

MC10H600, MC100H600

9-Bit TTL to ECL Translator

Description

The MC10H/100H600 is a 9-bit, dual supply TTL to ECL translator. Devices in the ON Semiconductor 9-bit translator series utilize the PLCC-28 for optimal power pinning, signal flow-through and electrical performance.

The H600 features both ECL and TTL logic enable controls for maximum flexibility.

The 10H version is compatible with MECL 10H ECL logic levels. The 100H version is compatible with 100K levels.

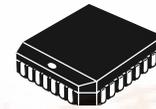
Features

- 9-Bit Ideal for Byte-Parity Applications
- Flow-Through Configuration
- Extra TTL and ECL Power/Ground Pins to Minimize Switching Noise
- ECL and TTL Enable Inputs
- Dual Supply
- 3.5 ns Max D to Q
- PNP TTL Inputs for Low Loading
- Choice of ECL Compatibility:
MECL 10H (10Hxxx) or 100K (100Hxxx)
- Pb-Free Packages are Available*



ON Semiconductor®

<http://onsemi.com>



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.



MC10H600, MC100H600

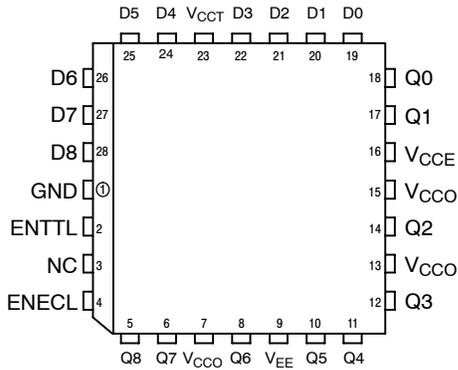


Figure 1. Pinout: PLCC-28 (Top View)

Table 1. PIN NAMES

| PIN | FUNCTION |
|------------------|-------------------------------------|
| GND | TTL Ground (0 V) |
| V _{CCE} | ECL V _{CC} (0 V) |
| V _{CCO} | ECL V _{CC} (0 V) – Outputs |
| V _{CCT} | TTL Supply (+5.0 V) |
| V _{EE} | ECL Supply (-5.2/-4.5 V) |
| D0–D8 | Data Inputs (TTL) |
| Q0–Q8 | Data Outputs (ECL) |
| ENECL | Enable Control (ECL) |
| ENTTL | Enable Control (TTL) |

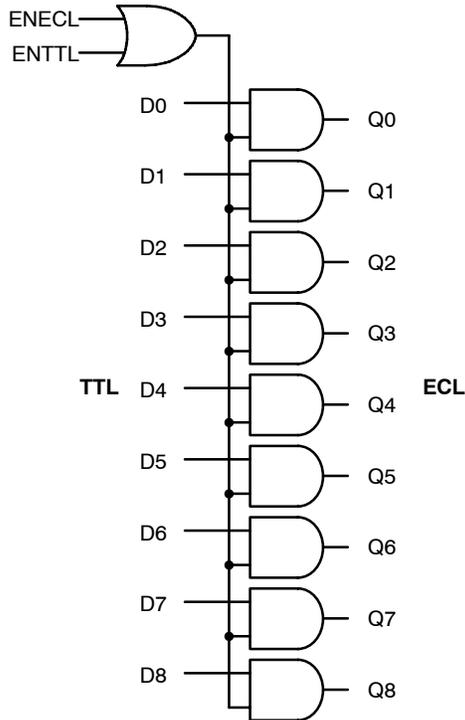


Figure 2. Logic Symbol

Table 2. TRUTH TABLE

| ENECL | ENTTL | D | Q |
|-------|-------|---|---|
| H | X | H | H |
| H | X | L | L |
| X | H | H | H |
| X | H | L | L |
| L | L | X | L |

Table 3. DC CHARACTERISTICS: V_{CCT} = 5.0 V ± 10%; V_{EE} = -5.2 V ± 5% (10H version); V_{EE} = -4.2 V to -5.5 V (100H)

| Symbol | Parameter | 0°C | | 25°C | | 75°C | | Unit |
|--------------------------------------|-----------|------|----------|----------|----------|----------|------|------|
| | | Min | Max | Min | Max | Min | Max | |
| Power Supply Current | | | | | | | | |
| I _{EE} | ECL | 10H | -125 | -125 | -125 | -125 | -125 | mA |
| | | 100H | -122 | -123 | -132 | -132 | | |
| I _{CCH} I _{CCL} | TTL | | 48 50 | 48 50 | 48 50 | 48 50 | | 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 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.

MC10H600, MC100H600

Table 4. 10H ECL DC CHARACTERISTICS: $V_{CCT} = 5.0\text{ V} \pm 10\%$; $V_{EE} = -5.2\text{ V} \pm 5\%$

| Symbol | Parameter | Condition | 0°C | | 25°C | | 75°C | | Unit |
|-----------------------|---|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|
| | | | Min | Max | Min | Max | Min | Max | |
| I_{INH} I_{IL} | Input HIGH Current Input LOW Current | | 0.5 | 225 | 0.5 | 175 | 0.5 | 175 | μA μA |
| V_{IH} V_{IL} | Input HIGH Voltage Input LOW Voltage | | -1170 -1950 | -840 -1480 | -1130 -1950 | -810 -1480 | -1070 -1950 | -735 -1450 | mV |
| V_{OH} V_{OL} | Output HIGH Voltage Output LOW Voltage | 50 Ω to -2.0 V | -1020 -1950 | -840 -1630 | -980 -1950 | -810 -1630 | -920 -1950 | -735 -1600 | 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.

Table 5. 100H ECL DC CHARACTERISTICS: $V_{CCT} = 5.0\text{ V} \pm 10\%$; $V_{EE} = -4.2\text{ V}$ to -5.5 V

| Symbol | Parameter | Condition | 0°C | | 25°C | | 75°C | | Unit |
|-----------------------|---|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|
| | | | Min | Max | Min | Max | Min | Max | |
| I_{INH} I_{IL} | Input HIGH Current Input LOW Current | | 0.5 | 255 | 0.5 | 175 | 0.5 | 175 | μA μA |
| V_{IH} V_{IL} | Input HIGH Voltage Input LOW Voltage | | -1165 -1810 | -880 -1475 | -1165 -1810 | -880 -1475 | -1165 -1810 | -880 -1475 | mV |
| V_{OH} V_{OL} | Output HIGH Voltage Output LOW Voltage | 50 Ω to -2.0 V | -1025 -1810 | -880 -1620 | -1025 -1810 | -880 -1620 | -1025 -1810 | -880 -1620 | 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.

Table 6. TTL DC CHARACTERISTICS: $V_{CCT} = 5.0\text{ V} \pm 10\%$; $V_{EE} = -5.2\text{ V} \pm 5\%$ (10H); $V_{EE} = -4.2\text{ V}$ to -5.5 V (100H)

| Symbol | Parameter | Condition | 0°C | | 25°C | | 75°C | | Unit |
|----------------------|---|--|-----|-----------|------|-----------|------|-----------|---------------|
| | | | Min | Max | Min | Max | Min | Max | |
| V_{IH} V_{IL} | Input HIGH Voltage Input LOW Voltage | | 2.0 | 0.8 | 2.0 | 0.8 | 2.0 | 0.8 | V V |
| I_{IH} | Input HIGH Current | $V_{IN} = 2.7\text{ V}$ $V_{IN} = 7.0\text{ V}$ | | 20 100 | | 20 100 | | 20 100 | μA |
| I_{IL} | Input LOW Current | $V_{IN} = 0.5\text{ V}$ | | -0.6 | | -0.6 | | -0.6 | mA |
| V_{IK} | Input Clamp Voltage | $I_{IN} = -18\text{ mA}$ | | -1.2 | | -1.2 | | -1.2 | 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.

MC10H600, MC100H600

Table 7. AC CHARACTERISTICS: $V_{CCT} = 5.0\text{ V} \pm 10\%$; $V_{EE} = -5.2\text{ V} \pm 5\%$ (10H); $V_{EE} = -4.2\text{ V to } -5.5\text{ V}$ (100H)

| Symbol | Parameter | Condition | 0°C | | 25°C | | 75°C | | Unit | |
|------------------------|------------------------------------|-----------------|-----------------------|-----|------|-----|------|-----|------|----|
| | | | Min | Max | Min | Max | Min | Max | | |
| t_{PLH} t_{PHL} | Propagation Delay to Output | D | 50 Ω to -2.0 V | 1.4 | 3.0 | 1.5 | 3.2 | 1.7 | 3.5 | ns |
| | | ENECL/ ENTTL | | 1.8 | 3.7 | 1.9 | 3.9 | 2.0 | 4.1 | ns |
| t_R t_F | Output Rise/Fall Time 20% - 80% | | | 0.5 | 1.5 | 0.5 | 1.5 | 0.5 | 1.5 | 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 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.

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|----------------|----------------------|-----------------------|
| MC10H600FN | PLCC-28 | 37 Units / Rail |
| MC10H600FNG | PLCC-28 (Pb-Free) | 37 Units / Rail |
| MC10H600FNR2 | PLCC-28 | 500 / Tape & Reel |
| MC10H600FNR2G | PLCC-28 (Pb-Free) | 500 / Tape & Reel |
| MC100H600FN | PLCC-28 | 37 Units / Rail |
| MC100H600FNG | PLCC-28 (Pb-Free) | 37 Units / Rail |
| MC100H600FNR2 | PLCC-28 | 500 / Tape & Reel |
| MC100H600FNR2G | PLCC-28 (Pb-Free) | 500 / Tape & Reel |

[†]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.

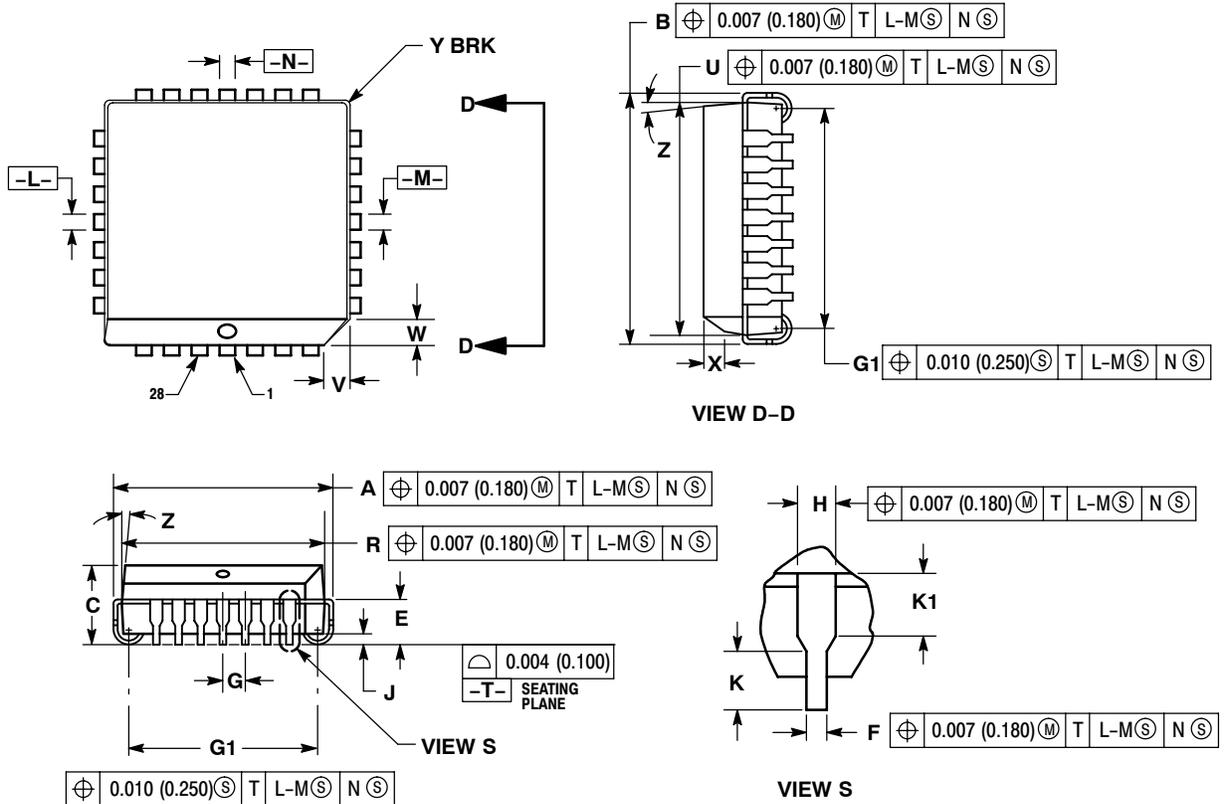
Resource Reference of Application Notes

- 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

MC10H600, MC100H600

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 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.
- 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 | --- |

MC10H600, MC100H600

ECLinPS is a trademark of Semiconductor Components Industries, LLC (SCILLC).

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative