

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 ($n\bar{A}$ or $n\bar{B}$). By repeating this process, the output pulse period ($nQ = HIGH$, $n\bar{Q} = LOW$) can be made as long as desired. Alternatively, an output delay can be terminated at any time by a LOW-going edge on input $n\bar{RD}$. 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

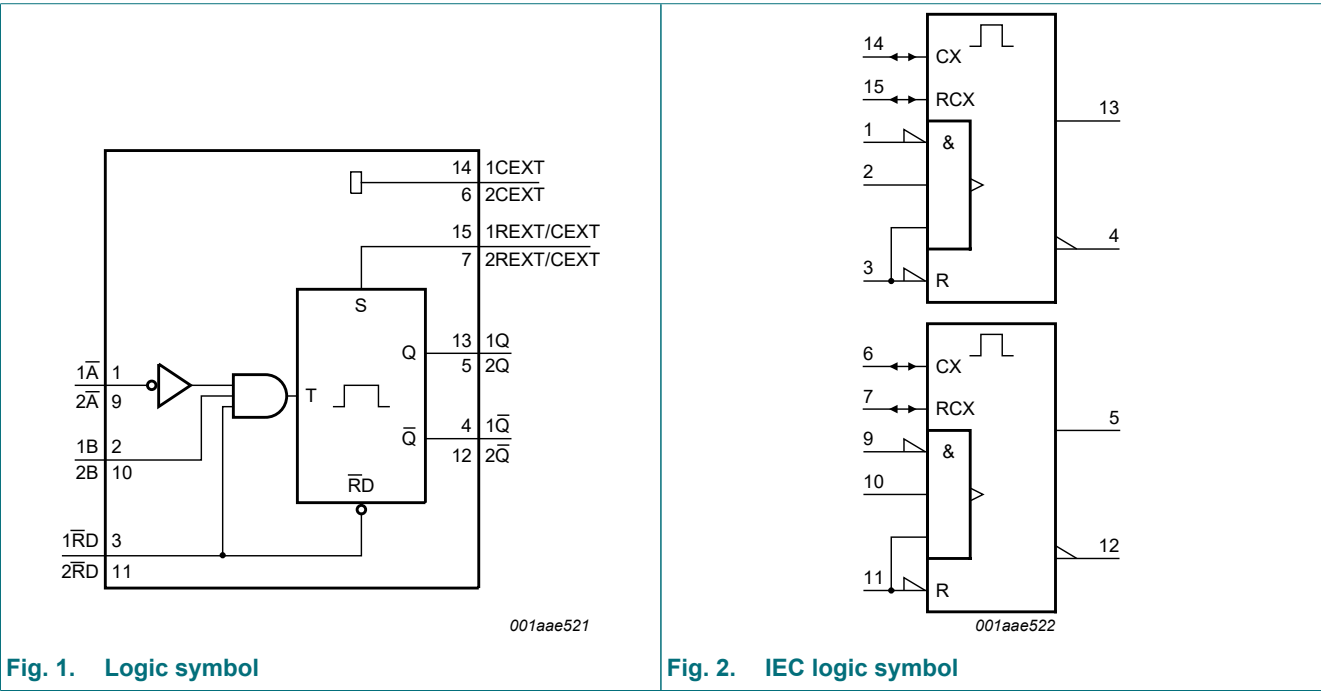
- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
 - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 2.0 V to 5.5 V
- DC triggered from active HIGH or active LOW inputs
- Retriggerable for very long pulses up to 100 % duty factor
- Direct 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



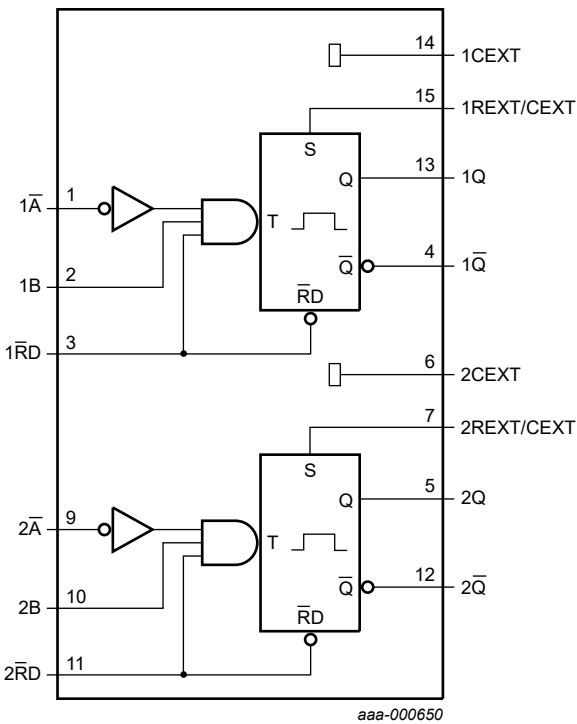
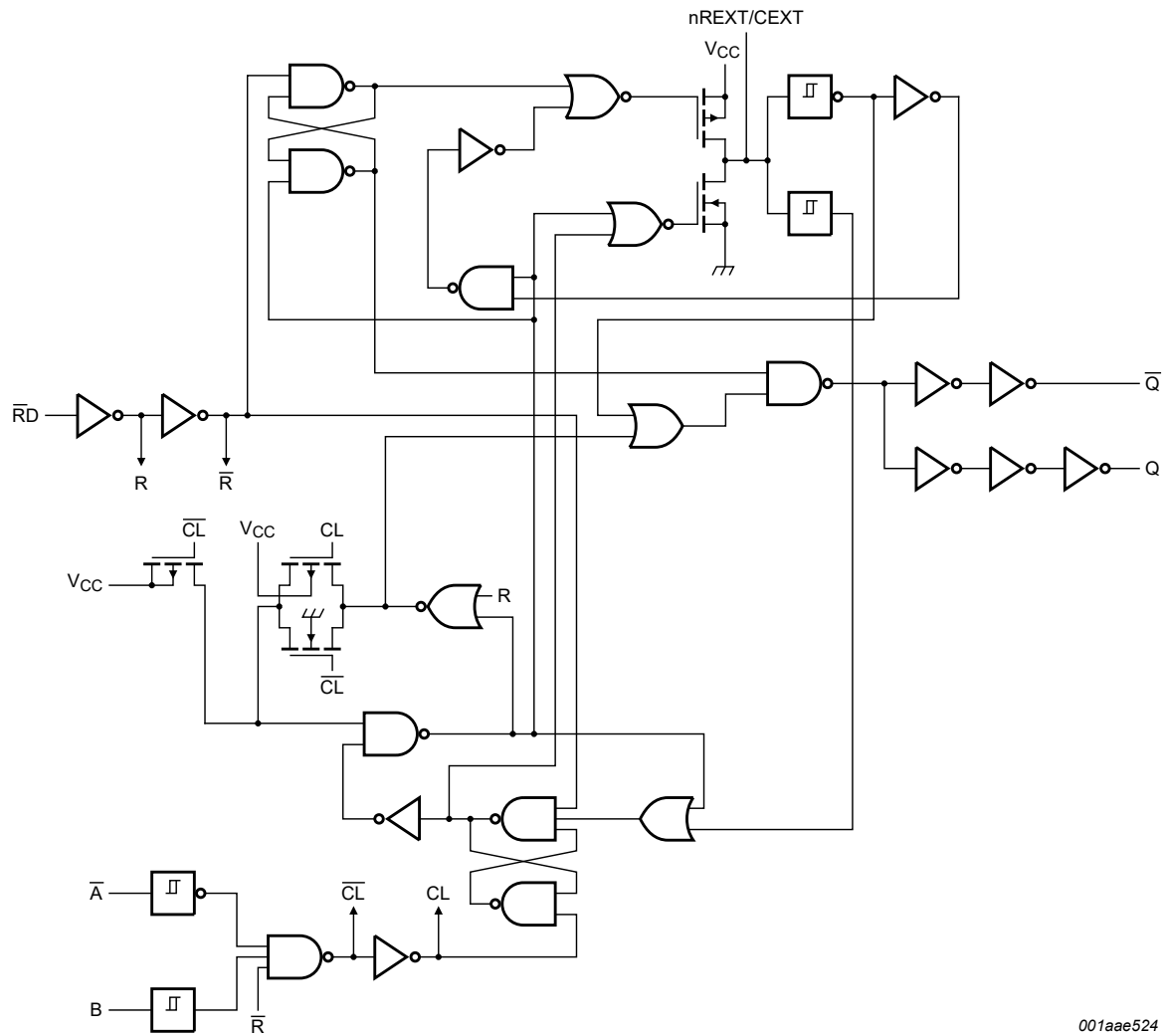


Fig. 3. Functional diagram



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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)

1A 1 16 V_{CC}
1B 2 15 1REXT/CEXT
1RD 3 14 1CEXT
1Q 4 13 1Q
2Q 5 12 2Q
2CEXT 6 11 2RD
2REXT/CEXT 7 10 2B
GND 8 9 2A

aaa-035377

PW package
SOT403-1 (TSSOP16)

1A 1 16 V_{CC}
1B 2 15 1REXT/CEXT
1RD 3 14 1CEXT
1Q 4 13 1Q
2Q 5 12 2Q
2CEXT 6 11 2RD
2REXT/CEXT 7 10 2B
GND 8 9 2A

aaa-035378

BQ package
SOT763-1 (DHVQFN16)

terminal 1
index area

1A 1 16 V_{CC}
1B 2 15 1REXT/CEXT
1RD 3 14 1CEXT
1Q 4 13 1Q
2Q 5 12 2Q
2CEXT 6 11 2RD
2REXT/CEXT 7 10 2B
GND 8 9 2A

GND(1)

aaa-035379

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
1A	1	negative-edge triggered input 1
1B	2	positive-edge triggered input 1
1RD	3	direct reset LOW and positive-edge triggered input 1
1Q	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)
2A	9	negative-edge triggered input 2
2B	10	positive-edge triggered input 2
2RD	11	direct reset LOW and positive-edge triggered input 2
2Q	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
VCC	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	
nRD	nA	nB	nQ	nQ
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 n $\overline{\text{A}}$, nB, n $\overline{\text{RD}}$	-	-	±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); V _I = V _{CC} or GND [1]								
		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; V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V [1]	-	-	±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); V _I = V _{CC} or GND [1]								
		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{RD} 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{RD} 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{RD} = 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 k Ω								
		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 μ F; R _{EXT} = 10 k Ω								
		V _{CC} = 3.0 V to 3.6 V	90	100	110	90	110	85	115	μ s
		V _{CC} = 4.5 V to 5.5 V	90	100	110	90	110	85	115	μ s
		C _{EXT} = 0.1 μ F; R _{EXT} = 10 k Ω ;								
		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_{trig}	retrigger time	$n\bar{A}$ to nB; $C_{\text{EXT}} = 100 \text{ pF}$; $R_{\text{EXT}} = 1 \text{ k}\Omega$; $C_L = 50 \text{ pF}$; see Fig. 6 and Fig. 8								
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	-	60	-	-	-	-	-	ns
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	-	39	-	-	-	-	-	ns
		$n\bar{A}$ to nB; $C_{\text{EXT}} = 0.01 \text{ }\mu\text{F}$; $R_{\text{EXT}} = 1 \text{ k}\Omega$; $C_L = 50 \text{ pF}$; see Fig. 6 and Fig. 8								
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	-	1.5	-	-	-	-	-	μs
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	-	1.2	-	-	-	-	-	μs
C_{PD}	power dissipation capacitance	$C_L = 50 \text{ pF}$; $f_i = 1 \text{ MHz}$; $V_i = \text{GND to } V_{\text{CC}}$ [4]	-	57	-	-	-	-	-	pF
74AHCT123A-Q100										
t_{pd}	propagation delay	$n\bar{A}$ and nB to nQ and $n\bar{Q}$; see Fig. 5 [2]								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 15 \text{ pF}$	-	5.0	12.0	1.0	14.0	1.0	15.5	ns
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 50 \text{ pF}$	-	7.1	14.0	1.0	16.0	1.0	17.5	ns
		$n\bar{R}\text{D}$ to nQ and $n\bar{Q}$; see Fig. 5 [2]								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 15 \text{ pF}$	-	5.2	12.9	1.0	15.0	1.0	16.5	ns
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 50 \text{ pF}$	-	7.5	14.9	1.0	17.0	1.0	18.5	ns
		$n\bar{R}\text{D}$ to nQ and $n\bar{Q}$ (reset); see Fig. 5 [2]								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 15 \text{ pF}$	-	4.7	9.4	1.0	11.0	1.0	12.0	ns
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$; $C_L = 50 \text{ pF}$	-	6.7	11.4	1.0	13.0	1.0	14.5	ns
t_{W}	pulse width	inputs; $n\bar{A} = \text{LOW}$; $C_L = 50 \text{ pF}$; see Fig. 5								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	5.0	-	-	5.0	-	5.0	-	ns
		inputs; nB = HIGH; $C_L = 50 \text{ pF}$; see Fig. 5								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	5.0	-	-	5.0	-	5.0	-	ns
		inputs; $n\bar{R}\text{D} = \text{LOW}$; $C_L = 50 \text{ pF}$; see Fig. 5								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	5.0	-	-	5.0	-	5.0	-	ns
		outputs; $n\bar{Q} = \text{LOW}$ and nQ = HIGH; $C_L = 50 \text{ pF}$; $C_{\text{EXT}} = 28 \text{ pF}$; $R_{\text{EXT}} = 2 \text{ k}\Omega$; see Fig. 5, Fig. 6, Fig. 7 and Fig. 8 [3]								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	-	100	200	-	240	-	240	ns
		$C_{\text{EXT}} = 0.01 \text{ }\mu\text{F}$; $R_{\text{EXT}} = 10 \text{ k}\Omega$								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	90	100	110	90	110	85	115	μs
		$C_{\text{EXT}} = 0.1 \text{ }\mu\text{F}$; $R_{\text{EXT}} = 10 \text{ k}\Omega$								
		$V_{\text{CC}} = 4.5 \text{ V to } 5.5 \text{ V}$	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 k Ω ; 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 μ F; R _{EXT} = 1 k Ω ; C _L = 50 pF; see Fig. 6 and Fig. 8								
		V _{CC} = 4.5 V to 5.5 V	-	1.5	-	-	-	-	-	μ s
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	-	-	-	-	-	-	k Ω
		V _{CC} > 3.0 V	1	-	-	-	-	-	-	k Ω
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 k Ω .

[3] For C_{EXT} \geq 10 nF the typical value of the pulse width t_W (μ s) = C_{EXT} (nF) \times R_{EXT} (k Ω).

[4] C_{PD} is used to determine the dynamic power dissipation P_D (μ W).

P_D = C_{PD} \times V_{CC}² \times f_i + Σ (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

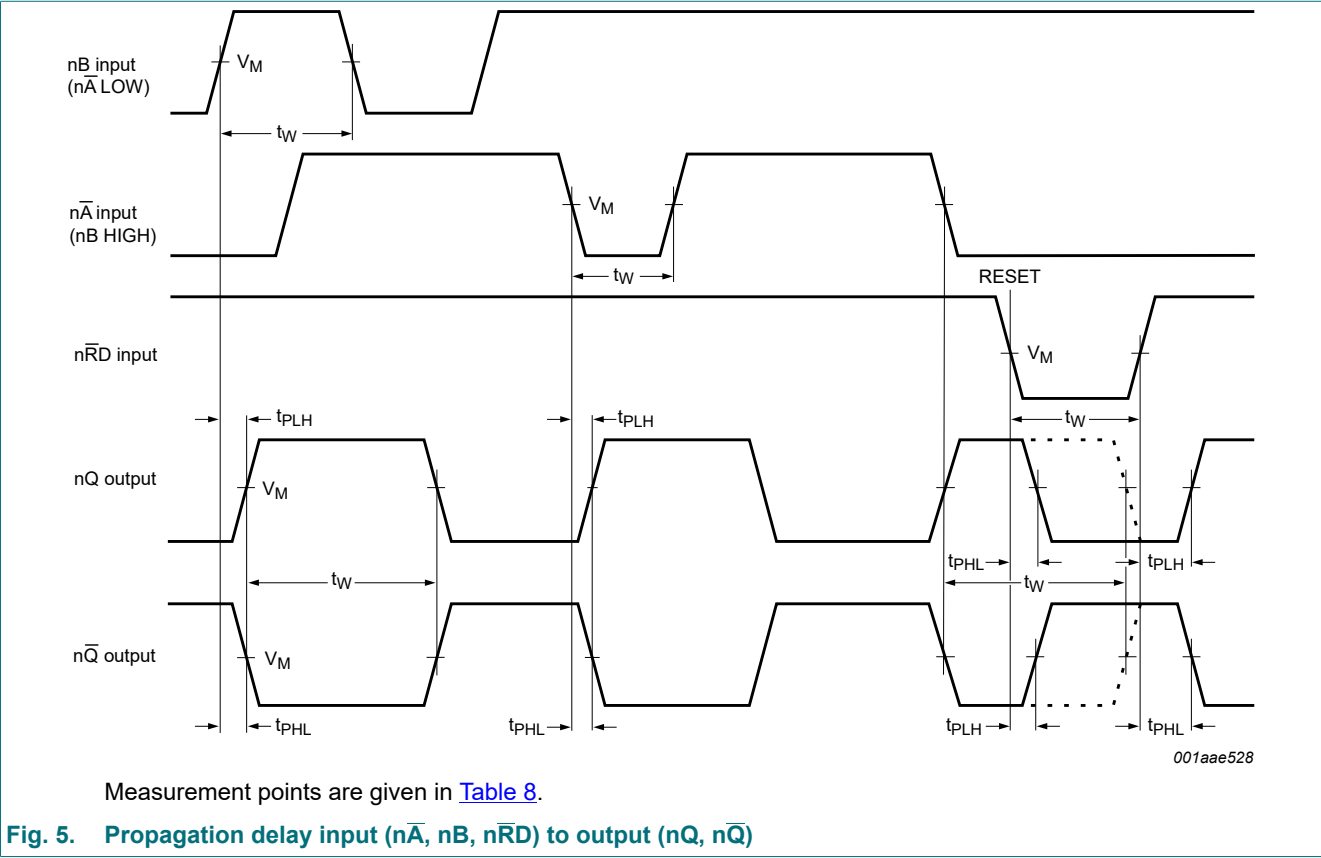
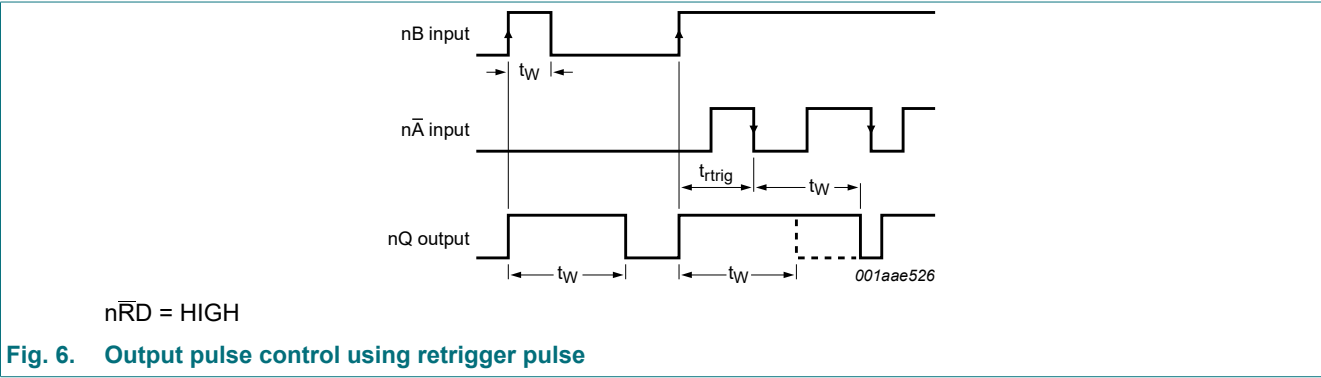
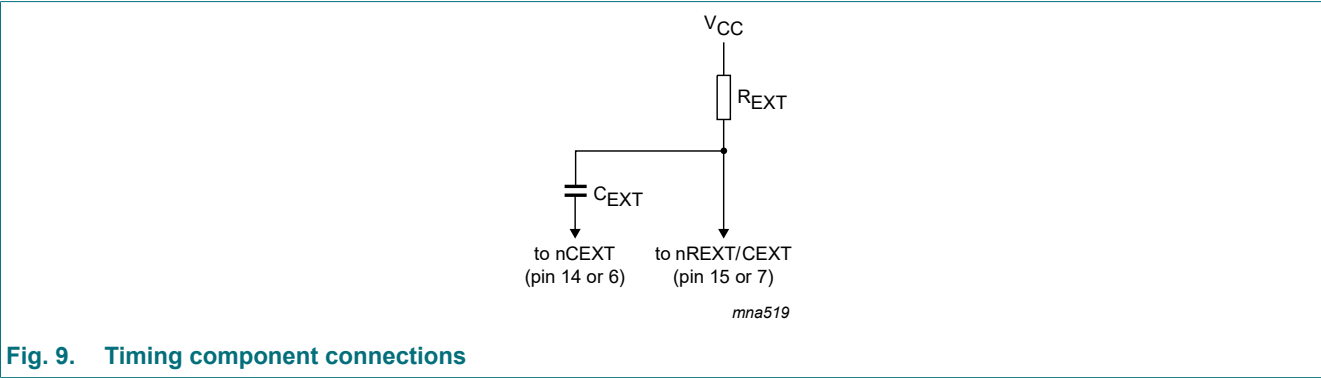
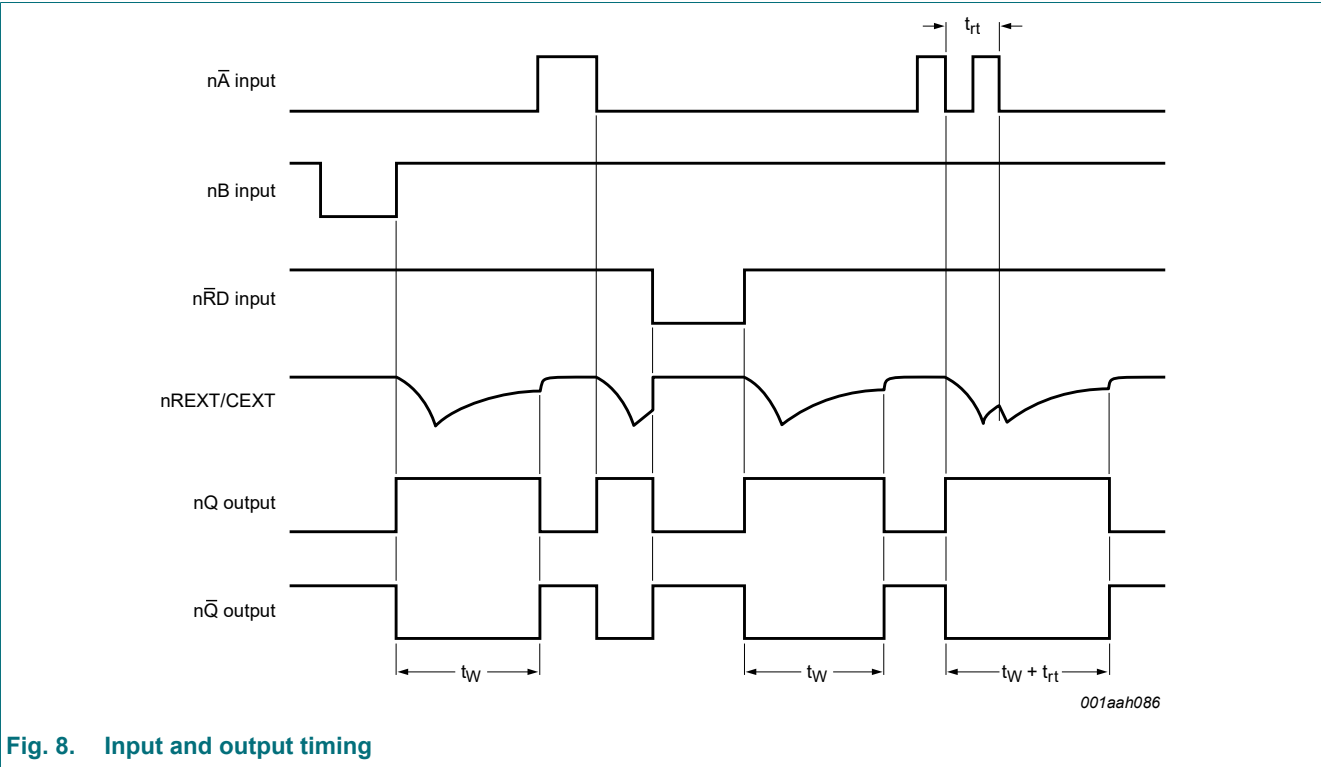
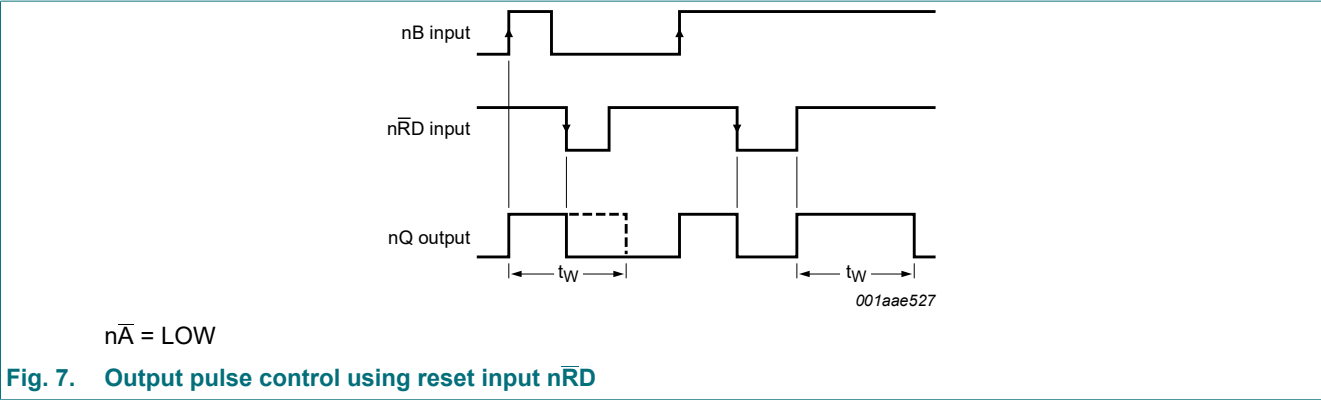


Table 8. Measurement points

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





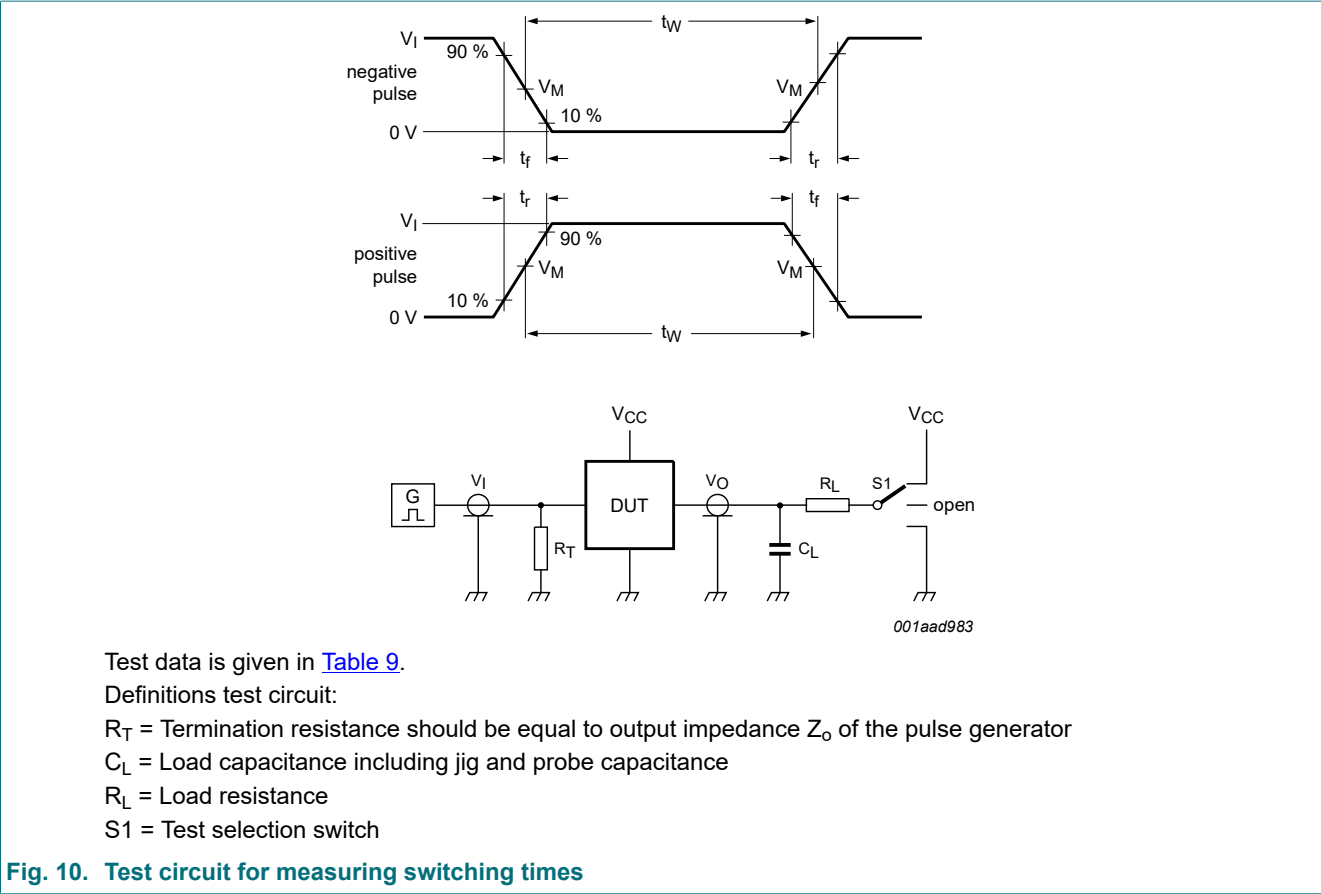


Fig. 10. Test circuit for measuring switching times

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 k Ω	open	GND	V_{CC}
74AHCT123A-Q100	3.0 V	3.0 ns	15 pF, 50 pF	1 k Ω	open	GND	V_{CC}

11. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1

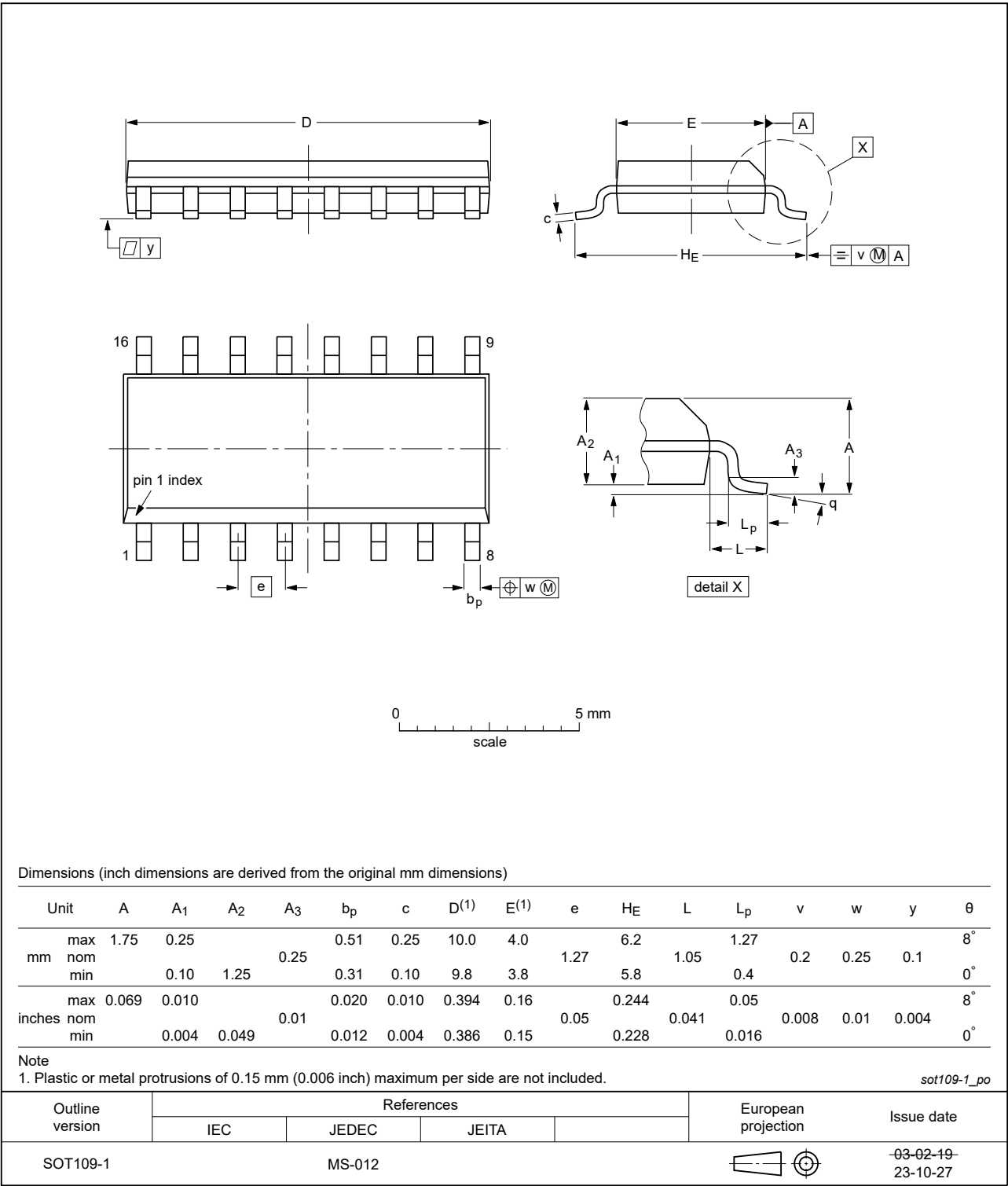


Fig. 11. Package outline SOT109-1 (SO16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm

SOT403-1

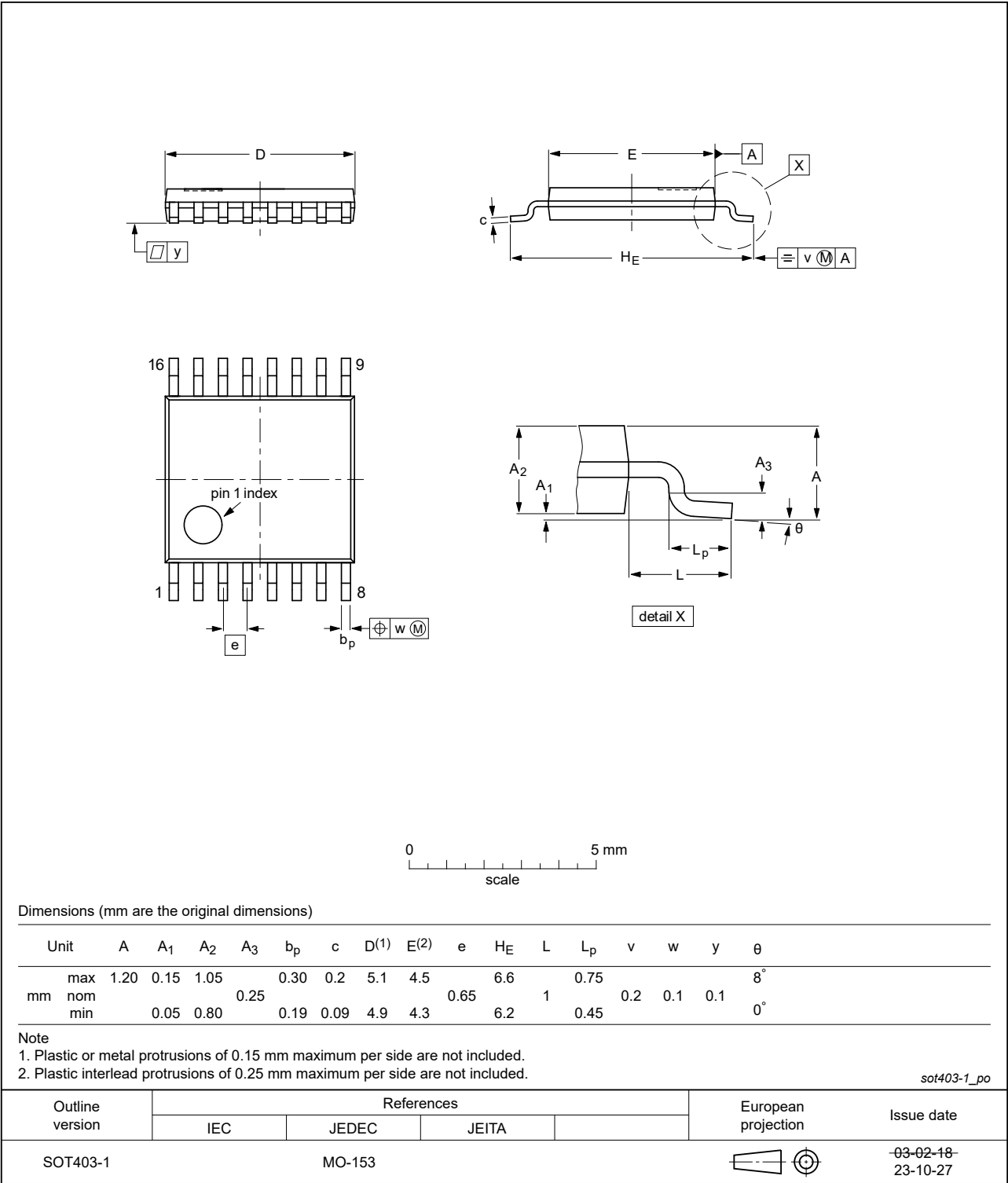


Fig. 12. Package outline SOT403-1 (TSSOP16)

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

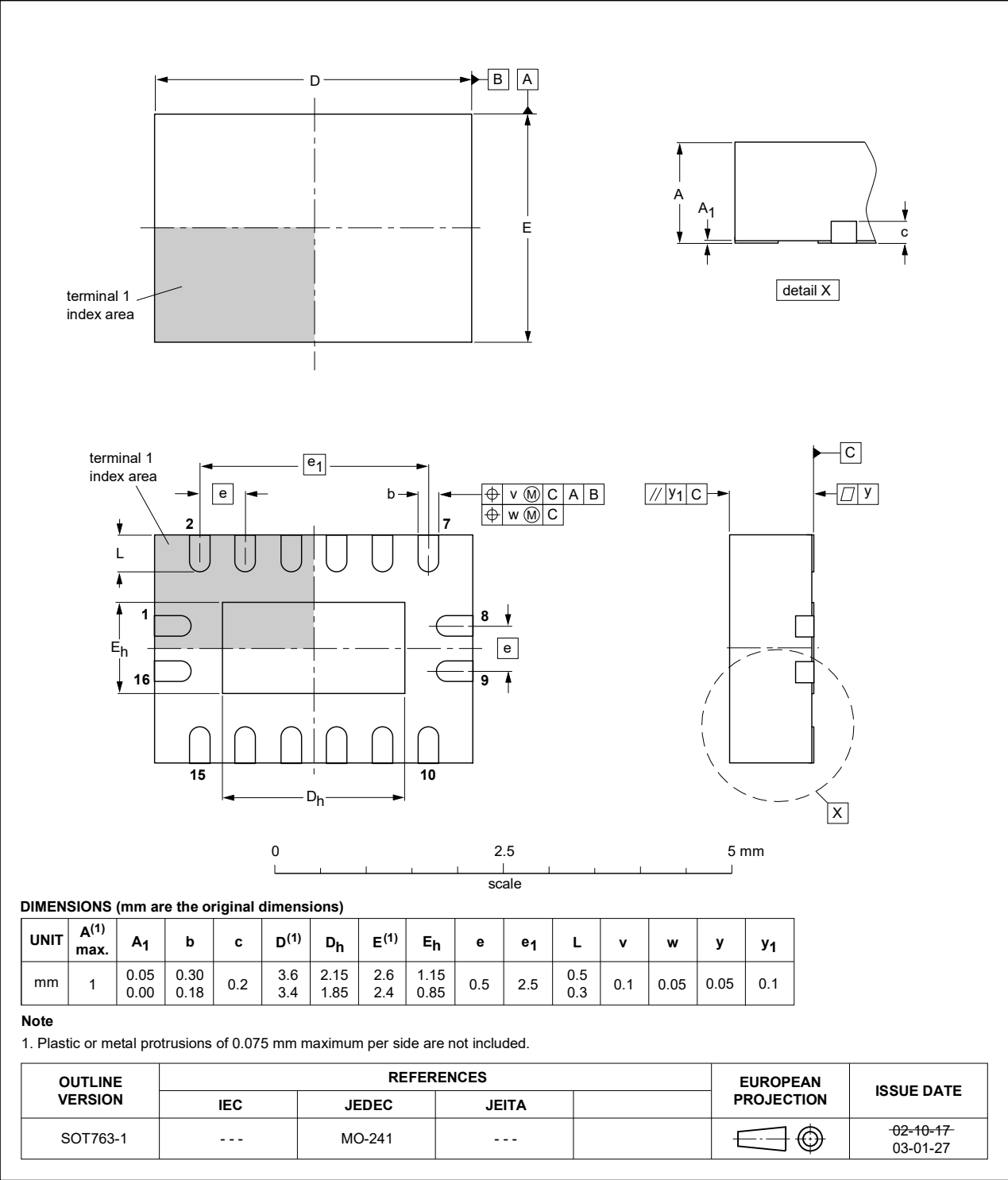


Fig. 13. Package outline SOT763-1 (DHVQFN16)

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:	<ul style="list-style-type: none">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:	<ul style="list-style-type: none">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:	<ul style="list-style-type: none">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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Contents

1. General description.....	1
2. Features and benefits.....	1
3. Ordering information.....	2
4. Functional diagram.....	2
5. Pinning information.....	5
5.1. Pinning.....	5
5.2. Pin description.....	6
6. Functional description.....	6
7. Limiting values.....	7
8. Recommended operating conditions.....	7
9. Static characteristics.....	8
10. Dynamic characteristics.....	10
10.1. Waveforms and test circuit.....	13
11. Package outline.....	16
12. Abbreviations.....	19
13. Revision history.....	19
14. Legal information.....	20

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