*INCLUDES JIG AND PROBE CAPACITANCE

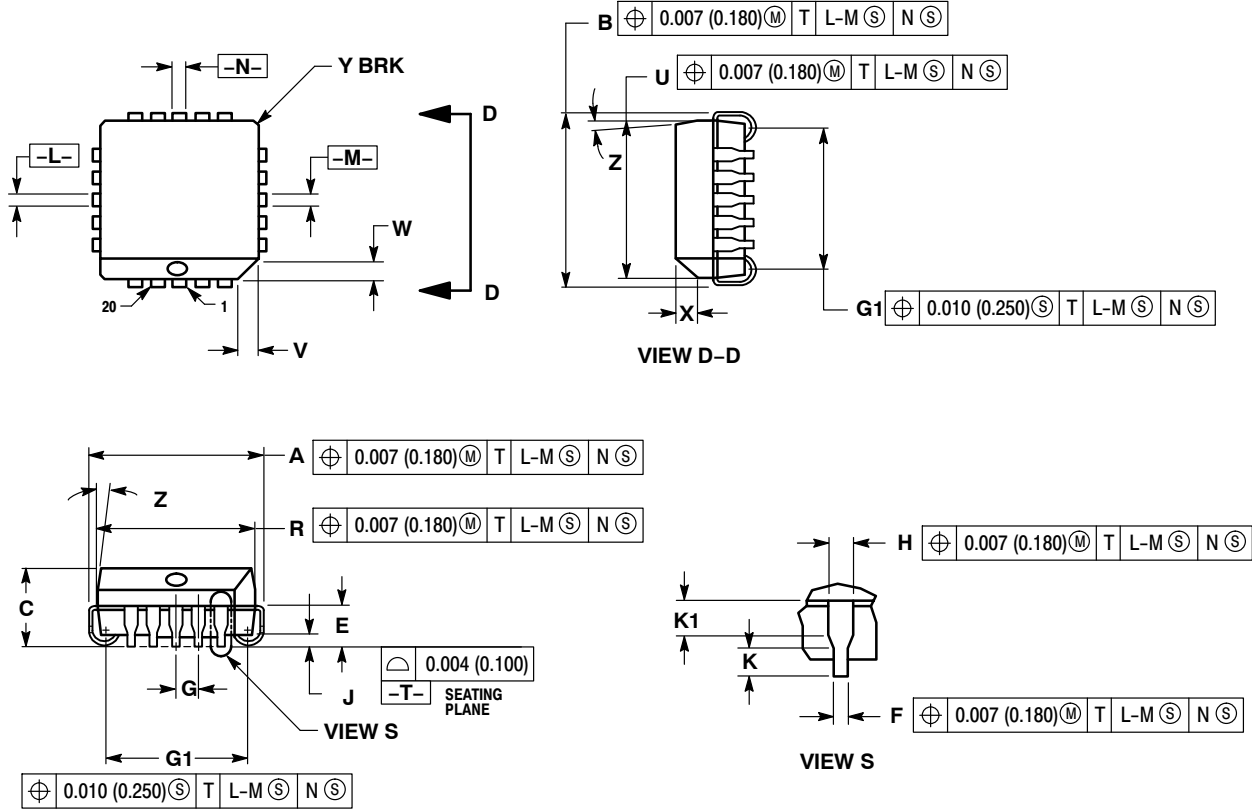
Application Note: Pin 9 is an \overline{OE} and the MC10H350 is disabled when \overline{OE} is at V_{IH} or higher.

Figure 5. Test Load

MC10H350

PACKAGE DIMENSIONS

20 LEAD PLLC
FN SUFFIX
CASE 775-02
ISSUE F



NOTES:

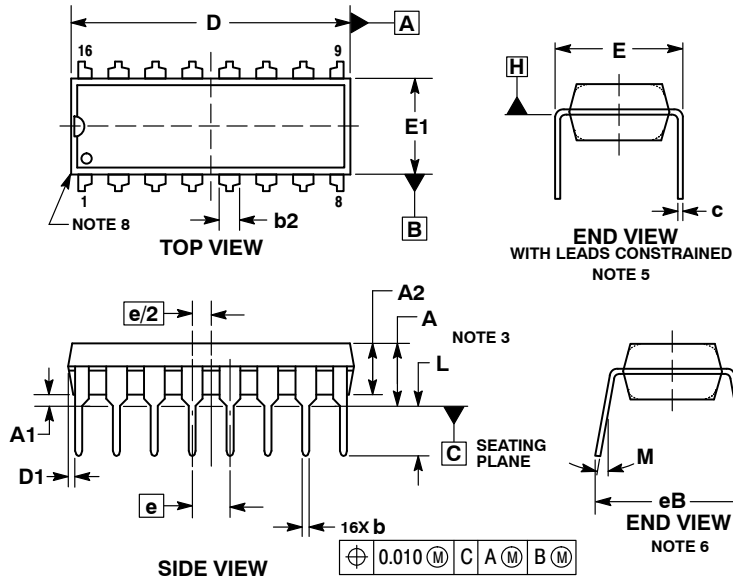
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
2. DIMENSIONS IN INCHES.
3. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
4. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
5. DIMENSIONS R AND U DO NOT INCLUDE MOLD 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 | ---- |

MC10H350

PACKAGE DIMENSIONS

PDP-16
P SUFFIX
CASE 648-08
ISSUE V



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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