

# 74LVC1G123

## Single retriggerable monostable multivibrator; Schmitt trigger inputs

Rev. 7 — 20 April 2021

Product data sheet

## 1. General description

The 74LVC1G123 is a single retriggerable monostable multivibrator with Schmitt trigger inputs. Output pulse width is controlled by three methods:

1. The basic pulse is programmed by selection of an external resistor ( $R_{EXT}$ ) and capacitor ( $C_{EXT}$ ).
2. Once triggered, the basic output pulse width may be extended by retriggering the gated active LOW-going edge input ( $\overline{A}$ ) or the active HIGH-going edge input (B). By repeating this process, the output pulse period ( $Q = \text{HIGH}$ ) can be made as long as desired. Alternatively an output delay can be terminated at any time by a LOW-going edge on input  $\overline{CLR}$ , which also inhibits the triggering.
3. An internal connection from  $\overline{CLR}$  to the input gates makes it possible to trigger the circuit by a HIGH-going signal at input  $\overline{CLR}$ .

Inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in a mixed 3.3 V and 5 V environment. Schmitt trigger inputs, makes the circuit highly tolerant to slower input rise and fall times.

This device is fully specified for partial power-down applications using  $I_{OFF}$ . The  $I_{OFF}$  circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

## 2. Features and benefits

- Wide supply voltage range from 1.65 V to 5.5 V
- High noise immunity
- $\pm 24$  mA output drive ( $V_{CC} = 3.0$  V)
- CMOS low power consumption
- DC triggered from active HIGH or active LOW inputs
- Retriggerable for very long pulses up to 100 % duty factor
- Direct reset terminates output pulse
- Schmitt trigger on all inputs
- Complies with JEDEC standard:
  - JESD8-7 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8-B/JESD36 (2.7 V to 3.6 V)
- Power-on-reset on outputs
- Latch-up performance exceeds 100 mA
- Direct interface with TTL levels
- Inputs accept voltages up to 5.5 V
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Multiple package options
- Specified from  $-40$  °C to  $+85$  °C and  $-40$  °C to  $+125$  °C

### 3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74LVC1G123DP	-40 °C to +125 °C	TSSOP8	plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm	SOT505-2
74LVC1G123DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74LVC1G123GT	-40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm	SOT833-1
74LVC1G123GN	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	SOT1116
74LVC1G123GS	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	SOT1203

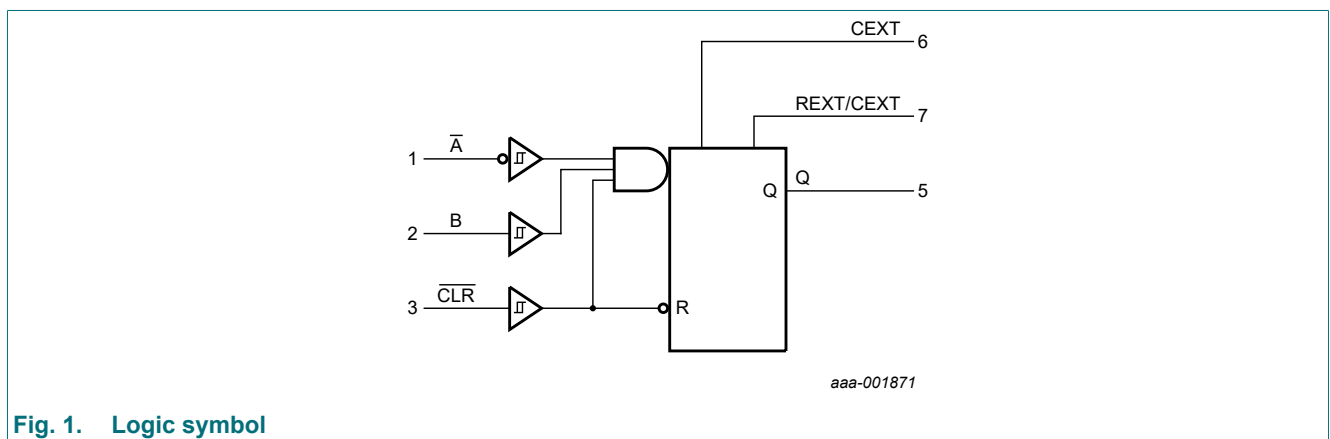
### 4. Marking

Table 2. Marking codes

Type number	Marking code[1]
74LVC1G123DP	Y3
74LVC1G123DC	Y3
74LVC1G123GT	Y3
74LVC1G123GN	Y3
74LVC1G123GS	Y3

[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

### 5. Functional diagram



Single retriggerable monostable multivibrator; Schmitt trigger inputs

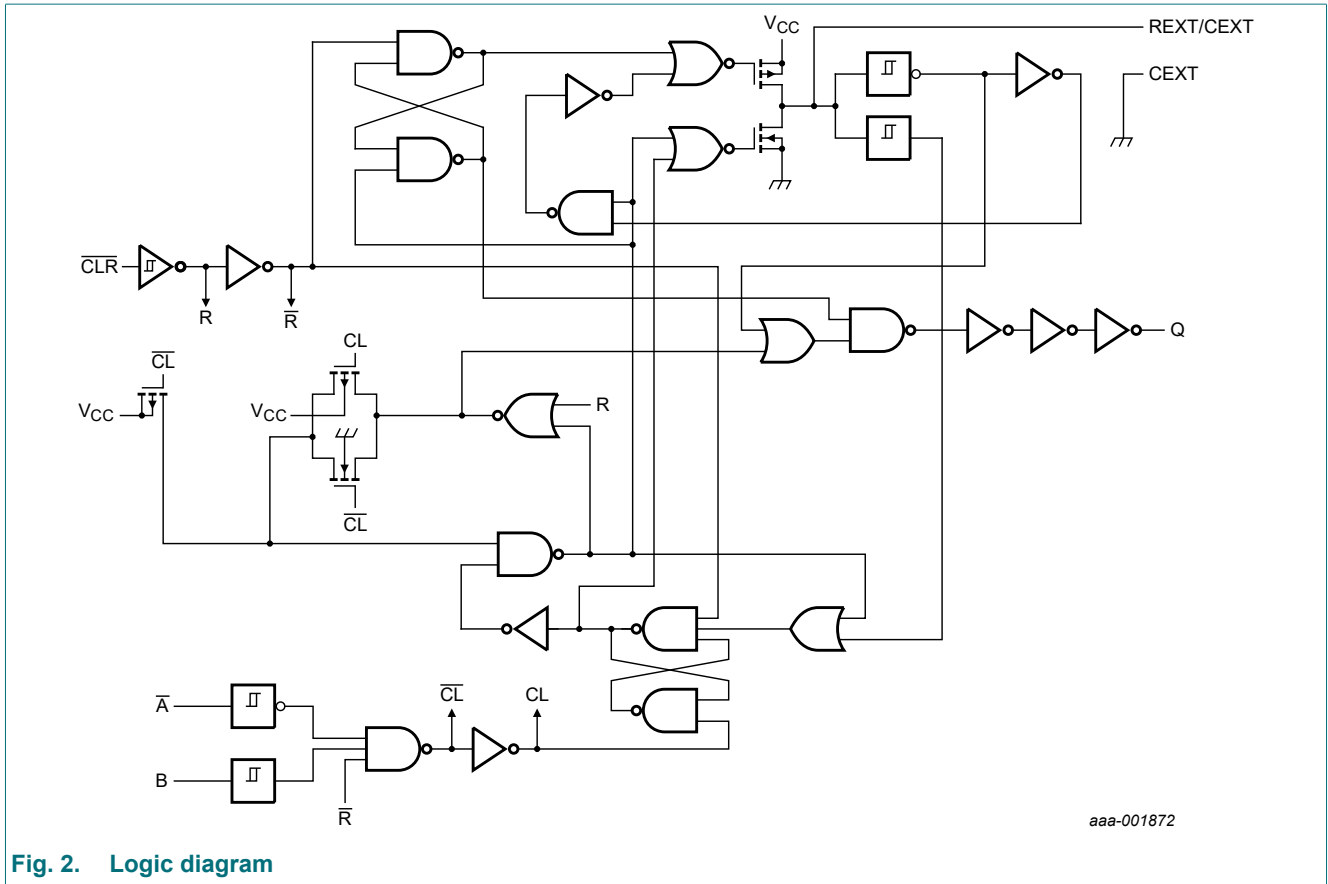


Fig. 2. Logic diagram

## 6. Pinning information

### 6.1. Pinning

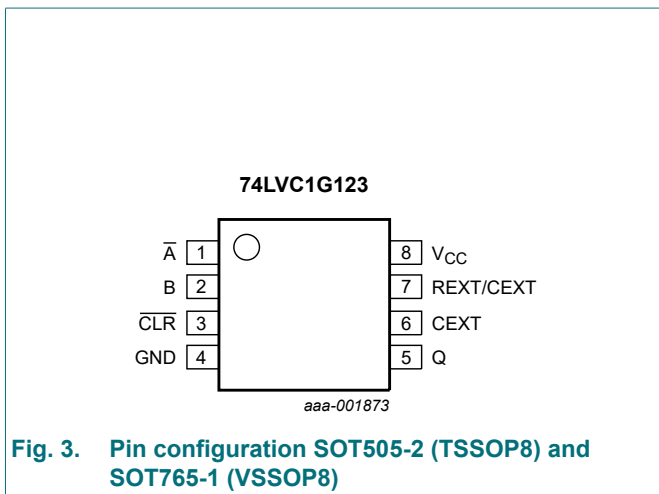


Fig. 3. Pin configuration SOT505-2 (TSSOP8) and SOT765-1 (VSSOP8)

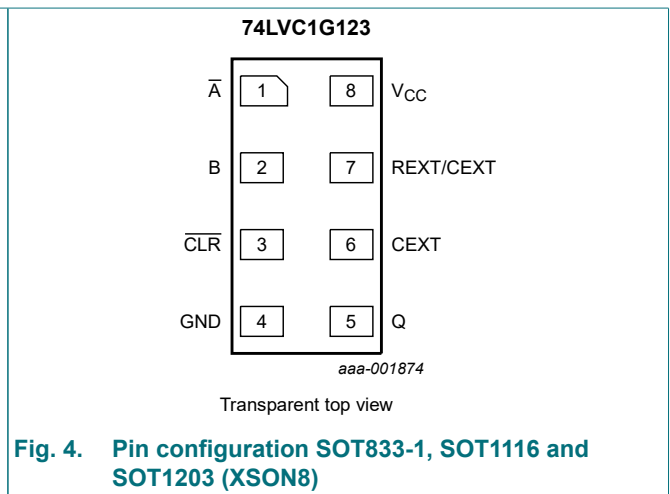


Fig. 4. Pin configuration SOT833-1, SOT1116 and SOT1203 (XSON8)

## 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
$\bar{A}$	1	negative-edge triggered input
B	2	positive-edge triggered input
$\overline{\text{CLR}}$	3	direct reset LOW and positive-edge triggered input
GND	4	ground (0 V)
Q	5	active HIGH output
CEXT	6	external capacitor connection
REXT/CEXT	7	external resistor and capacitor connection
$V_{\text{CC}}$	8	supply voltage

## 7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care;  $\uparrow$  = LOW-to-HIGH transition;  $\downarrow$  = HIGH-to-LOW transition;  $\square$  = one HIGH level output pulse.

Input			Output
CLR	$\bar{A}$	B	Q
L	X	X	L
X	H	X	L <sup>[1]</sup>
X	X	L	L <sup>[1]</sup>
H	L	$\uparrow$	$\square$
H	$\downarrow$	H	$\square$
$\uparrow$	L	H	$\square$

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

## 8. Limiting values

Table 5. 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
$V_{\text{CC}}$	supply voltage		-0.5	+6.5	V
$V_{\text{I}}$	input voltage	[1]	-0.5	+6.5	V
$V_{\text{O}}$	output voltage	Active mode	[1]	$V_{\text{CC}} + 0.5$	V
		Power-down mode; $V_{\text{CC}} = 0 \text{ V}$	[1]	+6.5	V
$I_{\text{IK}}$	input clamping current	$V_{\text{I}} < 0 \text{ V}$	-50	-	mA
$I_{\text{OK}}$	output clamping current	$V_{\text{O}} < 0 \text{ V}$ or $V_{\text{O}} > V_{\text{CC}}$	-	$\pm 50$	mA
$I_{\text{O}}$	output current	$V_{\text{O}} = 0 \text{ V}$ to $V_{\text{CC}}$	-	$\pm 50$	mA
$I_{\text{CC}}$	supply current		-	100	mA
$I_{\text{GND}}$	ground current		-100	-	mA
$T_{\text{stg}}$	storage temperature		-65	+150	$^{\circ}\text{C}$

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Symbol	Parameter	Conditions	Min	Max	Unit
$P_{tot}$	total power dissipation	$T_{amb} = -40\text{ °C to }+125\text{ °C}$ [2]	-	250	mW

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

- [2] For SOT505-2 (TSSOP8) package:  $P_{tot}$  derates linearly with 4.6 mW/K above 96 °C.  
 For SOT765-1 (VSSOP8) package:  $P_{tot}$  derates linearly with 4.9 mW/K above 99 °C.  
 For SOT833-1 (XSON8) package:  $P_{tot}$  derates linearly with 3.1 mW/K above 68 °C.  
 For SOT1116 (XSON8) package:  $P_{tot}$  derates linearly with 4.2 mW/K above 90 °C.  
 For SOT1203 (XSON8) package:  $P_{tot}$  derates linearly with 3.6 mW/K above 81 °C.

## 9. Recommended operating conditions

Table 6. Operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	supply voltage		1.65	5.5	V
$V_I$	input voltage		0	5.5	V
$V_O$	output voltage	Active mode	0	$V_{CC}$	V
		Power-down mode; $V_{CC} = 0\text{ V}$	0	5.5	V
$T_{amb}$	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 1.65\text{ V to }5.5\text{ V}$	-	1	ms/V

## 10. Static characteristics

Table 7. Static characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	Min	Typ[1]	Max	Unit
<b><math>T_{amb} = -40\text{ °C to }+85\text{ °C}</math></b>						
$V_{OH}$	HIGH-level output voltage	$V_I = V_{T+}$ or $V_{T-}$				
		$I_O = -100\text{ }\mu\text{A}$ ; $V_{CC} = 1.65\text{ V to }5.5\text{ V}$	$V_{CC} - 0.1$	-	-	V
		$I_O = -4\text{ mA}$ ; $V_{CC} = 1.65\text{ V}$	1.2	-	-	V
		$I_O = -8\text{ mA}$ ; $V_{CC} = 2.3\text{ V}$	1.9	-	-	V
		$I_O = -12\text{ mA}$ ; $V_{CC} = 2.7\text{ V}$	2.2	-	-	V
		$I_O = -24\text{ mA}$ ; $V_{CC} = 3.0\text{ V}$	2.4	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{T+}$ or $V_{T-}$				
		$I_O = 100\text{ }\mu\text{A}$ ; $V_{CC} = 1.65\text{ V to }5.5\text{ V}$	-	-	0.1	V
		$I_O = 4\text{ mA}$ ; $V_{CC} = 1.65\text{ V}$	-	-	0.45	V
		$I_O = 8\text{ mA}$ ; $V_{CC} = 2.3\text{ V}$	-	-	0.3	V
		$I_O = 12\text{ mA}$ ; $V_{CC} = 2.7\text{ V}$	-	-	0.4	V
		$I_O = 24\text{ mA}$ ; $V_{CC} = 3.0\text{ V}$	-	-	0.55	V
$I_I$	input leakage current	$V_I = 5.5\text{ V or GND}$ ; $V_{CC} = 0\text{ V to }5.5\text{ V}$	-	-	$\pm 2$	$\mu\text{A}$
		$V_I$ or $V_O = 5.5\text{ V}$ ; $V_{CC} = 0\text{ V}$	-	-	$\pm 2$	$\mu\text{A}$
$I_{OFF}$	power-off leakage current	$V_I$ or $V_O = 5.5\text{ V}$ ; $V_{CC} = 0\text{ V}$	-	-	$\pm 2$	$\mu\text{A}$

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Symbol	Parameter	Conditions	Min	Typ[1]	Max	Unit
I <sub>CC</sub>	supply current	V <sub>I</sub> = 5.5 V or GND;				
		Quiescent; V <sub>CC</sub> = 1.65 V to 5.5 V; I <sub>O</sub> = 0 A	-	0.1	10	μA
		Active state; R <sub>EXT</sub> /C <sub>EXT</sub> = 0.5V <sub>CC</sub>				
		V <sub>CC</sub> = 1.65 V	-	-	80	μA
		V <sub>CC</sub> = 2.3 V	-	-	130	μA
		V <sub>CC</sub> = 3 V	-	-	240	μA
		V <sub>CC</sub> = 4.5 V	-	-	400	μA
		V <sub>CC</sub> = 5.5 V	-	-	650	μA
C <sub>I</sub>	input capacitance		-	2.0	-	pF
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</sub>				
		I <sub>O</sub> = -100 μA; V <sub>CC</sub> = 1.65 V to 5.5 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V	1.2	-	-	V
		I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V
		I <sub>O</sub> = -12 mA; V <sub>CC</sub> = 2.7 V	2.2	-	-	V
		I <sub>O</sub> = -24 mA; V <sub>CC</sub> = 3.0 V	2.4	-	-	V
		I <sub>O</sub> = -32 mA; V <sub>CC</sub> = 4.5 V	3.8	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>T+</sub> or V <sub>T-</sub>				
		I <sub>O</sub> = 100 μA; V <sub>CC</sub> = 1.65 V to 5.5 V	-	-	0.1	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V	-	-	0.45	V
		I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V	-	-	0.3	V
		I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	-	0.4	V
		I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V	-	-	0.55	V
		I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V	-	-	0.55	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = 5.5 V or GND; V <sub>CC</sub> = 0 V to 5.5 V	-	-	±10	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 5.5 V; V <sub>CC</sub> = 0 V	-	-	±10	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = 5.5 V or GND;				
		Quiescent; V <sub>CC</sub> = 1.65 V to 5.5 V; I <sub>O</sub> = 0 A	-	-	20	μA
		Active state; R <sub>EXT</sub> /C <sub>EXT</sub> = 0.5V <sub>CC</sub>				
		V <sub>CC</sub> = 1.65 V	-	-	80	μA
		V <sub>CC</sub> = 2.3 V	-	-	130	μA
		V <sub>CC</sub> = 3 V	-	-	240	μA
		V <sub>CC</sub> = 4.5 V	-	-	400	μA
		V <sub>CC</sub> = 5.5 V	-	-	650	μA

[1] All typical values are measured at T<sub>amb</sub> = 25 °C.

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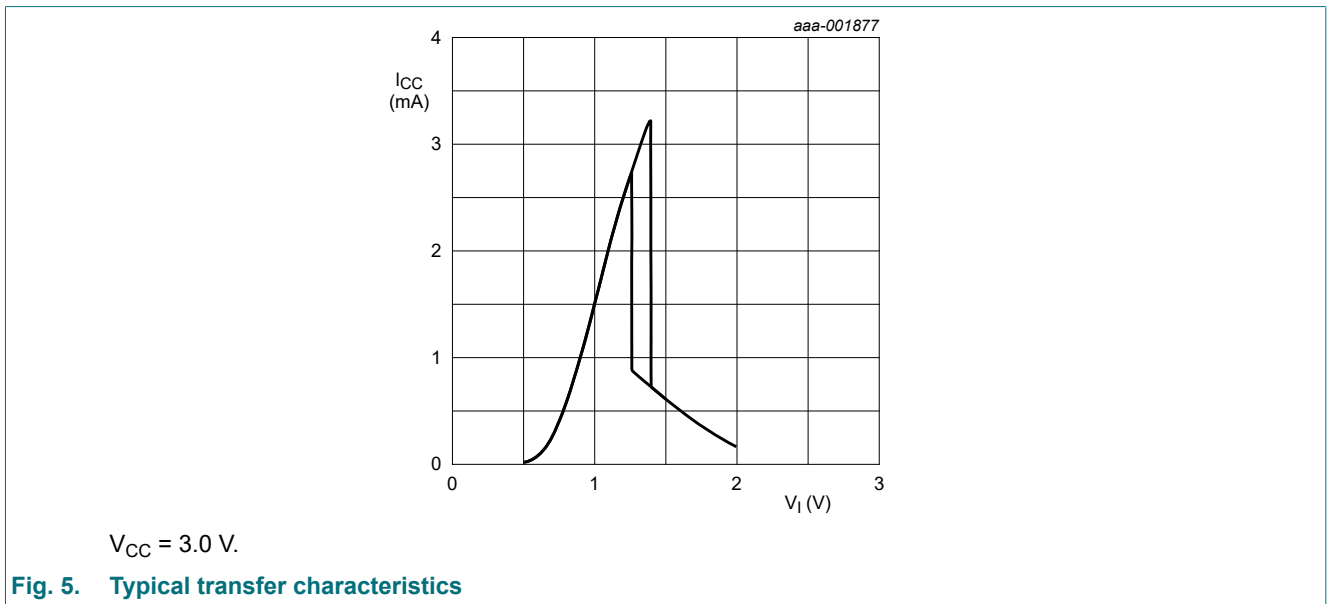
Table 8. Transfer characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 17.

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	
V <sub>T+</sub>	positive-going threshold voltage	$\bar{A}$ , B and $\bar{CLR}$ input; see Fig. 5						
		V <sub>CC</sub> = 1.65 V to 1.95 V	0.72	0.98	1.22	0.71	1.22	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	0.97	1.26	1.52	0.97	1.52	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.20	1.58	1.90	1.20	1.90	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.74	2.27	2.75	1.74	2.78	V
V <sub>T-</sub>	negative-going threshold voltage	$\bar{A}$ , B and $\bar{CLR}$ input; see Fig. 5						
		V <sub>CC</sub> = 1.65 V to 1.95 V	0.56	0.81	1.04	0.56	1.04	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	0.83	1.09	1.33	0.82	1.33	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.08	1.40	1.70	1.08	1.72	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.61	2.07	2.53	1.61	2.57	V
V <sub>H</sub>	hysteresis voltage	$\bar{A}$ , B and $\bar{CLR}$ input; (V <sub>T+</sub> - V <sub>T-</sub> ); see Fig. 5						
		V <sub>CC</sub> = 1.65 V to 1.95 V	61	170	295	54	295	mV
		V <sub>CC</sub> = 2.3 V to 2.7 V	41	174	304	41	304	mV
		V <sub>CC</sub> = 3.0 V to 3.6 V	40	183	319	40	319	mV
		V <sub>CC</sub> = 4.5 V to 5.5 V	32	199	363	26	363	mV

[1] Typical values are measured at T<sub>amb</sub> = 25 °C and V<sub>CC</sub> = 1.8 V, 2.5 V, 3.3 V and 5.0 V respectively.

10.1. Waveform transfer characteristics



## 11. Dynamic characteristics

**Table 9. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 17.

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	
t <sub>pd</sub>	propagation delay	$\bar{A}$ , B to Q; see Fig. 6 [2]						
		C <sub>L</sub> = 15 pF;						
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.5	7.1	16.3	2.5	17.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.9	-	10.3	1.9	11.2	ns
		V <sub>CC</sub> = 2.7 V	1.9	-	8.5	1.9	9.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.5	-	7.6	1.5	8.3	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.2	-	5.3	1.2	5.8	ns
		C <sub>L</sub> = 30 pF or C <sub>L</sub> = 50 pF						
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.9	7.8	17.6	2.9	19.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.2	-	11.3	2.2	12.3	ns
		V <sub>CC</sub> = 2.7 V	2.7	-	10.5	2.7	11.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	9.5	2.0	10.3	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.5	-	6.7	1.5	7.2	ns
		$\bar{CLR}$ to Q; see Fig. 6						
		C <sub>L</sub> = 15 pF;						
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	6.9	16.2	3.0	17.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.2	-	9.6	2.2	10.5	ns
		V <sub>CC</sub> = 2.7 V	2.2	-	8.2	2.2	8.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	7.3	2.0	8.0	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.5	-	5.1	1.5	5.5	ns
		C <sub>L</sub> = 30 pF or C <sub>L</sub> = 50 pF						
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.3	7.5	17.2	3.8	18.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.5	-	10.3	2.0	11.2	ns
V <sub>CC</sub> = 2.7 V	2.8	-	9.3	2.8	10.2	ns		
V <sub>CC</sub> = 3.0 V to 3.6 V	1.5	-	8.4	1.5	9.2	ns		
V <sub>CC</sub> = 4.5 V to 5.5 V	1.5	-	6.0	1.5	6.6	ns		
t <sub>pd</sub>	propagation delay	$\bar{CLR}$ to Q (trigger); see Fig. 6 [2]						
		C <sub>L</sub> = 15 pF;						
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.7	7.6	17.4	2.7	18.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	-	11.0	2.1	12.0	ns
		V <sub>CC</sub> = 2.7 V	2.1	-	9.2	2.1	10.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	-	8.2	1.7	8.9	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.4	-	5.9	1.4	6.4	ns
		C <sub>L</sub> = 30 pF or C <sub>L</sub> = 50 pF						
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.1	8.3	18.8	3.3	20.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.5	-	12.0	2.5	13.1	ns
		V <sub>CC</sub> = 2.7 V	2.8	-	11.1	2.8	12.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	10.1	2.0	11.0	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	1.5	-	7.1	1.5	7.7	ns



Single retriggerable monostable multivibrator; Schmitt trigger inputs

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	
t <sub>w</sub>	pulse width	input $\bar{A}$ LOW; B HIGH; see Fig. 6 and Fig. 7						
		V <sub>CC</sub> = 1.65 V to 1.95 V	8.0	-	-	8.0	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	4.0	-	-	4.0	-	ns
		V <sub>CC</sub> = 2.7 V	3.0	-	-	3.0	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	3.0	-	-	3.0	-	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	2.5	-	-	2.5	-	ns
		input $\bar{CLR}$ LOW; see Fig. 6 and Fig. 8						
		V <sub>CC</sub> = 1.65 V to 1.95 V	8.0	-	-	8.0	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	4.0	-	-	4.0	-	ns
		V <sub>CC</sub> = 2.7 V	3.0	-	-	3.0	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	3.0	-	-	3.0	-	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	2.5	-	-	2.5	-	ns
t <sub>w</sub>	pulse width	output Q HIGH; see Fig. 6, Fig. 7 and Fig. 8; [3] R <sub>EXT</sub> = 10 kΩ						
		C <sub>EXT</sub> = 100 pF						
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	1.4	2.2	-	2.2	μs
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	1.3	1.8	-	1.8	μs
		V <sub>CC</sub> = 2.7 V	-	1.2	1.8	-	1.8	μs
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	1.2	1.8	-	1.8	μs
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	1.2	1.8	-	1.8	μs
		C <sub>EXT</sub> = 0.01 μF [3]						
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	100	110	-	110	μs
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	100	110	-	110	μs
		V <sub>CC</sub> = 2.7 V	-	100	110	-	110	μs
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	100	110	-	110	μs
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	100	110	-	110	μs
		C <sub>EXT</sub> = 0.1 μF [3]						
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	1.0	1.05	-	1.05	ms
		V <sub>CC</sub> = 2.7 V	-	1.0	1.05	-	1.05	ms
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	1.0	1.05	-	1.05	ms
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	1.0	1.05	-	1.05	ms
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	1.0	1.05	-	1.05	ms

Single retriggerable monostable multivibrator; Schmitt trigger inputs

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	
t <sub>trig</sub>	retrigger time	$\bar{A}$ , B; see Fig. 7						
		C <sub>EXT</sub> = 100 pF; R <sub>EXT</sub> = 5 kΩ						
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	174	-	-	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	59	-	-	-	ns
		C <sub>EXT</sub> = 100 pF; R <sub>EXT</sub> = 1 kΩ						
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	32	-	-	-	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	20	-	-	-	ns
		C <sub>EXT</sub> = 100 μF; R <sub>EXT</sub> = 5 kΩ						
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	14	-	-	-	ms
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	10	-	-	-	ms
		C <sub>EXT</sub> = 100 μF; R <sub>EXT</sub> = 1 kΩ						
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	10	-	-	-	ms
V <sub>CC</sub> = 4.5 V to 5.5 V	-	8	-	-	-	ms		
R <sub>ext</sub>	external resistance	see Fig. 11, Fig. 12 and Fig. 13						
		V <sub>CC</sub> = 2.0 V	5	-	-	-	-	kΩ
		V <sub>CC</sub> ≥ 3.0 V	1	-	-	-	-	kΩ
C <sub>ext</sub>	external capacitance	V <sub>CC</sub> = 5.0 V; see Fig. 11, Fig. 12 and Fig. 13	-	-	-	-	-	pF
C <sub>PD</sub>	power dissipation capacitance	V <sub>I</sub> = GND to V <sub>CC</sub> ; C <sub>EXT</sub> = 0 pF;						
		R <sub>EXT</sub> = 5 kΩ						
		V <sub>CC</sub> = 1.8 V	-	35	-	-	-	pF
		V <sub>CC</sub> = 2.5 V	-	35	-	-	-	pF
		R <sub>EXT</sub> = 1 kΩ						
		V <sub>CC</sub> = 3.3 V	-	27	-	-	-	pF
V <sub>CC</sub> = 5.0 V	-	29	-	-	-	pF		

[1] Typical values are measured at T<sub>amb</sub> = 25 °C and V<sub>CC</sub> = 1.8 V, 2.5 V, 3.3 V and 5.0 V respectively.  
 [2] t<sub>pd</sub> is the same as t<sub>PHL</sub> and t<sub>PLH</sub>  
 [3] For other R<sub>EXT</sub> and C<sub>EXT</sub> combinations see Fig. 11, Fig. 12 and Fig. 13. If C<sub>EXT</sub> > 10 nF, the next formula is valid.  
 t<sub>W</sub> = K x R<sub>EXT</sub> x C<sub>EXT</sub>, where:  
 t<sub>W</sub> = typical output pulse width in ns;  
 R<sub>EXT</sub> = external resistor in kΩ;  
 C<sub>EXT</sub> = external capacitor in pF;  
 K = constant = 1; see Fig. 14 for typical "K" factor as function of V<sub>CC</sub>.

11.1. Waveforms, graphs and test circuit

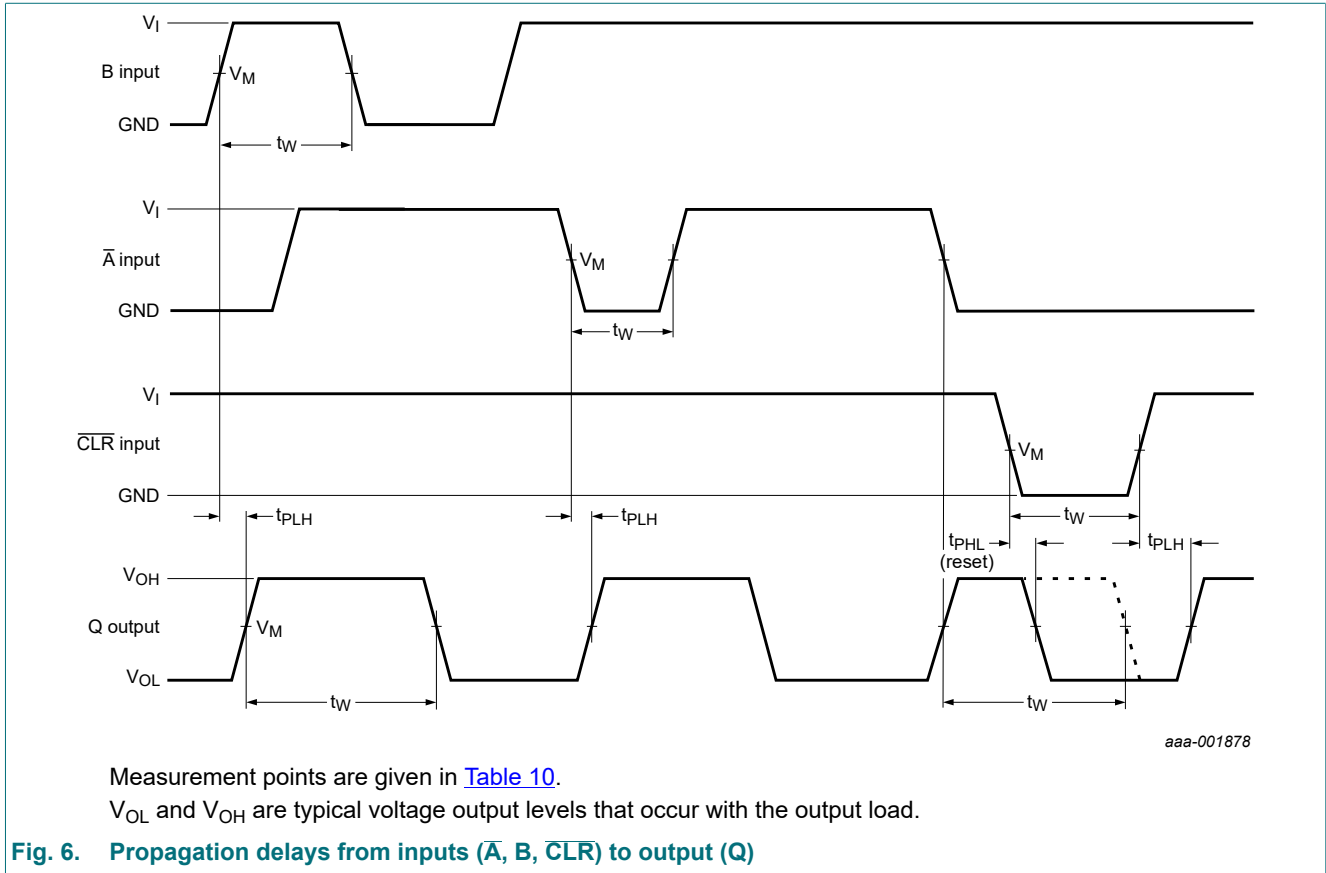
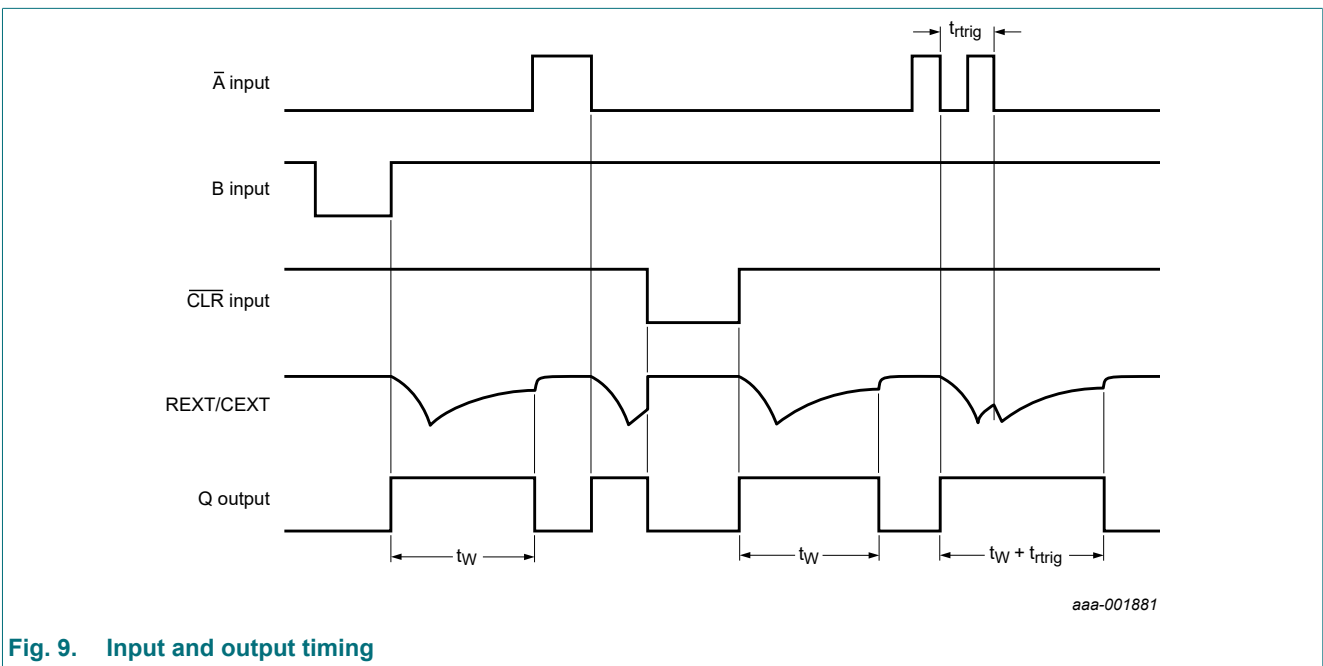
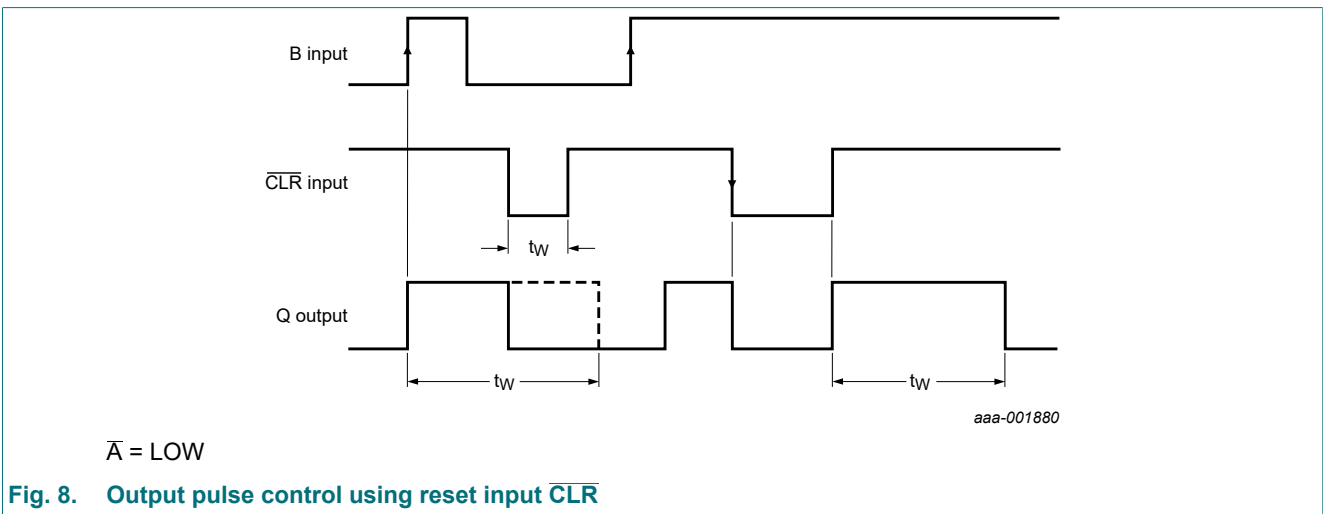
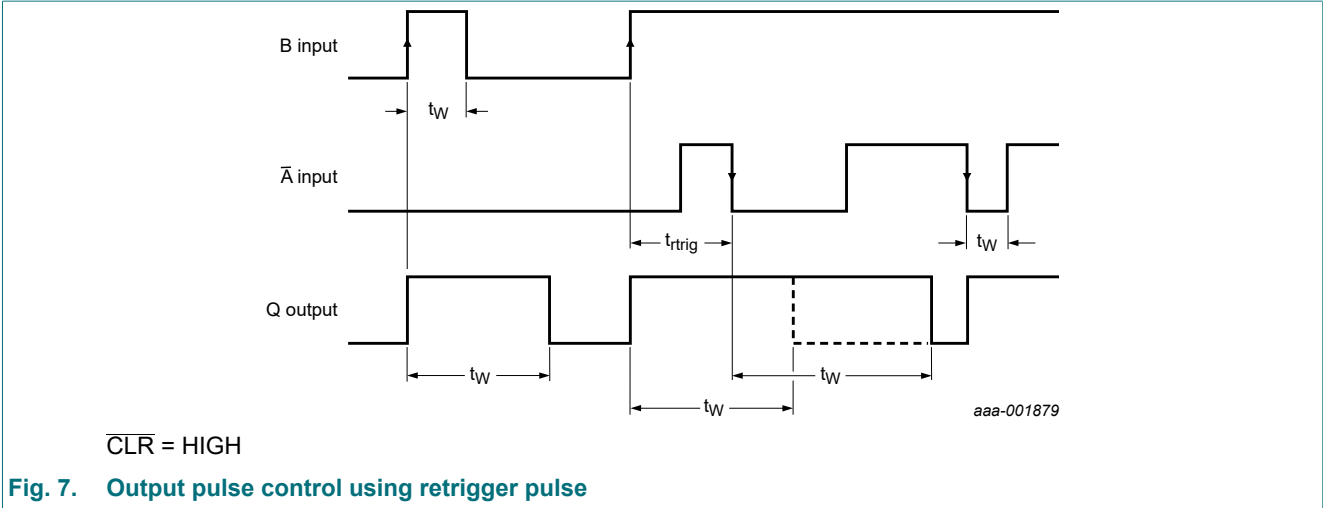


Table 10. Measurement points

Supply voltage	Input	Output
$V_{CC}$	$V_M$	$V_M$
1.65 V to 1.95 V	$0.5V_{CC}$	$0.5V_{CC}$
2.3 V to 2.7 V	$0.5V_{CC}$	$0.5V_{CC}$
2.7 V	1.5 V	1.5 V
3.0 V to 3.6 V	1.5 V	1.5 V
4.5 V to 5.5 V	$0.5V_{CC}$	$0.5V_{CC}$

Single retriggerable monostable multivibrator; Schmitt trigger inputs



Single retriggerable monostable multivibrator; Schmitt trigger inputs

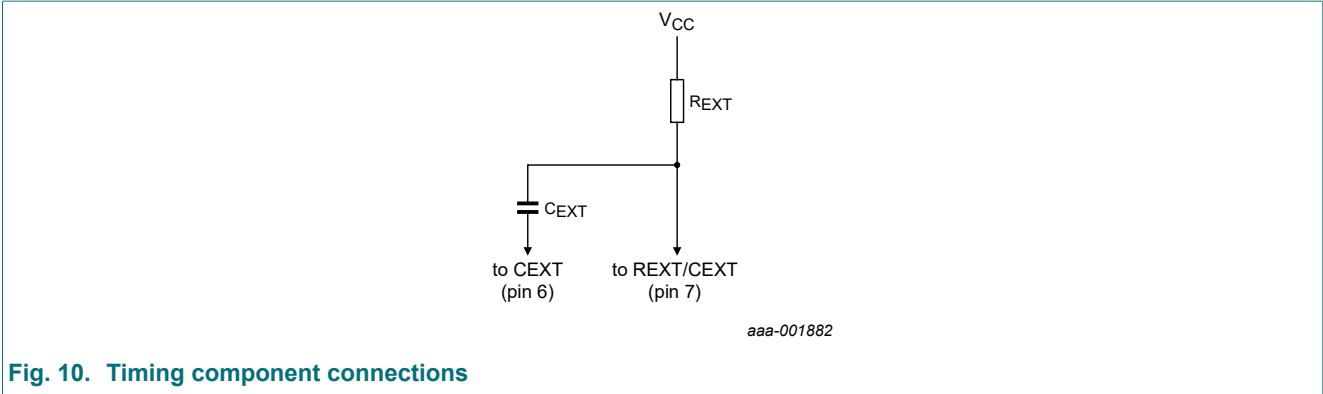


Fig. 10. Timing component connections

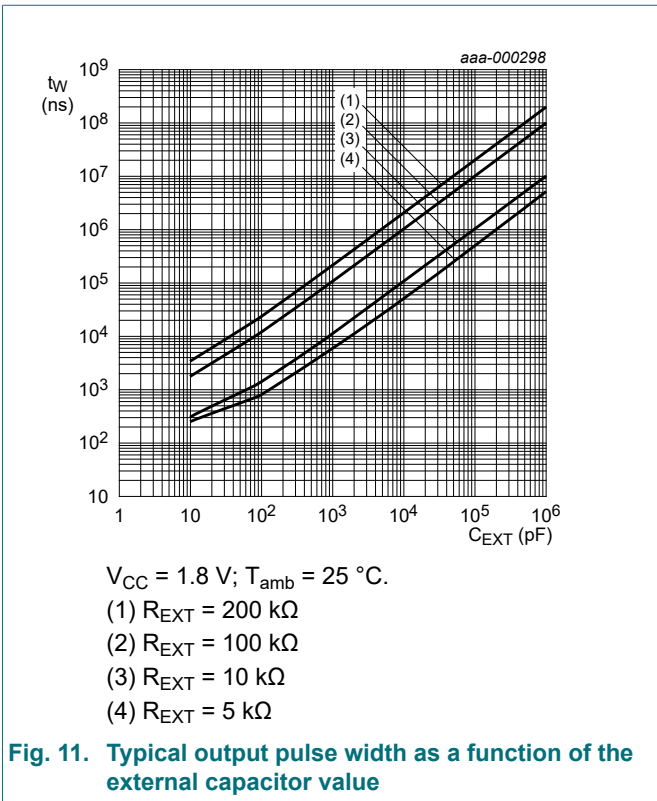


Fig. 11. Typical output pulse width as a function of the external capacitor value

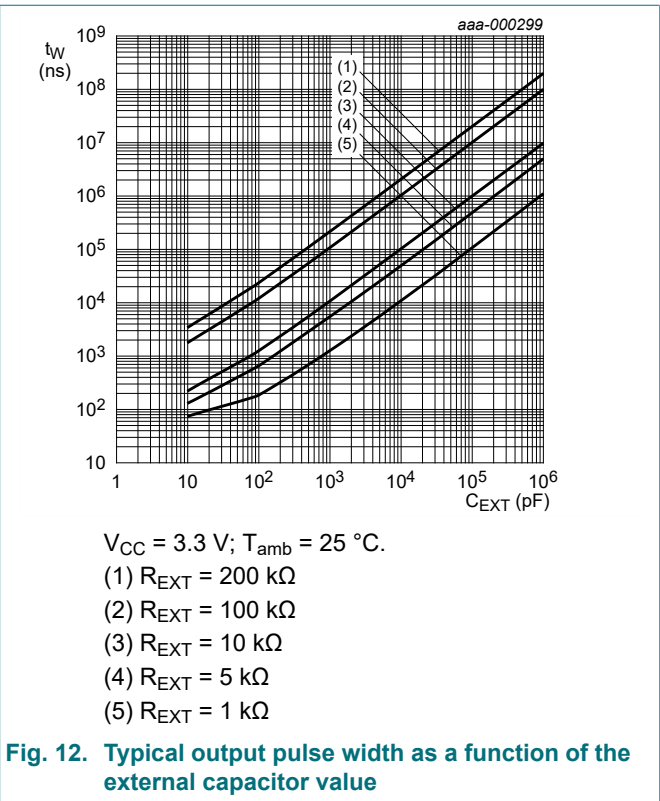
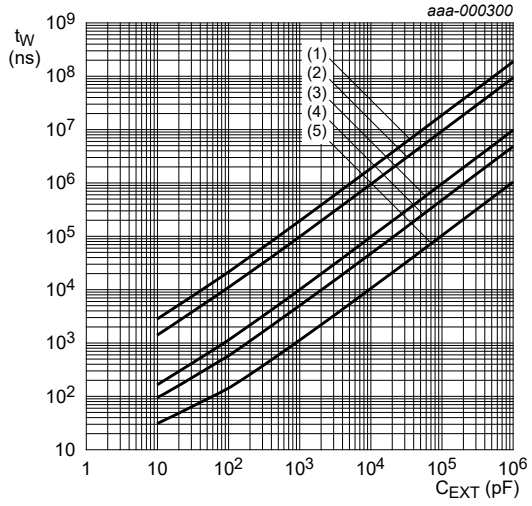


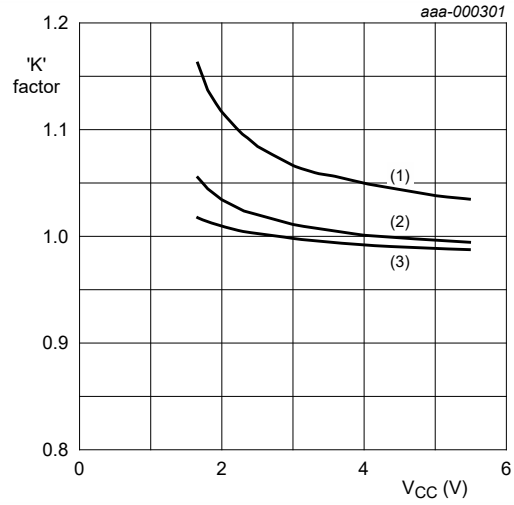
Fig. 12. Typical output pulse width as a function of the external capacitor value

Single retriggerable monostable multivibrator; Schmitt trigger inputs



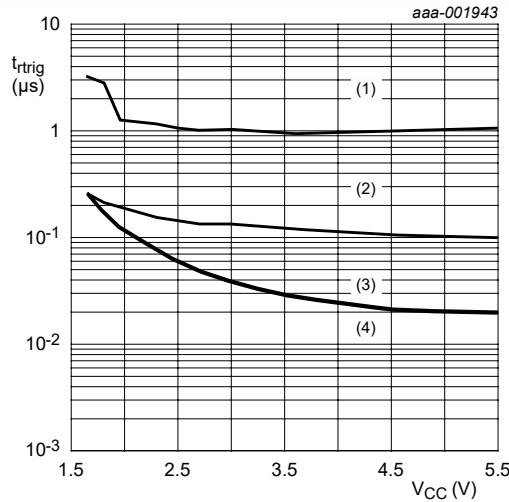
$V_{CC} = 5.0 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}.$   
 (1)  $R_{EXT} = 200 \text{ k}\Omega$   
 (2)  $R_{EXT} = 100 \text{ k}\Omega$   
 (3)  $R_{EXT} = 10 \text{ k}\Omega$   
 (4)  $R_{EXT} = 5 \text{ k}\Omega$   
 (5)  $R_{EXT} = 1 \text{ k}\Omega$

Fig. 13. Typical output pulse width as a function of the external capacitor value



$R_{EXT} = 10 \text{ k}\Omega; T_{amb} = 25 \text{ }^\circ\text{C}.$   
 (1)  $C_{EXT} = 1000 \text{ pF}$   
 (2)  $C_{EXT} = 0.01 \text{ }\mu\text{F}$   
 (3)  $C_{EXT} = 0.1 \text{ }\mu\text{F}$

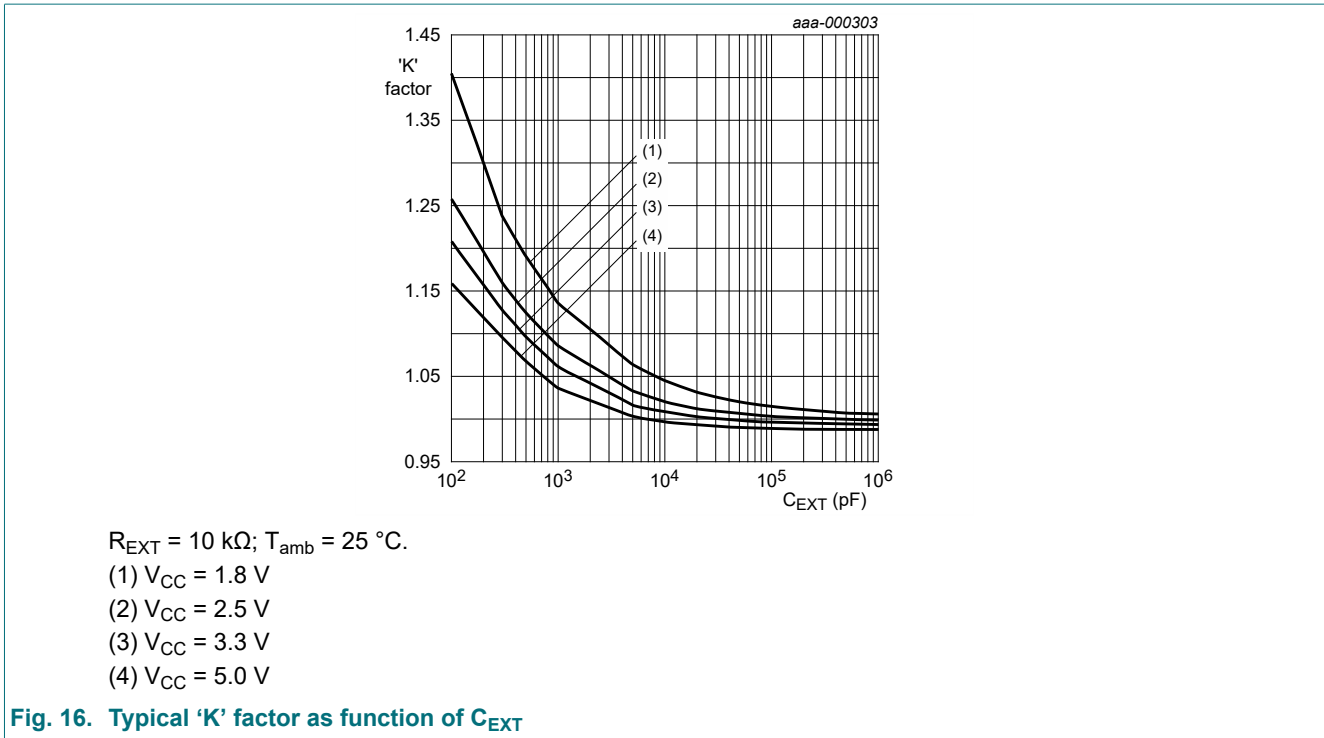
Fig. 14. Typical 'K' factor as function of  $V_{CC}$



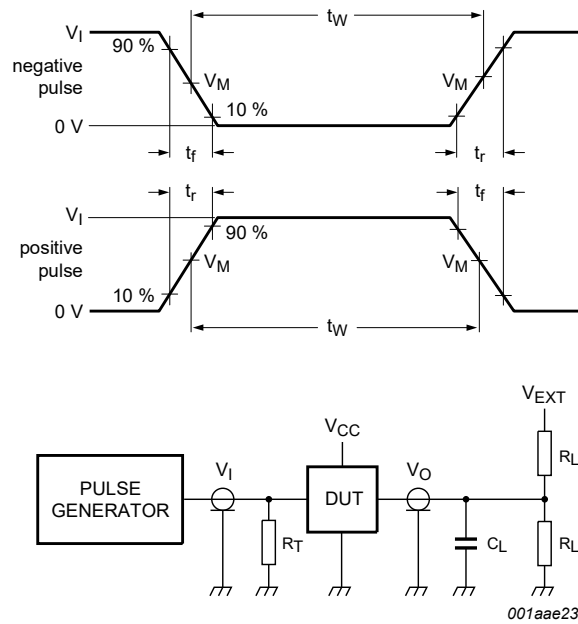
$T_{amb} = 25 \text{ }^\circ\text{C}.$   
 (1)  $C_{EXT} = 0.01 \text{ }\mu\text{F}$   
 (2)  $C_{EXT} = 1000 \text{ pF}$   
 (3)  $C_{EXT} = 100 \text{ pF}$   
 (4)  $C_{EXT} = 10 \text{ pF}$

Fig. 15. Minimum retrigger time as function of the supply voltage

Single retriggerable monostable multivibrator; Schmitt trigger inputs



Single retriggerable monostable multivibrator; Schmitt trigger inputs



Test data is given in [Table 11](#).

Definitions for test circuit:

$R_L$  = Load resistance.

$C_L$  = Load capacitance including jig and probe capacitance.

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

$V_{EXT}$  = Test voltage for switching times.

**Fig. 17. Test circuit for measuring switching times**

**Table 11. Test data**

Supply voltage	Input		Load		$V_{EXT}$
$V_{CC}$	$V_I$	$t_r, t_f$	$C_L$	$R_L$	$t_{PLH}, t_{PHL}$
1.65 V to 1.95 V	$V_{CC}$	$\leq 2.0$ ns	15 pF	1 M $\Omega$	open
2.3 V to 2.7 V	$V_{CC}$	$\leq 2.0$ ns	15 pF	1 M $\Omega$	open
2.7 V	2.7 V	$\leq 2.5$ ns	15 pF	1 M $\Omega$	open
3.0 V to 3.6 V	2.7 V	$\leq 2.5$ ns	15 pF	1 M $\Omega$	open
4.5 V to 5.5 V	$V_{CC}$	$\leq 2.5$ ns	15 pF	1 M $\Omega$	open
1.65 V to 1.95 V	$V_{CC}$	$\leq 2.0$ ns	30 pF	1 k $\Omega$	open
2.3 V to 2.7 V	$V_{CC}$	$\leq 2.0$ ns	30 pF	500 $\Omega$	open
2.7 V	2.7 V	$\leq 2.5$ ns	50 pF	500 $\Omega$	open
3.0 V to 3.6 V	2.7 V	$\leq 2.5$ ns	50 pF	500 $\Omega$	open
4.5 V to 5.5 V	$V_{CC}$	$\leq 2.5$ ns	50 pF	500 $\Omega$	open



## 12. Package outline

TSSOP8: plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm SOT505-2

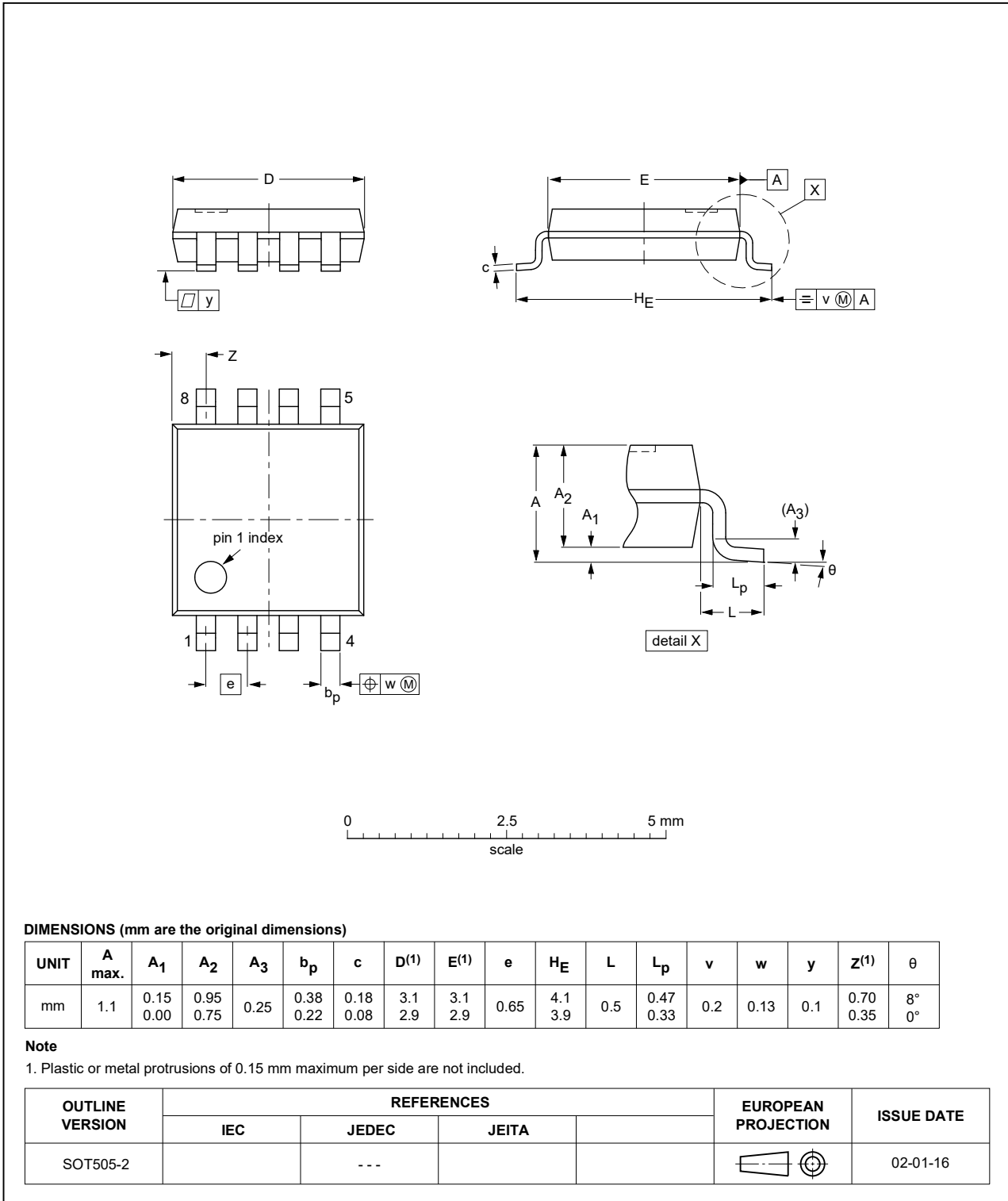


Fig. 18. Package outline SOT505-2 (TSSOP8)

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1



Fig. 19. Package outline SOT765-1 (VSSOP8)

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm

SOT833-1

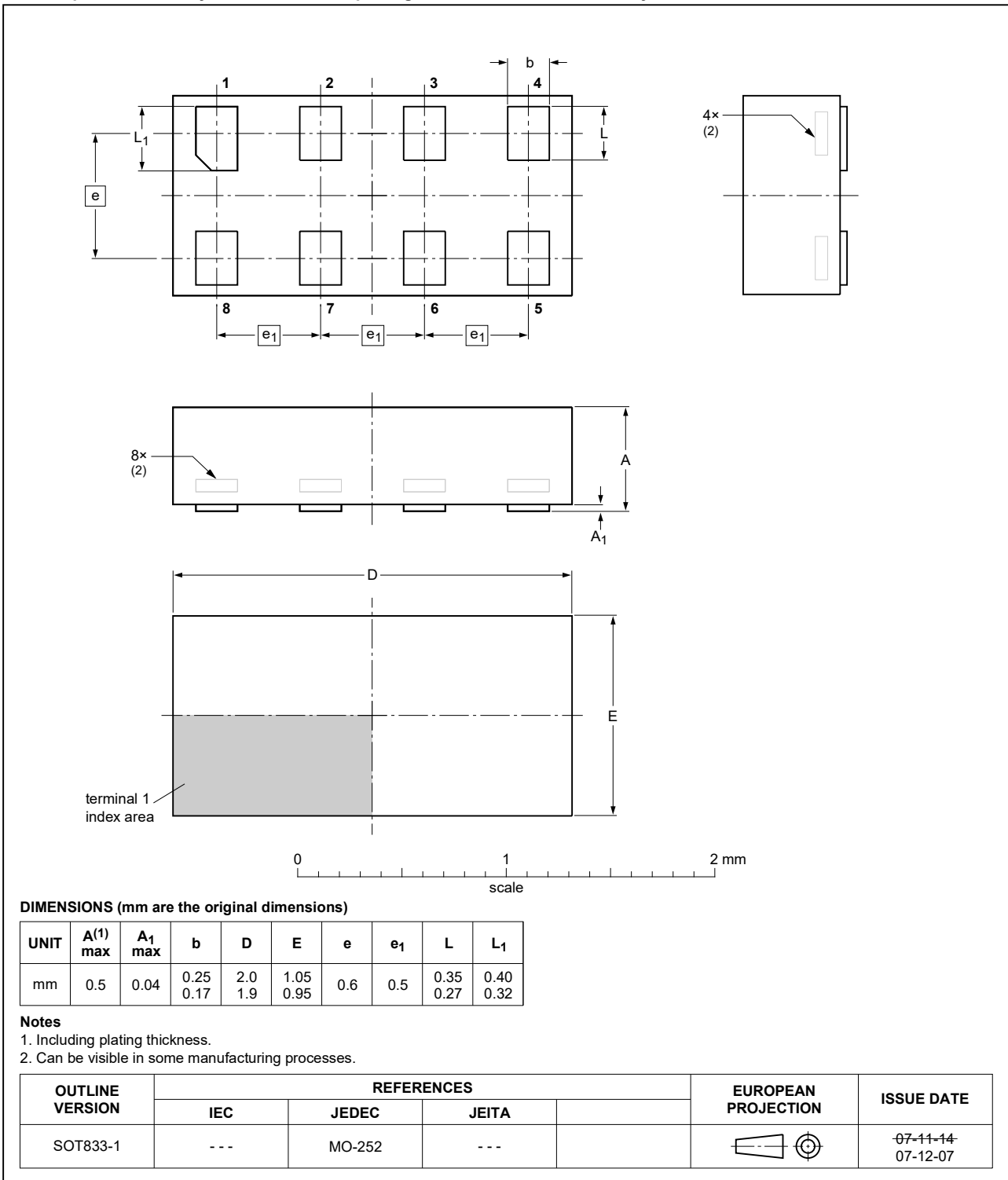


Fig. 20. Package outline SOT833-1 (XSON8)

Single retriggerable monostable multivibrator; Schmitt trigger inputs

XSON8: extremely thin small outline package; no leads;  
8 terminals; body 1.2 x 1.0 x 0.35 mm

SOT1116

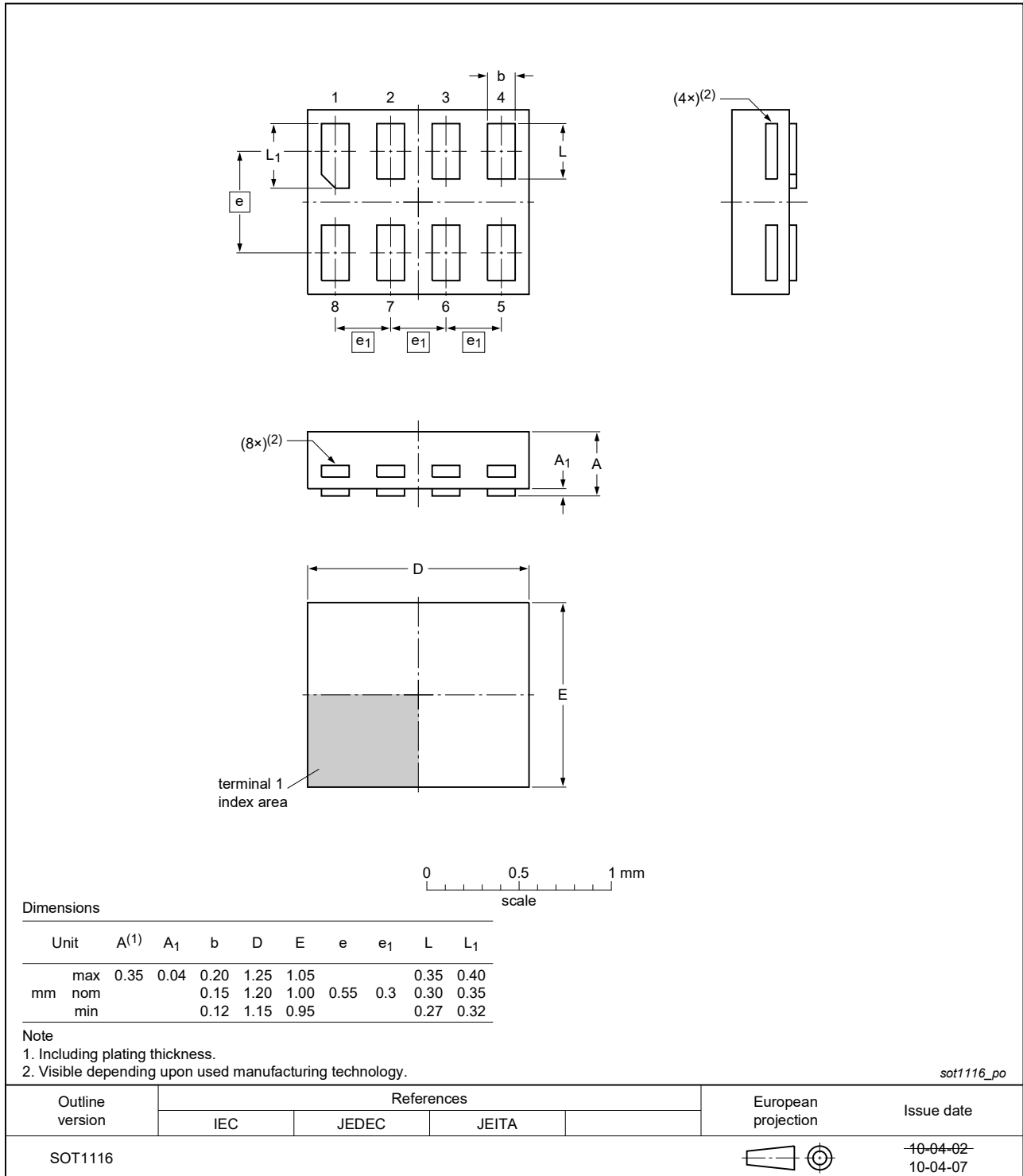


Fig. 21. Package outline SOT1116 (XSON8)

Single retriggerable monostable multivibrator; Schmitt trigger inputs

XSON8: extremely thin small outline package; no leads;  
8 terminals; body 1.35 x 1.0 x 0.35 mm

SOT1203

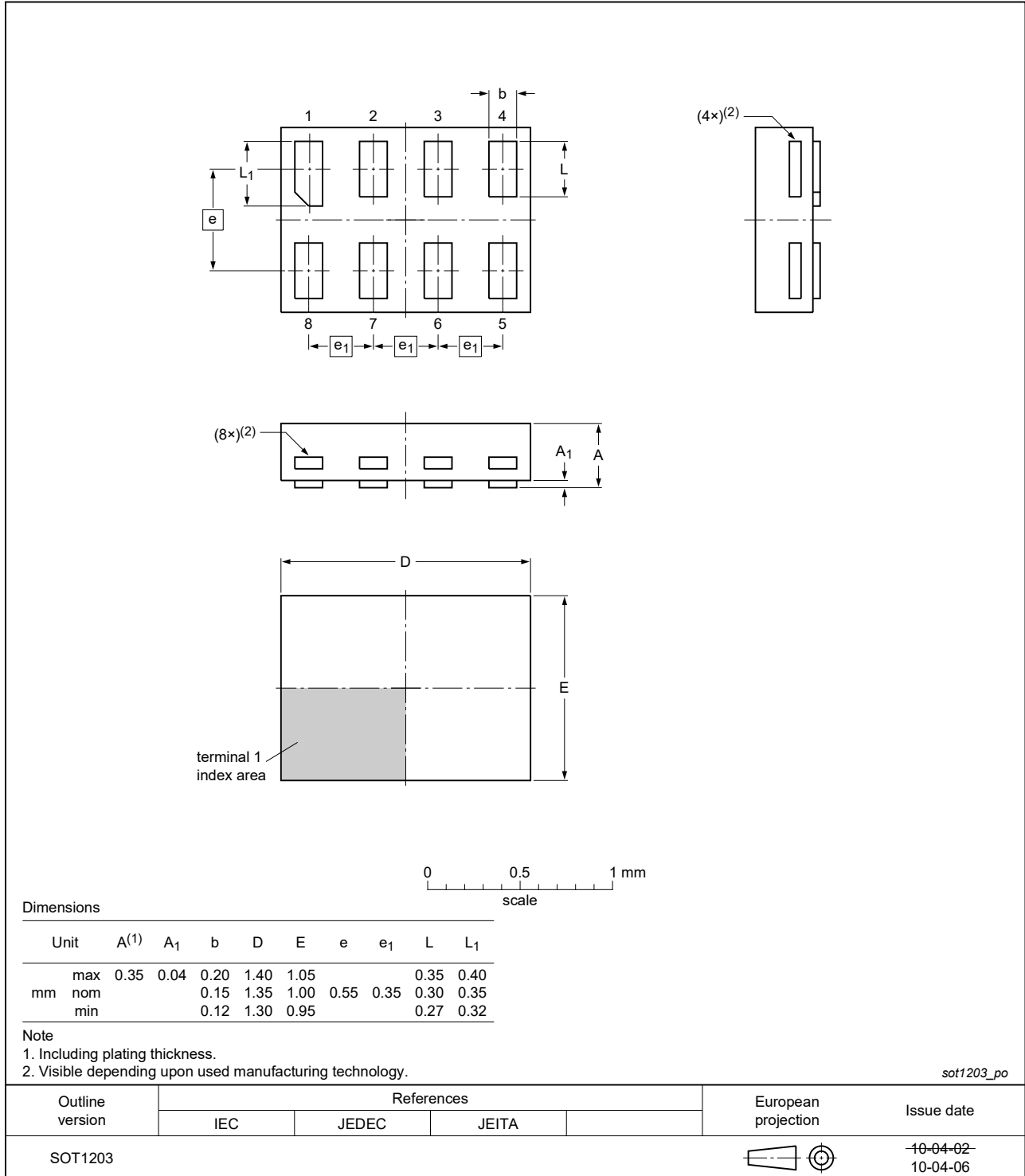


Fig. 22. Package outline SOT1203 (XSON8)

## 13. Abbreviations

Table 12. Abbreviations

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

## 14. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC1G123 v.7	20210420	Product data sheet	-	74LVC1G123 v.6
Modifications:	<ul style="list-style-type: none"> <li>Type number 74LVC1G123GF (SOT1089/XSON8) removed.</li> <li><a href="#">Section 8</a>: Derating values for <math>P_{tot}</math> total power dissipation have been updated.</li> </ul>			
74LVC1G123 v.6	20181102	Product data sheet	-	74LVC1G123 v.5
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Type numbers 74LVC1G123GD (SOT996-2/XSON8) removed.</li> </ul>			
74LVC1G123 v.5	20160614	Product data sheet	-	74LVC1G123 v.4
Modifications:	<ul style="list-style-type: none"> <li><a href="#">Fig. 19</a>, package outline drawing for SOT765-1 has changed</li> </ul>			
74LVC1G123 v.4	20131127	Product data sheet	-	74LVC1G123 v.3
Modifications:	<ul style="list-style-type: none"> <li>74LVC1G123GM (XQFN8) removed.</li> </ul>			
74LVC1G123 v.3	20130329	Product data sheet	-	74LVC1G123 v.2
Modifications:	<ul style="list-style-type: none"> <li>For type number 74LVC1G123GD XSON8U has changed to XSON8.</li> </ul>			
74LVC1G123 v.2	20120801	Product data sheet	-	74LVC1G123 v.1
Modifications:	<ul style="list-style-type: none"> <li><math>V_{HYS}</math> conditions and limits corrected (errata).</li> </ul>			
74LVC1G123 v.1	20120123	Product data sheet	-	-

## 15. 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".
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