

SN54259, SN54LS259B, SN74259, SN74LS259B 8-BIT ADDRESSABLE LATCHES

DECEMBER 1983 — REVISED MARCH 1988

- 8-Bit Parallel-Out Storage Register Performs Serial-to-Parallel Conversion with Storage
- Asynchronous Parallel Clear
- Active High Decoder
- Enable/Disable Input Simplified Expansion
- Expandable for N-Bit Applications
- Four Distinct Functional Modes
- Package Options Include Ceramic Chip Carriers and Flat Packages in Addition to Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

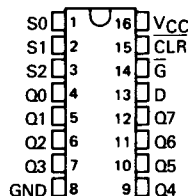
These 8-bit addressable latches are designed for general purpose storage applications in digital systems. Specific uses include working registers, serial-holding registers, and active-high decoders or demultiplexers. They are multifunctional devices capable of storing single-line data in eight addressable latches, and being a 1-of-8 decoder or demultiplexer with active-high outputs.

Four distinct modes of operation are selectable by controlling the clear (CLR) and enable (\bar{G}) inputs as enumerated in the function table. In the addressable-latch mode, data at the data-in terminal is written into the addressed latch. The addressed latch will follow the data input with all unaddressed latches remaining in their previous states. In the memory mode, all latches remain in their previous states and are unaffected by the data or address inputs. To eliminate the possibility of entering erroneous data in the latches, enable \bar{G} should be held high (inactive) while the address lines are changing. In the 1-of-8 decoding or demultiplexing mode, the addressed output will follow the level of the D input with all other outputs low. In the clear mode, all outputs are low and unaffected by the address and data inputs.

The SN54259 and SN54LS259B are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74259 and SN74LS259B are characterized for operation from 0°C to 70°C .

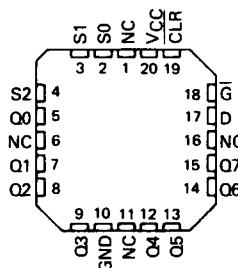
SN54259, SN54LS259B . . . J OR W PACKAGE
SN74259 . . . N PACKAGE
SN74LS259B . . . D OR N PACKAGE

(TOP VIEW)



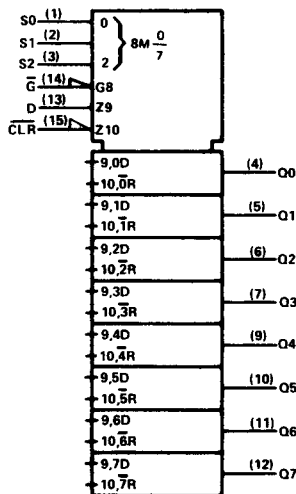
SN54LS259B . . . FK PACKAGE

(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.

PRODUCTION DATA documents contain 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

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

2

TTL Devices

SN54259, SN54LS259B, SN74259, SN74LS259B

8-BIT ADDRESSABLE LATCHES

FUNCTION TABLE

INPUTS		OUTPUT OF ADDRESSED LATCH	EACH OTHER OUTPUT	FUNCTION
CLR	\bar{G}			
H	L	D	Q_{i0}	Addressable Latch
H	H	Q_{i0}	Q_{i0}	Memory
L	L	D	L	8-Line Demultiplexer
L	H	L	L	Clear

H \equiv high level, L \equiv low level

D \equiv the level at the data input

Q_{i0} \equiv the level of Q_i ($i = 0, 1, \dots, 7$, as appropriate) before the indicated steady-state input conditions were established.

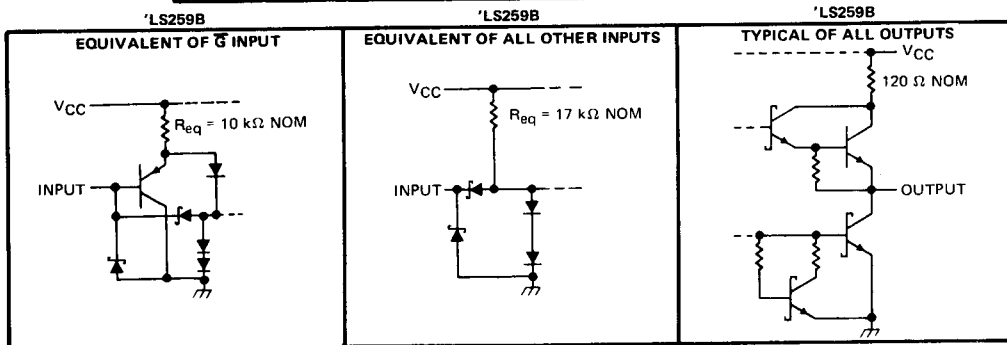
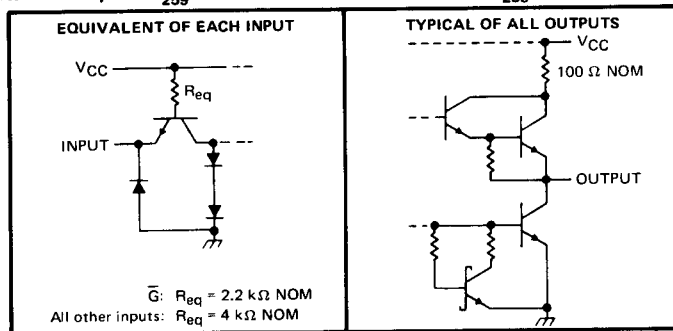
LATCH SELECTION TABLE

SELECT INPUTS			LATCH ADDRESSED
S2	S1	S0	
L	L	L	0
L	L	H	1
L	H	L	2
L	H	H	3
H	L	L	4
H	L	H	5
H	H	L	6
H	H	H	7

schematic of inputs and outputs

2

TTL Devices



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

Supply voltage (see Note 1)	7 V
Input voltage: SN54259, SN74259	5.5 V
SN54LS259B, SN74LS259B	7 V
Operating free-air temperature range: SN54259, SN54LS259B	-55°C to 125°C
SN74259, SN74LS259B	0°C to 70°C
Storage temperature range	-65°C to 150°C

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

Pin Descriptions

T 51 00 07

SN54LS259B, SN74LS259B 8-BIT ADDRESSABLE LATCHES

recommended operating conditions

	SN54LS259B			SN74LS259B			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	\bar{G} low		17			17	ns
	CLR low		10			10	
t _{su} Set up time	Data before \bar{G} ↑		20			20	ns
	Address before \bar{G} ↑		17			17	
	Address before \bar{G} ↓		0			0	
	Data after \bar{G} ↑		0			0	
t _h Hold time	Data after \bar{G} ↑		0			0	ns
	Address after \bar{G} ↑		0			0	
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†	SN54LS259B		SN74LS259B		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 _{IH} = 2 V, 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, V _{IL} = MAX, I _{OL} = 4 mA		0.25	0.4		0.25	0.4	V
	I _{OL} = 8 mA					0.35	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			-0.4		-0.4	mA	
I _{OS} §	V _{CC} = MAX	-20	-100		-20	-100	mA	
I _{CC}	V _{CC} = MAX, See Note 2		27	36		22	36	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 duration short-circuit should not exceed one second.

NOTE 2: I_{CC} is measured with the inputs grounded and the outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT	
t _{PHL}	CLR	Any Q	C _L = 15 pF, See Note 3	R _L = 2 kΩ,		12	18	ns	
t _{PLH}	Data	Any Q					19	30	ns
t _{PHL}							13	20	
t _{PLH}	Address	Any Q					17	27	ns
t _{PHL}							14	20	
t _{PLH}	\bar{G}	Any Q					15	24	ns
t _{PHL}							15	24	

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

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

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

2

TTL Devices