74AUP1G126

Low-power buffer/line driver; 3-state

Rev. 9 — 14 January 2022 — Product data sheet

1. General description

The 74AUP1G126 provides a single non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (OE). A LOW level at pin OE causes the output to assume a high-impedance OFF-state. This device has the input-disable feature, which allows floating input signals. The inputs are disabled when the output enable input OE is LOW.

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 μA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- Input-disable feature allows floating input conditions
- 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			
	Temperature range	Name	Description	Version
74AUP1G126GW	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1
74AUP1G126GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP1G126GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AUP1G126GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74AUP1G126GX	-40 °C to +125 °C	X2SON5	plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 × 0.8 × 0.32 mm	SOT1226-3

4. Marking

Table 2. Marking

Type number	Marking code[1]
74AUP1G126GW	pN
74AUP1G126GM	pN
74AUP1G126GN	pN
74AUP1G126GS	pN
74AUP1G126GX	pN

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

5. Functional diagram

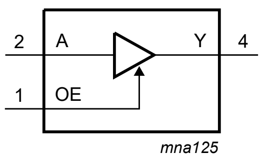


Fig. 1. Logic symbol

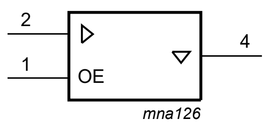


Fig. 2. IEC logic symbol

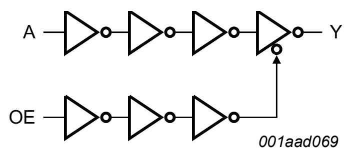


Fig. 3. Logic diagram

6. Pinning information

6.1. Pinning

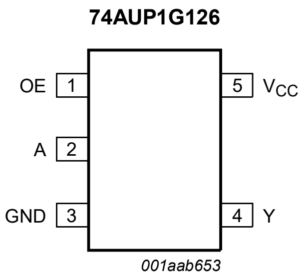


Fig. 4. Pin configuration SOT353-1 (TSSOP5)

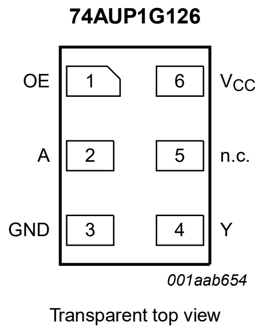


Fig. 5. Pin configuration SOT886 (XSON6)

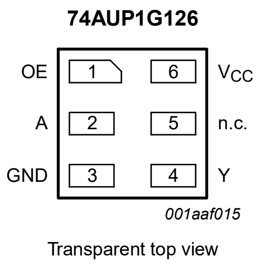


Fig. 6. Pin configuration SOT1115 and SOT1202 (XSON6)

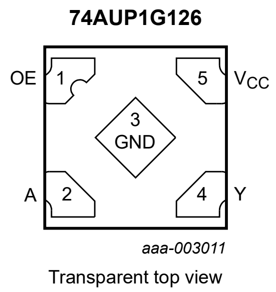


Fig. 7. Pin configuration SOT1226-3 (X2SON5)

6.2. Pin description

Table 3. Pin description

Symbol	Pin		Description
	TSSOP5 and X2SON5	XSON6	
OE	1	1	output enable input
A	2	2	data input
GND	3	3	ground (0 V)
Y	4	4	data output
n.c.	-	5	not connected
V_{CC}	5	6	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
OE	A	Y
H	L	L
H	H	H
L	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
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	[1]	-0.5	V_{CC} + 0.5	V
		Power-down mode; V_{CC} = 0 V	[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 input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SOT353-1 (TSSOP5) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT886 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT1115 (XSON6) package: P_{tot} derates linearly with 3.2 mW/K above 71 °C.
For SOT1202 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT1226-3 (X2SON5) package: P_{tot} derates linearly with 3.0 mW/K above 67 °C.

9. Recommended operating conditions

Table 6. Recommended 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	0	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
		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; 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}		-	0.9	-	pF
C_O	output capacitance	output enabled; V_O = GND; V_{CC} = 0 V		-	1.7	-	pF
		output disabled; V_{CC} = 0 V to 3.6 V; V_O = GND or V_{CC}		-	1.5	-	pF
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

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		-	-	±0.5	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
		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; OE = GND; V_{CC} = 0.8 V to 3.6 V	[2]	-	-	1	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
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

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		-	-	±0.75	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
		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; 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. 10

Symbol	Parameter	Conditions		Min	Typ[1]	Max	Unit
T_{amb} = 25 °C; C_L = 5 pF							
t_{pd}	propagation delay	A to Y; see Fig. 8	[2]				
		V_{CC} = 0.8 V		-	20.6	-	ns
		V_{CC} = 1.1 V to 1.3 V		2.8	5.5	10.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	3.9	6.1	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	3.2	4.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.6	2.6	3.6	ns
		V_{CC} = 3.0 V to 3.6 V		1.4	2.4	3.1	ns
t_{en}	enable time	OE to Y; see Fig. 9	[3]				
		V_{CC} = 0.8 V		-	71.6	-	ns
		V_{CC} = 1.1 V to 1.3 V		2.8	6.2	12.4	ns
		V_{CC} = 1.4 V to 1.6 V		2.3	4.2	6.9	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	3.3	5.3	ns
		V_{CC} = 2.3 V to 2.7 V		1.5	2.4	3.6	ns
		V_{CC} = 3.0 V to 3.6 V		1.3	2.0	2.9	ns
t_{dis}	disable time	OE to Y; see Fig. 9	[4]				
		V_{CC} = 0.8 V		-	10.3	-	ns
		V_{CC} = 1.1 V to 1.3 V		2.6	4.2	6.2	ns
		V_{CC} = 1.4 V to 1.6 V		2.1	3.2	4.4	ns
		V_{CC} = 1.65 V to 1.95 V		2.1	3.1	4.4	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	2.4	3.2	ns
		V_{CC} = 3.0 V to 3.6 V		2.1	2.8	3.6	ns

Symbol	Parameter	Conditions		Min	Typ[1]	Max	Unit
T_{amb} = 25 °C; C_L = 10 pF							
t_{pd}	propagation delay	see Fig. 8	[2]				
		V_{CC} = 0.8 V		-	24.0	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.2	6.4	12.3	ns
		V_{CC} = 1.4 V to 1.6 V		2.1	4.5	7.3	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	3.8	5.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.1	3.2	4.2	ns
		V_{CC} = 3.0 V to 3.6 V		1.8	3.0	3.8	ns
t_{en}	enable time	see Fig. 9	[3]				
		V_{CC} = 0.8 V		-	75.3	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.2	7.1	14.1	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	4.8	8.0	ns
		V_{CC} = 1.65 V to 1.95 V		1.8	3.9	5.9	ns
		V_{CC} = 2.3 V to 2.7 V		1.5	2.9	4.2	ns
		V_{CC} = 3.0 V to 3.6 V		1.4	2.6	3.6	ns
t_{dis}	disable time	see Fig. 9	[4]				
		V_{CC} = 0.8 V		-	12.2	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.5	5.3	7.6	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	4.1	5.6	ns
		V_{CC} = 1.65 V to 1.95 V		2.4	4.2	5.7	ns
		V_{CC} = 2.3 V to 2.7 V		1.9	3.2	4.1	ns
		V_{CC} = 3.0 V to 3.6 V		2.4	4.1	5.0	ns
T_{amb} = 25 °C; C_L = 15 pF							
t_{pd}	propagation delay	see Fig. 8	[2]				
		V_{CC} = 0.8 V		-	27.4	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.6	7.2	14.1	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.1	8.1	ns
		V_{CC} = 1.65 V to 1.95 V		2.2	4.3	6.3	ns
		V_{CC} = 2.3 V to 2.7 V		2.0	3.7	4.9	ns
		V_{CC} = 3.0 V to 3.6 V		2.0	3.5	4.4	ns
t_{en}	enable time	see Fig. 9	[3]				
		V_{CC} = 0.8 V		-	79.2	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.6	7.8	15.8	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.4	8.8	ns
		V_{CC} = 1.65 V to 1.95 V		2.1	4.3	6.7	ns
		V_{CC} = 2.3 V to 2.7 V		1.8	3.4	4.8	ns
		V_{CC} = 3.0 V to 3.6 V		1.6	3.1	4.3	ns
t_{dis}	disable time	see Fig. 9	[4]				
		V_{CC} = 0.8 V		-	14.9	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.3	6.4	8.5	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.0	6.6	ns
		V_{CC} = 1.65 V to 1.95 V		3.1	5.4	6.6	ns
		V_{CC} = 2.3 V to 2.7 V		2.4	4.0	5.0	ns
		V_{CC} = 3.0 V to 3.6 V		3.2	5.3	6.2	ns

Symbol	Parameter	Conditions		Min	Typ[1]	Max	Unit
T_{amb} = 25 °C; C_L = 30 pF							
t_{pd}	propagation delay	see Fig. 8	[2]				
		V_{CC} = 0.8 V		-	37.4	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.8	9.5	18.7	ns
		V_{CC} = 1.4 V to 1.6 V		4.0	6.7	10.8	ns
		V_{CC} = 1.65 V to 1.95 V		2.9	5.6	8.4	ns
		V_{CC} = 2.3 V to 2.7 V		2.7	4.8	6.3	ns
		V_{CC} = 3.0 V to 3.6 V		2.7	4.6	5.8	ns
t_{en}	enable time	see Fig. 9	[3]				
		V_{CC} = 0.8 V		-	90.6	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.7	10.0	20.4	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	6.9	11.3	ns
		V_{CC} = 1.65 V to 1.95 V		2.6	5.6	8.6	ns
		V_{CC} = 2.3 V to 2.7 V		2.3	4.5	6.3	ns
		V_{CC} = 3.0 V to 3.6 V		2.2	4.2	5.8	ns
t_{dis}	disable time	see Fig. 9	[4]				
		V_{CC} = 0.8 V		-	51.6	-	ns
		V_{CC} = 1.1 V to 1.3 V		6.0	9.8	13.6	ns
		V_{CC} = 1.4 V to 1.6 V		4.5	7.7	10.5	ns
		V_{CC} = 1.65 V to 1.95 V		5.2	8.8	11.4	ns
		V_{CC} = 2.3 V to 2.7 V		3.9	6.4	7.4	ns
		V_{CC} = 3.0 V to 3.6 V		5.5	9.0	10.7	ns
T_{amb} = 25 °C							
C_{PD}	power dissipation capacitance	f = 1 MHz; V_I = GND to V_{CC}; output enabled	[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 the outputs.

Table 9. Dynamic characteristics

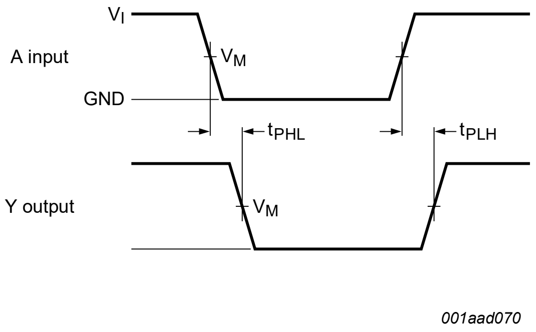
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 10

Symbol	Parameter	Conditions	-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Max	Min	Max	
C_L = 5 pF							
t_{pd}	propagation delay	A to Y; see Fig. 8 [1]					
		V_{CC} = 1.1 V to 1.3 V	2.5	11.7	2.5	12.9	ns
		V_{CC} = 1.4 V to 1.6 V	2.0	7.3	2.0	8.1	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	6.1	1.7	6.7	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	4.3	1.4	4.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.2	3.9	1.2	4.4	ns
t_{en}	enable time	OE to Y; see Fig. 9 [2]					
		V_{CC} = 1.1 V to 1.3 V	2.6	13.6	2.6	13.6	ns
		V_{CC} = 1.4 V to 1.6 V	2.2	7.4	2.2	7.7	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	5.9	1.7	6.2	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	3.8	1.4	4.1	ns
		V_{CC} = 3.0 V to 3.6 V	1.2	3.2	1.2	3.4	ns
t_{dis}	disable time	OE to Y; see Fig. 9 [3]					
		V_{CC} = 1.1 V to 1.3 V	2.9	6.4	2.9	6.5	ns
		V_{CC} = 1.4 V to 1.6 V	2.2	4.6	2.2	4.7	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	4.6	1.7	4.8	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	3.4	1.4	3.6	ns
		V_{CC} = 3.0 V to 3.6 V	1.2	3.7	1.2	3.8	ns
C_L = 10 pF							
t_{pd}	propagation delay	A to Y; see Fig. 8 [1]					
		V_{CC} = 1.1 V to 1.3 V	3.0	13.8	3.0	15.2	ns
		V_{CC} = 1.4 V to 1.6 V	1.9	8.5	1.9	9.4	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	6.8	1.7	7.6	ns
		V_{CC} = 2.3 V to 2.7 V	1.6	5.3	1.6	5.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.6	4.6	1.6	5.2	ns
t_{en}	enable time	OE to Y; see Fig. 9 [2]					
		V_{CC} = 1.1 V to 1.3 V	3.0	15.4	3.0	15.4	ns
		V_{CC} = 1.4 V to 1.6 V	2.1	8.3	2.1	8.6	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	6.5	1.7	6.8	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	4.5	1.4	4.8	ns
		V_{CC} = 3.0 V to 3.6 V	1.3	3.8	1.3	4.0	ns
t_{dis}	disable time	OE to Y; see Fig. 9 [3]					
		V_{CC} = 1.1 V to 1.3 V	3.3	7.9	3.3	7.9	ns
		V_{CC} = 1.4 V to 1.6 V	2.1	5.7	2.1	5.9	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	5.8	1.7	6.0	ns
		V_{CC} = 2.3 V to 2.7 V	1.4	4.3	1.4	4.5	ns
		V_{CC} = 3.0 V to 3.6 V	1.3	5.2	1.3	5.3	ns

Symbol	Parameter	Conditions		-40 °C to +85 °C		-40 °C to +125 °C		Unit
				Min	Max	Min	Max	
C_L = 15 pF								
t_{pd}	propagation delay	A to Y; see Fig. 8	[1]					
		V_{CC} = 1.1 V to 1.3 V		3.3	15.8	3.3	17.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	9.8	2.5	10.9	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	7.9	2.0	8.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.8	6.0	1.8	6.7	ns
		V_{CC} = 3.0 V to 3.6 V		1.8	5.4	1.8	6.1	ns
t_{en}	enable time	OE to Y; see Fig. 9	[2]					
		V_{CC} = 1.1 V to 1.3 V		3.3	17.1	3.3	17.1	ns
		V_{CC} = 1.4 V to 1.6 V		2.9	9.4	2.9	9.7	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	7.3	2.0	7.7	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	5.2	1.7	5.6	ns
		V_{CC} = 3.0 V to 3.6 V		1.5	4.5	1.5	4.7	ns
t_{dis}	disable time	OE to Y; see Fig. 9	[3]					
		V_{CC} = 1.1 V to 1.3 V		3.7	9.3	3.7	9.4	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	6.9	2.5	7.0	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	7.4	2.0	7.5	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	5.1	1.7	5.5	ns
		V_{CC} = 3.0 V to 3.6 V		1.5	6.7	1.5	6.9	ns
C_L = 30 pF								
t_{pd}	propagation delay	A to Y; see Fig. 8	[1]					
		V_{CC} = 1.1 V to 1.3 V		4.4	21.4	4.4	24.0	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	13.0	3.0	14.5	ns
		V_{CC} = 1.65 V to 1.95 V		2.6	10.3	2.6	11.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.5	7.8	2.5	8.7	ns
		V_{CC} = 3.0 V to 3.6 V		2.5	7.0	2.5	8.3	ns
t_{en}	enable time	OE to Y; see Fig. 9	[2]					
		V_{CC} = 1.1 V to 1.3 V		4.3	22.0	4.3	22.0	ns
		V_{CC} = 1.4 V to 1.6 V		3.7	12.0	3.7	12.5	ns
		V_{CC} = 1.65 V to 1.95 V		3.2	9.5	3.2	10.1	ns
		V_{CC} = 2.3 V to 2.7 V		2.9	6.8	2.9	7.3	ns
		V_{CC} = 3.0 V to 3.6 V		2.7	6.4	2.7	6.7	ns
t_{dis}	disable time	OE to Y; see Fig. 9	[3]					
		V_{CC} = 1.1 V to 1.3 V		4.7	14.3	4.7	14.4	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	10.7	3.0	11.0	ns
		V_{CC} = 1.65 V to 1.95 V		2.6	11.5	2.6	11.6	ns
		V_{CC} = 2.3 V to 2.7 V		2.3	9.0	2.3	10.2	ns
		V_{CC} = 3.0 V to 3.6 V		2.2	10.8	2.2	12.0	ns

[1] t_{pd} is the same as t_{PLH} and t_{PHL}.
[2] t_{en} is the same as t_{PZH} and t_{PZL}.
[3] t_{dis} is the same as t_{PHZ} and t_{PLZ}.

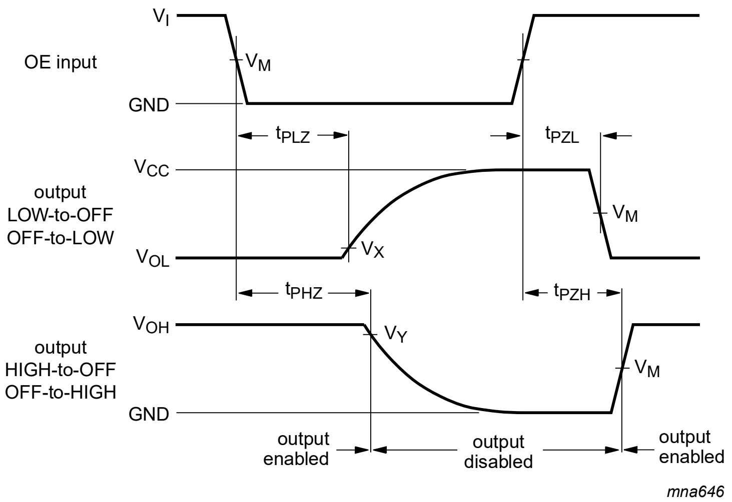
11.1. Waveforms and test circuit



Measurement points are given in Table 10.

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

Fig. 8. The data input (A) to output (Y) propagation delays



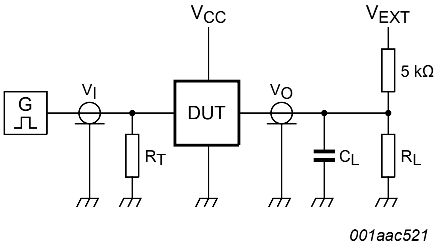
Measurement points are given in Table 10.

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

Fig. 9. Enable and disable times

Table 10. Measurement points

Supply voltage	Input			Output		
V_{CC}	V_M	V_I	$t_r = t_f$	V_M	V_X	V_Y
0.8 V to 1.6 V	0.5 × V_{CC}	V_{CC}	≤ 3.0 ns	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}	V_{CC}	≤ 3.0 ns	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}	V_{CC}	≤ 3.0 ns	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. 10. Test circuit for measuring switching times

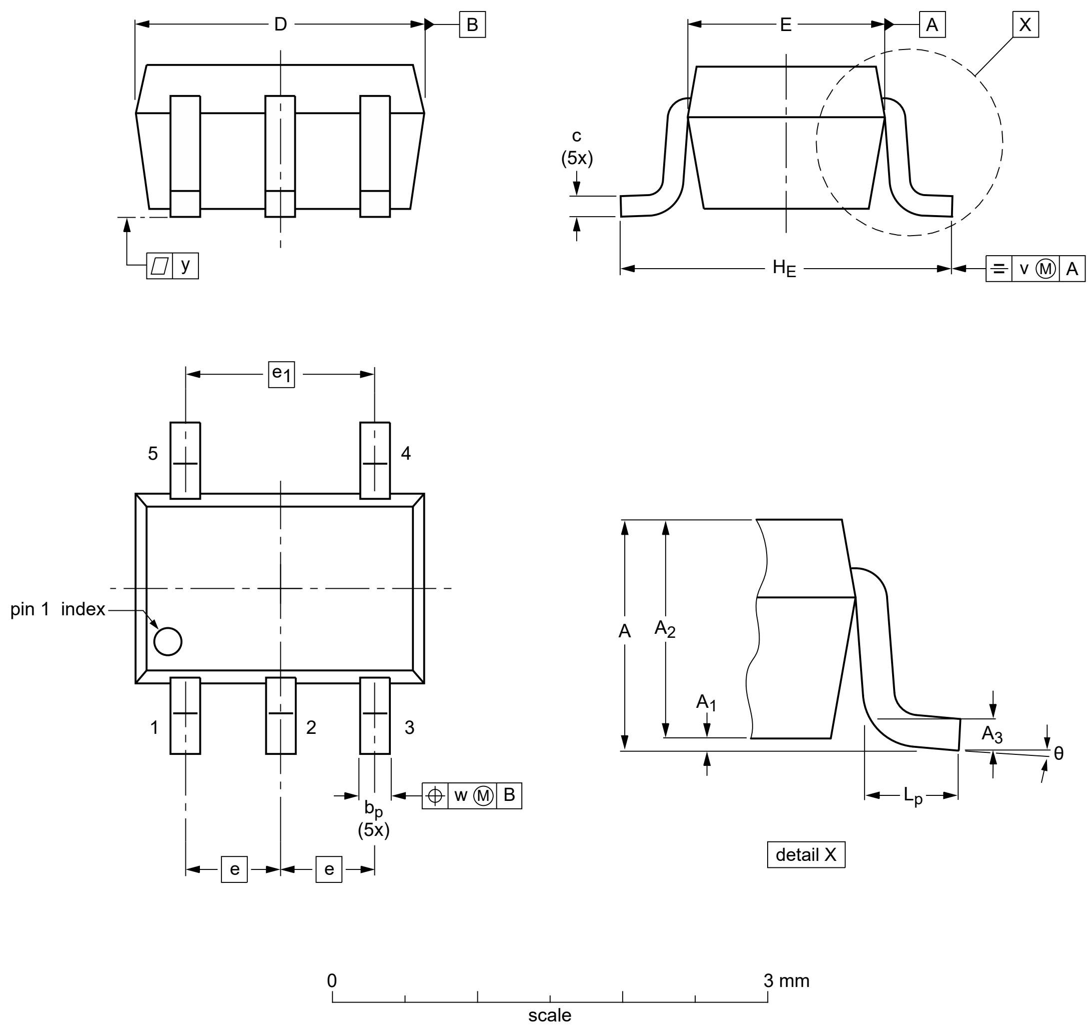
Table 11. Test data

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

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm **SOT353-1**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_2	A_3	b_p	c	D[(1)]	E[(1)]	e	e_1	H_E	L_p	v	w	y	θ
mm	max	1.1	0.1	1.0	0.15	0.30	0.25	2.2	1.35	0.65	1.3	2.4	0.46	0.3	0.1	0.1	8°
	min	0.8	0	0.8		0.15	0.08	1.8	1.15			1.8	0.26				0°

Note
1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

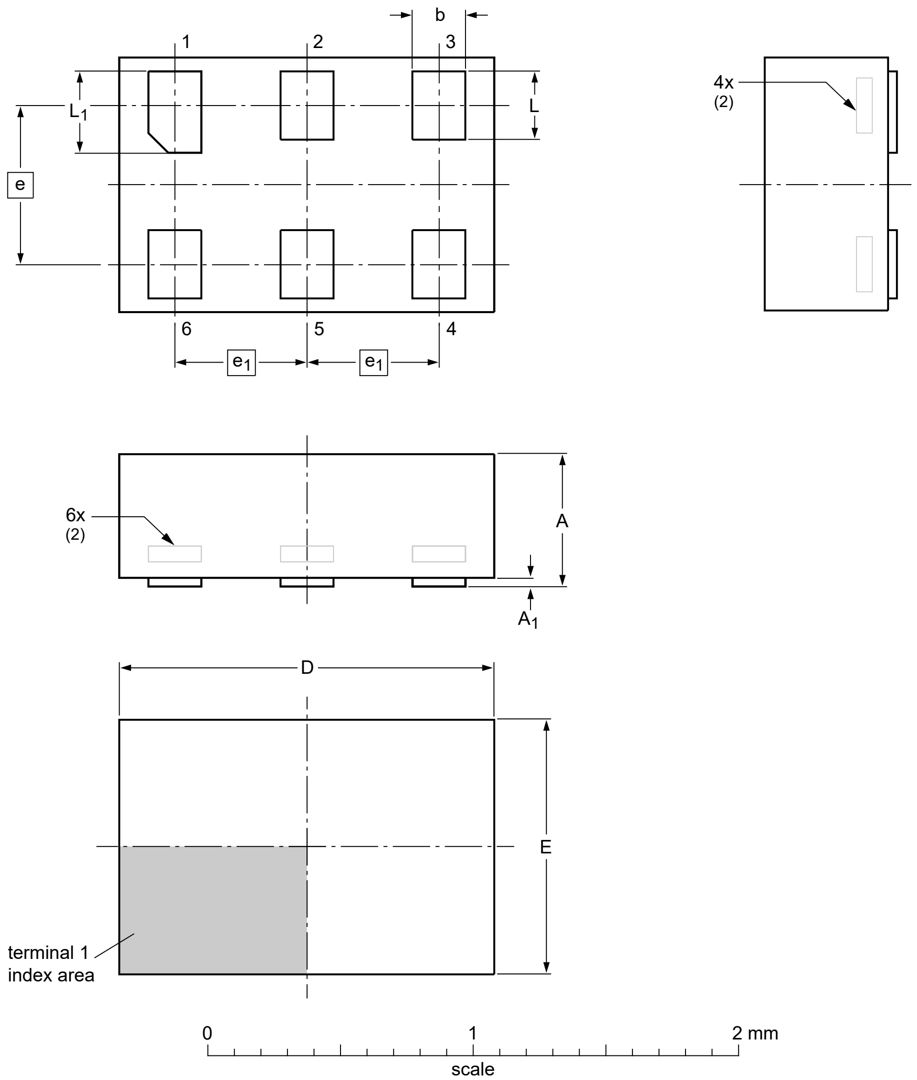
sot353-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT353-1		MO-203	SC-88A			~~21-12-15~~ 21-12-16

Fig. 11. Package outline SOT353-1 (TSSOP5)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886



Dimensions (mm are the original dimensions)

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
	max	0.5	0.04	0.25	1.50	1.05			0.35	0.40
mm	nom			0.20	1.45	1.00	0.6	0.5	0.30	0.35
	min			0.17	1.40	0.95			0.27	0.32

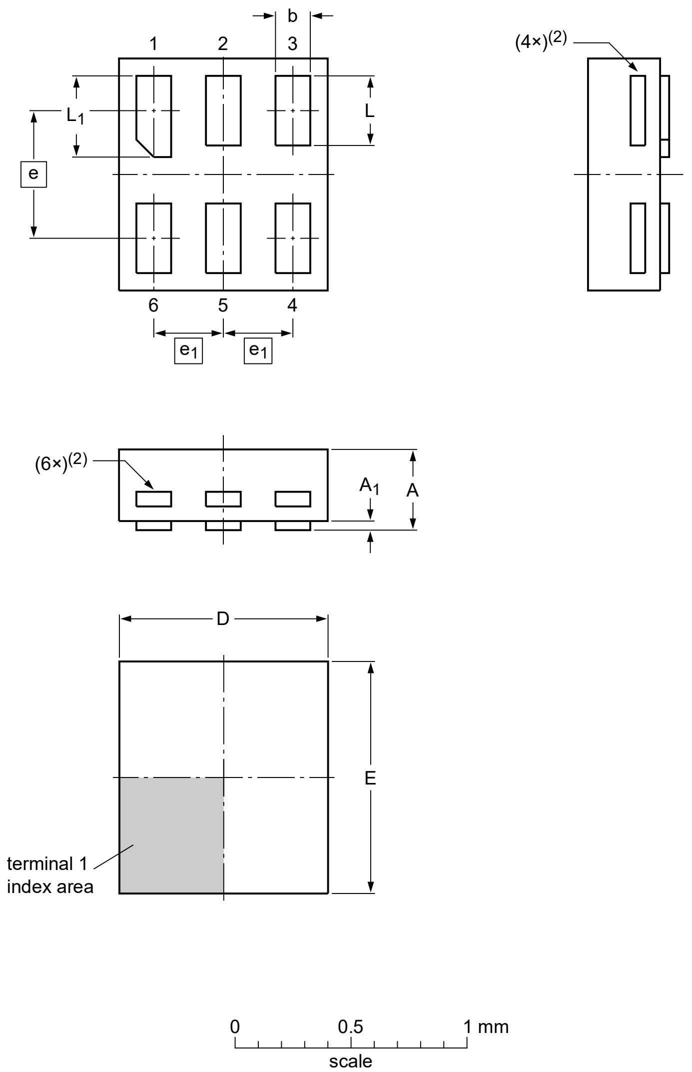
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT886		MO-252				~~04-07-22~~ 12-01-05

Fig. 12. Package outline SOT886 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 0.9 x 1.0 x 0.35 mm **SOT1115**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	0.95	1.05			0.35	0.40
	nom			0.15	0.90	1.00	0.55	0.3	0.30	0.35
	min			0.12	0.85	0.95			0.27	0.32

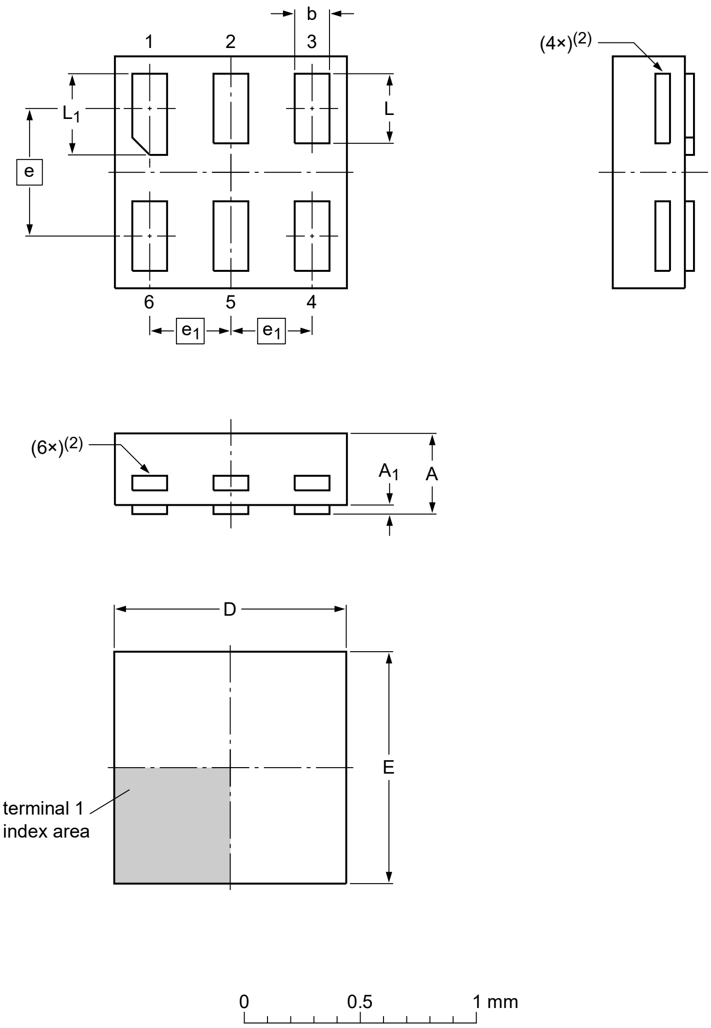
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1115_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1115						~~10-04-02~~ 10-04-07

Fig. 13. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm **SOT1202**



Dimensions

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

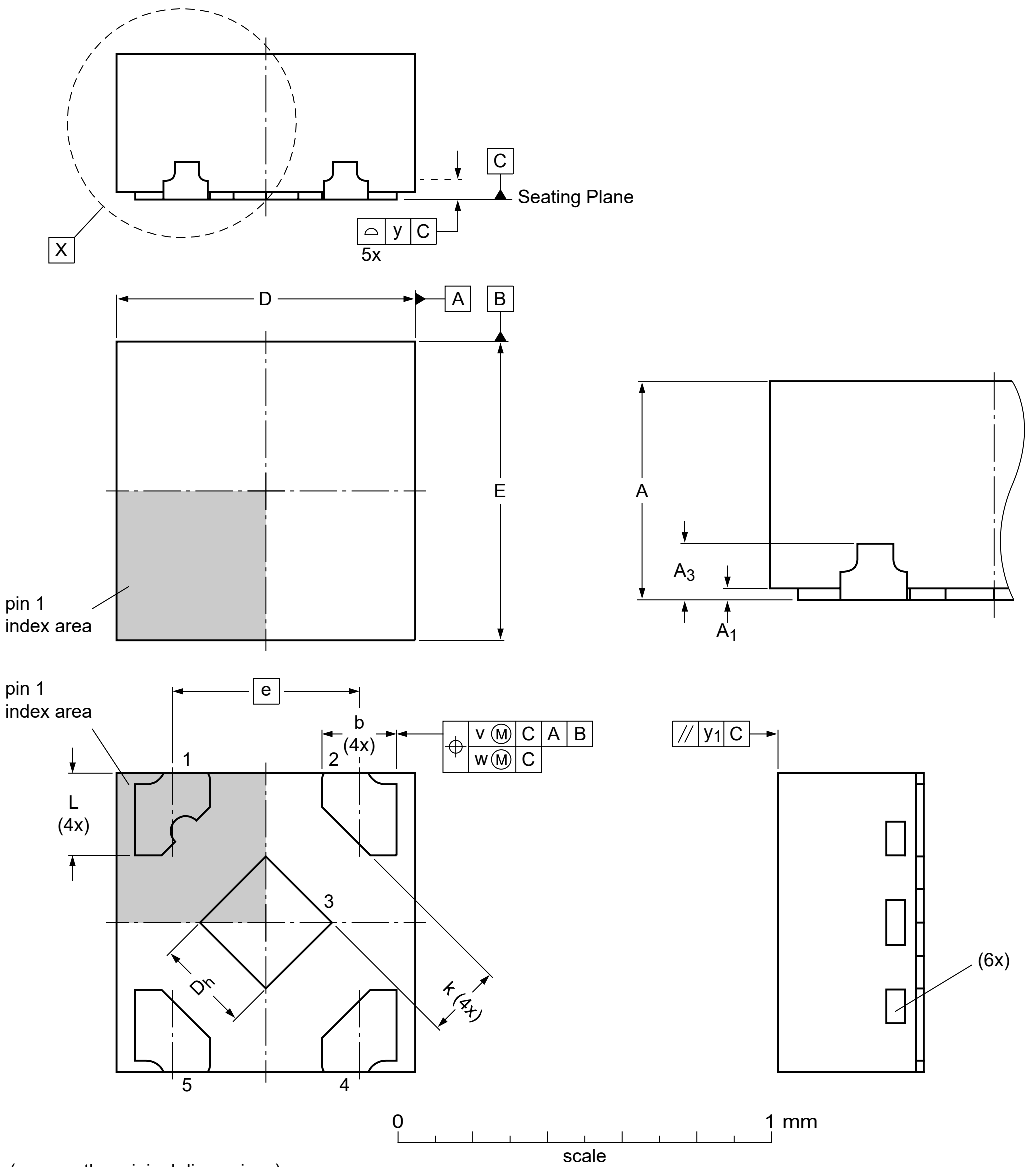
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1202_po

Outline version	References IEC	References JEDEC	References JEITA		European projection	Issue date
SOT1202						~~10-04-02~~ 10-04-06

Fig. 14. Package outline SOT1202 (XSON6)

X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.32 mm **SOT1226-3**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_3	D	D_h	E	b	e	K	L	v	w	y	y_1
mm	max	0.35	0.04	0.10 (Typ.)	0.85	0.30	0.85	0.25			0.27				
	nom	0.32	0.02		0.80	0.25	0.80	0.20	0.50		0.22	0.1	0.05	0.05	0.05
	min	0.30	0.00		0.75	0.20	0.75	0.15		0.20	0.17				

sot1226-3_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	EIAJ			
SOT1226-3		- - -				~~19-11-06~~ 19-11-07

Fig. 15. Package outline SOT1226-3 (X2SON5)

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
74AUP1G126 v.9	20220114	Product data sheet	-	74AUP1G126 v.8
Modifications:	• Fig. 11: Package outline drawing for SOT353-1 (TSSOP5) has changed.			
74AUP1G126 v.8	20210430	Product data sheet	-	74AUP1G126 v.7
Modifications:	• SOT1226 (X2SON5) package changed to SOT1226-3 (X2SON5) package. • Type number 74AUP1G126GF (SOT891) removed. • Table 5: Derating values for P_{tot} total power dissipation updated.			
74AUP1G126 v.7	20180516	Product data sheet	-	74AUP1G126 v.6
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.			
74AUP1G126 v.6	20151002	Product data sheet	-	74AUP1G126 v.5
Modifications:	• I_{OK} minimum changed from -0.5 mA to -50 mA (errata) in Table 5..			
74AUP1G126 v.5	20120628	Product data sheet	-	74AUP1G126 v.4
Modifications:	• Added type number 74AUP1G126GX (SOT1226) • Package outline drawing of SOT886 (Fig. 12) modified.			
74AUP1G126 v.4	20111124	Product data sheet	-	74AUP1G126 v.3
74AUP1G126 v.3	20100903	Product data sheet	-	74AUP1G126 v.2
74AUP1G126 v.2	20060628	Product data sheet	-	74AUP1G126 v.1
74AUP1G126 v.1	20050725	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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