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

FUNCTION TABLE
(each latch)

INPUTS		OUTPUT
$\overline{S}$†	$\overline{R}$	Q
H	H	Q_0
L	H	H
H	L	L
L	L	H‡

H = high level L = low level

†For latches with double S inputs:

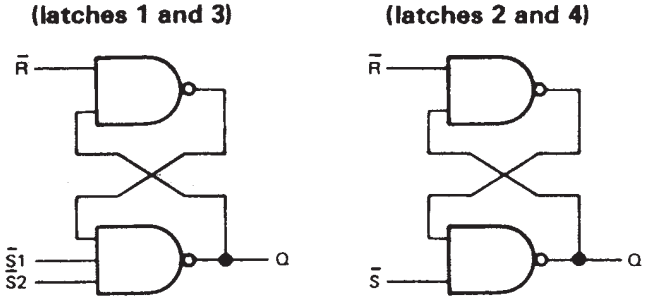
Q_0 = the level of Q before the indicated input conditions were established.

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

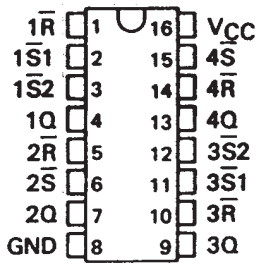
H = both $\overline{S}$ inputs high

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

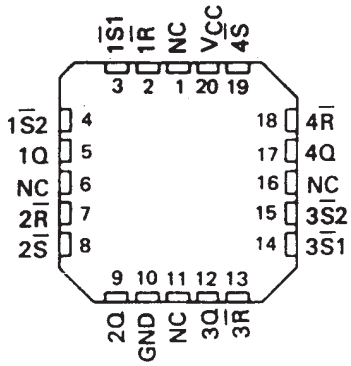
logic diagram (positive logic)



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

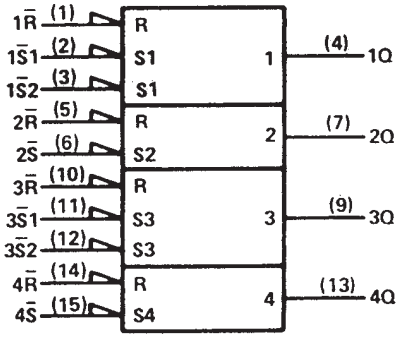


SN54LS279A . . . FK PACKAGE
(TOP VIEW)



NC - No internal connection

logic symbol§

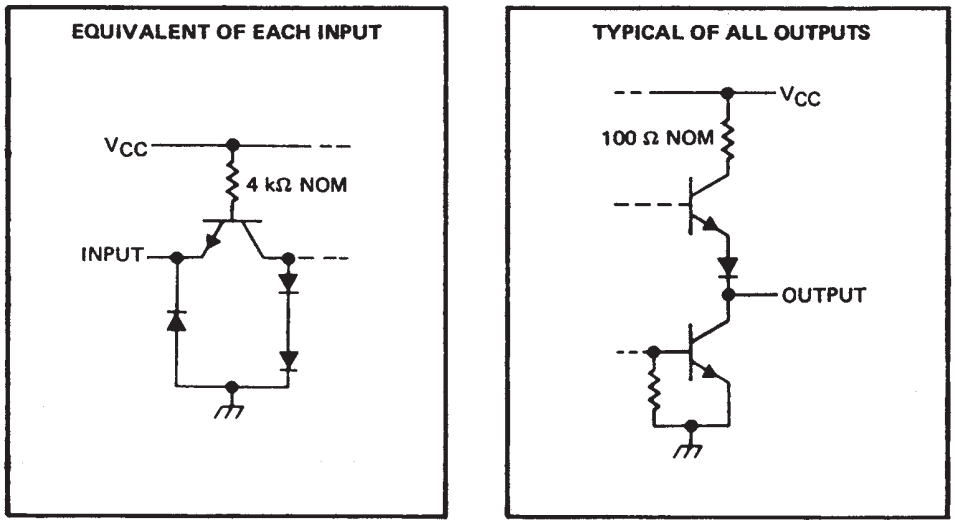


§This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.

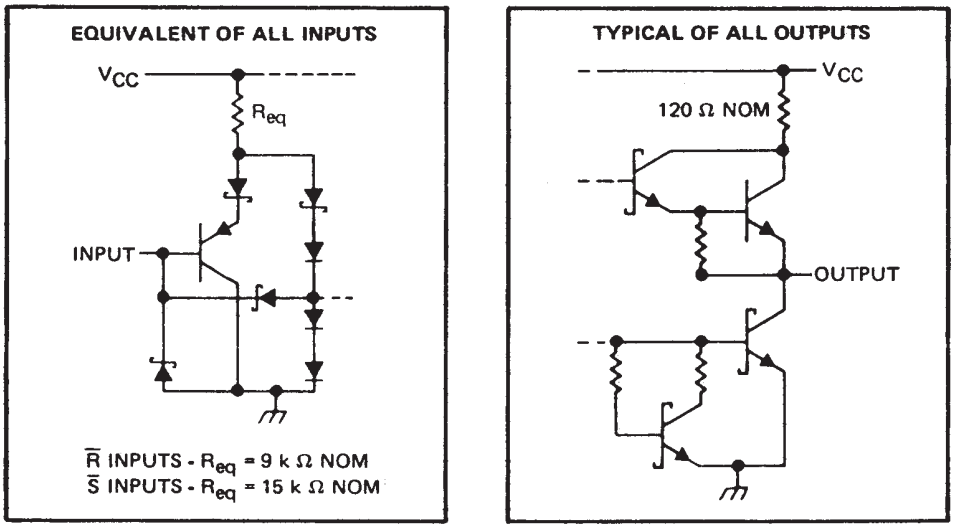
Pin numbers shown are for D, J, N, and W packages.

schematics of inputs and outputs

'279 CIRCUITS



'LS279A CIRCUITS



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage: '279 . . . . . 5.5 V
' LS279A . . . . . 7 V
Operating free-air temperature range: SN54' TYPES . . . . . −55°C to 125°C
SN74' TYPES . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54279			SN74279			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{OH}	High-level output current			−0.8			−0.8	mA
I_{OL}	Low-level output current			16			16	mA
t_w	Pulse duration, low	20			20			ns
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS†			SN54279			SN74279			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	V_{CC} = MIN,	I_I = −12 mA				−1.5			−1.5	V
V_{OH}	V_{CC} = MIN,	V_{IL} = 0.8 V,	I_{OH} = −0.8 mA	2.4	3.4		2.4	3.4		V
V_{OL}	V_{CC} = MIN,	V_{IH} = 2 V,	I_{OL} = 16 mA		0.2	0.4		0.2	0.4	V
I_I	V_{CC} = MAX,	V_I = 5.5 V				1			1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.4 V				40			40	μA
I_{IL}	V_{CC} = MAX,	V_I = 0.4 V				−1.6			−1.6	mA
I_{OS}§	V_{CC} = MAX			−18		−55	−18		−57	mA
I_{CC}	V_{CC} = MAX,	See Note 2			18	30		18	30	mA

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

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time.

NOTE 2: I_{CC} is measured with all R inputs grounded, all S inputs at 4.5 V, and all outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	$\overline{S}$	Q	R_L = 400 Ω, C_L = 15 pF		12	22	ns
t_{PHL}					9	15	
t_{PHL}	$\overline{R}$	Q			15	27	ns

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

recommended operating conditions

		SN54LS279A			SN74LS279A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			– 0.4			– 0.4	mA
I_{OL}	Low-level output current			4			8	mA
t_w	Pulse duration, low	20			20			ns
T_A	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_{IK}	V_{CC} = MIN,	I_I = – 18 mA				– 1.5			– 1.5	V
V_{OH}	V_{CC} = MIN,	V_{IL} = MAX,	I_{OH} = – 0.4 mA	2.5	3.4		2.7	3.4		V
V_{OL}	V_{CC} = MIN,	V_{IH} = 2 V,	I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
	V_{CC} = MIN,	V_{IH} = 2 V,	I_{OL} = 8 mA					0.25	0.5	
I_I	V_{CC} = MAX,	V_I = 7 V				0.1			0.1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.7 V				20			20	μA
I_{IL}	V_{CC} = MAX,	V_I = 0.4 V				– 0.2			– 0.2	mA
I_{OS}§	V_{CC} = MAX			– 20		– 100	– 20		– 100	mA
I_{CC}	V_{CC} = 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_{CC} = 5 V, T_A = 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_{CC} is measured with all R inputs grounded, all S inputs at 4.5 V, and all outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	$\overline{S}$	Q	R_L = 2 kΩ, C_L = 15 pF		12	22	ns
t_{PHL}					13	21	
t_{PHL}	$\overline{R}$	Q			15	27	ns

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

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PRODUCT FOLDER | PRODUCT INFO: FEATURES | DESCRIPTION | DATASHEETS | PRICING/AVAILABILITY/PKG | APPLICATION NOTES | USER GUIDES | MORE LITERATURE

PRODUCT SUPPORT: TRAINING

SN54LS279A, Quadruple /S-/R Latches

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54LS279A	SN74LS279A
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.75 to 5.25
Input Level	TTL	TTL
Output Level	TTL	TTL
Output Drive (mA)		-0.4/8
Output	2S	2S
No. of Bits	4	4
tpd max (ns)		22

FEATURES

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- 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

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

TECHNICAL DOCUMENTS

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To view the following documents, Acrobat Reader 4.0 is required.

To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET

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Full datasheet in Acrobat PDF: sn54ls279a.pdf (162 KB) (Updated: 03/01/1988)

APPLICATION NOTES

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View Application Notes for Digital Logic

- Designing With Logic (Rev. C) (SDYA009C - Updated: 06/01/1997)
- Designing with the SN54/74LS123 (Rev. A) (SDLA006A - Updated: 03/01/1997)
- Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits (SZZA026 - Updated: 06/20/2001)
- Input and Output Characteristics of Digital Integrated Circuits (SDYA010 - Updated: 10/01/1996)
- Live Insertion (SDYA012 - Updated: 10/01/1996)
- TI IBIS File Creation, Validation, and Distribution Processes (SZZA034 - Updated: 08/29/2002)
- Understanding and Interpreting Texas Instruments Standard-Logic Products Data Sh (Rev. A) (SZZA036A - Updated: 02/27/2003)

MORE LITERATURE

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- Enhanced Plastic Portfolio Brochure (SGZB004, 387 KB - Updated: 08/19/2002)

Product Folder: SN54LS279A, Quadruple /S-/R Latches

- Logic Reference Guide (SCYB004, 1032 KB - Updated: 10/23/2001)
- MicroStar Junior BGA Design Summary (SCET004, 167 KB - Updated: 07/28/2000)
- Military Brief (SGYN138, 803 KB - Updated: 10/10/2000)
- Overview of IEEE Std 91-1984, Explanation of Logic Symbols Training Booklet (Rev. A) (SDYZ001A, 138 KB - Updated: 07/01/1996)
- Palladium Lead Finish User's Manual (SDYV001, 2041 KB - Updated: 11/01/1996)
- QML Class V Space Products Military Brief (Rev. A) (SGZN001A, 257 KB - Updated: 10/07/2002)

USER GUIDES

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- LOGIC Pocket Data Book (SCYD013, 4837 KB - Updated: 12/05/2002)

PRICING/AVAILABILITY/PKG

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DEVICE INFORMATION Updated Daily

TI INVENTORY STATUS As Of 09:00 AM GMT, 17 Apr 2003

REPORTED DISTRIBUTOR INVENTORY As Of 09:00 AM GMT, 17 Apr 2003

ORDERABLE DEVICE	STATUS	PACKAGE TYPE | PINS	TEMP (°C)	DSCC NUMBER	PRODUCT CONTENT	BUDGETARY PRICING QTY | $US	STD PACK QTY	IN STOCK	IN PROGRESS QTY | DATE	LEAD TIME	DISTRIBUTOR COMPANY | REGION	IN STOCK	PURCHASE
76018012A	ACTIVE	LCCC (FK) | 20	-55 TO 125		View Contents	1KU | 6.94	1	0*	4066 | 20 May	6 WKS	None Reported View Distributors		
									>10k | 27 May				
7601801EA	ACTIVE	CDIP (J) | 16	-55 TO 125		View Contents	1KU | 2.00	1	0*	>10k | 20 May	6 WKS	Avnet | Americas	41	BUY NOW
7601801FA	ACTIVE	CFP (W) | 16	-55 TO 125		View Contents	1KU | 7.29	1	45*	>10k | 20 May	6 WKS	Avnet | Americas	149	BUY NOW
SN54LS279AJ	ACTIVE	CDIP (J) | 16	-55 TO 125		View Contents	1KU | 1.70	1	398*	279 | 05 May	6 WKS	Avnet-SILICA | Europe	28	BUY NOW
									>10k | 20 May		Avnet | Americas	12	BUY NOW
SNJ54LS279AFK	ACTIVE	LCCC (FK) | 20	-55 TO 125	76018012A	View Contents	1KU | 6.94	1	97*	3580 | 20 May	6 WKS	None Reported View Distributors		
									>10k | 27 May				
SNJ54LS279AJ	ACTIVE	CDIP (J) | 16	-55 TO 125	7601801EA	View Contents	1KU | 2.00	1	166*	>10k | 20 May	6 WKS	Avnet-SILICA | Europe	39	BUY NOW
SNJ54LS279AW	ACTIVE	CFP (W) | 16	-55 TO 125	7601801FA	View Contents	1KU | 7.29	1	0*	>10k | 20 May	6 WKS	None Reported View Distributors		

Table Data Updated on: 4/17/2003