

# MC10H351

## Quad TTL/NMOS to PECL\* Translator

### Description

The MC10H351 is a quad translator for interfacing data between a saturated logic section and the PECL section of digital systems when only a +5.0 Vdc power supply is available. The MC10H351 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 ( $\approx +3.2$  V) and all inverting outputs to the PECL high logic state ( $\approx +4.1$  V).

The MC10H351 can also be used with the MC10H350 to transmit and receive TTL/NMOS information differentially via balanced twisted pair lines.

### Features

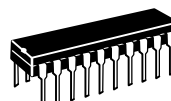
- Single +5.0 Power Supply
- All  $V_{CC}$  Pins Isolated On Chip
- Differentially Drive Balanced Lines
- $t_{pd} = 1.3$  nsec Typical
- Pb-Free Packages are Available\*



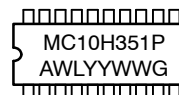
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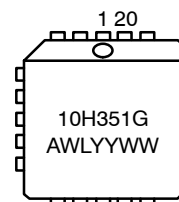
### MARKING DIAGRAMS\*



PDIP-20  
P SUFFIX  
CASE 738



PLCC-20  
FN SUFFIX  
CASE 775



A = Assembly Location  
WL = Wafer Lot  
YY = Year  
WW = Work Week  
G = Pb-Free Package

\*For additional marking information, refer to Application Note AND8002/D.

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MC10H351

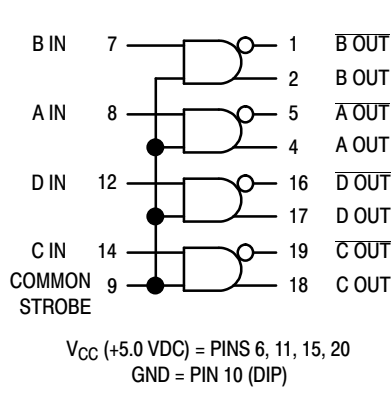


Figure 1. Logic Diagram

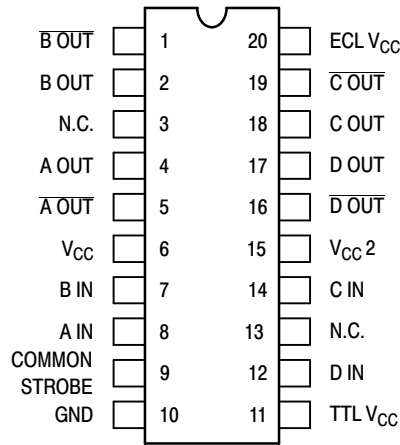


Figure 2. Dip Pin Assignment

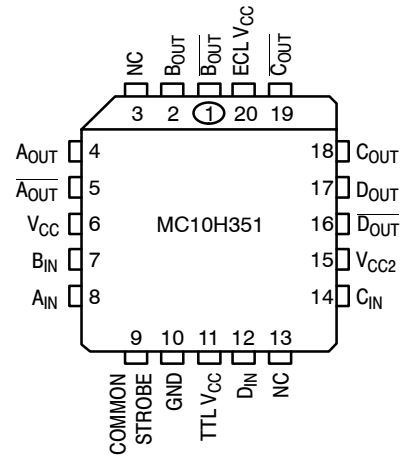


Figure 3. PLCC-20 Pin Assignment

Table 1. MAXIMUM RATINGS

Symbol	Characteristic	Rating	Unit
$V_{CC}$	Power Supply	0 to +7.0	Vdc
$V_I$	Input Voltage ( $V_{CC} = 5.0$ V)	0 to $V_{CC}$	Vdc
$I_{out}$	Output Current – Continuous – Surge	50 100	mA
$T_A$	Operating Temperature Range	0 to +75	°C
$T_{stg}$	Storage Temperature Range – Plastic	–55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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**Table 2. ELECTRICAL CHARACTERISTICS** ( $V_{CC} = V_{CC1} = V_{CC2} = 5.0\text{ V} \pm 5.0\%$ )†

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
ECL	Power Supply Current	-	50	-	45	-	50	mA
TTL		-	20	-	15	-	20	mA
$I_R$	Reverse Current	-	25	-	20	-	25	$\mu\text{A}$
$I_{INH}$	Pins 7, 8, 12, 14 Pin 9	-	100	-	80	-	100	
$I_F$	Forward Current	-	-0.8	-	-0.6	-	-0.8	mA
$I_{INL}$	Pins 7, 8, 12, 14 Pin 9	-	-3.2	-	-2.4	-	-3.2	
$V_{(BR)in}$	Input Breakdown Voltage	5.5	-	5.5	-	5.5	-	Vdc
$V_I$	Input Clamp Voltage ( $I_{in} = -18\text{ mA}$ )	-	-1.5	-	-1.5	-	-1.5	Vdc
$V_{OH}$	High Output Voltage (Note 1.)	3.98	4.16	4.02	4.19	4.08	4.27	Vdc
$V_{OL}$	Low Output Voltage (1)	3.05	3.37	3.05	3.37	3.05	3.37	Vdc
$V_{IH}$	High Input Voltage	2.0	-	2.0	-	2.0	-	Vdc
$V_{IL}$	Low Input Voltage	-	0.8	-	0.8	-	0.8	Vdc

†Each MECL 10H™ series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 lpm is maintained. Outputs are terminated through a 50  $\Omega$  resistor to  $V_{CC} - 2.0\text{ Vdc}$ .

\*Positive Emitter Coupled Logic

1. With  $V_{CC}$  at 5.0 V.  $V_{OH}/V_{OL}$  change 1:1 with  $V_{CC}$ .

**Table 3. AC PARAMETERS**

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
$t_{pd}$	Propagation Delay (Note 2)	0.4	2.2	0.4	2.2	0.4	2.1	ns
$t_r$	Rise Time (20% to 80%)	0.4	1.9	0.4	2.0	0.4	2.1	ns
$t_f$	Fall Time (80% to 20%)	0.4	1.9	0.4	2.0	0.4	2.1	ns
$f_{max}$	Maximum Operating Frequency	150	-	150	-	150	-	MHz

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 lpm. 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.

2. Propagation delay is measured on this circuit from +1.5 V on the input waveform to the 50% point on the output waveform.

## ORDERING INFORMATION

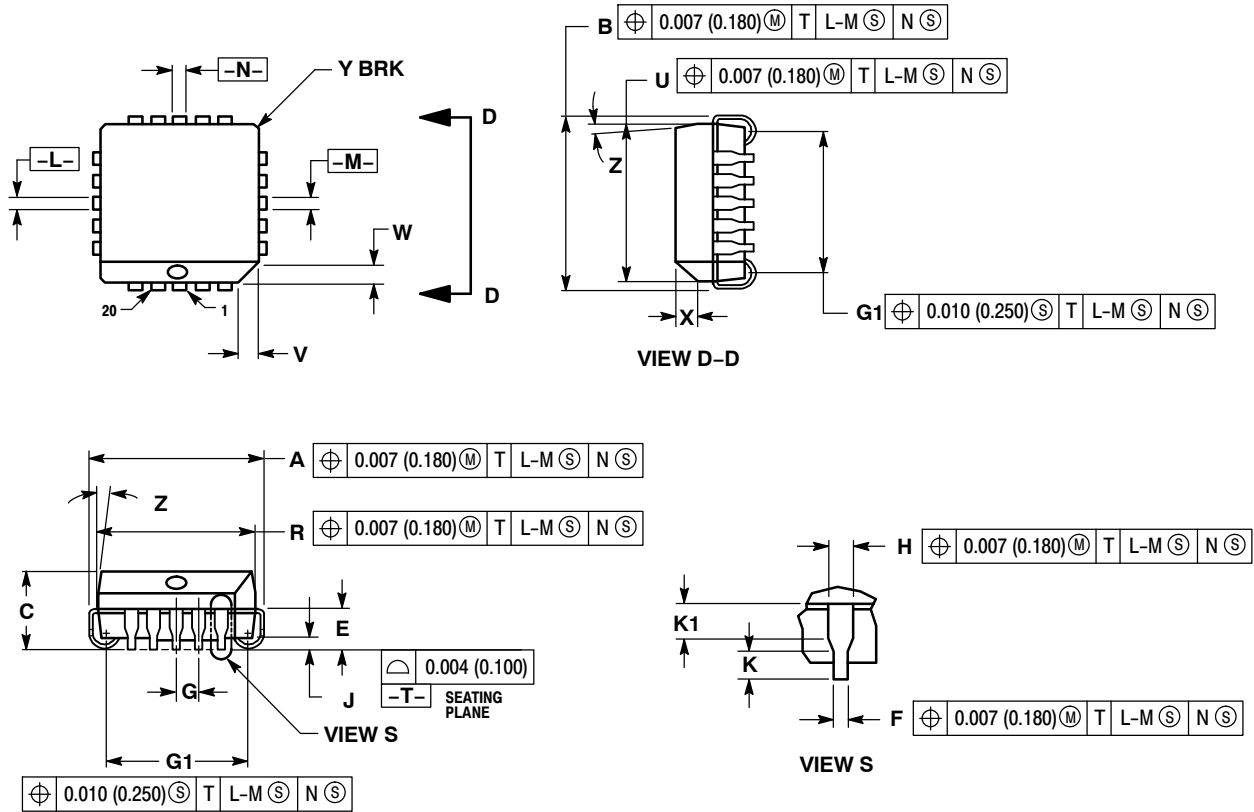
Device	Package	Shipping†
MC10H351FNG	PLCC-20 (Pb-Free)	46 Units / Rail
MC10H351FNR2G	PLCC-20 (Pb-Free)	500 / Tape & Reel
MC10H351P	PDIP-20	18 Unit / Rail
MC10H351PG	PDIP-20 (Pb-Free)	18 Unit / Rail

†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.

# MC10H351

## PACKAGE DIMENSIONS

20 LEAD PLCC  
CASE 775-02  
ISSUE F



**NOTES:**

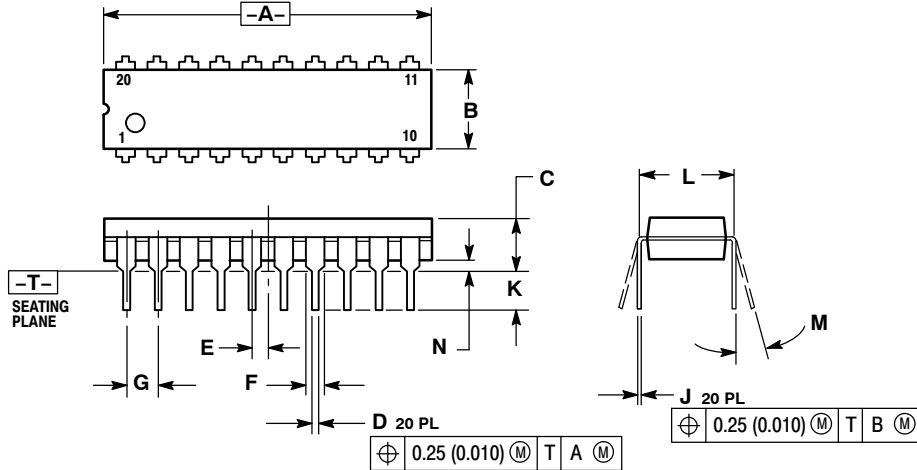
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
2. DIMENSIONS IN INCHES.
3. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
4. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
5. DIMENSIONS R AND U DO NOT INCLUDE MOLD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

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## PACKAGE DIMENSIONS

PDIP-20  
P SUFFIX  
CASE 738-03  
ISSUE E



**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 B DOES NOT INCLUDE MOLD FLASH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.010	1.070	25.66	27.17
B	0.240	0.260	6.10	6.60
C	0.150	0.180	3.81	4.57
D	0.015	0.022	0.39	0.55
E	0.050 BSC		1.27 BSC	
F	0.050	0.070	1.27	1.77
G	0.100 BSC		2.54 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.140	2.80	3.55
L	0.300 BSC		7.62 BSC	
M	0° 15°		0° 15°	
N	0.020	0.040	0.51	1.01

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