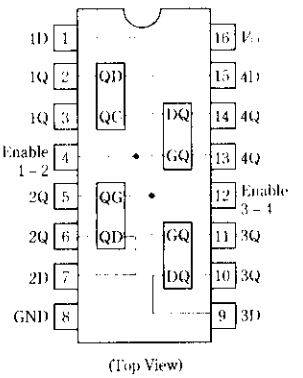
HD74LS375 ●Quadruple Bistable Latches

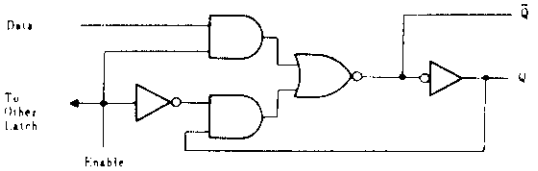
The HD74LS375 bistable latch is electrically and functionally identical to the HD74LS75, respectively. Only the arrangement of the terminals has been changed in the HD74LS375. This latch is ideally suited for use as temporary storage for binary information between processing units and input/output or indicator units. Information present at a data (D) input is transferred to the Q output when the enable (G) is high and the Q output will follow the data input as long as the enable remains high. When the enable goes low, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable goes high.

■PIN ARRANGEMENT



(Top View)

■BLOCK DIAGRAM (1/4)



■FUNCTION TABLE

Inputs		Outputs	
D	G	Q	$\bar{Q}$
L	H	L	H
H	H	H	L
×	L	Q_0	$\bar{Q}_0$

Notes) H; high level, L; low level, X; irrelevant
Q_0 level of Q before the indicated steady-state input conditions were established.
$\bar{Q}_0$ complement of Q_0 or level of $\bar{Q}$ before the indicated steady-state input conditions were established.

■RECOMMENDED OPERATING CONDITIONS

Item	Symbol	min	typ	max	Unit
Pulse width	t_w	20	—	—	ns
Setup time	t_{su}	20	—	—	ns
Hold time	t_h	5	—	—	ns

■ELECTRICAL CHARACTERISTICS (Ta=−20∼+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}=−400μA		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	D	—	—	20	μA
			G	—	—	80	
	I_{IL}	V_{CC}=5.25V, V_I=0.4V	D	—	—	−0.4	mA
			G	—	—	−1.6	
	I_I	V_{CC}=5.25V, V_I=7V	D	—	—	0.1	mA
			G	—	—	0.4	
Short-circuit output current	I_{OS}	V_{CC}=5.25V		−20	—	−100	mA
Supply current **	I_{CC}	V_{CC}=5.25V		—	6.3	12	mA
Input clamp voltage	V_{IK}	V_{CC}=4.75V, I_{IN}=−18mA		—	—	−1.5	V

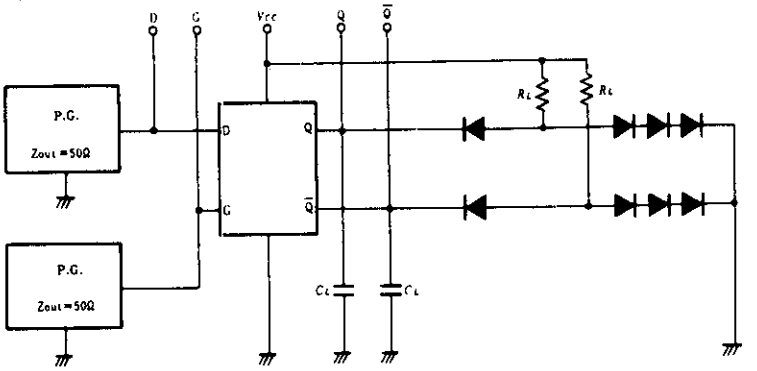
* V_{CC}=5V, Ta=25°C
** I_{CC} is measured with all outputs open and all inputs grounded.

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

Item	Symbol	Inputs	Outputs	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	D	Q	R_L=2kΩ C_L=15pF	—	15	27	ns
	t_{PHL}				—	9	17	
	t_{PLH}	D	$\overline{Q}$		—	12	20	
	t_{PHL}				—	7	15	
	t_{PLH}	G	Q		—	15	27	
	t_{PHL}				—	14	25	
	t_{PLH}	G	$\overline{Q}$		—	16	30	
	t_{PHL}				—	7	15	

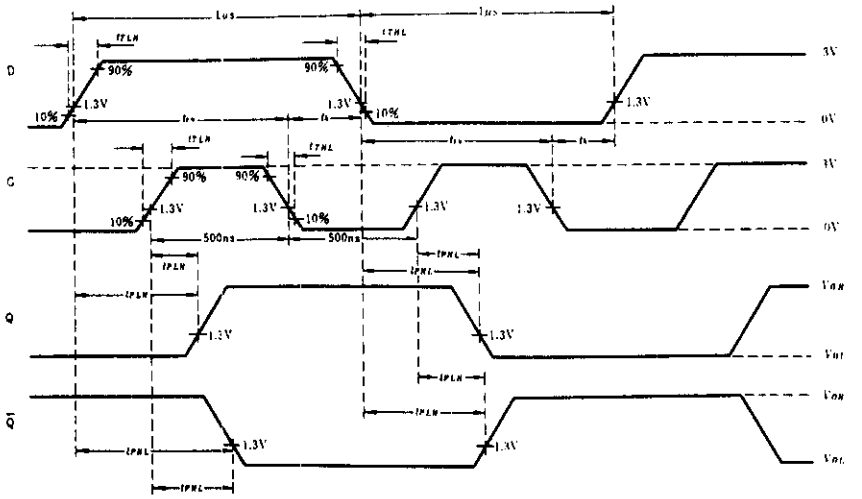
■TESTING METHOD

1) Test Circuit



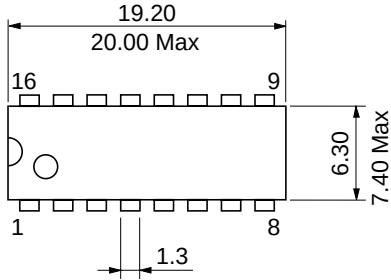
Notes) 1. Test is put into the each latch.
2. All diodes are 1S2074 Ⓗ.
3. C_L includes probe and jig capacitance.

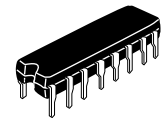
Waveform

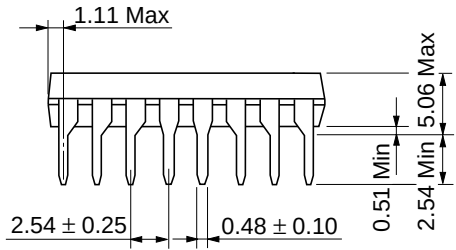


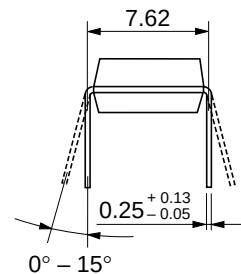
Notes) 1. Input pulse: D input: *PRR*=500kHz, G input: *PRR*=1MHz, $t_{THL} \leqq$ 10ns, $t_{TLH} \leqq$ 10ns.
2. When measuring propagation delay times from the D input, the corresponding G input must be held high.

Unit: mm



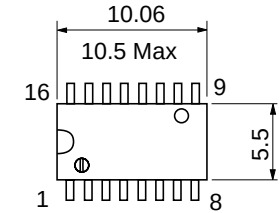


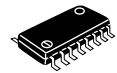


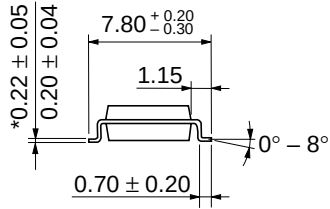


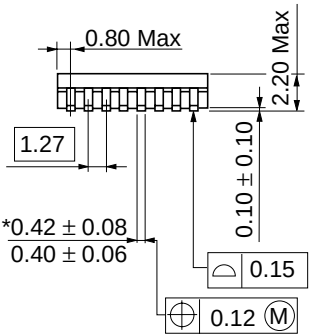
Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm





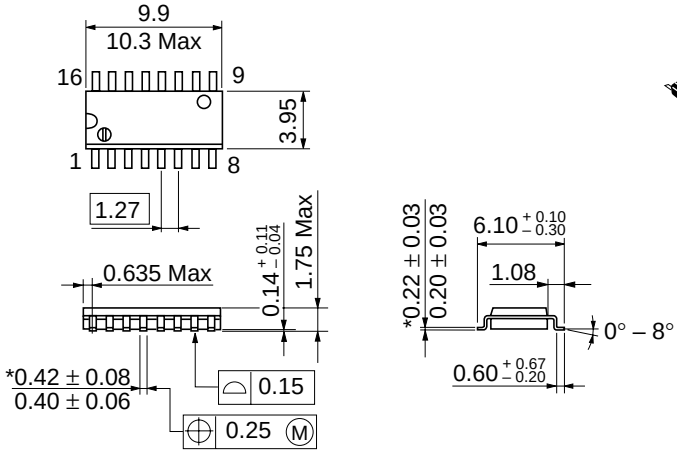


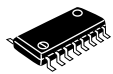


*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g

Unit: mm





Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

*Dimension including the plating thickness
Base material dimension

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