74AUP2G125

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

Rev. 14 — 21 June 2022 **Product data sheet**

1. General description

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

- 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 μA (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 JESD22-A114F Class 3A exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

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3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP2G125DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74AUP2G125GT	-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
74AUP2G125GF	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1 × 0.5 mm	SOT1089
74AUP2G125GN	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	SOT1116
74AUP2G125GS	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	SOT1203
74AUP2G125GX	-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	SOT1233-2

4. Marking

Table 2. Marking codes

Type number	Marking code[1]
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

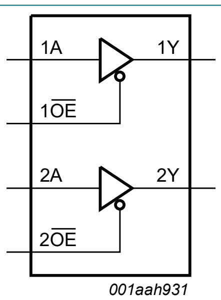


Fig. 1. Logic symbol

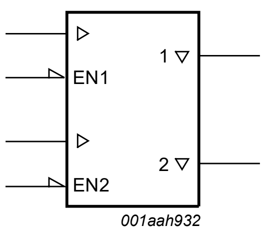


Fig. 2. IEC logic symbol

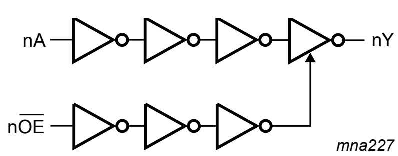


Fig. 3. Logic diagram (one gate)

6. Pinning information

6.1. Pinning

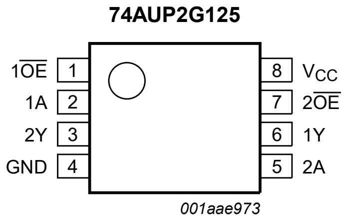


Fig. 4. Pin configuration SOT765-1 (VSSOP8)

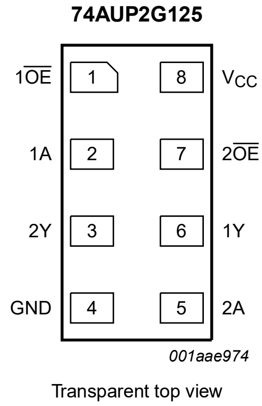


Fig. 5. Pin configuration SOT833-1, SOT1089, SOT1116 and SOT1203 (XSON8)

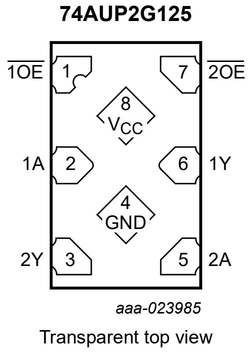


Fig. 6. Pin configuration SOT1233-2 (X2SON8)

6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
$1\overline{OE}$, $2\overline{OE}$	1, 7	output enable input (active LOW)
1A, 2A	2, 5	data input
GND	4	ground (0 V)
1Y, 2Y	6, 3	data output
V_{CC}	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
n$\overline{OE}$	**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]	-0.5	+4.6	V
V_O	output voltage	Active mode and Power-down mode	[1]	-0.5	+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]	-	250	mW
		SOT833-1 (XSON8)	[3]	-	250	mW
		SOT1089 (XSON8)	[4]	-	250	mW
		SOT1116 (XSON8)	[5]	-	250	mW
		SOT1203 (XSON8)	[6]	-	250	mW
		SOT1233-2 (X2SON8)	[7]	-	300	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
Δt/ΔV	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 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.65 × 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 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.35 × 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} - 0.1	-	-	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_{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	-	-	0.31	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 = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; V_O = 0 V 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	data input; $V_I = V_{CC}$ - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	40	μA
		n$\overline{OE}$ input; $V_I = V_{CC}$ - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	110	μA
		all inputs; V_I = GND to 3.6 V; n$\overline{OE}$ = GND; V_{CC} = 0.8 V to 3.6 V [2]	-	-	1	μA
C_I	input capacitance	V_{CC} = 0 V to 3.6 V; V_I = GND or V_{CC}	-	0.8	-	pF
C_O	output capacitance	output enabled; V_O = GND; V_{CC} = 0 V	-	1.4	-	pF
		output disabled; V_O = GND or V_{CC} = 0 V; V_{CC} = 0 V to 3.6 V	-	1.3	-	pF

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +85 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V	0.70 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.65 × 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 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.35 × 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} - 0.1	-	-	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_{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_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = 0 V 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	data input; V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	50	μA
		n$\overline{OE}$ input; V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	120	μA
		all inputs; V_I = GND to 3.6 V; n$\overline{OE}$ = GND; V_{CC} = 0.8 V to 3.6 V [2]	-	-	1	μA

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
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
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_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = 0 V 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	data input; V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	75	μA
		$n\overline{OE}$ input; V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	180	μA
		all inputs; V_I = GND to 3.6 V; $n\overline{OE}$ = GND; V_{CC} = 0.8 V to 3.6 V	[2]	-	-	1	μA

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

[2] To show I_{CC} 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_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 5 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 7. [2]								
		V_{CC} = 0.8 V	-	20.6	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.8	5.5	10.5	2.5	11.7	2.5	12.9	ns
		V_{CC} = 1.4 V to 1.6 V	2.2	3.9	6.1	2.0	7.3	2.0	8.1	ns
		V_{CC} = 1.65 V to 1.95 V	1.9	3.2	4.8	1.7	6.1	1.7	6.7	ns
		V_{CC} = 2.3 V to 2.7 V	1.6	2.6	3.6	1.4	4.3	1.4	4.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.4	2.4	3.1	1.2	3.9	1.2	4.4	ns
t_{en}	enable time	n$\overline{OE}$ to nY; see Fig. 8. [3]								
		V_{CC} = 0.8 V	-	69.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.1	6.1	11.8	2.9	13.9	2.9	15.4	ns
		V_{CC} = 1.4 V to 1.6 V	2.5	4.2	6.6	2.3	7.7	2.3	8.3	ns
		V_{CC} = 1.65 V to 1.95 V	2.1	3.4	5.1	2.0	6.2	2.0	6.8	ns
		V_{CC} = 2.3 V to 2.7 V	1.8	2.6	3.7	1.7	4.5	1.7	5.0	ns
		V_{CC} = 3.0 V to 3.6 V	1.7	2.4	3.1	1.7	3.5	1.7	3.9	ns
t_{dis}	disable time	n$\overline{OE}$ to nY; see Fig. 8. [4]								
		V_{CC} = 0.8 V	-	14.3	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.7	4.3	6.5	2.7	7.3	2.7	8.2	ns
		V_{CC} = 1.4 V to 1.6 V	2.1	3.2	4.4	2.1	5.1	2.1	5.7	ns
		V_{CC} = 1.65 V to 1.95 V	2.0	3.0	4.3	2.0	5.0	2.0	5.7	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	2.2	2.9	1.4	3.3	1.4	4.1	ns
		V_{CC} = 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_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 10 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 7. [2]								
		V_{CC} = 0.8 V	-	24.0	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.2	6.4	12.3	3.0	13.8	3.0	15.2	ns
		V_{CC} = 1.4 V to 1.6 V	2.1	4.5	7.3	1.9	8.5	1.9	9.4	ns
		V_{CC} = 1.65 V to 1.95 V	1.9	3.8	5.5	1.7	6.8	1.7	7.6	ns
		V_{CC} = 2.3 V to 2.7 V	2.1	3.2	4.2	1.6	5.3	1.6	5.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.8	3.0	3.8	1.6	4.6	1.6	5.2	ns
t_{en}	enable time	n$\overline{OE}$ to nY; see Fig. 8. [3]								
		V_{CC} = 0.8 V	-	73.7	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.6	6.9	13.5	3.4	15.8	3.4	17.5	ns
		V_{CC} = 1.4 V to 1.6 V	2.3	4.8	7.7	2.2	8.6	2.2	9.4	ns
		V_{CC} = 1.65 V to 1.95 V	2.0	3.9	5.8	1.9	6.8	1.9	7.4	ns
		V_{CC} = 2.3 V to 2.7 V	1.8	3.2	4.3	1.7	5.3	1.7	5.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.7	3.0	3.9	1.7	4.3	1.7	4.8	ns
t_{dis}	disable time	n$\overline{OE}$ to nY; see Fig. 8. [4]								
		V_{CC} = 0.8 V	-	32.7	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.4	5.4	7.9	3.4	8.8	3.4	9.9	ns
		V_{CC} = 1.4 V to 1.6 V	2.2	4.1	5.5	2.2	6.2	2.2	7.1	ns
		V_{CC} = 1.65 V to 1.95 V	2.2	4.2	5.6	1.9	6.3	1.9	7.1	ns
		V_{CC} = 2.3 V to 2.7 V	1.7	3.0	3.8	1.7	4.5	1.7	5.1	ns
		V_{CC} = 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_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 15 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 7.	[2]							
		V_{CC} = 0.8 V	-	27.4	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.6	7.2	14.1	3.3	15.8	3.3	17.5	ns
		V_{CC} = 1.4 V to 1.6 V	3.0	5.1	8.1	2.5	9.8	2.5	10.9	ns
		V_{CC} = 1.65 V to 1.95 V	2.2	4.3	6.3	2.0	7.9	2.0	8.8	ns
		V_{CC} = 2.3 V to 2.7 V	2.0	3.7	4.9	1.8	6.0	1.8	6.7	ns
		V_{CC} = 3.0 V to 3.6 V	2.0	3.5	4.4	1.8	5.4	1.8	6.1	ns
t_{en}	enable time	n$\overline{OE}$ to nY; see Fig. 8.	[3]							
		V_{CC} = 0.8 V	-	77.5	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.0	7.7	15.2	3.7	17.6	3.7	19.6	ns
		V_{CC} = 1.4 V to 1.6 V	3.0	5.3	8.4	2.5	9.8	2.5	10.7	ns
		V_{CC} = 1.65 V to 1.95 V	2.3	4.4	6.5	2.1	7.7	2.1	8.5	ns
		V_{CC} = 2.3 V to 2.7 V	2.1	3.6	5.0	2.0	6.1	2.0	6.8	ns
		V_{CC} = 3.0 V to 3.6 V	2.0	3.5	4.4	1.9	4.9	1.9	5.5	ns
t_{dis}	disable time	n$\overline{OE}$ to nY; see Fig. 8.	[4]							
		V_{CC} = 0.8 V	-	60.8	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.3	6.5	9.2	3.7	10.3	3.7	11.6	ns
		V_{CC} = 1.4 V to 1.6 V	3.0	5.0	6.5	2.5	7.4	2.5	8.4	ns
		V_{CC} = 1.65 V to 1.95 V	3.0	5.3	7.0	2.1	7.4	2.1	8.9	ns
		V_{CC} = 2.3 V to 2.7 V	2.1	3.8	4.9	2.0	5.1	2.0	6.4	ns
		V_{CC} = 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_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 30 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 7. [2]								
		V_{CC} = 0.8 V	-	37.4	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.8	9.5	19.0	4.4	21.6	4.4	24.0	ns
		V_{CC} = 1.4 V to 1.6 V	4.0	6.7	10.8	3.0	13.0	3.0	14.5	ns
		V_{CC} = 1.65 V to 1.95 V	2.9	5.6	8.4	2.6	10.3	2.6	11.5	ns
		V_{CC} = 2.3 V to 2.7 V	2.7	4.8	6.3	2.5	7.8	2.5	8.7	ns
		V_{CC} = 3.0 V to 3.6 V	2.7	4.6	5.8	2.5	7.5	2.5	8.3	ns
t_{en}	enable time	$n\overline{OE}$ to nY; see Fig. 8. [3]								
		V_{CC} = 0.8 V	-	88.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	5.2	9.9	19.8	4.8	22.8	4.8	25.3	ns
		V_{CC} = 1.4 V to 1.6 V	4.0	6.8	10.8	3.1	12.6	3.1	14.1	ns
		V_{CC} = 1.65 V to 1.95 V	3.0	5.6	8.5	2.8	10.2	2.8	11.3	ns
		V_{CC} = 2.3 V to 2.7 V	2.7	4.8	6.5	2.6	7.8	2.6	8.8	ns
		V_{CC} = 3.0 V to 3.6 V	2.7	4.6	6.0	2.6	6.9	2.6	7.7	ns
t_{dis}	disable time	$n\overline{OE}$ to nY; see Fig. 8. [4]								
		V_{CC} = 0.8 V	-	49.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	6.0	9.9	13.3	4.8	14.8	4.8	16.5	ns
		V_{CC} = 1.4 V to 1.6 V	4.4	7.7	9.6	3.1	10.8	3.1	12.1	ns
		V_{CC} = 1.65 V to 1.95 V	5.1	8.7	11.1	2.8	12.4	2.8	13.8	ns
		V_{CC} = 2.3 V to 2.7 V	3.6	6.2	7.6	2.6	8.6	2.6	9.6	ns
		V_{CC} = 3.0 V to 3.6 V	5.2	8.7	10.5	2.6	10.8	2.6	13.1	ns
C_L = 5 pF, 10 pF, 15 pF and 30 pF										
C_{PD}	power dissipation capacitance	output enabled; f_i = 1 MHz; V_I = GND to V_{CC} [5]								
		V_{CC} = 0.8 V	-	2.7	-	-	-	-	-	pF
		V_{CC} = 1.1 V to 1.3 V	-	2.8	-	-	-	-	-	pF
		V_{CC} = 1.4 V to 1.6 V	-	2.9	-	-	-	-	-	pF
		V_{CC} = 1.65 V to 1.95 V	-	3.0	-	-	-	-	-	pF
		V_{CC} = 2.3 V to 2.7 V	-	3.6	-	-	-	-	-	pF
		V_{CC} = 3.0 V to 3.6 V	-	4.2	-	-	-	-	-	pF

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

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

[3] t_{en} is the same as t_{PZH} and t_{PZL}.

[4] t_{dis} is the same as t_{PHZ} and t_{PLZ}.

[5] 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;

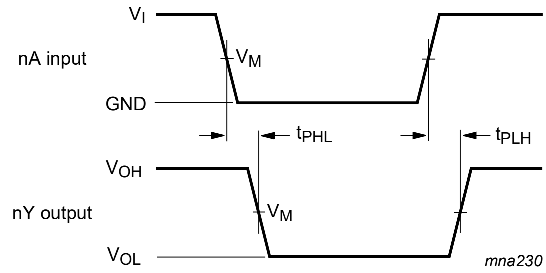
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

11.1. Waveforms and test circuit



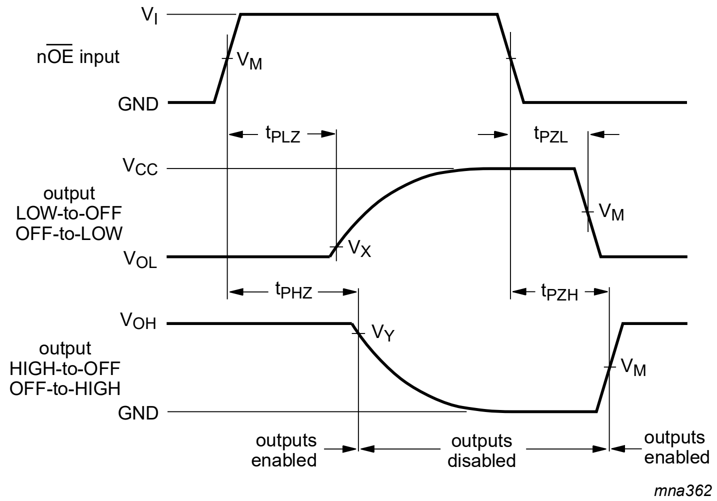
Measurement points are given in Table 9.

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

Fig. 7. The data input (nA) to output (nY) propagation delays

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 × V_{CC}	V_{CC}	≤ 3.0 ns	0.5 × V_{CC}



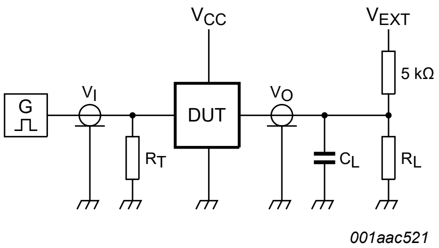
Measurement points are given in Table 10.

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

Fig. 8. Enable and disable times

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 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.1 V	V_{OH} - 0.1 V
1.65 V to 2.7 V	0.5 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.15 V	V_{OH} - 0.15 V
3.0 V to 3.6 V	0.5 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.3 V	V_{OH} - 0.3 V



Test data is given in Table 11.

Definitions for test circuit:

R_L = Load resistance;

C_L = Load capacitance including jig and probe capacitance;

R_T = Termination resistance should be equal to the output impedance Z_O of the pulse generator;

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

Fig. 9. Test circuit for measuring switching times

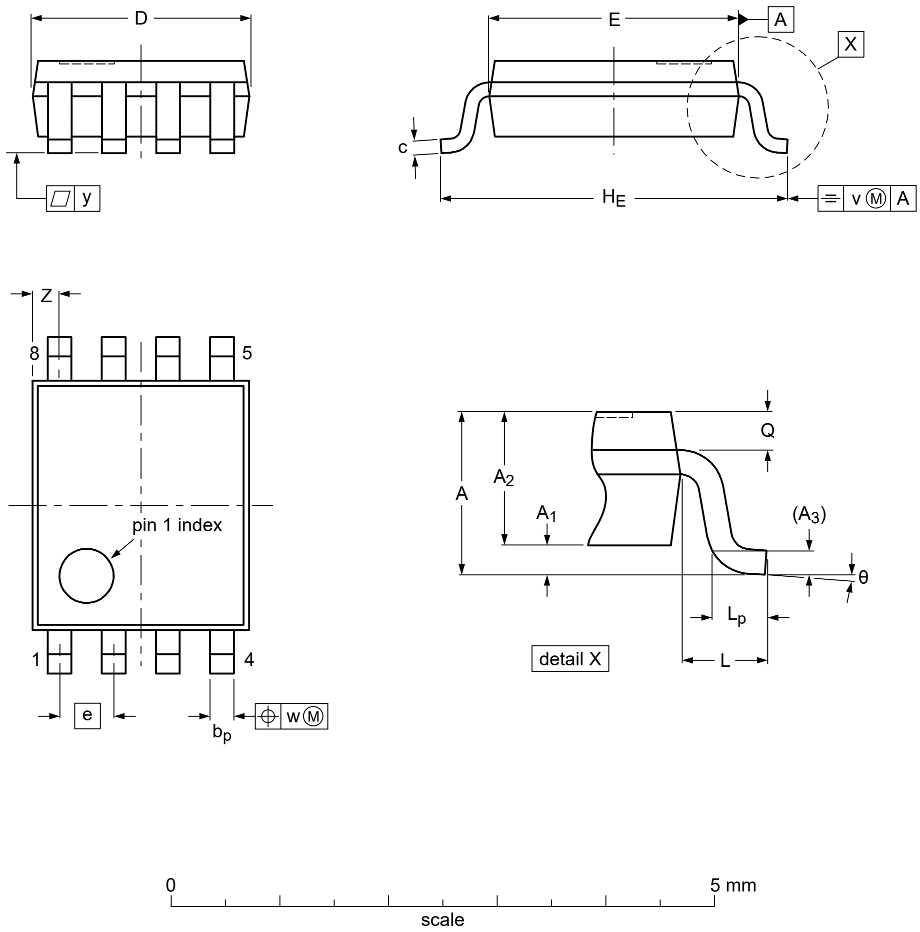
Table 11. Test data

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 × V_{CC}

[1] For measuring enable and disable times R_L = 5 kΩ.
For measuring propagation delays, setup 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**



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°

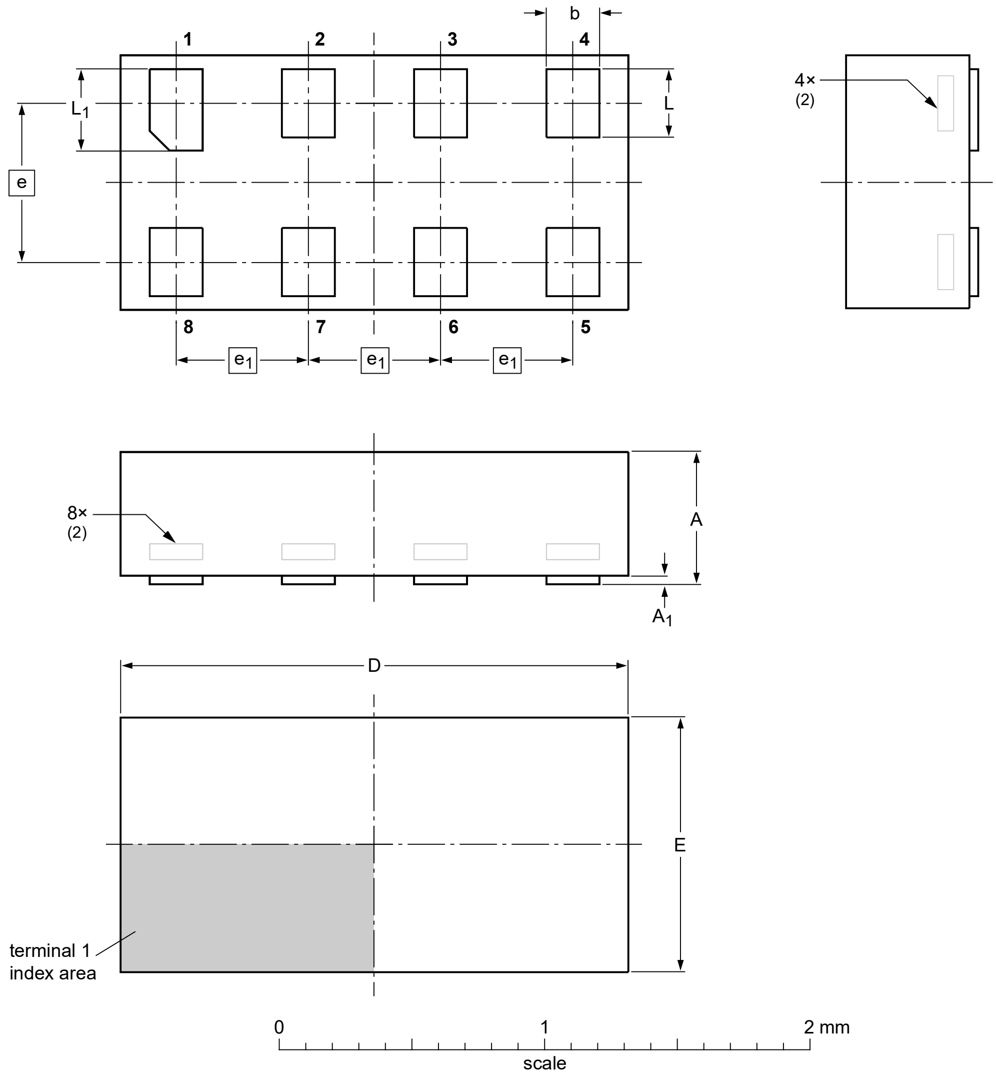
Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

sot765-1_po

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

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**



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.

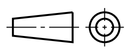
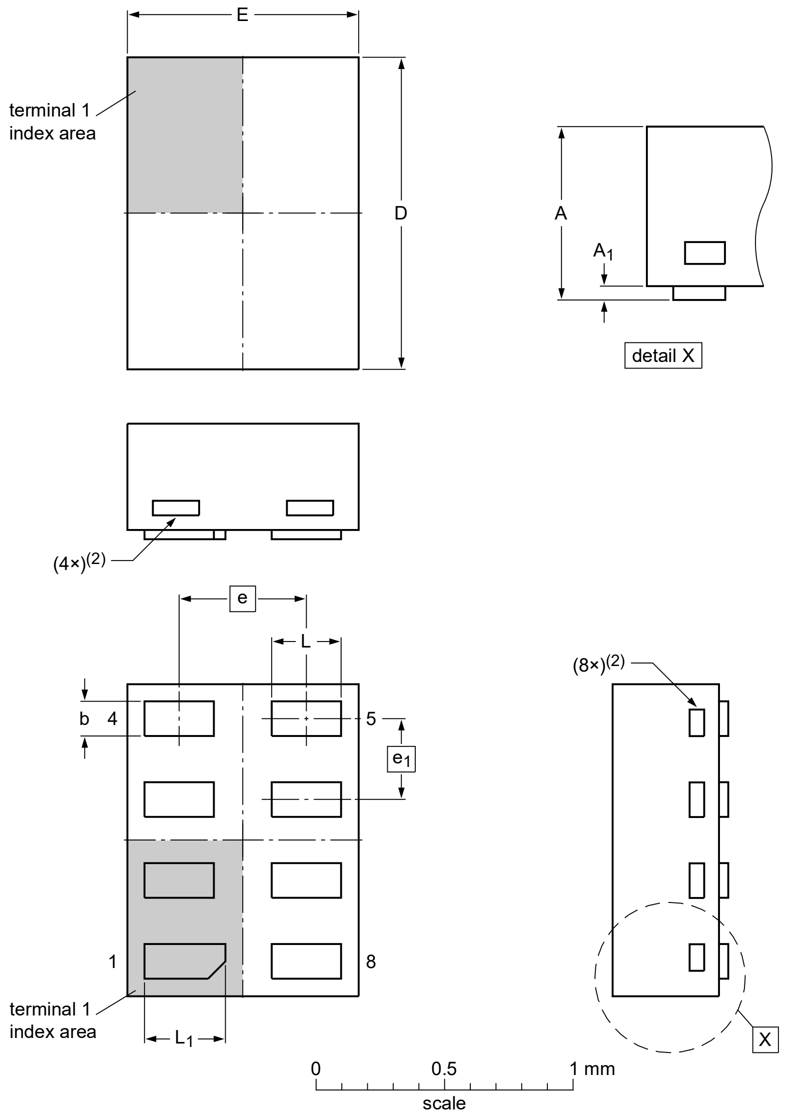
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT833-1	- - -	MO-252	- - -			~~07-11-14~~ 07-12-07

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**



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

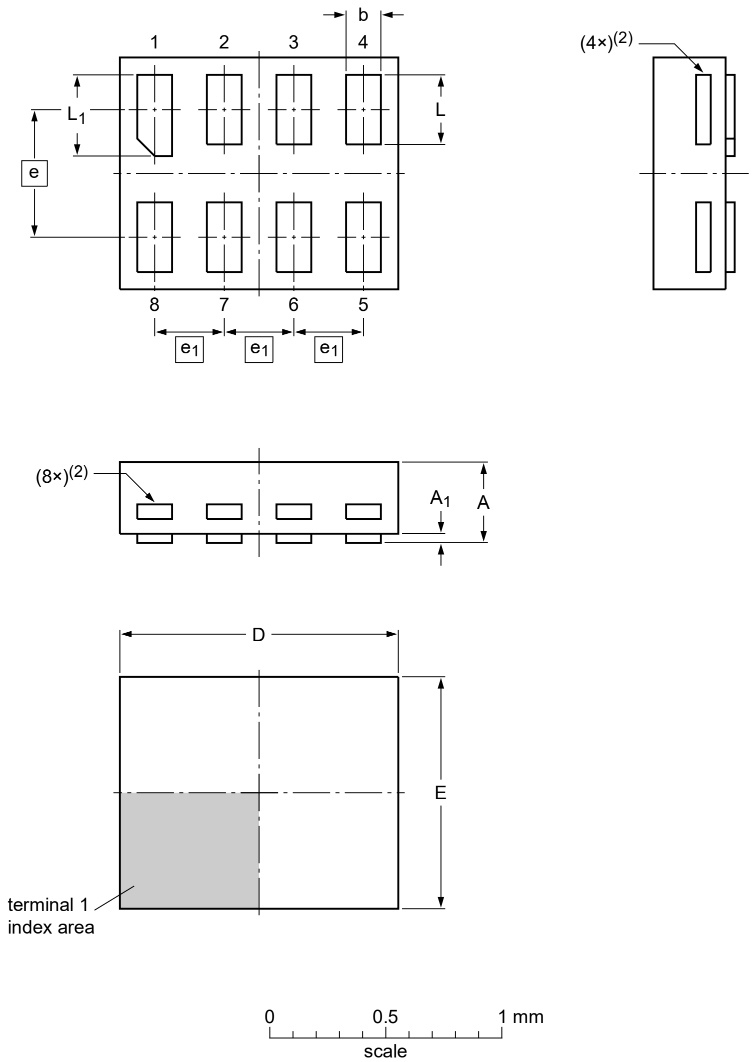
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1089_po

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

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**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
	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

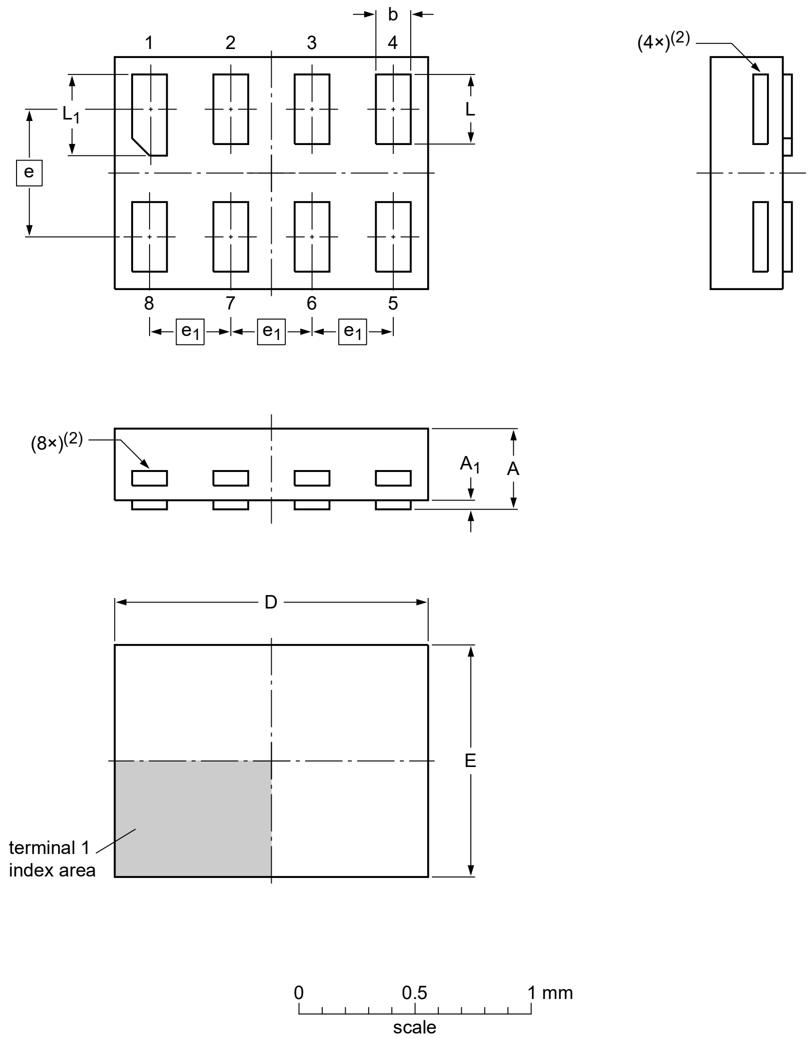
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1116_po

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

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**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	1.40	1.05			0.35	0.40
	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

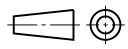
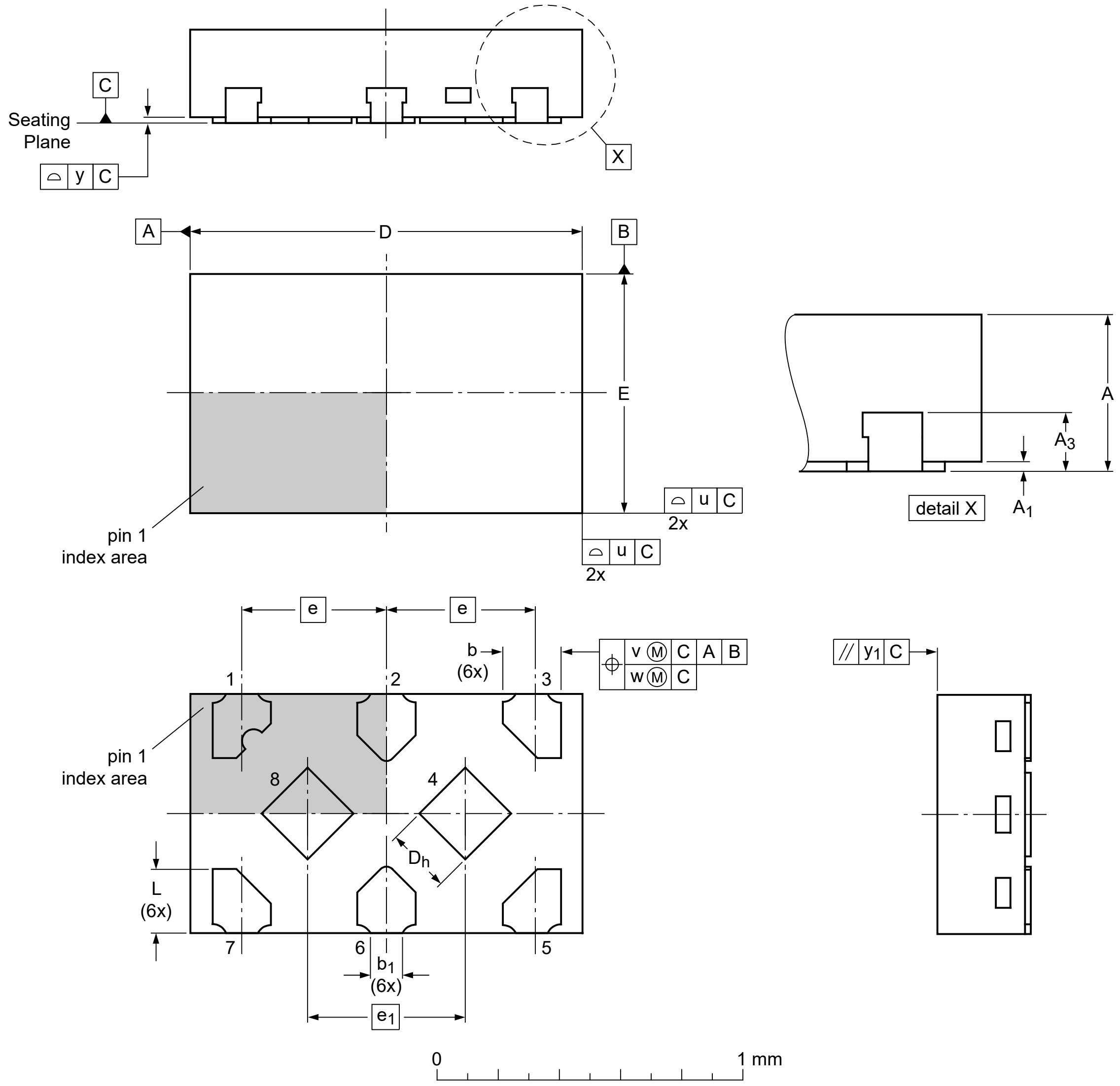
Outline version	References IEC	JEDEC	JEITA		European projection	Issue date
SOT1203						~~10-04-02~~ 10-04-06

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**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_3	b	b_1	D	D_h	E	e	e_1	L	u	v	w	y	y_1
mm	max	0.35	0.04		0.25			0.27				0.27					
	nom	0.32	0.02	0.10 (Typ.)	0.20	0.11 (ref)	1.35	0.22	0.80	0.50	0.54	0.22	0.05	0.10	0.05	0.05	0.05
	min	0.30	0.00		0.15			0.17				0.17					

sot1233-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1233-2		- - -				19-11-12

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
MM	Machine Model

14. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G125 v.14	20220621	Product data sheet	-	74AUP2G125 v.13
Modifications:	• Package SOT1233 (X2SON8) changed to SOT1233-2 (X2SON8).			
74AUP2G125 v.13	20220310	Product data sheet	-	74AUP2G125 v.12
Modifications:	• Type number 74AUP2G125GM (SOT902-2/XQFN8) removed. • Section 1 and Section 2 updated. • Table 5: Derating values for P_{tot} total power dissipation have been updated.			
74AUP2G125 v.12	20170703	Product data sheet	-	74AUP2G125 v.11
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. • Fig. 6 and Fig. 15 (drawings SOT1233/X2SON8) updated • Type number 74AUP2G125GD removed.			
74AUP2G125 v.11	20161028	Product data sheet	-	74AUP2G125 v.10
Modifications:	• Added type number 74AUP2G125GX (SOT1233/X2SON8)			
74AUP2G125 v.10	20130208	Product data sheet	-	74AUP2G125 v.9
Modifications:	• For type number 74AUP2G125GD XSON8U has changed to XSON8.			
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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