HD74AC123A ●Dual Retriggerable Resettable Multivibrator

Preliminary

Description

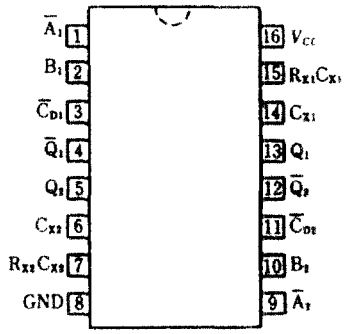
Each half of the HD74AC123A features retriggerable capability, complementary dc level triggering and overriding Direct Clear. When a circuit is in the quasi-stable (delay) state, another trigger applied to the inputs (per the Truth Table) will cause the delay period to start again, without disturbing the outputs. By repeating this process, the output pulse period (Q High, $\overline{Q}$ Low) can be made as long as desired. Alternatively, a delay period can be terminated at any time by a Low signal on $\overline{C}_D$, which also inhibits triggering. An internal connection from $\overline{C}_D$ to the input gate makes it possible to trigger the circuit by a positive-going signal on $\overline{C}_D$, as shown in the Truth Table. For timing capacitor values greater than 1000 pF, the output pulse width is defined as follows.

Where tw is in ns, R_X is in kΩ and C_X is in pF.

$tw = R_X C_X$

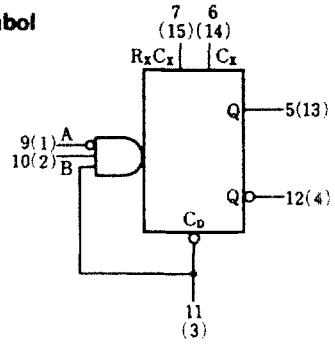
- Outputs Source/Sink 24 mA

Pin Assignment



(Top View)

Logic Symbol



V_{CC} = Pin16
GND = Pin8

Triggering Truth Table

Inputs			Response
A	B	$\overline{C}_D$	
X	X	L	No Trigger
⊓	L	X	No Trigger
⊓	H	H	Trigger
H	⊔	X	No Trigger
L	⊔	H	Trigger
L	H	⊔	Trigger

H = High Voltage Level
L = Low Voltage Level
X = Immaterial
⊔ = Low-to-High Transition
⊓ = High-to-Low Transition

Pin Names

$\overline{A}_1$, $\overline{A}_2$	Trigger Inputs (Active Falling Edge)
B_1, B_2	Trigger Inputs (Active Rising Edge)
$\overline{C}_{D1}$, $\overline{C}_{D2}$	Direct Clear Inputs (Active Low)
Q_1, Q_2	Positive Pulse Output
$\overline{Q}_1$, $\overline{Q}_2$	Negative Pulse Output

DC Characteristics (unless otherwise specified)

Symbol	Parameter	Max	Unit	Condition
I_{CC}	Maximum Quiescent Supply Current	80	μA	V_{IN} = V_{CC} or Ground, V_{CC} = 5.5 V, Ta = Worst Case
I_{CC}	Maximum Quiescent Supply Current	8.0	μA	V_{IN} = V_{CC} or Ground, V_{CC} = 5.5 V, Ta = 25℃

AC Characteristics: HD74AC123A

Symbol	Parameter	V_{CC}* (V)	Ta = +25°C, C_L = 50pF			Ta = −40°C to +85°C, C_L = 50pF		Unit	Condition
			Min	Typ	Max	Min	Max		
t_{PLH}	Propagation Delay $\overline{A}$ or B to Q	3.3	1.0		19.0	1.0	22.0	ns	Cext = 0pF
t_{PHL}		5.0	1.0		15.0	1.0	17.0		Rext = 5kΩ
t_{PLH}	Propagation Delay $\overline{A}$ or B to $\overline{Q}$	3.3	1.0		19.0	1.0	22.0	ns	
t_{PHL}		5.0	1.0		15.0	1.0	17.0		
t_{PLH}	Propagation Delay $\overline{CD_n}$ to $\overline{Q}$	3.3	1.0		15.0	1.0	18.0	ns	
t_{PHL}		5.0	1.0		12.0	1.0	13.5		
t_{PHL}	Propagation Delay $\overline{CD_n}$ to Q	3.3	1.0		15.0	1.0	18.0	ns	
		5.0	1.0		12.0	1.0	13.5		

* Voltage Range 3.3 is 3.3V ± 0.3V
Voltage Range 5.0 is 5.0V ± 0.5V

AC Operating Requirements: HD74AC123A

Symbol	Parameter	V_{CC}* (V)	Ta = +25°C, C_L = 50pF	Ta = −40 to +85°C, C_L = 50pF	Unit	Condition
			Typ	Guaranteed Minimum		
t_w	Pulse Width $\overline{A}$ or B or $\overline{CD_n}$	3.3		5.0	7.0	ns	Cext = 0pF
		5.0		4.5	5.0		
t_{rec}	Recovery Time $\overline{CD_n}$ to $\overline{A}$ or B	3.3		2.0	2.0	ns	Rext = 5kΩ
		5.0		2.0	2.0		

* Voltage Range 3.3 is 3.3V ± 0.3V
Voltage Range 5.0 is 5.0V ± 0.5V

Capacitance

Symbol	Parameter	Typ	Unit	Condition
C_{IN}	Input Capacitance		pF	V_{CC} = 5.5V
C_{PD}	Power Dissipation Capacitance		pF	V_{CC} = 5.0V

Symbol	Parameter	V_{CC}* (V)	Ta = +25°C, C_L = 50pF			Ta = −40°C to +85°C, C_L = 50pF		Unit	Condition
			Min	Typ	Max	Min	Max		
T_{wo}	Output Pulse Width	3.3						ms	Cext = 0.1μF
		5.0	0.90		1.10	0.85	1.15		Rext = 10kΩ
T_{wo}(min)	Minimum Output Pulse Width	3.3	190		350	170	380	ns	Cext = 28pF
		5.0	160		300	140	330		Rext = 2kΩ

* Voltage Range 3.3 is 3.3V ± 0.3V
Voltage Range 5.0 is 5.0V ± 5.0V

Cext and Rext should be connected as close to the IC terminals as possible, in order to prevent malfunction.