

# MC10H602, MC100H602

## 9-Bit Latch TTL to ECL Translator

### Description

The MC10H/100H602 is a 9-bit, dual supply TTL to ECL translator with latch. Devices in the ON Semiconductor 9-bit translator series utilize the PLCC-28 for optimal power pinning, signal flow-through and electrical performance.

The H602 features D-type latches. Latching is controlled by Latch Enable (LEN), while the Master Reset input resets the latches. A post-latch logic enable is also provided (ENECL), allowing control of the output state without destroying latch data. All control inputs are ECL level.

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

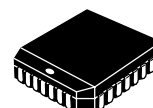
### Features

- 9-Bit Ideal for Byte-Parity Applications
- Flow-Through Configuration
- Extra TTL and ECL Power/Ground Pins to Minimize Switching Noise
- Dual Supply
- 3.5 ns Max D to Q
- PNP TTL Inputs for Low Loading
- Pb-Free Packages are Available\*



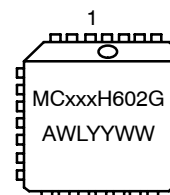
**ON Semiconductor®**

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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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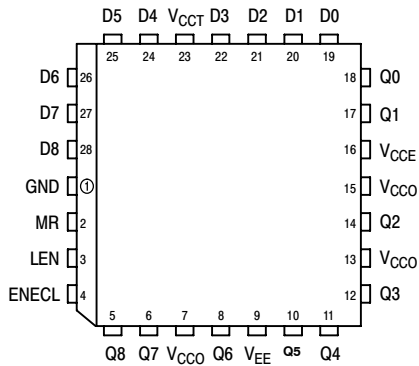


Figure 1. PLCC-28 Pinout (Top View)

Table 1. PIN NAMES

| PIN              | FUNCTION                            |
|------------------|-------------------------------------|
| GND              | TTL Ground (0 V)                    |
| V <sub>CCE</sub> | ECL V <sub>CC</sub> (0 V)           |
| V <sub>CCO</sub> | ECL V <sub>CC</sub> (0 V) — Outputs |
| V <sub>CCT</sub> | TTL Supply (+5.0 V)                 |
| V <sub>EE</sub>  | ECL Supply (–5.2/–4.5 V)            |
| D0–D8            | Data Inputs (TTL)                   |
| Q0–Q8            | Data Outputs (ECL)                  |
| ENECL            | Enable Control (ECL)                |
| LEN              | Latch Enable (ECL)                  |
| MR               | Master Reset (ECL)                  |

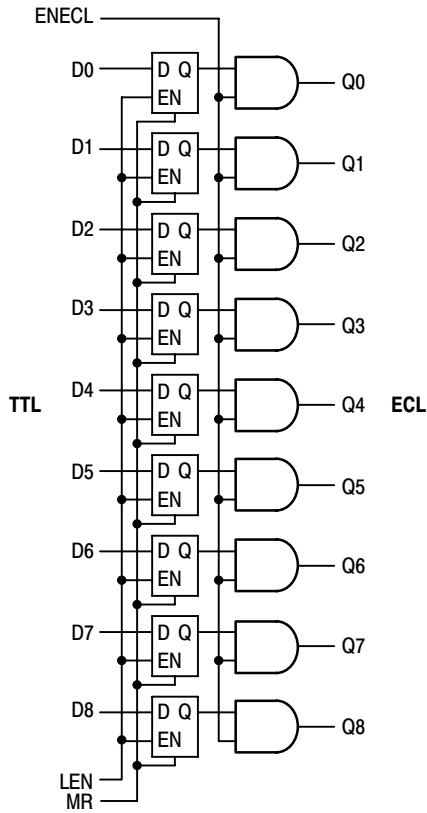


Figure 2. LOGIC SYMBOL

Table 2. TRUTH TABLE

| D | LEN | MR | ENECL | Q              |
|---|-----|----|-------|----------------|
| L | L   | L  | H     | L              |
| H | L   | L  | H     | H              |
| X | H   | L  | H     | Q <sub>0</sub> |
| X | X   | H  | H     | L              |
| X | X   | X  | L     | L              |

Table 3. DC CHARACTERISTICS: V<sub>CCT</sub> = 5.0 V ± 10%; V<sub>EE</sub> = –5.2 V ± 5% (10H version); V<sub>EE</sub> = –4.2 V to –5.5 V (100H version)

| Symbol                               | Parameter            |             | 0°C |              | 25°C |              | 75°C |              | Unit |
|--------------------------------------|----------------------|-------------|-----|--------------|------|--------------|------|--------------|------|
|                                      |                      |             | Min | Max          | Min  | Max          | Min  | Max          |      |
|                                      | Power Supply Current |             |     |              |      |              |      |              |      |
| I <sub>EE</sub>                      | ECL                  | 10H<br>100H |     | –125<br>–122 |      | –125<br>–123 |      | –125<br>–132 | mA   |
| I <sub>CCH</sub><br>I <sub>CCL</sub> | TTL                  |             |     | 48<br>50     |      | 48<br>50     |      | 48<br>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.

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**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           |                                |
| $I_{INH}$<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 | -1070<br>-1950 | -735<br>-1450 | mV                             |
| $V_{OH}$<br>$V_{OL}$   | Output HIGH Voltage<br>Output LOW Voltage | 50 $\Omega$ to -2.0 V | -1020<br>-1950 | -840<br>-1630 | -980<br>-1950  | -810<br>-1630 | -920<br>-1950  | -735<br>-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 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. 100H ECL DC CHARACTERISTICS:**  $V_{CCT} = 5.0 \text{ V} \pm 10\%$ ;  $V_{EE} = -4.2 \text{ V}$  to  $-5.5 \text{ V}$

| Symbol                 | Parameter                                 | Condition             | 0°C            |               | 25°C           |               | 75°C           |               | Unit                           |
|------------------------|---|-----------------------|----------------|---------------|----------------|---------------|----------------|---------------|--------------------------------|
|                        |   |                       | Min            | Max           | Min            | Max           | Min            | Max           |                                |
| $I_{INH}$<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                             |
| $V_{OH}$<br>$V_{OL}$   | Output HIGH Voltage<br>Output LOW Voltage | 50 $\Omega$ to -2.0 V | -1025<br>-1810 | -880<br>-1620 | -1025<br>-1810 | -880<br>-1620 | -1025<br>-1810 | -880<br>-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 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 6. TTL DC 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 |           | 75°C |           | Unit          |
|----------------------|---|--|-----|-----------|------|-----------|------|-----------|---------------|
|                      |   |  | Min | Max       | Min  | Max       | Min  | Max       |               |
| $V_{IH}$<br>$V_{IL}$ | Input HIGH Voltage<br>Input LOW Voltage |  | 2.0 | 0.8       | 2.0  | 0.8       | 2.0  | 0.8       | V<br>V        |
| $I_{IH}$             | 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            |
| $V_{IK}$             | 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 7. 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                          |                         | 0°C                      |                          | 25°C                     |                          | 75°C                     |                          | Unit |
|------------------------|------------------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------|
|                        |                                    |                         | Min                      | Max                      | Min                      | Max                      | Min                      | Max                      |      |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output        | D<br>LEN<br>MR<br>ENECL | 1.4<br>2.0<br>2.0<br>1.6 | 3.0<br>3.4<br>3.4<br>3.2 | 1.5<br>2.1<br>2.1<br>1.7 | 3.2<br>3.5<br>3.5<br>3.3 | 1.7<br>2.4<br>2.5<br>1.8 | 3.5<br>3.7<br>3.9<br>3.7 | ns   |
| $t_s$                  | Set-Up Time, D to LEN              |                         | 2.0                      |                          | 2.0                      |                          | 2.0                      |                          | ns   |
| $t_h$                  | Hold Time, D to LEN                |                         | 1.0                      |                          | 1.0                      |                          | 1.0                      |                          | ns   |
| $t_w(L)$               | LEN Pulse Width, LOW               |                         | 2.0                      |                          | 2.0                      |                          | 2.0                      |                          | ns   |
| $t_R$<br>$t_F$         | Output Rise/Fall Time<br>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 <sup>†</sup> |
|----------------|----------------------|-----------------------|
| MC10H602FN     | PLCC-28              | 37 Units / Rail       |
| MC10H602FNG    | PLCC-28<br>(Pb-Free) | 37 Units / Rail       |
| MC10H602FNR2   | PLCC-28              | 500 / Tape & Reel     |
| MC10H602FNR2G  | PLCC-28<br>(Pb-Free) | 500 / Tape & Reel     |
| MC100H602FN    | PLCC-28              | 37 Units / Rail       |
| MC100H602FNG   | PLCC-28<br>(Pb-Free) | 37 Units / Rail       |
| MC100H602FNR2G | 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.

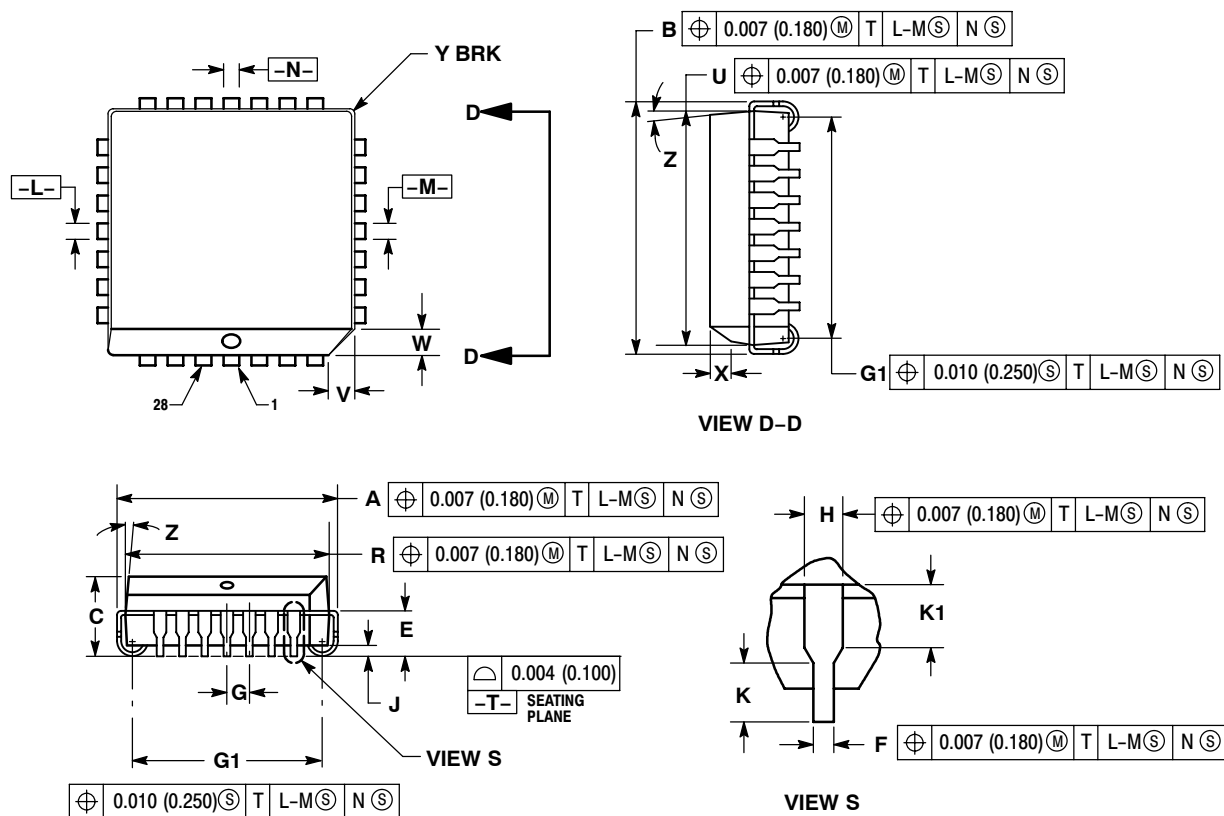
## Resource Reference of Application Notes

- 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
- AN1642/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 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        | ---   |

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