

# MC10H607, MC100H607

## Registered Hex PECL to TTL Translator

### Description

The MC10H/100H607 is a 6-bit, registered PECL to TTL translator. The device features differential PECL inputs for both data and clock. The TTL outputs feature 48 mA sink, 24 mA source drive capability for driving high fanout loads or transmission lines. The asynchronous master reset control is an ECL level input.

With its differential PECL inputs and TTL outputs the H607 device is ideally suited for the receive function of a HPPI bus type board-to-board interface application. The on chip registers simplify the task of synchronizing the data between the two boards.

The device is available in either ECL standard: the 10H device is compatible with MECL 10H™ logic levels, with a  $V_{CC}$  of +5.0 V, while the 100H device is compatible with 100K logic levels, with a  $V_{CC}$  of +5.0 V.

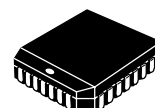
### Features

- Differential ECL Data and Clock Inputs
- 48 mA Sink, 24 mA Source TTL Outputs
- Single Power Supply
- Multiple Power and Ground Pins to Minimize Noise
- Pb-Free Packages are Available\*



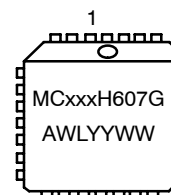
**ON Semiconductor®**

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**PLCC-28  
FN SUFFIX  
CASE 776**

### MARKING DIAGRAM\*



xxx = 10 or 100  
A = Assembly Location  
WL = Wafer Lot  
YY = Year  
WW = Work Week  
G = Pb-Free Package

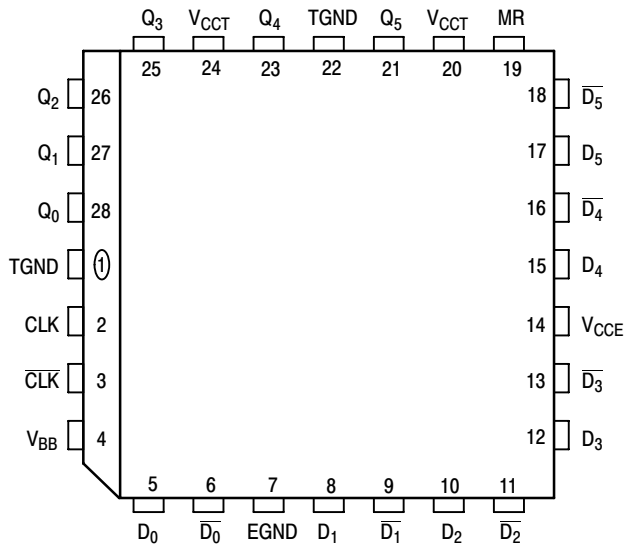
\*For additional marking information, refer to Application Note AND8002/D.

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 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.

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**Figure 1. Pinout: PLCC-28**  
(Top View)

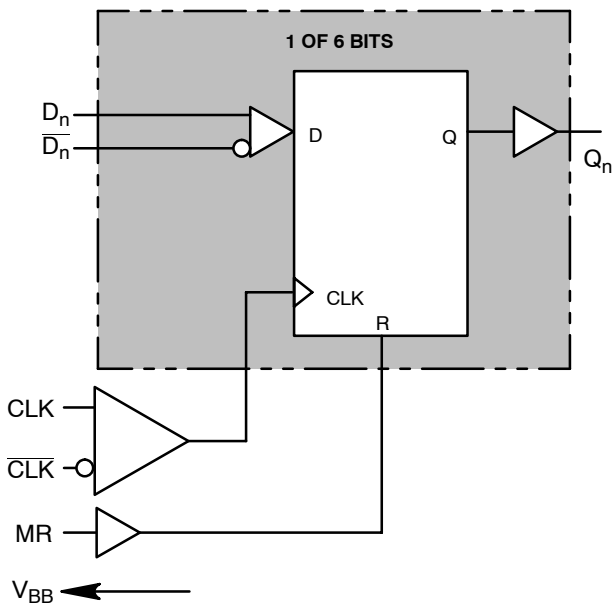
**Table 1. PIN NAMES**

Pin	Function
D <sub>0</sub> - D <sub>5</sub>	True PECL Data Inputs
D <sub>0</sub> - D <sub>5</sub>	Inverted PECL Data Inputs
CLK, CLK	Differential PECL Clock Input
MR	PECL Master Reset Input
Q <sub>0</sub> - Q <sub>5</sub>	TTL Outputs
V <sub>CCE</sub>	PECL V <sub>CC</sub>
V <sub>CCT</sub>	TTL V <sub>CC</sub>
TGND	TTL Ground
EGND	PECL Ground

**Table 2. TRUTH TABLE**

D <sub>n</sub>	MR	TCLK/CLK	Q <sub>n + 1</sub>
L	L	Z	L
H	L	Z	H
X	H	X	L
Open Input	X	X	L

Z = LOW to HIGH Transition



**Figure 2. Logic Diagram**

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**Table 3. 10H PECL DC CHARACTERISTICS** ( $V_{CCT} = V_{CCE} = 5.0 \text{ V} \pm 5\%$ )

Symbol	Characteristic	Condition	$T_A = 0^\circ\text{C}$		$T_A = 25^\circ\text{C}$		$T_A = 85^\circ\text{C}$		Unit
			Min	Max	Min	Max	Min	Max	
$I_{INH}$	Input HIGH Current			255		175		175	$\mu\text{A}$
$I_{INL}$	Input LOW Current			0.5		0.5		0.5	$\mu\text{A}$
$V_{IH}$	Input HIGH Voltage	$V_{CCT} = 5.0 \text{ V}$	3830	4160	3870	4190	3930	4280	mV
$V_{IL}$	Input LOW Voltage	$V_{CCT} = 5.0 \text{ V}$	3050	3520	3050	3520	3050	3555	mV
$V_{BB}$	Output Bias Voltage	$V_{CCT} = 5.0 \text{ V}$	3600	3710	3630	3730	3670	3790	mV

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. PECL  $V_{IL}$ ,  $V_{IH}$ ,  $V_{OL}$ ,  $V_{OH}$ ,  $V_{BB}$  are given for  $V_{CCT} = V_{CCE} = 5.0 \text{ V}$  and will vary 1:1 with power supply.

**Table 4. 100H PECL DC CHARACTERISTICS** ( $V_{CCT} = V_{CCE} = 5.0 \text{ V} \pm 5\%$ )

Symbol	Characteristic	Condition	$T_A = 0^\circ\text{C}$		$T_A = 25^\circ\text{C}$		$T_A = 85^\circ\text{C}$		Unit
			Min	Max	Min	Max	Min	Max	
$I_{IH}$	Input HIGH Current			255		175		175	$\mu\text{A}$
$I_{IL}$	Input LOW Current			0.5		0.5		0.5	$\mu\text{A}$
$V_{IH}$	Input HIGH Voltage	$V_{CCT} = 5.0 \text{ V}$	3835	4120	3835	4120	3835	4120	mV
$V_{IL}$	Input LOW Voltage	$V_{CCT} = 5.0 \text{ V}$	3190	3525	3190	3525	3190	3525	mV
$V_{BB}$	Output Bias Voltage	$V_{CCT} = 5.0 \text{ V}$	3600	3720	3600	3720	3600	3720	mV

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.

2. PECL  $V_{IL}$ ,  $V_{IH}$ ,  $V_{OL}$ ,  $V_{OH}$ ,  $V_{BB}$  are given for  $V_{CCT} = V_{CCE} = 5.0 \text{ V}$  and will vary 1:1 with power supply.

**Table 5. 10H/100H TTL DC CHARACTERISTICS** ( $V_{CCT} = V_{CCE} = 5.0 \text{ V} \pm 5\%$ )

Symbol	Characteristic	Condition	$T_A = 0^\circ\text{C}$		$T_A = 25^\circ\text{C}$		$T_A = 85^\circ\text{C}$		Unit
			Min	Max	Min	Max	Min	Max	
$V_{OH}$	Output HIGH Voltage	$I_{OH} = -15 \text{ mA}$ $I_{OH} = -24 \text{ mA}$	2.5 2.0		2.5 2.0		2.5 2.0		V
$V_{OL}$	Output LOW Voltage	$I_{OL} = 48 \text{ mA}$		0.55		0.55		0.55	V

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.

3. DC levels such as  $V_{OH}$ ,  $V_{OL}$ , etc., are standard for PECL and FAST devices, with the exceptions of:  $I_{OL} = 48 \text{ mA}$  at  $0.5 V_{OL}$ ; and  $I_{OH} = -24 \text{ mA}$  at  $2.0 V_{OH}$ .

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**Table 6. DC CHARACTERISTICS** ( $V_{CCT} = V_{CCE} = 5.0V \pm 5\%$ )

Symbol	Characteristic	$T_A = 0^\circ C$			$T_A = +25^\circ C$			$T_A = +85^\circ C$			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	ECL Power Supply Current 10H 100H		70 65	85 80		70 70	85 85		70 75	85 95	mA
$I_{CCL}$	TTL Supply Current		100	120		100	120		100	120	mA
$I_{CCH}$	TTL Supply Current		100	120		100	120		100	120	mA

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 lfm. 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.

**Table 7. AC CHARACTERISTICS** ( $V_{CCT} = V_{CCE} = 5.0V \pm 5\%$ )

Symbol	Characteristic	Condition	$T_A = 0^\circ C$		$T_A = +25^\circ C$		$T_A = +85^\circ C$		Unit
			Min	Max	Min	Max	Min	Max	
$t_{PLH}$ $t_{PHH}$	Propagation Delay to Output CLK to Q	CL = 50 pF	5.5 4.6	7.7 7.7	6.0 4.9	8.2 8.3	6.7 5.9	10.0 10.0	ns
$t_{PHL}$	Propagation Delay to Output MR to Q	CL = 50 pF	4.4	7.5	4.7	8.1	5.8	10.5	ns
$t_{PW}$	Minimum Pulse Width CLK, MR		1.0		1.0		1.0		ns
$t_r$	Rise Time	1.0 V to 2.0 V	0.5	2.0	0.5	2.0	0.5	2.0	ns
$t_f$	Fall Time	1.0 V to 2.0 V	0.5	2.0	0.5	2.0	0.5	2.0	ns
$t_S$	Setup Time		1.5		1.5		1.5		ns
$t_H$	Hold Time		1.5		1.5		1.5		ns
$V_{PP}$	Minimum Input Swing		200		200		200		mV

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 lfm. 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.

4. Numbers are for both ++ and -- delay MR to Q.

## ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MC10H607FN	PLCC-28	37 Units / Rail
MC10H607FNG	PLCC-28 (Pb-Free)	37 Units / Rail
MC100H607FN	PLCC-28	37 Units / Rail
MC100H607FNG	PLCC-28 (Pb-Free)	37 Units / Rail
MC100H607FNR2	PLCC-28	500 / Tape & Reel
MC100H607FNR2G	PLCC-28 (Pb-Free)	500 / Tape & Reel

<sup>†</sup>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.

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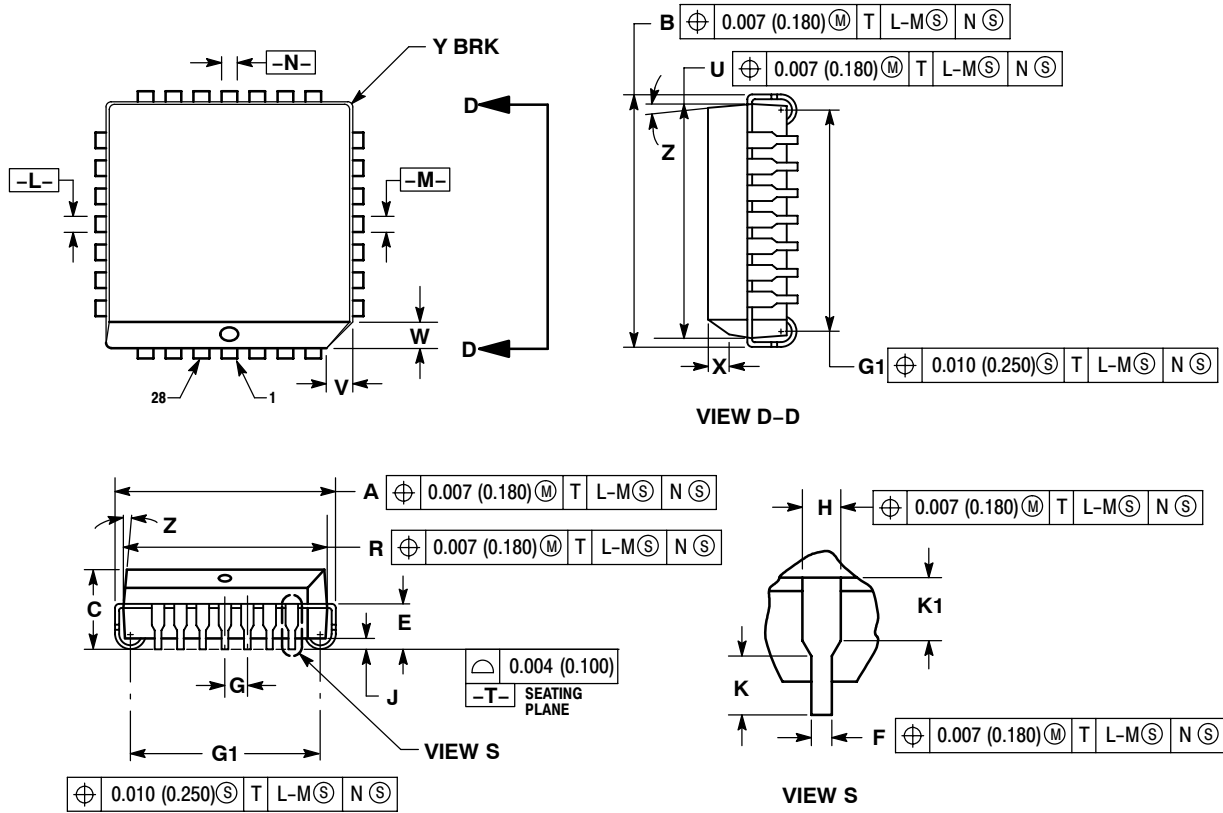
### Resource Reference of Application Notes

- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPiCE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices

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## PACKAGE DIMENSIONS

PLCC-28  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 776-02  
ISSUE E




**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 BOTTOM MAY BE SMALLER THAN THE PACKAGE TOP 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	0.485	0.495	12.32	12.57
B	0.485	0.495	12.32	12.57
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	0.450	0.456	11.43	11.58
U	0.450	0.456	11.43	11.58
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	0.410	0.430	10.42	10.92
K1	0.040	---	1.02	---

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