HD74HC123A

Dual Retriggerable Monostable Multivibrators (with Clear)

HITACHI

ADE-205-438 (Z)
1st. Edition
Sep. 2000

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**	$\overline{\mathbf{Q}}$
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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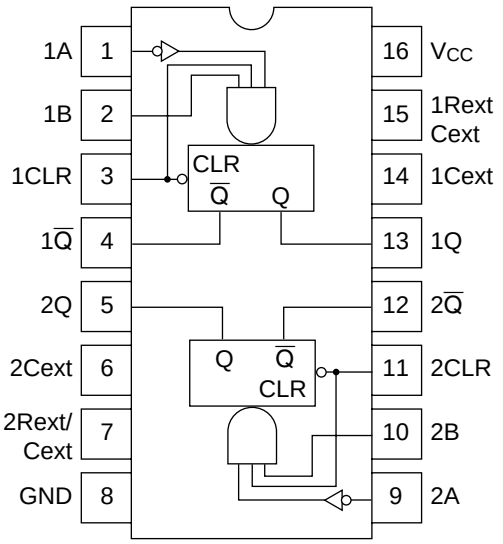
Pin Arrangement



(Top view)

DC Characteristics

Item		Symbol	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 supply current	Standby state	I_{CC}	6.0	—	—	130	—	220	µA	Vin = V_{CC} or GND	Iout = 0 µA
	Active state			—	—	130	—	220			Rext/Cext = 0.5 V_{CC}

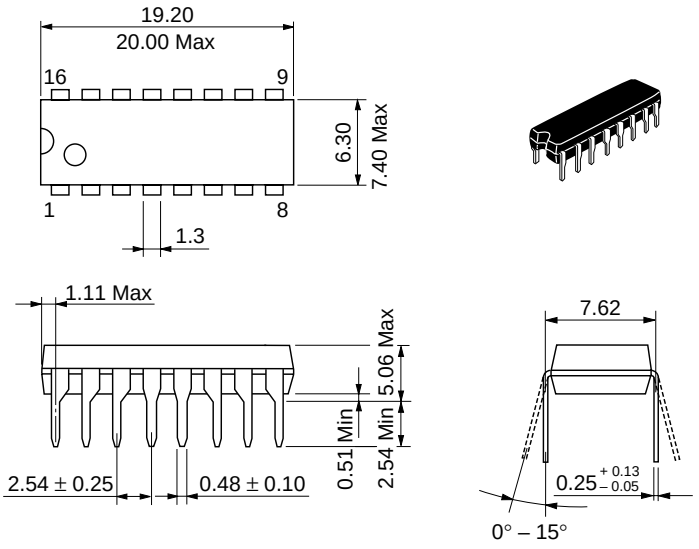
AC Characteristics (C_L = 50 pF, Input $t_r = t_f$ = 6 ns)

			Ta = 25°C			Ta = –40 to +85°C			
Item	**Symbol**	**V_{cc} (V)**	**Min**	**Typ**	**Max**	**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.

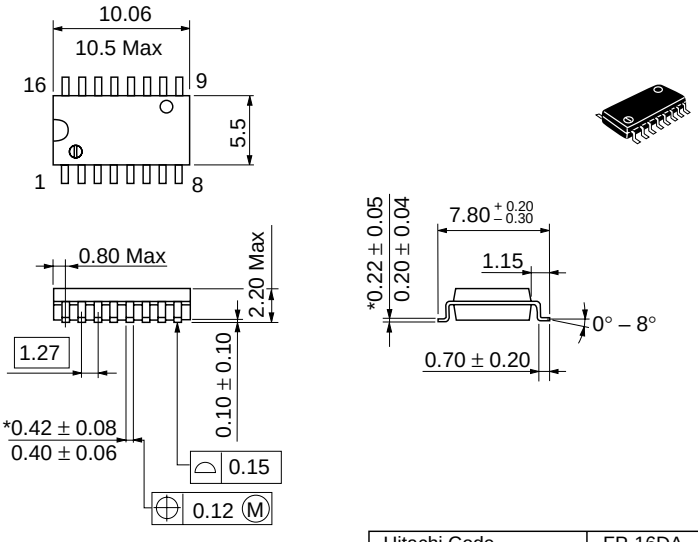
Package Dimensions

Unit: mm



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

Unit: mm



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

*Dimension including the plating thickness
Base material dimension

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HITACHI

Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL
NorthAmerica : http://semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
Asia : http://sicapac.hitachi-asia.com
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For further information write to:

Hitachi Semiconductor (America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic Components Group
Dornacher Straβe 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 585160

Hitachi Asia Ltd.
Hitachi Tower
16 Collyer Quay #20-00,
Singapore 049318
Tel : <65>-538-6533/538-8577
Fax : <65>-538-6933/538-3877
URL : http://www.hitachi.com.sg

Hitachi Asia Ltd.
(Taipei Branch Office)
4/F, No. 167, Tun Hwa North Road,
Hung-Kuo Building,
Taipei (105), Taiwan
Tel : <886>-(2)-2718-3666
Fax : <886>-(2)-2718-8180
Telex : 23222 HAS-TP
URL : http://www.hitachi.com.tw

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon,
Hong Kong
Tel : <852>-(2)-735-9218
Fax : <852>-(2)-730-0281
URL : http://www.hitachi.com.hk

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