## FEATURES

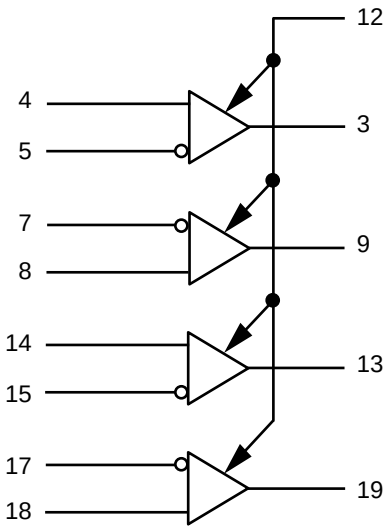
- **Single 5V power supply**
- **Propagation delay, 3.5ns typical**
- **Fully compatible with Motorola MC10H350**
- **Available in 20-pin PLCC package**

## DESCRIPTION

The SY10H350 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.

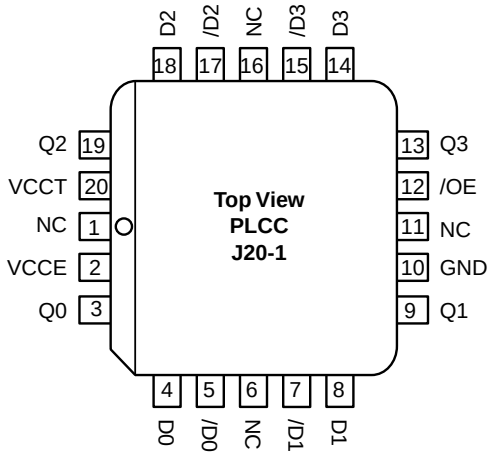
The SY10H350 is designed to be used primarily in systems incorporating both ECL and TTL logic operating off a common power supply. The separate $V_{CC}$ power pins are not connected internally and thus isolate the noisy TTL $V_{CC}$ runs from the relatively quiet ECL $V_{CC}$ runs on the printed circuit 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.

## BLOCK DIAGRAM




**$V_{CC}$ (+5 VDC) = Pins 2 and 20; GND = Pin 10**

## PIN CONFIGURATION




## PIN NAMES

| Pin | Function |
|---|---|
| $D_0 – D_3$ | True PECL Inputs |
| $/D_0 – /D_3$ | Inverted PECL Inputs |
| $Q_0 – Q_3$ | TTL Outputs |
| $V_{CCE}$ | PECL $V_{CC}$ (5.0V) |
| $V_{CCT}$ | TTL $V_{CC}$ (5.0V) |
| GND | Ground |
| /OE | Output Enable |

## ABSOLUTE MAXIMUM RATINGS[1]

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | Power Supply Voltage | –0.5 to +7.0 | V |
| $V_I$ | PECL Input Voltage | 0V to $V_{CC}$+0.5 | V |
| $V_O$ | Voltage Applied to Output at HIGH State | –0.5 to +5.5 | V |
| $I_O$ | Current Applied to Output at LOW State | Twice the Rated $I_{OL}$ | mA |
| $T_{store}$ | Storage Temperature | –65 to +150 | °C |
| $T_A$ | Operating Temperature | 0 to +85 | °C |

**NOTE:**

1. Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to ABSOLUTE MAXIMUM RATING conditions for extended periods may affect device reliability.

## TRUTH TABLE

| /EN | D | /D | Q |
|---|---|---|---|
| L | L | H | L |
| L | H | L | H |
| L | Open | Open | L |
| H | X | X | Z |
| Open | X | X | Z |

## DC ELECTRICAL CHARACTERISTICS

$V_{CC}$ = 4.75V to 5.25V

| Symbol | Parameter | $T_A$ = 0°C | | $T_A$ = +25°C | | | $T_A$ = +85°C | | Unit | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Max. | Min. | Typ. | Max. | Min. | Max. | | |
| $I_{CC}$ | Power Supply Current TTL<br>ECL | —<br>— | 20<br>12 | —<br>— | 12<br>12 | 20<br>— | —<br>— | 20<br>12 | mA | No output loads |
| $V_{OH}$ | Output HIGH Voltage | 2.7 | — | 2.7 | — | — | 2.7 | — | V | $I_{OH}$ = –3.0mA |
| $V_{OL}$ | Output LOW Voltage | — | 0.5 | — | — | 0.5 | — | 0.5 | V | $I_{OL}$ = 20mA |
| $I_{IH}$<br>$I_{INH}$ | Input HIGH Current (Pin 12)<br>Reverse Current Others | —<br>— | 20<br>50 | —<br>— | —<br>— | 20<br>50 | —<br>— | 20<br>50 | µA<br>µA | |
| $I_{IL}$<br>$I_{INL}$ | Input LOW Current (Pin 12)<br>Forward Current Others | —<br>— | –0.6<br>50 | —<br>— | —<br>— | –0.6<br>50 | —<br>— | –0.6<br>50 | mA<br>µA | |
| $I_{OS}$ | Output Short Circuit Current | –60 | –150 | –60 | — | –150 | –60 | –150 | mA | $V_{OUT}$ = 0V |
| $I_{OZH}$ | Output Disable Current HIGH | — | 50 | — | — | 50 | — | 50 | µA | $V_{OUT}$ = 2.7V |
| $I_{OZL}$ | Output Disable Current LOW | –50 | +50 | –50 | — | +50 | –50 | +50 | µA | $V_{OUT}$ = 0.5 |
| $V_{CMR}$ | Common Mode Range | 2.8 | $V_{CC}$ | 2.8 | — | $V_{CC}$ | 2.8 | $V_{CC}$ | V | |
| $V_{PP}$ | Minimum Peak-to-Peak Input[1] | 200 | — | 200 | — | — | 200 | — | mV | |
| $V_{IH}$ | Input HIGH Voltage (Pin 12) | 2.0 | — | 2.0 | — | — | 2.0 | — | V | |
| $V_{IL}$ | Input LOW Voltage (Pin 12) | — | 0.8 | — | — | 0.8 | — | 0.8 | V | |

**NOTES:**

1. 200mV input guarantees full logic at output.
2. These values are for $V_{cc}$ = 5.0V. Level Specifications will vary 1:1 $V_{cc}$.

## AC ELECTRICAL CHARACTERISTICS

$V_{CC}$ = 4.75V to 5.25V

| Symbol | Parameter | $T_A$ = 0°C | | $T_A$ = +25°C | | | $T_A$ = +85°C | | Unit | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Max. | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay<br>D to Output Q | 1.5 | 5.0 | 1.5 | 3.5 | 5.0 | 1.5 | 5.0 | ns | $C_L$ = 50pF |
| $t_{pdLZ}$<br>$t_{pdHZ}$ | Output Disable Time(1) | 2.0 | 8.0 | 2.0 | — | 8.0 | 2.0 | 8.0 | ns | $C_L$ = 50pF |
| $t_{pdZL}$<br>$t_{pdZH}$ | Output Enable Time(1) | 2.0 | 8.0 | 2.0 | — | 8.0 | 2.0 | 8.0 | ns | $C_L$ = 50pF |
| $t_r$<br>$t_f$ | Output Rise/Fall Time<br>(1.0V to 2.0V) | 0.3 | 1.6 | 0.3 | 0.8 | 1.6 | 0.3 | 1.6 | ns | $C_L$ = 50pF |

**NOTES:**

1. Guaranteed, but not tested.

## SWITCHING WAVEFORMS

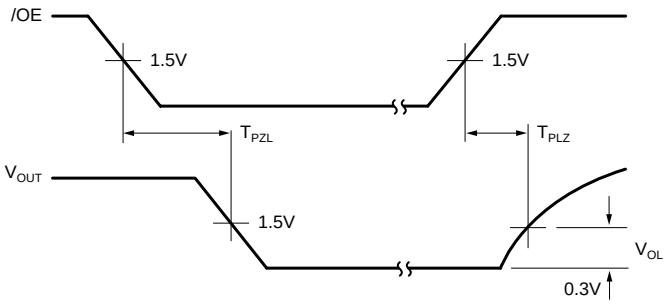



**Figure 1. 3-State Output Low Enable and Disable Times**

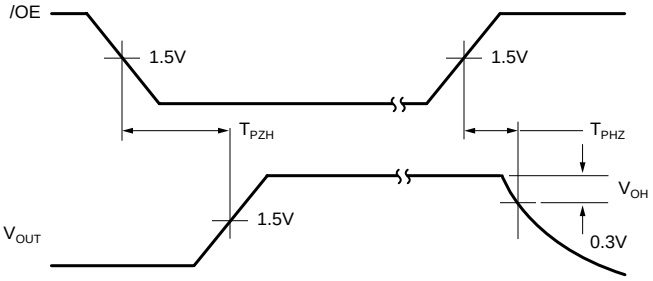



**Figure 2. 3-State Output High Enable and Disable Times**

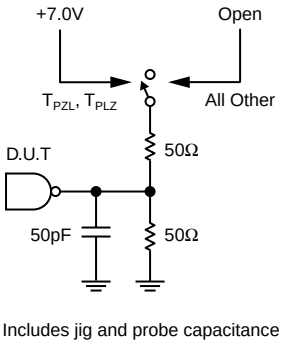



**Figure 3. Test Load**

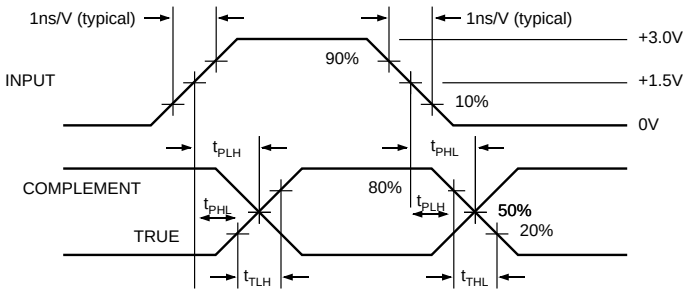


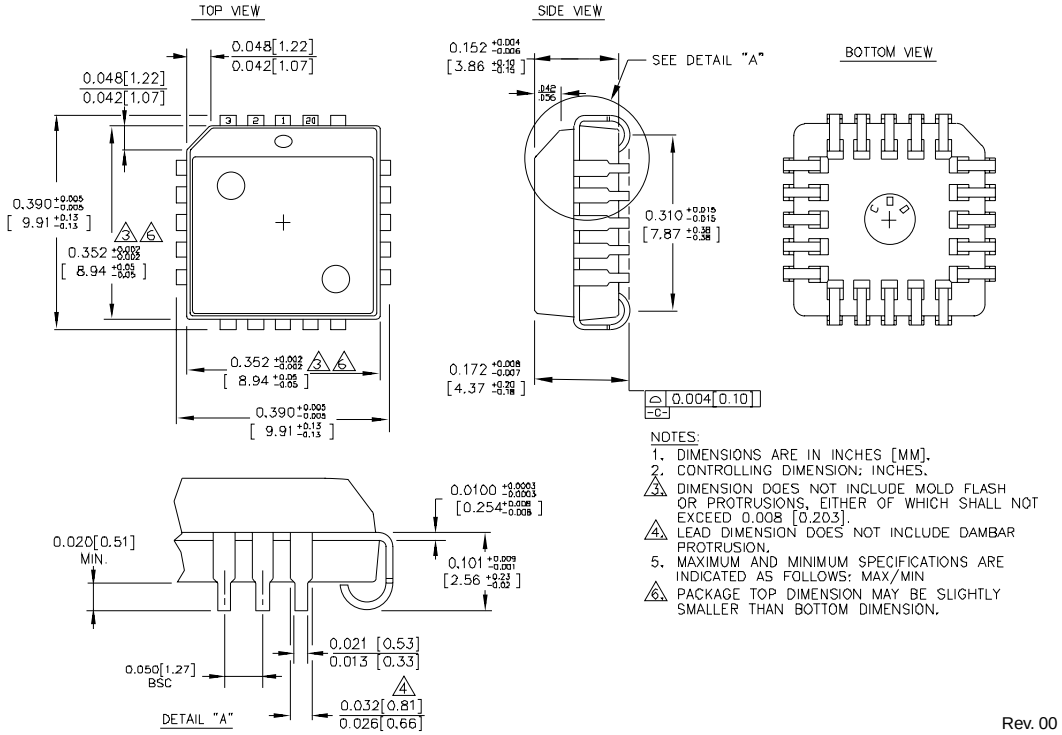

**Figure 4. Propagation Delay and Transition Times**

***Application Note: Pin 12 is an /OE and the 10H350 is disabled when /OE is at $V_{IH}$ or higher.**

## PRODUCT ORDERING CODE

| Ordering Code | Package Type | Operating Range | Vcc Range (V) |
|---|---|---|---|
| SY10H350JC | J20-1 | Commercial | +4.75 to +5.25 |
| SY10H350JCTR | J20-1 | Commercial | +4.75 to +5.25 |

## 20 LEAD PLASTIC LEADED CHIP CARRIER (J20-1)




Rev. 00

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