

74AUP1G885

Low-power dual function gate

Rev. 9 — 31 January 2013

Product data sheet

1. General description

The 74AUP1G885 provides two functions in one device. The output state of the outputs (1Y, 2Y) is determined by the inputs (A, B and C). The output 1Y provides the Boolean function: $1Y = A \times C$. The output 2Y provides the Boolean function: $2Y = \bar{A} \times B + A \times \bar{C}$.

Schmitt trigger action at all inputs makes the circuit tolerant to slower input rise and fall times across the entire V_{CC} range from 0.8 V to 3.6 V.

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.

2. Features and benefits

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
 - ◆ JESD8-12 (0.8 V to 1.3 V)
 - ◆ JESD8-11 (0.9 V to 1.65 V)
 - ◆ JESD8-7 (1.2 V to 1.95 V)
 - ◆ JESD8-5 (1.8 V to 2.7 V)
 - ◆ JESD8-B (2.7 V to 3.6 V)
- ESD protection:
 - ◆ HBM JESD22-A114F Class 3A exceeds 5000 V
 - ◆ MM JESD22-A115-A exceeds 200 V
 - ◆ CDM JESD22-C101E exceeds 1000 V
- Low static power consumption; $I_{CC} = 0.9 \mu A$ (maximum)
- Latch-up performance exceeds 100 mA per JESD78 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 $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ and $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$



3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G885DC	–40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74AUP1G885GT	–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
74AUP1G885GF	–40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1 × 0.5 mm	SOT1089
74AUP1G885GD	–40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 3 × 2 × 0.5 mm	SOT996-2
74AUP1G885GM	–40 °C to +125 °C	XQFN8	plastic, extremely thin quad flat package; no leads; 8 terminals; body 1.6 × 1.6 × 0.5 mm	SOT902-2
74AUP1G885GN	–40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	SOT1116
74AUP1G885GS	–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]
74AUP1G885DC	pS8
74AUP1G885GT	pS8
74AUP1G885GF	58
74AUP1G885GD	pS8
74AUP1G885GM	pS8
74AUP1G885GN	58
74AUP1G885GS	58

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

5. Functional diagram

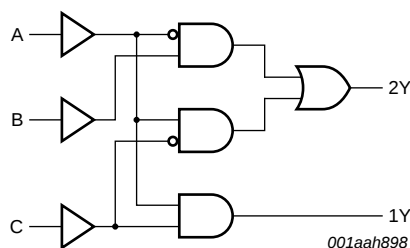
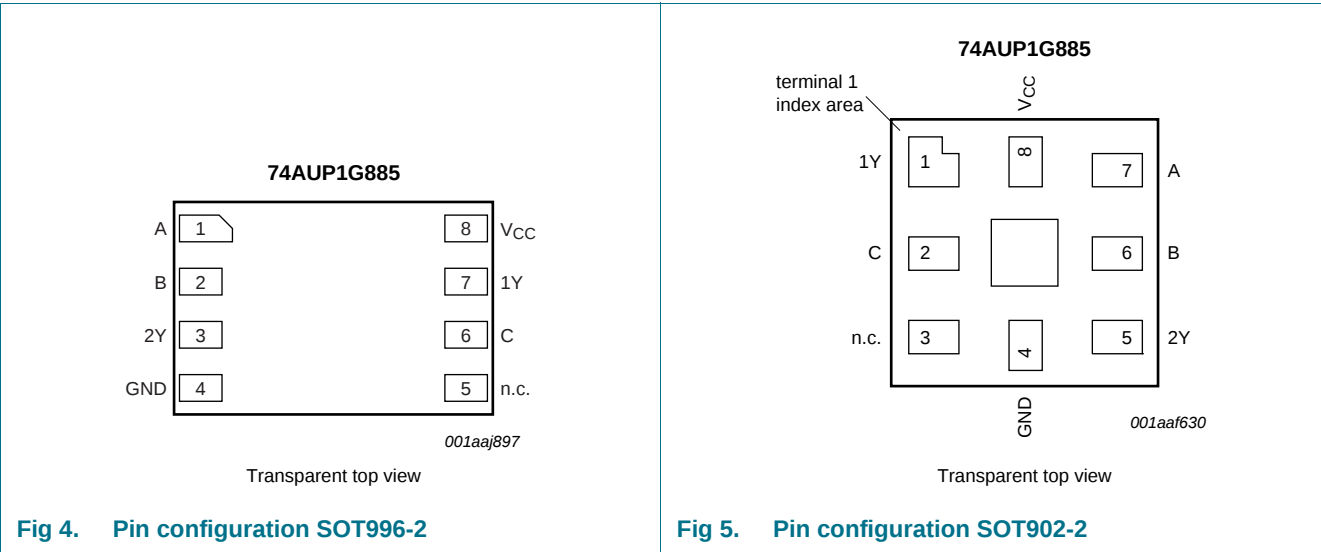
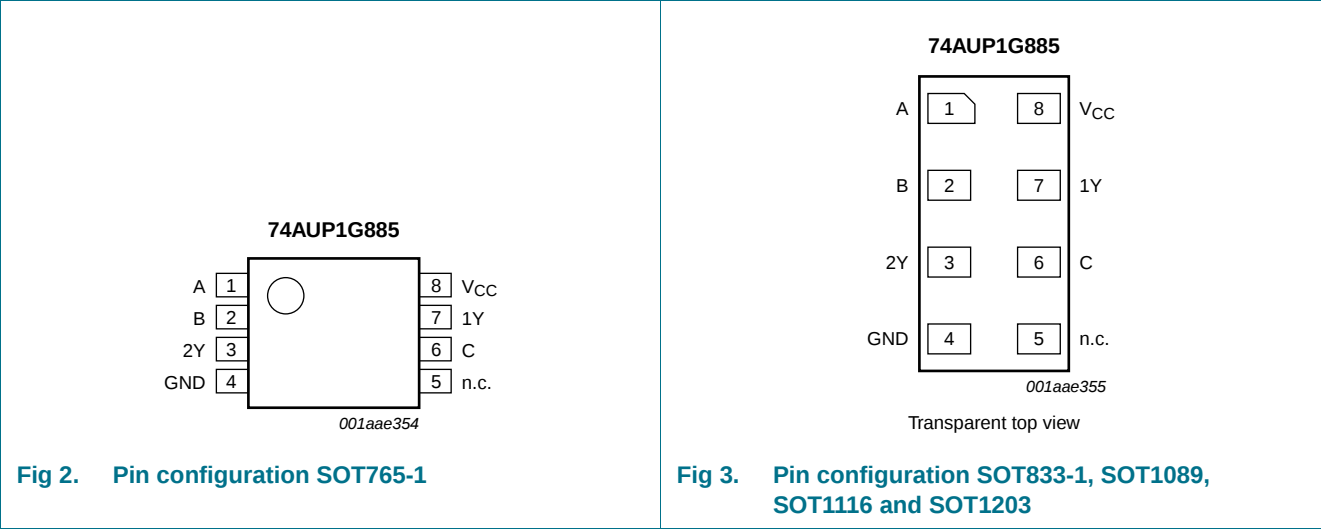


Fig 1. Logic diagram

6. Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

Symbol	Pin		Description
	SOT765-1, SOT833-1, SOT1089, SOT996-2, SOT1116 and SOT1203	SOT902-2	
A, B, C	1, 2, 6	7, 6, 2	data input
GND	4	4	ground (0 V)
n.c.	5	3	not connected
1Y, 2Y	7, 3	1, 5	data output
V _{CC}	8	8	supply voltage

7. Functional description

Table 4. Function table^[1]

Input			Output	
A	B	C	1Y	2Y
L	L	L	L	L
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	L
H	L	H	H	L
L	H	H	L	H
H	H	H	H	L

[1] H = HIGH voltage level; L = LOW voltage level.

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_{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.

9. 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
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 0.8$ V to 3.6 V	-	200	ns/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	Max	Unit
$T_{amb} = 25$ °C						
V_{IH}	HIGH-level input voltage	$V_{CC} = 0.8$ V	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9$ V to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3$ V to 2.7 V	1.6	-	-	V
		$V_{CC} = 3.0$ V to 3.6 V	2.0	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC} = 0.8$ V	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9$ V to 1.95 V	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3$ V to 2.7 V	-	-	0.7	V
		$V_{CC} = 3.0$ V to 3.6 V	-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = -20$ μ A; $V_{CC} = 0.8$ V to 3.6 V	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1$ mA; $V_{CC} = 1.1$ V	$0.75 \times V_{CC}$	-	-	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

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	-	-	0.1	V
		$I_O = 1.1\ \text{mA}$; $V_{CC} = 1.1\ \text{V}$	-	-	$0.3 \times V_{CC}$	V
		$I_O = 1.7\ \text{mA}$; $V_{CC} = 1.4\ \text{V}$	-	-	0.31	V
		$I_O = 1.9\ \text{mA}$; $V_{CC} = 1.65\ \text{V}$	-	-	0.31	V
		$I_O = 2.3\ \text{mA}$; $V_{CC} = 2.3\ \text{V}$	-	-	0.31	V
		$I_O = 3.1\ \text{mA}$; $V_{CC} = 2.3\ \text{V}$	-	-	0.44	V
		$I_O = 2.7\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	-	-	0.31	V
		$I_O = 4.0\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	-	-	0.44	V
I_I	input leakage current	$V_I = \text{GND}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$	-	-	± 0.1	μA
I_{OFF}	power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$	-	-	± 0.2	μA
ΔI_{OFF}	additional power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $0.2\ \text{V}$	-	-	± 0.2	μA
I_{CC}	supply current	$V_I = \text{GND}$ or V_{CC} ; $I_O = 0\ \text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	-	-	0.5	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC} - 0.6\ \text{V}$; $I_O = 0\ \text{A}$; $V_{CC} = 3.3\ \text{V}$	[1] -	-	40	μA
C_I	input capacitance	$V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$; $V_I = \text{GND}$ or V_{CC}	-	0.6	-	pF
C_O	output capacitance	$V_O = \text{GND}$; $V_{CC} = 0\ \text{V}$	-	1.3	-	pF
$T_{amb} = -40\ ^\circ\text{C}$ to $+85\ ^\circ\text{C}$						
V_{IH}	HIGH-level input voltage	$V_{CC} = 0.8\ \text{V}$	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	1.6	-	-	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	2.0	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC} = 0.8\ \text{V}$	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	-	-	0.7	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = -20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1\ \text{mA}$; $V_{CC} = 1.1\ \text{V}$	$0.7 \times V_{CC}$	-	-	V
		$I_O = -1.7\ \text{mA}$; $V_{CC} = 1.4\ \text{V}$	1.03	-	-	V
		$I_O = -1.9\ \text{mA}$; $V_{CC} = 1.65\ \text{V}$	1.30	-	-	V
		$I_O = -2.3\ \text{mA}$; $V_{CC} = 2.3\ \text{V}$	1.97	-	-	V
		$I_O = -3.1\ \text{mA}$; $V_{CC} = 2.3\ \text{V}$	1.85	-	-	V
		$I_O = -2.7\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	2.67	-	-	V
		$I_O = -4.0\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	2.55	-	-	V

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{OL}	LOW-level output voltage	V _I = V _{IH} or V _{IL}				
		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
T_{amb} = -40 °C to +125 °C						
V _{IH}	HIGH-level input voltage	V _{CC} = 0.8 V	0.75 × V _{CC}	-	-	V
		V _{CC} = 0.9 V to 1.95 V	0.70 × V _{CC}	-	-	V
		V _{CC} = 2.3 V to 2.7 V	1.6	-	-	V
		V _{CC} = 3.0 V to 3.6 V	2.0	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} = 0.8 V	-	-	0.25 × V _{CC}	V
		V _{CC} = 0.9 V to 1.95 V	-	-	0.30 × V _{CC}	V
		V _{CC} = 2.3 V to 2.7 V	-	-	0.7	V
		V _{CC} = 3.0 V to 3.6 V	-	-	0.9	V
V _{OH}	HIGH-level output voltage	V _I = V _{IH} or V _{IL}				
		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

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{OL}	LOW-level output voltage	V _I = V _{IH} or V _{IL}				
		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 inputs at V_{CC} or GND.

11. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V; for test circuit see [Figure 7](#)).

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	

$C_L = 5 \text{ pF}$

t _{pd}	propagation delay	A, C to 1Y; see Figure 6	[2]						
		V _{CC} = 0.8 V	-	17.3	-	-	-	ns	
		V _{CC} = 1.1 V to 1.3 V	1.1	5.2	9.7	0.9	12.8	14.2	ns
		V _{CC} = 1.4 V to 1.6 V	1.2	3.7	5.9	1.0	7.8	8.6	ns
		V _{CC} = 1.65 V to 1.95 V	1.1	3.0	4.8	0.9	6.2	6.9	ns
		V _{CC} = 2.3 V to 2.7 V	1.1	2.4	3.6	1.0	4.1	4.5	ns
		V _{CC} = 3.0 V to 3.6 V	1.1	2.1	3.1	1.0	3.6	4.1	ns
		A, B to 2Y; see Figure 6	[2]						
		V _{CC} = 0.8 V	-	21.5	-	-	-	ns	
		V _{CC} = 1.1 V to 1.3 V	1.7	6.0	12.7	1.4	12.8	14.2	ns
		V _{CC} = 1.4 V to 1.6 V	1.7	4.2	7.2	1.4	7.8	8.7	ns
		V _{CC} = 1.65 V to 1.95 V	1.4	3.3	5.8	1.2	6.5	7.2	ns
		V _{CC} = 2.3 V to 2.7 V	1.2	2.6	4.1	1.0	4.7	5.2	ns
		V _{CC} = 3.0 V to 3.6 V	1.1	2.3	3.5	0.9	3.8	4.2	ns

$C_L = 10 \text{ pF}$

t _{pd}	propagation delay	A, C to 1Y; see Figure 6	[2]						
		V _{CC} = 0.8 V	-	20.8	-	-	-	ns	
		V _{CC} = 1.1 V to 1.3 V	1.2	6.1	11.4	1.2	14.6	16.1	ns
		V _{CC} = 1.4 V to 1.6 V	1.4	4.3	7.2	1.2	8.7	9.6	ns
		V _{CC} = 1.65 V to 1.95 V	1.4	3.6	5.7	1.3	6.8	7.5	ns
		V _{CC} = 2.3 V to 2.7 V	1.4	2.9	4.2	1.2	4.8	5.4	ns
		V _{CC} = 3.0 V to 3.6 V	1.4	2.7	3.9	1.3	4.1	4.6	ns
		A, B to 2Y; see Figure 6	[2]						
		V _{CC} = 0.8 V	-	25.0	-	-	-	ns	
		V _{CC} = 1.1 V to 1.3 V	1.8	6.9	14.4	1.7	14.6	16.1	ns
		V _{CC} = 1.4 V to 1.6 V	1.9	4.8	8.5	1.5	9.1	10.1	ns
		V _{CC} = 1.65 V to 1.95 V	1.9	3.9	6.6	1.7	7.2	8.0	ns
		V _{CC} = 2.3 V to 2.7 V	1.5	3.1	4.7	1.3	5.4	5.9	ns
		V _{CC} = 3.0 V to 3.6 V	1.4	2.8	4.3	1.3	4.6	5.1	ns

Table 8. Dynamic characteristics ...continuedVoltages are referenced to GND (ground = 0 V; for test circuit see [Figure 7](#)).

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	

C_L = 15 pF

t _{pd}	propagation delay	A, C to 1Y; see Figure 6 ^[2]							
		V _{CC} = 0.8 V		-	24.3	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V		1.3	6.9	13.0	1.2	16.2	ns
		V _{CC} = 1.4 V to 1.6 V		1.7	4.9	8.0	1.4	9.7	ns
		V _{CC} = 1.65 V to 1.95 V		1.5	4.1	6.4	1.4	7.6	ns
		V _{CC} = 2.3 V to 2.7 V		1.7	3.4	5.0	1.6	5.4	ns
		V _{CC} = 3.0 V to 3.6 V		1.7	3.1	4.4	1.6	4.7	ns
		A, B to 2Y; see Figure 6 ^[2]							
		V _{CC} = 0.8 V		-	28.5	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V		2.1	7.7	16.0	1.9	16.3	ns
		V _{CC} = 1.4 V to 1.6 V		2.2	5.4	9.4	2.4	10.3	ns
		V _{CC} = 1.65 V to 1.95 V		2.0	4.4	7.4	1.8	8.2	ns
		V _{CC} = 2.3 V to 2.7 V		1.8	3.6	5.5	1.6	6.0	ns
		V _{CC} = 3.0 V to 3.6 V		1.7	3.3	4.8	1.5	5.2	ns

C_L = 30 pF

t _{pd}	propagation delay	A, C to 1Y; see Figure 6 ^[2]							
		V _{CC} = 0.8 V		-	34.7	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V		2.4	9.2	17.7	2.3	20.9	ns
		V _{CC} = 1.4 V to 1.6 V		2.5	6.5	10.6	2.5	12.2	ns
		V _{CC} = 1.65 V to 1.95 V		2.5	5.4	8.5	2.4	9.4	ns
		V _{CC} = 2.3 V to 2.7 V		2.6	4.5	6.4	2.4	7.0	ns
		V _{CC} = 3.0 V to 3.6 V		2.5	4.2	5.7	2.3	6.6	ns
		A, B to 2Y; see Figure 6 ^[2]							
		V _{CC} = 0.8 V		-	38.9	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V		2.6	10.0	20.5	2.6	21.5	ns
		V _{CC} = 1.4 V to 1.6 V		2.6	6.9	11.9	2.6	13.2	ns
		V _{CC} = 1.65 V to 1.95 V		2.7	5.7	9.5	2.7	10.5	ns
		V _{CC} = 2.3 V to 2.7 V		2.5	4.7	6.9	2.5	7.6	ns
		V _{CC} = 3.0 V to 3.6 V		2.4	4.4	6.1	2.4	7.1	ns

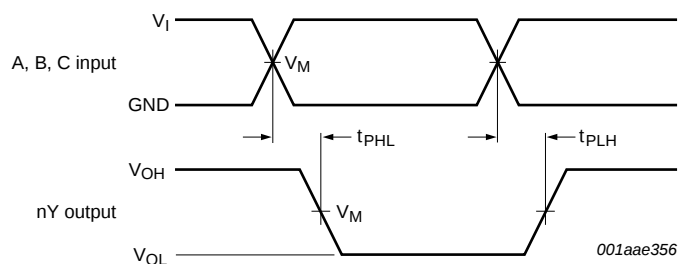
Table 8. Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V; for test circuit see [Figure 7](#)).

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	
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][4]							
		V _{CC} = 0.8 V	-	2.7	-	-	-	-	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	-	3.1	-	-	-	-	pF
		V _{CC} = 2.3 V to 2.7 V	-	3.5	-	-	-	-	pF
		V _{CC} = 3.0 V to 3.6 V	-	4.1	-	-	-	-	pF

- [1] All typical values are measured at nominal V_{CC} .
- [2] t_{pd} is the same as t_{PLH} and t_{PHL} .
- [3] All specified values are the average typical values over all stated loads.
- [4] 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. Waveforms



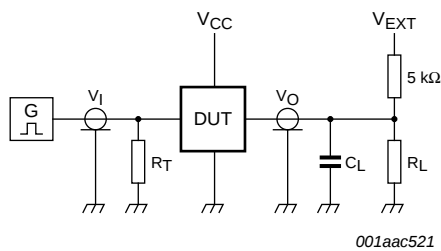
Measurement points are given in [Table 9](#).

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

Fig 6. The data input (A, B, C) 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	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	V_{CC}	$\leq 3.0 \text{ ns}$



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.

Fig 7. 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	$2 \times V_{CC}$

[1] For measuring enable and disable times $R_L = 5\text{ k}\Omega$.
For measuring propagation delays, set-up and hold times and pulse width $R_L = 1\text{ M}\Omega$.

13. Package outline

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

SOT765-1

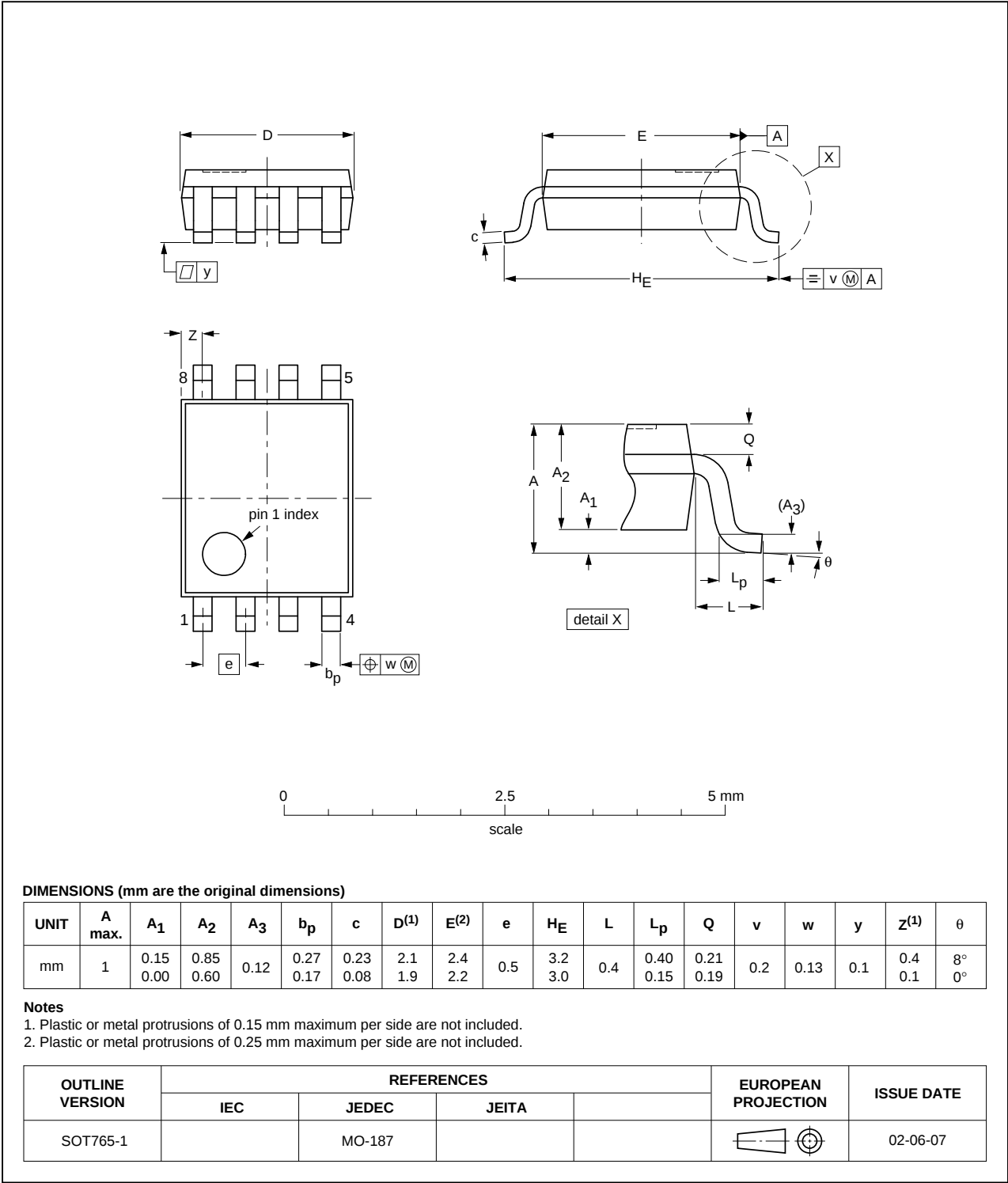


Fig 8. Package outline SOT765-1 (VSSOP8)

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

SOT833-1

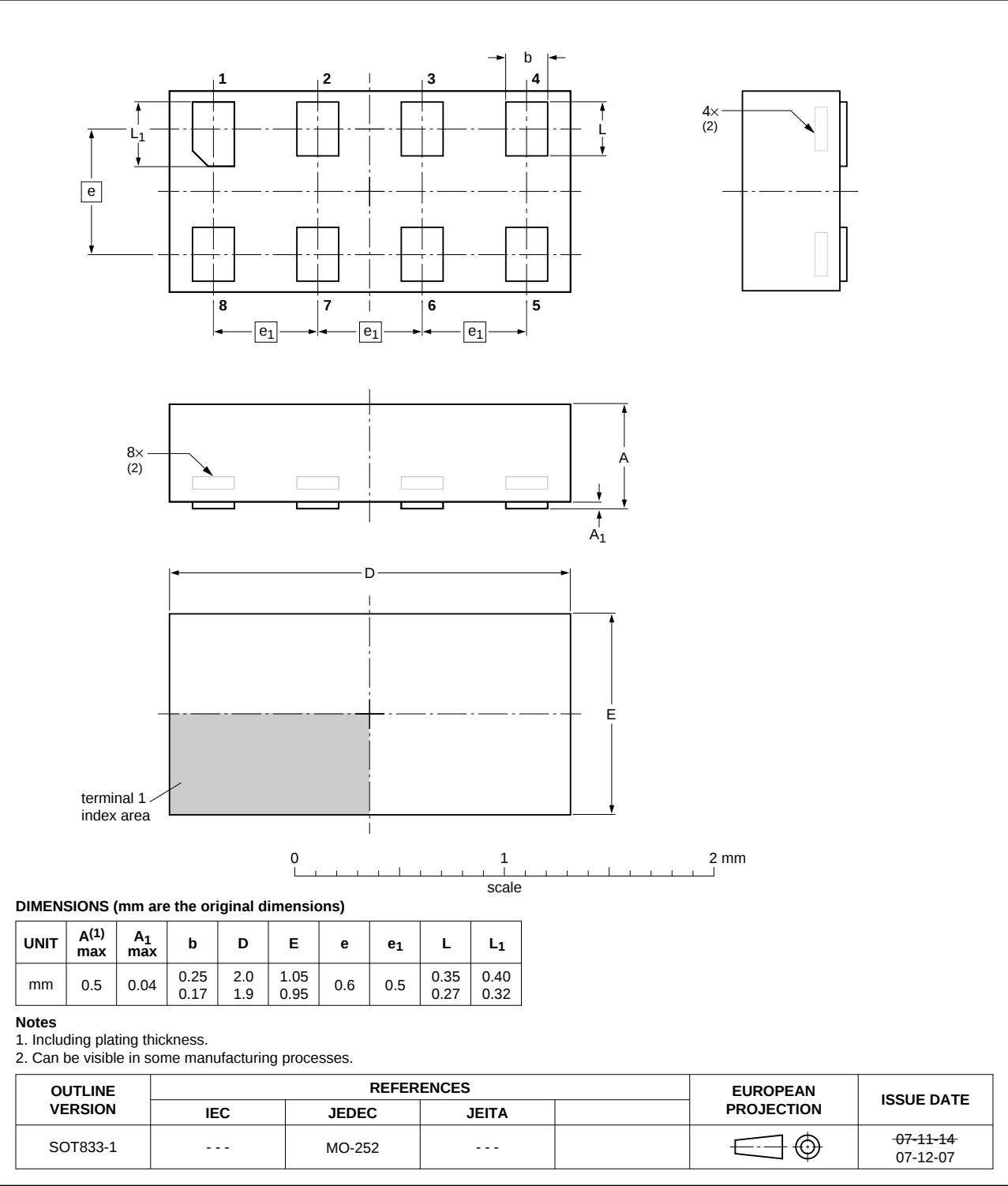
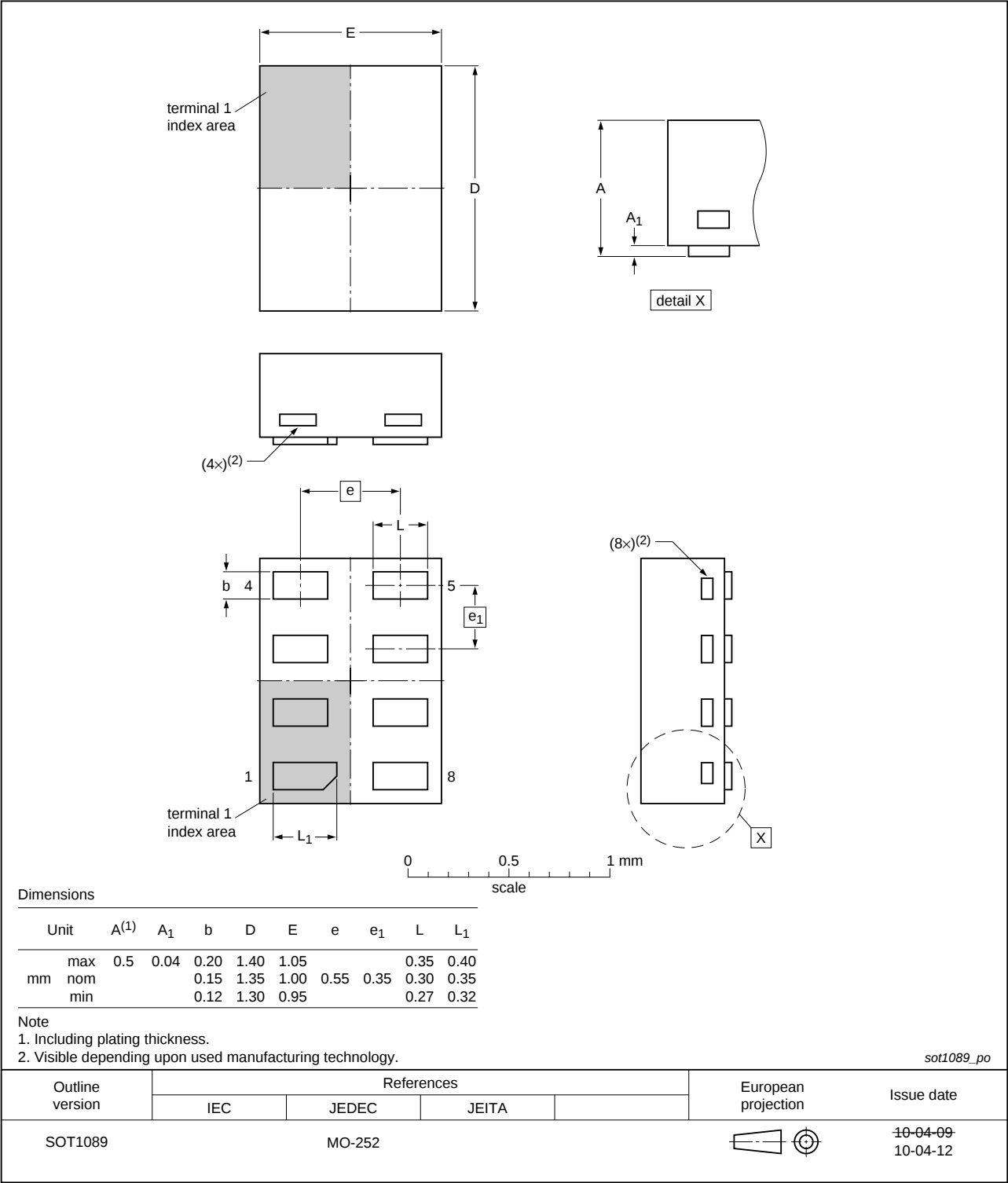


Fig 9. Package outline SOT833-1 (XSON8)

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

SOT1089



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

SOT902-2

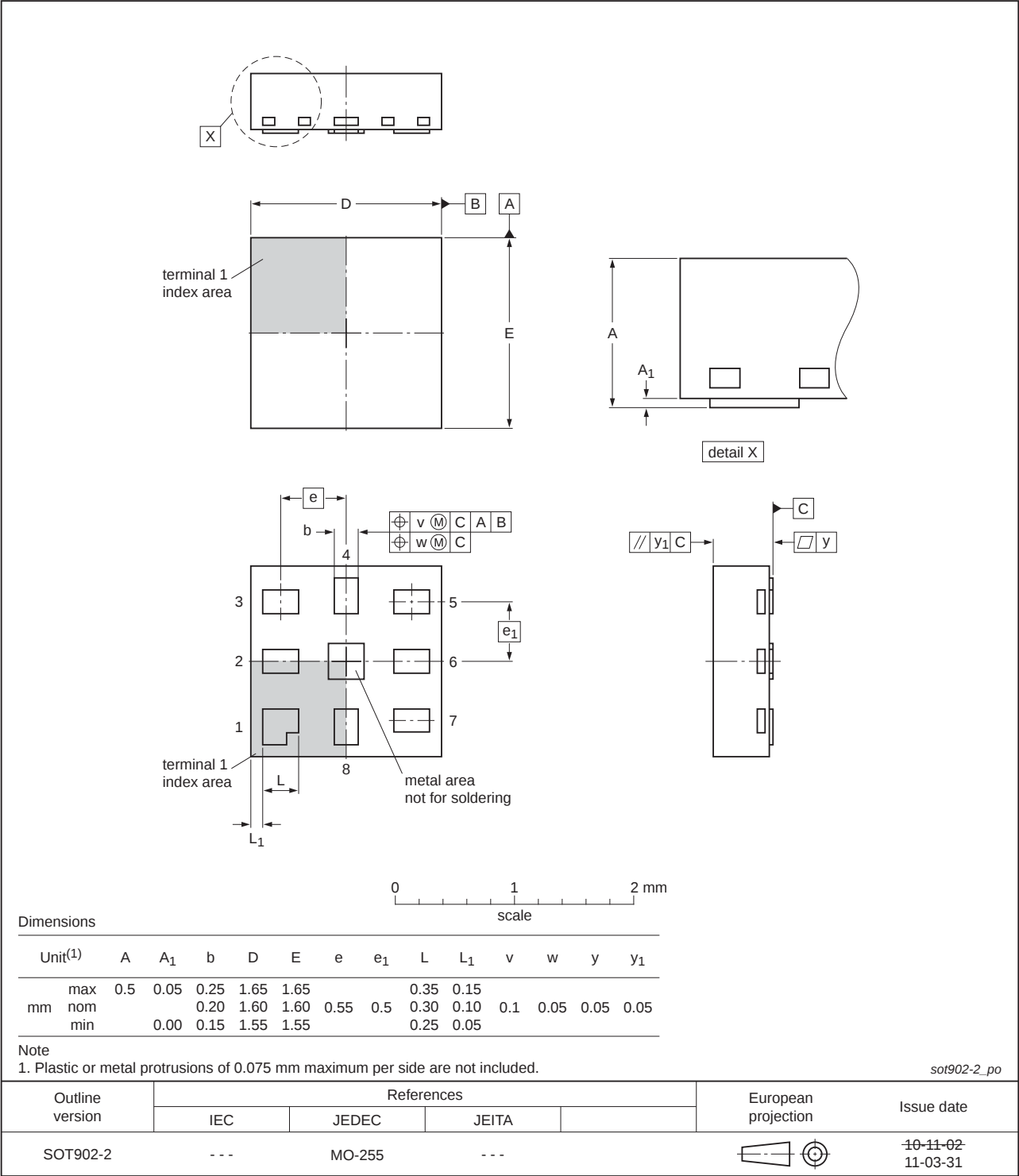


Fig 11. Package outline SOT902-2 (XQFN8)

XSON8: plastic extremely thin small outline package; no leads;
8 terminals; body 3 x 2 x 0.5 mm

SOT996-2

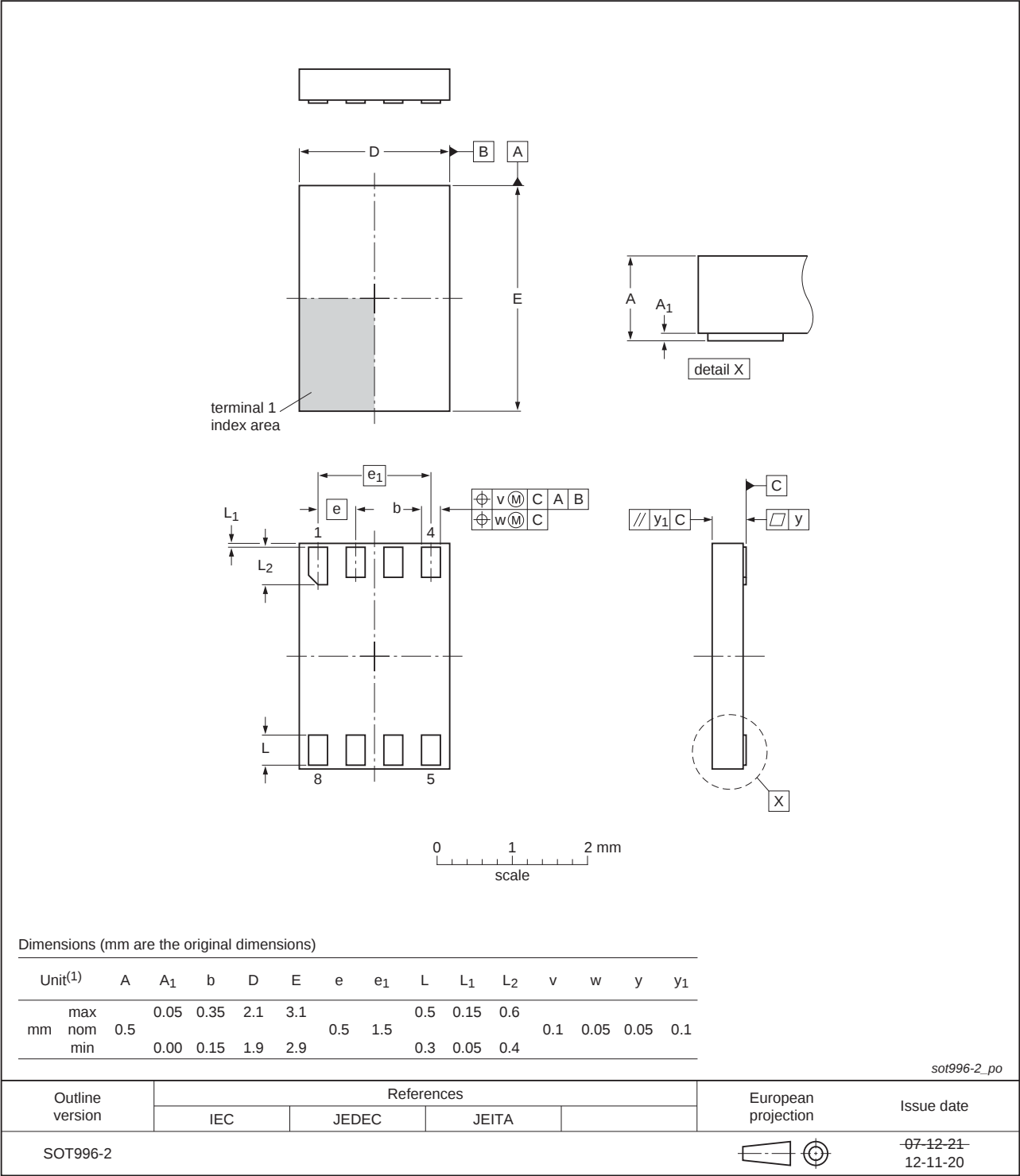


Fig 12. Package outline SOT996-2 (XSON8)

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

SOT1116

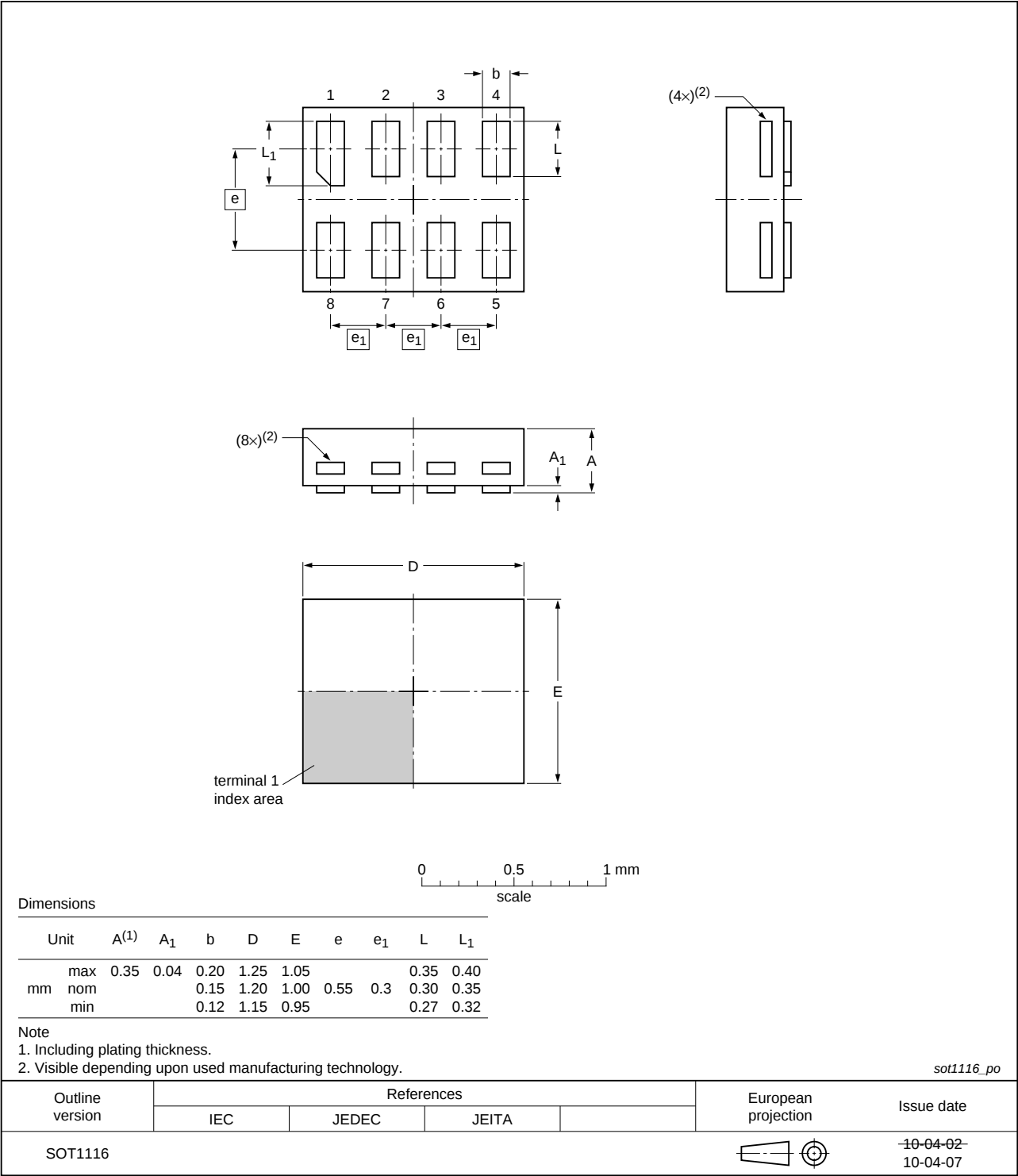


Fig 13. Package outline SOT1116 (XSON8)

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

SOT1203

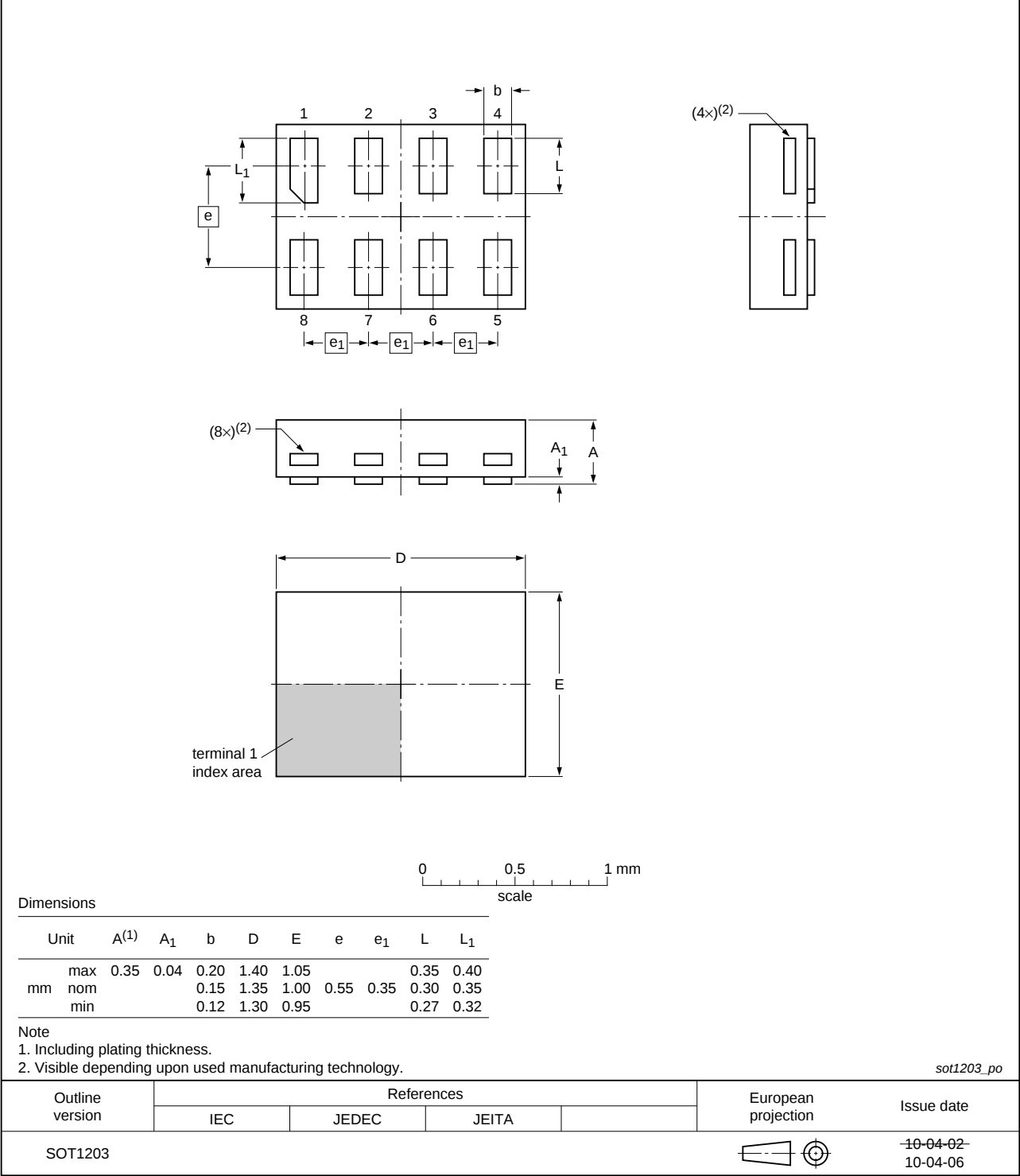


Fig 14. Package outline SOT1203 (XSON8)

14. Abbreviations

Table 11. Abbreviations

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

15. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G885 v.9	20130131	Product data sheet	-	74AUP1G885 v.8
Modifications:	• For type number 74AUP1G885GD XSON8U has changed to XSON8.			
74AUP1G885 v.8	20120608	Product data sheet	-	74AUP1G885 v.7
74AUP1G885 v.7	20111129	Product data sheet	-	74AUP1G885 v.6
74AUP1G885 v.6	20101021	Product data sheet	-	74AUP1G885 v.5
74AUP1G885 v.5	20090626	Product data sheet	-	74AUP1G885 v.4
74AUP1G885 v.4	20090401	Product data sheet	-	74AUP1G885 v.3
74AUP1G885 v.3	20080328	Product data sheet	-	74AUP1G885 v.2
74AUP1G885 v.2	20070710	Product data sheet	-	74AUP1G885 v.1
74AUP1G885 v.1	20061201	Product data sheet	-	-

16. Legal information

16.1 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 URL <http://www.nxp.com>.

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18. Contents

1	General description	1
2	Features and benefits	1
3	Ordering information	2
4	Marking	2
5	Functional diagram	2
6	Pinning information	3
6.1	Pinning	3
6.2	Pin description	3
7	Functional description	4
8	Limiting values	4
9	Recommended operating conditions	5
10	Static characteristics	5
11	Dynamic characteristics	9
12	Waveforms	11
13	Package outline	13
14	Abbreviations	20
15	Revision history	20
16	Legal information	21
16.1	Data sheet status	21
16.2	Definitions	21
16.3	Disclaimers	21
16.4	Trademarks	22
17	Contact information	22
18	Contents	23

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