



**THE DATASHEET OF  
74AUP2G125DC,125**



# 74AUP2G125

Low-power dual buffer/line driver; 3-state

Rev. 15 — 26 July 2023

Product data sheet

## 1. General description

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The 74AUP2G125 is a dual buffer/line driver with 3-state outputs controlled by the output enable inputs ( $n\overline{OE}$ ). Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times. This device ensures 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 the potentially 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
- CMOS low power dissipation
- Low static power consumption;  $I_{CC} = 0.9 \mu\text{A}$  (maximum)
- Latch-up performance exceeds 100 mA per JESD78B Class II
- Overvoltage tolerant inputs to 3.6 V
- Low noise overshoot and undershoot < 10 % of  $V_{CC}$
- Input-disable feature allows floating input conditions
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- 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: ANSI/ESDA/JEDEC JS-001 class 3A exceeds 5000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 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			Version
	Temperature range	Name	Description	
<a href="#">74AUP2G125DC</a>	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	<a href="#">SOT765-1</a>
<a href="#">74AUP2G125GT</a>	-40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm	<a href="#">SOT833-1</a>
<a href="#">74AUP2G125GF</a>	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1 × 0.5 mm	<a href="#">SOT1089</a>
<a href="#">74AUP2G125GN</a>	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	<a href="#">SOT1116</a>
<a href="#">74AUP2G125GS</a>	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	<a href="#">SOT1203</a>
<a href="#">74AUP2G125GX</a>	-40 °C to +125 °C	X2SON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 0.8 × 0.32 mm	<a href="#">SOT1233-2</a>

### 4. Marking

Table 2. Marking codes

Type number	Marking code <sup>[1]</sup>
74AUP2G125DC	p25
74AUP2G125GT	p25
74AUP2G125GF	aM
74AUP2G125GN	aM
74AUP2G125GS	aM
74AUP2G125GX	aM

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

### 5. Functional diagram

001aah931

001aah932

mna227

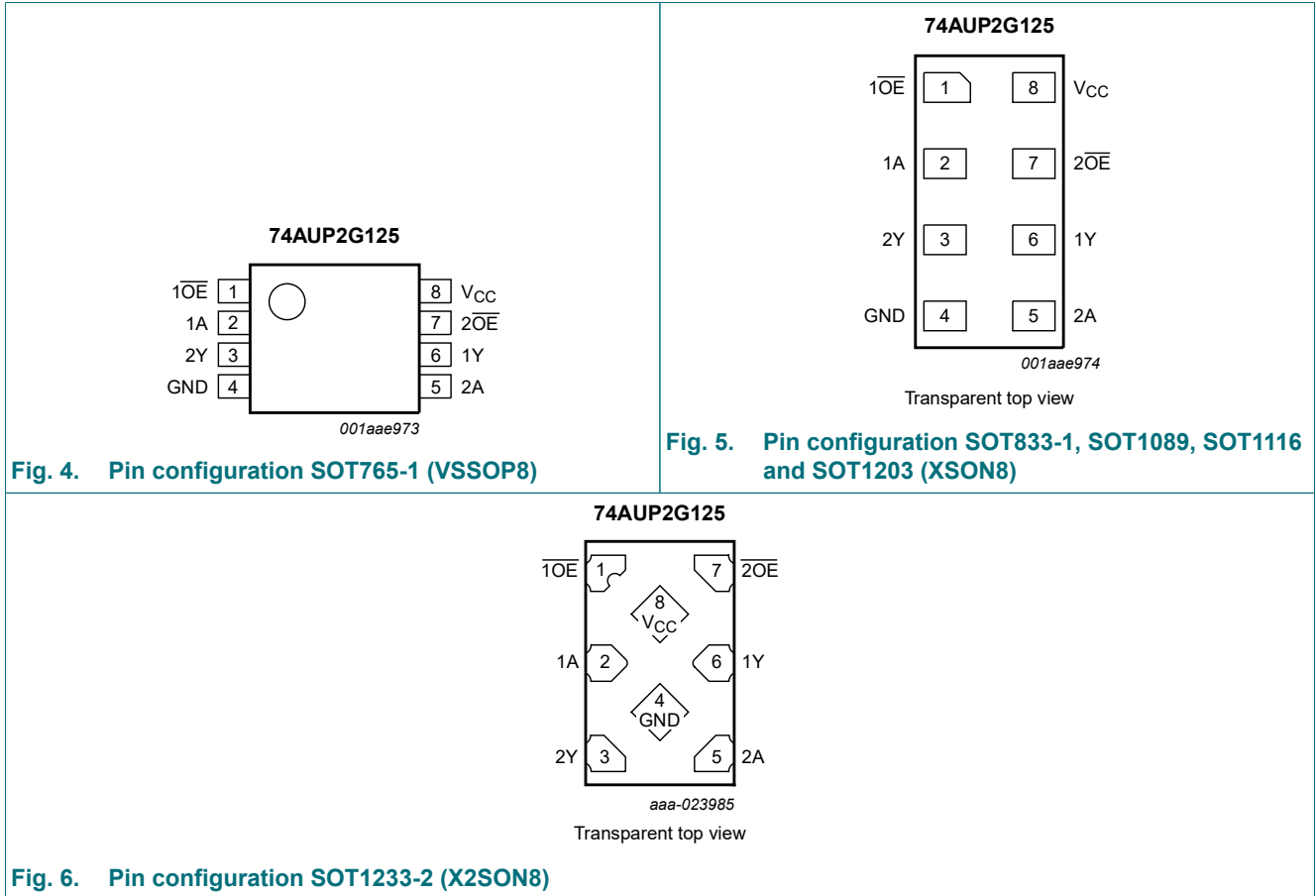
**Fig. 1. Logic symbol**

**Fig. 2. IEC logic symbol**

**Fig. 3. Logic diagram (one gate)**

## 6. Pinning information

### 6.1. Pinning



### 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
1OE, 2OE	1, 7	output enable input (active LOW)
1A, 2A	2, 5	data input
GND	4	ground (0 V)
1Y, 2Y	6, 3	data output
VCC	8	supply voltage

## 7. Functional description

**Table 4. Function table**

*H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.*

Input		Output
nOE	nA	nY
L	L	L
L	H	H
H	X	Z

## 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
$V_I$	input voltage		[1]	+4.6	V
$V_O$	output voltage	Active mode and Power-down mode	[1]	+4.6	V
$I_{IK}$	input clamping current	$V_I < 0$ V	-50	-	mA
$I_{OK}$	output clamping current	$V_O < 0$ V	-50	-	mA
$I_O$	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 SOT765-1 (VSSOP8) [2] SOT833-1 (XSON8) [3] SOT1089 (XSON8) [4] SOT1116 (XSON8) [5] SOT1203 (XSON8) [6] SOT1233-2 (X2SON8) [7]	-	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) package:  $P_{tot}$  derates linearly with 4.9 mW/K above 99 °C.

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

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

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

[6] For SOT1203 (XSON8) package:  $P_{tot}$  derates linearly with 3.6 mW/K above 81 °C.

[7] For SOT1233-2 (X2SON8) package:  $P_{tot}$  derates linearly with 7.7 mW/K above 118 °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><math>T_{amb} = 25</math> °C</b>						
$V_{IH}$	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 $V_{IL}$				
		$I_O = -20$ $\mu$ 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
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20$ $\mu$ A; $V_{CC} = 0.8$ V to 3.6 V	-	-	0.1	V
		$I_O = 1.1$ mA; $V_{CC} = 1.1$ V	-	-	$0.3 \times V_{CC}$	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	

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_I$	input leakage current	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.1$	$\mu\text{A}$
$I_{OZ}$	OFF-state output current	$V_I = V_{IH} \text{ or } V_{IL}; V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.1$	$\mu\text{A}$
$I_{OFF}$	power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$\Delta I_{OFF}$	additional power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$I_{CC}$	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	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	data input; $V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	40	$\mu\text{A}$
		$\overline{\text{nOE}}$ input; $V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	110	$\mu\text{A}$
		all inputs; $V_I = \text{GND to } 3.6 \text{ V}; \overline{\text{nOE}} = \text{GND}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$ [2]	-	-	1	$\mu\text{A}$
$C_I$	input capacitance	$V_{CC} = 0 \text{ V to } 3.6 \text{ V}; V_I = \text{GND or } V_{CC}$	-	0.8	-	pF
$C_O$	output capacitance	output enabled; $V_O = \text{GND}; V_{CC} = 0 \text{ V}$	-	1.4	-	pF
		output disabled; $V_O = \text{GND or } V_{CC} = 0 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	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	0.70 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <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	-	-	0.30 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <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	0.7 × V <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
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.55	-	-	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	-	-	0.3 × V <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>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.45	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
I <sub>OZ</sub>	OFF-state output current	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 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	data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; [1] V <sub>CC</sub> = 3.3 V	-	-	50	μA
		n $\overline{\text{OE}}$ input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; [1] V <sub>CC</sub> = 3.3 V	-	-	120	μA
		all inputs; V <sub>I</sub> = GND to 3.6 V; n $\overline{\text{OE}}$ = GND; V <sub>CC</sub> = 0.8 V to 3.6 V [2]	-	-	1	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	0.75 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.70 × V <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	-	-	0.25 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.30 × V <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	0.6 × V <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	-	-	0.33 × V <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
I <sub>OZ</sub>	OFF-state output current	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 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	data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; [1] V <sub>CC</sub> = 3.3 V	-	-	75	μA
		n $\overline{O\bar{E}}$ input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; [1] V <sub>CC</sub> = 3.3 V	-	-	180	μA
		all inputs; V <sub>I</sub> = GND to 3.6 V; n $\overline{O\bar{E}}$ = GND; V <sub>CC</sub> = 0.8 V to 3.6 V [2]	-	-	1	μA

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

[2] To show I<sub>CC</sub> remains very low when the input-disable feature is enabled.

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

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

Symbol	Parameter	Conditions	25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 5 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 7. [2]								
		V <sub>CC</sub> = 0.8 V	-	20.6	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.8	5.5	10.5	2.5	11.7	2.5	12.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	3.9	6.1	2.0	7.3	2.0	8.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.9	3.2	4.8	1.7	6.1	1.7	6.7	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	2.6	3.6	1.4	4.3	1.4	4.9	ns
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 8. [3]								
		V <sub>CC</sub> = 0.8 V	-	69.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.1	6.1	11.8	2.9	13.9	2.9	15.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	4.2	6.6	2.3	7.7	2.3	8.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.1	3.4	5.1	2.0	6.2	2.0	6.8	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	2.6	3.7	1.7	4.5	1.7	5.0	ns
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 8. [4]								
		V <sub>CC</sub> = 0.8 V	-	14.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.7	4.3	6.5	2.7	7.3	2.7	8.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	3.2	4.4	2.1	5.1	2.1	5.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.0	4.3	2.0	5.0	2.0	5.7	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	2.2	2.9	1.4	3.3	1.4	4.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	2.5	3.2	1.7	3.4	1.7	3.9	ns

Symbol	Parameter	Conditions	25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 10 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 7. [2]								
		V <sub>CC</sub> = 0.8 V	-	24.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.2	6.4	12.3	3.0	13.8	3.0	15.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	4.5	7.3	1.9	8.5	1.9	9.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.9	3.8	5.5	1.7	6.8	1.7	7.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.2	4.2	1.6	5.3	1.6	5.9	ns
t <sub>en</sub>	enable time	nOE to nY; see Fig. 8. [3]								
		V <sub>CC</sub> = 0.8 V	-	73.7	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.6	6.9	13.5	3.4	15.8	3.4	17.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	4.8	7.7	2.2	8.6	2.2	9.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.9	5.8	1.9	6.8	1.9	7.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.2	4.3	1.7	5.3	1.7	5.9	ns
t <sub>dis</sub>	disable time	nOE to nY; see Fig. 8. [4]								
		V <sub>CC</sub> = 0.8 V	-	32.7	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.4	5.4	7.9	3.4	8.8	3.4	9.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	4.1	5.5	2.2	6.2	2.2	7.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	4.2	5.6	1.9	6.3	1.9	7.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	3.0	3.8	1.7	4.5	1.7	5.1	ns
t <sub>dis</sub>	disable time	V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	3.8	4.8	1.7	5.0	1.7	5.6	ns

Symbol	Parameter	Conditions	25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -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	nA to nY; see Fig. 7. [2]								
		V <sub>CC</sub> = 0.8 V	-	27.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.6	7.2	14.1	3.3	15.8	3.3	17.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.1	8.1	2.5	9.8	2.5	10.9	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	4.3	6.3	2.0	7.9	2.0	8.8	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.0	3.7	4.9	1.8	6.0	1.8	6.7	ns
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 8. [3]								
		V <sub>CC</sub> = 0.8 V	-	77.5	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.0	7.7	15.2	3.7	17.6	3.7	19.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.3	8.4	2.5	9.8	2.5	10.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.4	6.5	2.1	7.7	2.1	8.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.6	5.0	2.0	6.1	2.0	6.8	ns
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 8. [4]								
		V <sub>CC</sub> = 0.8 V	-	60.8	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.3	6.5	9.2	3.7	10.3	3.7	11.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.0	6.5	2.5	7.4	2.5	8.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	5.3	7.0	2.1	7.4	2.1	8.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.8	4.9	2.0	5.1	2.0	6.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.9	5.0	6.2	1.9	6.6	1.9	7.4	ns

Symbol	Parameter	Conditions	25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 30 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 7. [2]								
		V <sub>CC</sub> = 0.8 V	-	37.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.8	9.5	19.0	4.4	21.6	4.4	24.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.0	6.7	10.8	3.0	13.0	3.0	14.5	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.9	5.6	8.4	2.6	10.3	2.6	11.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.7	4.8	6.3	2.5	7.8	2.5	8.7	ns
t <sub>en</sub>	enable time	nOE to nY; see Fig. 8. [3]								
		V <sub>CC</sub> = 0.8 V	-	88.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	5.2	9.9	19.8	4.8	22.8	4.8	25.3	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.0	6.8	10.8	3.1	12.6	3.1	14.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	5.6	8.5	2.8	10.2	2.8	11.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.7	4.8	6.5	2.6	7.8	2.6	8.8	ns
t <sub>dis</sub>	disable time	nOE to nY; see Fig. 8. [4]								
		V <sub>CC</sub> = 0.8 V	-	49.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	6.0	9.9	13.3	4.8	14.8	4.8	16.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.4	7.7	9.6	3.1	10.8	3.1	12.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	5.1	8.7	11.1	2.8	12.4	2.8	13.8	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.6	6.2	7.6	2.6	8.6	2.6	9.6	ns
C <sub>PD</sub>	power dissipation capacitance	output enabled; f <sub>i</sub> = 1 MHz; [5] V <sub>I</sub> = GND to V <sub>CC</sub>								
		V <sub>CC</sub> = 0.8 V	-	2.7	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.8	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	2.9	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	3.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.6	-	-	-	-	-	pF
C <sub>PD</sub>	power dissipation capacitance	V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.2	-	-	-	-	-	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] t<sub>en</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.
- [4] t<sub>dis</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.
- [5] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> 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<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 outputs.

11.1. Waveforms and test circuit

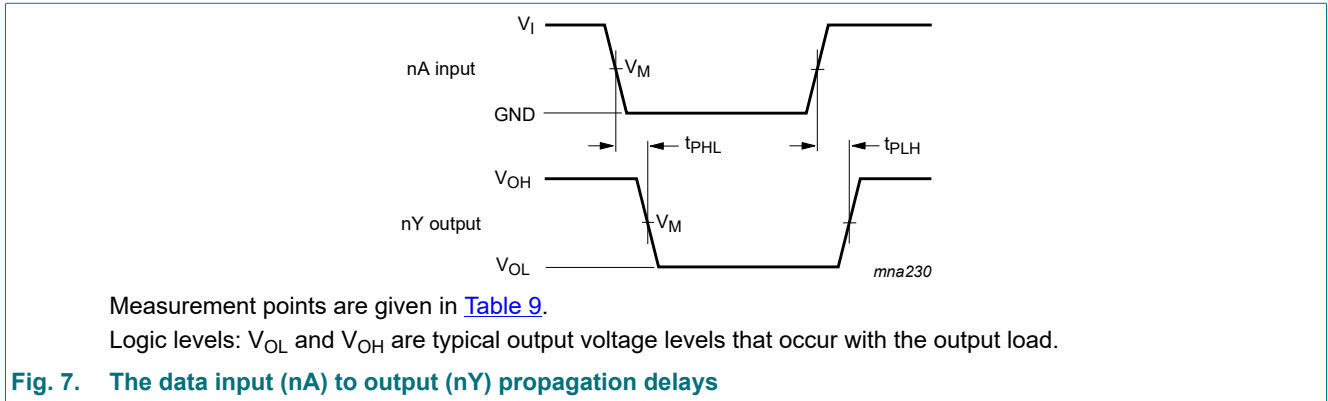


Table 9. Measurement points

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

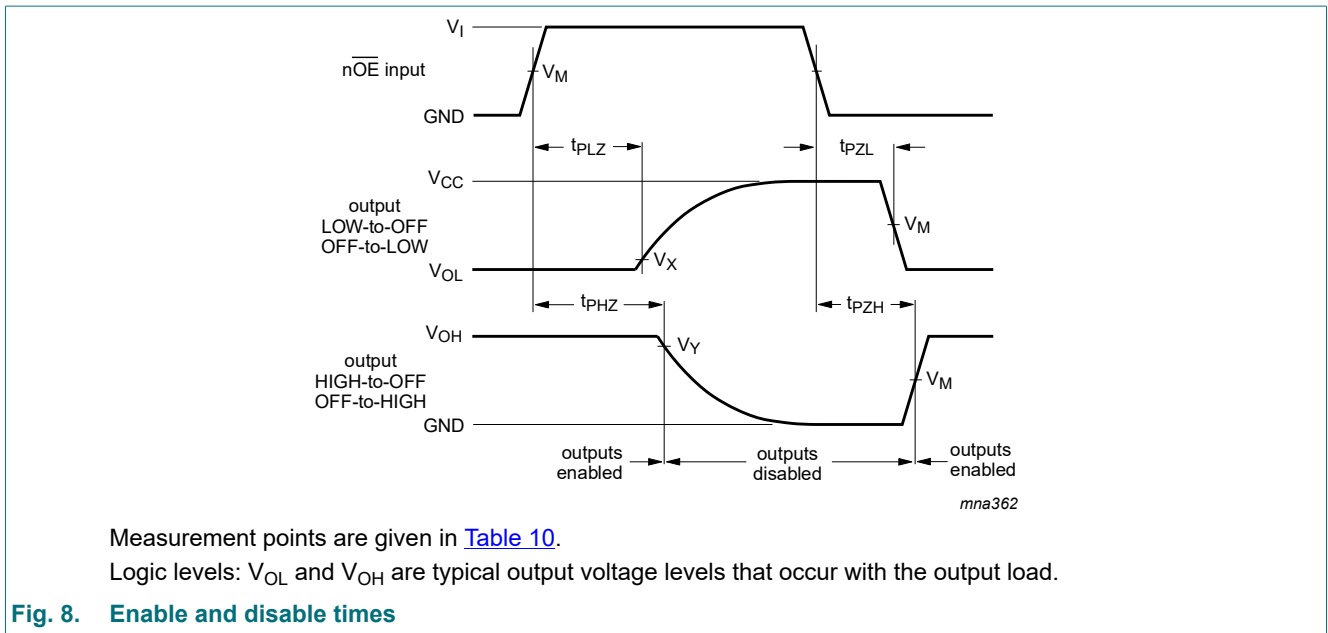
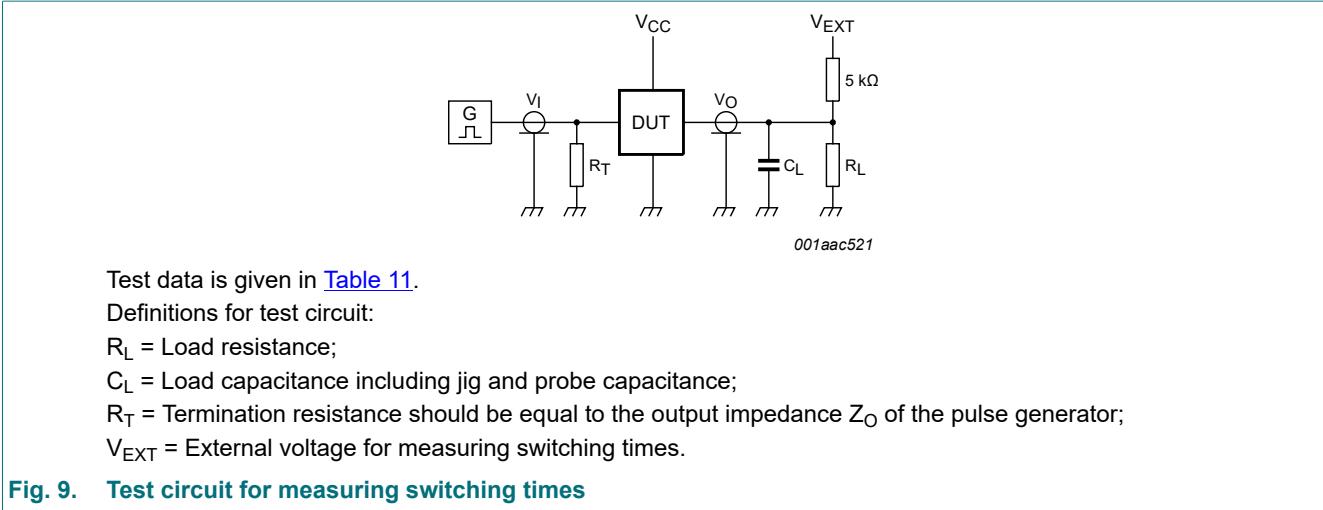


Table 10. Measurement points

Supply voltage	Input	Output		
$V_{CC}$	$V_M$	$V_M$	$V_X$	$V_Y$
0.8 V to 1.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.1$ V	$V_{OH} - 0.1$ V
1.65 V to 2.7 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15$ V	$V_{OH} - 0.15$ V
3.0 V to 3.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3$ V	$V_{OH} - 0.3$ V



**Table 11. 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, setup and hold times and pulse width  $R_L = 1 \text{ M}\Omega$ .

## 12. Package outline

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

SOT765-1

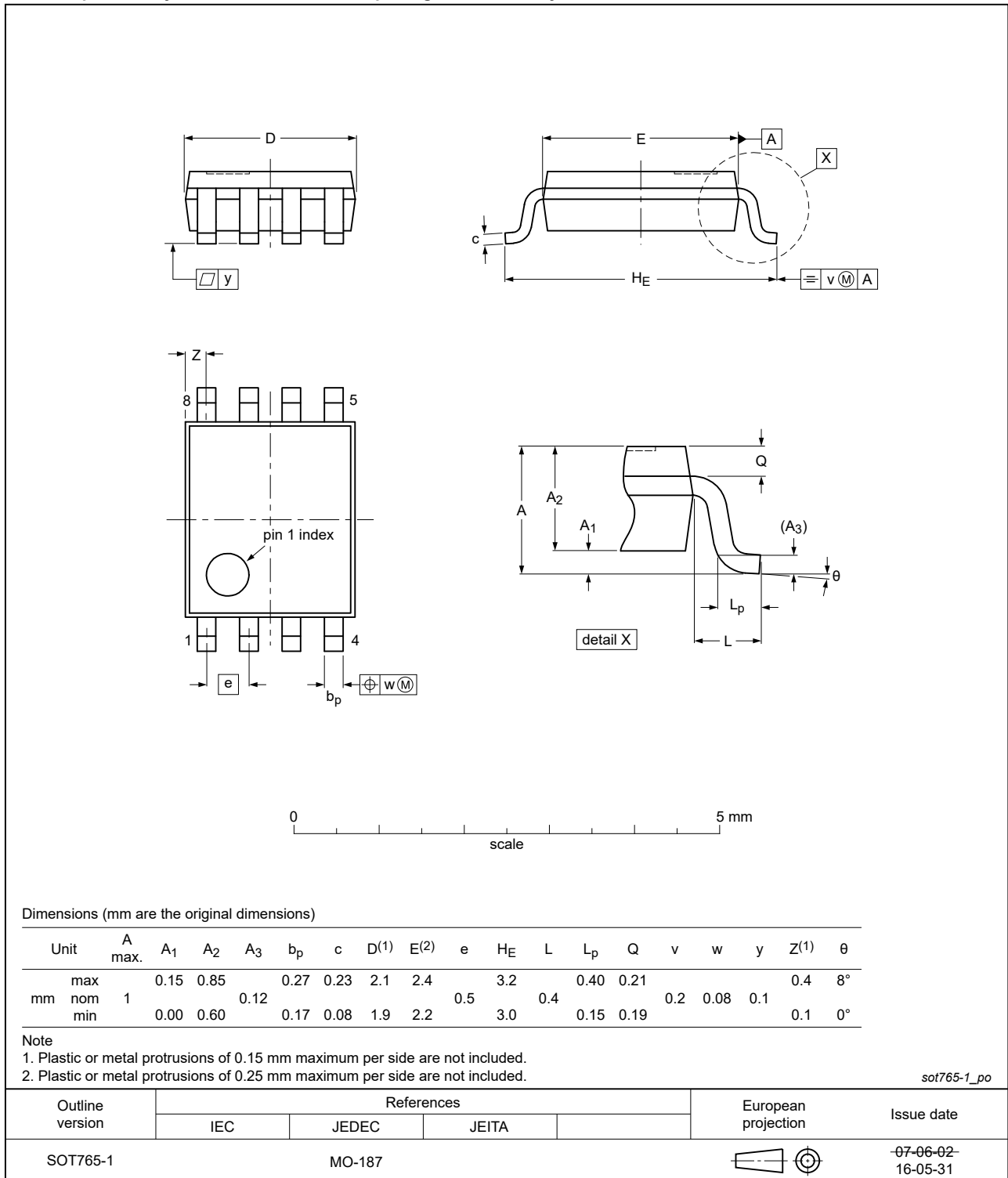


Fig. 10. Package outline SOT765-1 (VSSOP8)

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

SOT833-1

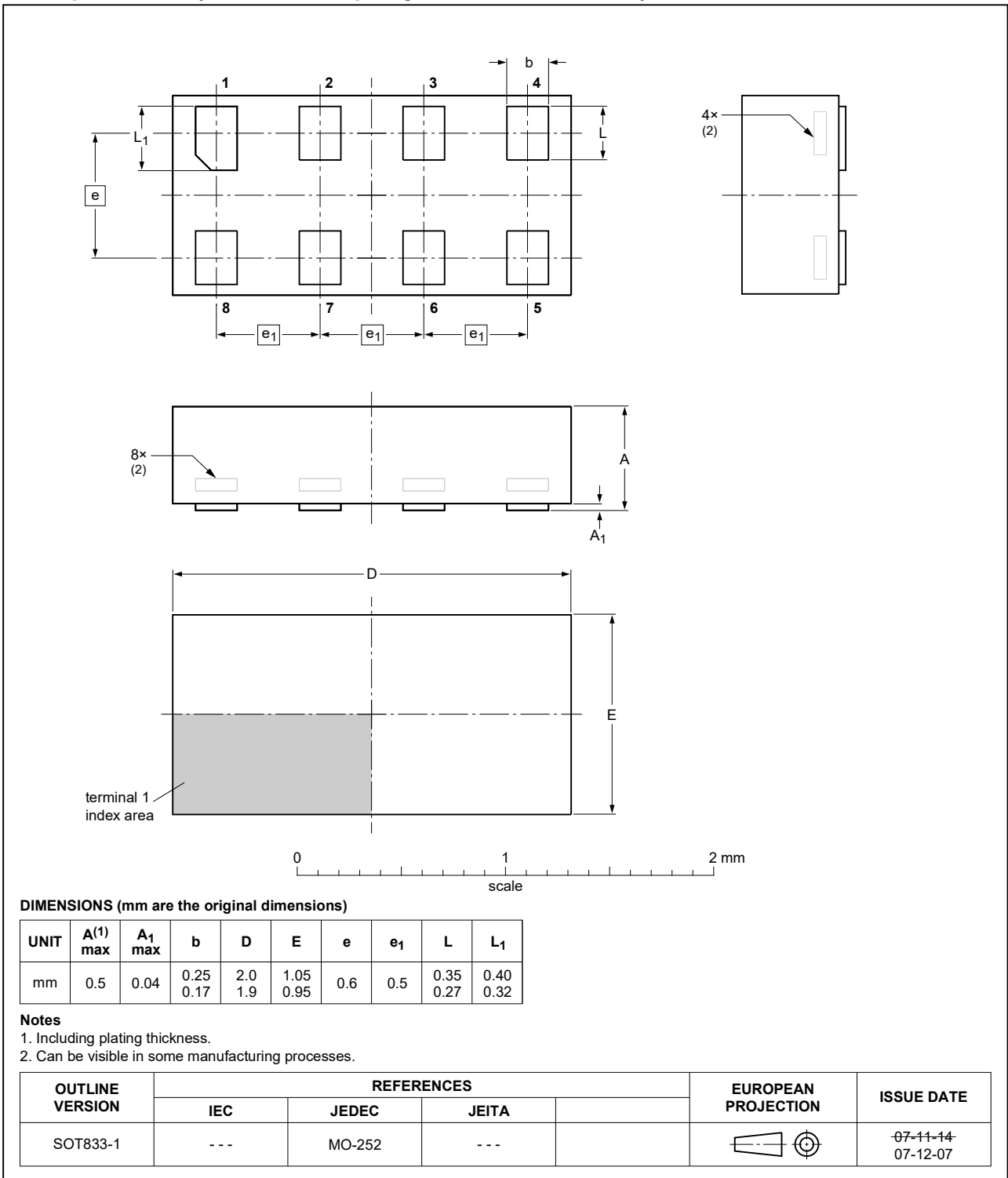


Fig. 11. Package outline SOT833-1 (XSON8)

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

SOT1089

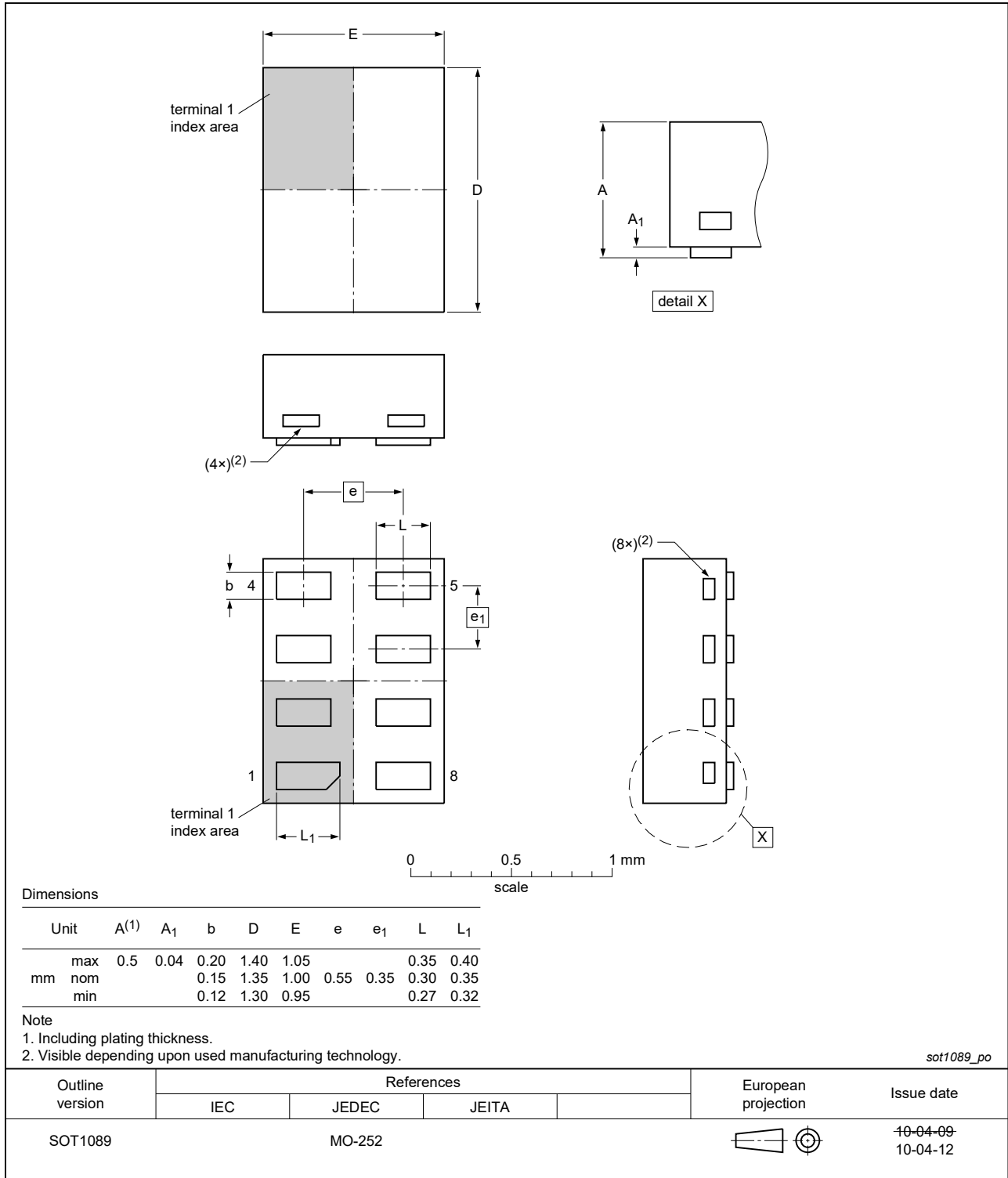


Fig. 12. Package outline SOT1089 (XSON8)

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

SOT1116

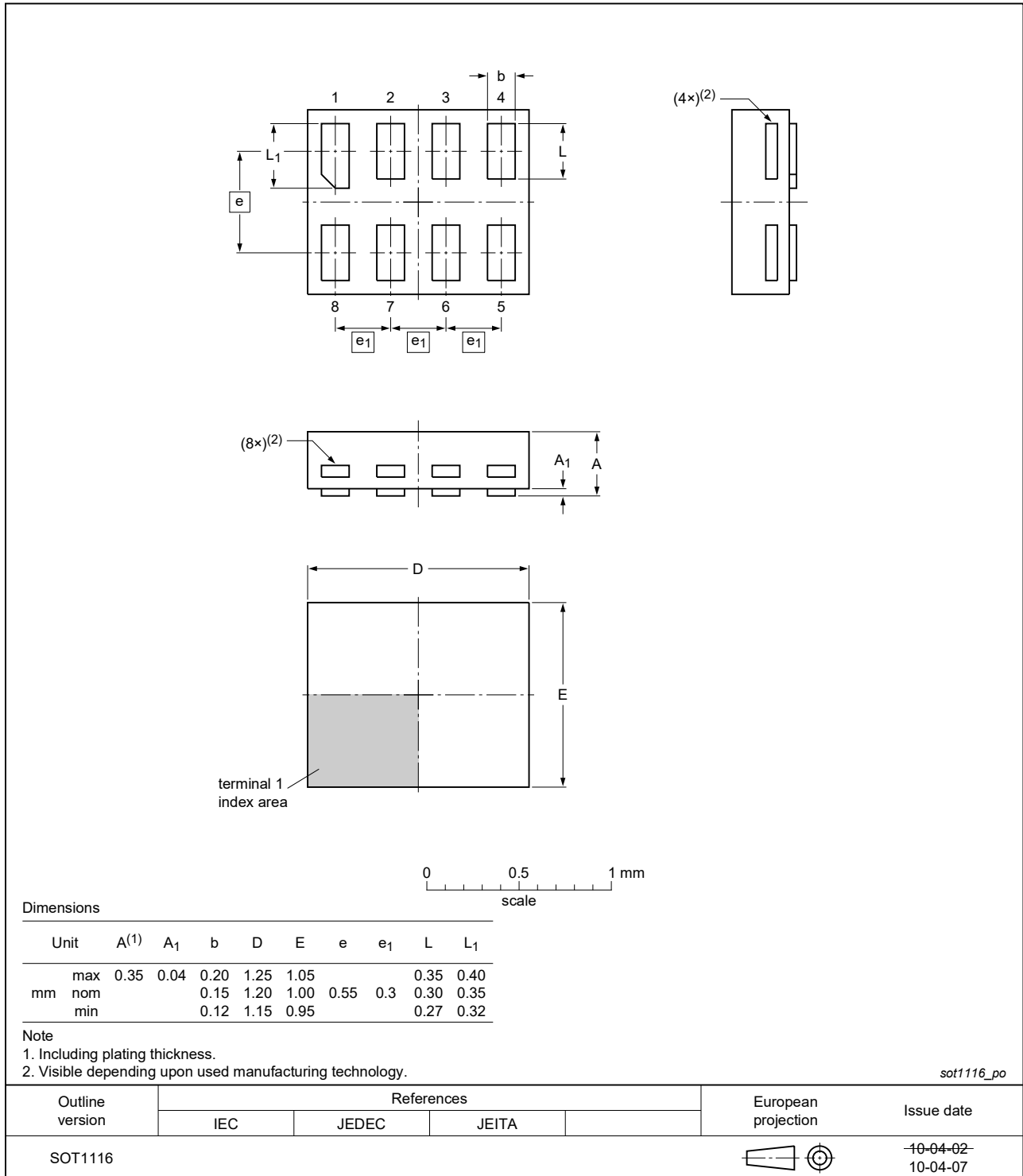


Fig. 13. Package outline SOT1116 (XSON8)

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

SOT1203

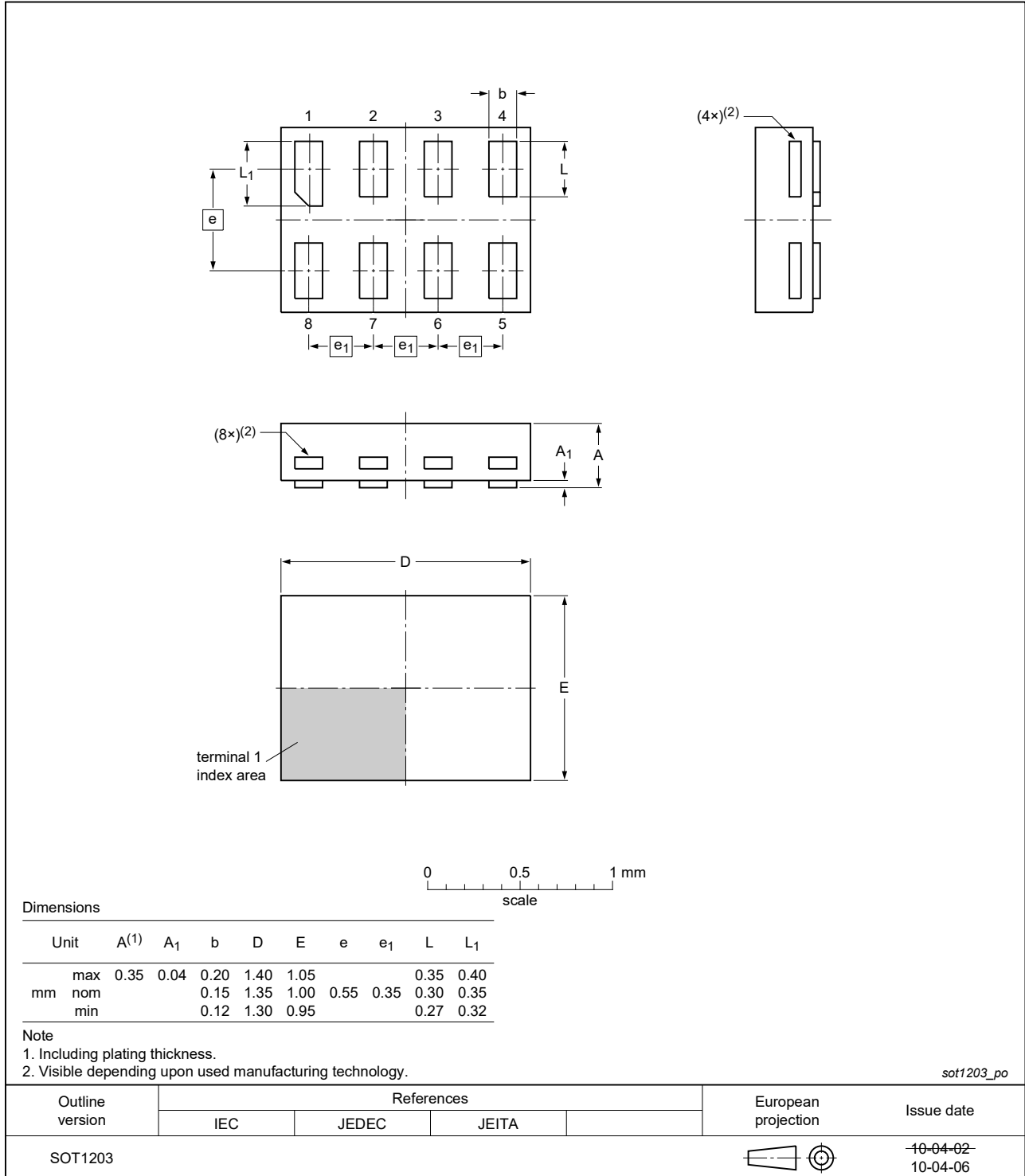


Fig. 14. Package outline SOT1203 (XSON8)

X2SON8: plastic thermal enhanced extremely thin small outline package; no leads;  
8 terminals; body 1.35 x 0.8 x 0.32 mm

SOT1233-2

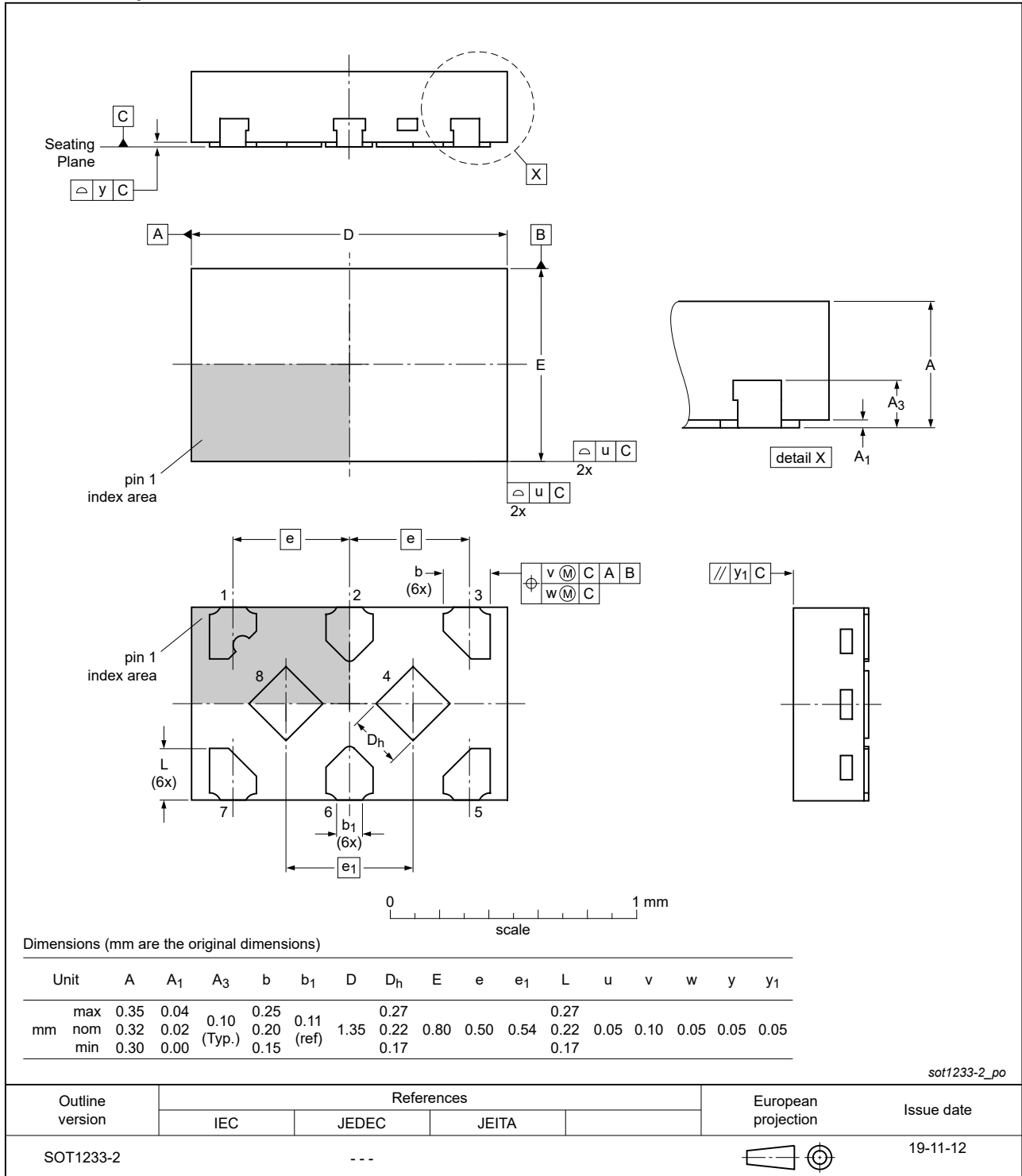


Fig. 15. Package outline SOT1233-2 (X2SON8)

## 13. Abbreviations

Table 12. Abbreviations

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

## 14. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G125 v.15	20230726	Product data sheet	-	74AUP2G125 v.14
Modifications:	<ul style="list-style-type: none"> <li>Section 2: ESD specification updated according to the latest JEDEC standard.</li> </ul>			
74AUP2G125 v.14	20220621	Product data sheet	-	74AUP2G125 v.13
Modifications:	<ul style="list-style-type: none"> <li>Package SOT1233 (X2SON8) changed to SOT1233-2 (X2SON8).</li> </ul>			
74AUP2G125 v.13	20220310	Product data sheet	-	74AUP2G125 v.12
Modifications:	<ul style="list-style-type: none"> <li>Type number 74AUP2G125GM (SOT902-2/XQFN8) removed.</li> <li>Section 1 and Section 2 updated.</li> <li>Table 5: Derating values for <math>P_{tot}</math> total power dissipation have been updated.</li> </ul>			
74AUP2G125 v.12	20170703	Product data sheet	-	74AUP2G125 v.11
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>Fig. 6 and Fig. 15 (drawings SOT1233/X2SON8) updated</li> <li>Type number 74AUP2G125GD removed.</li> </ul>			
74AUP2G125 v.11	20161028	Product data sheet	-	74AUP2G125 v.10
Modifications:	<ul style="list-style-type: none"> <li>Added type number 74AUP2G125GX (SOT1233/X2SON8)</li> </ul>			
74AUP2G125 v.10	20130208	Product data sheet	-	74AUP2G125 v.9
Modifications:	<ul style="list-style-type: none"> <li>For type number 74AUP2G125GD XSON8U has changed to XSON8.</li> </ul>			
74AUP2G125 v.9	20120607	Product data sheet	-	74AUP2G125 v.8
74AUP2G125 v.8	20111202	Product data sheet	-	74AUP2G125 v.7
74AUP2G125 v.7	20100921	Product data sheet	-	74AUP2G125 v.6
74AUP2G125 v.6	20091127	Product data sheet	-	74AUP2G125 v.5
74AUP2G125 v.5	20090202	Product data sheet	-	74AUP2G125 v.4
74AUP2G125 v.4	20090122	Product data sheet	-	74AUP2G125 v.3
74AUP2G125 v.3	20080409	Product data sheet	-	74AUP2G125 v.2
74AUP2G125 v.2	20070419	Product data sheet	-	74AUP2G125 v.1
74AUP2G125 v.1	20061017	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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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## Contents

<b>1. General description</b> .....	<b>1</b>
<b>2. Features and benefits</b> .....	<b>1</b>
<b>3. Ordering information</b> .....	<b>2</b>
<b>4. Marking</b> .....	<b>2</b>
<b>5. Functional diagram</b> .....	<b>2</b>
<b>6. Pinning information</b> .....	<b>3</b>
6.1. Pinning.....	3
6.2. Pin description.....	3
<b>7. Functional description</b> .....	<b>4</b>
<b>8. Limiting values</b> .....	<b>4</b>
<b>9. Recommended operating conditions</b> .....	<b>5</b>
<b>10. Static characteristics</b> .....	<b>5</b>
<b>11. Dynamic characteristics</b> .....	<b>9</b>
11.1. Waveforms and test circuit.....	13
<b>12. Package outline</b> .....	<b>15</b>
<b>13. Abbreviations</b> .....	<b>21</b>
<b>14. Revision history</b> .....	<b>21</b>
<b>15. Legal information</b> .....	<b>22</b>

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