



# QUAD TTL/NMOS-to-PECL TRANSLATOR

SY10H351

## FEATURES

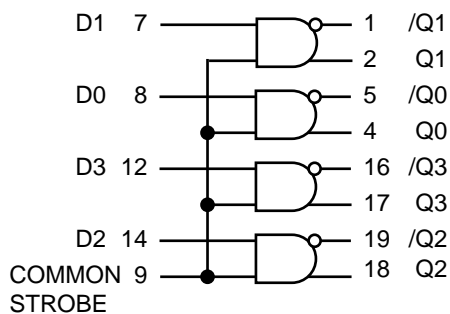
- Single 5V power supply
- All  $V_{CC}$  pins isolated on chip
- Differentially drive balanced lines
- $t_{PD}$  1.3ns typical
- Fully compatible with MC10H351
- Available in 20-pin PLCC package

## DESCRIPTION

The SY10H351 is a quad translator for interfacing data between a saturated logic selection and the PECL section of digital systems when only a +5.0V  $V_{DC}$  power supply is available. The SY10H351 has TTL/NMOS compatible inputs and PECL complementary open-emitter outputs that allow use as an inverting/non-inverting translator or as a differential line driver. When the common strobe input is at a low logic level, it forces all true outputs to the PECL low logic state ( $\approx +3.2V$ ) and all inverting outputs to the PECL high logic state ( $\approx 4.1V$ ).

The SY10H351 can also be used with the SY10H350 to transmit and receive TTL/NMOS information differentially via balanced twisted pair lines.

## BLOCK DIAGRAM

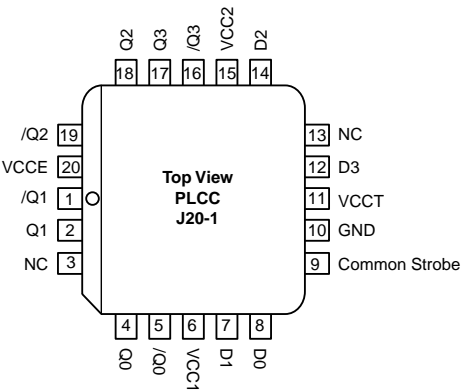


$V_{CC}$  (+5  $V_{DC}$ ) = Pins 6, 11, 15, 20;  
GND = Pin 10

## PIN NAMES

Pin	Function
D0 – D3	Inputs
Q0 – Q3	Outputs
/Q0 – /Q3	Inverted outputs
VCC1	PECL $V_{CC}$ (5.0V)
VCCE	PECL $V_{CC}$ (5.0V)
VCCT	TTL $V_{CC}$ (5.0V)
VCC2	PECL $V_{CC}$ (5.0V)
Common Strobe	Common Strobe
GND	Ground

PACKAGE/ORDERING INFORMATION



20-Pin PLCC (J20-1)

Ordering Information<sup>(1)</sup>

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10H351JC	J20-1	Commercial	SY10H351JC	Sn-Pb
SY10H351JCTR <sup>(2)</sup>	J20-1	Commercial	SY10H351JC	Sn-Pb
SY10H351JZ <sup>(3)</sup>	J20-1	Commercial	SY10H351JZ with Pb-Free bar-line indicator	Matte-Sn
SY10H351JZTR <sup>(2, 3)</sup>	J20-1	Commercial	SY10H351JZ with Pb-Free bar-line indicator	Matte-Sn

Notes:

- 1. Contact factory for die availability. Dice are guaranteed at T<sub>A</sub> = 25°C, DC Electricals only.
- 2. Tape and Reel.
- 3. Pb-Free package is recommended for new designs.

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Power Supply Voltage	−0.5 to +7.0	V
I <sub>OUT</sub>	Output Current −Continuous −Surge	50 100	mA
T <sub>LEAD</sub>	Lead Temperature (soldering, 20sec.)	+260	°C
T <sub>store</sub>	Storage Temperature	−65 to +150	°C
T <sub>A</sub>	Operating Temperature	0 to +85	°C

**TRUTH TABLE**

CS	D	Q	/Q
H	L	L	H
H	H	H	L
H	Open	H	L
L	X	L	H
Open	L	L	H
Open	H	H	L
Open	Open	H	L

**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.

**DC ELECTRICAL CHARACTERISTICS**

V<sub>CC1</sub> = V<sub>CC2</sub> = V<sub>CC</sub> = V<sub>CE</sub> = V<sub>CT</sub> = 4.75V to 5.25V

Symbol	Parameter	T <sub>A</sub> = 0°C		T <sub>A</sub> = +25°C			T <sub>A</sub> = +85°C		Unit	Condition
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.		
I <sub>CC</sub>	Power Supply Current ECL <sup>(1)</sup> TTL <sup>(2)</sup>	—	45 15	—	—	45 15	—	45 15	mA	No output loads
I <sub>R</sub>	Reverse Current (Pins 7, 8, 12, 14)	—	20	—	—	20	—	20	μA	
I <sub>INH</sub>	Reverse Current, (Pin 9)	—	80	—	—	80	—	80	μA	
I <sub>F</sub>	Forward Current (Pins 7, 8, 12, 14)	—	−0.6	—	—	−0.6	—	−0.6	mA	
I <sub>INL</sub>	Forward Current, (Pin 9)	—	−2.4	—	—	−2.4	—	−2.4	mA	
V <sub>BR(in)</sub>	Input Breakdown Voltage	5.5	—	5.5	—	—	5.5	—	V	
V <sub>I</sub>	Input Clamp Voltage	—	−1.5	—	—	−1.5	—	−1.5	V	I <sub>IN</sub> = −18mA
V <sub>OH</sub>	Output HIGH Voltage <sup>(3)</sup>	3.98	4.16	4.02	—	4.19	4.08	4.27	V	
V <sub>OL</sub>	Output LOW Voltage <sup>(3)</sup>	3.05	3.37	3.05	—	3.37	3.05	3.37	V	
V <sub>IH</sub>	Input HIGH Voltage	2.0	—	2.0	—	—	2.0	—	V	
V <sub>IL</sub>	Input LOW Voltage	—	0.8	—	—	0.8	—	0.8	V	

**Notes:**

1. Total I<sub>CC</sub> at V<sub>CC1</sub>, V<sub>CC2</sub> and V<sub>CE</sub>.
2. I<sub>CC</sub> at I<sub>CT</sub>.
3. These values are for V<sub>CC</sub> = 5.0V. Level Specifications will vary 1:1 V<sub>CC</sub>.

## AC ELECTRICAL CHARACTERISTICS

$V_{CC1} = V_{CC2} = V_{CE} = V_{CT} = 4.75V$  to  $5.25V$

Symbol	Parameter	$T_A = 0^\circ C$		$T_A = +25^\circ C$			$T_A = +85^\circ C$		Unit	Condition
		Min.	Max.	Min.	Typ.	Max.	Min.	Max.		
$t_{PD}$	Propagation Delay <sup>(1)</sup>	0.4	2.2	0.4	—	2.2	0.4	2.1	ns	$50\Omega$ to $V_{CC}-2V$
$t_r$ $t_f$	Output Rise/Fall Time (20% to 80%)	0.4	1.9	0.4	—	2.0	0.4	2.1	ns	$50\Omega$ to $V_{CC}-2V$
$f_{MAX}$	Maximum Input Frequency <sup>(2)</sup>	150	—	150	—	—	150	—	MHz	$50\Omega$ to $V_{CC}-2V$

### Notes:

1. Propagation delay is measured on this circuit from +1.5V on the input waveform to the 50% point on the output waveform.
2. These parameters are guaranteed but not tested.

## SWITCHING WAVEFORM

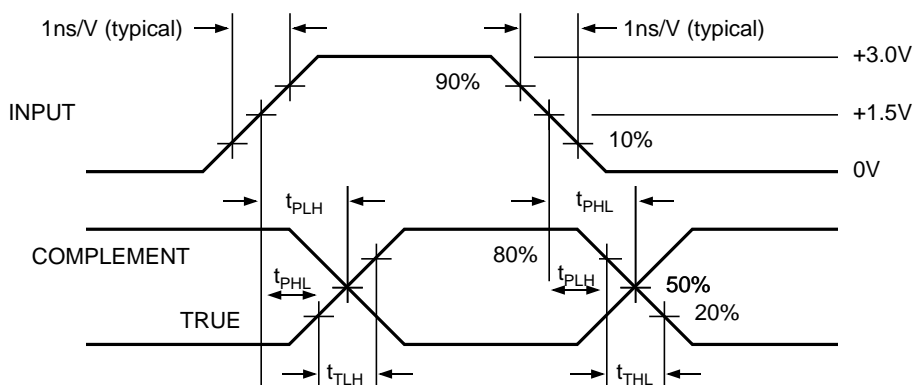
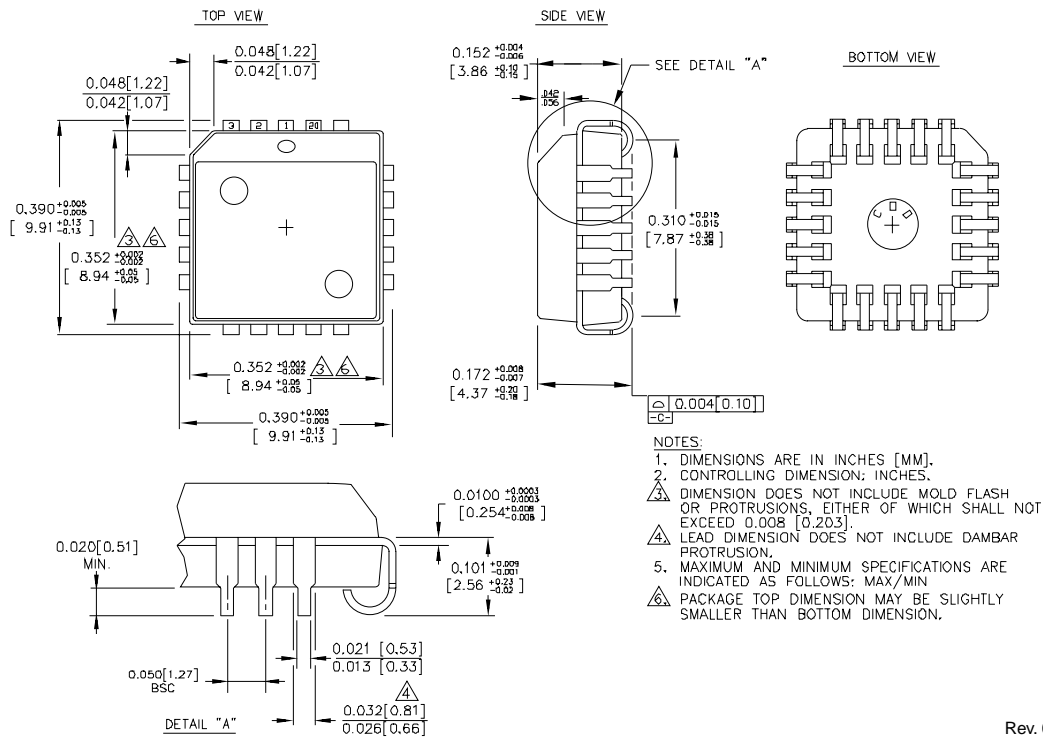


Figure 1. Propagation Delay and Transition Times

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



Rev. 00

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