

Distributed by:



www.Jameco.com ♦ 1-800-831-4242

The content and copyrights of the attached
material are the property of its owner.

Jameco Part Number 47052TI

SN54194, SN54LS194A, SN54S194, SN74194, SN74LS194A, SN74S194 4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

MARCH 1974—REVISED MARCH 1988

- Parallel Inputs and Outputs
- Four Operating Modes:
Synchronous Parallel Load
Right Shift
Left Shift
Do Nothing
- Positive Edge-Triggered Clocking
- Direct Overriding Clear

TYPE	TYPICAL MAXIMUM CLOCK FREQUENCY	TYPICAL POWER DISSIPATION
'194	36 MHz	195 mW
'LS194A	36 MHz	75 mW
'S194	105 MHz	425 mW

description

These bidirectional shift registers are designed to incorporate virtually all of the features a system designer may want in a shift register. The circuit contains 46 equivalent gates and features parallel inputs, parallel outputs, right-shift and left-shift serial inputs, operating-mode-control inputs, and a direct overriding clear line. The register has four distinct modes of operation, namely:

- Inhibit clock (do nothing)
- Shift right (in the direction Q_A toward Q_D)
- Shift left (in the direction Q_D toward Q_A)
- Parallel (broadside) load

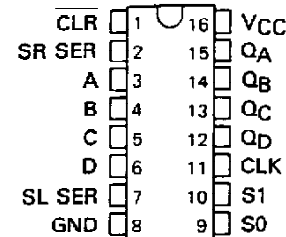
Synchronous parallel loading is accomplished by applying the four bits of data and taking both mode control inputs, S_0 and S_1 , high. The data are loaded into the associated flip-flops and appear at the outputs after the positive transition of the clock input. During loading, serial data flow is inhibited.

Shift right is accomplished synchronously with the rising edge of the clock pulse when S_0 is high and S_1 is low. Serial data for this mode is entered at the shift-right data input. When S_0 is low and S_1 is high, data shifts left synchronously and new data is entered at the shift-left serial input.

Clocking of the shift register is inhibited when both mode control inputs are low. The mode controls of the SN54194/SN74194 should be changed only while the clock input is high.

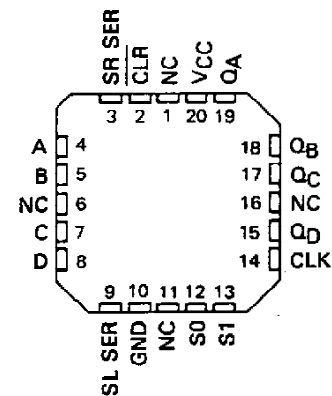
SN54194, SN54LS194A, SN54S194 . . . J OR W PACKAGE
SN74194 . . . N PACKAGE
SN74LS194A, SN74S194 . . . D OR N PACKAGE

(TOP VIEW)



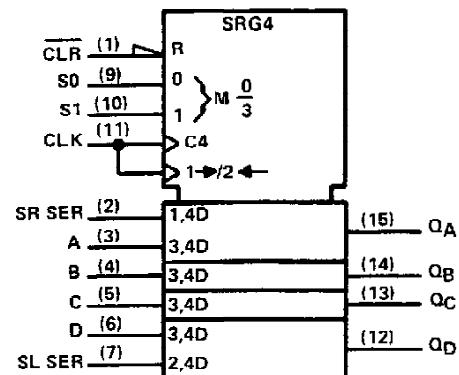
SN54LS194A, SN54S194 . . . FK PACKAGE

(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

**SN54194, SN54LS194A, SN54S194
SN74194, SN74LS194A, SN74S194
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS**

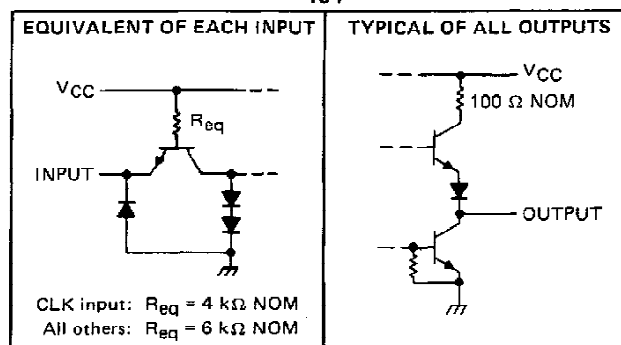
FUNCTION TABLE

INPUTS									OUTPUTS				
CLEAR	MODE		CLOCK	SERIAL		PARALLEL				Q _A	Q _B	Q _C	Q _D
	S1	S0		LEFT	RIGHT	A	B	C	D				
L	X	X	X	X	X	X	X	X	X	L	L	L	L
H	X	X	L	X	X	X	X	X	X	Q _{A0}	Q _{B0}	Q _{C0}	Q _{D0}
H	H	H	↑	X	X	a	b	c	d	a	b	c	d
H	L	H	↑	X	H	X	X	X	X	H	Q _{An}	Q _{Bn}	Q _{Cn}
H	L	L	↑	X	L	X	X	X	X	L	Q _{An}	Q _{Bn}	Q _{Cn}
H	H	L	↑	H	X	X	X	X	X	Q _{Bn}	Q _{Cn}	Q _{Dn}	H
H	H	L	↑	L	X	X	X	X	X	Q _{Bn}	Q _{Cn}	Q _{Dn}	L
H	L	L	X	X	X	X	X	X	X	Q _{A0}	Q _{B0}	Q _{C0}	Q _{D0}

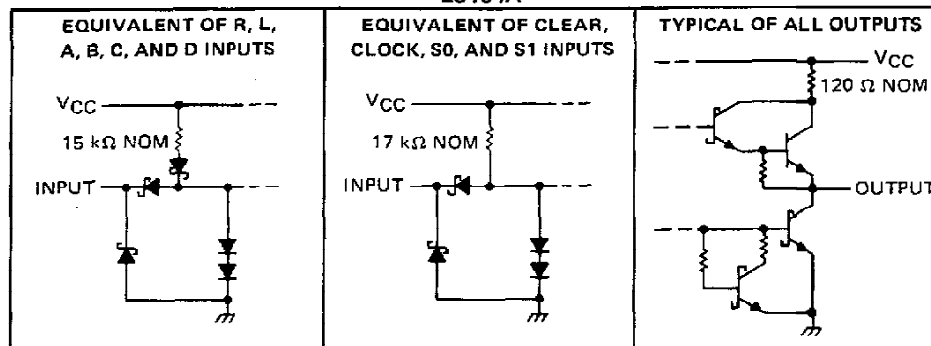
H = high level (steady state)
L = low level (steady state)
X = irrelevant (any input, including transitions)
↑ = transition from low to high level
a, b, c, d = the level of steady-state input at inputs A, B, C, or D, respectively.
Q_{A0}, Q_{B0}, Q_{C0}, Q_{D0} = the level of Q_A, Q_B, Q_C, or Q_D, respectively, before the indicated steady-state input conditions were established.
Q_{An}, Q_{Bn}, Q_{Cn}, Q_{Dn} = the level of Q_A, Q_B, Q_C, respectively, before the most-recent ↑ transition of the clock.

schematics of inputs and outputs

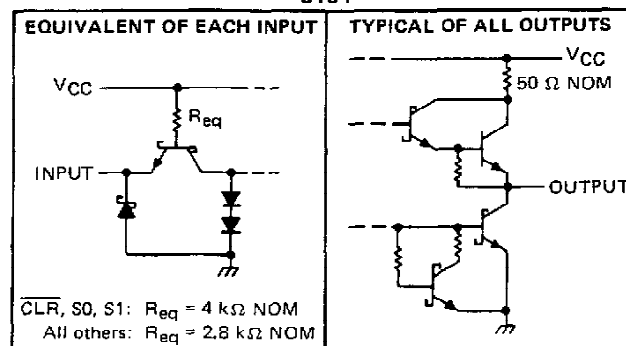
'194



'LS194A



'S194

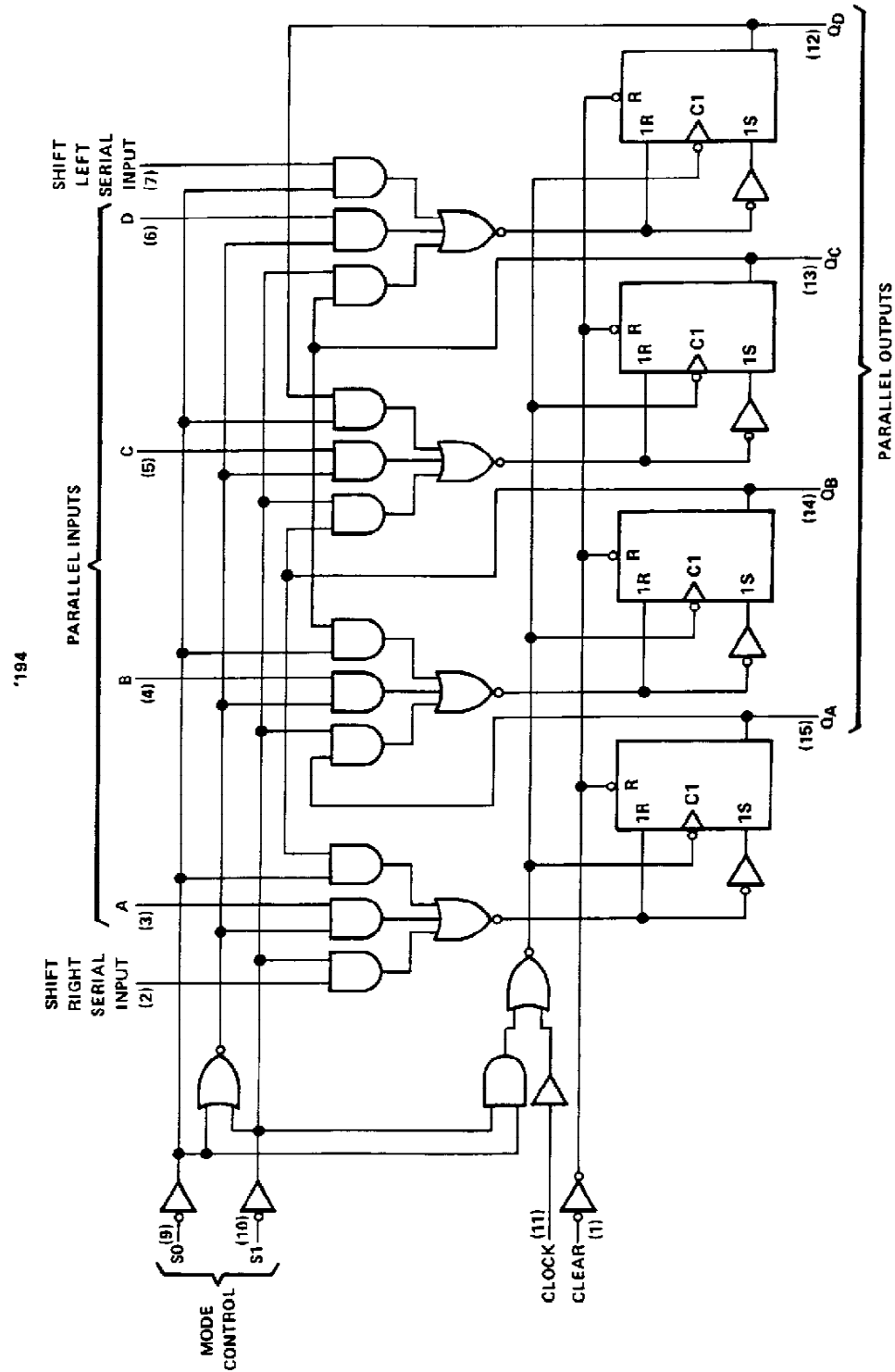


**TEXAS
INSTRUMENTS**

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

SN54194, SN74194
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

logic diagrams (positive logic)



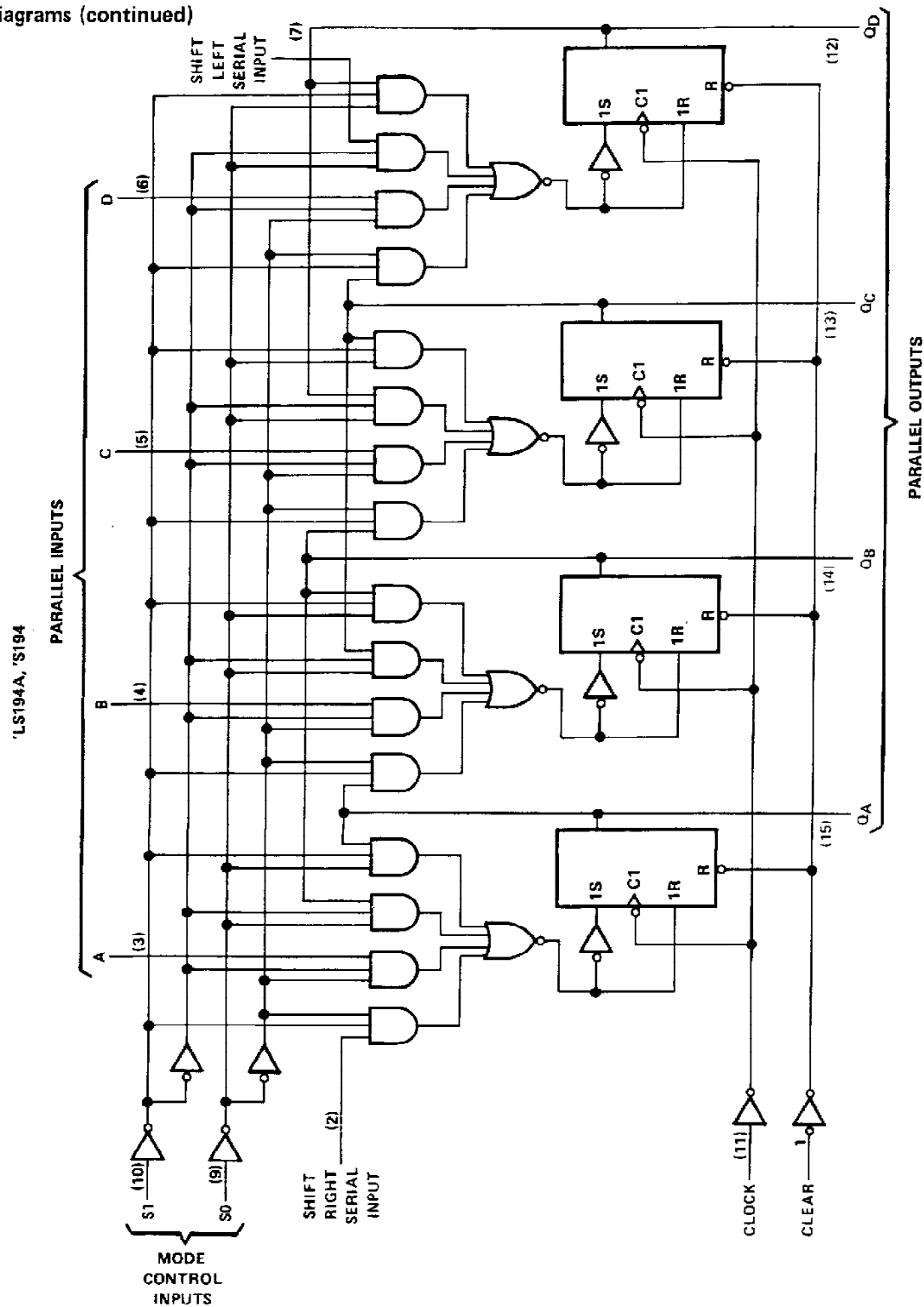
Pin numbers shown are for D, J, N, and W packages.

TEXAS
INSTRUMENTS

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

SN54LS194A, SN54S194
SN74LS194A, SN74S194
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

logic diagrams (continued)



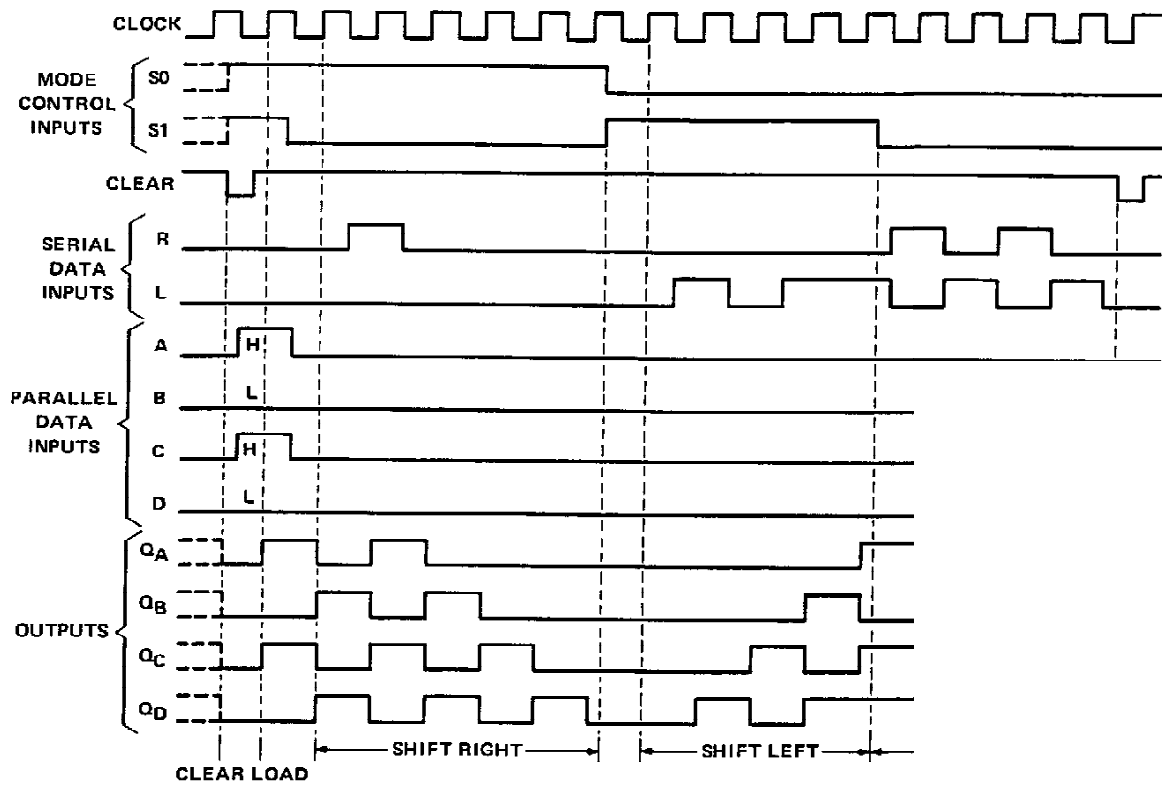
Pin numbers shown on logic notation are for D, J, and N, and W packages.

TEXAS
INSTRUMENTS

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

SN54194, SN54LS194A, SN54S194,
SN74194, SN74LS194A, SN74S194
4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTERS

typical clear, load, right-shift, left-shift, inhibit, and clear sequences



TEXAS
INSTRUMENTS

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265