5-BIT SHIFT REGISTER

S5496
N7496

S5496-B,F,W • N7496-B, F

DIGITAL 54/74 TTL SERIES

DESCRIPTION

This shift register consists of five R-S master-slave flip-flops connected to perform parallel-to-serial or serial-to-parallel conversion of binary data. Since both inputs and outputs to all flip-flops are accessible, parallel-in/parallel-out or serial-in/serial-out operation may be performed.

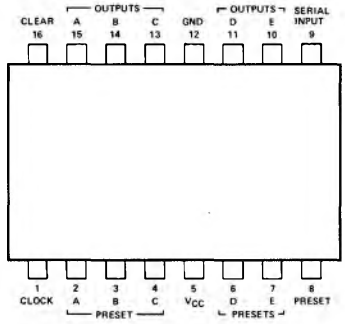
All flip-flops are simultaneously set to the logical 0 state by applying a logical 0 voltage to the clear input. This condition may be applied independent of the state of the clock input.

The flip-flops may be independently set to the logical 1 state by applying a logical 1 to both the preset input of the specific flip-flop and the common preset input. The common preset input is provided to allow flexibility of either setting each flip-flop independently or setting two or more flip-flops simultaneously. Preset is also independent of the state of the clock input or clear input.

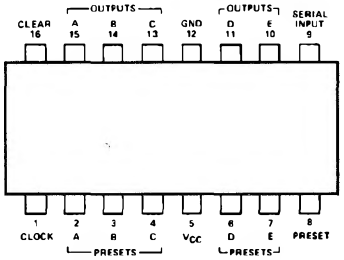
Transfer of information to the output pins occurs when the clock input goes from a logical 0 to a logical 1. Since the flip-flops are R-S master-slave circuits, the proper information must appear at the R-S inputs of each flip-flop prior to the rising edge of the clock input voltage waveform. The serial input provides this information to the first flip-flop, while the outputs of the subsequent flip-flops provide information for the remaining R-S inputs. The clear input must be at a logical 1 and the preset input must be at a logical 0 when clocking occurs.

PIN CONFIGURATIONS

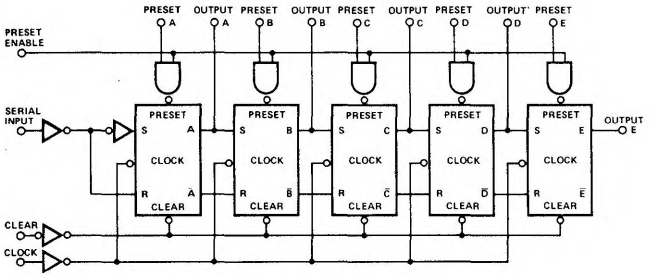
W PACKAGE



B,F PACKAGE



LOGIC DIAGRAM



RECOMMENDED OPERATING CONDITIONS

		MIN	TYP	MAX	UNIT
Supply Voltage V_{CC} (See Note 1):	S5496 Circuits	4.5	5	5.5	V
	N7496 Circuits	4.75	5	5.25	V
Normalized Fan-Out from Output				10	
Width of Clock Pulse, $t_{p(clock)}$		35			ns
Width of Clear Pulse, $t_{p(clear)}$		30			ns
Width of Preset Pulse, $t_{p(preset)}$		30			ns
Serial Input Setup Time, t_{setup}		30			ns
Serial Input Hold Time, t_{hold}		0			ns

NOTE: 1. This voltage value is with respect to network ground terminal.

ELECTRICAL CHARACTERISTICS (over recommended operating free-air temperature range unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
$V_{in(1)}$	Input voltage required to ensure logical 1 at any input terminal	V_{CC} = MIN		2			V
$V_{in(0)}$	Input voltage required to ensure logical 0 at any input terminal	V_{CC} = MIN				0.8	V
$V_{out(1)}$	Logical 1 output voltage	V_{CC} = MIN, I_{load} = -400μA		2.4	3.5		V
$V_{out(0)}$	Logical 0 output voltage	V_{CC} = MIN, I_{sink} = 16mA			0.22	0.4	V
$I_{in(1)}$	Logical 1 level input current at any input except preset (pin (8))	V_{CC} = MAX, V_{in} = 2.4V				40	μA
		V_{CC} = MAX, V_{in} = 5.5V				1	mA
$I_{in(1)}$	Logical 1 level input current at preset (pin (8))	V_{CC} = MAX, V_{in} = 2.4V				200	μA
		V_{CC} = MAX, V_{in} = 5.5V				1	mA
$I_{in(0)}$	Logical 0 level input current at any input except preset (pin (8))	V_{CC} = MAX, V_{in} = 0.4V				-1.6	mA
$I_{in(0)}$	Logical 0 level input current at preset (pin (8))	V_{CC} = MAX, V_{in} = 0.4V				-8	mA
I_{OS}	Short-circuit output current†	V_{CC} = MAX, V_{out} = 0	S5496	-20		-57	mA
			N7496	-18		-57	mA
I_{CC}	Supply current	V_{CC} = MAX	S5496		48	68	mA
			N7496		48	79	mA

SWITCHING CHARACTERISTICS, V_{CC} = 5V, T_A = 25°C, N = 10

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
f_{max}	Maximum clock frequency	C_L = 15pF,	R_L = 400Ω	10			MHz
t_{pd1}	Propagation delay time to logical 1 level from clock to output	C_L = 15pF,	R_L = 400Ω		25	40	ns
t_{pd0}	Propagation delay time to logical 0 level from clock to output	C_L = 15pF,	R_L = 400Ω		25	40	ns
t_{pd1}	Propagation delay time to logical 1 level from preset to output	C_L = 15pF,	R_L = 400Ω			35	ns
t_{pd0}	Propagation delay time to logical 0 level from preset to output	C_L = 15pF,	R_L = 400Ω		28	40	ns
t_{pd0}	Propagation delay time to logical 0 level from clear to output	C_L = 15pF,	R_L = 400			55	ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable circuit type.

** All typical values are at V_{CC} = 5V, T_A = 25°C.

† Not more than one output should be shorted at a time.