

# MC10H130

## Dual Latch

### Description

The MC10H130 is a MECL 10H™ part which is a functional/pinout duplication of the standard MECL 10K™ family part, with 100% improvement in clock speed and propagation delay and no increase in power supply current.

### Features

- Propagation Delay, 1.0 ns Typical
- Power Dissipation, 155 mW Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K Compatible
- Pb-Free Packages are Available\*

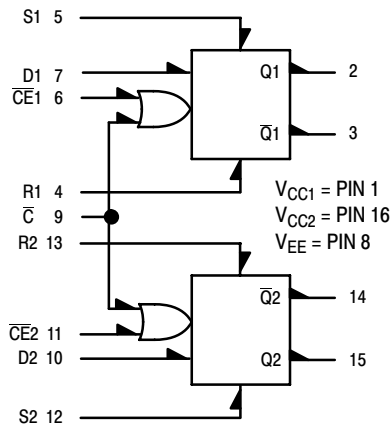
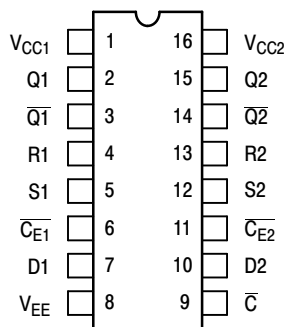


Figure 1. Logic Diagram



Pin assignment is for Dual-in-Line Package.

Figure 2. Pin Assignment

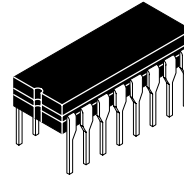
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



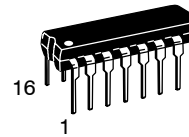
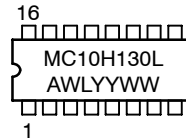
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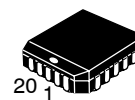
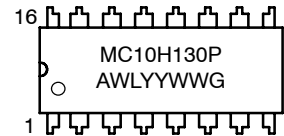
### MARKING DIAGRAMS\*



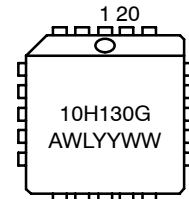
CDIP-16  
L SUFFIX  
CASE 620A



PDIP-16  
P SUFFIX  
CASE 648



PLLC-20  
FN SUFFIX  
CASE 775



- 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 3 of this data sheet.

# MC10H130

**Table 1. MAXIMUM RATINGS**

| Symbol           | Characteristic                                  | Rating                     | Unit     |
|------------------|---|----------------------------|----------|
| V <sub>EE</sub>  | Power Supply (V <sub>CC</sub> = 0)              | -8.0 to 0                  | Vdc      |
| V <sub>I</sub>   | Input Voltage (V <sub>CC</sub> = 0)             | 0 to V <sub>EE</sub>       | Vdc      |
| I <sub>out</sub> | Output Current<br>Continuous<br>Surge           | 50<br>100                  | mA       |
| T <sub>A</sub>   | Operating Temperature Range                     | 0 to +75                   | °C       |
| T <sub>stg</sub> | Storage Temperature Range<br>Plastic<br>Ceramic | -55 to +150<br>-55 to +165 | °C<br>°C |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

**Table 2. ELECTRICAL CHARACTERISTICS** (V<sub>EE</sub> = -5.2 V ±5%) (Note 1)

| Symbol           | Characteristic       | 0°    |       | 25°   |       | 75°   |        | Unit |
|------------------|----------------------|-------|-------|-------|-------|-------|--------|------|
|                  |                      | Min   | Max   | Min   | Max   | Min   | Max    |      |
| I <sub>E</sub>   | Power Supply Current | -     | 38    | -     | 35    | -     | 38     | mA   |
| I <sub>inH</sub> | Input Current High   |       |       |       |       |       |        | μA   |
|                  | Pins 6, 11           | -     | 468   | -     | 275   | -     | 275    |      |
|                  | Pins 7, 9, 10        | -     | 545   | -     | 320   | -     | 320    |      |
|                  | Pins 4, 5, 12, 13    | -     | 434   | -     | 255   | -     | 255    |      |
| I <sub>inL</sub> | Input Current Low    | 0.5   | -     | 0.5   | -     | 0.3   | -      | μA   |
| V <sub>OH</sub>  | High Output Voltage  | -1.02 | -0.84 | -0.98 | -0.81 | -0.92 | -0.735 | Vdc  |
| V <sub>OL</sub>  | Low Output Voltage   | -1.95 | -1.63 | -1.95 | -1.63 | -1.95 | -1.60  | Vdc  |
| V <sub>IH</sub>  | High Input Voltage   | -1.17 | -0.84 | -1.13 | -0.81 | -1.07 | -0.735 | Vdc  |
| V <sub>IL</sub>  | Low Input Voltage    | -1.95 | -1.48 | -1.95 | -1.48 | -1.95 | -1.45  | Vdc  |

1. 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 Ω resistor to -2.0 V.

**Table 3. AC PARAMETERS**

| Symbol            | Characteristic         | 0°  |     | 25° |     | 75° |     | Unit |
|-------------------|------------------------|-----|-----|-----|-----|-----|-----|------|
|                   |                        | Min | Max | Min | Max | Min | Max |      |
| t <sub>pd</sub>   | Propagation Delay      |     |     |     |     |     |     | ns   |
|                   | Data                   | 0.4 | 1.6 | 0.4 | 1.7 | 0.4 | 1.8 |      |
|                   | Set, Reset             | 0.6 | 1.7 | 0.7 | 1.8 | 0.8 | 1.9 |      |
|                   | Clock, $\overline{CE}$ | 0.5 | 1.6 | 0.5 | 1.7 | 0.6 | 1.8 |      |
| t <sub>r</sub>    | Rise Time              | 0.5 | 1.6 | 0.5 | 1.7 | 0.5 | 1.8 | ns   |
| t <sub>f</sub>    | Fall Time              | 0.5 | 1.6 | 0.5 | 1.7 | 0.5 | 1.8 | ns   |
| t <sub>set</sub>  | Set-up Time            | 2.2 | -   | 2.2 | -   | 2.2 | -   | ns   |
| t <sub>hold</sub> | Hold Time              | 0.7 | -   | 0.7 | -   | 0.7 | -   | 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 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.

# MC10H130

## APPLICATION INFORMATION

The MC10H130 is a clocked dual D type latch. Each latch may be clocked separately by holding the common clock in the low state, and using the clock enable inputs for the clocking function. If the common clock is to be used to clock the latch, the clock enable ( $\overline{CE}$ ) inputs must be in the low state. In this mode, the enable inputs perform the function of controlling the common clock ( $\overline{C}$ ).

Any change at the D input will be reflected at the output while the clock is low. The outputs are latched on the

positive transition of the clock. While the clock is in the high state, a change in the information present at the data inputs will not affect the output information.

The set and reset inputs do not override the clock and D inputs. They are effective only when either  $\overline{C}$  or  $\overline{CE}$  or both are high.

## ORDERING INFORMATION

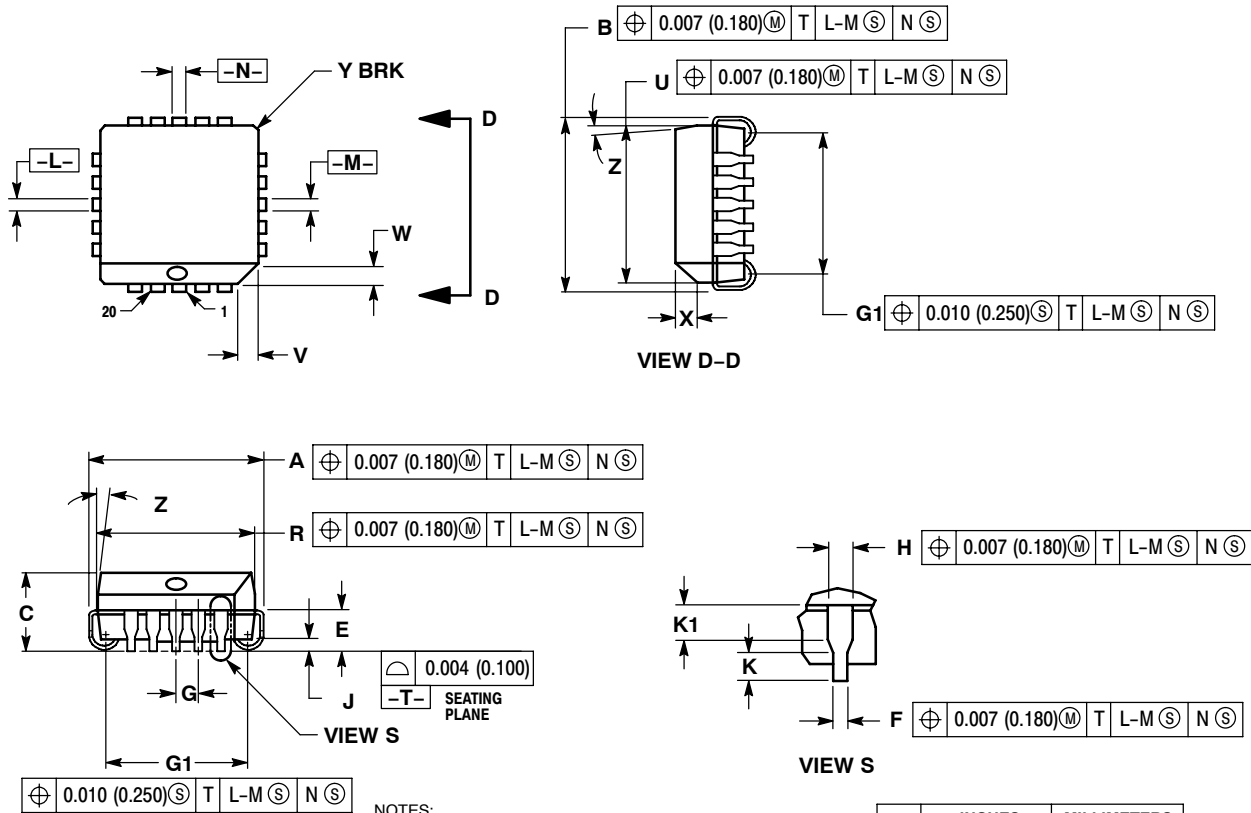
| Device        | Package              | Shipping <sup>†</sup> |
|---------------|----------------------|-----------------------|
| MC10H130FN    | PLLC-20              | 46 Units / Rail       |
| MC10H130FNG   | PLLC-20<br>(Pb-Free) | 46 Units / Rail       |
| MC10H130FNR2  | PLLC-20              | 500 / Tape & Reel     |
| MC10H130FNR2G | PLLC-20<br>(Pb-Free) | 500 / Tape & Reel     |
| MC10H130L     | CDIP-16              | 25 Unit / Rail        |
| MC10H130P     | PDIP-16              | 25 Unit / Rail        |
| MC10H130PG    | PDIP-16<br>(Pb-Free) | 25 Unit / Rail        |

<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.

# MC10H130

## PACKAGE DIMENSIONS

20 LEAD PLLC  
CASE 775-02  
ISSUE E



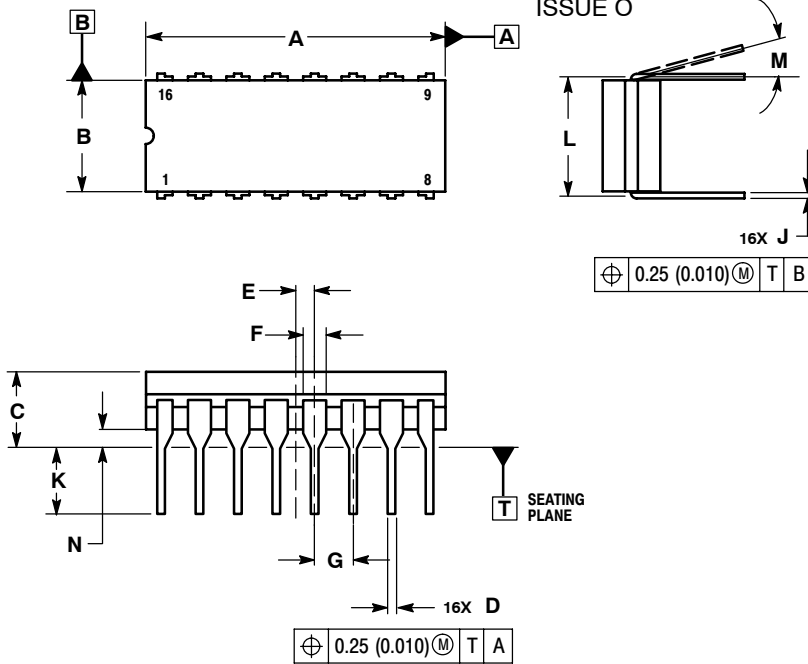
- NOTES:
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. DIMENSIONS IN INCHES.
  3. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
  4. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
  5. DIMENSIONS R AND U DO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

# MC10H130

## PACKAGE DIMENSIONS

### CDIP-16 L SUFFIX CERAMIC DIP PACKAGE CASE 620A-01 ISSUE O

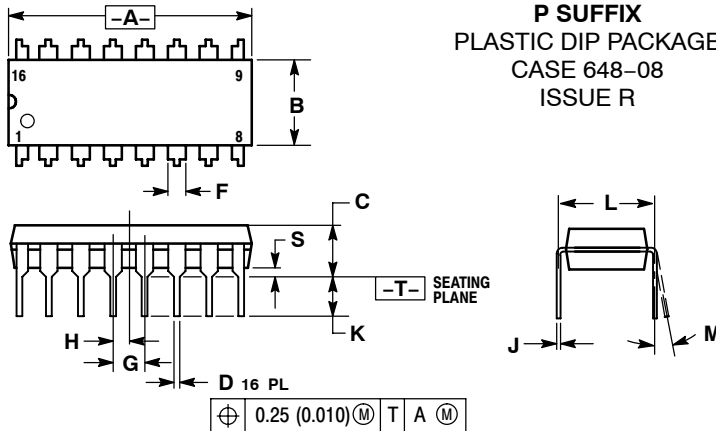


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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.
5. THIS DRAWING REPLACES OBSOLETE CASE OUTLINE 620-10.

| 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  |

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