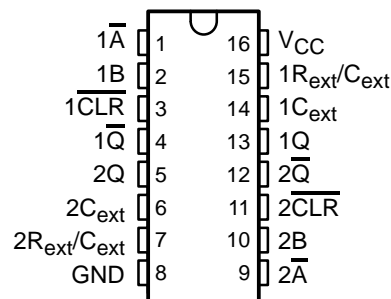


SN54AHCT123A, SN74AHCT123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

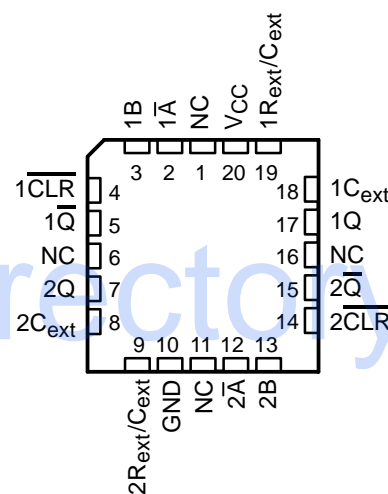
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- Inputs Are TTL-Voltage Compatible
- Schmitt-Trigger Circuitry On \overline{A} , B, and \overline{CLR} Inputs for Slow Input Transition Rates
- Edge Triggered From Active-High or Active-Low Gated Logic Inputs
- Retriggerable for Very Long Output Pulses
- Overriding Clear Terminates Output Pulse
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

SN54AHCT123A . . . J OR W PACKAGE
SN74AHCT123A . . . D, DB, DGV, N, OR PW PACKAGE
(TOP VIEW)



SN54AHCT123A . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

description/ordering information

These edge-triggered multivibrators feature output pulse-duration control by three methods. In the first method, the \overline{A} input is low, and the B input goes high. In the second method, the B input is high, and the \overline{A} input goes low. In the third method, the \overline{A} input is low, the B input is high, and the clear (\overline{CLR}) input goes high.

The output pulse duration is programmed by selecting external resistance and capacitance values. The external timing capacitor must be connected between C_{ext} and R_{ext}/C_{ext} (positive) and an external resistor connected between R_{ext}/C_{ext} and V_{CC} . To obtain variable pulse durations, connect an external variable resistance between R_{ext}/C_{ext} and V_{CC} . The output pulse duration also can be reduced by taking \overline{CLR} low.

ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING	
–40°C to 85°C	PDIP – N	Tube	SN74AHCT123AN	SN74AHCT123AN	
	SOIC – D	Tube	SN74AHCT123AD	AHCT123A	
		Tape and reel	SN74AHCT123ADR		
	–55°C to 125°C	SSOP – DB	Tape and reel	SN74AHCT123ADBR	HB123A
		TSSOP – PW	Tape and reel	SN74AHCT123APWR	HB123A
		TVSOP – DGV	Tape and reel	SN74AHCT123ADGVR	HB123A
–55°C to 125°C	CDIP – J	Tube	SNJ54AHCT123AJ	SNJ54AHCT123AJ	
	CFP – W	Tube	SNJ54AHCT123AW	SNJ54AHCT123AW	
	LCCC – FK	Tube	SNJ54AHCT123AFK	SNJ54AHCT123AFK	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS
INSTRUMENTS**

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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

SN54AHCT123A, SN74AHCT123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

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description/ordering information(continued)

Pulse triggering occurs at a particular voltage level and is not directly related to the transition time of the input pulse. The \overline{A} , B, and \overline{CLR} inputs have Schmitt triggers with sufficient hysteresis to handle slow input transition rates with jitter-free triggering at the outputs.

Once triggered, the basic pulse duration can be extended by retriggering the gated low-level-active (\overline{A}) or high-level-active (B) input. Pulse duration can be reduced by taking \overline{CLR} low. \overline{CLR} input can be used to override \overline{A} or B inputs. The input/output timing diagram illustrates pulse control by retriggering the inputs and early clearing.

The variance in output pulse duration from device to device typically is less than $\pm 0.5\%$ for given external timing components. An example of this distribution for the 'AHCT123A is shown in Figure 10. Variations in output pulse duration versus supply voltage and temperature are shown in Figure 6.

During power up, Q outputs are in the low state, and \overline{Q} outputs are in the high state. The outputs are glitch free, without applying a reset pulse.

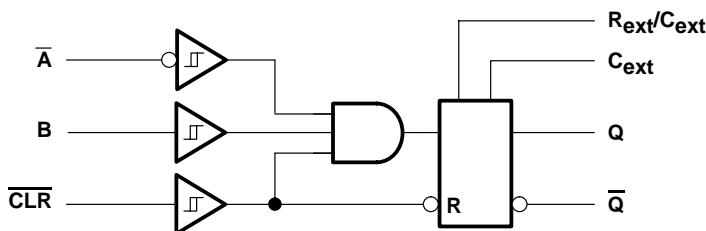
For additional application information on multivibrators, see the application report, *Designing With the SN74AHC123A and SN74AHCT123A*, literature number SCLA014.

FUNCTION TABLE
(each multivibrator)

INPUTS			OUTPUTS	
CLR	\overline{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		

[†] These outputs are based on the assumption that the indicated steady-state conditions at the \overline{A} and B inputs have been set up long enough to complete any pulse started before the setup.

logic diagram, each multivibrator (positive logic)



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input/output timing diagram



absolute maximum ratings over operating free-air temperature (unless otherwise noted)†

Supply voltage range, V_{CC} (see Note 1)	–0.5 V to 7 V
Input voltage range, V_I (see Note 2)	–0.5 V to 7 V
Output voltage range, V_O (see Note 1)	–0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$)	–20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	± 20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	± 25 mA
Continuous current through V_{CC} or GND	± 50 mA
Package thermal impedance, θ_{JA} (see Note 3):	
D package	73°C/W
DB package	82°C/W
DGV package	120°C/W
N package	67°C/W
PW package	108°C/W
Storage temperature range, T_{Stg}	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. Voltage values are with respect to the network ground terminal.
 2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 3. The package thermal impedance is calculated in accordance with JESD 51-7.

SN54AHCT123A, SN74AHCT123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

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recommended operating conditions (see Note 4)

		SN54AHCT123A		SN74AHCT123A		UNIT
		MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level input voltage	2		2		V
V_{IL}	Low-level input voltage		0.8		0.8	V
V_I	Input voltage	0	5.5	0	5.5	V
V_O	Output voltage	0	V_{CC}	0	V_{CC}	V
I_{OH}	High-level output current		-8		-8	mA
I_{OL}	Low-level output current		8		8	mA
R_{ext}	External timing resistance	1k		1k		Ω
$\Delta t/\Delta V_{CC}$	Power-up ramp rate	1		1		ms/V
T_A	Operating free-air temperature	-55	125	-40	85	$^{\circ}C$

NOTE 4: Unused R_{ext}/C_{ext} terminals should be left unconnected. All remaining unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V_{CC}	$T_A = 25^{\circ}C$			SN54AHCT123A		SN74AHCT123A		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	$I_{OH} = -50 \mu A$	4.5 V	4.4	4.5		4.4		4.4	V	
	$I_{OH} = -8 \text{ mA}$		3.94			3.8		3.8		
V_{OL}	$I_{OL} = 50 \mu A$	4.5 V			0.1			0.1	V	
	$I_{OL} = 8 \text{ mA}$				0.36		0.5	0.44		
I_I	$R_{ext}/C_{ext}^{\dagger}$ $\bar{A}, B,$ and CLR	$V_I = V_{CC}$ or GND			± 0.25		± 2.5	± 2.5	μA	
		$V_I = V_{CC}$ or GND	0 V to 5.5 V		± 0.1		$\pm 1^*$	± 1		
I_{CC}	Quiescent	$V_I = V_{CC}$ or GND, $I_O = 0$			4		40	40	μA	
I_{CC}	Active state (per circuit)	$V_I = V_{CC}$ or GND, $R_{ext}/C_{ext} = 0.5 V_{CC}$		560	750		975	975	μA	
ΔI_{CC}^{\ddagger}		One input at 3.4 V, Other inputs at V_{CC} or GND			1.35		1.5	1.5	mA	
C_i		$V_I = V_{CC}$ or GND		1.9	10			10	pF	

* On products compliant to MIL-PRF-38535, this parameter is not production tested at $V_{CC} = 0 \text{ V}$.

\dagger This test is performed with the terminal in the off-state condition.

\ddagger This is the increase in supply current for each input at one of the specified TTL voltage levels rather than 0 V or V_{CC} .

timing requirements over recommended operating free-air temperature range, $V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$ (unless otherwise noted) (see Figure 1)

	TEST CONDITIONS	$T_A = 25^{\circ}C$			SN54AHCT123A		SN74AHCT123A		UNIT
		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_w	Pulse duration CLR A or B trigger		5			5		5	ns
			5			5		5	
t_{rr}	Pulse retrigger time	$R_{ext} = 1 \text{ k}\Omega, C_{ext} = 100 \text{ pF}$	§	60		§		§	ns
		$R_{ext} = 1 \text{ k}\Omega, C_{ext} = 0.01 \mu\text{F}$	§	1.5		§		§	μs

§ See retriggering data in the *application information* section.



SN54AHCT123A, SN74AHCT123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

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**switching characteristics over recommended operating free-air temperature range,
V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A = 25°C			SN54AHCT123A		SN74AHCT123A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A̅ or B	Q or Q̅	C _L = 15 pF	5.3*	10*	1*	13*	1	11	ns	
t _{PHL}				5.3*	10*	1*	13*	1	11		
t _{PLH}	CLR̅	Q or Q̅	C _L = 15 pF	7.7*	12*	1*	15*	1	13	ns	
t _{PHL}				7.7*	12*	1*	15*	1	13		
t _{PLH}	CLR̅ trigger	Q or Q̅	C _L = 15 pF	8*	13*	1*	16*	1	14	ns	
t _{PHL}				8*	13*	1*	16*	1	14		
t _{PLH}	A̅ or B	Q or Q̅	C _L = 50 pF	6.8	11	1	14	1	12	ns	
t _{PHL}				6.8	11	1	14	1	12		
t _{PLH}	CLR̅	Q or Q̅	C _L = 50 pF	9.2	13	1	16	1	14	ns	
t _{PHL}				9.2	13	1	16	1	14		
t _{PLH}	CLR̅ trigger	Q or Q̅	C _L = 50 pF	9.5	14	1	17	1	15	ns	
t _{PHL}				9.5	14	1	17	1	15		
t _w †		Q or Q̅	C _L = 50 pF, C _{ext} = 28 pF, R _{ext} = 2 kΩ	133	200		240		240	ns	
			C _L = 50 pF, C _{ext} = 0.01 μF, R _{ext} = 10 kΩ	90	100	110	90	110	90	110	μs
			C _L = 50 pF, C _{ext} = 0.1 μF, R _{ext} = 10 kΩ	0.9	1	1.1	0.9	1.1	0.9	1.1	ms
Δt _w ‡				±1						%	

* On products compliant to MIL-PRF-38535, this parameter is not production tested.

† t_w = Pulse duration at Q and Q̅ outputs

‡ Δt_w = Output pulse-duration variation (Q and Q̅) between circuits in same package

operating characteristics, V_{CC} = 5 V, T_A = 25°C

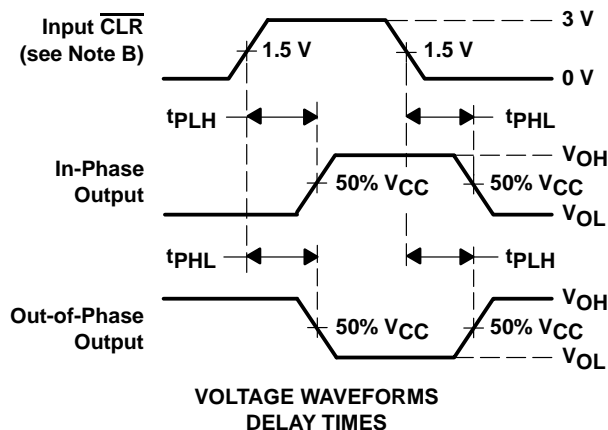
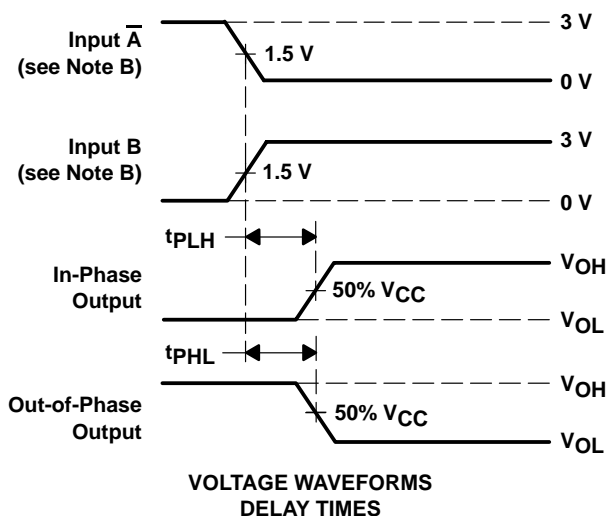
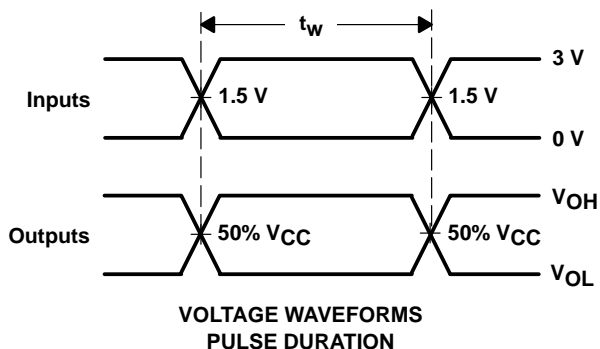
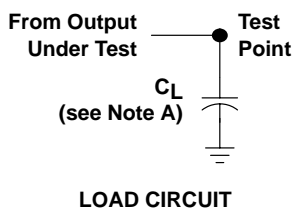
PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance	No load	29	pF



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PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and jig capacitance.
 B. All input pulses are supplied by generators having the following characteristics: $Z_O = 50 \Omega$, $t_r = 3 \text{ ns}$, $t_f = 3 \text{ ns}$.
 C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

APPLICATION INFORMATION

caution in use

To prevent malfunctions due to noise, connect a high-frequency capacitor between V_{CC} and GND, and keep the wiring between the external components and C_{ext} and R_{ext}/C_{ext} terminals as short as possible.

power-down considerations

Large values of C_{ext} may cause problems when powering down the 'AHCT123A devices because of the amount of energy stored in the capacitor. When a system containing this device is powered down, the capacitor may discharge from V_{CC} through the protection diodes at pin 2 or pin 14. Current through the input protection diodes must be limited to 30 mA; therefore, the turn-off time of the V_{CC} power supply must not be faster than $t = V_{CC} \times C_{ext} / 30 \text{ mA}$. For example, if $V_{CC} = 5 \text{ V}$ and $C_{ext} = 15 \text{ pF}$, the V_{CC} supply must turn off no faster than $t = (5 \text{ V}) \times (15 \text{ pF}) / 30 \text{ mA} = 2.5 \text{ ns}$. Usually, this is not a problem because power supplies are heavily filtered and cannot discharge at this rate. When a more rapid decrease of V_{CC} to zero occurs, the 'AHCT123A devices may sustain damage. To avoid this possibility, use external clamping diodes.

output pulse duration

The output pulse duration, t_w , is determined primarily by the values of the external capacitance (C_T) and timing resistance (R_T). The timing components are connected as shown in Figure 2.

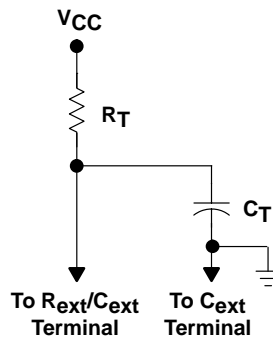


Figure 2. Timing-Component Connections

The pulse duration is given by:

$$t_w = K \times R_T \times C_T \tag{1}$$

if C_T is $\geq 1000 \text{ pF}$, $K = 1.0$ or
 if C_T is $< 1000 \text{ pF}$, K can be determined from Figure 5

where:

- t_w = pulse duration in ns
- R_T = external timing resistance in $k\Omega$
- C_T = external capacitance in pF
- K = multiplier factor

Equation 1 and Figure 3 can be used to determine values for pulse duration, external resistance, and external capacitance.

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APPLICATION INFORMATION

retriggering data

The minimum input retriggering time (t_{MIR}) is the minimum time required after the initial signal before retriggering the input. After t_{MIR} , the device retriggers the output. Experimentally, it also can be shown that to retrigger the output pulse, the two adjacent input signals should be t_{MIR} apart, where $t_{MIR} = 0.30 \times t_w$. The retrigger pulse duration is calculated as shown in Figure 3.

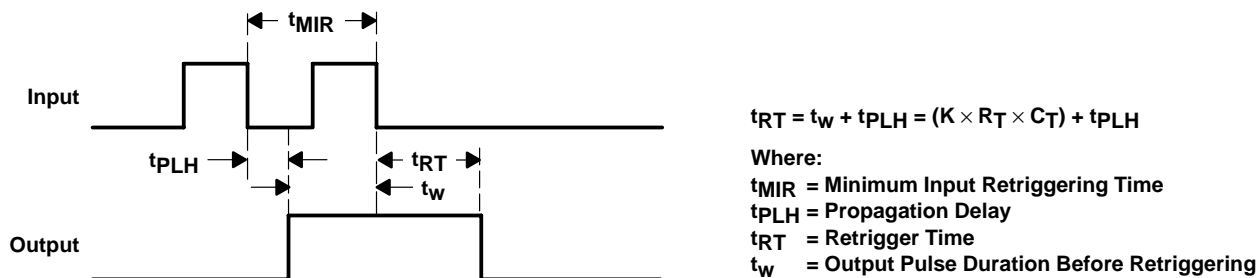


Figure 3. Retrigger Pulse Duration

The minimum value from the end of the input pulse to the beginning of the retriggered output should be approximately 15 ns to ensure a retriggered output (see Figure 4).



t_{MRT} = Minimum Time Between the End of the Second Input Pulse and the Beginning of the Retriggered Output
 $t_{MRT} = 15 \text{ ns}$

Figure 4. Input/Output Requirements

APPLICATION INFORMATION†

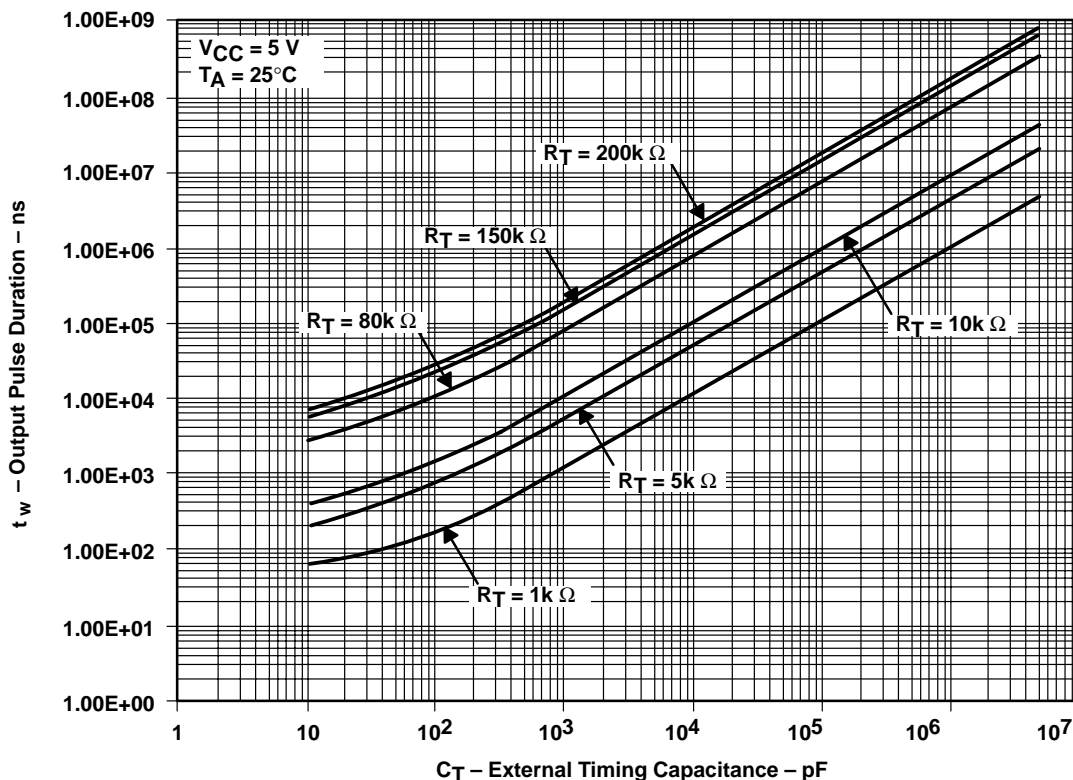


Figure 5. Output Pulse Duration vs External Timing Capacitance

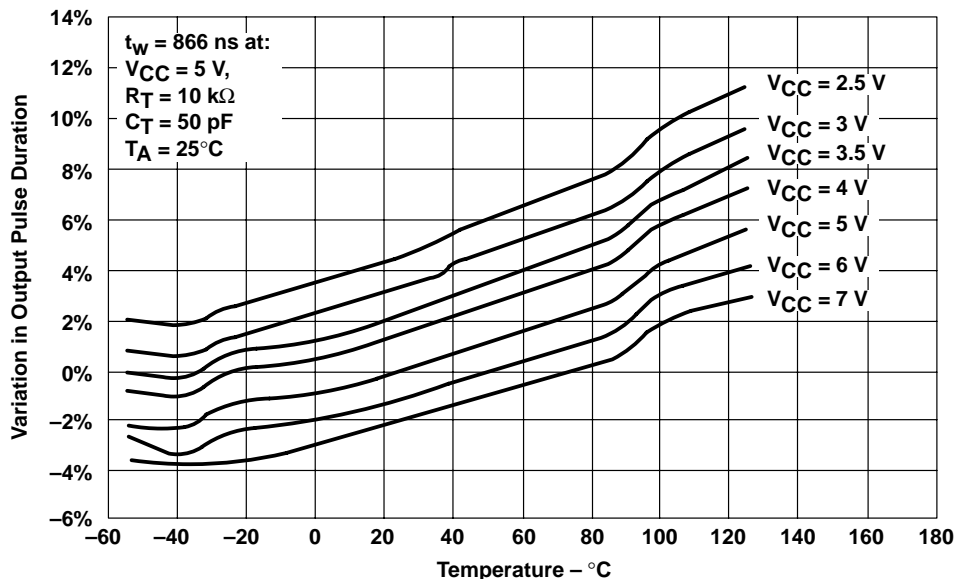


Figure 6. Variations in Output Pulse Duration vs Temperature

† Operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied.

SN54AHCT123A, SN74AHCT123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

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APPLICATION INFORMATION†

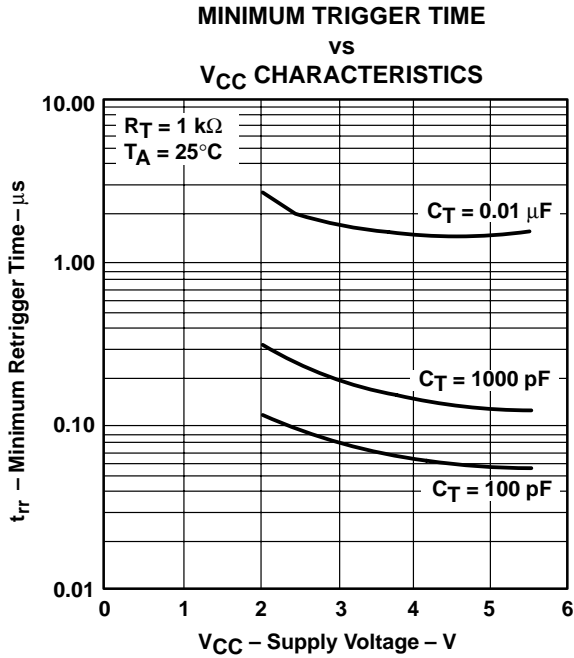


Figure 7

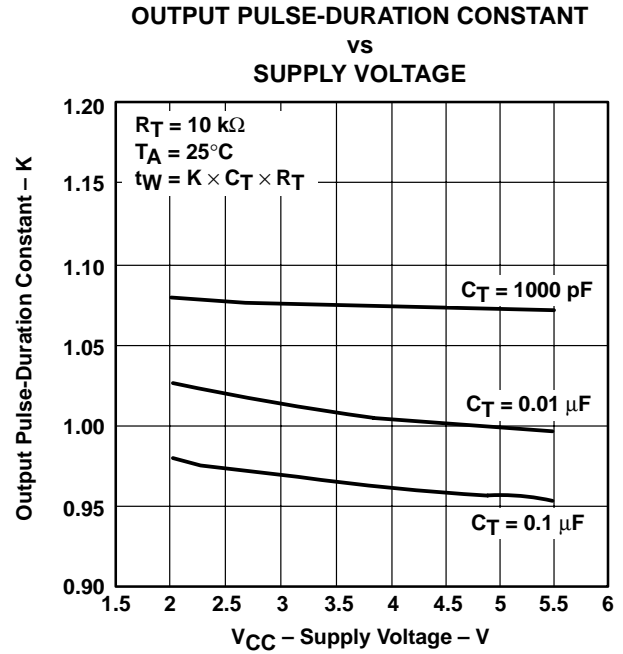


Figure 8

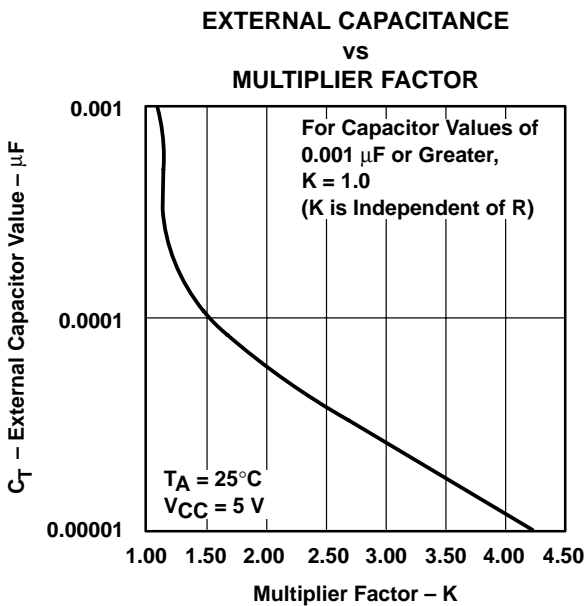


Figure 9

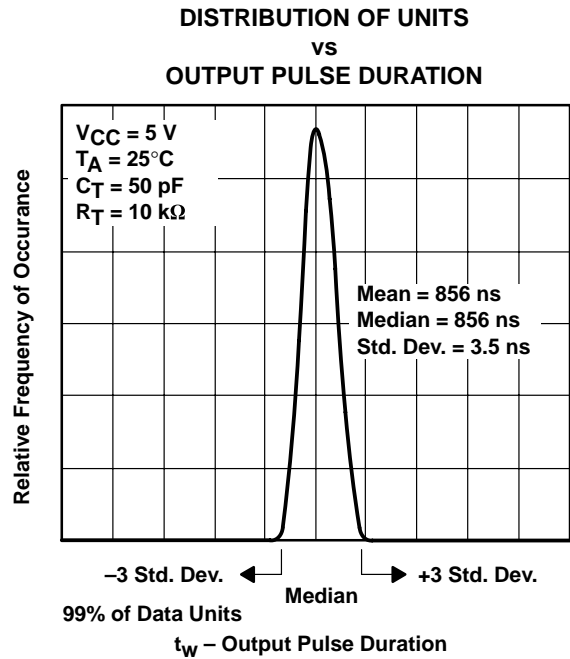


Figure 10

† Operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied.



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PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
5962-9861601Q2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
5962-9861601QEA	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
5962-9861601QFA	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC
74AHCT123ADGVRE4	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123AD	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADBR	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADBRE4	ACTIVE	SSOP	DB	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADGVR	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123ADRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123AN	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74AHCT123ANE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74AHCT123APWR	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AHCT123APWRE4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54AHCT123AFK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Level-NC-NC-NC
SNJ54AHCT123AJ	ACTIVE	CDIP	J	16	1	TBD	Call TI	Level-NC-NC-NC
SNJ54AHCT123AW	ACTIVE	CFP	W	16	1	TBD	Call TI	Level-NC-NC-NC

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package is hermetically sealed with a ceramic lid using glass frit.
 - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
 - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F16)

CERAMIC DUAL FLATPACK



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package can be hermetically sealed with a ceramic lid using glass frit.
 - D. Index point is provided on cap for terminal identification only.
 - E. Falls within MIL STD 1835 GDFP1-F16 and JEDEC MO-092AC

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



4040140/D 10/96

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package can be hermetically sealed with a metal lid.
 - D. The terminals are gold plated.
 - E. Falls within JEDEC MS-004

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - The 20 pin end lead shoulder width is a vendor option, either half or full width.

DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

24 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194

D (R-PDSO-G16)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - D. Falls within JEDEC MS-012 variation AC.

DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
 D. Falls within JEDEC MO-150

PW (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
 D. Falls within JEDEC MO-153

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SN74AHCT123A, Status: ACTIVE

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Dual Retriggerable Monostable Multivibrators

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Features	Samples	Technical Documents
Quality & Pb-Free Data	Pricing/Packaging	Applications Notes
Related Products	Inventory	Simulation Models
Tools & Software	Symbols/Footprints	Reference Designs

Refine Your Selection

- Logic: Monostable Multivibrators

Support

- KnowledgeBase
- Contact Technical Support
- TI Cross Reference
- Training
- Part Marking Lookup
- Part Number Nomenclature

Datasheet

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SN54AHCT123A, SN74AHCT123A (Rev. G) (sn74ahct123a.pdf, 570 KB)
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	SN54AHCT123A	SN74AHCT123A
Voltage Nodes(V)	5	5
Vcc range(V)	2 to 5.5	4.5 to 5.5
	Samples	Samples
	Inventory	Inventory

Product Information

Features Save this to your personal library

- Inputs Are TTL-Voltage Compatible
- Schmitt-Trigger Circuitry On A\, B, and CLR\ Inputs for Slow Input Transition Rates
- Edge Triggered From Active-High or Active-Low Gated Logic Inputs
- Retriggerable for Very Long Output Pulses
- Overriding Clear Terminates Output Pulse
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

Description

These edge-triggered multivibrators feature output pulse-duration control by three methods. In the first method, the A\ input is low, and the B input goes high. In the second method, the B input is high, and the A\ input goes low. In the third method, the A\ input is low, the B input is high, and the clear (CLR)\ input goes high.

The output pulse duration is programmed by selecting external resistance and capacitance values. The external timing capacitor must be connected between C_{ext} and R_{ext}/C_{ext} (positive) and an external resistor connected between R_{ext}/C_{ext} and V_{CC}. To obtain variable pulse durations, connect an external variable resistance between R_{ext}/C_{ext} and V_{CC}. The output pulse duration also can be reduced by taking CLR\ low.

Pulse triggering occurs at a particular voltage level and is not directly related to the transition time of the input pulse. The A\, B, and CLR\ inputs have Schmitt triggers with sufficient hysteresis to handle slow input transition rates with jitter-free triggering at the outputs.

Once triggered, the basic pulse duration can be extended by retriggering the gated low-level-active (A\) or high-level-active (B) input. Pulse duration can be reduced by taking CLR\ low. CLR\ input can be used to override A\ or B inputs. The input/output timing diagram illustrates pulse control by retriggering the inputs and early clearing.

The variance in output pulse duration from device to device typically is less than ±0.5% for given external timing components. An example of this distribution for the 'AHCT123A is shown in Figure 10. Variations in output pulse duration versus supply voltage and temperature are shown in Figure 6.

During power up, Q outputs are in the low state, and Q\ outputs are in the high state. The outputs are glitch free, without applying a reset pulse.

For additional application information on multivibrators, see the application report, *Designing With the SN74AHC123A and SN74AHCT123A*, literature number SCLA014.

Pricing/Packaging/CAD Design Tools/Samples								
Device	Status	Temp (°C)	Price Budget Price (\$US) QTY	Industry Standard (TI Pkg) Pins	Top Side Marking	Standard Pack Quantity	CAD Design Tools Footprints	Samples
74AHCT123ADGVRE4	ACTIVE	-40 to 85	0.31 1KU	TVSOP (DGV) 16		2000	<input type="checkbox"/>	Purchase Samples
SN74AHCT123AD	ACTIVE	-40 to 85	0.24 1KU	SOIC (D) 16	View	40	<input type="checkbox"/>	Purchase Samples
SN74AHCT123ADBR	ACTIVE	-40 to 85	0.24 1KU	SSOP (DB) 16	View	2000	<input type="checkbox"/>	Contact TI Distributor or Sales Office
SN74AHCT123ADBRE4	ACTIVE	-40 to 85	0.24 1KU	SSOP (DB) 16	View	2000	<input type="checkbox"/>	Purchase Samples
SN74AHCT123ADE4	ACTIVE	-40 to 85	0.24 1KU	SOIC (D) 16	View	40	<input type="checkbox"/>	Purchase Samples
SN74AHCT123ADGVR	ACTIVE	-40 to 85	0.31 1KU	TVSOP (DGV) 16		2000	<input type="checkbox"/>	Contact TI Distributor or Sales Office
SN74AHCT123ADR	ACTIVE	-40 to 85	0.24 1KU	SOIC (D) 16	View	2500	<input type="checkbox"/>	Contact TI Distributor or Sales Office
SN74AHCT123ADRE4	ACTIVE	-40 to 85	0.24 1KU	SOIC (D) 16	View	2500	<input type="checkbox"/>	Request Free Samples
SN74AHCT123AN	ACTIVE	-40 to 85	0.24 1KU	PDIP (N) 16	View	25	<input type="checkbox"/>	Purchase Samples
SN74AHCT123ANE4	ACTIVE	-40 to 85	0.24 1KU	PDIP (N) 16	View	25	<input type="checkbox"/>	Purchase Samples
SN74AHCT123APWR	ACTIVE	-40 to 85	0.24 1KU	TSSOP (PW) 16	View	2000	<input type="checkbox"/>	Contact TI Distributor or Sales Office
SN74AHCT123APWRE4	ACTIVE	-40 to 85	0.24 1KU	TSSOP (PW) 16	View	2000	<input type="checkbox"/>	Request Free Samples

Inventory							
	TI Inventory Status			Reported Distributor Inventory			
74AHCT123ADGVRE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	774 21 Dec	8 Weeks	None Reported View Distributors			
		970 28 Dec					
		941 4 Jan					
		686 1 Feb					
		49 8 Feb					
SN74AHCT123AD	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	2360*	>10k 17 Jan	10 Weeks	Europe	Arrow Southern Europe	277	<input type="text"/>
					EBV Elektronik	800	<input type="text"/>
SN74AHCT123ADBR	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			

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	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k 1 Mar	12 Weeks	Americas	DigiKey	>1k	<input type="text"/>
SN74AHCT123ADBRE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k 1 Mar	12 Weeks	None Reported View Distributors			
SN74AHCT123ADE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	2360*	>10k 17 Jan	10 Weeks	None Reported View Distributors			
SN74AHCT123ADGVR	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	774 21 Dec	8 Weeks	Americas	DigiKey	173	<input type="text"/>
		970 28 Dec					
		941 4 Jan					
		686 1 Feb					
		49 8 Feb					
SN74AHCT123ADR	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k 19 Jan	10 Weeks	Americas	DigiKey	790	<input type="text"/>
SN74AHCT123ADRE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	>10k 19 Jan	10 Weeks	None Reported View Distributors			
SN74AHCT123AN	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	6823 6 Dec	10 Weeks	None Reported View Distributors			
		>10k 5 Jan					
SN74AHCT123ANE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*	6823 6 Dec	10 Weeks	None Reported View Distributors			
		>10k 5 Jan					
SN74AHCT123APWR	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			

	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*		16 Weeks	Americas	Avnet	>1k	<input type="text"/>
					DigiKey	380	<input type="text"/>
SN74AHCT123APWRE4	As of 9:16 AM GMT, 25 Nov 2005			As of 9:16 AM GMT, 25 Nov 2005			
	In Stock	In Progress QTY Date	Lead Time	Region	Company	In Stock	Purchase
	0*		16 Weeks	None Reported View Distributors			

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Quality & Lead (Pb)-Free Data

<input type="checkbox"/>	Product Content				MTBF/FIT Rate	
Device	Eco Plan*	Lead/Ball Finish	MSL Rating/Peak Reflow	Details	Details	
74AHCT123ADGVRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123AD <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADBR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADBRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADGVR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123ADRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123AN <input type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	View	View	
SN74AHCT123ANE4 <input type="checkbox"/>	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC	View	View	
SN74AHCT123APWR <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	
SN74AHCT123APWRE4 <input type="checkbox"/>	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	View	View	

* The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please click on the Product Content Details "View" link in the table above for the latest availability information and additional product content details.

If the information you are requesting is not available online at this time, contact one of our [Product Information Centers](#) regarding the availability of this information.

Technical Documents

Datasheets

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SN54AHCT123A, SN74AHCT123A (Rev. G) (sn74ahct123a.pdf, 570 KB)

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Semiconductor Packing Material Electrostatic Discharge (ESD) Protection (szza047.htm, 9 KB)

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Understanding and Interpreting Standard-Logic Data Sheets (Rev. B) (szza036b.htm, 8 KB)

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Advanced High-Speed CMOS (AHC) Logic Family (Rev. C) (scaa034c.htm, 9 KB)

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Texas Instruments Little Logic Application Report (scea029.htm, 9 KB)

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TI IBIS File Creation, Validation, and Distribution Processes (szza034.htm, 9 KB)

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Designing With the SN74AHC123A and SN74AHCT123A (scla014.htm, 9 KB)

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Bus-Interface Devices With Output-Damping Resistors Or Reduced-Drive Outputs (Rev. A) (scba012a.htm, 9 KB)

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User Guides

LOGIC Pocket Data Book (scyd013.pdf, 4835 KB)

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Design Summary for WCSP Little Logic (Rev. B) (scet007b.pdf, 295 KB)

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Military Semiconductors Selection Guide 2004-2005 (Rev. D) (sgyc003d.pdf, 964 KB)

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Logic Cross-Reference (Rev. A) (scyb017a.pdf, 2938 KB)

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AHC/AHCT Designer's Guide February 2000 (Rev. D) (scla013d.htm, 9 KB)

24 Feb 2000 [Abstract](#)

Military Advanced High-Speed CMOS Logic (AHC/AHCT) (sgyn133.pdf, 85 KB)

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