

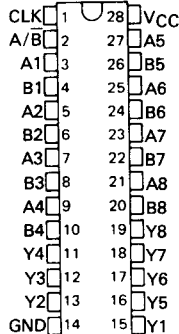
TYPES SN54LS604 THRU SN54LS607, SN74LS604 THRU SN74LS607 OCTAL 2-INPUT MULTIPLEXED LATCHES

D2545, JULY 1979 - REVISED DECEMBER 1983

(TIM99604 THRU TIM99607)

- Choice of Outputs:
Three-State ('LS604, 'LS606)
Open-Collector ('LS605, 'LS607)
- 16 D-Type Registers, One for each Data Input
- Multiplexer Selects Stored Data from Either A Bus or B Bus
- Application Oriented:
Maximum Speed ('LS604, 'LS605)
Glitch-Free Operation ('LS606, 'LS607)

SN54LS604 thru SN54LS607 ... JD PACKAGE
SN74LS604 thru SN74LS607 ... JD OR N PACKAGE
(TOP VIEW)



description

The 'LS604 through 'LS607 multiplexed latches are ideal for storing data from two input buses, A and B, and providing the output bus with stored data from either the A or B register.

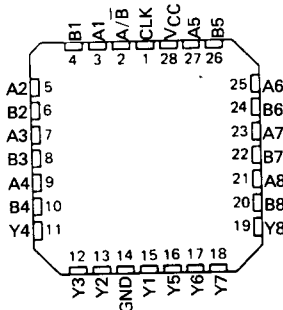
The clock loads data on the positive-going (low-level to high-level) transition. The clock pin also controls the active and high-impedance states of the outputs. When the clock pin is low, the outputs are in the high-impedance or off state. When the clock pin is high, the outputs are enabled.

The 'LS604 and 'LS605 are optimized for high-speed operation. The 'LS606 and 'LS607 are especially designed to eliminate decoding voltage spikes.

These functions are ideal for interface from a 16-bit microprocessor to a 64K RAM board. The row and column addresses can be loaded as one word from the microprocessor and then multiplexed sequentially to the RAM during the time that RAS and CAS are active.

The SN54LS604 through SN54LS607 are characterized for operation over the full military temperature range of -55°C to 125°C ; the SN74LS604 through SN74LS607 are characterized for operation from 0°C to 70°C .

SN54LS604 thru SN54LS607 ... FK PACKAGE
SN74LS604 thru SN74LS607 ... FN PACKAGE
(TOP VIEW)



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FUNCTION TABLE

INPUTS				CLOCK	OUTPUTS Y1-Y8
A1-A8	B1-B8	SELECT A/B			
A data	B data	L		↑	B data
A data	B data	H		↑	A data
X	X	X		L	Z or Off
X	X	L		H	B register stored data
X	X	H		H	A register stored data

H = high level (steady state)

L = low level (steady state)

X = irrelevant

Z = high-impedance state

Off = H if pull-up resistor is connected to open-collector output

↑ = transition from low to high level

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.

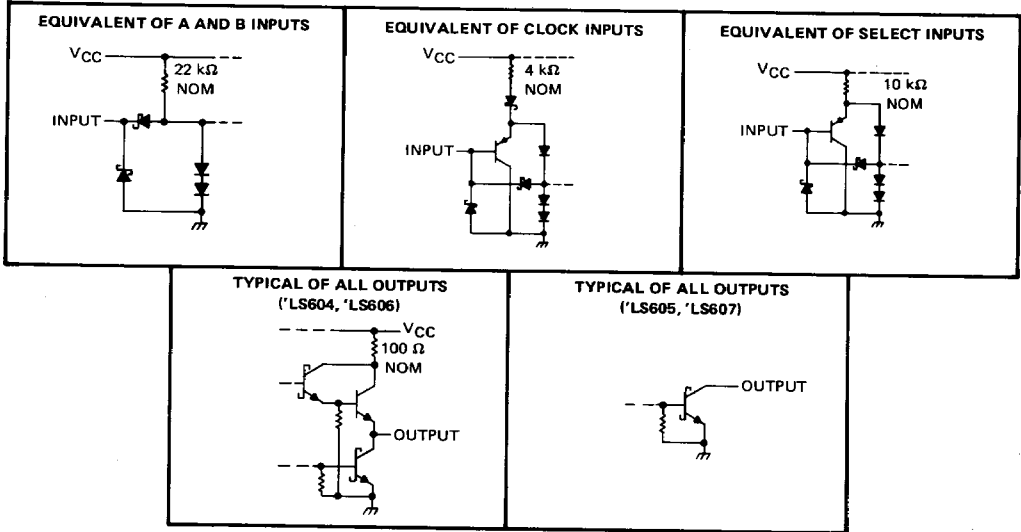
TEXAS
INSTRUMENTS

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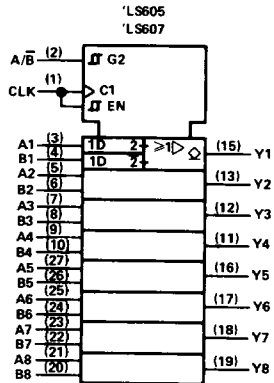
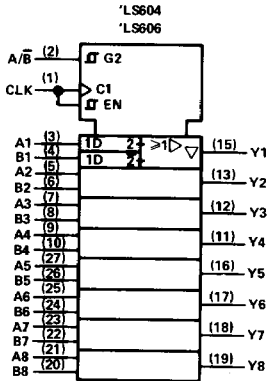
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TYPES SN54LS604 THRU SN54LS607, SN74LS604 THRU SN74LS607 OCTAL 2-INPUT MULTIPLEXED LATCHES

schematics of inputs and outputs



logic symbols



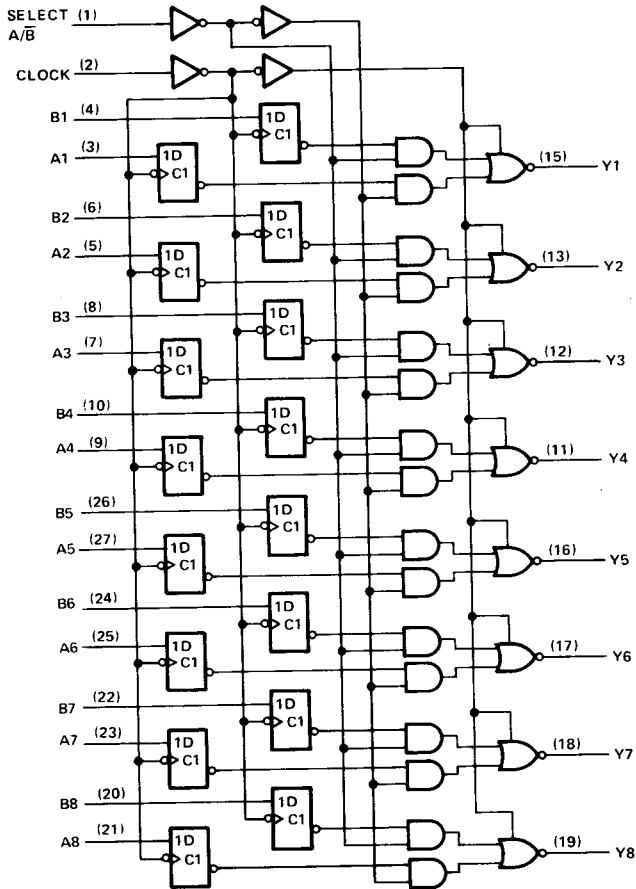
Pin numbers shown on logic notation are for JD or N packages.



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TYPES SN54LS604 THRU SN54LS607, SN74LS604 THRU SN74LS607
OCTAL 2-INPUT MULTIPLEXED LATCHES

logic diagram (positive logic)



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TYPES SN54LS604, SN54LS606, SN74LS604, SN74LS606

OCTAL 2-INPUT MULTIPLEXED LATCHES WITH 3-STATE OUTPUTS

recommended operating conditions

	SN54LS604 SN54LS606			SN74LS604 SN74LS606			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC} (see Note 1)	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			-1			-2.6	mA
Low-level output current, I_{OL}			12			24	mA
Width of clock pulse, t_W	20			20			ns
Setup time, t_{SU}	20†			20†			ns
Hold time, t_H	0†			0†			ns
Operating free-air temperature, T_A	-55	125		0	70		°C

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

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

PARAMETER	TEST CONDITIONS†	SN54LS604 SN54LS606			SN74LS604 SN74LS606			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH} High-level input voltage		2			2			V
V_{IL} Low-level input voltage				0.7			0.8	V
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$			-1.5			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, I_{OH} = \text{MAX}$	2.4	3.1		2.4	3.1		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = V_{IL \text{ max}}, I_{OL} = 12 \text{ mA}$ $I_{OL} = 24 \text{ mA}$		0.25	0.4		0.25	0.4	V
I_{OZH} Off-state output current, high-level voltage applied	$V_{CC} = \text{MAX}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, V_O = 2.7 \text{ V}$			20			20	µA
I_{OZL} Off-state output current, low-level voltage applied	$V_{CC} = \text{MAX}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, V_O = 0.4$			-20			-20	µA
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7 \text{ V}$	A, B CLK, SELECT		0.1			0.1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$	A, B CLK, SELECT		20			20	µA
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$	A, B CLK, SELECT		-0.4			-0.4	mA
I_{OS} Short-circuit output current §	$V_{CC} = \text{MAX}$			-30			-130	mA
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 2		55	70		55	70	mA

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

‡ All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$.

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

NOTE 2: I_{CC} is tested with all inputs grounded and all outputs open.

switching characteristics, $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$

PARAMETER	FROM (INPUT)	TEST CONDITIONS	'LS604			'LS606			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Select A/B (Data: A = H, B = L)	$C_L = 45 \text{ pF}, R_L = 667 \Omega,$ See Note 3	15	25		36	50	ns	
t_{PHL}	Select A/B (Data: A = L, B = H)		23	35		16	30		
t_{PLH}	Select A/B (Data: A = L, B = H)		31	45		22	35		
t_{PHL}	Clock		19	30		22	35	ns	
t_{PZH}	Clock		19	30		27	40		
t_{PZL}	Clock		28	40		35	50		
t_{PHZ}	Clock	$C_L = 5 \text{ pF}, R_L = 667 \Omega,$ See Note 3	20	30		20	30	ns	
t_{PLZ}	Clock		15	25		15	25		

t_{PLH} = propagation delay time, low-to-high-level output

t_{PHL} = propagation delay time, high-to-low-level output

t_{PZH} = output enable time to high level

t_{PZL} = output enable time to low level

t_{PHZ} = output disable time from high level

t_{PLZ} = output disable time from low level

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

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TTL DEVICES

TYPES SN54LS605, SN54LS607, SN74LS605, SN74LS607

OCTAL 2-INPUT MULTIPLEXED LATCHES WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

	SN54LS605 SN54LS607			SN74LS605 SN74LS607			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC} (see Note 1)	4.5	5	5.5	4.75	5	5.25	V
High-level output voltage, V_{OH}	5.5			5.5			V
Low-level output current, I_{OL}	12			24			mA
Width of clock pulse, t_{W}	20			20			ns
Setup time, t_{SU}	20†			20†			ns
Hold time, t_H	0†			0†			ns
Operating free-air temperature, T_A	-55			125			0
				70			°C

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

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

PARAMETER	TEST CONDITIONS†	SN54LS605 SN54LS607			SN74LS605 SN74LS607			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH} High-level input voltage		2			2			V
V_{IL} Low-level input voltage		0.7			0.8			V
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$	-1.5			-1.5			V
I_{OH} High-level output current	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, V_{OH} = 5.5 \text{ V}$	250			250			μA
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 12 \text{ mA}$	0.25	0.4	0.25	0.4	V	
		$I_{OL} = 24 \text{ mA}$				0.35	0.5	
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7 \text{ V}$	A, B	0.1			0.1	mA	
		CLK, SELECT	0.1			0.1		
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$	A, B	20			20	μA	
		CLK, SELECT	20			20		
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$	A, B	-0.4			-0.4	mA	
		CLK, SELECT	-0.2			-0.2		
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 2	40	60	40	60	mA		

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

‡ All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

NOTE 2: I_{CC} is tested with all inputs grounded and all outputs open.

switching characteristics, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

PARAMETER	FROM (INPUT)	TEST CONDITIONS	'LS605			'LS607			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Select A/B	$C_L = 45 \text{ pF}, R_L = 667 \Omega,$ See Note 3	28	40	51	70	ns		
t_{PHL}	(Data: A = H, B = L)		28	40	21	30			
t_{PLH}	Select A/B		39	60	28	40	ns		
t_{PHL}	(Data: A = L, B = H)		25	40	28	40			
t_{PLH}	Clock		27	40	30	45	ns		
t_{PHL}			25	40	32	45			

t_{PLH} = propagation delay time, low-to-high-level output

t_{PHL} = propagation delay time, high-to-low-level output

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

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