

## 54LS279/DM54LS279/DM74LS279 Quad $\bar{S}$ - $\bar{R}$ Latches

### General Description

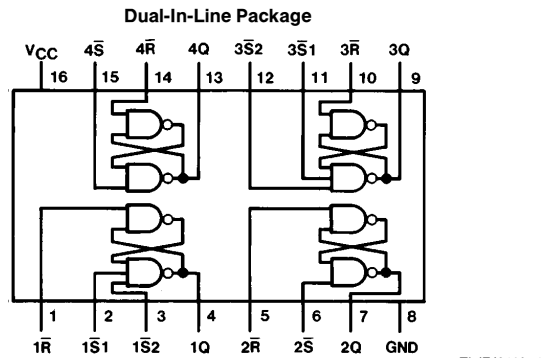
The  $\bar{S}$ - $\bar{R}$  Latch consists of four individual and independent Set-Reset Latches with active low inputs. Two of the four latches have an additional  $\bar{S}$  input ANDed with the primary  $\bar{S}$  input. A low on any  $\bar{S}$  input while the  $\bar{R}$  input is high will be stored 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 National Semiconductor Sales Office/Distributor for specifications.

### Connection Diagram



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

### Function Table

Inputs		Output
$\bar{S}(1)$	$\bar{R}$	Q
L	L	H*
L	H	H
H	L	L
H	H	Q <sub>0</sub>

H = High Level

L = Low Level

Q<sub>0</sub> = The Level of Q before the indicated input conditions were established.

\*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 1:** 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)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

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

Note: 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.

## 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

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

Symbol	Parameter	Conditions	Min	Typ (Note 1)	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
		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 (Note 2)	DM54	−20	−100	mA
			DM74	−20	−100	
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max (Note 3)		3.8	7	mA

Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

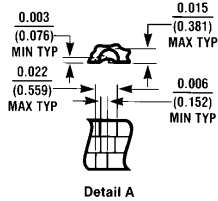
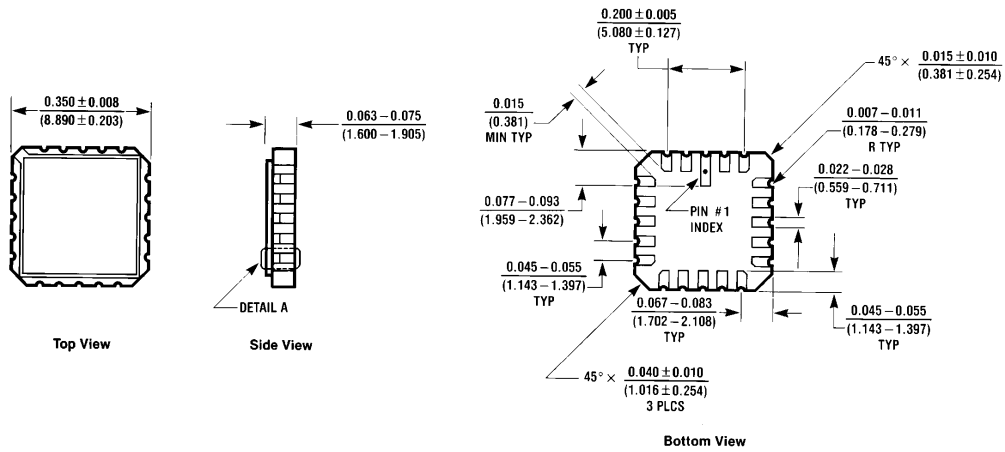
Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 3: I<sub>CC</sub> is measured with all  $\bar{F}$  inputs grounded, all  $\bar{S}$  inputs at 4.5V and all outputs open.

**Switching Characteristics** at  $V_{CC} = 5V$  and  $T_A = 25^\circ C$  (See Section 1 for Test Waveforms and Output Load)

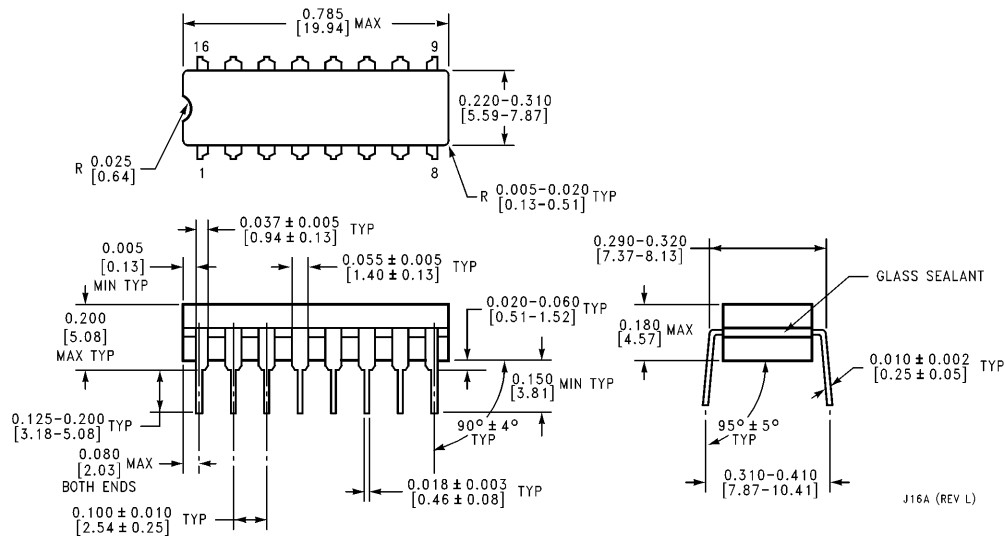
Symbol	Parameter	From (Input) To (Output)	$R_L = 2\text{ k}\Omega$				Units
			$C_L = 15\text{ pF}$		$C_L = 50\text{ pF}$		
			Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output	$\bar{S}$ to Q		22		25	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	$\bar{S}$ to Q		15		23	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	$\bar{R}$ to Q		27		33	ns

**Physical Dimensions** inches (millimeters)



**Ceramic Leadless Chip Carrier Package (E)**  
**Order Number 54LS279LMQB**  
**NS Package Number E20A**

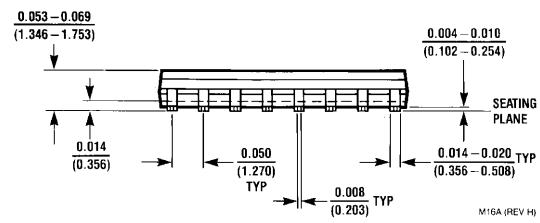
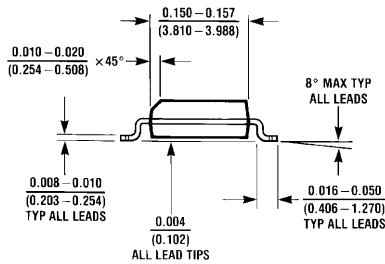
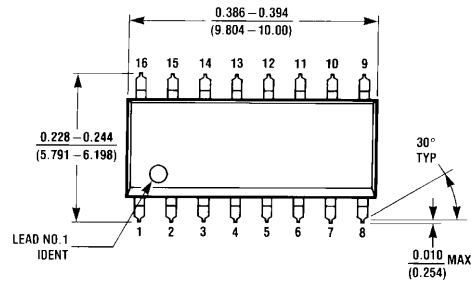
E20A (REV D)



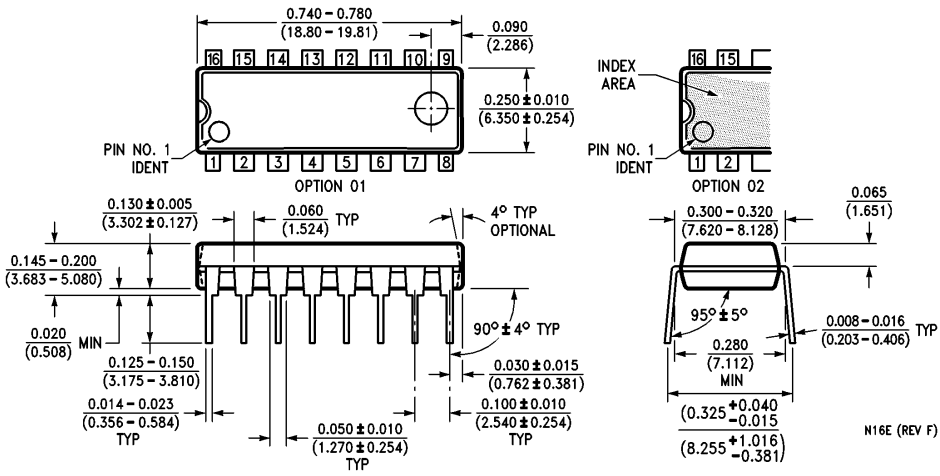
**16-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number 54LS279DMQB or DM54LS279J**  
**NS Package Number J16A**

J16A (REV L)

**Physical Dimensions** inches (millimeters) (Continued)



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



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

**Physical Dimensions** inches (millimeters) (Continued)



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

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**National Semiconductor Corporation**  
 1111 West Bardin Road  
 Arlington, TX 76017  
 Tel: 1(800) 272-9959  
 Fax: 1(800) 737-7018

**National Semiconductor Europe**  
 Fax: (+49) 0-180-530 85 86  
 Email: onjwge@tevm2.nsc.com  
 Deutsch Tel: (+49) 0-180-530 85 85  
 English Tel: (+49) 0-180-532 78 32  
 Français Tel: (+49) 0-180-532 93 58  
 Italiano Tel: (+49) 0-180-534 16 80

**National Semiconductor Hong Kong Ltd.**  
 13th Floor, Straight Block,  
 Ocean Centre, 5 Canton Rd.  
 Tsimshatsui, Kowloon  
 Hong Kong  
 Tel: (852) 2737-1600  
 Fax: (852) 2736-9960

**National Semiconductor Japan Ltd.**  
 Tel: 81-043-299-2309  
 Fax: 81-043-299-2408

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