

## DM74LS279 Quad $\bar{S}$ - $\bar{R}$ Latches

### General Description

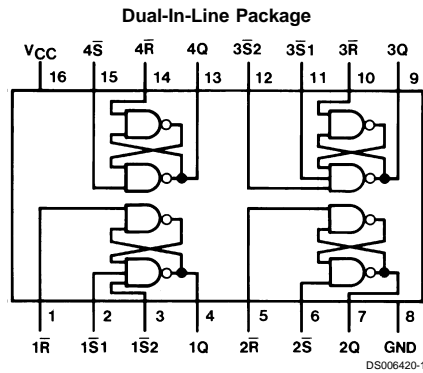
The 'LS279 consists of four individual and independent Set-Reset Latches with active low inputs. Two of the four latches have an additional  $\bar{S}$  input ANDed with the primary  $\bar{S}$  input. A low on any  $\bar{S}$  input while the  $\bar{R}$  input is high will be stored in the latch and appear on the corresponding Q output as a high. A low on the  $\bar{R}$  input while the  $\bar{S}$  input is high will clear the Q output to a low. Simultaneous transition of the  $\bar{R}$

and  $\bar{S}$  inputs from low to high will cause the Q output to be indeterminate. Both inputs are voltage level triggered and are not affected by transition time of the input data.

### Features

- Alternate military/aerospace device (54LS279) is available. Contact a Fairchild Semiconductor Sales Office/Distributor for specifications.

### Connection Diagram



Order Number 54LS279DMQB, 54LS279FMQB, 54LS279LMQB,  
DM54LS279J, DM74LS279M or DM74LS279N  
See Package Number E20A, J16A, M16A, N16E or W16A

### Function Table

| Inputs             |           | Output     |
|--------------------|-----------|------------|
| $\bar{S}$ (Note 2) | $\bar{R}$ | Q          |
| L                  | L         | H (Note 1) |
| L                  | H         | H          |
| H                  | L         | L          |
| H                  | H         | $Q_0$      |

H = High Level

L = Low Level

$Q_0$  = The Level of Q before the indicated input conditions were established.

**Note 1:** This output level is pseudo stable; that is, it may not persist when the  $\bar{S}$  and  $\bar{R}$  inputs return to their inactive (high) level.

**Note 2:** For latches with double  $\bar{S}$  inputs:

H = both  $\bar{S}$  inputs high

L = one or both  $\bar{S}$  inputs low

### Absolute Maximum Ratings (Note 3)

|                                      |    |                           |                 |
|--------------------------------------|----|---------------------------|-----------------|
| Supply Voltage                       | 7V | DM54LS and 54LS           | -55°C to +125°C |
| Input Voltage                        | 7V | DM74LS                    | 0°C to +70°C    |
| Operating Free Air Temperature Range |    | Storage Temperature Range | -65°C to +150°C |

### Recommended Operating Conditions

| Symbol          | Parameter                      | DM54LS279 |     |      | DM74LS279 |     |      | Units |
|-----------------|--------------------------------|-----------|-----|------|-----------|-----|------|-------|
|                 |                                | Min       | Nom | Max  | Min       | Nom | Max  |       |
| V <sub>CC</sub> | Supply Voltage                 | 4.5       | 5   | 5.5  | 4.75      | 5   | 5.25 | V     |
| V <sub>IH</sub> | High Level Input Voltage       | 2         |     |      | 2         |     |      | V     |
| V <sub>IL</sub> | Low Level Input Voltage        |           |     | 0.7  |           |     | 0.8  | V     |
| I <sub>OH</sub> | High Level Output Current      |           |     | -0.4 |           |     | -0.4 | mA    |
| I <sub>OL</sub> | Low Level Output Current       |           |     | 4    |           |     | 8    | mA    |
| T <sub>A</sub>  | Free Air Operating Temperature | -55       |     | 125  | 0         |     | 70   | °C    |

**Note 3:** The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

### Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

| Symbol          | Parameter                         | Conditions                                     | Min  | Typ<br>(Note 4) | Max  | Units |    |
|-----------------|-----------------------------------|--|------|-----------------|------|-------|----|
| V <sub>I</sub>  | Input Clamp Voltage               | V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA |      |                 | -1.5 | V     |    |
| V <sub>OH</sub> | High Level Output Voltage         | V <sub>CC</sub> = Min, I <sub>OH</sub> = Max   | DM54 | 2.5             | 3.5  | V     |    |
|                 |                                   | V <sub>IL</sub> = Max, V <sub>IH</sub> = Min   | DM74 | 2.7             | 3.5  |       |    |
| V <sub>OL</sub> | Low Level Output Voltage          | V <sub>CC</sub> = Min, I <sub>OL</sub> = Max   | DM54 |                 | 0.25 | 0.4   |    |
|                 |                                   | V <sub>IL</sub> = Max, V <sub>IH</sub> = Min   | DM74 |                 | 0.35 | 0.5   |    |
|                 |                                   | I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = Min  | DM74 |                 | 0.25 | 0.4   |    |
| I <sub>I</sub>  | Input Current @ Max Input Voltage | V <sub>CC</sub> = Max, V <sub>I</sub> = 7V     |      |                 | 0.1  | mA    |    |
| I <sub>IH</sub> | High Level Input Current          | V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V   |      |                 | 20   | µA    |    |
| I <sub>IL</sub> | Low Level Input Current           | V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V   |      |                 | -0.4 | mA    |    |
| I <sub>OS</sub> | Short Circuit Output Current      | V <sub>CC</sub> = Max                          | DM54 | -20             |      | -100  |    |
|                 |                                   | (Note 5)                                       | DM74 | -20             |      | -100  |    |
| I <sub>CC</sub> | Supply Current                    | V <sub>CC</sub> = Max (Note 6)                 |      |                 | 3.8  | 7     | mA |

**Note 4:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 5:** Not more than one output should be shorted at a time, and the duration should not exceed one second.

**Note 6:** I<sub>CC</sub> is measured with all  $\bar{R}$  inputs grounded, all  $\bar{S}$  inputs at 4.5V and all outputs open.

### Switching Characteristics

at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C

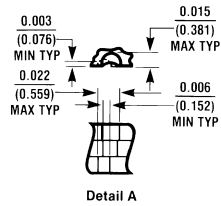
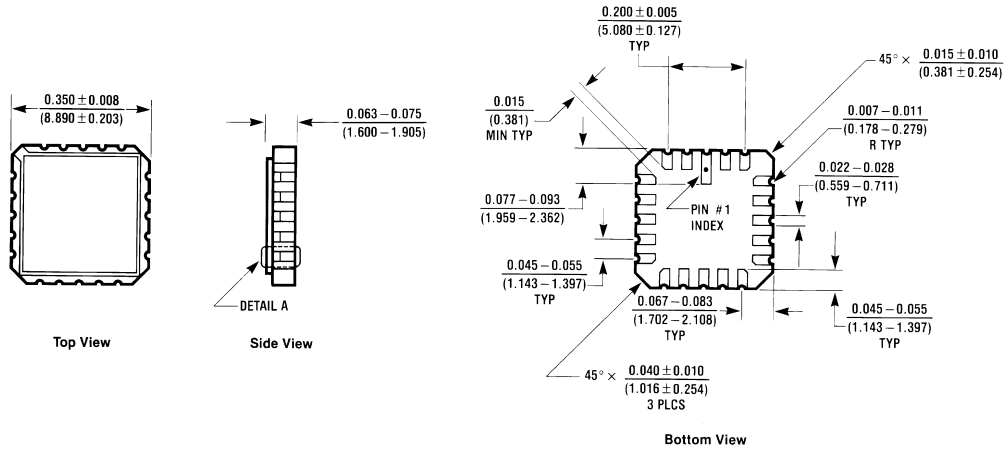
| Symbol           | Parameter  | From (Input)<br>To (Output) | R <sub>L</sub> = 2 kΩ  |     |                        |     | Units |
|------------------|--|-----------------------------|------------------------|-----|------------------------|-----|-------|
|                  |  |                             | C <sub>L</sub> = 15 pF |     | C <sub>L</sub> = 50 pF |     |       |
|                  |  |                             | Min                    | Max | Min                    | Max |       |
| t <sub>PLH</sub> | Propagation Delay Time<br>Low to High Level Output | $\bar{S}$ to<br>Q           |                        | 22  |                        | 25  | ns    |
| t <sub>PHL</sub> | Propagation Delay Time<br>High to Low Level Output | $\bar{S}$ to<br>Q           |                        | 15  |                        | 23  | ns    |

### Switching Characteristics (Continued)

at  $V_{CC} = 5V$  and  $T_A = 25^\circ C$

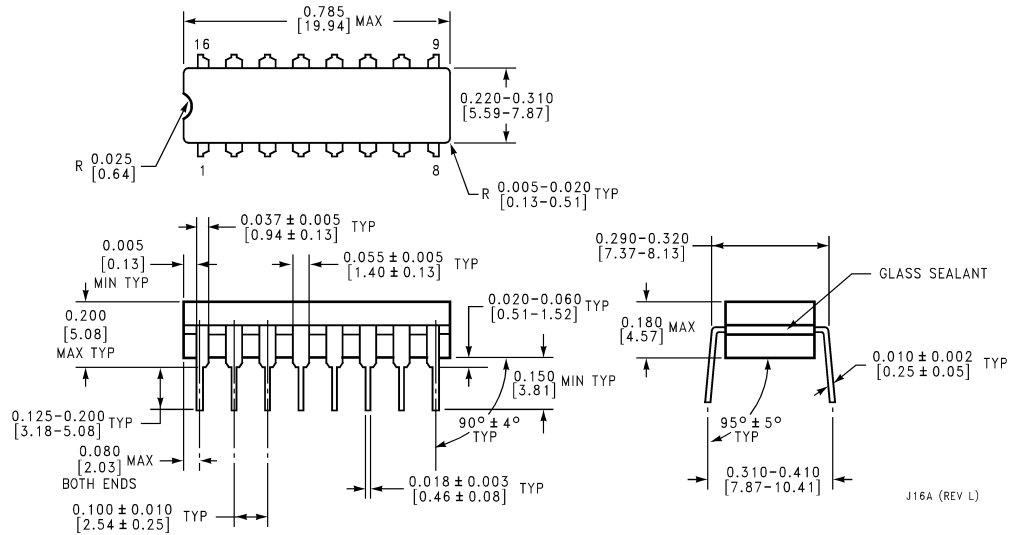
| Symbol    | Parameter  | From (Input)<br>To (Output) | $R_L = 2\text{ k}\Omega$ |     |                      |     | Units |
|-----------|--|-----------------------------|--------------------------|-----|----------------------|-----|-------|
|           |  |                             | $C_L = 15\text{ pF}$     |     | $C_L = 50\text{ pF}$ |     |       |
|           |  |                             | Min                      | Max | Min                  | Max |       |
| $t_{PHL}$ | Propagation Delay Time<br>High to Low Level Output | $\bar{R}$ to<br>Q           |                          | 27  |                      | 33  | ns    |

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



**Ceramic Leadless Chip Carrier Package (E)**  
**Order Number 54LS279LMB**  
**Package Number E20A**

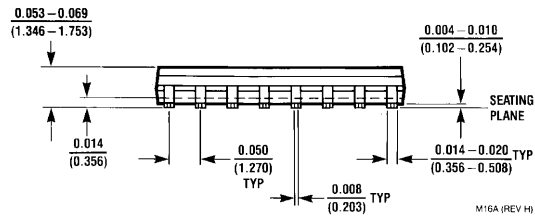
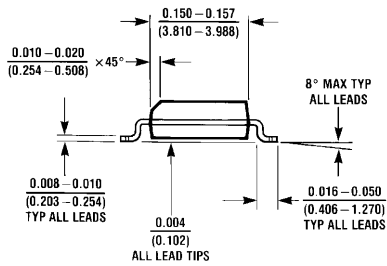
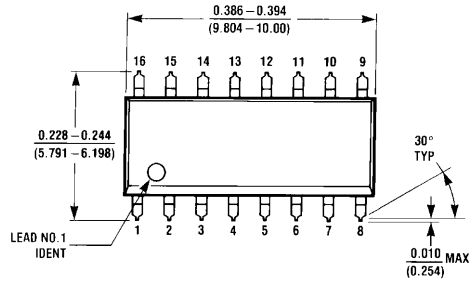
E20A (REV D)



**16-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number 54LS279DMQB or DM54LS279J**  
**Package Number J16A**

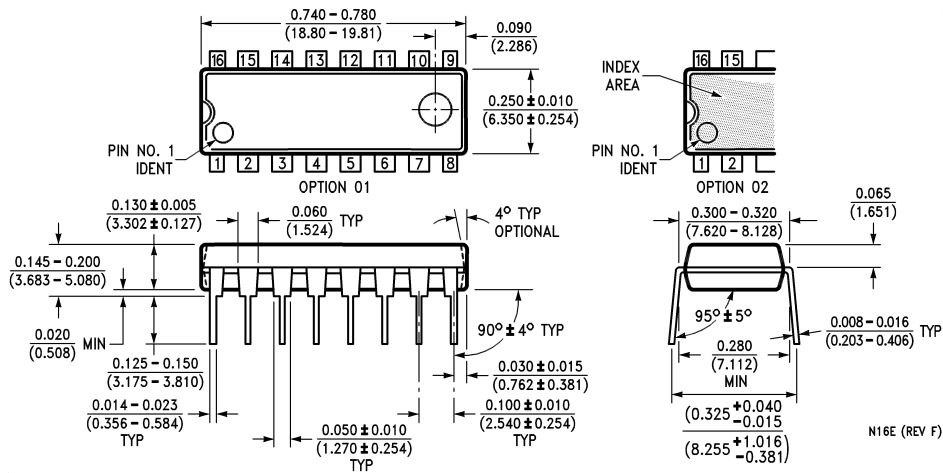
J16A (REV L)

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



M16A (REV H)

**16-Lead Small Outline Molded Package (M)**  
**Order Number DM74LS279M**  
**Package Number M16A**

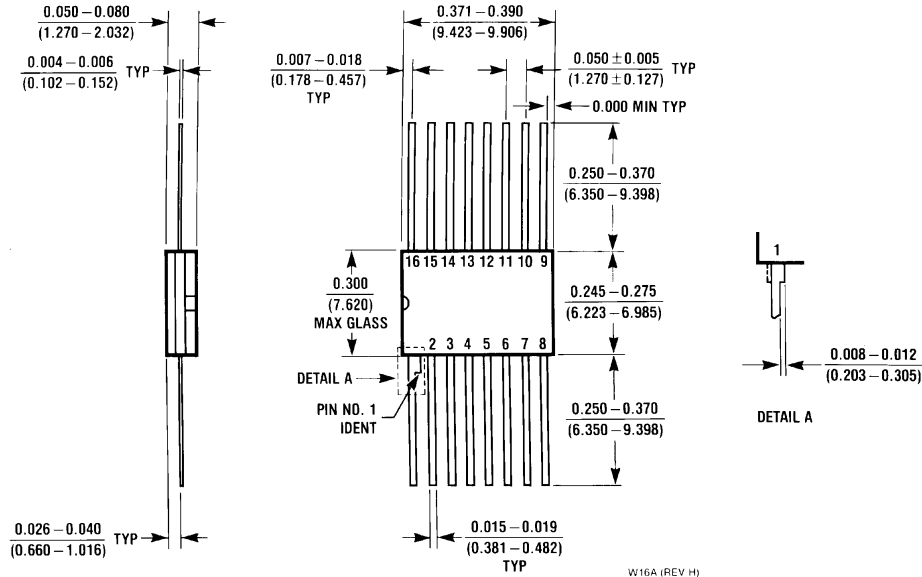


N16E (REV F)

**16-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74LS279N**  
**Package Number N16E**

**DM74LS279 Quad S-R Latches**

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



**16-Lead Ceramic Flat Package (W)**  
**Order Number 54LS279FMQB or DM54LS279W**  
**Package Number W16A**

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