8-Bit Serial Shift Registers

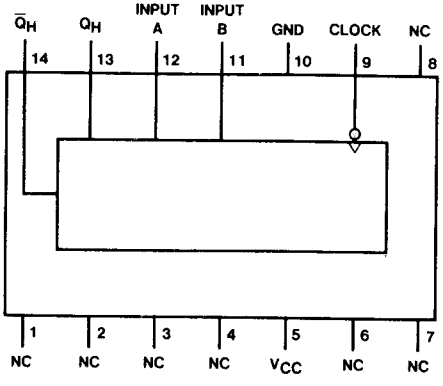
General Description

These serial-in, serial-out 8-bit shift registers are composed of eight R-S master-slave flip-flops, input gating, and a clock driver. Single-rail data and input control are gated through inputs A and B and an internal inverter to form the complementary inputs to the first bit of the shift-register. Drive for the internal common clock line is provided by an inverting clock driver. This clock pulse inverter/driver causes these circuits to shift information one bit on the positive edge of an input clock pulse.

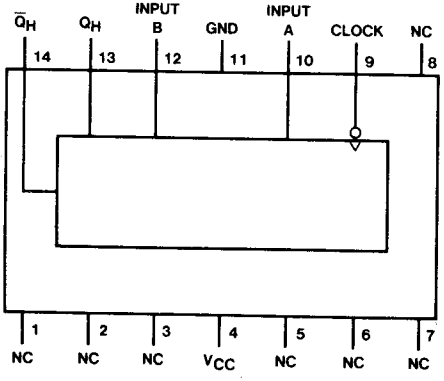
Features

Type	Typical Clock Frequency	Typical Power Dissipation
91A	22 MHz	175 mW
L91	8 MHz	17.5 mW

Connection Diagrams



54L91 (J); 74L91 (N)



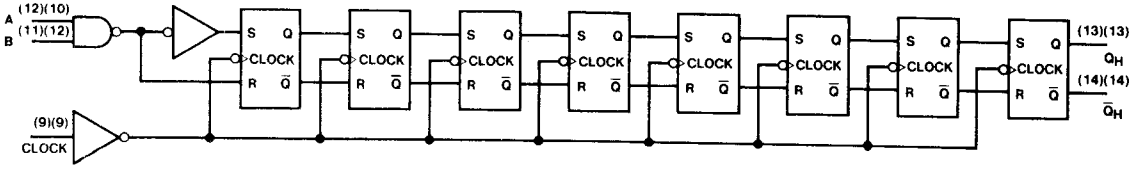
54L91/74L91 (W)

Truth Table

Inputs AT t_n		Outputs AT t_{n+8}	
A	B	Q_H	$\overline{Q}_H$
H	H	H	L
L	X	L	H
X	L	L	H

H = High, L = Low
X = Don't Care
t_n = Reference bit time, clock low.
t_{n+8} = Bit time after 8 low-to-high clock transitions.

Logic Diagram



Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

Parameter		Conditions		DM54/74 L91 Min	DM54/74 L91 Typ(1)	DM54/74 L91 Max	Units
V_{IH}	High Level Input Voltage			2			V
V_{IL}	Low Level Input Voltage					0.7	V
I_{OH}	High Level Output Current					−200	μA
V_{OH}	High Level Output Voltage	V_{CC} = Min, V_{IH} = 2 V V_{IL} = Max, I_{OH} = Max		2.4	2.8		V
I_{OL}	Low Level Output Current		DM54			2	mA
			DM74			3.6	
V_{OL}	Low Level Output Voltage	V_{CC} = Min, V_{IH} = 2 V V_{IL} = Max, I_{OL} = Max	DM54		0.15	0.3	V
			DM74		0.2	0.4	
I_I	Input Current at Maximum Input Voltage	V_{CC} = Max, V_I = 5.5 V				0.1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4 V				10	μA
I_{IL}	Low Level Input Current	V_{CC} = Max	V_I = 0.3 V			−0.18	mA
			V_I = 0.4 V				
I_{OS}	Short Circuit Output Current	V_{CC} = Max (2)	DM54	−3	−8	−15	mA
			DM74	−3	−8	−15	
I_{CC}	Supply Current	V_{CC} =Max (3)	DM54		3.5	6.6	mA
			DM74		3.5	6.6	

Note 1: All typical values are at V_{CC} = 5 V, T_A = 25°C.
Note 2: Not more than one output should be shorted at a time.
Note 3: I_{CC} is measured after the eighth clock pulse with the output open and A and B inputs grounded.

Switching Characteristics V_{CC} = 5 V, T_A = 25°C

Parameter		Conditions	DM54/74 L91 Min	DM54/74 L91 Typ	DM54/74 L91 Max	Units
f_{max}	Maximum Clock Frequency	C_L = 50 pF R_L = 4 kΩ	4	8		MHz
t_{PLH}	Propagation Delay Time, Low-to-High Level Output			40	80	ns
t_{PHL}	Propagation Delay Time, High-to-Low Level Output			65	130	ns
$t_{W(CLOCK)}$	Width of Clock Input Pulse		120			ns
t_{SETUP}	Setup Time		120			ns
t_{HOLD}	Hold Time		0			ns

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