

TYPES SN54LS597, SN54LS598, SN74LS597, SN74LS598 8-BIT SHIFT REGISTERS WITH INPUT LATCHES

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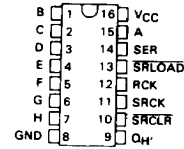
- 8-Bit Parallel Storage Register Inputs ('LS597)
- Parallel 3-State I/O, Storage Register Inputs, Shift Register Outputs ('LS598)
- Shift Register has Direct Overriding Load and Clear
- Guaranteed Shift Frequency ... DC to 20 MHz

description

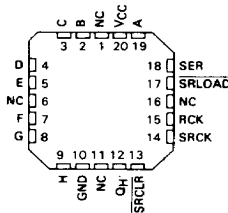
The 'LS597 comes in a 16-pin package and consists of an 8-bit storage latch feeding a parallel-in, serial-out 8-bit shift register. Both the storage register and shift register have positive-edge triggered clocks. The shift register also has direct load (from storage) and clear inputs.

The 'LS598 comes in a 20-pin package and has all the features of the 'LS597 plus 3-state I/O ports that provide parallel shift register outputs and also has multiplexed serial data inputs.

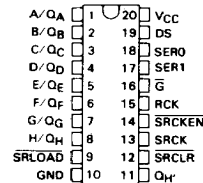
SN54LS597 ... J PACKAGE
SN74LS597 ... J OR N PACKAGE
(TOP VIEW)



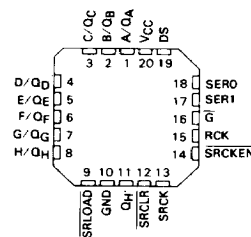
SN54LS597 ... FK PACKAGE
SN74LS597 ... FN PACKAGE
(TOP VIEW)



SN54LS598 ... J PACKAGE
SN74LS598 ... DW, J OR N PACKAGE
(TOP VIEW)



SN54LS598 ... FK PACKAGE
SN74LS598 ... FN PACKAGE
(TOP VIEW)



NC - No internal connection

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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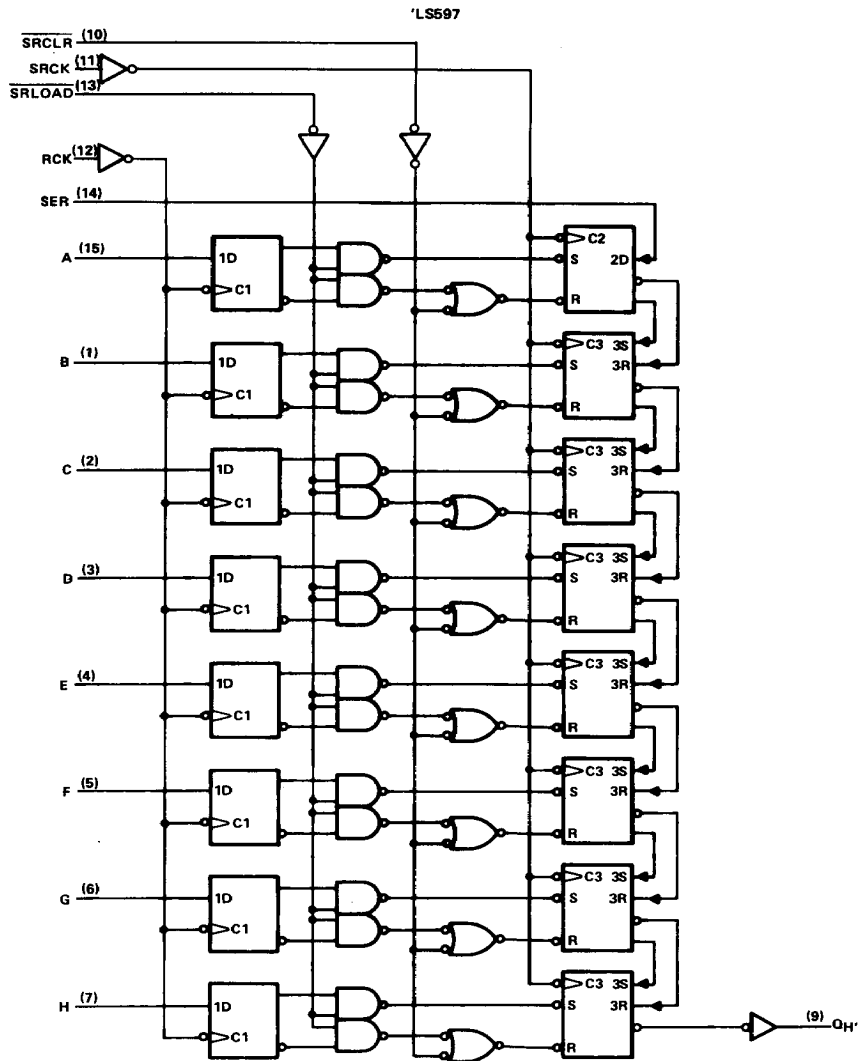
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TTL DEVICES

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TYPES SN54LS597, SN74LS597
8-BIT SHIFT REGISTERS WITH INPUT LATCHES

logic diagram (positive logic)



Pin numbers shown on logic notation are for J or N packages.

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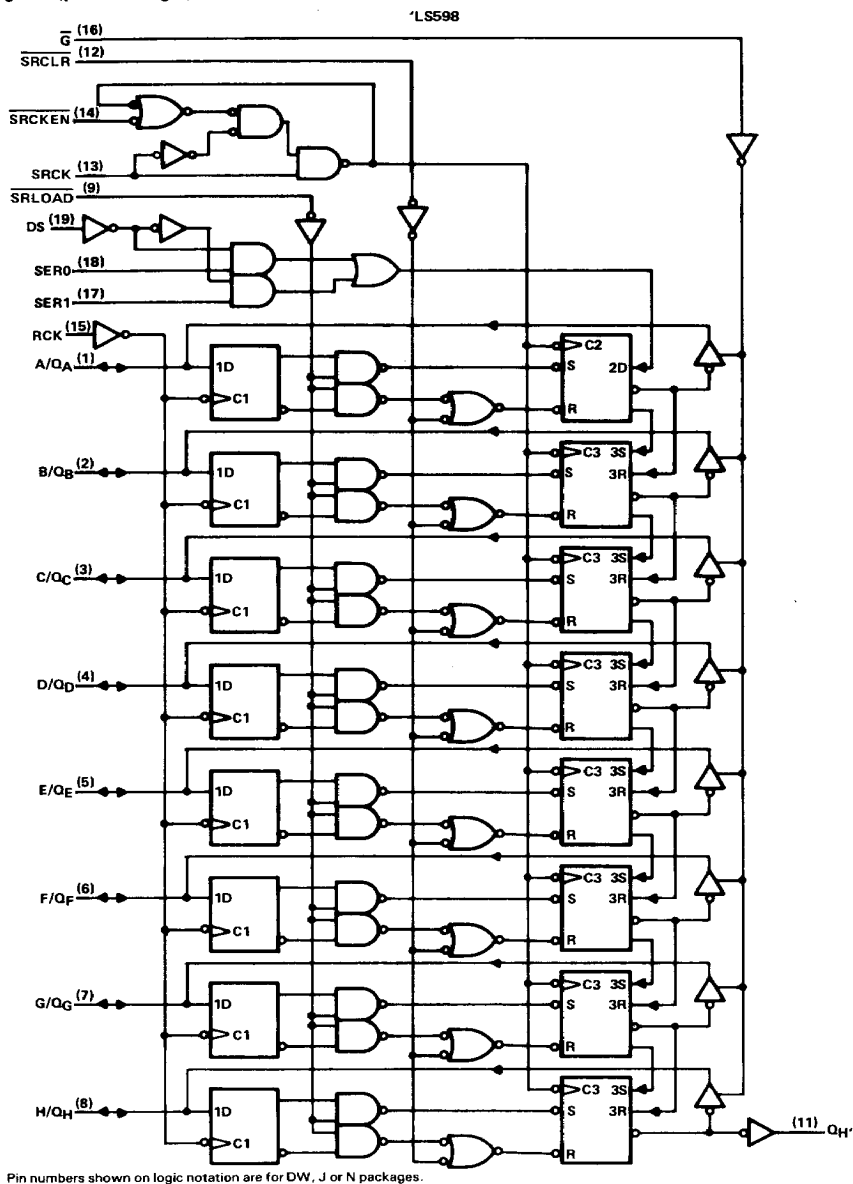
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TYPES SN54LS598, SN74LS598 8-BIT SHIFT REGISTERS WITH INPUT LATCHES

logic diagram (positive logic)



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TYPES SN54LS597, SN54LS598, SN74LS597, SN74LS598 8-BIT SHIFT REGISTERS WITH INPUT LATCHES

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage (excluding I/O ports)	7 V
Off-state output voltage (including I/O ports)	5.5 V
Operating free-air temperature range: SN54LS597, SN54LS598	– 55°C to 125°C
SN74LS597, SN74LS598	0°C to 70°C
Storage temperature range	– 65°C to 150°C

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

recommended operating conditions

				SN54LS'			SN74LS'			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			V
I _{OH}	High-level output current		Q _H '	– 1			– 1			mA
			Q _A thru Q _H , 'LS598 only	– 1			– 2.6			
I _{OL}	Low-level output current		Q _H '	8			16			mA
			Q _A thru Q _H , 'LS598 only	12			24			
f _{SCK}	Shift clock frequency			0	20		0	20		MHz
t _w	Pulse duration	SRCK	high	15	15			ns		
			low	35	35					
		RCK		20	20					
		SRCLR		20	20					
		SRLOAD		40	40					
t _{su}	Setup time	Data before RCK ↑			20	20			ns	
		DS before SRCK ↑ ('LS598 only)			30	30				
		SRCKEN low before SRCK ↑ ('LS598 only)			20	20				
		SRCLR inactive before SRCK ↑			25	25				
		SRLOAD inactive before SRCK ↑			30	30				
		RCK ↑ before SRLOAD ↑ (see Note 2)			40	40				
		SER before SRCK ↑		20	20					
t _h	Hold time			0	0			ns		
T _A	Operating free-air temperature			– 55	125		0	70		°C

NOTE 2: The RCK ↑ before SRLOAD ↑ setup time ensures the data saved by RCK ↑ will also be loaded into the shift register.

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TYPES SN54LS597, SN54LS598, SN74LS597, SN74LS598
8-BIT SHIFT REGISTERS WITH INPUT LATCHES

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

PARAMETER		TEST CONDITIONS†		SN54LS'		SN74LS'		UNIT
				MIN	TYP‡	MAX	MIN	
V _{IK}		V _{CC} = MIN, I _I = - 18 mA				- 1.5	- 1.5	V
V _{OH}	'LS598 Q	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX	I _{OH} = - 1 mA	2.4	3.2			V
			I _{OH} = - 2.6 mA			2.4	3.1	
	Q _H '		I _{OH} = - 1 mA	2.4	3.2		2.4 3.2	
V _{OL}	'LS598 Q	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX	I _{OL} = 12 mA		0.25	0.4	0.25 0.4	V
			I _{OL} = 24 mA			0.35 0.5		
			I _{OL} = 8 mA		0.25 0.4	0.25 0.4		
			I _{OL} = 16 mA			0.35 0.5		
I _{OZH}	'LS598 Q	V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 2.7 V				20	20	μA
I _{OZL}	'LS598 Q	V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 0.4 V				- 0.4	- 0.4	mA
I _I	'LS598 Q	V _{CC} = MAX	V _I = 5.5 V			0.1	0.1	mA
	Others		V _I = 7 V			0.1	0.1	
I _{IH}		V _{CC} = MAX, V _I = 2.7 V				20	20	μA
I _{IL}	'LS598 SRCK	V _{CC} = MAX, V _I = 0.4 V				- 0.8	- 0.8	mA
	SER, A Thru H					- 0.4	- 0.4	
	Others					- 0.2	- 0.2	
I _{OS} §	'LS598 Q	V _{CC} = MAX, V _O = 0 V			- 30	- 130	- 30 - 130	mA
	Q _H '				- 20	- 100	- 20 - 100	
I _{CC}	'LS597	V _{CC} = MAX, All possible inputs grounded, All outputs open	I _{CC} H		35	53	35 53	mA
			I _{CC} L		35	53	35 53	
	'LS598		I _{CC} H		45	68	45 68	
			I _{CC} L		54	80	54 80	
			I _{CC} Z		56	85	56 85	

† 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 not exceed one second.

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TYPES SN54LS597, SN54LS598, SN74LS597, SN74LS598
8-BIT SHIFT REGISTERS WITH INPUT LATCHES

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$, (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	'LS597			'LS598			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
f_{max}	SRCK		$R_L = 1\text{ k}\Omega$, $C_L = 30\text{ pF}$	20	35		20	35		MHz
t_{PLH}	SRCK $\uparrow$	Q_H'			15	23		11	17	ns
t_{PHL}	SRCK $\downarrow$	Q_H'			20	30		15	23	ns
t_{PLH}	SRLOAD $\downarrow$	Q_H'			38	57		28	42	ns
t_{PHL}	SRLOAD $\downarrow$	Q_H'			29	44		20	30	ns
t_{PHL}	SRCLR $\downarrow$	Q_H'			24	36		18	27	ns
t_{PLH}	RCK $\uparrow$	Q_H'	$R_L = 1\text{ k}\Omega$, $C_L = 30\text{ pF}$ SRLOAD = L		41	60		32	48	ns
t_{PHL}	RCK $\uparrow$	Q_H'			32	48		24	36	ns
t_{PLH}	SRCK $\uparrow$	Q						12	18	ns
t_{PHL}	SRCK $\uparrow$	Q	$R_L = 667\text{ }\Omega$, $C_L = 45\text{ pF}$					19	28	ns
t_{PLH}	SRLOAD $\downarrow$	Q						32	48	ns
t_{PHL}	SRLOAD $\downarrow$	Q						27	40	ns
t_{PHL}	SRCLR $\downarrow$	Q						25	38	ns
t_{PZH}	G $\downarrow$	Q						26	31	ns
t_{PZL}	G $\downarrow$	Q						29	43	ns
t_{PHZ}	G $\uparrow$	Q	$R_L = 667\text{ }\Omega$, $C_L = 5\text{ pF}$					25	38	ns
t_{PLZ}	G $\uparrow$	Q						20	30	ns

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

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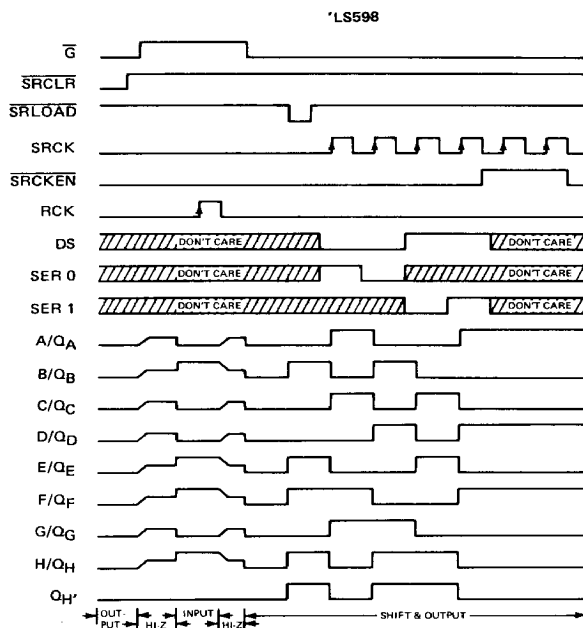
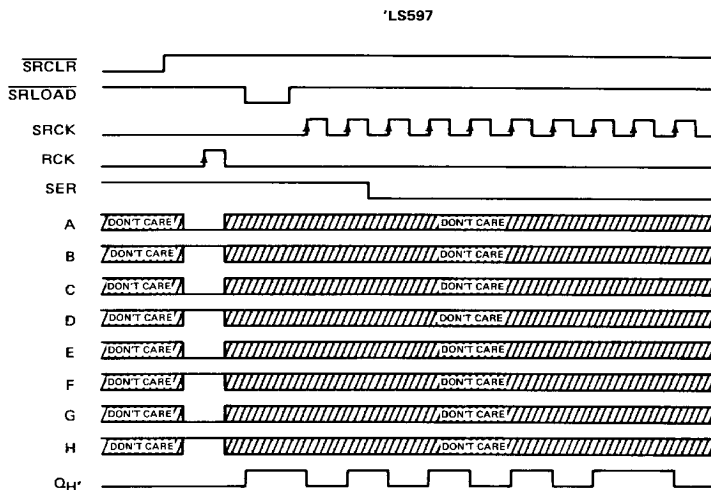


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TYPES SN54LS597, SN54LS598, SN74LS597, SN74LS598 8-BIT SHIFT REGISTERS WITH INPUT LATCHES

typical operating sequences



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