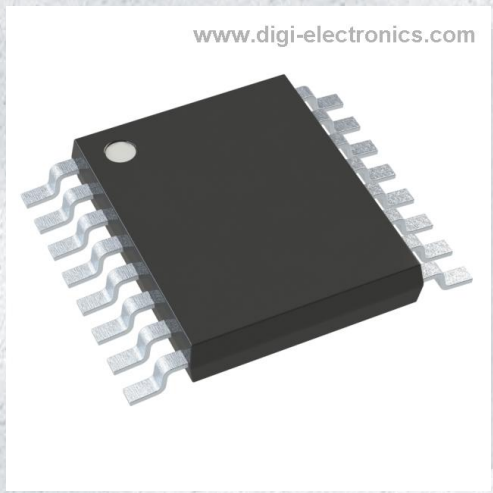
74AHCT123APW-Q100J Datasheet



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DiGi Electronics Part Number	74AHCT123APW-Q100J-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	74AHCT123APW-Q100J
Description	IC MULTIVIBRATOR 5NS 16TSSOP
Detailed Description	Monostable Multivibrator 5 ns 16-TSSOP

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RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
74AHCT123APW-Q100J	Nexperia USA Inc.
Series:	Product Status:
74AHCT	Active
Logic Type:	Independent Circuits:
Monostable	2
Schmitt Trigger Input:	Propagation Delay:
No	5 ns
Current - Output High, Low:	Voltage - Supply:
8mA, 8mA	4.5 V ~ 5.5 V
Operating Temperature:	Grade:
-40°C ~ 125°C	Automotive
Qualification:	Mounting Type:
AEC-Q100	Surface Mount
Package / Case:	Supplier Device Package:
16-TSSOP (0.173", 4.40mm Width)	16-TSSOP
Base Product Number:	
74AHCT123	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8542.39.0001	

74AHC123A-Q100; 74AHCT123A-Q100

Dual retriggerable monostable multivibrator with reset

Rev. 4 — 28 February 2024 Product data sheet

1. General description

The 74AHC123A-Q100; 74AHCT123A-Q100 is a dual retriggerable monostable multivibrator with reset. The basic output pulse width is programmed by selection of external components (R_{EXT} and C_{EXT}). Once triggered this basic pulse width may be extended by retriggering either of the edge triggered inputs (n$\overline{A}$ or (nB). By repeating this process, the output pulse period (nQ = HIGH, n$\overline{Q}$ = LOW) can be made as long as desired. Alternatively, an output delay can be terminated at any time by a LOW-going edge on input n$\overline{R}$D. Inputs are overvoltage tolerant. This feature allows the use of these devices as translators in mixed voltage environments.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 2.0 V to 5.5 V
- DC triggered from active HIGH or active LOW inputs
- Retriggerable for very long pulses up to 100 % duty factor
- Direct reset terminates output pulse
- Overvoltage tolerant inputs to 5.5 V
- All inputs have a Schmitt-trigger action
- High noise immunity
- Input levels:
  - For 74AHC123A-Q100: CMOS level
  - For 74AHCT123A-Q100: TTL level
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level A
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Multiple package options
- DHVQFN package with Side-Wettable Flanks enabling Automatic Optical Inspection (AOI) of solder joints

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AHC123AD-Q100 74AHCT123AD-Q100	-40 °C to +125 °C	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1
74AHC123APW-Q100 74AHCT123APW-Q100	-40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads; body width 4.4 mm	SOT403-1
74AHC123ABQ-Q100 74AHCT123ABQ-Q100	-40 °C to +125 °C	DHVQFN16	plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 × 3.5 × 0.85 mm	SOT763-1

4. Functional diagram

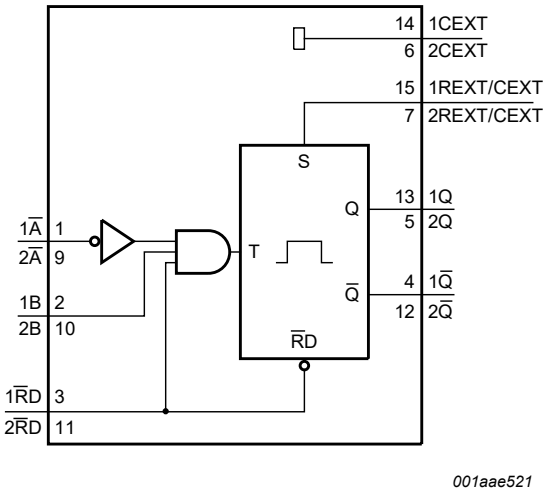


Fig. 1. Logic symbol

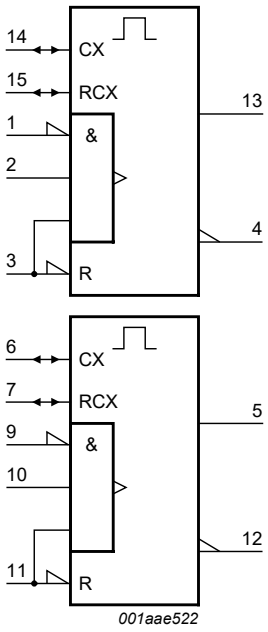


Fig. 2. IEC logic symbol

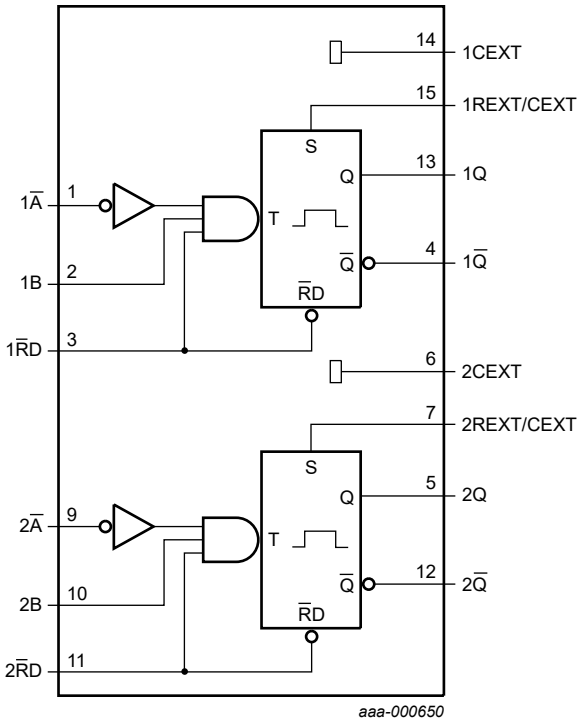
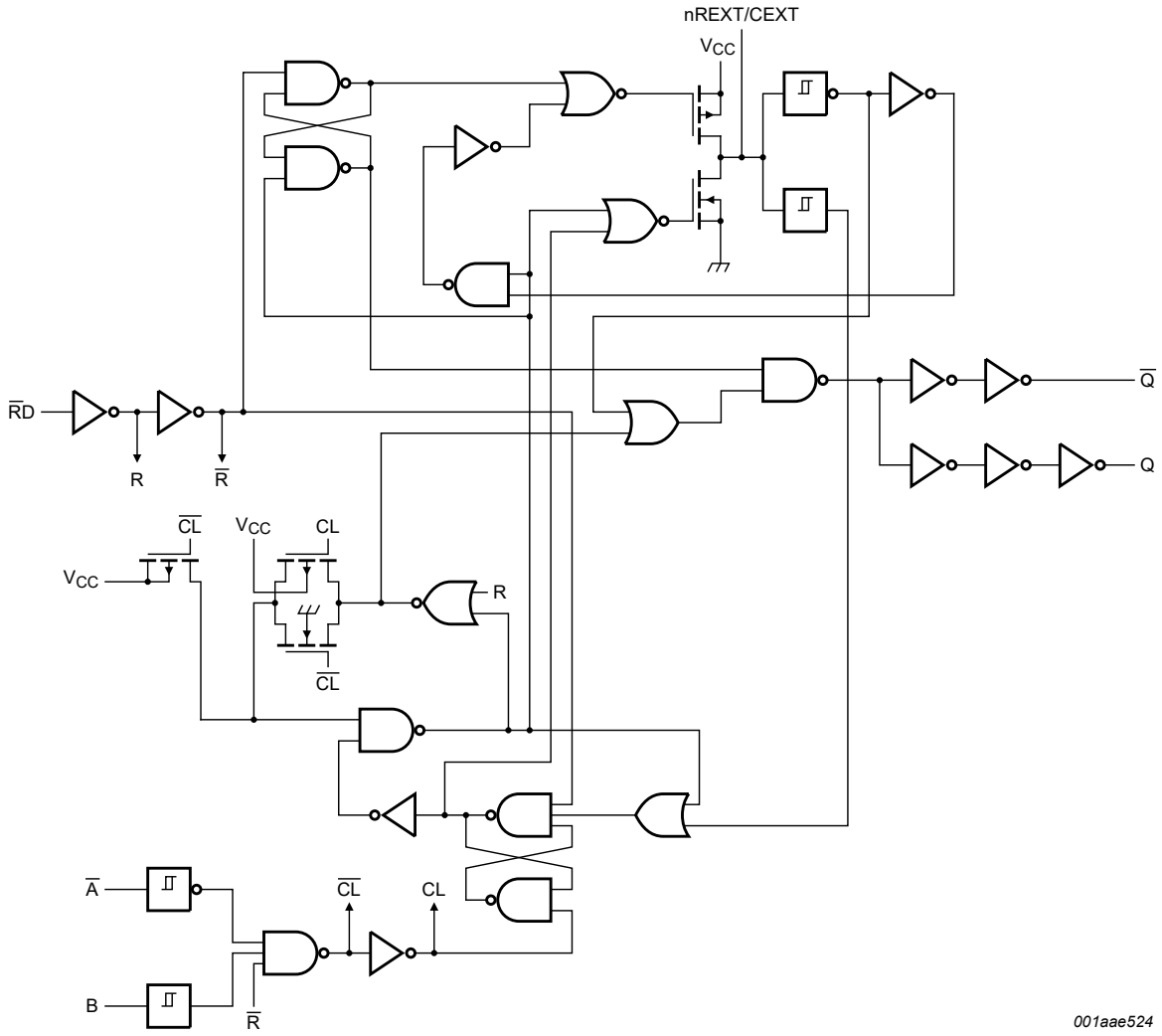


Fig. 3. Functional diagram



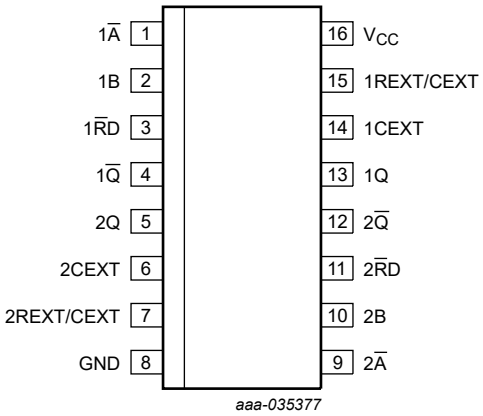
For minimum noise generation it is recommended to ground pins 6 (2CEXT) and 14 (1CEXT) externally to pin 8 (GND).

Fig. 4. Functional diagram

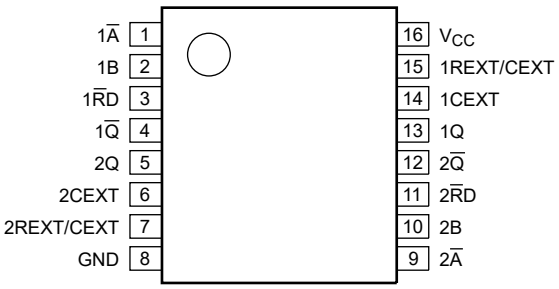
5. Pinning information

5.1. Pinning

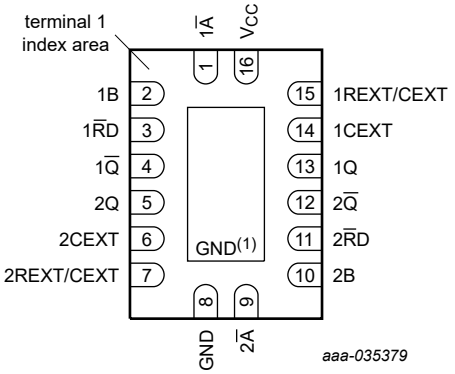
D package
SOT109-1 (SO16)



PW package
SOT403-1 (TSSOP16)



BQ package
SOT763-1 (DHVQFN16)



Transparent top view

(1) This is not a ground pin. There is no electrical or mechanical requirement to solder the pad. In case soldered, the solder land should remain floating or connected to GND.

5.2. Pin description

Table 2. Pin description

Symbol	Pin	Description
$1\overline{A}$	1	negative-edge triggered input 1
1B	2	positive-edge triggered input 1
$1\overline{R}D$	3	direct reset LOW and positive-edge triggered input 1
$1\overline{Q}$	4	active LOW output 1
2Q	5	active HIGH output 2
2CEXT	6	external capacitor connection 2
2REXT/CEXT	7	external resistor and capacitor connection 2
GND	8	ground (0 V)
$2\overline{A}$	9	negative-edge triggered input 2
2B	10	positive-edge triggered input 2
$2\overline{R}D$	11	direct reset LOW and positive-edge triggered input 2
$2\overline{Q}$	12	active LOW output 2
1Q	13	active HIGH output 1
1CEXT	14	external capacitor connection 1
1REXT/CEXT	15	external resistor and capacitor connection 1
V_{CC}	16	supply voltage

6. Functional description

Table 3. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care;
↑ = LOW-to-HIGH transition;
↓ = HIGH-to-LOW transition;
⎍ = one HIGH level output pulse;
⎎ = one LOW level output pulse.

Input			Output	
$n\overline{R}D$	$n\overline{A}$	nB	nQ	$n\overline{Q}$
L	X	X	L	H
X	H	X	L [1]	H [1]
X	X	L	L [1]	H [1]
H	L	↑	⎍	⎎
H	↓	H	⎍	⎎
↑	L	H	⎍	⎎

[1] If the monostable multivibrator was triggered before this condition was established, the pulse will continue as programmed.

7. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CC}	supply voltage			-0.5	+7.0	V
V_I	input voltage			-0.5	+7.0	V
I_{IK}	input clamping current	V_I < -0.5 V	[1]	-20	-	mA
I_{OK}	output clamping current	V_O < -0.5 V or V_O > V_{CC} + 0.5 V	[1]	-	±20	mA
I_O	output current	V_O = -0.5 V to (V_{CC} + 0.5 V)		-	±25	mA
I_{CC}	supply current			-	75	mA
I_{GND}	ground current			-75	-	mA
T_{stg}	storage temperature			-65	+150	°C
P_{tot}	total power dissipation	T_{amb} = -40 °C to +125 °C	[2]	-	500	mW

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
[2] For SOT109-1 (SO16) package: P_{tot} derates linearly with 12.4 mW/K above 110 °C.
For SOT403-1 (TSSOP16) package: P_{tot} derates linearly with 8.5 mW/K above 91 °C.
For SOT763-1 (DHVQFN16) package: P_{tot} derates linearly with 11.2 mW/K above 106 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	74AHC123A-Q100			74AHCT123A-Q100			Unit
			Min	Typ	Max	Min	Typ	Max	
V_{CC}	supply voltage		2.0	5.0	5.5	4.5	5.0	5.5	V
V_I	input voltage		0	-	5.5	0	-	5.5	V
V_O	output voltage		0	-	V_{CC}	0	-	V_{CC}	V
T_{amb}	ambient temperature		-40	+25	+125	-40	+25	+125	°C
Δt/ΔV	input transition rise and fall rate	V_{CC} = 3.3 V ± 0.3 V	-	-	100	-	-	-	ns/V
		V_{CC} = 5.0 V ± 0.5 V	-	-	20	-	-	20	ns/V

9. Static characteristics

Table 6. Static characteristics

Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
74AHC123A-Q100										
V_{IH}	HIGH-level input voltage	V_{CC} = 2.0 V	1.5	-	-	1.5	-	1.5	-	V
		V_{CC} = 3.0 V	2.1	-	-	2.1	-	2.1	-	V
		V_{CC} = 5.5 V	3.85	-	-	3.85	-	3.85	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 2.0 V	-	-	0.5	-	0.5	-	0.5	V
		V_{CC} = 3.0 V	-	-	0.9	-	0.9	-	0.9	V
		V_{CC} = 5.5 V	-	-	1.65	-	1.65	-	1.65	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH} or V_{IL}								
		I_O = -50 µA; V_{CC} = 2.0 V	1.9	2.0	-	1.9	-	1.9	-	V
		I_O = -50 µA; V_{CC} = 3.0 V	2.9	3.0	-	2.9	-	2.9	-	V
		I_O = -50 µA; V_{CC} = 4.5 V	4.4	4.5	-	4.4	-	4.4	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.58	-	-	2.48	-	2.40	-	V
		I_O = -8.0 mA; V_{CC} = 4.5 V	3.94	-	-	3.8	-	3.70	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}								
		I_O = 50 µA; V_{CC} = 2.0 V	-	0	0.1	-	0.1	-	0.1	V
		I_O = 50 µA; V_{CC} = 3.0 V	-	0	0.1	-	0.1	-	0.1	V
		I_O = 50 µA; V_{CC} = 4.5 V	-	0	0.1	-	0.1	-	0.1	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.36	-	0.44	-	0.55	V
		I_O = 8.0 mA; V_{CC} = 4.5 V	-	-	0.36	-	0.44	-	0.55	V
I_I	input leakage current	V_I = 5.5 V or GND; V_{CC} = 0 V to 5.5 V								
		nREXT/CEXT [1]	-	-	±0.25	-	±2.5	-	±10.0	µA
		pins nA, nB, nRD	-	-	±0.1	-	±1.0	-	±2.0	µA
I_{CC}	supply current	V_I = V_{CC} or GND; I_O = 0 A; V_{CC} = 5.5 V	-	-	4.0	-	40	-	80	µA
		active state (per circuit); [1] V_I = V_{CC} or GND								
		V_{CC} = 3.0 V	-	160	250	-	280	-	280	µA
		V_{CC} = 4.5 V	-	380	500	-	650	-	650	µA
		V_{CC} = 5.5 V	-	560	750	-	975	-	975	µA
C_I	input capacitance		-	5.0	10	-	10	-	10	pF
C_O	output capacitance		-	4.0	-	-	-	-	-	pF

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
74AHCT123A-Q100										
V_{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	2.0	-	2.0	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 4.5 V to 5.5 V	-	-	0.8	-	0.8	-	0.8	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH} or V_{IL}; V_{CC} = 4.5 V								
		I_O = -50 µA	4.4	4.5	-	4.4	-	4.4	-	V
		I_O = -8.0 mA	3.94	-	-	3.8	-	3.70	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}; V_{CC} = 4.5 V								
		I_O = 50 µA	-	0	0.1	-	0.1	-	0.1	V
		I_O = 8.0 mA	-	-	0.36	-	0.44	-	0.55	V
I_I	input leakage current	nREXT/CEXT; [1] V_I = 5.5 V or GND; V_{CC} = 0 V to 5.5 V	-	-	±0.25	-	±2.5	-	±10.0	µA
		pins n$\overline{A}$, nB, n$\overline{RD}$; V_I = V_{CC} or GND; V_{CC} = 5.5 V	-	-	±0.1	-	±1.0	-	±2.0	µA
I_{CC}	supply current	V_I = V_{CC} or GND; I_O = 0 A; V_{CC} = 5.5 V	-	-	4.0	-	40	-	80	µA
		active state (per circuit); [1] V_I = V_{CC} or GND								
		V_{CC} = 4.5 V	-	380	500	-	650	-	650	µA
		V_{CC} = 5.5 V	-	560	750	-	975	-	975	µA
C_I	input capacitance		-	3	10	-	10	-	10	pF
C_O	output capacitance		-	4.0	-	-	-	-	-	pF

[1] Voltage on nREXT/CEXT = 0.5 × V_{CC} and pin nREXT/CEXT in OFF-state during test.

10. Dynamic characteristics

Table 7. Dynamic characteristics

GND = 0 V; For test circuit see Fig. 10.

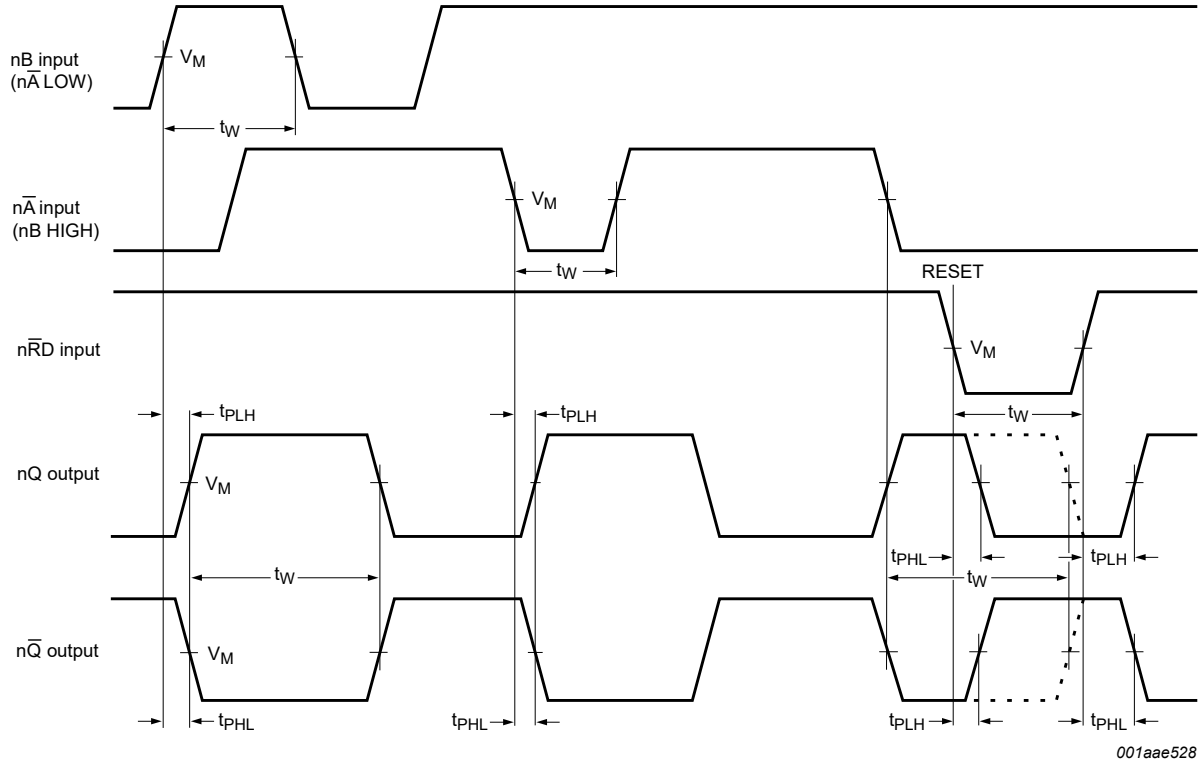
Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
74AHC123A-Q100										
t_{pd}	propagation delay	$n\overline{A}$ and nB to nQ and $n\overline{Q}$; see Fig. 5 [2]								
		V_{CC} = 3.0 V to 3.6 V; C_L = 15 pF	-	7.4	20.6	1.0	24.0	1.0	26.0	ns
		V_{CC} = 3.0 V to 3.6 V; C_L = 50 pF	-	10.5	24.1	1.0	27.5	1.0	30.0	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	5.1	12.0	1.0	14.0	1.0	15.5	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	7.3	14.0	1.0	16.0	1.0	17.5	ns
		$n\overline{R}D$ to nQ and $n\overline{Q}$; see Fig. 5 [2]								
		V_{CC} = 3.0 V to 3.6 V; C_L = 15 pF	-	8.2	22.4	1.0	26.0	1.0	28.0	ns
		V_{CC} = 3.0 V to 3.6 V; C_L = 50 pF	-	11.7	25.9	1.0	29.5	1.0	32.0	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	5.6	12.9	1.0	15.0	1.0	16.5	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	8.1	14.9	1.0	17.0	1.0	19.0	ns
		$n\overline{R}D$ to nQ and $n\overline{Q}$ (reset); see Fig. 5 [2]								
		V_{CC} = 3.0 V to 3.6 V; C_L = 15 pF	-	6.4	15.8	1.0	18.5	1.0	20.0	ns
		V_{CC} = 3.0 V to 3.6 V; C_L = 50 pF	-	9.2	19.3	1.0	22.0	1.0	24.5	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	4.4	9.4	1.0	11.0	1.0	12.0	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	6.3	11.4	1.0	13.0	1.0	14.5	ns
t_W	pulse width	inputs; $n\overline{A}$ = LOW; see Fig. 5								
		V_{CC} = 3.0 V to 3.6 V	5.0	-	-	5.0	-	5.0	-	ns
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		inputs; nB = HIGH; see Fig. 5								
		V_{CC} = 3.0 V to 3.6 V	5.0	-	-	5.0	-	5.0	-	ns
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		inputs; $n\overline{R}D$ = LOW; see Fig. 5								
		V_{CC} = 3.0 V to 3.6 V	5.0	-	-	5.0	-	5.0	-	ns
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		outputs; $n\overline{Q}$ = LOW and nQ = HIGH; C_L = 50 pF; see Fig. 5, Fig. 6, Fig. 7 and Fig. 8 [3]								
		C_{EXT} = 28 pF; R_{EXT} = 2 kΩ								
		V_{CC} = 3.0 V to 3.6 V	-	115	240	-	300	-	300	ns
		V_{CC} = 4.5 V to 5.5 V	-	100	200	-	240	-	240	ns
		C_{EXT} = 0.01 µF; R_{EXT} = 10 kΩ								
		V_{CC} = 3.0 V to 3.6 V	90	100	110	90	110	85	115	µs
		V_{CC} = 4.5 V to 5.5 V	90	100	110	90	110	85	115	µs
		C_{EXT} = 0.1 µF; R_{EXT} = 10 kΩ;								
		V_{CC} = 3.0 V to 3.6 V	0.9	1	1.1	0.9	1.1	0.85	1.15	ms
		V_{CC} = 4.5 V to 5.5 V	0.9	1	1.1	0.9	1.1	0.85	1.15	ms

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
t_{rtrig}	retrigger time	$n\overline{A}$ to nB; C_{EXT} = 100 pF; R_{EXT} = 1 kΩ; C_L = 50 pF; see Fig. 6 and Fig. 8								
		V_{CC} = 3.0 V to 3.6 V	-	60	-	-	-	-	-	ns
		V_{CC} = 4.5 V to 5.5 V	-	39	-	-	-	-	-	ns
		$n\overline{A}$ to nB; C_{EXT} = 0.01 µF; R_{EXT} = 1 kΩ; C_L = 50 pF; see Fig. 6 and Fig. 8								
		V_{CC} = 3.0 V to 3.6 V	-	1.5	-	-	-	-	-	µs
		V_{CC} = 4.5 V to 5.5 V	-	1.2	-	-	-	-	-	µs
C_{PD}	power dissipation capacitance	C_L = 50 pF; f_i = 1 MHz; V_I = GND to V_{CC} [4]	-	57	-	-	-	-	-	pF
74AHCT123A-Q100										
t_{pd}	propagation delay	$n\overline{A}$ and nB to nQ and $n\overline{Q}$; see Fig. 5 [2]								
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	5.0	12.0	1.0	14.0	1.0	15.5	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	7.1	14.0	1.0	16.0	1.0	17.5	ns
		$n\overline{R}D$ to nQ and $n\overline{Q}$; see Fig. 5 [2]								
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	5.2	12.9	1.0	15.0	1.0	16.5	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	7.5	14.9	1.0	17.0	1.0	18.5	ns
		$n\overline{R}D$ to nQ and $n\overline{Q}$ (reset); see Fig. 5 [2]								
		V_{CC} = 4.5 V to 5.5 V; C_L = 15 pF	-	4.7	9.4	1.0	11.0	1.0	12.0	ns
		V_{CC} = 4.5 V to 5.5 V; C_L = 50 pF	-	6.7	11.4	1.0	13.0	1.0	14.5	ns
t_W	pulse width	inputs; $n\overline{A}$ = LOW; C_L = 50 pF; see Fig. 5								
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		inputs; nB = HIGH; C_L = 50 pF; see Fig. 5								
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		inputs; $n\overline{R}D$ = LOW; C_L = 50 pF; see Fig. 5								
		V_{CC} = 4.5 V to 5.5 V	5.0	-	-	5.0	-	5.0	-	ns
		outputs; $n\overline{Q}$ = LOW and nQ = HIGH; C_L = 50 pF; C_{EXT} = 28 pF; R_{EXT} = 2 kΩ; see Fig. 5, Fig. 6, Fig. 7 and Fig. 8 [3]								
		V_{CC} = 4.5 V to 5.5 V	-	100	200	-	240	-	240	ns
		C_{EXT} = 0.01 µF; R_{EXT} = 10 kΩ								
		V_{CC} = 4.5 V to 5.5 V	90	100	110	90	110	85	115	µs
		C_{EXT} = 0.1 µF; R_{EXT} = 10 kΩ								
		V_{CC} = 4.5 V to 5.5 V	0.9	1	1.1	0.9	1.1	0.85	1.15	ms

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
t_{rtrig}	retrigger time	$n\overline{A}$ to nB; C_{EXT} = 100 pF; R_{EXT} = 1 kΩ; C_L = 50 pF; see Fig. 6 and Fig. 8								
		V_{CC} = 4.5 V to 5.5 V	-	60	-	-	-	-	-	ns
		$n\overline{A}$ to nB; C_{EXT} = 0.01 µF; R_{EXT} = 1 kΩ; C_L = 50 pF; see Fig. 6 and Fig. 8								
		V_{CC} = 4.5 V to 5.5 V	-	1.5	-	-	-	-	-	µs
C_{PD}	power dissipation capacitance	C_L = 50 pF; f_i = 1 MHz; V_I = GND to V_{CC} [4]	-	58	-	-	-	-	-	pF
External components										
R_{EXT}	external resistance	V_{CC} = 2.0 V	5	-	-	-	-	-	-	kΩ
		V_{CC} > 3.0 V	1	-	-	-	-	-	-	kΩ
C_{EXT}	external capacitance	V_{CC} = 2.0 V [5]	-	-	-	-	-	-	-	pF
		V_{CC} > 3.0 V [5]	-	-	-	-	-	-	-	pF

[1] Typical values are measured at nominal supply voltage (V_{CC} = 3.3 V and V_{CC} = 5.0 V).
[2] t_{pd} is the same as t_{PLH} and t_{PHL}; C_{EXT} = 0 pF; R_{EXT} = 5 kΩ.
[3] For $C_{EXT} \geq 10$ nF the typical value of the pulse width t_W (µs) = C_{EXT} (nF) × R_{EXT} (kΩ).
[4] C_{PD} is used to determine the dynamic power dissipation P_D (µW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
f_i = input frequency in MHz;
f_o = output frequency in MHz;
C_L = output load capacitance in pF;
V_{CC} = supply voltage in V.
[5] C_{EXT} has no limits.

10.1. Waveforms and test circuit

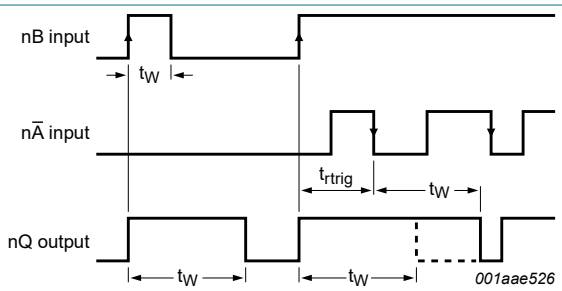


Measurement points are given in Table 8.

Fig. 5. Propagation delay input (nA, nB, nRD) to output (nQ, nQ)

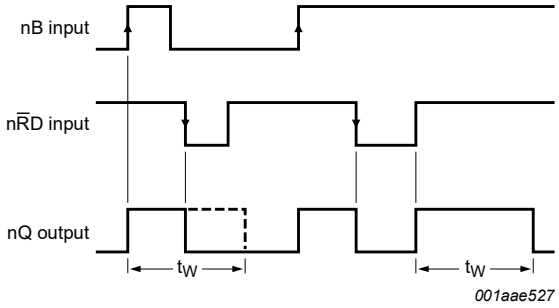
Table 8. Measurement points

Type	Input	Output
	V_M	V_M
74AHC123A-Q100	0.5 × V_{CC}	0.5 × V_{CC}
74AHCT123A-Q100	1.5 V	0.5 × V_{CC}



nRD = HIGH

Fig. 6. Output pulse control using retrigger pulse



nA̅ = LOW

Fig. 7. Output pulse control using reset input nR̄D

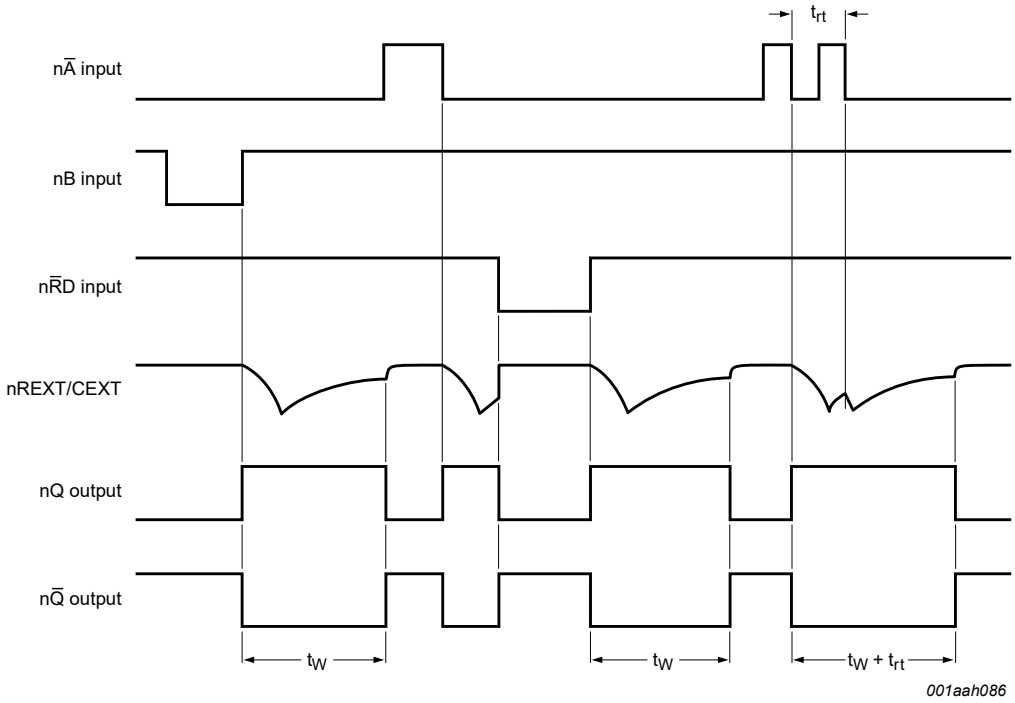


Fig. 8. Input and output timing

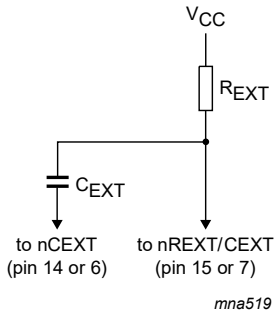
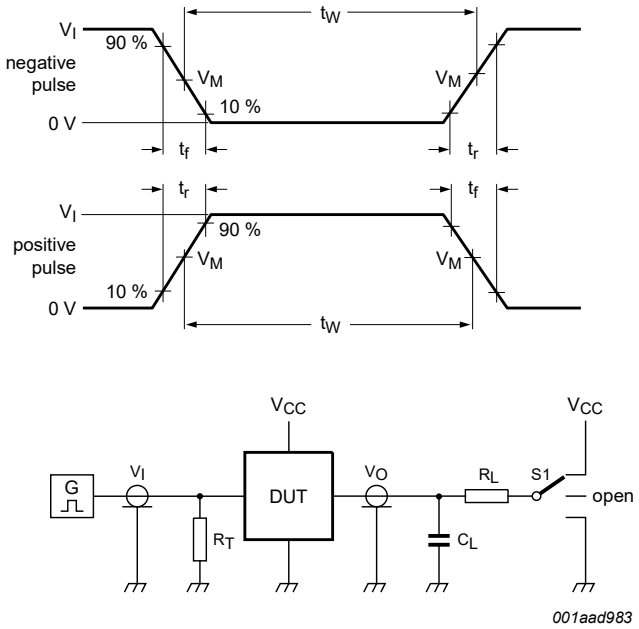


Fig. 9. Timing component connections



Test data is given in Table 9.

Definitions test circuit:

R_T = Termination resistance should be equal to output impedance Z_o of the pulse generator

C_L = Load capacitance including jig and probe capacitance

R_L = Load resistance

S1 = Test selection switch

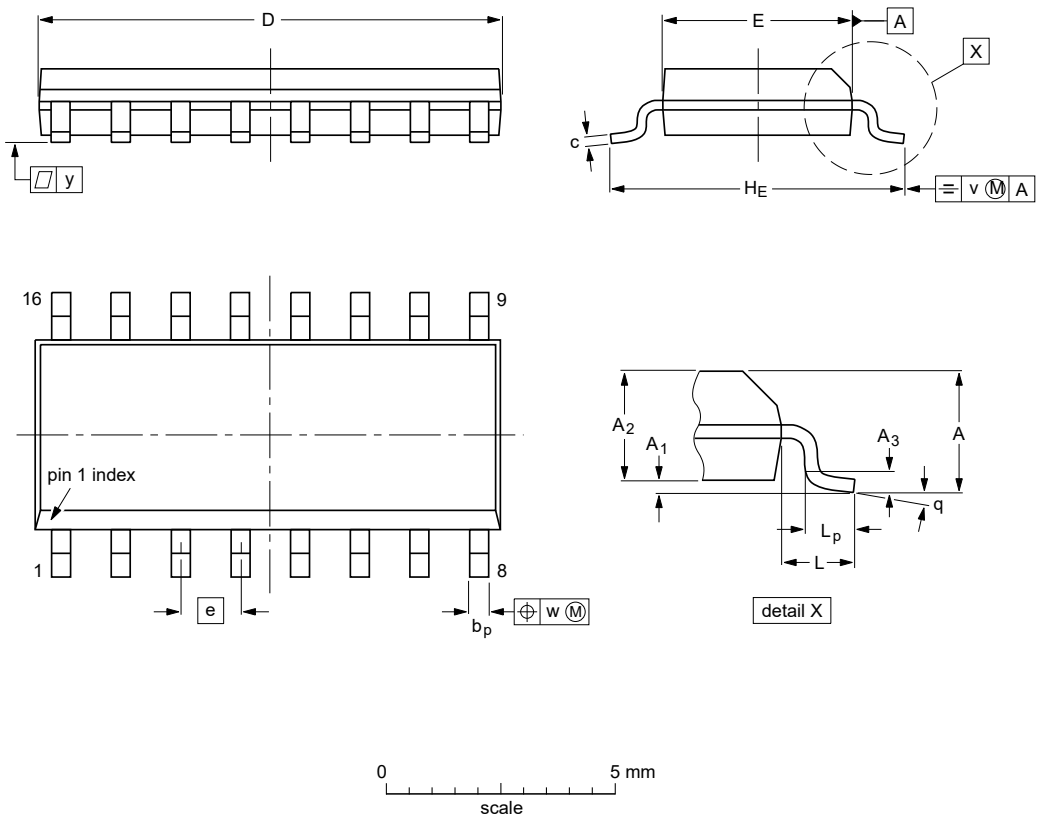
Fig. 10. Test circuit for measuring switching times

Table 9. Test data

Type	Input		Load		S1 position		
	V_I	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
74AHC123A-Q100	V_{CC}	3.0 ns	15 pF, 50 pF	1 kΩ	open	GND	V_{CC}
74AHCT123A-Q100	3.0 V	3.0 ns	15 pF, 50 pF	1 kΩ	open	GND	V_{CC}

11. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm **SOT109-1**



Dimensions (inch dimensions are derived from the original mm dimensions)

Unit		A	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	v	w	y	θ
mm	max	1.75	0.25			0.51	0.25	10.0	4.0		6.2		1.27				8°
	nom				0.25					1.27		1.05		0.2	0.25	0.1	
	min		0.10	1.25		0.31	0.10	9.8	3.8		5.8		0.4				0°
inches	max	0.069	0.010			0.020	0.010	0.394	0.16		0.244		0.05				8°
	nom				0.01					0.05		0.041		0.008	0.01	0.004	
	min		0.004	0.049		0.012	0.004	0.386	0.15		0.228		0.016				0°

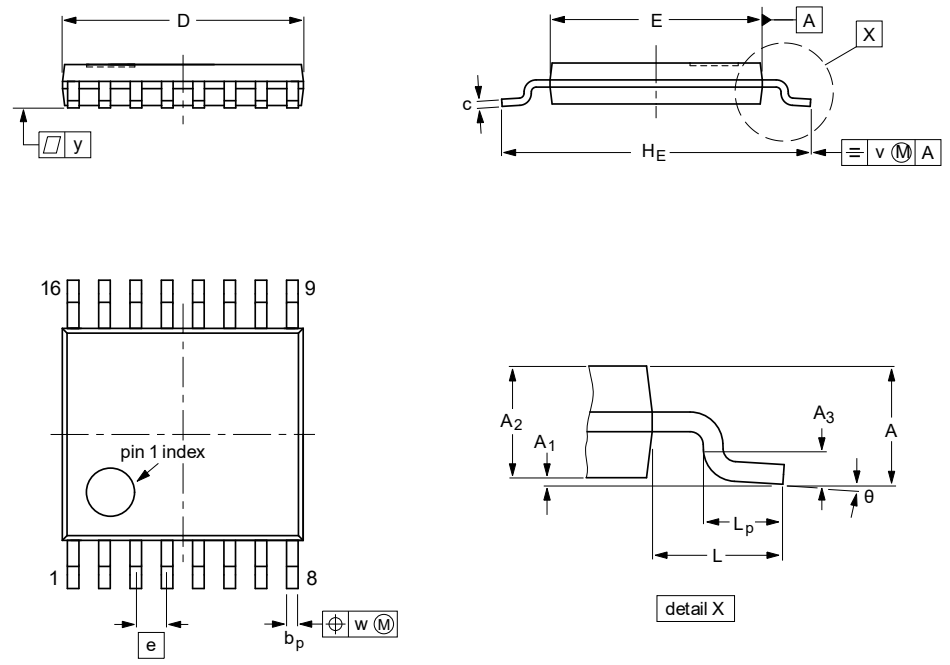
Note
1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

sot109-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT109-1		MS-012				~~03-02-19~~ 23-10-27

Fig. 11. Package outline SOT109-1 (SO16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm **SOT403-1**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	v	w	y	θ
mm	max	1.20	0.15	1.05		0.30	0.2	5.1	4.5		6.6		0.75				8°
	nom				0.25					0.65		1		0.2	0.1	0.1	
	min		0.05	0.80		0.19	0.09	4.9	4.3		6.2		0.45				0°

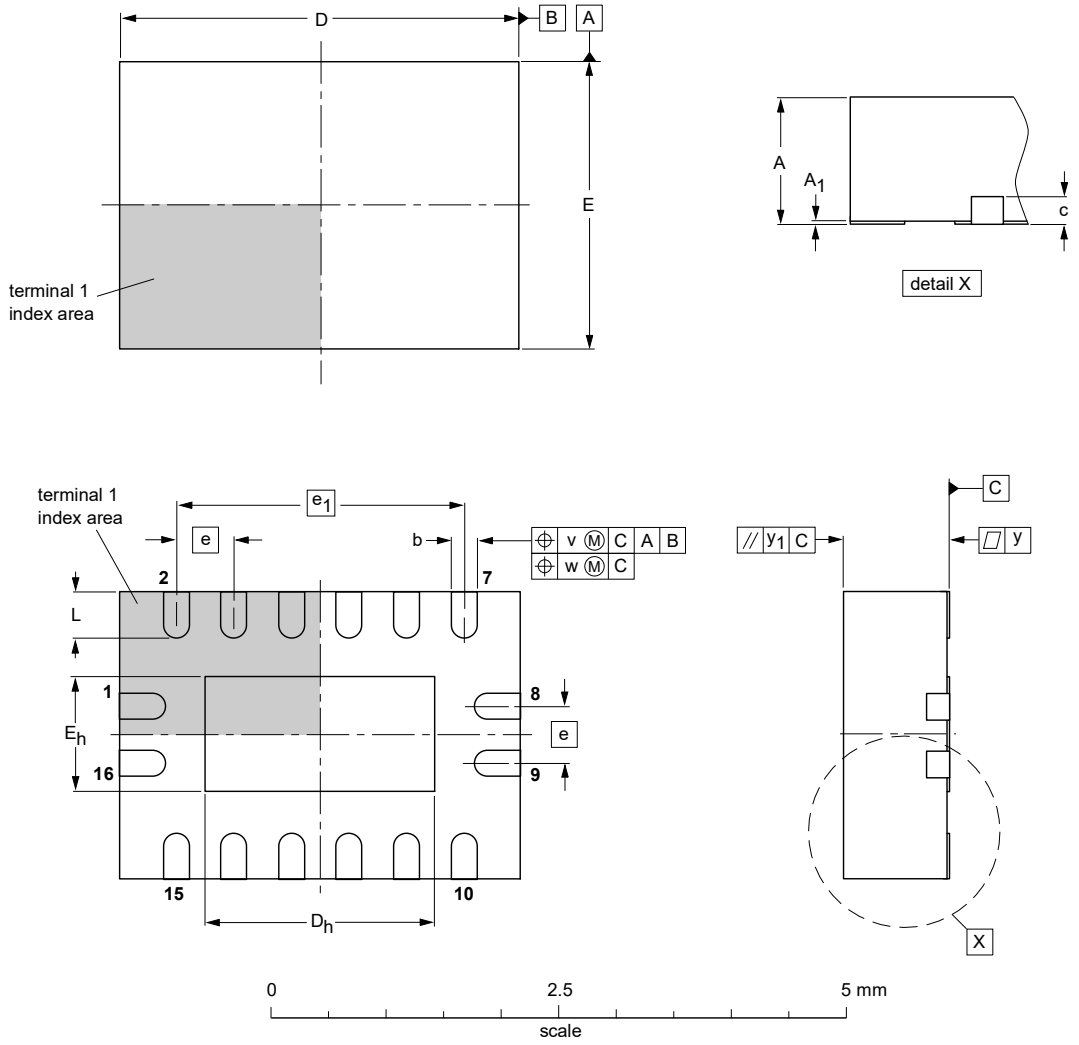
Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

sot403-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT403-1		MO-153				~~03-02-18~~ 23-10-27

Fig. 12. Package outline SOT403-1 (TSSOP16)

DHVQFN16: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 16 terminals; body 2.5 x 3.5 x 0.85 mm **SOT763-1**



DIMENSIONS (mm are the original dimensions)

UNIT	$A^{(1)}$ max.	A_1	b	c	$D^{(1)}$	D_h	$E^{(1)}$	E_h	e	e_1	L	v	w	y	y_1
mm	1	0.05 0.00	0.30 0.18	0.2	3.6 3.4	2.15 1.85	2.6 2.4	1.15 0.85	0.5	2.5	0.5 0.3	0.1	0.05	0.05	0.1

Note

1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT763-1	- - -	MO-241	- - -			~~02-10-17~~ 03-01-27

Fig. 13. Package outline SOT763-1 (DHVQFN16)

12. Abbreviations

Table 10. Abbreviations

Acronym	Description
CDM	Charged-Device Model
CMOS	Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
TTL	Transistor-Transistor Logic

13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AHC_AHCT123A_Q100 v.4	20240228	Product data sheet	-	74AHC_AHCT123A_Q100 v.3
Modifications:	• Fig. 11, Fig. 12: Aligned SO and TSSOP package outline drawings to JEDEC MS-012 and MO-153.			
74AHC_AHCT123A_Q100 v.3	20230904	Product data sheet	-	74AHC_AHCT123A_Q100 v.2
Modifications:	• Section 2: ESD specification updated according to the latest JEDEC standard.			
74AHC_AHCT123A_Q100 v.2	20200617	Product data sheet	-	74AHC_AHCT123A_Q100 v.1
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Section 1 and Section 2 updated. • Table 4: Derating values for P_{tot} total power dissipation updated.			
74AHC_AHCT123A_Q100 v.1	20130523	Product data sheet	-	-

14. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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