

TYPES SN54279, SN54LS279A, SN74279, SN74LS279A QUADRUPLE \bar{S} - \bar{R} LATCHES

REVISED DECEMBER 1983

- Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to 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*

H = high level L = low level

Q₀ = the level of Q before the indicated input conditions were established.

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

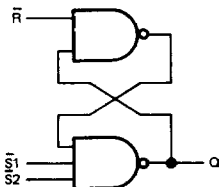
† For latches with double S inputs:

H = both \bar{S} inputs high

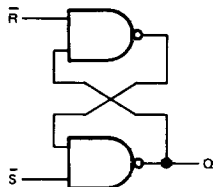
L = one or both \bar{S} inputs low

logic diagram

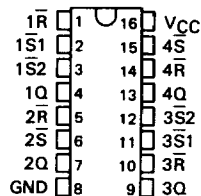
(latches 1 and 3)



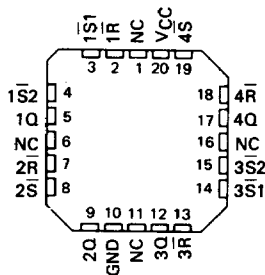
(latches 2 and 4)



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



SN54LS279A ... FK PACKAGE
SN74LS279A ... FN PACKAGE
(TOP VIEW)



NC - No internal connection

TTL DEVICES

PRODUCTION DATA

This document contains information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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INSTRUMENTS

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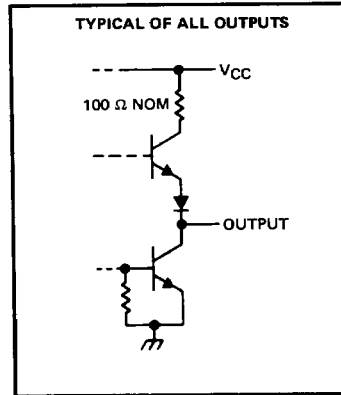
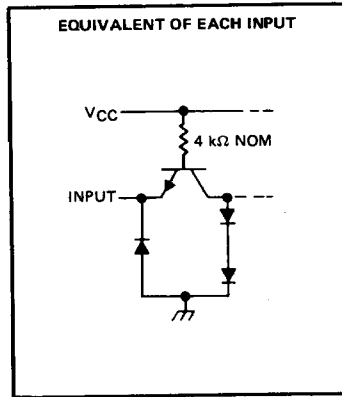
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TYPES SN54279, SN54LS279A, SN74279, SN74LS279A

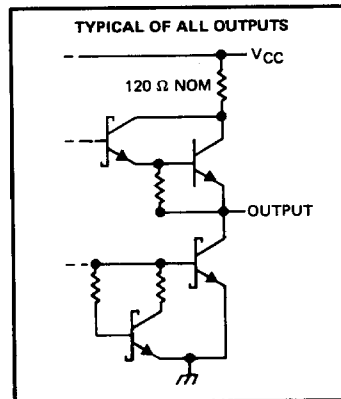
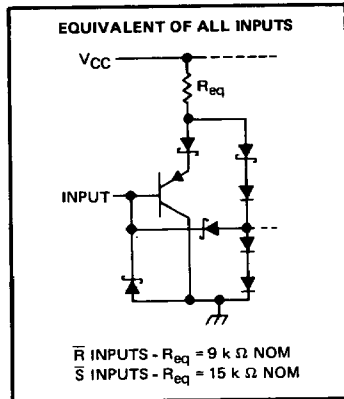
QUADRUPLE \bar{S} - \bar{R} LATCHES

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.

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TTL DEVICES

TYPES SN54279, SN74279 QUADRUPLE S-R LATCHES

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			V
I _{OH} High-level output current				-0.8			mA
I _{OL} Low-level output current				16			mA
t _w Pulse duration, low	20			20			ns
T _A Operating free-air temperature	-55			125			°C

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

PARAMETER	TEST CONDITIONS†	SN54279		SN74279		UNIT	
		MIN	TYP‡	MAX	MIN		TYP‡
V _{IK}	V _{CC} = MIN, I _I = -12 mA			-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		mA	
I _{IH}	V _{CC} = MAX, V _I = 2.4 V			40		μA	
I _{IL}	V _{CC} = MAX, V _I = 0.4 V			-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}	S	Q	R _L = 400 Ω, C _L = 15 pF			12	22
t _{PHL}						9	15
t _{PHL}	R	Q				15	27

NOTE 3: See General Information Section for load circuits and voltage waveforms.

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TTL DEVICES

TYPES SN54LS279A, SN74LS279A QUADRUPLE S-R LATCHES

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.

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TTL DEVICES

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}	S	Q	R _L = 2 kΩ, C _L = 15 pF		12	22	ns
t _{PJL}					13	21	
t _{PHL}	R	Q			15	27	ns

NOTE 3: See General Information Section for load circuits and voltage waveforms.