

# 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:  $t_w = (R_{ext}) (C_{ext})$ .

## 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  $\mu$ A max
- Low Quiescent Supply Current

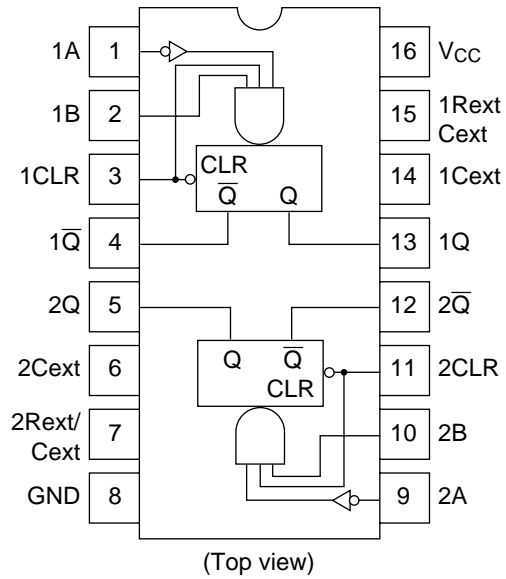
## Function Table

Inputs			Outputs	
Clear	A	B	Q	$\bar{Q}$
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  $C_{ext}$  and  $R_{ext}/C_{ext}$ .

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## Pin Arrangement



DC Characteristics

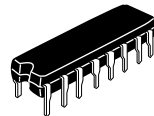
Item	Sym- bol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V <sub>OH</sub>	2.0	1.9	2.0	—	1.9	—	V	Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -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 <sub>OH</sub> = -4 mA
		6.0	5.68	—	—	5.63	—			I <sub>OH</sub> = -5.2 mA
	V <sub>OL</sub>	2.0	—	0.0	0.1	—	0.1	V	Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 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 <sub>OL</sub> = 4 mA
		6.0	—	—	0.26	—	0.33			I <sub>OL</sub> = 5.2 mA
Input current	lin	6.0	—	—	±0.1	—	±1.0	μA	Vin = V <sub>CC</sub> or GND	
Quiescent	Standby state	I <sub>CC</sub>	6.0	—	—	130	—	220	μA	Vin = V <sub>CC</sub> or I <sub>out</sub> = 0 μA
supply current	Active state			—	—	130	—	220		GND Rext/Cext = 0.5 V <sub>CC</sub>

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## AC Characteristics ( $C_L = 50 \text{ pF}$ , Input $t_r = t_f = 6 \text{ ns}$ )

Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$		$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions								
			Min	Typ	Max	Min			Max							
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 $\bar{Q}$					
		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 $\bar{Q}$								
	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	—	—	—			$\mu\text{s}$	Cext = 28 pF			Rext = 6 k $\Omega$		
		4.5	—	450	—	—	—								ns	Rext = 2 k $\Omega$
		6.0	—	380	—	—	—									
Output pulse width	$t_{WQ}$	4.5	—	1.0	—	—	ms			Cext = 0.1 $\mu\text{F}$ , Rext = 10 k $\Omega$						
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.



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



\*Dimension including the plating thickness  
Base material dimension

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



\*Dimension including the plating thickness  
Base material dimension

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

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