



**MOTOROLA**

# MC10130

## DUAL LATCH

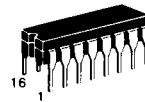
The MC10130 is a clocked dual D type latch. Each latch may be clocked separately by holding the common clock in the low state, and using the clock enable inputs for the clocking function. If the common clock is to be used to clock the latch, the clock enable ( $\overline{CE}$ ) inputs must be in the 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.

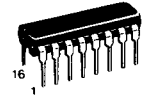
$P_D = 155 \text{ mW typ/pkg (No Load)}$   
 $t_{pd} = 2.5 \text{ ns typ}$   
 $t_r, t_f = 2.7 \text{ ns typ (20\%--80\%)}$

## DUAL LATCH



**L SUFFIX**  
 CERAMIC PACKAGE  
 CASE 620

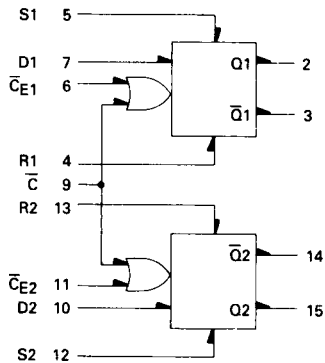
**P SUFFIX**  
 PLASTIC PACKAGE  
 CASE 648



**FN SUFFIX**  
 PLCC  
 CASE 775

3

## LOGIC DIAGRAM



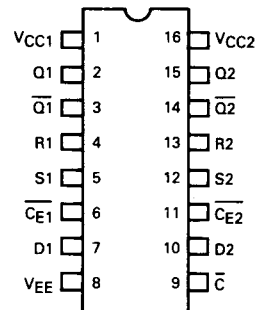
VCC1 = Pin 1  
 VCC2 = Pin 16  
 VEE = Pin 8

### TRUTH TABLE

| D      | C | $\overline{CE}$ | $Q_{n+1}$ |
|--------|---|-----------------|-----------|
| L      | L | L               | L         |
| H      | L | L               | H         |
| $\phi$ | L | H               | $Q_n$     |
| $\phi$ | H | L               | $Q_n$     |
| $\phi$ | H | H               | $Q_n$     |

$\phi$  = Don't Care

## DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-line Package.  
 For PLCC pin assignment, see tables on page 1-35.

**ELECTRICAL CHARACTERISTICS**

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 latch. The other latch is tested in the same manner.

| Characteristic                             | Symbol             | Pin Under Test | MC10130 Test Limits |        |        |        |        |        | TEST VOLTAGE VALUES (Volts) |                   |                    |                    |                     |                     | (V <sub>CC</sub> ) Grid |
|--|--------------------|----------------|---------------------|--------|--------|--------|--------|--------|-----------------------------|-------------------|--------------------|--------------------|---------------------|---------------------|-------------------------|
|  |                    |                | -30°C               |        | +25°C  |        | +85°C  |        | -30°C                       |                   | +25°C              |                    | +85°C               |                     |                         |
|  |                    |                | Min                 | Max    | Min    | Typ    | Max    | Min    | Max                         | Unit              | V <sub>IHmax</sub> | V <sub>IHmin</sub> | V <sub>IAnmax</sub> | V <sub>IAnmin</sub> |                         |
| Power Supply Drain Current                 | I <sub>E</sub>     | 8              | -                   | 38     | -      | 35     | -      | 38     | mAdc                        | -                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Input Current                              | I <sub>inH</sub>   | 6,11           | -                   | 350    | -      | 220    | -      | 220    | μAdc                        | 6,11              | -                  | -                  | -                   | 8                   | 1,16                    |
|  |                    | 9              | -                   | 425    | -      | 265    | -      | 265    | μAdc                        | 9                 | -                  | -                  | -                   | 8                   | 1,16                    |
|  |                    | 10,12,13       | -                   | 450    | -      | 285    | -      | 285    | μAdc                        | 4,5<br>7,10,12,13 | -                  | -                  | -                   | 8                   | 1,16                    |
| Logic "1"                                  | I <sub>inL</sub>   | 4*             | 0.5                 | -      | 0.5    | -      | 0.3    | -      | μAdc                        | -                 | 4                  | -                  | -                   | 8                   | 1,16                    |
| Logic "1" Output Voltage                   | V <sub>OH</sub>    | 2              | -1.060              | -0.890 | -0.960 | -      | -0.810 | -0.880 | Vdc                         | 5                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Logic "0" Output Voltage                   | V <sub>OL</sub>    | 2              | -1.890              | -1.675 | -1.850 | -      | -1.650 | -1.825 | Vdc                         | 4                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Logic "1" Threshold Voltage                | V <sub>OHA</sub>   | 2              | -1.080              | -      | -0.980 | -      | -      | -0.910 | Vdc                         | -                 | 9                  | 7                  | -                   | 8                   | 1,16                    |
| Logic "0" Threshold Voltage                | V <sub>OLA</sub>   | 2              | -                   | -1.655 | -      | -1.630 | -      | -1.595 | Vdc                         | -                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Switching Times (50 Ω Load) (See Figure 1) | t <sub>r</sub> +2+ | 2              | 1.0                 | 3.6    | 1.0    | 2.5    | 3.5    | 1.0    | 3.8                         | ns                | -                  | -                  | -                   | 8                   | 1,16                    |
| Propagation Delay                          | t <sub>s</sub> +2+ | 2              | →                   | 2.7    | →      | 2.7    | →      | 3.9    | →                           | 6                 | -                  | -                  | -                   | 8                   | 1,16                    |
|  | t <sub>d</sub> +2- | 2              | →                   | 4.3    | →      | 4.0    | →      | 4.1    | →                           | 6                 | -                  | -                  | -                   | 8                   | 1,16                    |
|  | t <sub>p</sub> +2+ | 2              | →                   | 3.6    | →      | 3.5    | →      | 3.8    | →                           | 7                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Rise Time (20% to 80%)                     | t <sub>r</sub> +2  | 2              | →                   | 3.6    | →      | 3.5    | →      | 3.8    | →                           | 7                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Fall Time (20% to 80%)                     | t <sub>f</sub> -2  | 2              | →                   | 3.6    | →      | 3.5    | →      | 3.8    | →                           | 7                 | -                  | -                  | -                   | 8                   | 1,16                    |
| Setup Time                                 | t <sub>setup</sub> | 2              | 2.5                 | -      | 2.5    | -      | 2.5    | -      | 2.5                         | ns                | ①                  | -                  | -                   | 8                   | 1,16                    |
| Hold Time                                  | t <sub>hold</sub>  | 2              | 1.5                 | -      | 1.5    | -      | 1.5    | -      | 1.5                         | ns                | ①                  | -                  | -                   | 8                   | 1,16                    |

\*All other inputs are tested in the same manner