

## 74F379 Quad Parallel Register with Enable

### General Description

The 74F379 is a 4-bit register with buffered common Enable. This device is similar to the 74F175 but features the common Enable rather than common Master Reset.

### Features

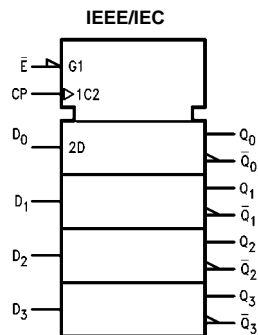
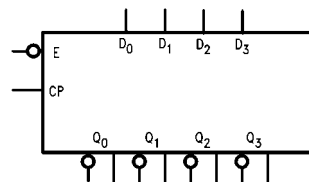
- Edge triggered D-type inputs
- Buffered positive edge-triggered clock
- Buffered common enable input
- True and complement outputs

### Ordering Code:

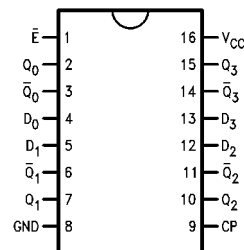
| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| 74F379SC     | M16A           | 16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow |
| 74F379SJ     | M16D           | 16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide               |
| 74F379PC     | N16E           | 16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide       |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

### Logic Symbols



### Connection Diagram



### Unit Loading/Fan Out

| Pin Names                 | Description                            | U.L.<br>HIGH/LOW | Input $I_{IH}/I_{IL}$<br>Output $I_{OH}/I_{OL}$ |
|---------------------------|--|------------------|---|
| $\bar{E}$                 | Enable Input (Active LOW)              | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| $D_0$ - $D_3$             | Data Inputs                            | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| CP                        | Clock Pulse Input (Active Rising Edge) | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| $Q_0$ - $Q_3$             | Flip-Flop Outputs                      | 50/33.3          | -1 mA/20 mA                                     |
| $\bar{Q}_0$ - $\bar{Q}_3$ | Complement Outputs                     | 50/33.3          | -1 mA/20 mA                                     |

### Functional Description

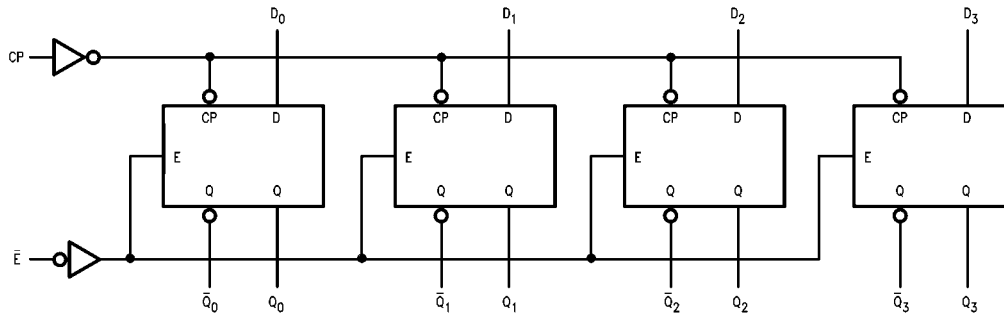
The 74F379 consists of four edge-triggered D-type flip-flops with individual D inputs and Q and  $\bar{Q}$  outputs. The Clock (CP) and Enable ( $\bar{E}$ ) inputs are common to all flip-flops. When the  $\bar{E}$  is input HIGH, the register will retain the present data independent of the CP input. The  $D_n$  and  $\bar{E}$  inputs can change when the clock is in either state, provided that the recommended setup and hold times are observed.

### Truth Table

| Inputs    |    |       | Outputs |             |
|-----------|----|-------|---------|-------------|
| $\bar{E}$ | CP | $D_n$ | $Q_n$   | $\bar{Q}_n$ |
| H         | —  | X     | NC      | NC          |
| L         | —  | H     | H       | L           |
| L         | —  | L     | L       | H           |

H = HIGH Voltage Level  
 L = LOW Voltage Level  
 X = Immaterial  
 — = LOW-to-HIGH Transition  
 NC = No Change

### Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

**Absolute Maximum Ratings**(Note 1)

|  |                                      |
|--|--------------------------------------|
| Storage Temperature  | -65°C to +150°C                      |
| Ambient Temperature under Bias   | -55°C to +125°C                      |
| Junction Temperature under Bias  | -55°C to +150°C                      |
| V <sub>CC</sub> Pin Potential to Ground Pin                            | -0.5V to +7.0V                       |
| Input Voltage (Note 2)   | -0.5V to +7.0V                       |
| Input Current (Note 2)   | -30 mA to +5.0 mA                    |
| Voltage Applied to Output<br>in HIGH State (with V <sub>CC</sub> = 0V) |                                      |
| Standard Output  | -0.5V to V <sub>CC</sub>             |
| 3-STATE Output   | -0.5V to +5.5V                       |
| Current Applied to Output<br>in LOW State (Max)                        | twice the rated I <sub>OL</sub> (mA) |
| ESD Last Passing Voltage (Min)   | 4000V                                |

**Recommended Operating Conditions**

|                              |                |
|------------------------------|----------------|
| Free Air Ambient Temperature | 0°C to +70°C   |
| Supply Voltage               | +4.5V to +5.5V |

**Note 1:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Note 2:** Either voltage limit or current limit is sufficient to protect inputs.

**DC Electrical Characteristics**

| Symbol           | Parameter                         | Min                 | Typ | Max  | Units | V <sub>CC</sub> | Conditions  |
|------------------|-----------------------------------|---------------------|-----|------|-------|-----------------|---|
| V <sub>IH</sub>  | Input HIGH Voltage                | 2.0                 |     |      | V     |                 | Recognized as a HIGH Signal                         |
| V <sub>IL</sub>  | Input LOW Voltage                 |                     |     | 0.8  | V     |                 | Recognized as a LOW Signal                          |
| V <sub>CD</sub>  | Input Clamp Diode Voltage         |                     |     | -1.2 | V     | Min             | I <sub>IN</sub> = -18 mA                            |
| V <sub>OH</sub>  | Output HIGH Voltage               | 10% V <sub>CC</sub> | 2.5 |      |       | Min             | I <sub>OH</sub> = -1 mA                             |
|                  |                                   | 5% V <sub>CC</sub>  | 2.7 |      |       |                 | I <sub>OH</sub> = -1 mA                             |
| V <sub>OL</sub>  | Output LOW Voltage                | 10% V <sub>CC</sub> |     | 0.5  | V     | Min             | I <sub>OL</sub> = 20 mA                             |
| I <sub>IH</sub>  | Input HIGH Current                |                     |     | 5.0  | μA    | Max             | V <sub>IN</sub> = 2.7V                              |
| I <sub>BVI</sub> | Input HIGH Current Breakdown Test |                     |     | 7.0  | μA    | Max             | V <sub>IN</sub> = 7.0V                              |
| I <sub>CEX</sub> | Output HIGH Leakage Current       |                     |     | 50   | μA    | Max             | V <sub>OUT</sub> = V <sub>CC</sub>                  |
| V <sub>ID</sub>  | Input Leakage Test                | 4.75                |     |      | V     | 0.0             | I <sub>ID</sub> = 1.9 μA<br>All Other Pins Grounded |
| I <sub>OD</sub>  | Output Leakage Circuit Current    |                     |     | 3.75 | μA    | 0.0             | V <sub>ID</sub> = 150 mV<br>All Other Pins Grounded |
| I <sub>IL</sub>  | Input LOW Current                 |                     |     | -0.6 | mA    | Max             | V <sub>IN</sub> = 0.5V                              |
| I <sub>OS</sub>  | Output Short-Circuit Current      | -60                 |     | -150 | mA    | Max             | V <sub>OUT</sub> = 0V                               |
| I <sub>CCL</sub> | Power Supply Current              |                     | 28  | 40   | mA    | Max             | V <sub>O</sub> = LOW                                |

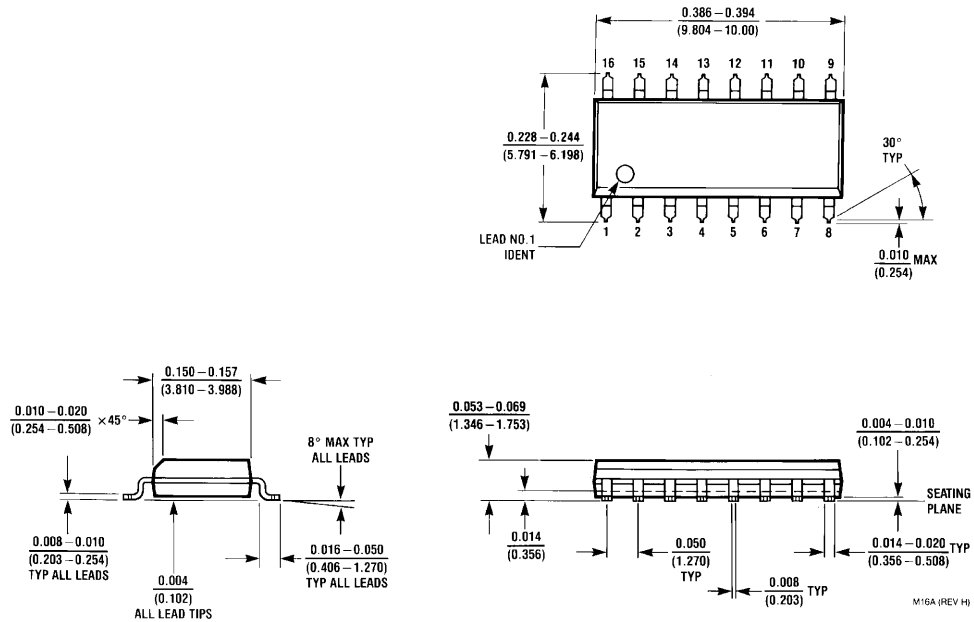
### AC Electrical Characteristics

| Symbol           | Parameter                               | T <sub>A</sub> = +25°C<br>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |     |     | T <sub>A</sub> = -55°C to +125°C<br>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |      | T <sub>A</sub> = 0°C to +70°C<br>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |     | Units |
|------------------|---|---|-----|-----|---|------|--|-----|-------|
|                  |   | Min   | Typ | Max | Min   | Max  | Min  | Max |       |
| f <sub>MAX</sub> | Maximum Clock Frequency                 | 100   | 140 |     | 75  |      | 100  |     | MHz   |
| t <sub>PLH</sub> | Propagation Delay                       | 3.5   | 5.0 | 6.5 | 3.0   | 8.5  | 3.5  | 7.5 | ns    |
| t <sub>PHL</sub> | CP to Q <sub>n</sub> , $\overline{Q}_n$ | 5.0   | 6.5 | 8.5 | 4.0   | 10.0 | 5.0  | 9.5 |       |

### AC Operating Requirements

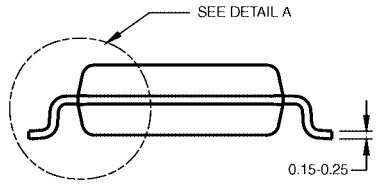
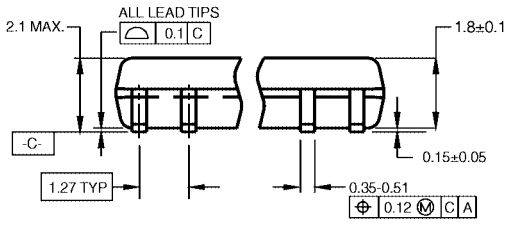
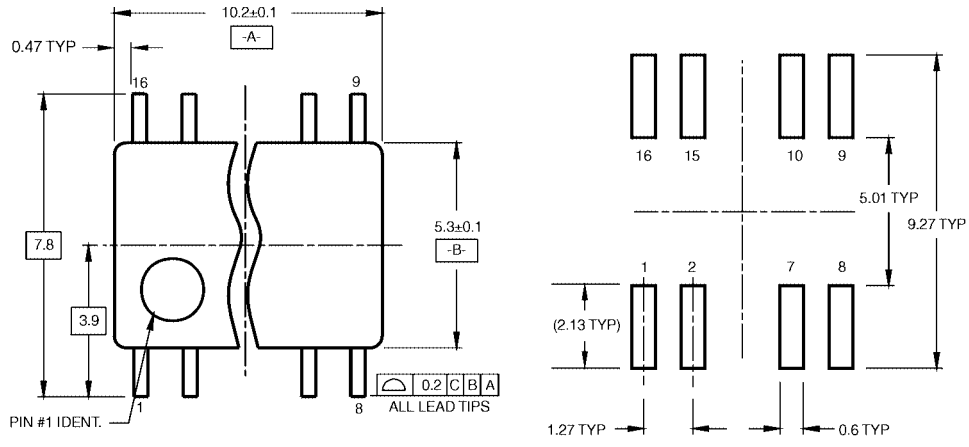
| Symbol             | Parameter               | T <sub>A</sub> = +25°C<br>V <sub>CC</sub> = +5.0V |     | T <sub>A</sub> = -55°C to +125°C<br>V <sub>CC</sub> = +5.0V |     | T <sub>A</sub> = 0°C to +70°C<br>V <sub>CC</sub> = +5.0V |     | Units |
|--------------------|-------------------------|---|-----|---|-----|--|-----|-------|
|                    |                         | Min   | Max | Min   | Max | Min  | Max |       |
| t <sub>S</sub> (H) | Setup Time, HIGH or LOW | 3.0   |     | 4.0   |     |  | 3.0 | ns    |
| t <sub>S</sub> (L) | D <sub>n</sub> to CP    | 3.0   |     | 4.0   |     |  | 3.0 |       |
| t <sub>H</sub> (H) | Hold Time, HIGH or LOW  | 1.0   |     | 2.0   |     |  | 1.0 |       |
| t <sub>H</sub> (L) | D <sub>n</sub> to CP    | 1.0   |     | 2.0   |     |  | 1.0 | ns    |
| t <sub>S</sub> (H) | Setup Time, HIGH or LOW | 6.0   |     | 8.0   |     |  | 6.0 |       |
| t <sub>S</sub> (L) | $\overline{E}$ to CP    | 6.0   |     | 8.0   |     |  | 6.0 |       |
| t <sub>H</sub> (H) | Hold Time, HIGH or LOW  | 0   |     | 0   |     |  | 0   | ns    |
| t <sub>H</sub> (L) | $\overline{E}$ to CP    | 0   |     | 0   |     |  | 0   |       |
| t <sub>W</sub> (H) | CP Pulse Width          | 4.0   |     | 5.0   |     |  | 4.0 | ns    |
| t <sub>W</sub> (L) | HIGH or LOW             | 5.0   |     | 7.0   |     |  | 5.0 |       |

**Physical Dimensions** inches (millimeters) unless otherwise noted



**16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow Package Number M16A**

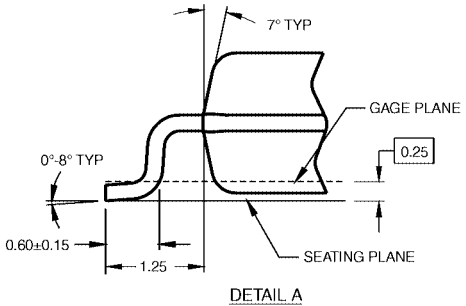
**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



DIMENSIONS ARE IN MILLIMETERS

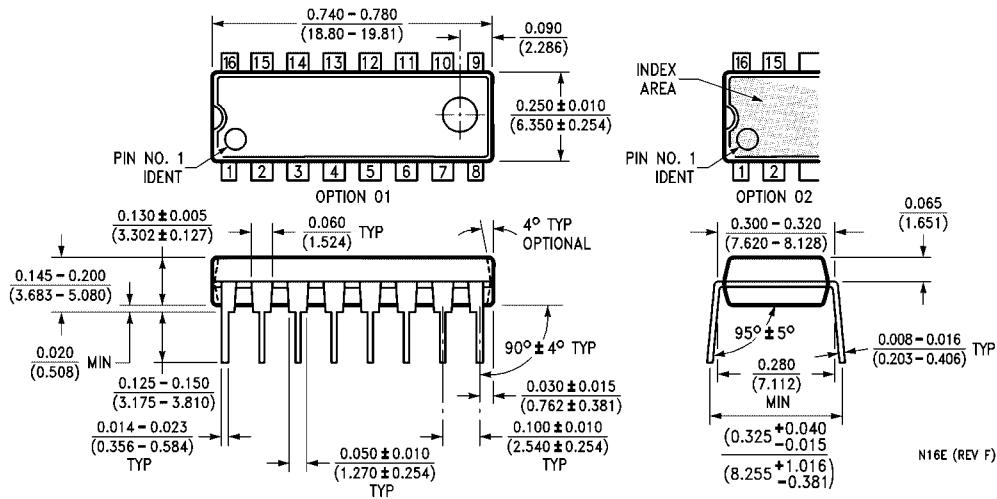
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 B. DIMENSIONS ARE IN MILLIMETERS.  
 C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M16DRRevB1



**16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide Package Number M16D**

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



**16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N16E**

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