74AUP2G132

Low-power dual 2-input NAND Schmitt trigger

Rev. 8 — 3 July 2017 | Product data sheet

1 General description

The 74AUP2G132 provides the dual 2-input NAND Schmitt trigger function which accepts standard input signals. They can transform slowly changing input signals into sharply defined, jitter-free output signals.

This device ensures a very low static and dynamic power consumption across the entire V_{CC} range from 0.8 V to 3.6 V.

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

The inputs switch at different points for positive and negative-going signals. The difference between the positive voltage V_{T+} and the negative voltage V_{T-} is defined as the input hysteresis voltage V_H.

2 Features and benefits

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- ESD protection:
  - HBM JESD22-A114F Class 3A exceeds 5 000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1 000 V
- Low static power consumption; I_{CC} = 0.9 μA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- I_{OFF} circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

3 Applications

- Wave and pulse shaper
- Astable multivibrator
- Monostable multivibrator

nexperia

4 Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP2G132DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74AUP2G132GT	-40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm	SOT833-1
74AUP2G132GF	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 x 1 x 0.5 mm	SOT1089
74AUP2G132GM	-40 °C to +125 °C	XQFN8	plastic, extremely thin quad flat package; no leads; 8 terminals; body 1.6 x 1.6 x 0.5 mm	SOT902-2
74AUP2G132GN	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 x 1.0 x 0.35 mm	SOT1116
74AUP2G132GS	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 x 1.0 x 0.35 mm	SOT1203
74AUP2G132GX	-40 °C to +125 °C	X2SON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 x 0.8 x 0.35 mm	SOT1233

5 Marking

Table 2. Marking codes

Type number	Marking code[1]
74AUP2G132DC	aE2
74AUP2G132GT	aE2
74AUP2G132GF	aE
74AUP2G132GM	aE2
74AUP2G132GN	aE
74AUP2G132GS	aE
74AUP2G132GX	aE

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

6 Functional diagram

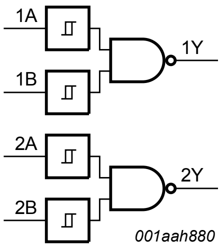


Figure 1. Logic symbol

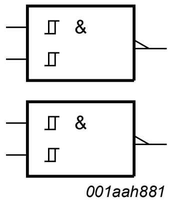


Figure 2. IEC logic symbol

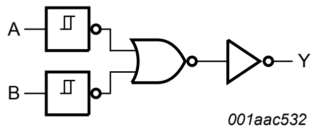


Figure 3. Logic diagram (one gate)

7 Pinning information

7.1 Pinning

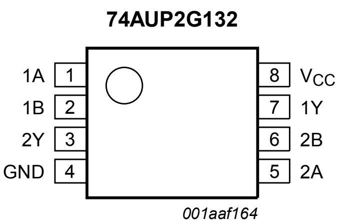
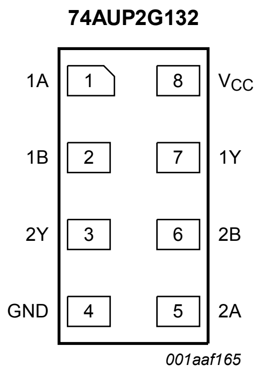
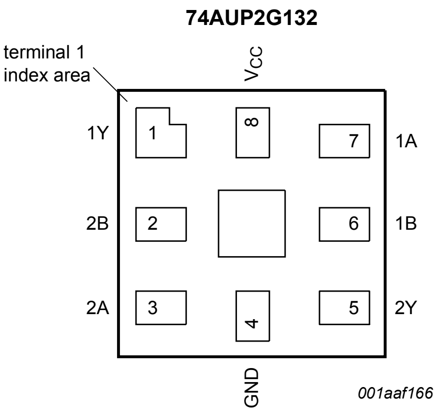


Figure 4. Pin configuration SOT765-1



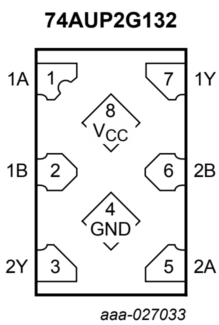
Transparent top view

Figure 5. Pin configuration SOT833-1, SOT1089, SOT1116 and SOT1203



Transparent top view

Figure 6. Pin configuration SOT902-2



Transparent top view

Figure 7. Pin configuration SOT1233

7.2 Pin description

Table 3. Pin description

Symbol	Pin		Description
	SOT765-1, SOT833-1, SOT1089, SOT1116, SOT1203 and SOT1233	SOT902-2	
1A, 2A	1, 5	7, 3	data input
1B, 2B	2, 6	6, 2	data input
GND	4	4	ground (0 V)
1Y, 2Y	7, 3	1, 5	data output
V_{CC}	8	8	supply voltage

8 Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level.

Input		Output
nA	nB	nY
L	L	H
L	H	H
H	L	H
H	H	L

9 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_{CC}	supply voltage		-0.5	+4.6	V
I_{IK}	input clamping current	V_I < 0 V	-50	-	mA
V_I	input voltage	[1]	-0.5	+4.6	V
I_{OK}	output clamping current	V_O < 0 V	-50	-	mA
V_O	output voltage	Active mode and Power-down mode [1]	-0.5	+4.6	V
I_O	output current	V_O = 0 V to V_{CC}	-	±20	mA
I_{CC}	supply current		-	50	mA
I_{GND}	ground current		-50	-	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	T_{amb} = -40 °C to +125 °C [2]	-	250	mW

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

[2] For VSSOP8 packages: above 110 °C the value of P_{tot} derates linearly with 8.0 mW/K.
For XSON8 and XQFN8 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.
For X2SON8 package: above 118 °C the value of P_{tot} derates linearly with 7.7 mW/K.

10 Recommended operating conditions

Table 6. Operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		0.8	3.6	V
V_I	input voltage		0	3.6	V
V_O	output voltage	Active mode	0	V_{CC}	V
		Power-down mode; V_{CC} = 0 V	0	3.6	V
T_{amb}	ambient temperature		-40	+125	°C

11 Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = 25 °C						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = -20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.1	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.75 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	1.11	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.32	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	2.05	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.9	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.72	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.6	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.31	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.31	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.31	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.44	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.31	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.44	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.2	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.2	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.5	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC}$ - 0.6 V; I_O = 0 A;V_{CC} = 3.3 V [1]	-	-	40	μA
C_I	input capacitance	V_I = GND or V_{CC}; V_{CC} = 0 V to 3.6 V	-	1.1	-	pF
C_O	output capacitance	V_O = GND; V_{CC} = 0 V	-	1.7	-	pF

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +85 °C						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = -20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.1	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.7 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	1.03	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.30	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.97	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.85	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.67	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.55	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.37	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.35	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.33	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.45	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.33	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.45	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.5	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.5	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.6	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.9	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC}$ - 0.6 V; I_O = 0 A;V_{CC} = 3.3 V [1]	-	-	50	μA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +125 °C						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = -20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.11	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.6 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	0.93	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.17	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.77	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.67	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.40	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.30	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.11	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.33 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.41	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.39	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.36	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.50	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.36	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.50	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.75	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.75	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.75	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	1.4	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC}$ - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	75	μA

[1] One input at V_{CC} - 0.6 V, other input at V_{CC} or GND.

12 Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V; for test circuit see Figure 9.

Symbol	Parameter	Conditions	T_{amb} = 25 °C			T_{amb} = -40 °C to +125 °C			Unit
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C_L = 5 pF									
t_{pd}	propagation delay	nA or nB to nY; see Figure 8 [2]							
		V_{CC} = 0.8 V	-	22.5	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.6	6.3	13.4	2.4	15.1	16.6	ns
		V_{CC} = 1.4 V to 1.6 V	2.2	4.6	8.2	1.9	9.7	10.7	ns
		V_{CC} = 1.65 V to 1.95 V	1.9	3.9	6.6	1.7	7.9	8.7	ns
		V_{CC} = 2.3 V to 2.7 V	1.7	3.2	5.3	1.5	6.2	6.8	ns
		V_{CC} = 3.0 V to 3.6 V	1.6	2.9	4.7	1.4	5.6	6.2	ns
C_L = 10 pF									
t_{pd}	propagation delay	nA or nB to nY; see Figure 8 [2]							
		V_{CC} = 0.8 V	-	26.1	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.0	7.2	15.4	2.7	17.3	19.0	ns
		V_{CC} = 1.4 V to 1.6 V	2.5	5.2	9.3	2.2	11.0	12.1	ns
		V_{CC} = 1.65 V to 1.95 V	2.3	4.5	7.5	2.0	9.0	9.9	ns
		V_{CC} = 2.3 V to 2.7 V	2.1	3.8	6.1	1.8	7.2	7.9	ns
		V_{CC} = 3.0 V to 3.6 V	2.0	3.5	5.5	1.8	6.5	7.2	ns
C_L = 15 pF									
t_{pd}	propagation delay	nA or nB to nY; see Figure 8 [2]							
		V_{CC} = 0.8 V	-	29.6	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.3	8.0	17.2	3.0	19.4	21.3	ns
		V_{CC} = 1.4 V to 1.6 V	2.8	5.8	10.4	2.5	12.3	13.5	ns
		V_{CC} = 1.65 V to 1.95 V	2.6	5.0	8.3	2.3	10.0	11.0	ns
		V_{CC} = 2.3 V to 2.7 V	2.3	4.2	6.7	2.1	7.9	8.7	ns
		V_{CC} = 3.0 V to 3.6 V	2.2	3.9	6.1	2.0	7.3	8.0	ns

Symbol	Parameter	Conditions	T_{amb} = 25 °C			T_{amb} = -40 °C to +125 °C			Unit
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C_L = 30 pF									
t_{pd}	propagation delay	nA or nB to nY; see Figure 8 [2]							
		V_{CC} = 0.8 V	-	39.9	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.3	10.2	22.6	3.8	25.4	27.9	ns
		V_{CC} = 1.4 V to 1.6 V	3.6	7.3	13.3	3.2	15.8	17.4	ns
		V_{CC} = 1.65 V to 1.95 V	3.2	6.3	10.6	2.9	12.8	14.1	ns
		V_{CC} = 2.3 V to 2.7 V	3.0	5.3	8.5	2.7	10.1	11.1	ns
		V_{CC} = 3.0 V to 3.6 V	2.8	5.0	7.8	2.7	9.2	10.1	ns
C_L = 5 pF, 10 pF, 15 pF and 30 pF									
C_{PD}	power dissipation capacitance	f_i = 1 MHz; V_I = GND to V_{CC} [3]							
		V_{CC} = 0.8 V	-	2.6	-	-	-	-	pF
		V_{CC} = 1.1 V to 1.3 V	-	2.9	-	-	-	-	pF
		V_{CC} = 1.4 V to 1.6 V	-	3.0	-	-	-	-	pF
		V_{CC} = 1.65 V to 1.95 V	-	3.2	-	-	-	-	pF
		V_{CC} = 2.3 V to 2.7 V	-	3.8	-	-	-	-	pF
		V_{CC} = 3.0 V to 3.6 V	-	4.4	-	-	-	-	pF

[1] All typical values are measured at nominal V_{CC}.

[2] t_{pd} is the same as t_{PLH} and t_{PHL}.

[3] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:

f_i = input frequency in MHz;

f_o = output frequency in MHz;

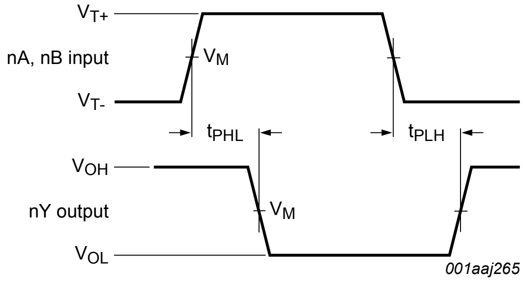
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

12.1 Waveforms and test circuit



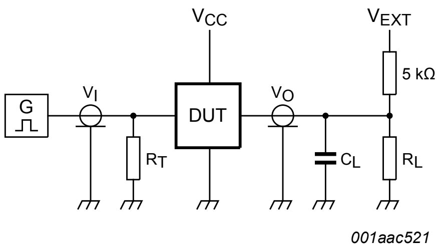
Measurement points are given in Table 9.

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 8. The data input (nA or nB) to output (nY) propagation delays

Table 9. Measurement points

Supply voltage	Output	Input		
V_{CC}	V_M	V_M	V_I	$t_r = t_f$
0.8 V to 3.6 V	0.5 x V_{CC}	0.5 x V_{CC}	V_{CC}	≤ 3.0 ns



Test data is given in Table 10.

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 the output impedance Z_o of the pulse generator.

V_{EXT} = External voltage for measuring switching times.

Figure 9. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Load		V_{EXT}		
V_{CC}	C_L	R_L [1]	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	2 x V_{CC}

[1] R_L = 5 kΩ when measuring enable and disable times. R_L = 1 MΩ when measuring propagation delays, setup and hold times and pulse width.

13 Transfer characteristics

Table 11. Transfer characteristics

Voltages are referenced to GND (ground = 0 V; for test circuit see Figure 9.

Symbol	Parameter	Conditions	T_{amb} = 25 °C			T_{amb} = -40 °C to +125 °C			Unit
			Min	Typ	Max	Min	Max (85 °C)	Max (125 °C)	
V_{T+}	positive-going threshold voltage	see Figure 10 and Figure 11							
		V_{CC} = 0.8 V	0.30	-	0.60	0.30	0.60	0.62	V
		V_{CC} = 1.1 V	0.53	-	0.90	0.53	0.90	0.92	V
		V_{CC} = 1.4 V	0.74	-	1.11	0.74	1.11	1.13	V
		V_{CC} = 1.65 V	0.91	-	1.29	0.91	1.29	1.31	V
		V_{CC} = 2.3 V	1.37	-	1.77	1.37	1.77	1.80	V
		V_{CC} = 3.0 V	1.88	-	2.29	1.88	2.29	2.32	V
V_{T-}	negative-going threshold voltage	see Figure 10 and Figure 11							
		V_{CC} = 0.8 V	0.10	-	0.60	0.10	0.60	0.60	V
		V_{CC} = 1.1 V	0.26	-	0.65	0.26	0.65	0.65	V
		V_{CC} = 1.4 V	0.39	-	0.75	0.39	0.75	0.75	V
		V_{CC} = 1.65 V	0.47	-	0.84	0.47	0.84	0.84	V
		V_{CC} = 2.3 V	0.69	-	1.04	0.69	1.04	1.04	V
		V_{CC} = 3.0 V	0.88	-	1.24	0.88	1.24	1.24	V
V_H	hysteresis voltage	(V_{T+} - V_{T-}); see Figure 10, Figure 11, Figure 12 and Figure 13							
		V_{CC} = 0.8 V	0.07	-	0.50	0.07	0.50	0.50	V
		V_{CC} = 1.1 V	0.08	-	0.46	0.08	0.46	0.46	V
		V_{CC} = 1.4 V	0.18	-	0.56	0.18	0.56	0.56	V
		V_{CC} = 1.65 V	0.27	-	0.66	0.27	0.66	0.66	V
		V_{CC} = 2.3 V	0.53	-	0.92	0.53	0.92	0.92	V
		V_{CC} = 3.0 V	0.79	-	1.31	0.79	1.31	1.31	V

13.1 Waveforms transfer characteristics

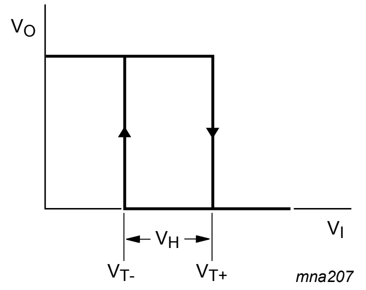
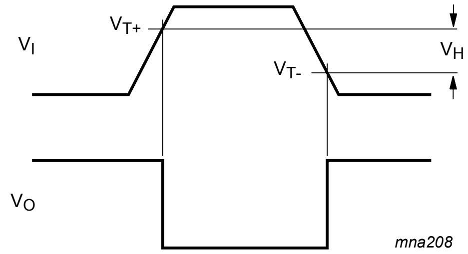


Figure 10. Transfer characteristic



V_{T+} and V_{T-} limits at 70 % and 20 %.

Figure 11. Definition of V_{T+}, V_{T-} and V_H

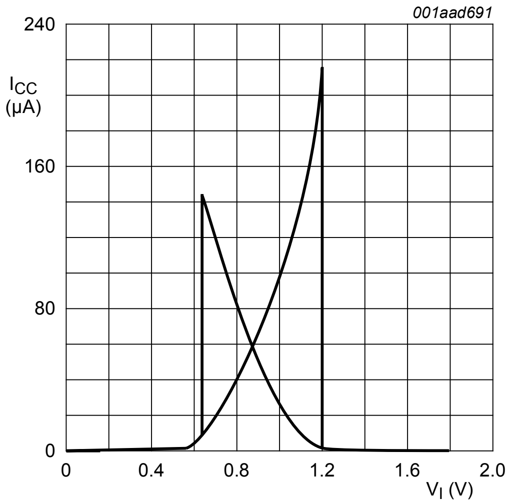


Figure 12. Typical transfer characteristics; V_{CC} = 1.8 V

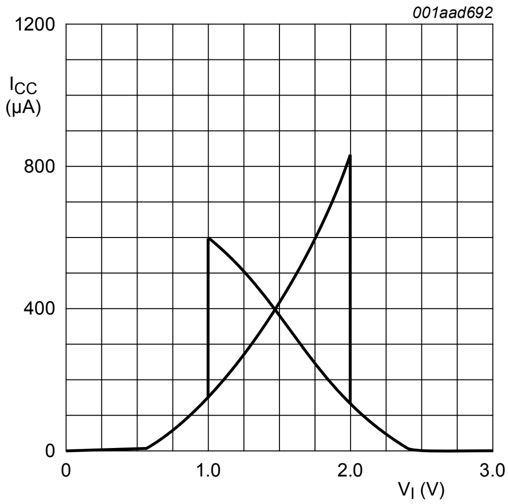


Figure 13. Typical transfer characteristics; V_{CC} = 3.0 V

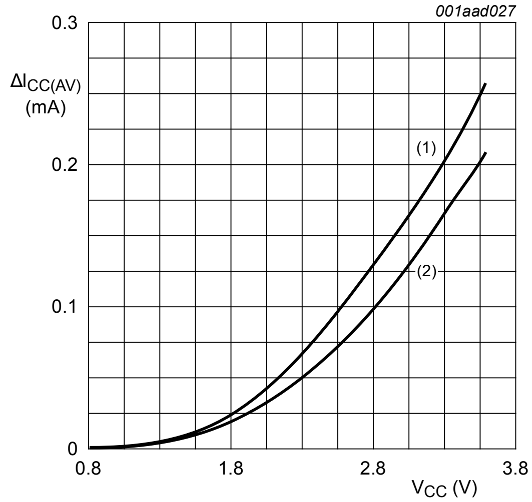
14 Application information

The slow input rise and fall times cause additional power dissipation which can be calculated using the following formula:

$P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC}$ where:

- P_{add} = additional power dissipation (μW);
- f_i = input frequency (MHz);
- t_r = input rise time (ns); 10 % to 90 %;
- t_f = input fall time (ns); 90 % to 10 %;
- $\Delta I_{CC(AV)}$ = average additional supply current (μA).

Average $\Delta I_{CC(AV)}$ differs with positive or negative input transitions, as shown in Figure 14.



(1) Positive-going edge

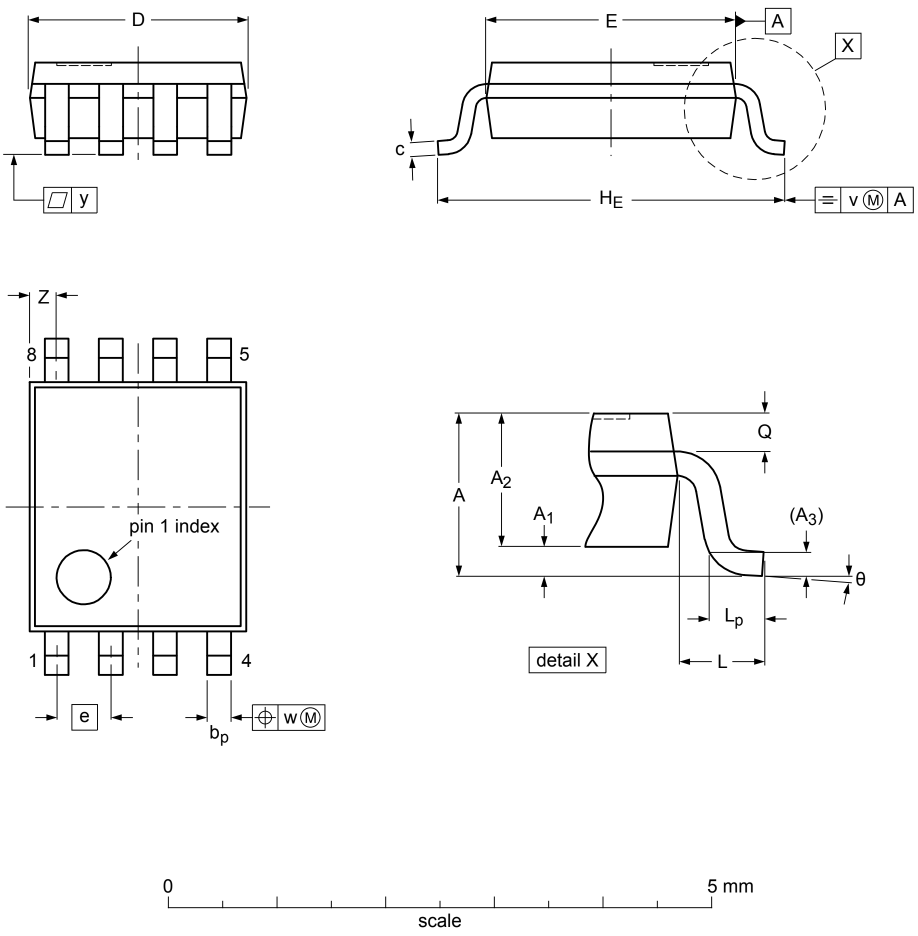
(2) Negative-going edge

Linear change of V_I between 0.8 V and 2.0 V. All values given are typical, unless otherwise specified.

Figure 14. Average I_{CC} as a function of V_{CC}

15 Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm **SOT765-1**



Dimensions (mm are the original dimensions)

Unit		A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	max		0.15	0.85		0.27	0.23	2.1	2.4		3.2		0.40	0.21				0.4	8°
	nom	1			0.12					0.5		0.4			0.2	0.08	0.1		
	min		0.00	0.60		0.17	0.08	1.9	2.2		3.0		0.15	0.19				0.1	0°

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

sot765-1_po

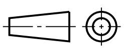
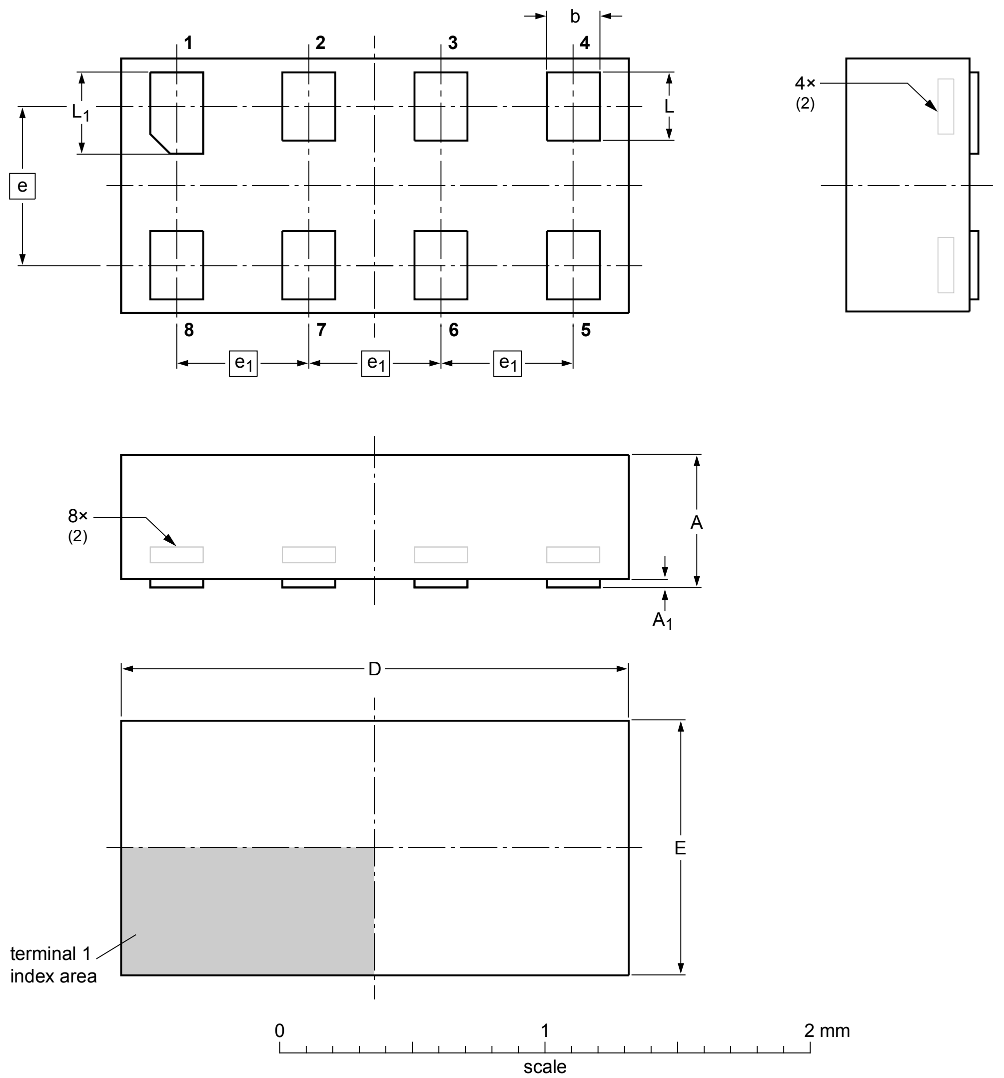
Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT765-1		MO-187				~~07-06-02~~ 16-05-31

Figure 15. 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**



DIMENSIONS (mm are the original dimensions)

UNIT	A(1) max	A_1 max	b	D	E	e	e_1	L	L_1
mm	0.5	0.04	0.25 0.17	2.0 1.9	1.05 0.95	0.6	0.5	0.35 0.27	0.40 0.32

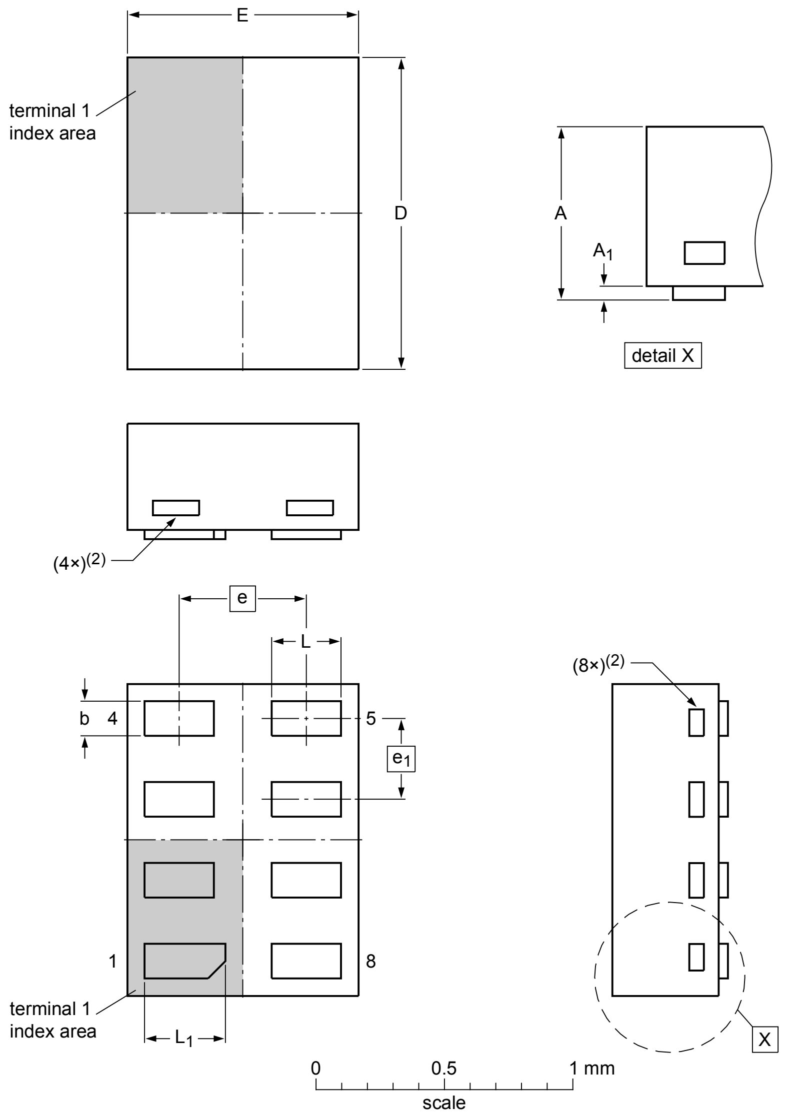
Notes

1. Including plating thickness.
2. Can be visible in some manufacturing processes.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT833-1	- - -	MO-252	- - -			~~07-11-14~~ 07-12-07

Figure 16. Package outline SOT833-1 (XSON8)

**XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1 x 0.5 mm** **SOT1089**



Dimensions

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
	max	0.5	0.04	0.20	1.40	1.05			0.35	0.40
mm	nom			0.15	1.35	1.00	0.55	0.35	0.30	0.35
	min			0.12	1.30	0.95			0.27	0.32

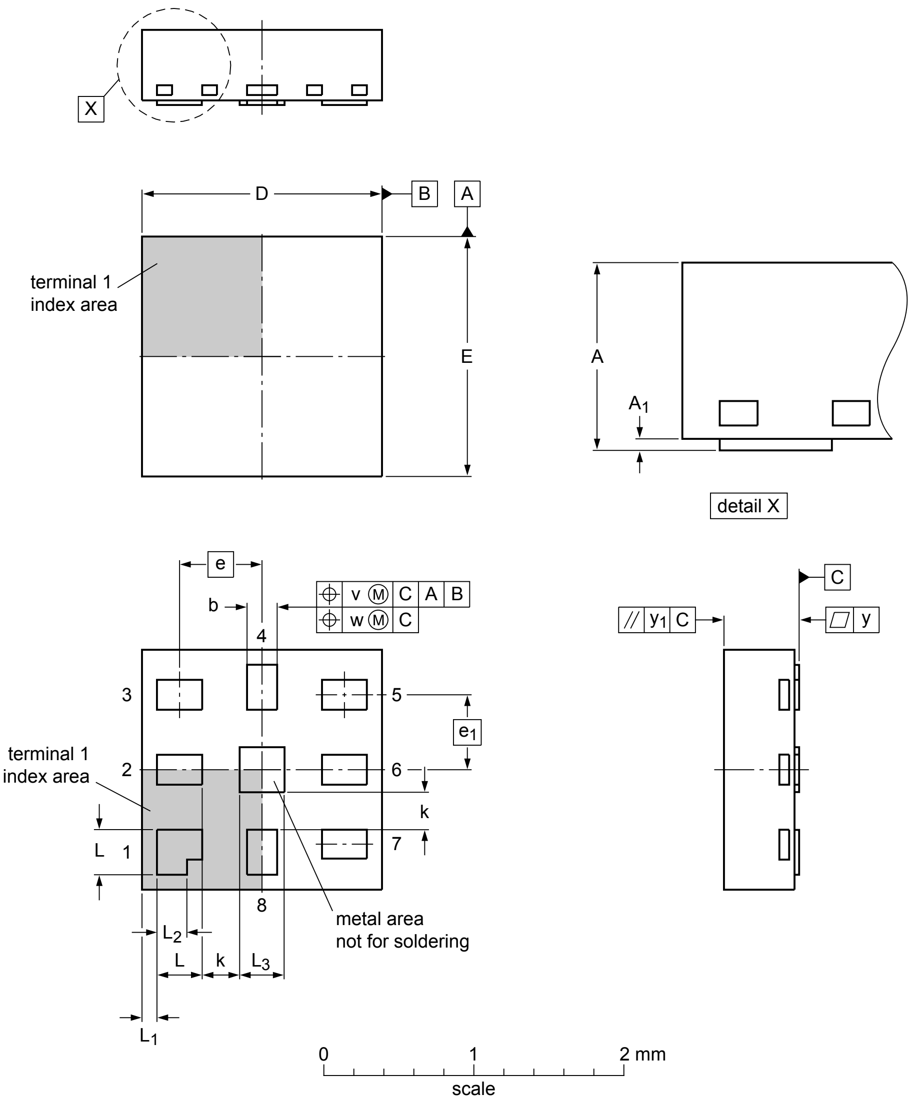
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1089_po

Outline version	References IEC	JEDEC	JEITA		European projection	Issue date
SOT1089		MO-252				~~10-04-09~~ 10-04-12

Figure 17. Package outline SOT1089 (XSON8)

XQFN8: plastic, extremely thin quad flat package; no leads; 8 terminals; body 1.6 x 1.6 x 0.5 mm **SOT902-2**



Dimensions

Unit(1)		A	A_1	b	D	E	e	e_1	k	L	L_1	L_2	L_3	v	w	y	y_1
	max	0.5	0.05	0.25	1.65	1.65				0.35	0.15	0.25	0.35				
mm	nom			0.20	1.60	1.60	0.55	0.5		0.30	0.10	0.20	0.30	0.1	0.05	0.05	0.05
	min		0.00	0.15	1.55	1.55			0.2	0.25	0.05	0.15	0.25				

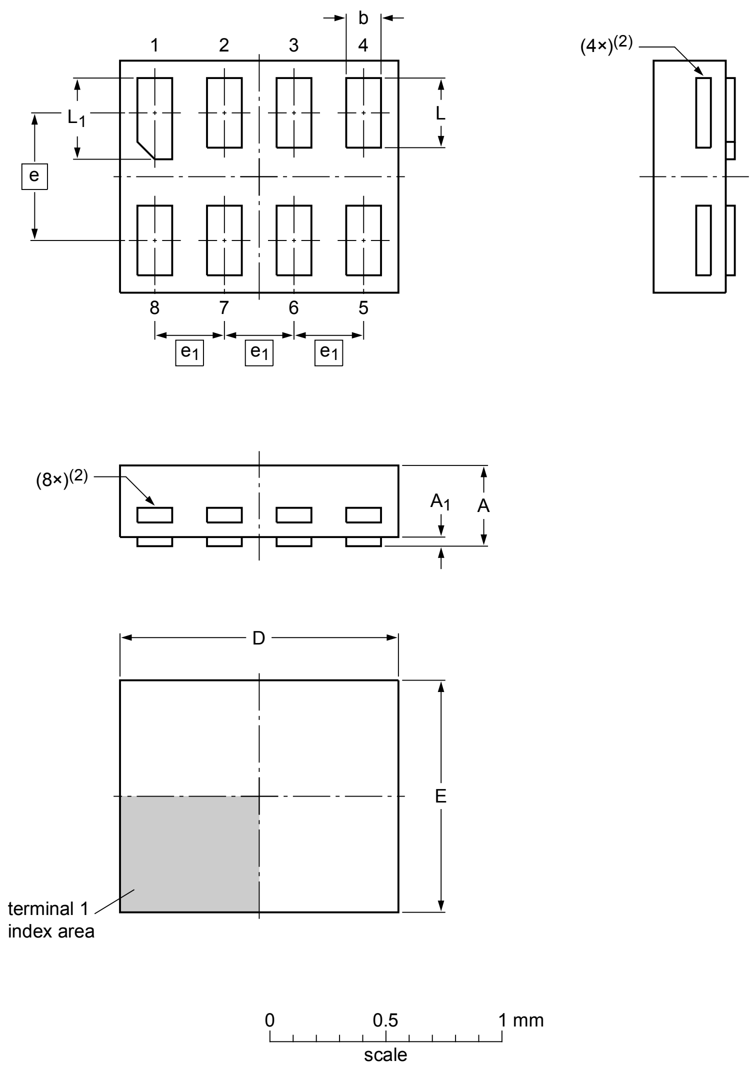
Note
1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot902-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT902-2	- - -	MO-255	- - -			~~16-07-14~~ 16-11-08

Figure 18. Package outline SOT902-2 (XQFN8)

XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.2 x 1.0 x 0.35 mm **SOT1116**



Dimensions

Unit		A(1)	A1	b	D	E	e	e1	L	L1
	max	0.35	0.04	0.20	1.25	1.05			0.35	0.40
mm	nom			0.15	1.20	1.00	0.55	0.3	0.30	0.35
	min			0.12	1.15	0.95			0.27	0.32

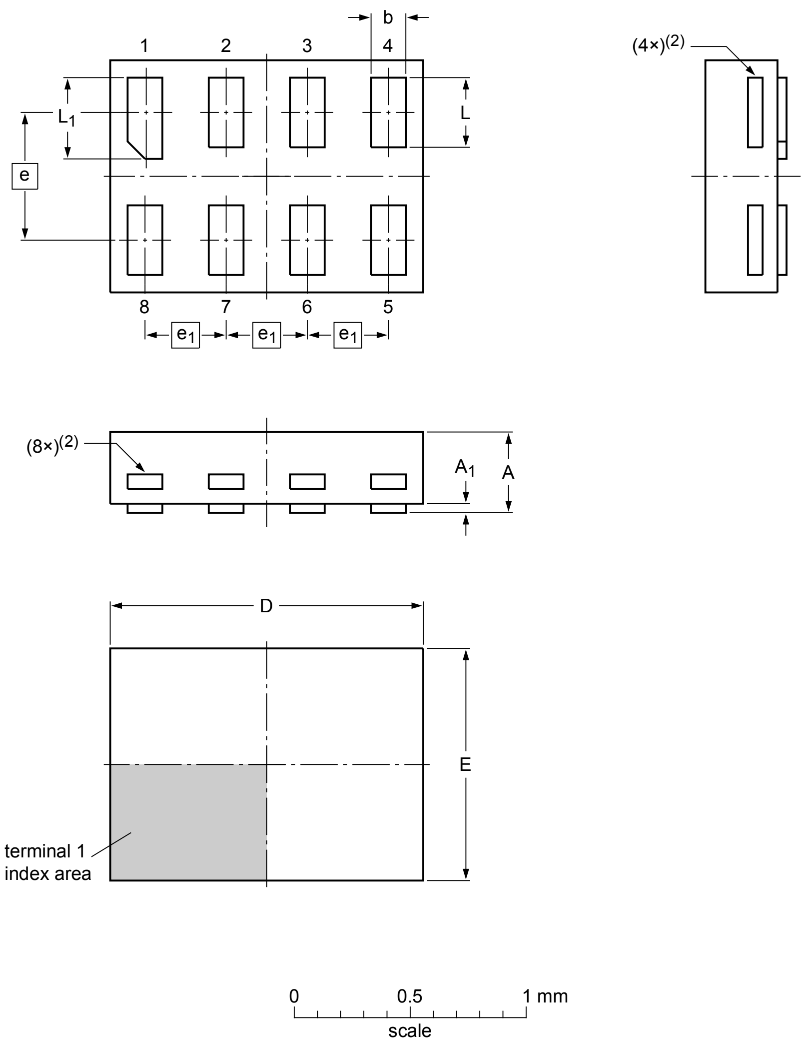
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1116_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1116						~~10-04-02~~ 10-04-07

Figure 19. Package outline SOT1116 (XSON8)

XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1.0 x 0.35 mm **SOT1203**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
	max	0.35	0.04	0.20	1.40	1.05			0.35	0.40
mm	nom			0.15	1.35	1.00	0.55	0.35	0.30	0.35
	min			0.12	1.30	0.95			0.27	0.32

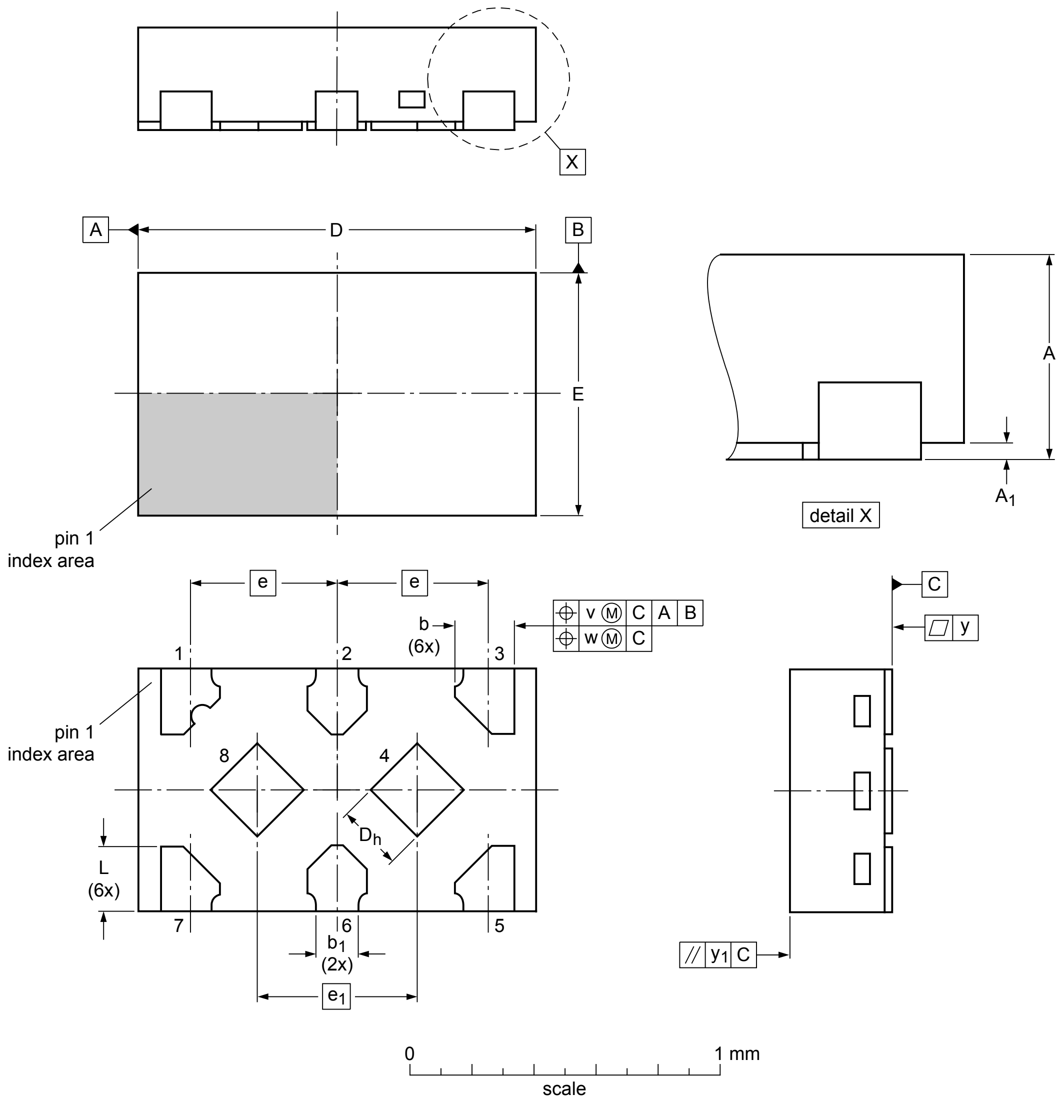
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1203_po

Outline version	References IEC	References JEDEC	References JEITA		European projection	Issue date
SOT1203						~~10-04-02~~ 10-04-06

Figure 20. Package outline SOT1203 (XSON8)

X2SON8: plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 x 0.8 x 0.35 mm **SOT1233**



Dimensions (mm are the original dimensions)

Unit		A	A_1	b	b_1	D	D_h	E	e	e_1	L	v	w	y	y_1
mm	max	0.35	0.04	0.25		1.40	0.27	0.85			0.27				
	nom	0.32		0.20	0.15 (ref)	1.35	0.22	0.80	0.5	0.54	0.22	0.1	0.05	0.05	0.05
	min	0.30	0.00	0.15		1.30	0.17	0.75			0.17				

sot1233_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1233		---				~~16-04-21~~ 17-01-05

Figure 21. Package outline SOT1233 (X2SON8)

16 Abbreviations

Table 12. Abbreviations

Acronym	Description
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model

17 Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G132 v.8	20170703	Product data sheet	-	74AUP2G132 v.7
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. • Type number 74AUP2G132GX (SOT1233 / X2SON8) added. • Type number 74AUP2G132GD removed.			
74AUP2G132 v.7	20130208	Product data sheet	-	74AUP2G132 v.6
Modifications:	• For type number 74AUP2G132GD XSON8U has changed to XSON8.			
74AUP2G132 v.6	20120803	Product data sheet	-	74AUP2G132 v.5
74AUP2G132 v.5	20111201	Product data sheet	-	74AUP2G132 v.4
74AUP2G132 v.4	20101104	Product data sheet	-	74AUP2G132 v.3
74AUP2G132 v.3	20081215	Product data sheet	-	74AUP2G132 v.2
74AUP2G132 v.2	20080314	Product data sheet	-	74AUP2G132 v.1
74AUP2G132 v.1	20061018	Product data sheet	-	-

18 Legal information

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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 URL http://www.nexperia.com.

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