TTL MSI

DM5495/DM7495(SN5495/SN7495)
4-bit right-shift left-shift register

general description

The DM5495/DM7495 is a TTL (Transistor-Transistor Logic) monolithic four-bit parallel-in parallel-out shift register employing four R-S master-slave flip flops, internal clock buffers and control gating for either right-shift or left-shift operation. Separate clocks are provided for right-shift and left-shift operation. A mode control input enables right-shift or left-shift operation, depending on whether its input is a zero or one
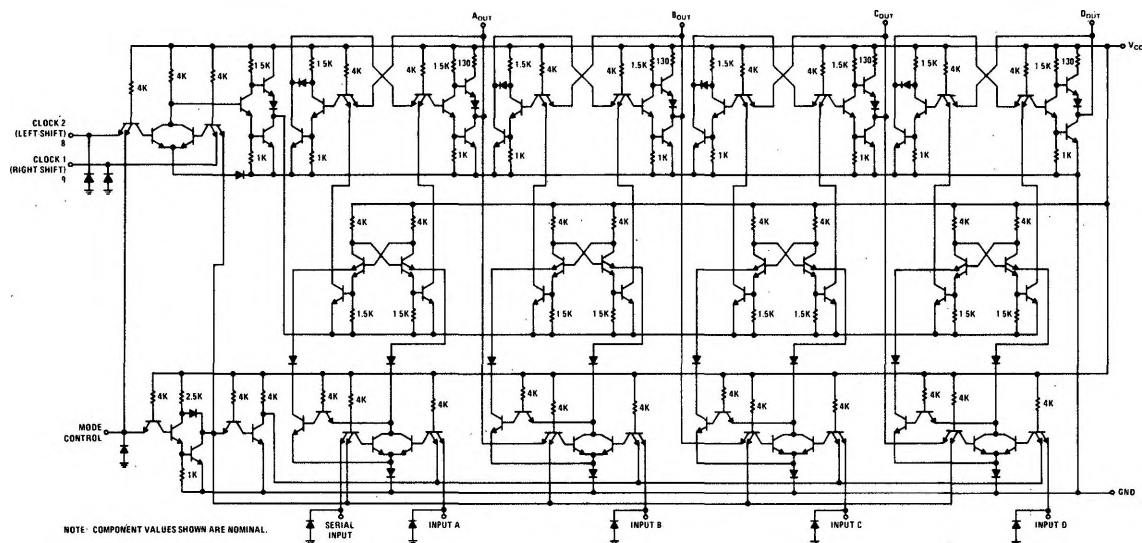
respectively. Data transfer occurs on the negative transition of the clock pulse. The three modes of operation are explained on page 4.
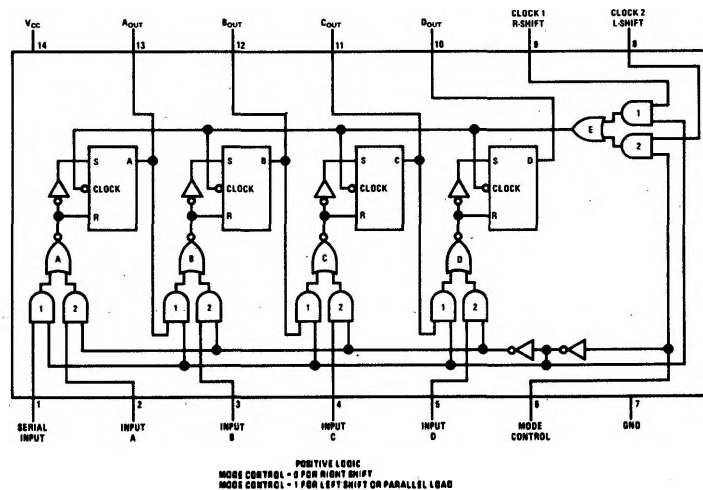
Features include:

- Input Clamping Diodes
- Typical Noise Immunity   1.0V
- High Clock Rate   35 MHz

schematic diagram

NOTE: COMPONENT VALUES SHOWN ARE NOMINAL.

logic and connection diagram

POSITIVE LOGIC
MODE CONTROL = 0 FOR RIGHT SHIFT
MODE CONTROL = 1 FOR LEFT SHIFT OR PARALLEL LOAD

absolute maximum ratings

Supply Voltage		7V
Input Voltage		5.5V
Operating Temperature Range	DM5495	–55°C to +125°C
	DM7495	0°C to +70°C
Storage Temperature Range		–65°C to +150°C
Lead Temperature (Soldering, 10 sec)		300°C

electrical characteristics (Note 1)

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
Logical "1" Input Voltage	DM5495	V_{CC} = 4.5V	2			V
	DM7495	V_{CC} = 4.75V				
Logical "0" Input Voltage	DM5495	V_{CC} = 4.5V			0.8	V
	DM7495	V_{CC} = 4.75				
Logical "1" Output Voltage	DM5495	V_{CC} = 4.5V	2.4			V
	DM7495	V_{CC} = 4.75V, I_{load} = –400 μA				
Logical "0" Output Voltage	DM5495	V_{CC} = 4.5V			0.4	V
	DM7495	V_{CC} = 4.75V, I_{sink} = 16 mA				
Logical "0" Input Current (at any Input Except Mode Control)	DM5495	V_{CC} = 5.5V			–1.6	mA
	DM7495	V_{CC} = 5.25V, V_{IN} = 0.4V				
Logical "0" Input Current at Mode Control	DM5495	V_{CC} = 5.5V			–3.2	mA
	DM7495	V_{CC} = 5.25V, V_{IN} = 0.4V				
Logical "1" Input Current (at any Input Except Mode Control)	DM5495	V_{CC} = 5.5V			40	μA
	DM7495	V_{CC} = 5.25V, V_{IN} = 2.4V				
	DM5495	V_{CC} = 5.5V			1	mA
	DM7495	V_{CC} = 5.25V, V_{IN} = 5.5V				
Logical "1" Input Current at Mode Control	DM5495	V_{CC} = 5.5V			80	μA
	DM7495	V_{CC} = 5.25V, V_{IN} = 2.4V				
	DM5495	V_{CC} = 5.5V			1	mA
	DM7495	V_{CC} = 5.25V, V_{IN} = 5.5V				
Short-Circuit Output Current (Note 2)	DM5495	V_{CC} = 5.5V	–18		–57	mA
	DM7495	V_{CC} = 5.25V				
Supply Current	DM5495	V_{CC} = 5.5V		50	80	mA
	DM7495	V_{CC} = 5.25V				
Input Diode Clamp Voltage		T_A = 25°C, I_{IN} = –12 mA, V_{CC} = 5.0V			–1.5	V

switching characteristics

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Maximum Shift Frequency	C_L = 50 pF, R_L = 400Ω	20	35		MHz
Propagation Delay Time to Logical "1" Level from Clock 1 or 2 to Outputs	C_L = 50 pF, R_L = 400Ω		26	35	ns
Propagation Delay Time to Logical "0" from Clock 1 or 2 to Outputs	C_L = 50 pF, R_L = 400Ω		24	35	ns

Note 1: Min/Max limits apply across the guaranteed operating temperature range of –55°C to +125°C for the DM5495 and 0°C to 70°C for the DM7495 unless otherwise specified. All typicals are given for T_A = 25°C and V_{CC} = 5.0V.

Note 2: Not more than one output should be shorted at a time.

recommended operating conditions

| OPERATING CONDITIONS		MIN	TYP	MAX	UNITS
Supply Voltage	DM5495	4.5	5	5.5	V
	DM7495	4.75	5	5.25	V
Clock Pulse Width, $t_{p\ (clock)}$		15	10		ns
Setup Time Required at Serial, A,B,C, or D Inputs, t_{setup}		20	10		ns
Hold Time Required at Serial, A,B,C, or D Inputs, t_{hold}		0	-10		ns
Logical "0" Level Setup Time Required at Mode Control $t_{A(0)}$ (With Respect to Clock 1 Input)		20			ns
Logical "1" Level Setup Time Required at Mode Control $t_{B(1)}$ (With Respect to Clock 2 Input)		15			ns
Logical "0" Level Setup Time Required at Mode Control $t_{C(0)}$ (With Respect to Clock 2 Input)		10			ns
Logical "1" Level Setup Time Required at Mode Control $t_{D(1)}$ (With Respect to Clock 1 Input)		10			ns

typical performance characteristics
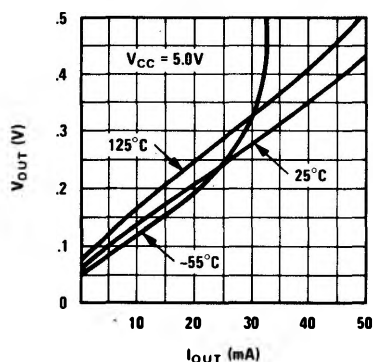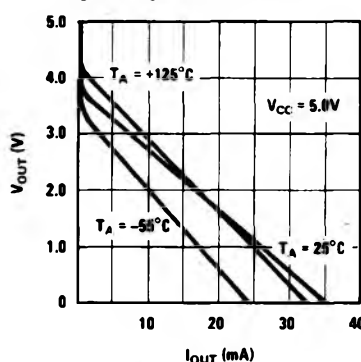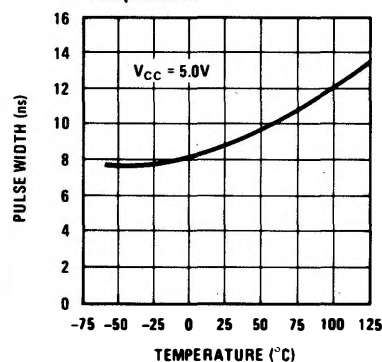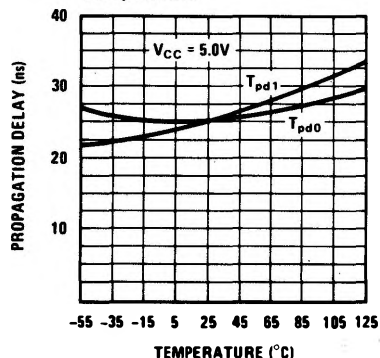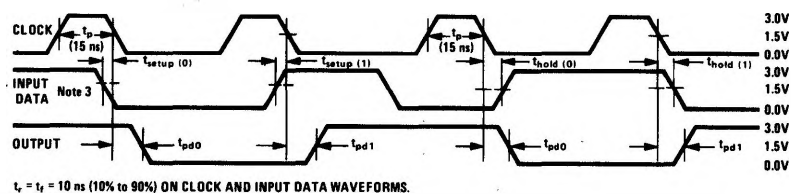

ac test circuit
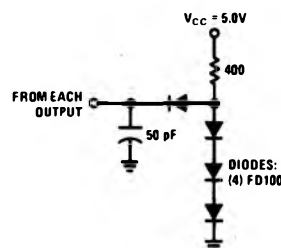
switching time waveforms

$t_r = t_f = 10$ ns (10% to 90%) ON CLOCK AND INPUT DATA WAVEFORMS.

Note 3: Input data is applied to serial input when mode control equals a logical zero. Input data is applied to input A, B, C, or D, when mode control equals a logical one.

87