To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

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   Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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HD74HC123A

Dual Retriggerable Monostable Multivibrators (with Clear)

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

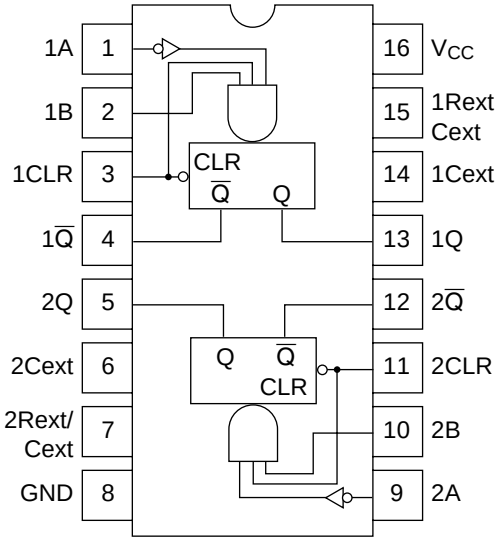
- High Speed Operation
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC} = 2 to 6 V
- Low Input Current: 1 μA max
- Low Quiescent Supply Current

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.

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}

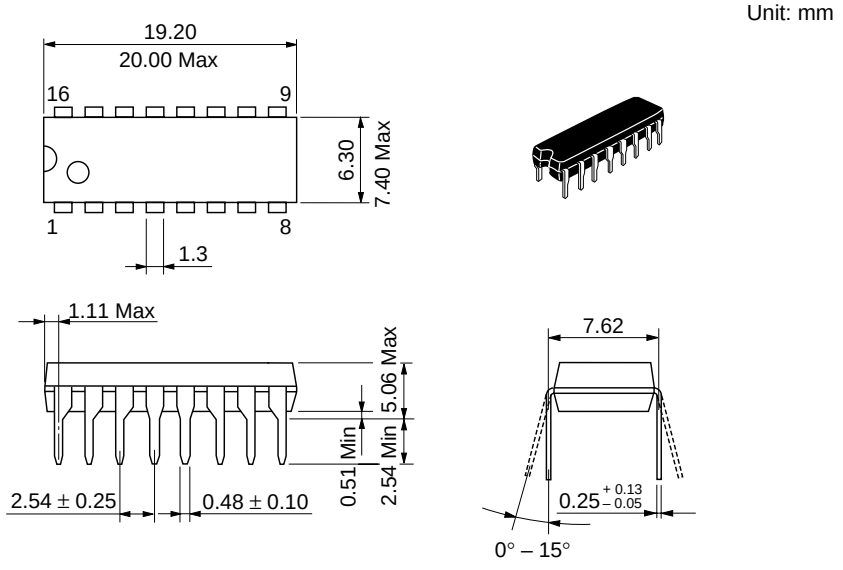
AC Characteristics (C_L = 50 pF, Input $t_r = t_f$ = 6 ns)

			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.

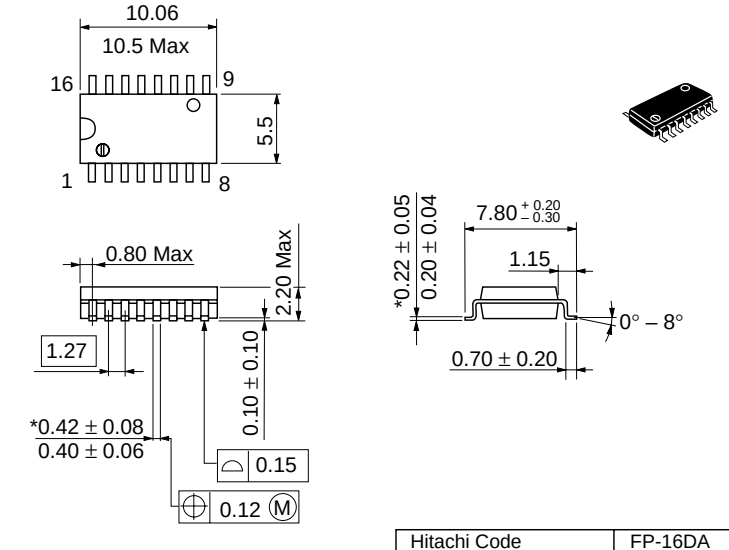
Package Dimensions

Unit: mm



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

Unit: mm



*Dimension including the plating thickness
Base material dimension

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

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