

Binary to 1-8 Decoder (High)

The MC10162 is designed to convert three lines of input data to a one-of-eight output. The selected output will be high while all other outputs are low. The enable inputs, when either or both are high, force all outputs low.

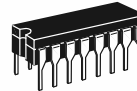
The MC10162 is a true parallel decoder. No series gating is used internally, eliminating unequal delay times found in other decoders.

This device is ideally suited for demultiplexer applications. One of the two enable inputs is used as the data input, while the other is used as a data enable input.

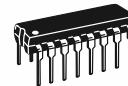
A complete mux/demux operation on 16 bits for data distribution is illustrated in Figure 1 of the MC10161 data sheet.

$P_D = 315 \text{ ns typ/pkg (No Load)}$
 $t_{pd} = 4.0 \text{ ns typ}$
 $t_r, t_f = 2.0 \text{ ns typ (20\%–80\%)}$

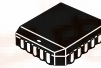
MC10162



L SUFFIX
 CERAMIC PACKAGE
 CASE 620-10

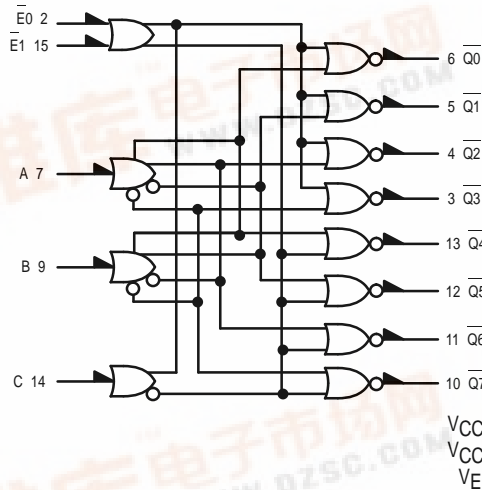


P SUFFIX
 PLASTIC PACKAGE
 CASE 648-08

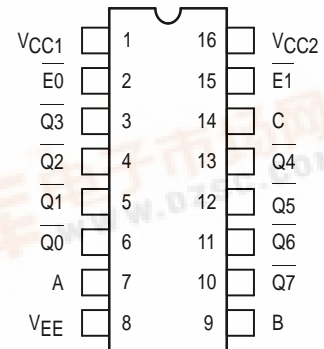


FN SUFFIX
 PLCC
 CASE 775-02

LOGIC DIAGRAM



DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package. For PLCC pin assignment, see the Pin Conversion Tables on page 6-11 of the Motorola MECL Data Book (DL122/D).

TRUTH TABLE

| INPUTS | | | | | OUTPUTS | | | | | | | |
|-----------------|-----------------|---|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| $\overline{E0}$ | $\overline{E1}$ | C | B | A | $\overline{Q0}$ | $\overline{Q1}$ | $\overline{Q2}$ | $\overline{Q3}$ | $\overline{Q4}$ | $\overline{Q5}$ | $\overline{Q6}$ | $\overline{Q7}$ |
| L | L | L | L | L | H | L | L | L | L | L | L | L |
| L | L | L | L | H | L | L | L | H | L | L | L | L |
| L | L | L | H | L | L | L | L | L | H | L | L | L |
| L | L | L | H | H | L | L | L | L | L | H | L | L |
| L | L | H | L | L | 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 | H |
| 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 |

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Pin Under Test | Test Limits | | | | | | Unit | | |
|------------------------------------|-----------|----------------|-------------|--------|--------|--------|-----|--------|--------|-----------|-----|
| | | | -30°C | | +25°C | | | +85°C | | | |
| | | | Min | Max | Min | Typ | Max | Min | | Max | |
| Power Supply Drain Current | I_E | 8 | | 84 | | 61 | 76 | | 84 | mAdc | |
| Input Current | I_{inH} | 14 | | 350 | | | 220 | | 220 | μ Adc | |
| | I_{inL} | 14 | 0.5 | | 0.5 | | | 0.3 | | μ Adc | |
| Output Voltage | Logic 1 | V_{OH} | 13 | -1.060 | -0.890 | -0.960 | | -0.810 | -0.890 | -0.700 | Vdc |
| Output Voltage | Logic 0 | V_{OL} | 13 | -1.890 | -1.675 | -1.850 | | -1.650 | -1.825 | -1.615 | Vdc |
| | | | 13 | -1.890 | -1.675 | -1.850 | | -1.650 | -1.825 | -1.615 | Vdc |
| Threshold Voltage | Logic 1 | V_{OHA} | 13 | -1.080 | | -0.980 | | | -0.910 | | Vdc |
| Threshold Voltage | Logic 0 | V_{OLA} | 13 | | -1.655 | | | -1.630 | | -1.595 | Vdc |
| | | | 13 | | -1.655 | | | -1.630 | | -1.595 | Vdc |
| Switching Times (50 Ω Load) | | | | | | | | | | ns | |
| Propagation Delay | | t_{14+13-} | 13 | 1.5 | 6.2 | 1.5 | 4.0 | 6.0 | 1.5 | 6.4 | |
| | | t_{14-13+} | 13 | 1.5 | 6.2 | 1.5 | 4.0 | 6.0 | 1.5 | 6.4 | |
| Rise Time (20 to 80%) | | t_{13+} | 13 | 1.0 | 3.3 | 1.1 | 2.0 | 3.3 | 1.1 | 3.5 | |
| Fall Time (20 to 80%) | | t_{13-} | 13 | 1.0 | 3.3 | 1.1 | 2.0 | 3.3 | 1.1 | 3.5 | |

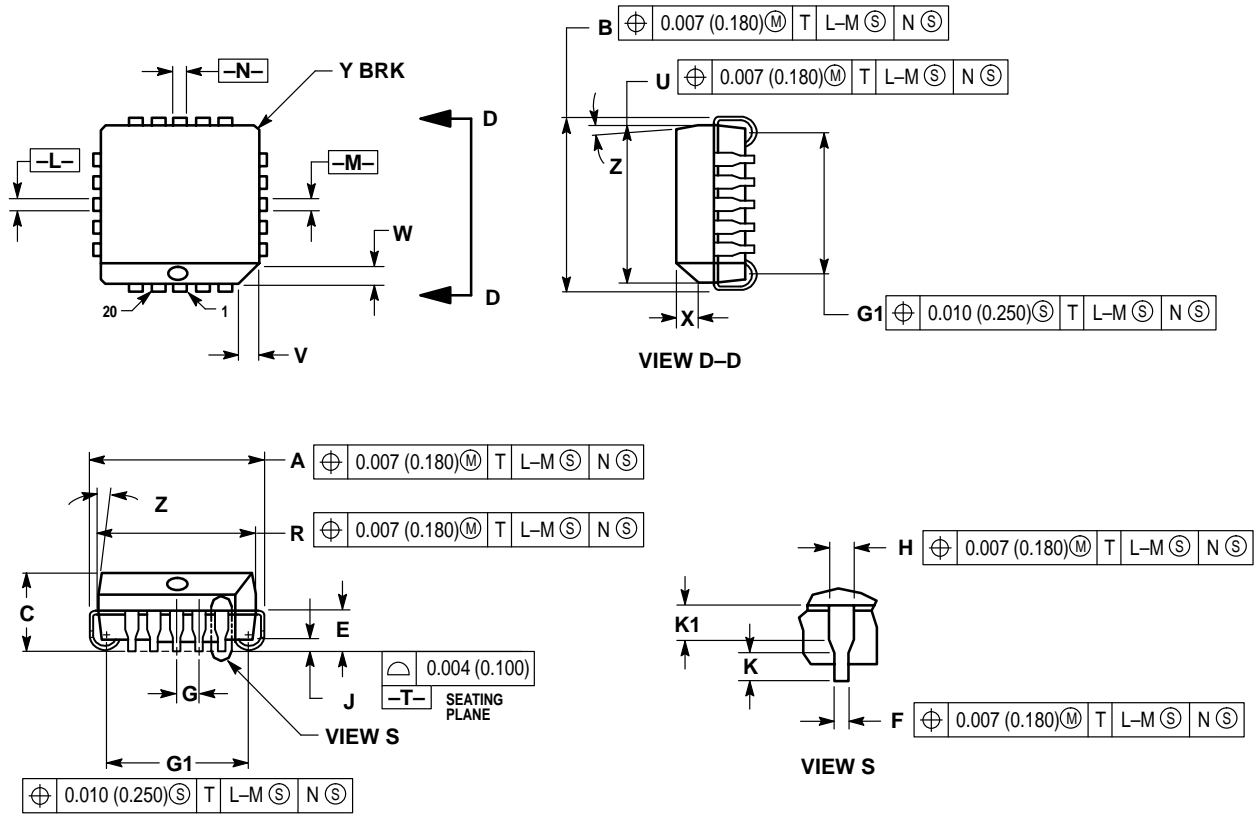
ELECTRICAL CHARACTERISTICS (continued)

| | | | TEST VOLTAGE VALUES (Volts) | | | | | | |
|------------------------------------|-----------|----------------|---|-------------|--------------|--------------|-----------|-------------------|--------|
| | | | V_{IHmax} | V_{ILmin} | V_{IHamin} | V_{ILAmax} | V_{EE} | | |
| @ Test Temperature | | | -30°C | -0.890 | -1.890 | -1.205 | -1.500 | -5.2 | |
| | | | +25°C | -0.810 | -1.850 | -1.105 | -1.475 | -5.2 | |
| | | | +85°C | -0.700 | -1.825 | -1.035 | -1.440 | -5.2 | |
| | | | | | | | | | |
| Characteristic | Symbol | Pin Under Test | TEST VOLTAGE APPLIED TO PINS LISTED BELOW | | | | | (V_{CC}) Gnd | |
| | | | V_{IHmax} | V_{ILmin} | V_{IHamin} | V_{ILAmax} | V_{EE} | | |
| Power Supply Drain Current | I_E | 8 | | | | | 8 | 1,16 | |
| Input Current | I_{inH} | 14 | 14 | | | | 8 | 1,16 | |
| | I_{inL} | 14 | | 14 | | | 8 | 1,16 | |
| Output Voltage | Logic 1 | V_{OH} | 13 | 14 | | | 8 | 1,16 | |
| Output Voltage | Logic 0 | V_{OL} | 13 | 2 | | | 8 | 1,16 | |
| | | | 13 | 15 | | | 8 | 1,16 | |
| Threshold Voltage | Logic 1 | V_{OHA} | 13 | | | 14 | 8 | 1,16 | |
| Threshold Voltage | Logic 0 | V_{OLA} | 13 | | | 2 | 8 | 1,16 | |
| | | | 13 | | | 15 | 8 | 1,16 | |
| Switching Times (50 Ω Load) | | | | | | Pulse In | Pulse Out | -3.2 V | +2.0 V |
| Propagation Delay | | t_{14+13+} | 13 | | | 14 | 13 | 8 | 1,16 |
| | | t_{14-13-} | 13 | | | 14 | 13 | 8 | 1,16 |
| Rise Time (20 to 80%) | | t_+ | 13 | | | 14 | 13 | 8 | 1,16 |
| Fall Time (20 to 80%) | | t_- | 13 | | | 14 | 13 | 8 | 1,16 |

Each MECL 10,000 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. Test procedures are shown for only one gate. The other gates are tested in the same manner.

OUTLINE DIMENSIONS

FN SUFFIX
 PLASTIC PLCC PACKAGE
 CASE 775-02
 ISSUE C



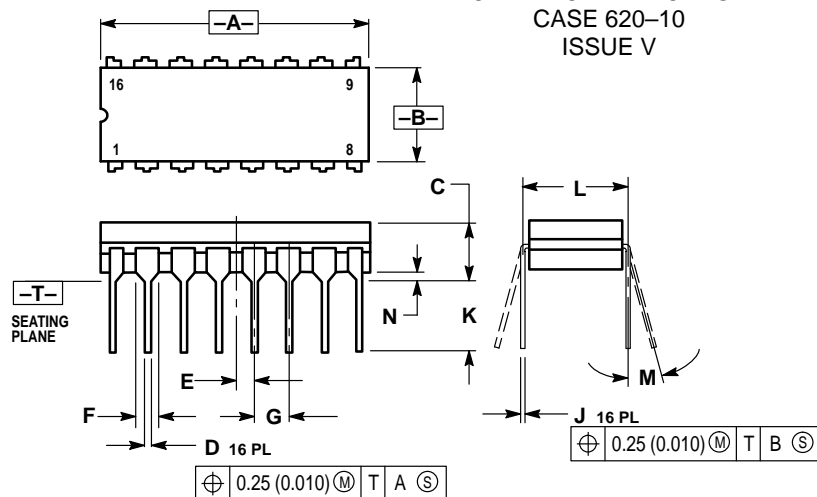
NOTES:

- 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 | — |

OUTLINE DIMENSIONS

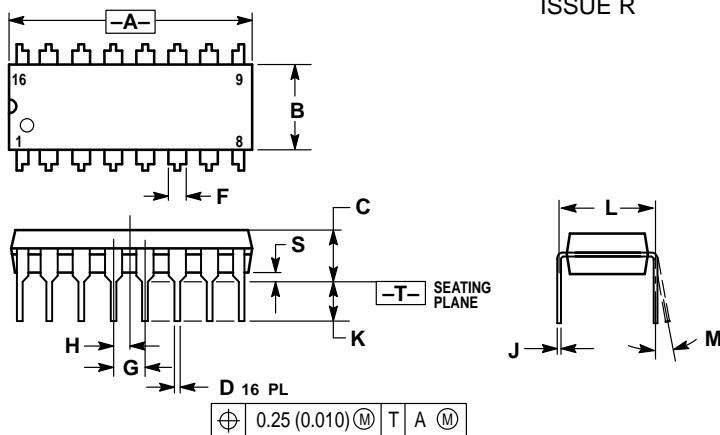
L SUFFIX
CERAMIC DIP PACKAGE
CASE 620-10
ISSUE V



- 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 |

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 |

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