

# SN54279, SN54LS279A, SN74279, SN74LS279A QUADRUPLE S-R LATCHES

SDLS093 – DECEMBER 1983 – REVISED MARCH 1988

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs

- Dependable Texas Instruments Quality and Reliability description

The '279 offers 4 basic  $\bar{S}$ - $\bar{R}$  flip-flop latches in one 16-pin, 300-mil package. Under conventional operation, the  $\bar{S}$ - $\bar{R}$  inputs are normally held high. When the  $\bar{S}$  input is pulsed low, the Q output will be set high. When  $\bar{R}$  is pulsed low, the Q output will be reset low. Normally, the  $\bar{S}$ - $\bar{R}$  inputs should not be taken low simultaneously. The Q output will be unpredictable in this condition.

**FUNCTION TABLE**  
(each latch)

INPUTS		OUTPUT
$\bar{S}$	$\bar{R}$	Q
H	H	$Q_0$
L	H	H
H	L	L
L	L	$H^\ddagger$

H = high level      L = low level

$^\dagger$  For latches with double S inputs:

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

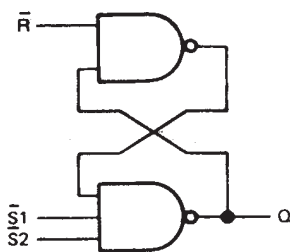
$^\ddagger$  This configuration is nonstable: that is, it may not persist when the  $\bar{S}$  and  $\bar{R}$  inputs return to their inactive (high) level.

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

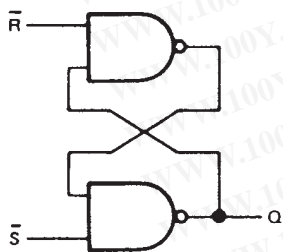
L = one or both  $\bar{S}$  inputs low

### logic diagram (positive logic)

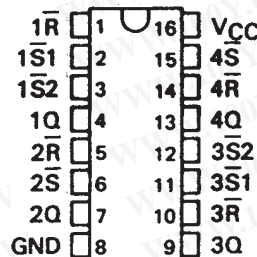
(latches 1 and 3)



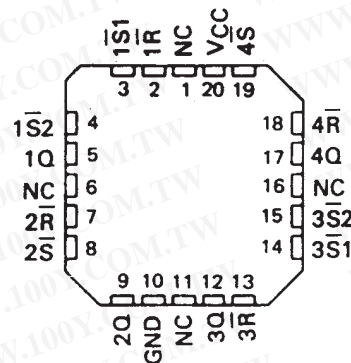
(latches 2 and 4)



SN54279, SN54LS279A . . . J OR W PACKAGE  
SN74279 . . . N PACKAGE  
SN74LS279A . . . D OR N PACKAGE  
(TOP VIEW)

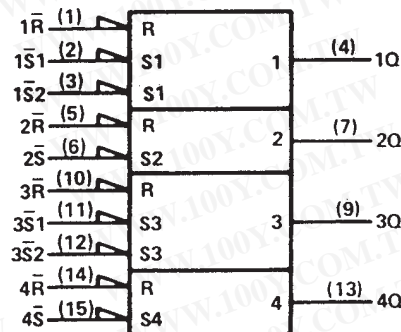


SN54LS279A . . . FK PACKAGE  
(TOP VIEW)



NC - No internal connection

### logic symbol<sup>§</sup>



<sup>§</sup>This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, N, and W packages.

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## recommended operating conditions

	SN54279			SN74279			UNIT
	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			0.8			0.8	V
I <sub>OH</sub> High-level output current			-0.8			-0.8	mA
I <sub>OL</sub> Low-level output current			16			16	mA
t <sub>w</sub> Pulse duration, low	20			20			ns
T <sub>A</sub> Operating free-air temperature	-55		125	0		70	°C

## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS <sup>†</sup>	SN54279			SN74279			UNIT
		MIN	TYP <sup>‡</sup>	MAX	MIN	TYP <sup>‡</sup>	MAX	
V <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -12 mA			-1.5			-1.5	V
V <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.8 V, I <sub>OH</sub> = -0.8 mA	2.4	3.4		2.4	3.4		V
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 16 mA		0.2	0.4		0.2	0.4	V
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V			1			1	mA
I <sub>IH</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V			40			40	μA
I <sub>IL</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V			-1.6			-1.6	mA
I <sub>OS</sub> <sup>§</sup>	V <sub>CC</sub> = MAX	-18		-55	-18		-57	mA
I <sub>CC</sub>	V <sub>CC</sub> = MAX, See Note 2		18	30		18	30	mA

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

<sup>‡</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>§</sup> Not more than one output should be shorted at a time.

NOTE 2: I<sub>CC</sub> is measured with all R inputs grounded, all S inputs at 4.5 V, and all outputs open.

## switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	$\bar{S}$	Q	R <sub>L</sub> = 400 Ω, C <sub>L</sub> = 15 pF		12	22	ns
t <sub>PHL</sub>	$\bar{R}$	Q			9	15	
t <sub>PHL</sub>	$\bar{R}$	Q			15	27	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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# SN54279, SN54LS279A, SN74279, SN74LS279A QUADRUPLE S-R LATCHES

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## recommended operating conditions

	SN54LS279A			SN74LS279A			UNIT
	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>w</sub> Pulse duration, low	20			20			ns
T <sub>A</sub> Operating free-air temperature	-55		125	0		70	°C

## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	SN54LS279A		SN74LS279A		UNIT		
		MIN	TYP‡	MAX	MIN		TYP‡	MAX
V <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA			-1.5		-1.5	V	
V <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, I <sub>OH</sub> = -0.4 mA	2.5	3.4		2.7	3.4	V	
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 4 mA		0.25	0.4		0.25	0.4	V
	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 8 mA					0.25	0.5	
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V			0.1		0.1	mA	
I <sub>IH</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V			20		20	μA	
I <sub>IL</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V			-0.2		-0.2	mA	
I <sub>OS</sub> §	V <sub>CC</sub> = MAX	-20		-100	-20	-100	mA	
I <sub>CC</sub>	V <sub>CC</sub> = MAX, See note 2		3.8	7		3.8	7	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

§ Not more than one output should be shorted at a time, and the duration of the short-circuit should be less than one second.

NOTE 2: I<sub>CC</sub> is measured with all R inputs grounded, all S inputs at 4.5 V, and all outputs open.

## switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	S	Q	R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 15 pF		12	22	ns
t <sub>PHL</sub>					13	21	
t <sub>PHL</sub>	R	Q			15	27	ns

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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