HD74LS91 ●8-bit Shift Registers

This serial-in, serial-out, 8-bit shift register is composed of eight R-S master-slave flip-flops, input gating, and a clock drive. 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.

■FUNCTION TABLE

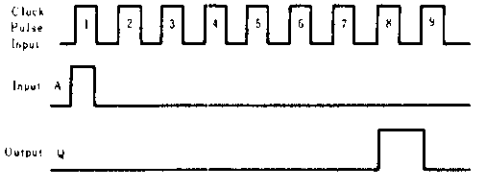
Inputs		Outputs	
t_n		t_{n+8}	
A	B	Q_H	$\overline{Q_H}$
H	H	H	L
L	X	L	H
X	L	L	H

Notes) H; high level, L; low level, X; irrelevant
t_n; Reference bit time, clock low
t_{n+8}; Bit time after 8 low-to-high clock transitions.

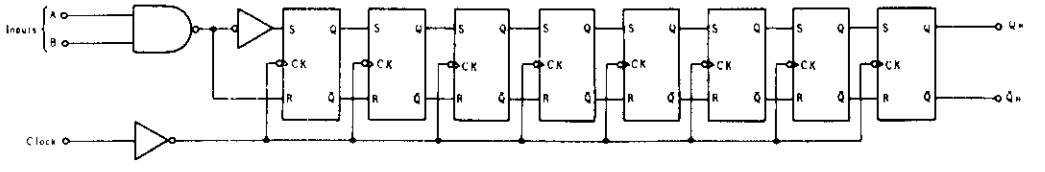
■RECOMMENDED OPERATING CONDITIONS

Item	Symbol	min	max	Unit
Clock pulse width	t_w	25	—	ns
Setup time	t_{su}	25	—	ns
Hold time	t_h	5	—	ns

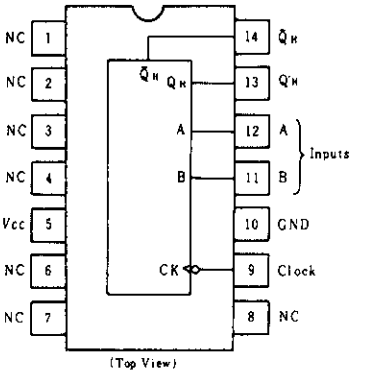
■TIMING CHART



■BLOCK DIAGRAM



■PIN ARRANGEMENT



■ELECTRICAL CHARACTERISTICS ($Ta = -20 \sim +75°C$)

Item	Symbol	Test Conditions		min	typ*	max	Unit
Input voltage	V_{IH}			2.0		—	V
	V_{IL}			—	—	0.8	V
Output voltage	V_{OH}	$V_{CC}=4.75V$, $V_{IH}=2V$, $V_{IL}=0.8V$, $I_{OH}=-400\mu A$		2.7		—	V
	V_{OL}	$V_{CC}=4.75V$, $V_{IH}=2V$, $V_{IL}=0.8V$	$I_{OL}=4mA$	—	—	0.4	V
			$I_{OL}=8mA$	—	—	0.5	
Input current	I_{IH}	$V_{CC}=5.25V$, $V_I=2.7V$		—	—	20	μA
	I_{IL}	$V_{CC}=5.25V$, $V_I=0.4V$				−0.4	mA
	I_I	$V_{CC}=5.25V$, $V_I=7V$		—	—	0.1	mA
Short circuit output current	I_{OS}	$V_{CC}=5.25V$		−20	—	−100	mA
Supply current	I_{CC}**	$V_{CC}=5.25V$		—	12	20	mA
Input clamp voltage	V_{IK}	$V_{CC}=4.75V$, $I_{IN}=-18mA$		—		−1.5	V

* V_{CC}=5V, Ta=25°C

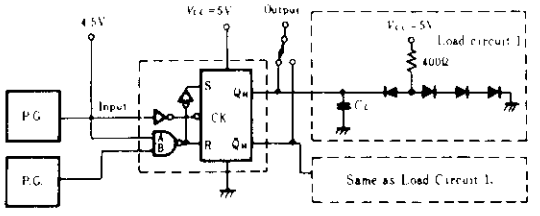
** I_{CC} is measured after the eighth clock pulse with the output open and A and B inputs grounded.

■SWITCHING CHARACTERISTICS ($V_{CC}=5V$, $Ta=25°C$)

Item	Symbol	Test Conditions	min	typ	max	Unit
Maximum clock frequency	f_{max}	$C_L=15pF$, $R_L=2k\Omega$	10	18	—	MHz
Propagation delay time	t_{PLH}		—	24	40	ns
	t_{PHL}		—	27	40	ns

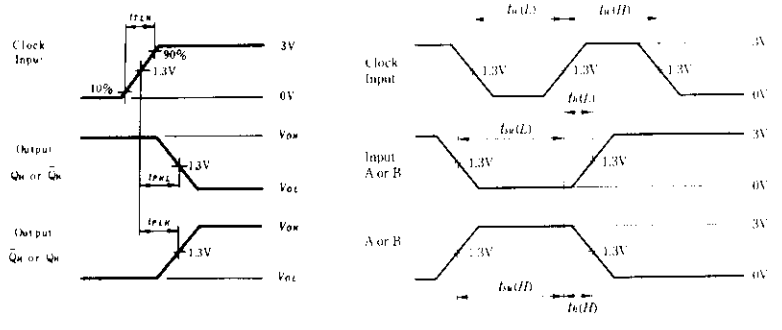
■TESTING METHOD

1) Test Circuit

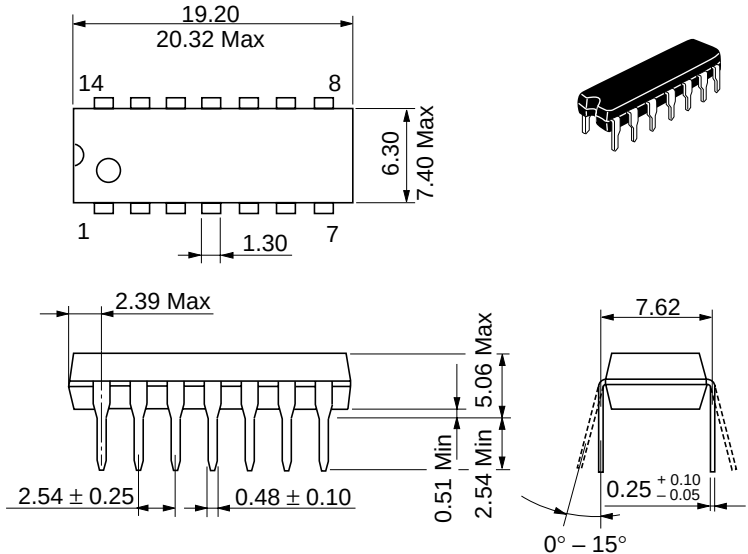


Notes) 1. Input pulse; $t_{TLH} \leqq 15ns$, $t_{THL} \leqq 6ns$, PRR=1MHz, duty cycle=50%
2. C_L includes probe and jig capacitance.
3. All diodes are 1S2074 Ⓗ.

Waveform

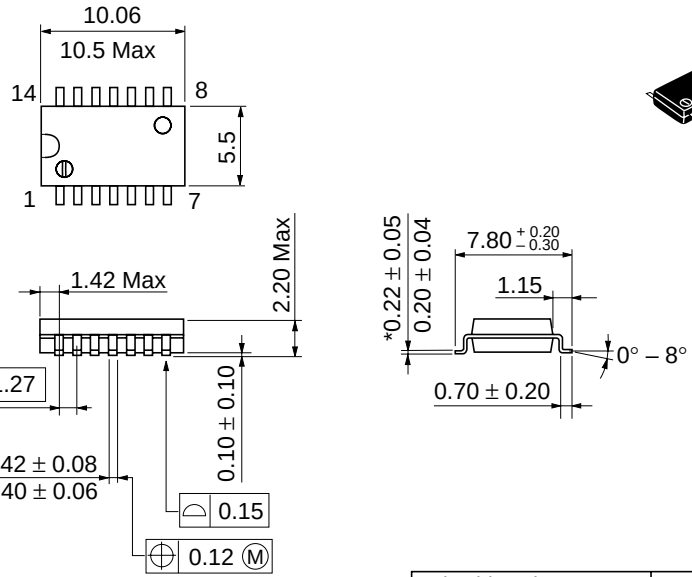


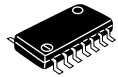
Unit: mm



Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.97 g

Unit: mm

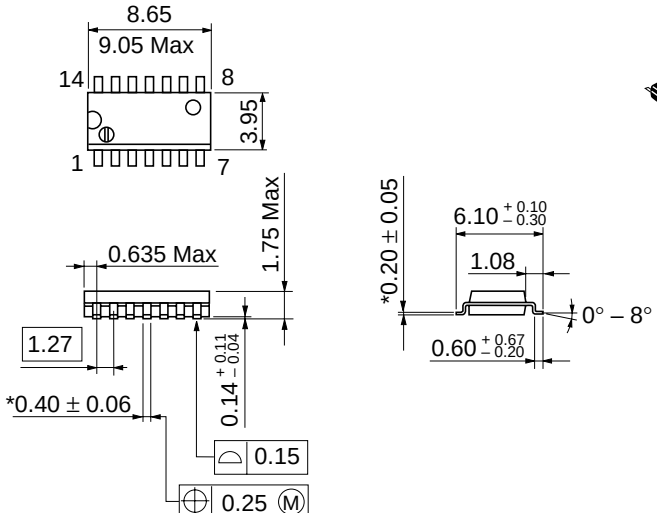




Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.23 g

*Dimension including the plating thickness
Base material dimension

Unit: mm



Hitachi Code	FP-14DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.13 g

*Pd plating

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