

# MC10H601, MC100H601

## 9-Bit ECL to TTL Translator

### Description

The MC10H/100H601 is a 9-bit, dual supply ECL to TTL translator. Devices in the ON Semiconductor 9-bit translator series utilize the 28-lead PLCC for optimal power pinning, signal flow-through and electrical performance.

The devices feature a 48 mA TTL output stage, and AC performance is specified into both a 50 pF and 200 pF load capacitance. For the 3-state output disable, both ECL and TTL control inputs are provided, allowing maximum design flexibility.

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

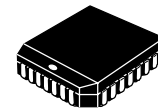
### Features

- 9-Bit Ideal for Byte-Parity Applications
- 3-State TTL Outputs
- Flow-Through Configuration
- Extra TTL and ECL Power Pins to Minimize Switching Noise
- ECL and TTL 3-State Control Inputs
- Dual Supply
- 4.8 ns Max Delay into 50 pF, 9.6 ns into 200 pF (all Outputs Switching)
- PNP TTL Inputs for Low Loading
- 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.

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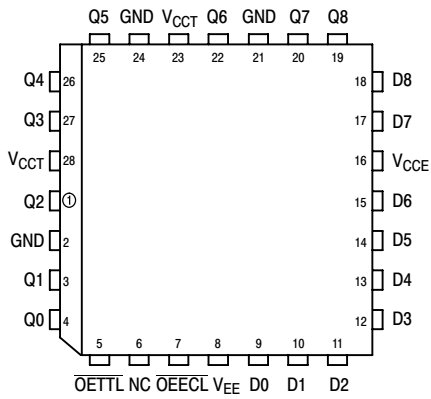


Figure 1. PLCC-28 Pinout (Top View)

Table 1. PIN NAMES

| PIN                       | FUNCTION                   |
|---------------------------|----------------------------|
| GND                       | TTL Ground (0 V)           |
| V <sub>CCE</sub>          | ECL V <sub>CC</sub> (0 V)  |
| V <sub>CCT</sub>          | Supply (+5.0 V)            |
| V <sub>EE</sub>           | ECL Supply (-5.2 / -4.5 V) |
| D0-D8                     | Data Inputs (ECL)          |
| Q0-Q8                     | Data Outputs (TTL)         |
| $\overline{\text{OEECL}}$ | 3-State Control (ECL)      |
| $\overline{\text{OETTL}}$ | 3-State Control (TTL)      |

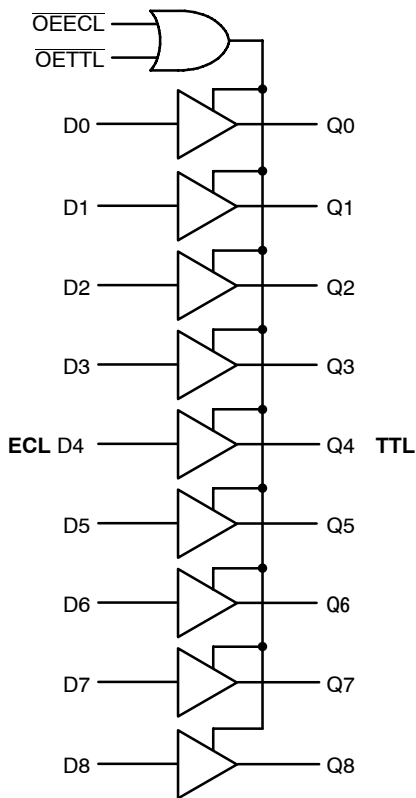


Figure 2. Logic Diagram

Table 2. TRUTH TABLE

| $\overline{\text{OEECL}}$ | $\overline{\text{OETTL}}$ | D | Q |
|---------------------------|---------------------------|---|---|
| L                         | L                         | L | L |
| L                         | L                         | H | H |
| H                         | X                         | X | Z |
| X                         | H                         | X | Z |

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**Table 3. 10H ECL DC CHARACTERISTICS:**  $V_{CC} = 5.0 \text{ V} \pm 10\%$ ;  $V_{EE} = -5.2 \text{ V} \pm 5\%$

| Symbol                 | Parameter                               | 0°C            |               | 25°C           |               | 85°C           |               | Unit                           |
|------------------------|---|----------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|
|                        |   | Min            | Max           | Min            | Max           | Min            | Max           |                                |
| $I_{EE}$               | Power Supply Current                    |                | -51           |                | -51           |                | -51           | mA                             |
| $I_{INH}$<br>$I_{INL}$ | Input HIGH Current<br>Input LOW Current | 0.5            | 255           | 0.5            | 175           | 0.5            | 175           | $\mu\text{A}$<br>$\mu\text{A}$ |
| $V_{IH}$<br>$V_{IL}$   | Input HIGH Voltage<br>Input LOW Voltage | -1170<br>-1950 | -840<br>-1480 | -1130<br>-1950 | -810<br>-1480 | -1060<br>-1950 | -720<br>-1445 | 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.

**Table 4. 100H ECL DC CHARACTERISTICS:**  $V_{CC} = 5.0 \text{ V} \pm 10\%$ ;  $V_{EE} = -4.2 \text{ V to } -5.5 \text{ V}$

| Symbol                 | Parameter                               | 0°C            |               | 25°C           |               | 85°C           |               | Unit                           |
|------------------------|---|----------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|
|                        |   | Min            | Max           | Min            | Max           | Min            | Max           |                                |
| $I_{EE}$               | Power Supply Current                    |                | -51           |                | -51           |                | -53           | mA                             |
| $I_{INH}$<br>$I_{INL}$ | Input HIGH Current<br>Input LOW Current | 0.5            | 255           | 0.5            | 175           | 0.5            | 175           | $\mu\text{A}$<br>$\mu\text{A}$ |
| $V_{IH}$<br>$V_{IL}$   | Input HIGH Voltage<br>Input LOW Voltage | -1165<br>-1810 | -880<br>-1475 | -1165<br>-1810 | -880<br>-1475 | -1165<br>-1810 | -880<br>-1475 | 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.

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

| Symbol                 | Parameter   | Condition   | 0°C        |           | 25°C       |           | 85°C       |           | Unit          |
|------------------------|---|---|------------|-----------|------------|-----------|------------|-----------|---------------|
|                        |   |   | Min        | Max       | Min        | Max       | Min        | Max       |               |
| $I_{CCH}$              | Power Supply Current                                      |   |            | 110       |            | 110       |            | 110       | mA            |
| $I_{CCL}$              |   |   |            | 110       |            | 110       |            | 110       |               |
| $I_{CCZ}$              |   |   |            | 105       |            | 105       |            | 105       |               |
| $I_{IH}$               | Input HIGH Current  | $V_{IN} = 2.7 \text{ V}$<br>$V_{IN} = 7.0 \text{ V}$    |            | 20<br>100 |            | 20<br>100 |            | 20<br>100 | $\mu\text{A}$ |
| $I_{IL}$               | Input LOW Current   | $V_{IN} = 0.5 \text{ V}$                                |            | -0.6      |            | -0.6      |            | -0.6      | mA            |
| $I_{OS}$               | Output Short Circuit Current                              | $V_{OUT} = 0 \text{ V}$                                 | -100       | -225      | -100       | -225      | -100       | -225      | mA            |
| $I_{OZH}$<br>$I_{OZL}$ | Output Disable Current HIGH<br>Output Disable Current LOW | $V_{OUT} = 2.7 \text{ V}$<br>$V_{OUT} = 0.5 \text{ V}$  | -50        | 50        | -50        | 50        | -50        | 50        | $\mu\text{A}$ |
| $V_{IHT}$<br>$V_{ILT}$ | Input HIGH Voltage<br>Input LOW Voltage                   |   | 2.0        | 0.8       | 2.0        | 0.8       | 2.0        | 0.8       | V             |
| $V_{OHT}$              | Output HIGH Voltage                                       | $I_{OH} = -3.0 \text{ mA}$<br>$I_{OH} = -15 \text{ mA}$ | 2.5<br>2.0 |           | 2.5<br>2.0 |           | 2.5<br>2.0 |           | V             |
| $V_{OLT}$              | Output LOW Voltage  | $I_{OL} = 48 \text{ mA}$                                |            | 0.55      |            | 0.55      |            | 0.55      | V             |
| $V_{IK}$               | 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 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.

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

| Symbol                 | Parameter                              | Condition                                     | 0°C   |            | 25°C       |            | 85°C       |            | Unit      |
|------------------------|--|---|---|------------|------------|------------|------------|------------|-----------|
|                        |  |   | Min   | Max        | Min        | Max        | Min        | Max        |           |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output            | $C_L = 50\text{ pF}$<br>$C_L = 200\text{ pF}$ | 1.7<br>3.4                                    | 4.8<br>9.6 | 1.7<br>3.4 | 4.8<br>9.6 | 1.7<br>3.4 | 4.8<br>9.6 | ns<br>ns  |
| $t_{PLZ}$<br>$t_{PHZ}$ | Output Disable Time                    | $\overline{OE}ECL$                            | 3.7<br>5.4                                    | 6.5<br>13  | 3.7<br>5.4 | 6.5<br>13  | 3.7<br>5.4 | 6.5<br>13  | ns<br>ns  |
| $t_{PLZ}$<br>$t_{PHZ}$ |  | $\overline{OE}TTL$                            | $C_L = 50\text{ pF}$<br>$C_L = 200\text{ pF}$ | 4.3<br>7.0 | 7.5<br>15  | 4.3<br>7.0 | 7.5<br>15  | 4.3<br>7.0 | 7.5<br>15 |
| $t_{PZL}$<br>$t_{PZH}$ | Output Enable Time                     | $\overline{OE}ECL$                            | 3.5<br>5.0                                    | 6.0<br>12  | 3.5<br>5.0 | 6.0<br>12  | 3.5<br>5.0 | 6.0<br>12  | ns<br>ns  |
| $t_{PZL}$<br>$t_{PZH}$ |  | $\overline{OE}TTL$                            | $C_L = 50\text{ pF}$<br>$C_L = 200\text{ pF}$ | 4.2<br>6.0 | 7.0<br>14  | 4.2<br>6.0 | 7.0<br>14  | 4.2<br>6.0 | 7.0<br>14 |
| $t_R$<br>$t_F$         | Output Rise/Fall Time<br>1.0 V – 2.0 V | $C_L = 50\text{ pF}$<br>$C_L = 200\text{ pF}$ |   | 1.2<br>3.0 |            | 1.2<br>3.0 |            | 1.2<br>3.0 | ns<br>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 <sup>†</sup> |
|----------------|----------------------|-----------------------|
| MC10H601FN     | PLCC-28              | 37 Units / Rail       |
| MC10H601FNG    | PLCC-28<br>(Pb-Free) | 37 Units / Rail       |
| MC10H601FNR2   | PLCC-28              | 500 / Tape & Reel     |
| MC10H601FNR2G  | PLCC-28<br>(Pb-Free) | 500 / Tape & Reel     |
| MC100H601FN    | PLCC-28              | 37 Units / Rail       |
| MC100H601FNG   | PLCC-28<br>(Pb-Free) | 37 Units / Rail       |
| MC100H601FNR2  | PLCC-28              | 500 / Tape & Reel     |
| MC100H601FNR2G | PLCC-28<br>(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.

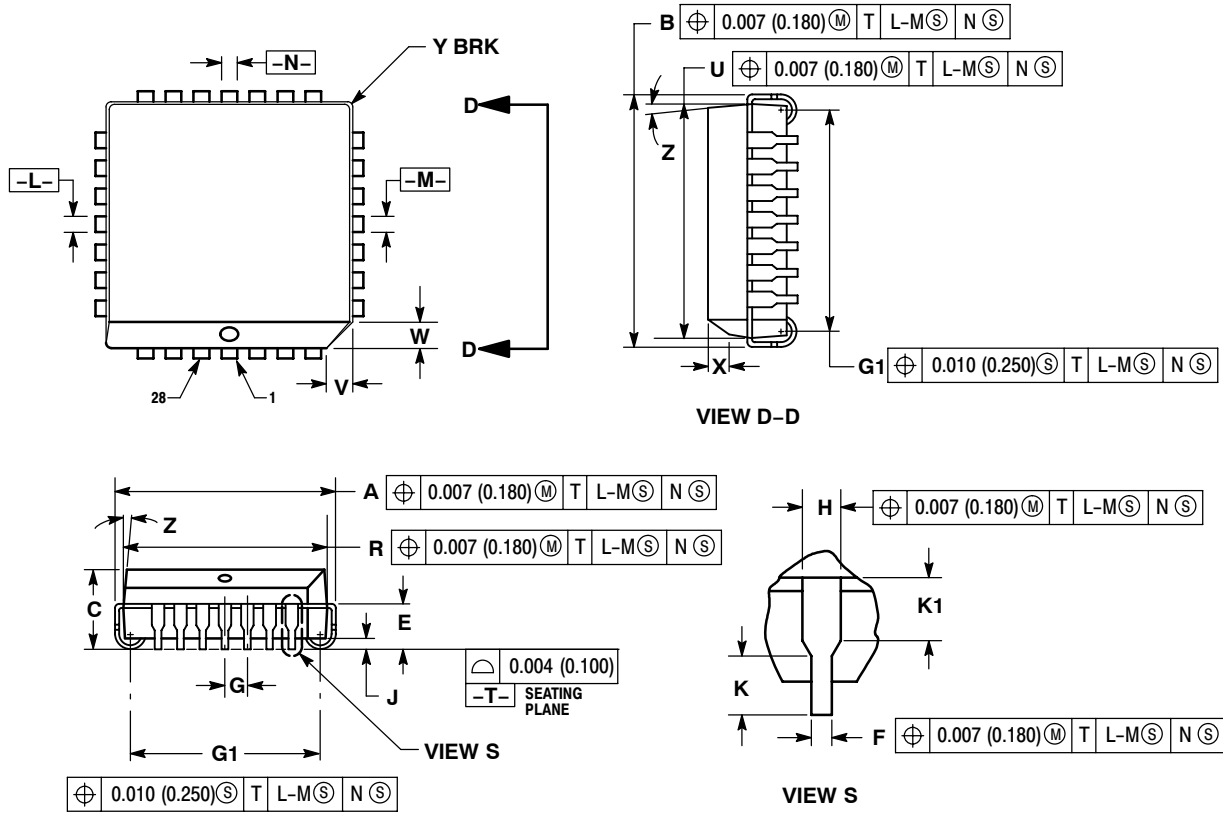
## Resource Reference of Application Notes

- 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°         |       |
| G1  | 0.410     | 0.430 | 10.42       | 10.92 |
| K1  | 0.040     | ---   | 1.02        | ---   |

# MC10H601, MC100H601

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