

# MC10H159

## Quad 2-Input Multiplexer

### (Inverting)

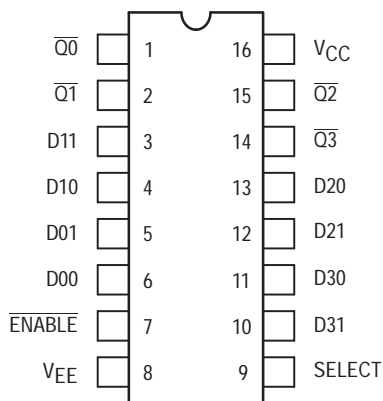
The MC10H159 is a quad 2-input multiplexer with enable. This MECL 10H part is a functional/pinout duplication of the standard MECL 10K family part, with 100% improvement in propagation delay and no increase in power-supply current.

- Propagation Delay, 1.5 ns Typical
- Power Dissipation, 218 mW Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible

TRUTH TABLE

| Enable | Select | D0 | D1 | Q |
|--------|--------|----|----|---|
| L      | L      | X  | L  | H |
| L      | L      | X  | H  | L |
| L      | H      | L  | X  | H |
| L      | H      | H  | X  | L |
| H      | X      | X  | X  | L |

DIP  
PIN ASSIGNMENT



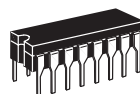
Pin assignment is for Dual-in-Line Package.  
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



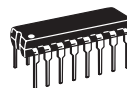
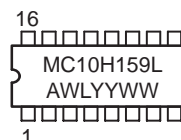
ON Semiconductor

<http://onsemi.com>

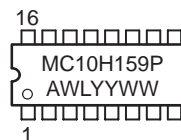
MARKING  
DIAGRAMS



CDIP-16  
L SUFFIX  
CASE 620



PDIP-16  
P SUFFIX  
CASE 648



PLCC-20  
FN SUFFIX  
CASE 775



A = Assembly Location  
WL = Wafer Lot  
YY = Year  
WW = Work Week

ORDERING INFORMATION

| Device     | Package | Shipping      |
|------------|---------|---------------|
| MC10H159L  | CDIP-16 | 25 Units/Rail |
| MC10H159P  | PDIP-16 | 25 Units/Rail |
| MC10H159FN | PLCC-20 | 46 Units/Rail |

# MC10H159

## MAXIMUM RATINGS

| Symbol    | Characteristic                                   | Rating                     | Unit     |
|-----------|--|----------------------------|----------|
| $V_{EE}$  | Power Supply ( $V_{CC} = 0$ )                    | -8.0 to 0                  | Vdc      |
| $V_I$     | Input Voltage ( $V_{CC} = 0$ )                   | 0 to $V_{EE}$              | Vdc      |
| $I_{out}$ | Output Current – Continuous<br>– Surge           | 50<br>100                  | mA       |
| $T_A$     | Operating Temperature Range                      | 0 to +75                   | °C       |
| $T_{stg}$ | Storage Temperature Range – Plastic<br>– Ceramic | -55 to +150<br>-55 to +165 | °C<br>°C |

## ELECTRICAL CHARACTERISTICS ( $V_{EE} = -5.2 \text{ V} \pm 5\%$ ) (See Note 1.)

| Symbol    | Characteristic                                    | 0°    |       | 25°   |       | 75°   |        | Unit          |
|-----------|---|-------|-------|-------|-------|-------|--------|---------------|
|           |   | Min   | Max   | Min   | Max   | Min   | Max    |               |
| $I_E$     | Power Supply Current                              | –     | 58    | –     | 53    | –     | 58     | mA            |
| $I_{inH}$ | Input Current High<br>Pin 9<br>Pins 3–7 and 10–13 | –     | 475   | –     | 295   | –     | 295    | $\mu\text{A}$ |
|           |   | –     | 515   | –     | 320   | –     | 320    |               |
| $I_{inL}$ | Input Current Low                                 | 0.5   | –     | 0.5   | –     | 0.3   | –      | $\mu\text{A}$ |
| $V_{OH}$  | High Output Voltage                               | -1.02 | -0.84 | -0.98 | -0.81 | -0.92 | -0.735 | Vdc           |
| $V_{OL}$  | Low Output Voltage                                | -1.95 | -1.63 | -1.95 | -1.63 | -1.95 | -1.60  | Vdc           |
| $V_{IH}$  | High Input Voltage                                | -1.17 | -0.84 | -1.13 | -0.81 | -1.07 | -0.735 | Vdc           |
| $V_{IL}$  | Low Input Voltage                                 | -1.95 | -1.48 | -1.95 | -1.48 | -1.95 | -1.45  | Vdc           |

## AC PARAMETERS

|          |                   |     |     |     |     |     |     |    |
|----------|-------------------|-----|-----|-----|-----|-----|-----|----|
| $t_{pd}$ | Propagation Delay |     |     |     |     |     |     | ns |
|          | Data              | 0.5 | 2.2 | 0.5 | 2.2 | 0.5 | 2.2 |    |
|          | Select            | 1.0 | 3.2 | 1.0 | 3.2 | 1.0 | 3.2 |    |
|          | Enable            | 1.0 | 3.2 | 1.0 | 3.2 | 1.0 | 3.2 |    |
| $t_r$    | Rise Time         | 0.5 | 2.2 | 0.5 | 2.2 | 0.5 | 2.2 | ns |
| $t_f$    | Fall Time         | 0.5 | 2.2 | 0.5 | 2.2 | 0.5 | 2.2 | ns |

- 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 linear fpm is maintained. Outputs are terminated through a 50-ohm resistor to -2.0 volts.

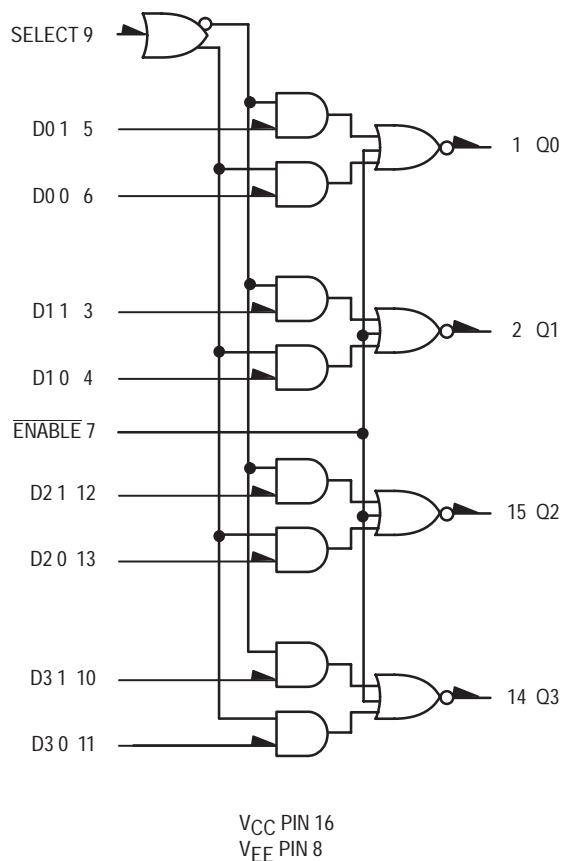
# MC10H159

## APPLICATION INFORMATION

The MC10H159 is a quad two channel multiplexer with enable. It incorporates common enable and common data select inputs. The select input determines which data inputs are enabled. A high (H) level enables data inputs D0 0, D1

0, D2 0, and D3 0. A low (L) level enables data inputs D0 1, D1 1, D2 1, and D3 1. Any change on the data inputs will be reflected at the outputs while the enable is low. Input levels are inverted at the output.

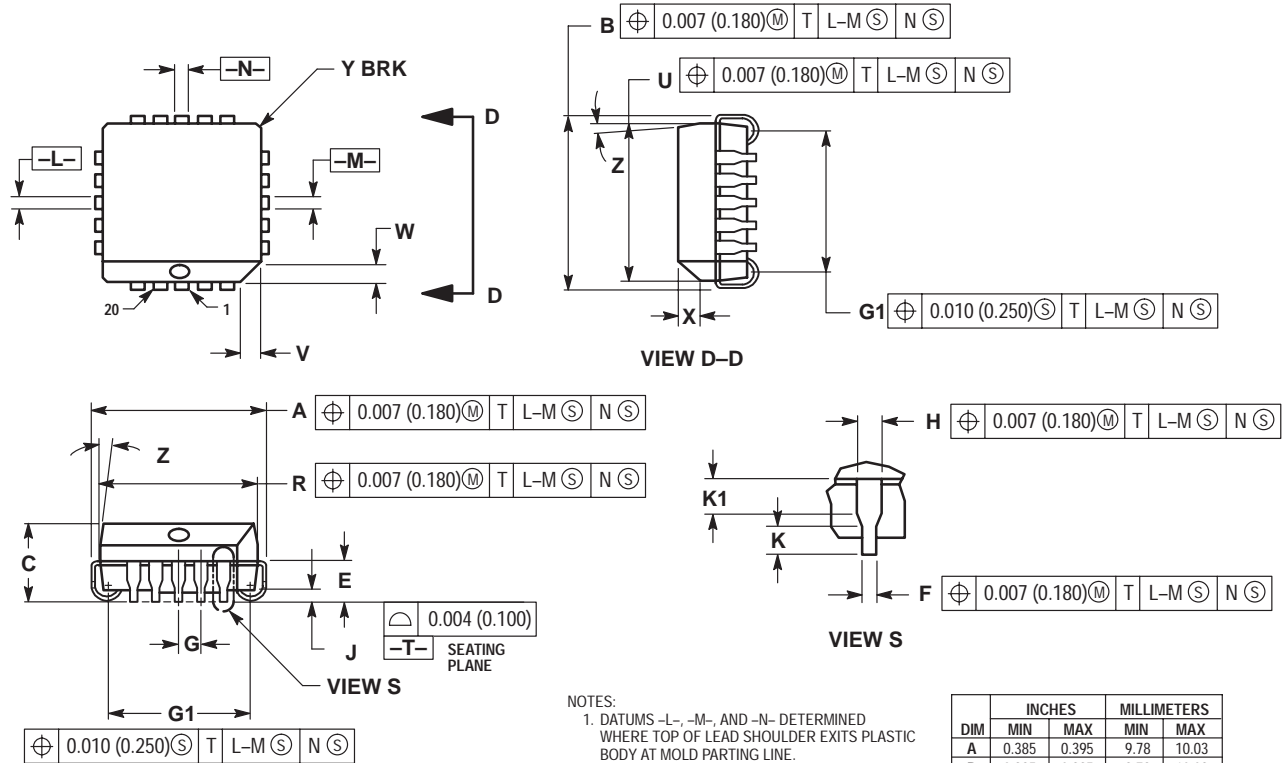
## LOGIC DIAGRAM



# MC10H159

## PACKAGE DIMENSIONS

PLCC-20  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 775-02  
ISSUE C



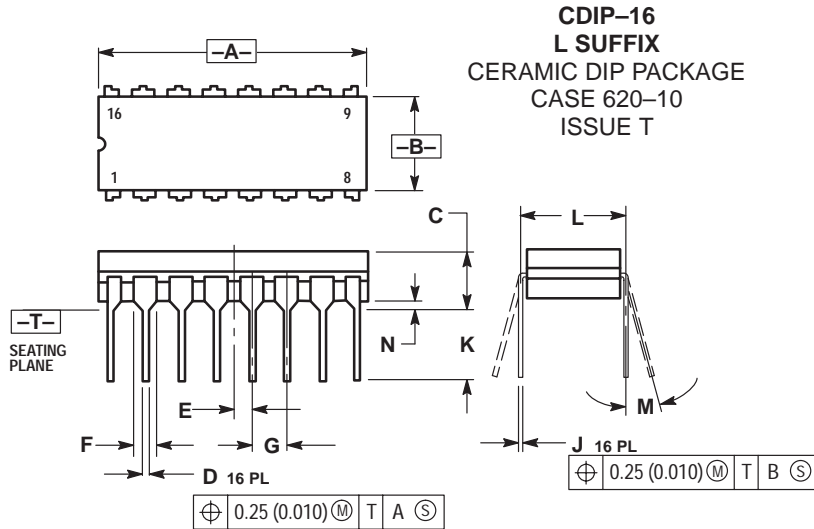
### NOTES:

1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. 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     | 0.019 | 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   | 0.350     | 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        | ---   |

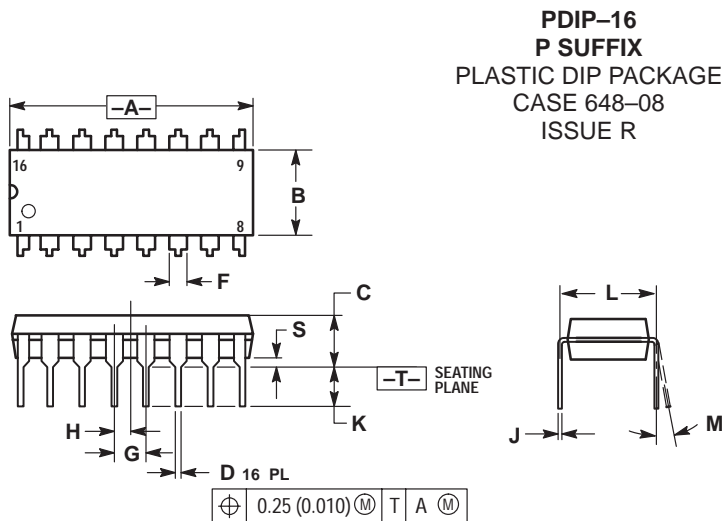
# MC10H159

## PACKAGE DIMENSIONS



- 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 F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.750     | 0.785 | 19.05       | 19.93 |
| B   | 0.240     | 0.295 | 6.10        | 7.49  |
| C   | ---       | 0.200 | ---         | 5.08  |
| D   | 0.015     | 0.020 | 0.39        | 0.50  |
| E   | 0.050 BSC |       | 1.27 BSC    |       |
| F   | 0.055     | 0.065 | 1.40        | 1.65  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.008     | 0.015 | 0.21        | 0.38  |
| K   | 0.125     | 0.170 | 3.18        | 4.31  |
| L   | 0.300 BSC |       | 7.62 BSC    |       |
| M   | 0°        | 15°   | 0°          | 15°   |
| N   | 0.020     | 0.040 | 0.51        | 1.01  |




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
  4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
  5. ROUNDED CORNERS OPTIONAL.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.740     | 0.770 | 18.80       | 19.55 |
| B   | 0.250     | 0.270 | 6.35        | 6.85  |
| C   | 0.145     | 0.175 | 3.69        | 4.44  |
| D   | 0.015     | 0.021 | 0.39        | 0.53  |
| F   | 0.040     | 0.70  | 1.02        | 1.77  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.050 BSC |       | 1.27 BSC    |       |
| J   | 0.008     | 0.015 | 0.21        | 0.38  |
| K   | 0.110     | 0.130 | 2.80        | 3.30  |
| L   | 0.295     | 0.305 | 7.50        | 7.74  |
| M   | 0°        | 10°   | 0°          | 10°   |
| S   | 0.020     | 0.040 | 0.51        | 1.01  |

## **Notes**

## **Notes**

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