# 74AUP1G126

# Low-power buffer/line driver; 3-state Rev. 6 — 2 October 2015

**Product data sheet** 

#### **General description** 1.

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<sub>CC</sub> 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<sub>OFF</sub>. The I<sub>OFF</sub> circuitry disables the output, preventing a damaging backflow current through the device when it is powered down.

#### **Features and benefits**

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - ◆ JESD8-11 (0.9 V to 1.65 V)
  - ◆ JESD8-7 (1.2 V to 1.95 V)
  - ◆ JESD8-5 (1.8 V to 2.7 V)
  - ◆ JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - ◆ HBM JESD22-A114F Class 3A exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Low static power consumption;  $I_{CC} = 0.9 \mu A$  (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V<sub>CC</sub>
- Input-disable feature allows floating input conditions
- I<sub>OFF</sub> 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 $\times$ 1.45 $\times$ 0.5 mm	SOT886			
74AUP1G126GF	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 $\times$ 1 $\times$ 0.5 mm	SOT891			
74AUP1G126GN	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body $0.9 \times 1.0 \times 0.35$ mm	SOT1115			
74AUP1G126GS	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 $\times$ 1.0 $\times$ 0.35 mm	SOT1202			
74AUP1G126GX	–40 °C to +125 °C	X2SON5	X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body $0.8 \times 0.8 \times 0.35$ mm	SOT1226			

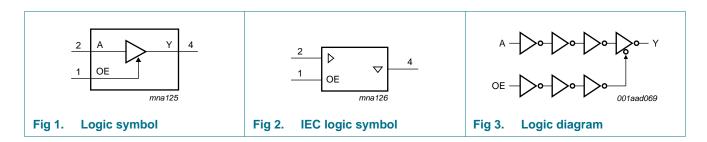
### 4. Marking

Table 2. Marking

Type number	Marking code <sup>[1]</sup>
74AUP1G126GW	pN
74AUP1G126GM	pN
74AUP1G126GF	pN
74AUP1G126GN	pN
74AUP1G126GS	pN
74AUP1G126GX	pN

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

# 5. Functional diagram



# 6. Pinning information

### 6.1 Pinning





### 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)
Υ	4	4	data output
n.c.	-	5	not connected
V <sub>CC</sub>	5	6	supply voltage

# 7. Functional description

Table 4. Function table[1]

Input		Output
OE	A	Υ
Н	L	L
Н	Н	Н
L	X	Z

<sup>[1]</sup> H = HIGH voltage level;

L = LOW voltage level;

### 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Unit
17
V
mA
V
mA
V
V
mA
mA
mA
°C
mW

<sup>[1]</sup> The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### 9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	supply voltage		0.8	3.6	V
VI	input voltage		0	3.6	V
Vo	output voltage	Active mode	0	$V_{CC}$	V
		Power-down mode; V <sub>CC</sub> = 0 V	0	3.6	V
T <sub>amb</sub>	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	0	200	ns/V

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X = Don't care;

Z = high-impedance OFF-state.

<sup>[2]</sup> For TSSOP5 packages: above 87.5 °C the value of P<sub>tot</sub> derates linearly with 4.0 mW/K.
For XSON6 and X2SON5 packages: above 118 °C the value of P<sub>tot</sub> derates linearly with 7.8 mW/K.

### 10. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
<b>T</b> <sub>amb</sub> = 2	5 °C					
$V_{IH}$	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	$0.70 \times V_{CC}$	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
$V_{IL}$	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	$0.30 \times V_{CC}$	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	-	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	$V_I = V_{IH}$ or $V_{IL}$				
		$I_{O} = -20 \mu A$ ; $V_{CC} = 0.8 \text{ V}$ to 3.6 V	$V_{CC}-0.1$	-	-	V
		$I_{O} = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.75 \times V_{CC}$	-	-	V
		$I_{O} = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	1.11	-	-	V
		$I_{O} = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.32	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	2.05	-	-	V
		$I_{O} = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.9	-	-	V
		$I_{O} = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.72	-	-	V
		$I_O = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.6	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20 \mu A$ ; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	$0.3 \times V_{CC}$	V
		$I_O = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	-	-	0.31	V
		$I_O = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	-	-	0.31	V
		$I_O = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.31	V
		$I_O = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.44	V
		$I_O = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.31	V
		$I_O = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.44	V
I <sub>I</sub>	input leakage current	$V_I = GND$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V	-	-	±0.1	μΑ
I <sub>OZ</sub>	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	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_I$ or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.2	μΑ
$\Delta I_{OFF}$	additional power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V to 0.2 V	-	-	±0.2	μΑ
I <sub>CC</sub>	supply current	$V_{I} = GND \text{ or } V_{CC}; I_{O} = 0 \text{ A};$ $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.5	μΑ

 Table 7.
 Static characteristics ...continued

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

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Δl <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; V <sub>CC</sub> = 3.3 V	<u>[1]</u>	-	-	40	μΑ
		OE input; $V_I = V_{CC} - 0.6 \text{ V}$ ; $I_O = 0 \text{ A}$ ; $V_{CC} = 3.3 \text{ V}$	[1]	-	-	110	μΑ
		all inputs; $V_I$ = GND to 3.6 V; OE = GND; $V_{CC}$ = 0.8 V to 3.6 V	[2]	-	-	1	μΑ
Cı	input capacitance	$V_{CC}$ = 0 V to 3.6 V; $V_{I}$ = GND or $V_{CC}$		-	0.9	-	рF
Co	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 <sub>amb</sub> = -	40 °C to +85 °C						
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 0.8 \text{ V}$		$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$		$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.6	-	-	V
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.0	-	-	V
$V_{IL}$	LOW-level input voltage	$V_{CC} = 0.8 \text{ V}$		-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$		-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		-	-	0.7	V
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$					
		$I_O = -20 \mu A$ ; $V_{CC} = 0.8 \text{ V}$ to 3.6 V		$V_{CC}-0.1$	-	-	V
		$I_O = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$		$0.7 \times V_{CC}$	-	-	V
		$I_O = -1.7 \text{ mA}$ ; $V_{CC} = 1.4 \text{ V}$		1.03	-	-	V
		$I_O = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$		1.30	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$		1.97	-	-	V
		$I_O = -3.1 \text{ mA}$ ; $V_{CC} = 2.3 \text{ V}$		1.85	-	-	V
		$I_{O} = -2.7 \text{ mA}$ ; $V_{CC} = 3.0 \text{ V}$		2.67	-	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$		2.55	-	-	V
$V_{OL}$	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
		$I_O = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$		-	-	$0.3 \times V_{CC}$	V
		$I_O = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$		-	-	0.37	V
		$I_O = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$		-	-	0.35	V
		$I_O = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$		-	-	0.33	V
		$I_O = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$		-	-	0.45	V
		$I_{O} = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$		-	-	0.33	V
		$I_O = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$		-	-	0.45	V
l <sub>l</sub>	input leakage current	$V_I = GND$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V		-	-	±0.5	μΑ
l <sub>oz</sub>	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	μΑ
OFF	power-off leakage current	$V_I$ or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V		-	-	±0.5	μΑ

 Table 7.
 Static characteristics ...continued

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

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
$\Delta I_{OFF}$	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	μΑ
I <sub>CC</sub>	supply current	$V_I$ = GND or $V_{CC}$ ; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V		-	-	0.9	μΑ
Δl <sub>CC</sub>	additional supply current	data input; $V_I$ = $V_{CC}$ – 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 3.3 V	[1]	-	-	50	μΑ
		OE input; $V_I = V_{CC} - 0.6 \text{ V}$ ; $I_O = 0 \text{ A}$ ; $V_{CC} = 3.3 \text{ V}$	[1]	-	-	120	μΑ
		all inputs; $V_I$ = GND to 3.6 V; OE = GND; $V_{CC}$ = 0.8 V to 3.6 V	[2]	-	-	1	μΑ
T <sub>amb</sub> = -	-40 °C to +125 °C						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V		$0.75 \times V_{CC}$	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V		$0.70 \times V_{CC}$	-	-	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
$V_{IL}$	LOW-level input voltage	V <sub>CC</sub> = 0.8 V		-	-	$0.25 \times V_{CC}$	V
		V <sub>CC</sub> = 0.9 V to 1.95 V		-	-	$0.30 \times V_{CC}$	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	$V_I = V_{IH}$ or $V_{IL}$					
		$I_O = -20 \mu A$ ; $V_{CC} = 0.8 \text{ V}$ to 3.6 V		$V_{CC}-0.11$	-	-	V
		$I_O = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$		$0.6 \times V_{CC}$	-	-	V
		$I_{O} = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$		0.93	-	-	V
		$I_O = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$		1.17	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$		1.77	-	-	V
		$I_O = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$		1.67	-	-	V
		$I_{O} = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$		2.40	-	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$		2.30	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$					
		$I_O = 20 \mu A$ ; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$		-	-	0.11	V
		$I_O = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$		-	-	$0.33 \times V_{CC}$	V
		$I_O = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$		-	-	0.41	V
		$I_O = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$		-	-	0.39	V
		$I_O = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$		-	-	0.36	V
		$I_O = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$		-	-	0.50	V
		$I_{O} = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$		-	-	0.36	V
		$I_O = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$		-	-	0.50	V
l <sub>l</sub>	input leakage current	$V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V		-	-	±0.75	μΑ
l <sub>OZ</sub>	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	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V		-	-	±0.75	μΑ

 Table 7.
 Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$\Delta I_{OFF}$	additional power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V to 0.2 V	-	-	±0.75	μΑ
I <sub>CC</sub>	supply current	$V_1 = GND \text{ or } V_{CC}; I_O = 0 \text{ A};$ $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	1.4	μΑ
$\Delta I_{CC}$	additional supply current	data input; $V_I$ = $V_{CC}$ – 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 3.3 V	[1] -	-	75	μΑ
		OE input; $V_I = V_{CC} - 0.6 \text{ V}$ ; $I_O = 0 \text{ A}$ ; $V_{CC} = 3.3 \text{ V}$	[1] -	-	180	μΑ
		all inputs; $V_I = GND$ to 3.6 V; OE = GND; $V_{CC} = 0.8$ V to 3.6 V	[2] _	-	1	μΑ

<sup>[1]</sup> One input at  $V_{CC}$  – 0.6 V, other input at  $V_{CC}$  or GND.

# 11. Dynamic characteristics

Table 8. Dynamic characteristics

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

<sup>[2]</sup> To show  $I_{CC}$  remains very low when the input-disable feature is enabled.

 Table 8.
 Dynamic characteristics ...continued

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

 Table 8.
 Dynamic characteristics ...continued

9	1,	<del></del>					
Symbol	Parameter	Conditions		Min	Typ [1]	Max	Unit
t <sub>dis</sub>	disable time	see <u>Figure 9</u>	<u>[4]</u>				
		V <sub>CC</sub> = 0.8 V		-	14.9	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V		4.3	6.4	8.5	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.0	5.0	6.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		3.1	5.4	6.6	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.4	4.0	5.0	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		3.2	5.3	6.2	ns
T <sub>amb</sub> = 25	°C; C <sub>L</sub> = 30 pF						
t <sub>pd</sub>	propagation delay	see Figure 8	[2]				
		V <sub>CC</sub> = 0.8 V		-	37.4	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		4.8	9.5	18.7	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		4.0	6.7	10.8	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.9	5.6	8.4	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.7	4.8	6.3	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.7	4.6	5.8	ns
t <sub>en</sub>	enable time	see <u>Figure 9</u>	<u>[3]</u>				
		V <sub>CC</sub> = 0.8 V		-	90.6	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V		4.7	10.0	20.4	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.0	6.9	11.3	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.6	5.6	8.6	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.3	4.5	6.3	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.2	4.2	5.8	ns
t <sub>dis</sub>	disable time	see Figure 9	<u>[4]</u>				
		$V_{CC} = 0.8 \text{ V}$		-	51.6	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V		6.0	9.8	13.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V		4.5	7.7	10.5	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		5.2	8.8	11.4	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		3.9	6.4	7.4	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		5.5	9.0	10.7	ns

 Table 8.
 Dynamic characteristics ...continued

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

Symbol	Parameter	Conditions		Min	Typ 🗓	Max	Unit
T <sub>amb</sub> = 25	°C						
C <sub>PD</sub>	power dissipation capacitance	$f = 1 \text{ MHz}$ ; $V_I = \text{GND to } V_{CC}$	<u>[5]</u>				
		output enabled					
		$V_{CC} = 0.8 \text{ V}$		-	2.7	-	pF
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		-	2.8	-	pF
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		-	2.9	-	pF
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		-	3.0	-	pF
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		-	3.6	-	pF
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		-	4.2	-	pF

- [1] All typical values are measured at nominal V<sub>CC</sub>.
- [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  $\mu W$ ).

 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma (C_L \times V_{CC}^2 \times f_o) \text{ where:}$ 

f<sub>i</sub> = input frequency in MHz;

f<sub>o</sub> = output frequency in MHz;

 $C_L$  = output load capacitance in pF;

V<sub>CC</sub> = 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

Symbol	Parameter	Conditions		–40 °C t	o +85 °C	-40 °C to	Unit	
				Min	Max	Min	Max	
$C_L = 5 pF$	•							
t <sub>pd</sub>	propagation delay	A to Y; see Figure 8	[1]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		2.5	11.7	2.5	12.9	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.0	7.3	2.0	8.1	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	6.1	1.7	6.7	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.4	4.3	1.4	4.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.2	3.9	1.2	4.4	ns
t <sub>en</sub>	enable time	OE to Y; see Figure 9	[2]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		2.6	13.6	2.6	13.6	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.2	7.4	2.2	7.7	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	5.9	1.7	6.2	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.4	3.8	1.4	4.1	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.2	3.2	1.2	3.4	ns

 Table 9.
 Dynamic characteristics ...continued

Symbol	Parameter	Conditions		–40 °C t	o +85 °C	-40 °C to	+125 °C	Unit
				Min	Max	Min	Max	
t <sub>dis</sub>	disable time	OE to Y; see Figure 9	[3]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		2.9	6.4	2.9	6.5	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.2	4.6	2.2	4.7	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	4.6	1.7	4.8	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.4	3.4	1.4	3.6	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.2	3.7	1.2	3.8	ns
C <sub>L</sub> = 10 p	F							
t <sub>pd</sub>	propagation delay	A to Y; see Figure 8	[1]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.0	13.8	3.0	15.2	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		1.9	8.5	1.9	9.4	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	6.8	1.7	7.6	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.6	5.3	1.6	5.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.6	4.6	1.6	5.2	ns
t <sub>en</sub>	enable time	OE to Y; see Figure 9	[2]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.0	15.4	3.0	15.4	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.1	8.3	2.1	8.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	6.5	1.7	6.8	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.4	4.5	1.4	4.8	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.3	3.8	1.3	4.0	ns
t <sub>dis</sub>	disable time	OE to Y; see Figure 9	[3]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.3	7.9	3.3	7.9	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.1	5.7	2.1	5.9	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.7	5.8	1.7	6.0	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.4	4.3	1.4	4.5	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.3	5.2	1.3	5.3	ns
C <sub>L</sub> = 15 p	F							
t <sub>pd</sub>	propagation delay	A to Y; see Figure 8	[1]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.3	15.8	3.3	17.5	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.5	9.8	2.5	10.9	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.0	7.9	2.0	8.8	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.8	6.0	1.8	6.7	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.8	5.4	1.8	6.1	ns
t <sub>en</sub>	enable time	OE to Y; see Figure 9	[2]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.3	17.1	3.3	17.1	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.9	9.4	2.9	9.7	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.0	7.3	2.0	7.7	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.7	5.2	1.7	5.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V		1.5	4.5	1.5	4.7	ns

 Table 9.
 Dynamic characteristics ...continued

Symbol	Parameter	Conditions		–40 °C t	o +85 °C	-40 °C to	+125 °C	Unit
				Min	Max	Min	Max	
t <sub>dis</sub>	disable time	OE to Y; see Figure 9	[3]		1			
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.7	9.3	3.7	9.4	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.5	6.9	2.5	7.0	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.0	7.4	2.0	7.5	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		1.7	5.1	1.7	5.5	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.5	6.7	1.5	6.9	ns
C <sub>L</sub> = 30 p	F							
t <sub>pd</sub>	propagation delay	A to Y; see Figure 8	<u>[1]</u>					
	, , ,	$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		4.4	21.4	4.4	24.0	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.0	13.0	3.0	14.5	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.6	10.3	2.6	11.5	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.5	7.8	2.5	8.7	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.5	7.0	2.5	8.3	ns
t <sub>en</sub>	enable time	OE to Y; see Figure 9	[2]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		4.3	22.0	4.3	22.0	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.7	12.0	3.7	12.5	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		3.2	9.5	3.2	10.1	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.9	6.8	2.9	7.3	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.7	6.4	2.7	6.7	ns
t <sub>dis</sub>	disable time	OE to Y; see Figure 9	[3]					
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		4.7	14.3	4.7	14.4	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.0	10.7	3.0	11.0	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.6	11.5	2.6	11.6	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.3	9.0	2.3	10.2	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.2	10.8	2.2	12.0	ns

<sup>[1]</sup>  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

<sup>[2]</sup>  $t_{en}$  is the same as  $t_{PZH}$  and  $t_{PZL}$ .

<sup>[3]</sup>  $t_{\mbox{\scriptsize dis}}$  is the same as  $t_{\mbox{\scriptsize PHZ}}$  and  $t_{\mbox{\scriptsize PLZ}}.$ 

### 12. Waveforms

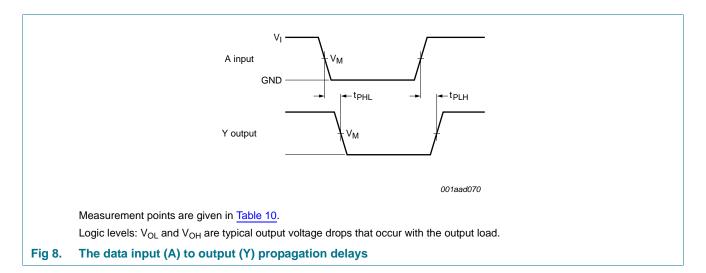


Table 10. Measurement points

Supply voltage	Output	Input		
V <sub>CC</sub>	V <sub>M</sub>	V <sub>M</sub>	VI	$t_r = t_f$
0.8 V to 3.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	V <sub>CC</sub>	≤ 3.0 ns

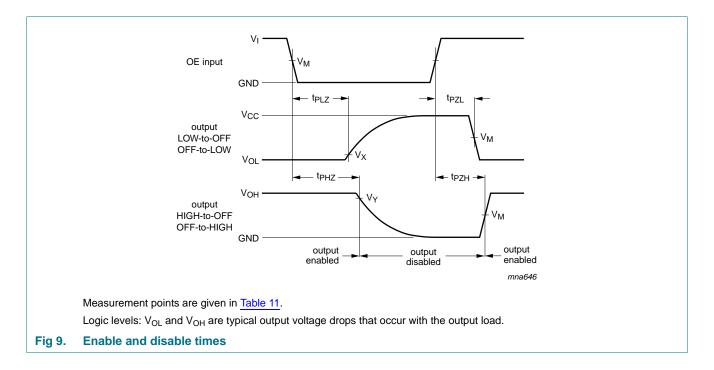
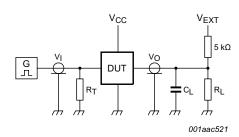


Table 11. Measurement points

Supply voltage	Input	Output						
V <sub>CC</sub>	V <sub>M</sub>	V <sub>M</sub>	V <sub>X</sub>	V <sub>Y</sub>				
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 <sub>OH</sub> – 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 <sub>OH</sub> – 0.3 V				



Test data is given in Table 12.

Definitions for test circuit:

 $R_1$  = 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.

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

Fig 10. Test circuit for measuring switching times

Table 12. Test data

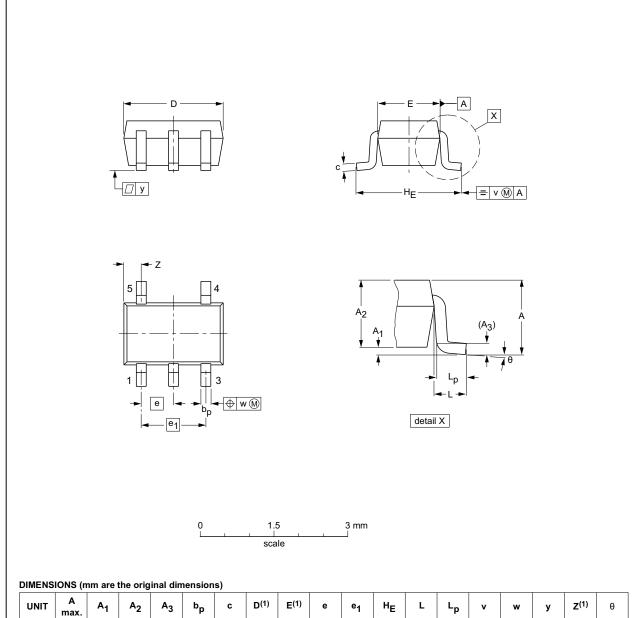
Supply voltage	Load		V <sub>EXT</sub>				
V <sub>CC</sub>	CL	R <sub>L</sub> [1]	t <sub>PLH</sub> , t <sub>PHL</sub>	t <sub>PZH</sub> , t <sub>PHZ</sub>	$t_{PZL}$ , $t_{PLZ}$		
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 k $\Omega$ or 1 M $\Omega$	open	GND	$2 \times V_{CC}$		

[1] For measuring enable and disable times  $R_L$  = 5  $k\Omega$ , for measuring propagation delays, setup and hold times and pulse width  $R_L$  = 1  $M\Omega$ .

# 13. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm

SOT353-1



UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	С	D <sup>(1)</sup>	E(1)	е	e <sub>1</sub>	HE	L	Lp	v	w	у	Z <sup>(1)</sup>	θ
mm	1.1	0.1 0	1.0 0.8	0.15	0.30 0.15	0.25 0.08	2.25 1.85	1.35 1.15	0.65	1.3	2.25 2.0	0.425	0.46 0.21	0.3	0.1	0.1	0.60 0.15	7° 0°

#### Note

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

OUTLINE		REFER	EUROPEAN	ISSUE DATE		
VERSION	IEC	JEDEC	JEITA		PROJECTION	ISSUE DATE
SOT353-1		MO-203	SC-88A			<del>00-09-01</del> 03-02-19

Fig 11. Package outline SOT353-1 (TSSOP5)

74AUP1G126

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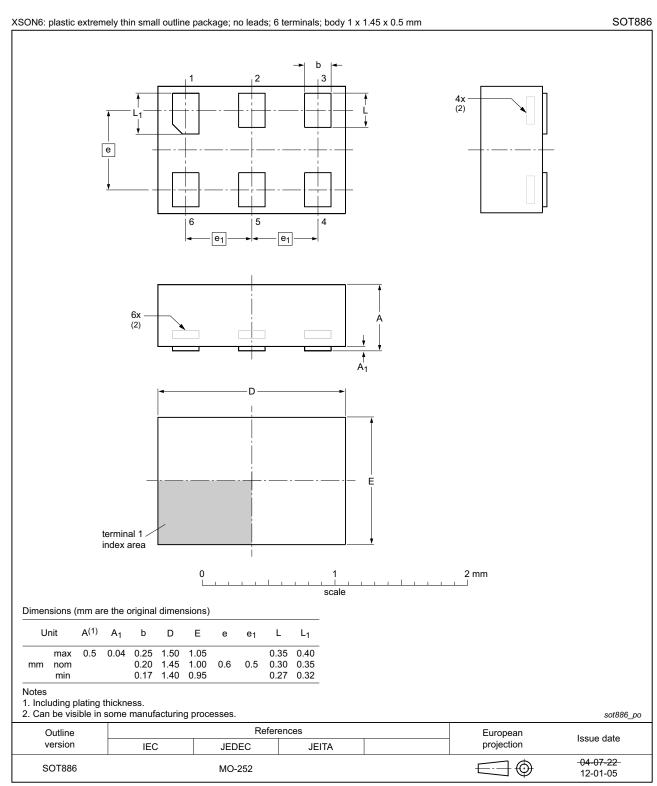


Fig 12. Package outline SOT886 (XSON6)

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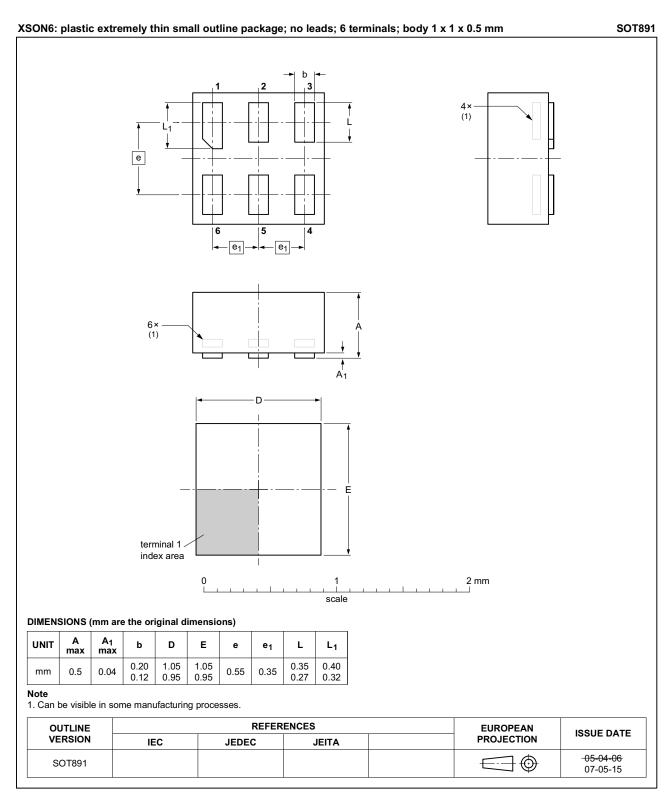


Fig 13. Package outline SOT891 (XSON6)

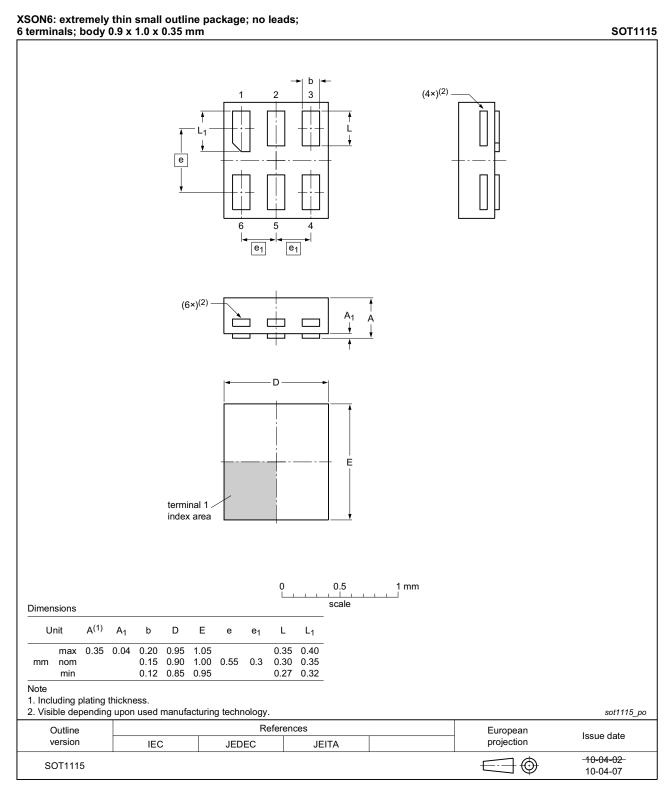


Fig 14. Package outline SOT1115 (XSON6)

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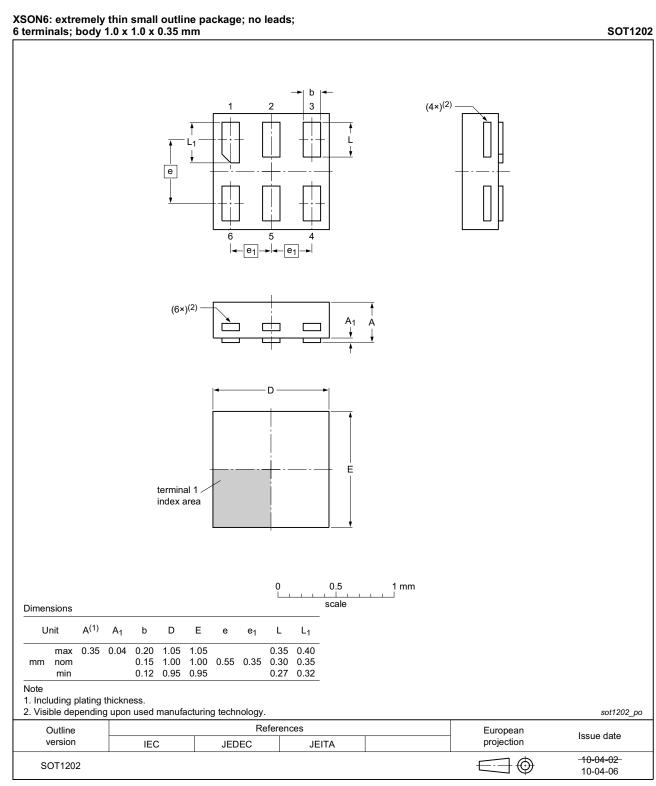


Fig 15. Package outline SOT1202 (XSON6)

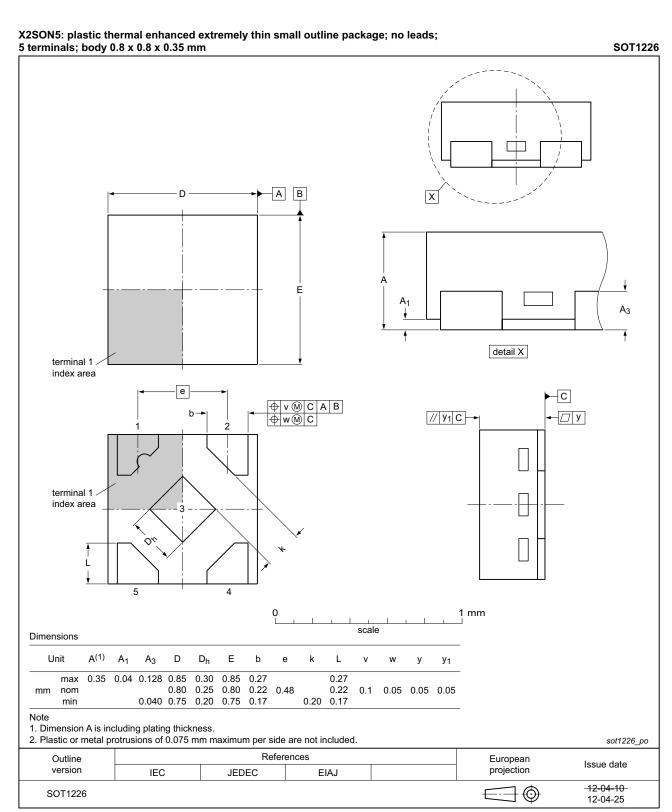


Fig 16. Package outline SOT1226 (X2SON5)

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### 14. Abbreviations

#### Table 13. Abbreviations

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

# 15. Revision history

#### Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes					
74AUP1G126 v.6	20151002	Product data sheet	-	74AUP1G126 v.5					
Modifications:	<ul> <li>I<sub>OK</sub> minimum c</li> </ul>	hanged from -0.5 mA to -50 mA	A (errata) in <u>Table 5</u>						
74AUP1G126 v.5	20120628	Product data sheet	-	74AUP1G126 v.4					
Modifications: • Added type number 74AUP1G126GX (SOT1226)									
	<ul> <li>Package outlin</li> </ul>	e drawing of SOT886 (Figure 12	2) 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	-	-					

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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.
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- [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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#### Low-power buffer/line driver; 3-state

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