

# 74AUP1G885

## Low-power dual function gate

Rev. 11 — 22 July 2019

Product data sheet

## 1. General description

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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

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- 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;  $I_{CC} = 0.9 \mu\text{A}$  (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 °C to +85 °C and -40 °C to +125 °C

### 3. Ordering information

Table 1. Ordering information

Type number	Package			Version
	Temperature range	Name	Description	
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
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
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

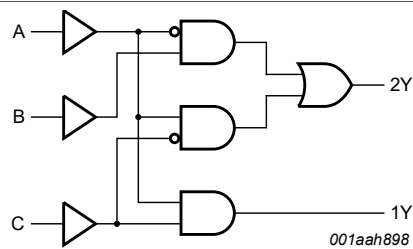
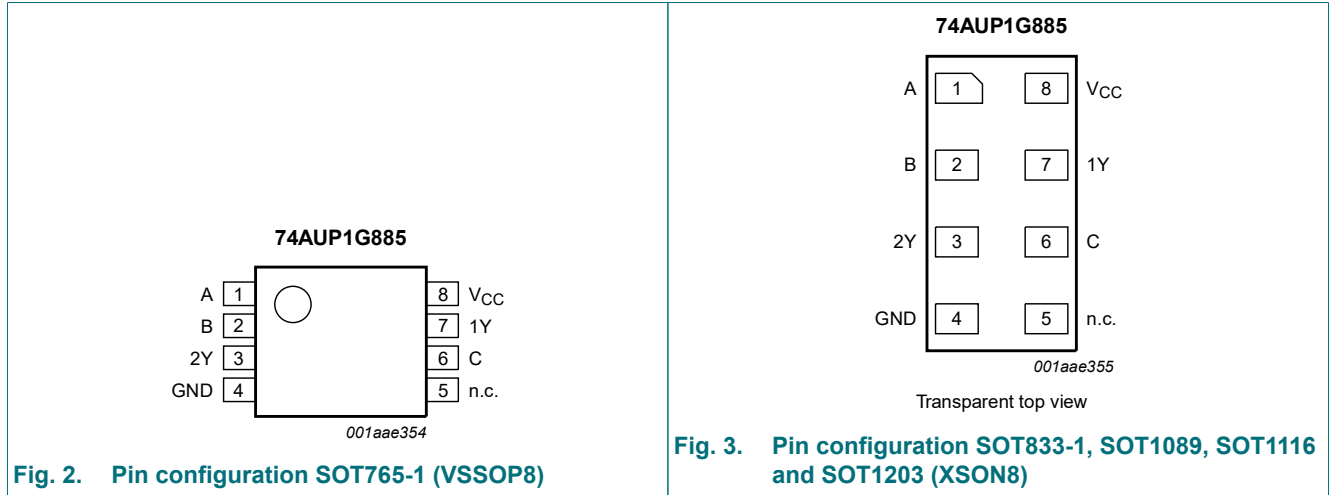


Fig. 1. Logic diagram

## 6. Pinning information

### 6.1. Pinning



### 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
A, B, C	1, 2, 6	data input
GND	4	ground (0 V)
n.c.	5	not connected
1Y, 2Y	7, 3	data output
V <sub>CC</sub>	8	supply voltage

## 7. Functional description

Table 4. Function table

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

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

## 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 SOT765-1 (VSSOP8) packages:  $P_{tot}$  derates linearly with 4.9 mW/K above 99 °C.

For SOT833-1 (XSON8) packages:  $P_{tot}$  derates linearly with 3.1 mW/K above 68 °C.

For SOT1089 (XSON8) packages:  $P_{tot}$  derates linearly with 4.0 mW/K above 88 °C.

For SOT1116 (XSON8) packages:  $P_{tot}$  derates linearly with 4.2 mW/K above 90 °C.

For SOT1203 (XSON8) packages:  $P_{tot}$  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		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
<b>T<sub>amb</sub> = 25 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.75V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.11	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.32	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	2.05	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.72	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.31	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.31	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.31	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.44	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.31	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.44	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.2	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.2	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.5	μA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V [1]	-	-	40	μA
C <sub>I</sub>	input capacitance	V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND or V <sub>CC</sub>	-	0.6	-	pF
C <sub>O</sub>	output capacitance	V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V	-	1.3	-	pF

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = -40 °C to +85 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.7V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.03	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.30	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.97	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.85	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.67	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.37	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.35	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.33	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.45	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.33	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.5	μA
		V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.5	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.5	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.6	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.9	μA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V [1]	-	-	50	μA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.75V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.70V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.25V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.30V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.11	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.6V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	0.93	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.17	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.77	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.67	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.40	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.11	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.33V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.41	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.39	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.36	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.36	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	μA
		V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.75	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1.4	μA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V [1]	-	-	75	μA

[1] One input at V<sub>CC</sub> - 0.6 V, other inputs at V<sub>CC</sub> or GND.

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V; for test circuit see Fig. 5).

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b><math>C_L = 5 \text{ pF}</math></b>										
$t_{pd}$	propagation delay	A, C to 1Y; see Fig. 4 [2]								
		$V_{CC} = 0.8 \text{ V}$	-	17.3	-	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	1.1	5.2	9.7	0.9	12.8	0.9	14.2	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	1.2	3.7	5.9	1.0	7.8	1.0	8.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	1.1	3.0	4.8	0.9	6.2	0.9	6.9	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.1	2.4	3.6	1.0	4.1	1.0	4.5	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	1.1	2.1	3.1	1.0	3.6	1.0	4.1	ns
		A, B to 2Y; see Fig. 4 [2]								
		$V_{CC} = 0.8 \text{ V}$	-	21.5	-	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	1.7	6.0	12.7	1.4	12.8	1.4	14.2	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	1.7	4.2	7.2	1.4	7.8	1.4	8.7	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	1.4	3.3	5.8	1.2	6.5	1.2	7.2	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.2	2.6	4.1	1.0	4.7	1.0	5.2	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	1.1	2.3	3.5	0.9	3.8	0.9	4.2	ns
<b><math>C_L = 10 \text{ pF}</math></b>										
$t_{pd}$	propagation delay	A, C to 1Y; see Fig. 4 [2]								
		$V_{CC} = 0.8 \text{ V}$	-	20.8	-	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	1.2	6.1	11.4	1.2	14.6	1.2	16.1	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	1.4	4.3	7.2	1.2	8.7	1.2	9.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	1.4	3.6	5.7	1.3	6.8	1.3	7.5	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.4	2.9	4.2	1.2	4.8	1.2	5.4	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	1.4	2.7	3.9	1.3	4.1	1.3	4.6	ns
		A, B to 2Y; see Fig. 4 [2]								
		$V_{CC} = 0.8 \text{ V}$	-	25.0	-	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	1.8	6.9	14.4	1.7	14.6	1.7	16.1	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	1.9	4.8	8.5	1.5	9.1	1.5	10.1	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	1.9	3.9	6.6	1.7	7.2	1.7	8.0	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.5	3.1	4.7	1.3	5.4	1.3	5.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	1.4	2.8	4.3	1.3	4.6	1.3	5.1	ns



Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 15 pF</b>										
t <sub>pd</sub>	propagation delay	A, C to 1Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	24.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	1.3	6.9	13.0	1.2	16.2	1.2	17.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.7	4.9	8.0	1.4	9.7	1.4	10.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.5	4.1	6.4	1.4	7.6	1.4	8.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	3.4	5.0	1.6	5.4	1.6	6.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	3.1	4.4	1.6	4.7	1.6	5.3	ns
		A, B to 2Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	28.5	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.1	7.7	16.0	1.9	16.3	1.9	18.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	5.4	9.4	2.4	10.3	2.4	11.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	4.4	7.4	1.8	8.2	1.8	9.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.6	5.5	1.6	6.0	1.6	6.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	3.3	4.8	1.5	5.2	1.5	5.8	ns
<b>C<sub>L</sub> = 30 pF</b>										
t <sub>pd</sub>	propagation delay	A, C to 1Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	34.7	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.4	9.2	17.7	2.3	20.9	2.3	23.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	6.5	10.6	2.5	12.2	2.5	13.5	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.5	5.4	8.5	2.4	9.4	2.4	10.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.6	4.5	6.4	2.4	7.0	2.4	7.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.5	4.2	5.7	2.3	6.6	2.3	7.3	ns
		A, B to 2Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	38.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.6	10.0	20.5	2.6	21.5	2.6	23.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.6	6.9	11.9	2.6	13.2	2.6	14.5	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.7	5.7	9.5	2.7	10.5	2.7	11.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.5	4.7	6.9	2.5	7.6	2.5	8.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.4	4.4	6.1	2.4	7.1	2.4	7.9	ns
<b>C<sub>L</sub> = 5 pF, 10 pF, 15 pF and 30 pF</b>										
C <sub>PD</sub>	power dissipation capacitance	f <sub>i</sub> = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> [3]								
		V <sub>CC</sub> = 0.8 V	-	2.7	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.9	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	3.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	3.1	-	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.5	-	-	-	-	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.1	-	-	-	-	-	pF

[1] All typical values are measured at nominal V<sub>CC</sub>.  
 [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.  
 [3] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW). P<sub>D</sub> = C<sub>PD</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>i</sub> × N + Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) where:  
 f<sub>i</sub> = input frequency in MHz; f<sub>o</sub> = output frequency in MHz; C<sub>L</sub> = output load capacitance in pF;  
 V<sub>CC</sub> = supply voltage in V; N = number of inputs switching; Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) = sum of the outputs.

11.1. Waveforms and test circuit

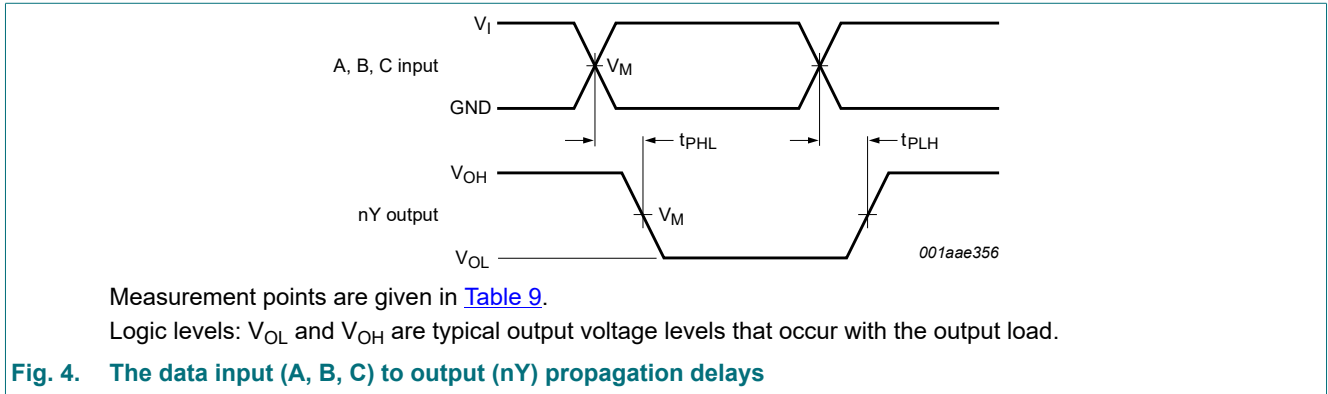


Table 9. Measurement points

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

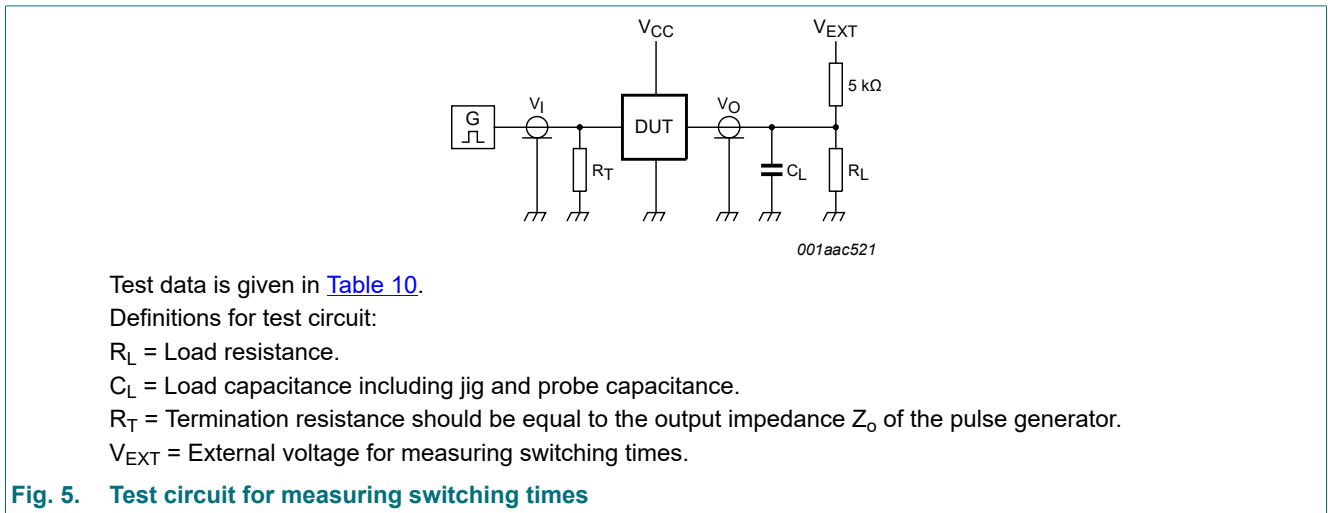


Table 10. Test data

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  $R_L = 5$  kΩ.  
 For measuring propagation delays, set-up and hold times and pulse width  $R_L = 1$  MΩ.

## 12. Package outline

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

SOT765-1



Fig. 6. 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. 7. 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

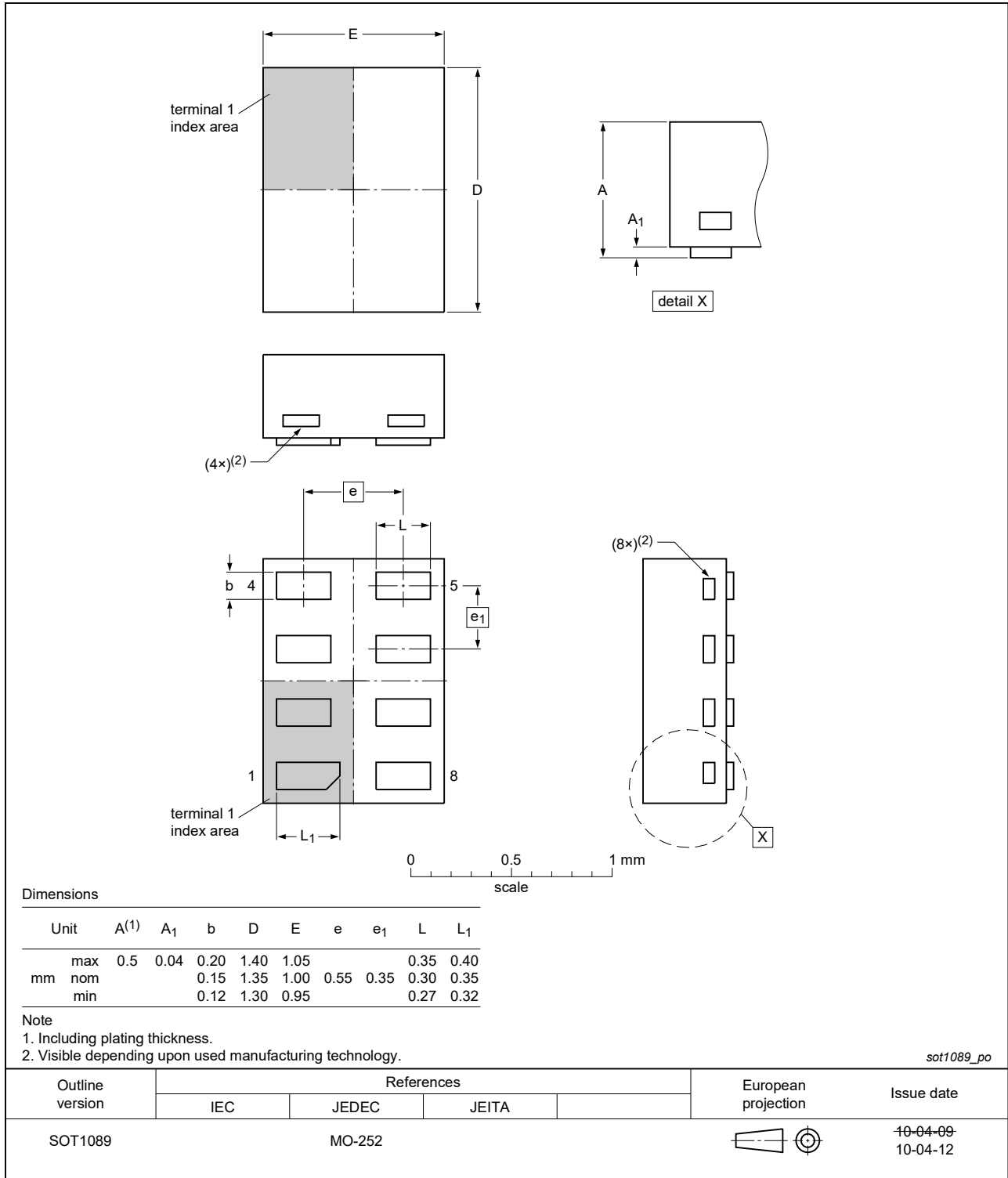


Fig. 8. Package outline SOT1089 (XSON8)

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

SOT1116

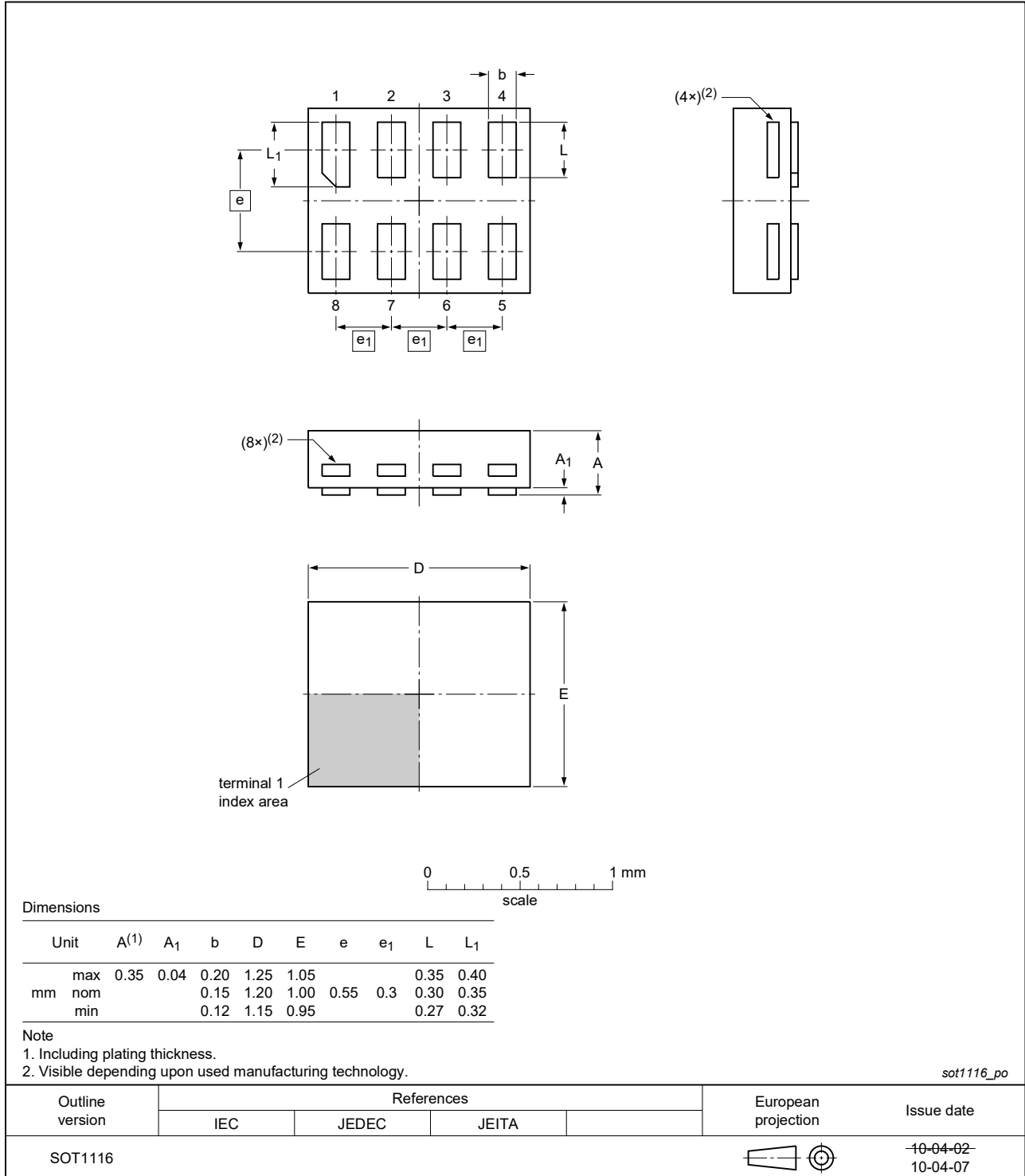


Fig. 9. Package outline SOT1116 (XSON8)

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

SOT1203



Fig. 10. Package outline SOT1203 (XSON8)

## 13. Abbreviations

Table 11. Abbreviations

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

## 14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G885 v.11	20190722	Product data sheet	-	74AUP1G885 v.10
Modifications:	<ul style="list-style-type: none"> <li>Type number 74AUP1G885GM (SOT902-2) removed.</li> <li>Layout of <a href="#">Table 8</a> Dynamic characteristics updated.</li> </ul>			
74AUP1G885 v.10	20190314	Product data sheet	-	74AUP1G885 v.9
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 number 74AUP1G885GD (SOT996-2) removed.</li> <li>Package outline drawing <a href="#">SOT765-1</a> (VSSOP8) updated.</li> <li>Package outline drawing SOT902-2 (XQFN8) updated.</li> </ul>			
74AUP1G885 v.9	20130131	Product data sheet	-	74AUP1G885 v.8
Modifications:	<ul style="list-style-type: none"> <li>For type number 74AUP1G885GD XSON8U has changed to XSON8.</li> </ul>			
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	-	-



## 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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