

# MC10H162

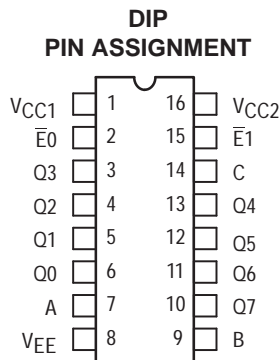
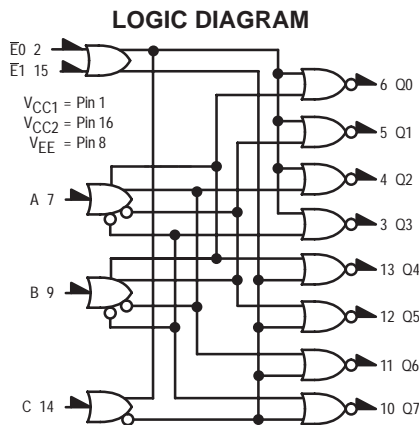
## Binary to 1-8 Decoder (High)

The MC10H162 provides parallel decoding of a three bit binary word to one of eight lines. The MC10H162 is useful in high-speed multiplexer/ demultiplexer applications.

The MC10H162 is designed to decode a three bit input word to one of eight output lines. The MC10H162 output will be high when selected while all other output are low. The enable inputs, when either or both are high, force all outputs low.

The MC10H162 is a true parallel decoder. This eliminates unequal parallel path delay times found in other decoder designs. These devices are ideally suited for multiplexer/demultiplexer applications.

- Propagation Delay, 1.0 ns Typical
- Power Dissipation, 315 mW Typical (same as MECL 10K)
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible



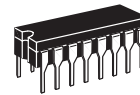
Pin assignment is for Dual-in-Line Package.  
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



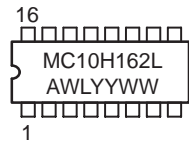
ON Semiconductor

<http://onsemi.com>

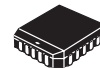
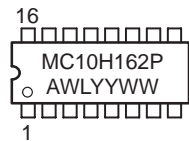
### MARKING DIAGRAMS



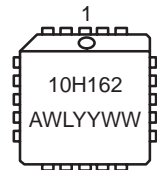
CDIP-16  
L SUFFIX  
CASE 620



PDIP-16  
P SUFFIX  
CASE 648



PLCC-20  
FN SUFFIX  
CASE 775



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

### TRUTH TABLE

| INPUTS |    |   |   |   | OUTPUTS |    |    |    |    |    |    |    |
|--------|----|---|---|---|---------|----|----|----|----|----|----|----|
| E0     | E1 | C | B | A | Q0      | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 |
| L      | L  | L | L | L | H       | L  | L  | L  | L  | L  | L  | L  |
| L      | L  | L | L | H | L       | L  | H  | L  | L  | L  | L  | L  |
| L      | L  | L | H | H | L       | L  | L  | L  | H  | L  | L  | L  |
| L      | L  | L | H | L | L       | L  | L  | L  | L  | H  | L  | L  |
| L      | L  | H | H | H | L       | L  | L  | L  | L  | L  | H  | L  |
| L      | L  | H | H | L | L       | L  | L  | L  | L  | L  | L  | H  |
| L      | L  | H | H | H | L       | L  | L  | L  | L  | L  | L  | L  |
| H      | X  | X | X | X | L       | L  | L  | L  | L  | L  | L  | L  |
| X      | H  | X | X | X | L       | L  | L  | L  | L  | L  | L  | L  |

### ORDERING INFORMATION

| Device     | Package | Shipping      |
|------------|---------|---------------|
| MC10H162L  | CDIP-16 | 25 Units/Rail |
| MC10H162P  | PDIP-16 | 25 Units/Rail |
| MC10H162FN | PLCC-20 | 46 Units/Rail |

# MC10H162

## 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 | –     | 84    | –     | 76    | –     | 84     | mA   |
| $I_{inH}$ | Input Current High   | –     | 465   | –     | 275   | –     | 275    | μA   |
| $I_{inL}$ | Input Current Low    | 0.5   | –     | 0.5   | –     | 0.3   | –      | μA   |
| $V_{OH}$  | 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

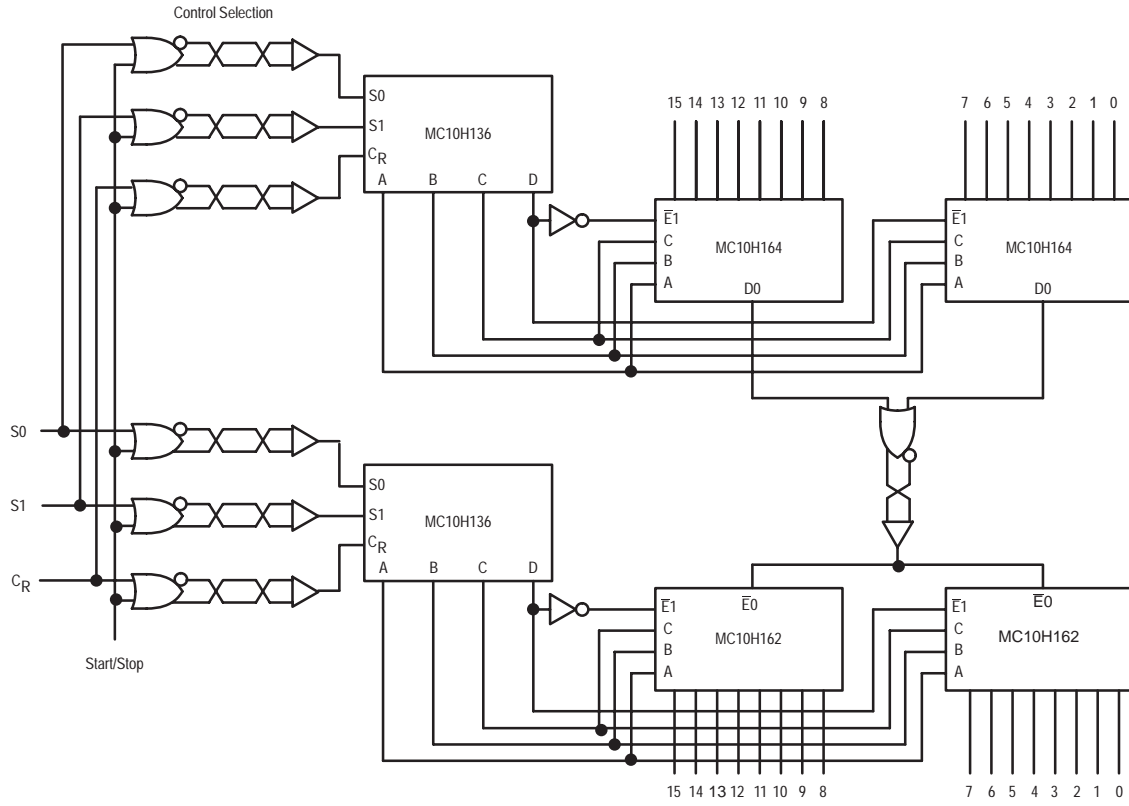
| Symbol   | Characteristic   | 0°  | 25° | 75° | Unit |
|----------|--|-----|-----|-----|------|
| $t_{pd}$ | Propagation Delay<br>Pins 7, 9, 14 Only<br>Pins 2, 15 Only | 0.7 | 2.0 | 0.7 | ns   |
|          |  | 0.8 | 2.3 | 0.8 |      |
| $t_r$    | Rise Time  | 0.6 | 1.8 | 0.6 | ns   |
| $t_f$    | Fall Time  | 0.6 | 1.8 | 0.6 | 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.

# MC10H162

## TYPICAL APPLICATIONS

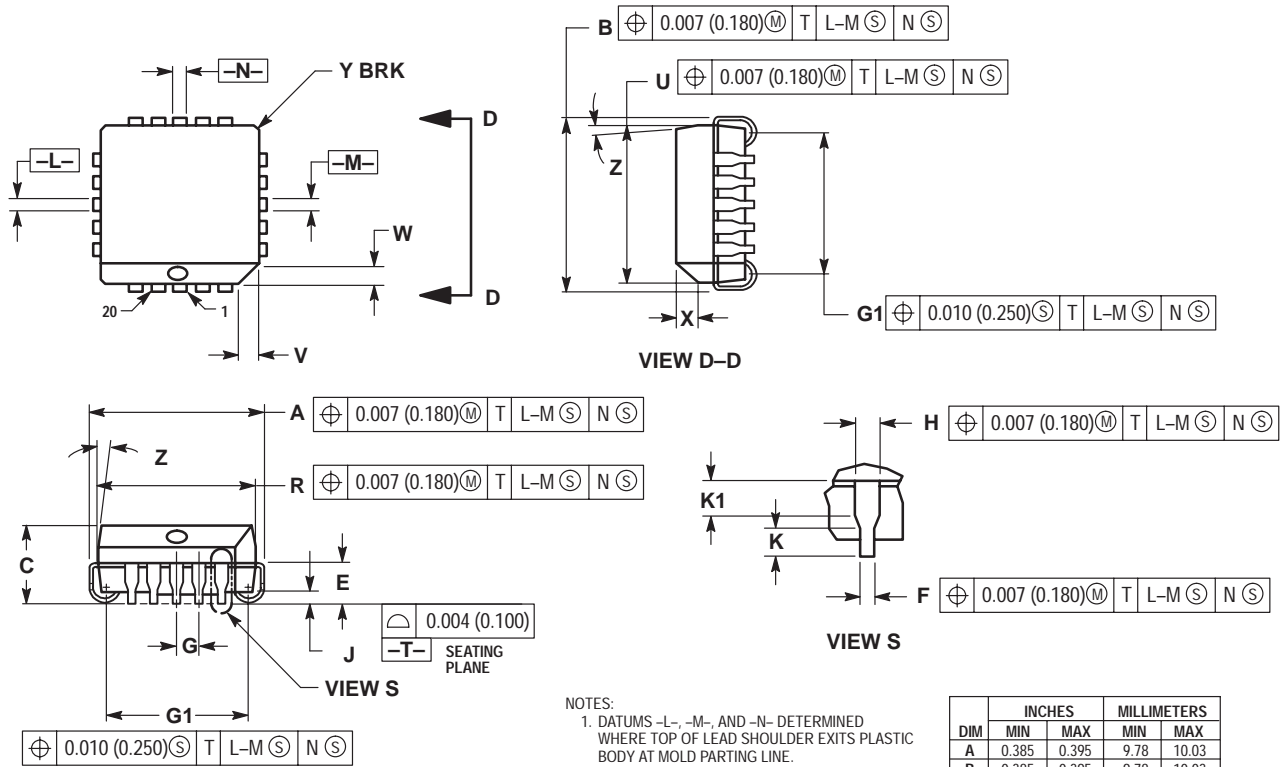
FIGURE 1 – HIGH SPEED 16-BIT MULTIPLEXER/DEMULTIPLEXER



# MC10H162

## PACKAGE DIMENSIONS

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



### NOTES:

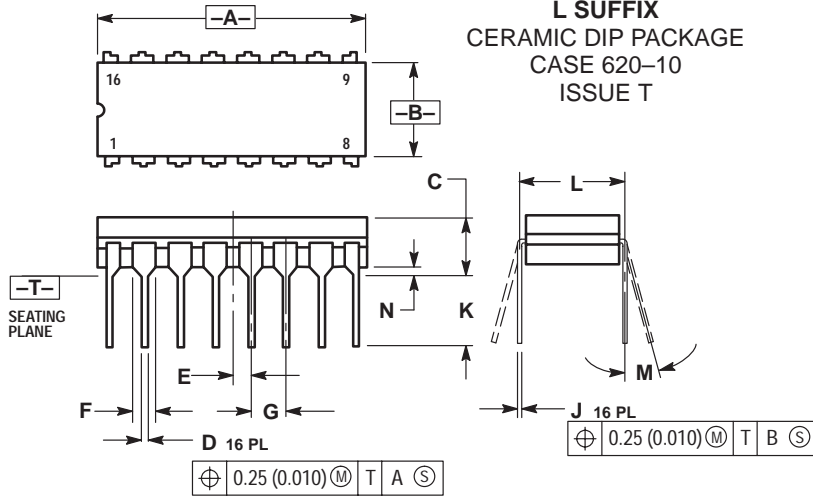
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING 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   | 0.385     | 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        | ---   |

# MC10H162

## PACKAGE DIMENSIONS

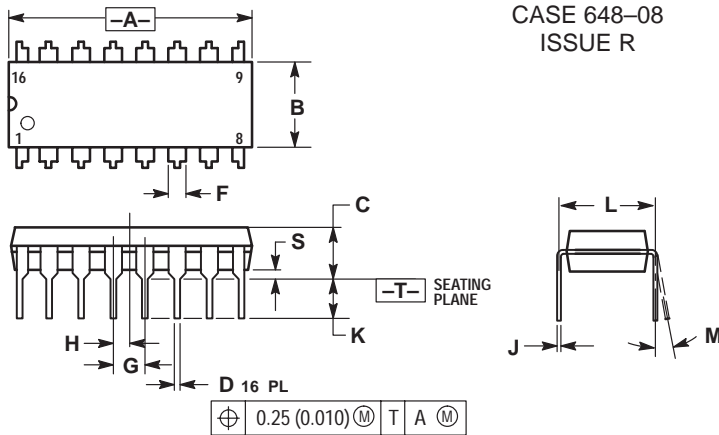
### CDIP-16 L SUFFIX CERAMIC DIP PACKAGE CASE 620-10 ISSUE T



- 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  |

### PDIP-16 P SUFFIX PLASTIC DIP PACKAGE CASE 648-08 ISSUE R



- 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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