HD74HC123A

Dual Retriggerable Monostable Multivibrators (with Clear)

HITACHI

Description

This multivibrator features both a negative, A, and a positive, B, transition triggered input, either of which can be used as an inhibit input. Also included is a clear input that when taken low resets the one shot. The HD74HC123A can be triggered on the positive transition of the clear while A is held low and B is held high.

The HD74HC123A is retriggerable. That is it may be triggered repeatedly while their outputs are generating a pulse and the pulse will be extended.

Pulse width stability over a wide range of temperature. The output pulse equation is simply: t_w = (Rext) (Cext).

Features

- High Speed Operation
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC} = 2 to 6 V
- Low Input Current: 1 µA max
- Low Quiescent Supply Current

Function Table

Inputs			Outputs	
Clear	**A**	**B**	**Q**	**$\overline{Q}$**
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

Note: External timing capacitance connects between Cext and Rext/Cext.

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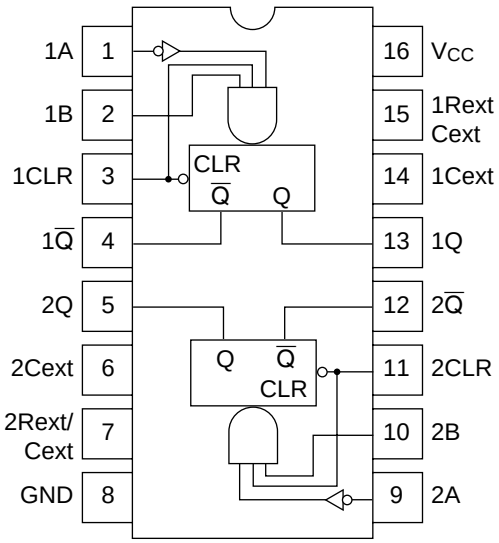
Pin Arrangement



(Top view)

DC Characteristics

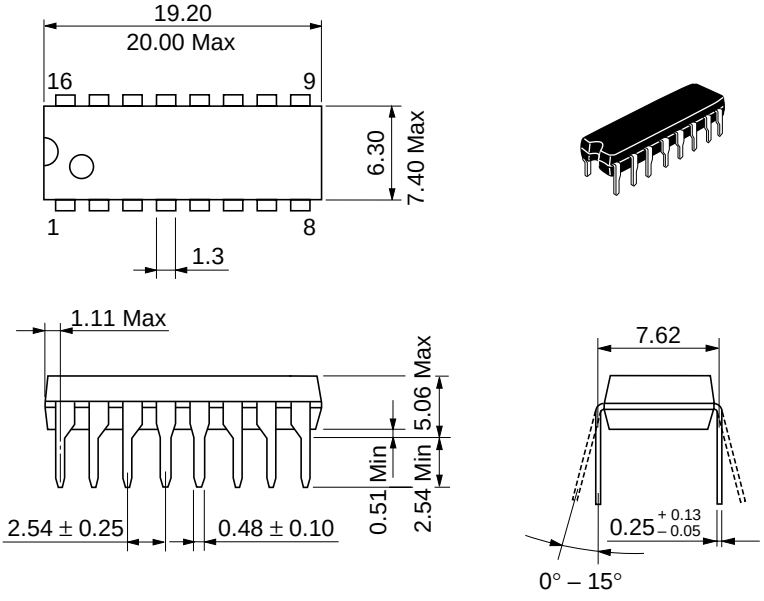
Item		Sym-bol	V_{CC} (V)	Ta = 25°C Min	Typ	Max	Ta = –40 to +85°C Min	Max	Unit	Test Conditions	
Input voltage		V_{IH}	2.0	1.5	—	—	1.5	—	V		
			4.5	3.15	—	—	3.15	—			
			6.0	4.2	—	—	4.2	—			
		V_{IL}	2.0	—	—	0.5	—	0.5	V		
			4.5	—	—	1.35	—	1.35			
			6.0	—	—	1.8	—	1.8			
Output voltage		V_{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V_{IH} or V_{IL}	I_{OH} = –20 µA
			4.5	4.4	4.5	—	4.4	—			
			6.0	5.9	6.0	—	5.9	—			
			4.5	4.18	—	—	4.13	—			I_{OH} = –4 mA
			6.0	5.68	—	—	5.63	—			I_{OH} = –5.2 mA
		V_{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V_{IH} or V_{IL}	I_{OL} = 20 µA
			4.5	—	0.0	0.1	—	0.1			
			6.0	—	0.0	0.1	—	0.1			
			4.5	—	—	0.26	—	0.33			I_{OL} = 4 mA
			6.0	—	—	0.26	—	0.33			I_{OL} = 5.2 mA
Input current		Iin	6.0	—	—	±0.1	—	±1.0	µA	Vin = V_{CC} or GND	
Quiescent	Standby state	I_{CC}	6.0	—	—	130	—	220	µA	Vin = V_{CC} or	Iout = 0 µA
supply current	Active state			—	—	130	—	220		GND	Rext/Cext = 0.5 V_{CC}

AC Characteristics (C_L = 50 pF, Input $t_r = t_f$ = 6 ns)

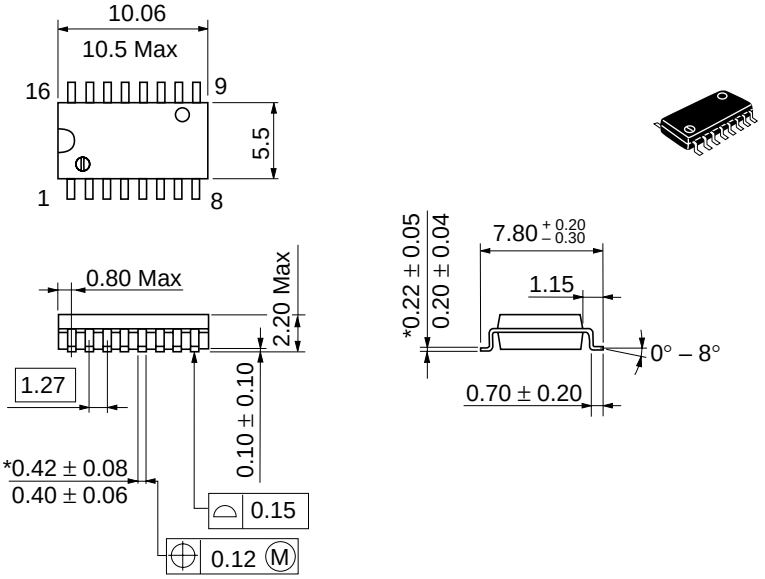
Item	Symbol	V_{cc} (V)	Ta = 25°C Min	Typ	Max	Ta = –40 to +85°C Min	Max	Unit	Test Conditions
Propagation delay time	t_{PLH}	2.0	—	—	210	—	265	ns	A, B or Clear to Q
		4.5	—	22	42	—	53		
		6.0	—	—	36	—	45		
	t_{PHL}	2.0	—	—	240	—	300	ns	A, B or Clear to $\overline{Q}$
		4.5	—	23	48	—	60		
		6.0	—	—	41	—	51		
	t_{PHL}	2.0	—	—	170	—	215	ns	Clear to Q
		4.5	—	18	34	—	43		
		6.0	—	—	29	—	37		
	t_{PLH}	2.0	—	—	180	—	225	ns	Clear to $\overline{Q}$
		4.5	—	16	36	—	45		
		6.0	—	—	31	—	38		
Output rise time	t_{TLH}	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Output fall time	t_{THL}	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Pulse width	t_w	2.0	150	—	—	190	—	ns	A, B, Clear
		4.5	30	6	—	38	—		
		6.0	26	—	—	33	—		
Minimum output pulse width	$t_{WQ(min)}$	2.0	—	1.5	—	—	—	µs	Cext = 28 pF, Rext = 6 kΩ
		4.5	—	450	—	—	—	ns	Rext = 2 kΩ
		6.0	—	380	—	—	—		
Output pulse width	t_{WQ}	4.5	—	1.0	—	—	—	ms	Cext = 0.1 µF, Rext = 10 kΩ
Input capacitance	Cin	—	—	5	10	—	10	pF	

Caution in use: In order to prevent any malfunctions due to noise, connect a high-frequency performance capacitor between V_{CC} and GND, and keep the wiring between the External components and Cext, Rext/Cext pins as short as possible.

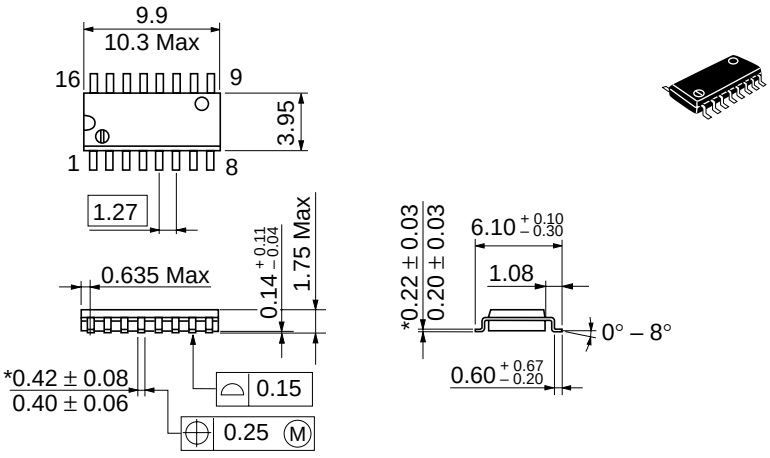
Unit: mm


19.20
20.00 Max
16
9
1
8
6.30
7.40 Max
1.3
1.11 Max
5.06 Max
2.54 Min
0.51 Min
2.54 ± 0.25
0.48 ± 0.10
7.62
0.25 + 0.13 − 0.05
0° – 15°

Unit: mm


10.06
10.5 Max
16
9
1
8
5.5
0.80 Max
2.20 Max
1.27
*0.42 ± 0.08
0.40 ± 0.06
0.10 ± 0.10
0.15
0.12 M
*0.22 ± 0.05
0.20 ± 0.04
7.80 +0.20 −0.30
1.15
0° – 8°
0.70 ± 0.20

Unit: mm


9.9
10.3 Max
16
9
1
8
3.95
1.27
0.635 Max
0.14 +0.11 −0.04
1.75 Max
*0.42 ± 0.08
0.40 ± 0.06
0.15
0.25 M
*0.22 ± 0.03
0.20 ± 0.03
6.10 +0.10 −0.30
1.08
0° – 8°
0.60 +0.67 −0.20

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