

# 74AUP1G157

## Low-power 2-input multiplexer

Rev. 6 — 16 September 2015

Product data sheet

## 1. General description

The 74AUP1G157 is a single 2-input multiplexer which selects data from two data inputs (I0 and I1) under control of a common data select input (S). The state of the common data select input determines the particular register from which the data comes. The output (Y) presents the selected data in the true (non-inverted) form.

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 the 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;  $I_{CC} = 0.9 \mu A$  (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  $V_{CC}$
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from  $-40^{\circ}C$  to  $+85^{\circ}C$  and  $-40^{\circ}C$  to  $+125^{\circ}C$

**nexperia**

### 3. Ordering information

Table 1. Ordering information

Type number	Package				Version
	Temperature range	Name	Description		
74AUP1G157GW	−40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads		SOT363
74AUP1G157GM	−40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm		SOT886
74AUP1G157GF	−40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm		SOT891
74AUP1G157GN	−40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm		SOT1115
74AUP1G157GS	−40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm		SOT1202
74AUP1G157GX	−40 °C to +125 °C	X2SON6	plastic thermal extremely thin small outline package; no leads; 6 terminals; body 1 × 0.8 × 0.35 mm		SOT1255

### 4. Marking

Table 2. Marking

Type number	Marking code <sup>[1]</sup>
74AUP1G157GW	aP
74AUP1G157GM	aP
74AUP1G157GF	aP
74AUP1G157GN	aP
74AUP1G157GS	aP
74AUP1G157GX	aP

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

### 5. Functional diagram

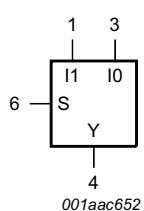


Fig 1. Logic symbol

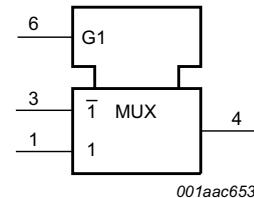


Fig 2. IEC logic symbol

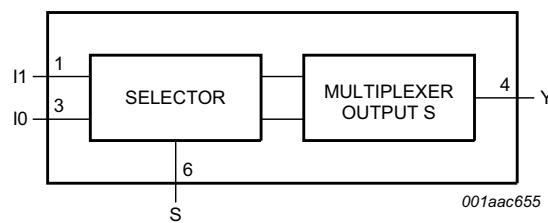


Fig 3. Functional diagram

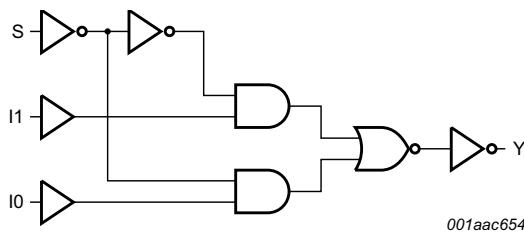


Fig 4. Logic diagram

## 6. Pinning information

### 6.1 Pinning

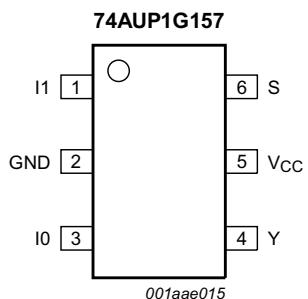


Fig 5. Pin configuration SOT363

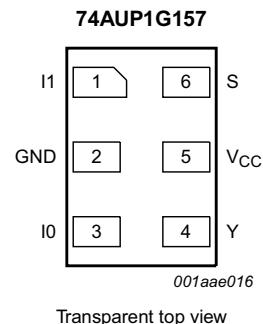


Fig 6. Pin configuration SOT886

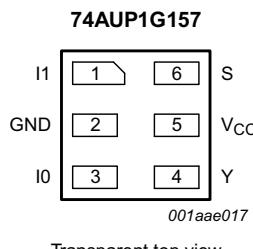


Fig 7. Pin configuration SOT891, SOT1115 and SOT1202

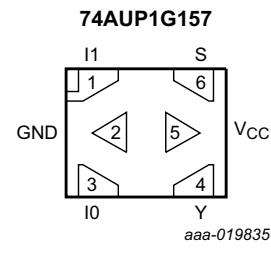


Fig 8. Pin configuration SOT1255 (X2SON6)

### 6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
I1	1	data input from source 1
GND	2	ground (0 V)
I0	3	data input from source 0
Y	4	multiplexer output
V <sub>CC</sub>	5	supply voltage
S	6	common data select input

## 7. Functional description

Table 4. Function table<sup>[1]</sup>

Input			Output
S	I <sub>1</sub>	I <sub>0</sub>	Y
L	X	L	L
L	X	H	H
H	L	X	L
H	H	X	H

[1] H = HIGH voltage level;  
L = LOW voltage level;  
X = don't care.

## 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 <sub>CC</sub>	supply voltage		-0.5	+4.6	V
I <sub>IK</sub>	input clamping current	V <sub>I</sub> < 0 V	-50	-	mA
V <sub>I</sub>	input voltage		<sup>[1]</sup> -0.5	+4.6	V
I <sub>OK</sub>	output clamping current	V <sub>O</sub> < 0 V	-50	-	mA
V <sub>O</sub>	output voltage	Active mode and Power-down mode	<sup>[1]</sup> -0.5	+4.6	V
I <sub>O</sub>	output current	V <sub>O</sub> = 0 V to V <sub>CC</sub>	-	±20	mA
I <sub>CC</sub>	supply current		-	50	mA
I <sub>GND</sub>	ground current		-50	-	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = -40 °C to +125 °C	<sup>[2]</sup> -	250	mW

[1] The minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SC-88 packages: above 87.5 °C the value of P<sub>tot</sub> derates linearly with 4.0 mW/K.

For X2SON6 and XSON6 packages: above 118 °C the value of P<sub>tot</sub> derates linearly with 7.8 mW/K.

## 9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	supply voltage		0.8	3.6	V
V <sub>I</sub>	input voltage		0	3.6	V
V <sub>O</sub>	output voltage	Active mode	0	V <sub>CC</sub>	V
		Power-down mode; V <sub>CC</sub> = 0 V	0	3.6	V
T <sub>amb</sub>	ambient temperature		-40	+125	°C
Δt/ΔV	input transition rise and fall rate	V <sub>CC</sub> = 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
<b>T<sub>amb</sub> = 25 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.75 × V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.11	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.32	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	2.05	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.72	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.6	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3 × V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.31	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.31	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.31	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.44	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.31	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.44	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.2	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.2	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.5	μA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	40	μA
C <sub>I</sub>	input capacitance	V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND or V <sub>CC</sub>	-	0.8	-	pF
C <sub>O</sub>	output capacitance	V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V	-	1.7	-	pF

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>T<sub>amb</sub> = -40 °C to +85 °C</b>							
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V	
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V	
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V	
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.7 × V <sub>CC</sub>	-	-	V	
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.03	-	-	V	
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.30	-	-	V	
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.97	-	-	V	
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.85	-	-	V	
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.67	-	-	V	
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.55	-	-	V	
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V	
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3 × V <sub>CC</sub>	V	
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.37	V	
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.35	V	
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.33	V	
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.45	V	
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.33	V	
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.45	V	
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.5	μA	
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.5	μA	
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.6	μA	
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.9	μA	
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	-	50	μA

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>							
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.75 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.70 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V	
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.25 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.30 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V	
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.11	-	-	V	
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.6 × V <sub>CC</sub>	-	-	V	
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	0.93	-	-	V	
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.17	-	-	V	
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.77	-	-	V	
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.67	-	-	V	
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.40	-	-	V	
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.30	-	-	V	
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.11	V	
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.33 × V <sub>CC</sub>	V	
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.41	V	
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.39	V	
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.36	V	
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V	
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.36	V	
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.50	V	
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	μA	
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	μA	
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.75	μA	
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1.4	μA	
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	-	75	μA

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

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

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

Symbol	Parameter	Conditions	25 °C			−40 °C to +125 °C			Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max (85 °C)	Max (125 °C)	
<b>C<sub>L</sub> = 5 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see <a href="#">Figure 9</a> [2]							
		V <sub>CC</sub> = 0.8 V	-	19.9	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.3	5.7	11.2	2.1	11.4	12.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.7	4.0	6.5	1.9	7.0	7.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.6	3.2	5.2	1.5	5.8	6.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	2.5	3.8	1.1	4.2	4.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.2	2.2	3.2	0.9	3.5	3.9	ns
<b>C<sub>L</sub> = 10 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see <a href="#">Figure 9</a> [2]							
		V <sub>CC</sub> = 0.8 V	-	23.5	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.7	6.6	12.8	2.4	13.0	14.3	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	4.6	7.5	2.3	8.1	9.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.8	6.0	1.8	6.7	7.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.0	4.5	1.5	5.0	5.5	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.6	2.8	3.9	1.3	4.2	4.7	ns
<b>C<sub>L</sub> = 15 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see <a href="#">Figure 9</a> [2]							
		V <sub>CC</sub> = 0.8 V	-	27.2	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.1	7.4	14.3	2.7	14.8	16.3	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.4	5.1	8.5	2.6	9.2	10.2	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.2	6.8	2.0	7.6	8.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.5	5.1	1.8	5.7	6.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.9	3.2	4.5	1.6	4.9	5.4	ns
<b>C<sub>L</sub> = 30 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see <a href="#">Figure 9</a> [2]							
		V <sub>CC</sub> = 0.8 V	-	35.3	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.1	9.6	19.1	3.5	19.9	21.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.2	6.7	11.1	3.3	12.1	13.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	5.5	8.9	2.6	10.1	11.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.8	4.6	6.6	2.5	7.5	8.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.6	4.3	6.0	2.3	6.4	7.1	ns

Table 8. Dynamic characteristics ...continued

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

Symbol	Parameter	Conditions	25 °C			−40 °C to +125 °C			Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max (85 °C)	Max (125 °C)	
<b><math>C_L = 5 \text{ pF}, 10 \text{ pF}, 15 \text{ pF} \text{ and } 30 \text{ pF}</math></b>									
$C_{PD}$	power dissipation capacitance	$f_i = 1 \text{ MHz}; V_I = \text{GND to } V_{CC}$ <sup>[3]</sup>							
		$V_{CC} = 0.8 \text{ V}$	-	2.6	-	-	-	-	pF
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	-	2.7	-	-	-	-	pF
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	-	2.8	-	-	-	-	pF
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	-	2.9	-	-	-	-	pF
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	3.4	-	-	-	-	pF
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	-	4.0	-	-	-	-	pF

[1] All typical values are measured at nominal  $V_{CC}$ .[2]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .[3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ ).

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

 $f_i$  = 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.

## 12. Waveforms

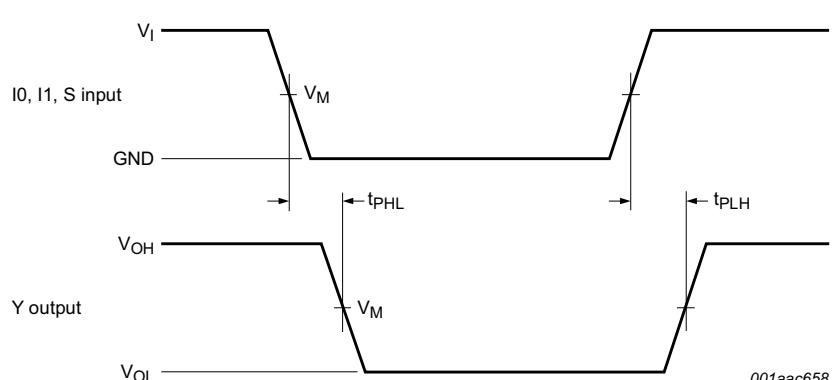
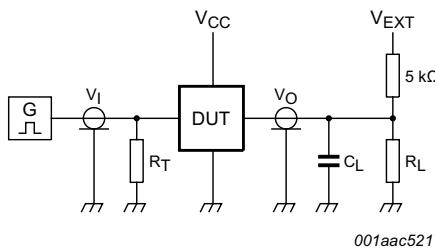
Measurement points are given in [Table 9](#).Logic levels:  $V_{OL}$  and  $V_{OH}$  are typical output voltage levels that occur with the output load.Fig 9. The data inputs ( $I0, I1$ ) and common data select input (S) to output (Y) propagation delays

Table 9. Measurement points

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



Test data is given in [Table 10](#).

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 10. Test data**

Supply voltage	Load	$V_{EXT}$	$t_{PLH}, t_{PHL}$	$t_{PZH}, t_{PHZ}$	$t_{PZL}, t_{PLZ}$
$V_{CC}$	$C_L$	$R_L$ <sup>[1]</sup>			
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	$2 \times V_{CC}$

[1] For measuring enable and disable times  $R_L = 5 \text{ k}\Omega$ , for measuring propagation delays, set-up and hold times and pulse width  $R_L = 1 \text{ M}\Omega$ .

## 13. Package outline

Plastic surface-mounted package; 6 leads

SOT363

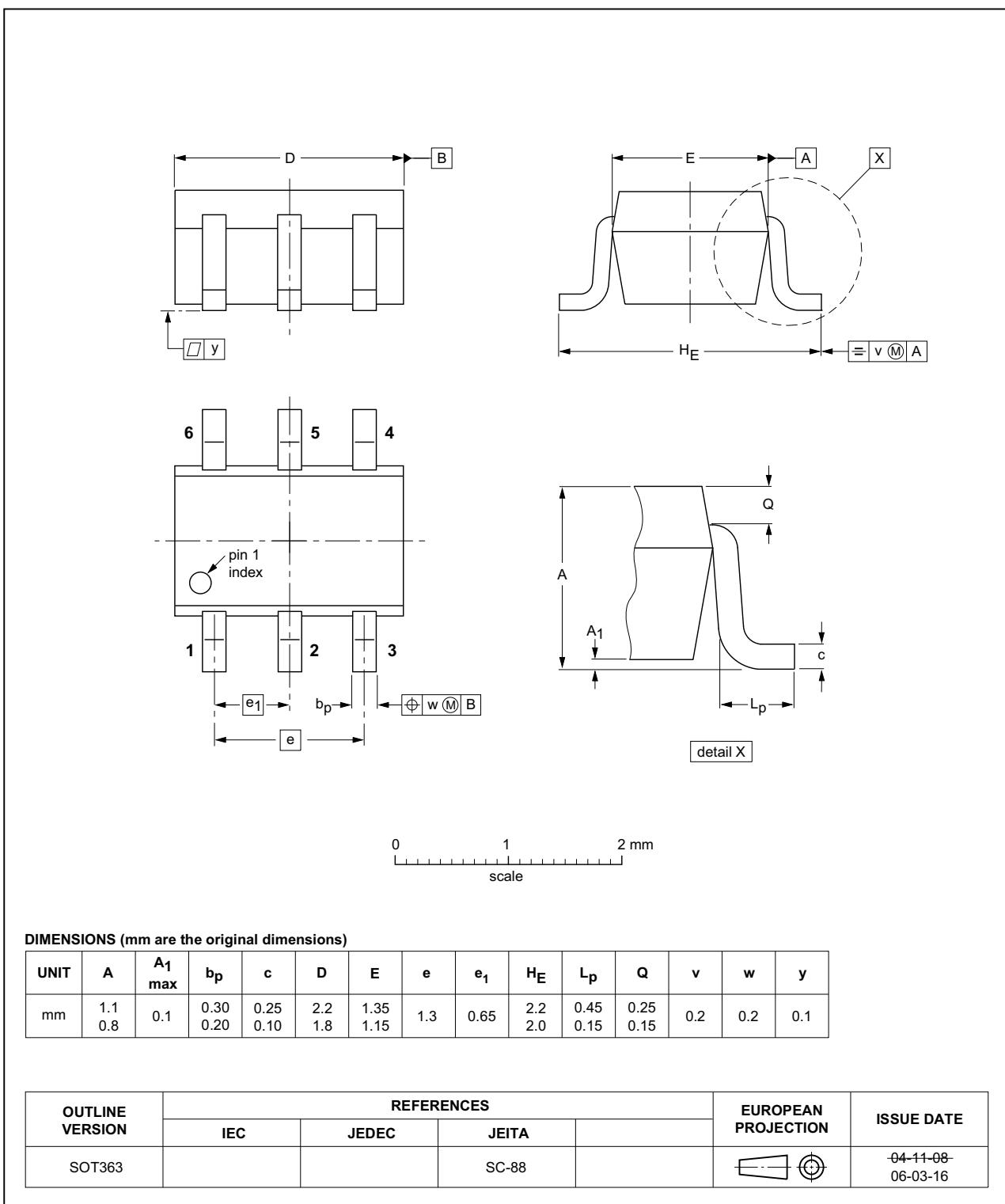


Fig 11. Package outline SOT363 (SC-88)

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

SOT886

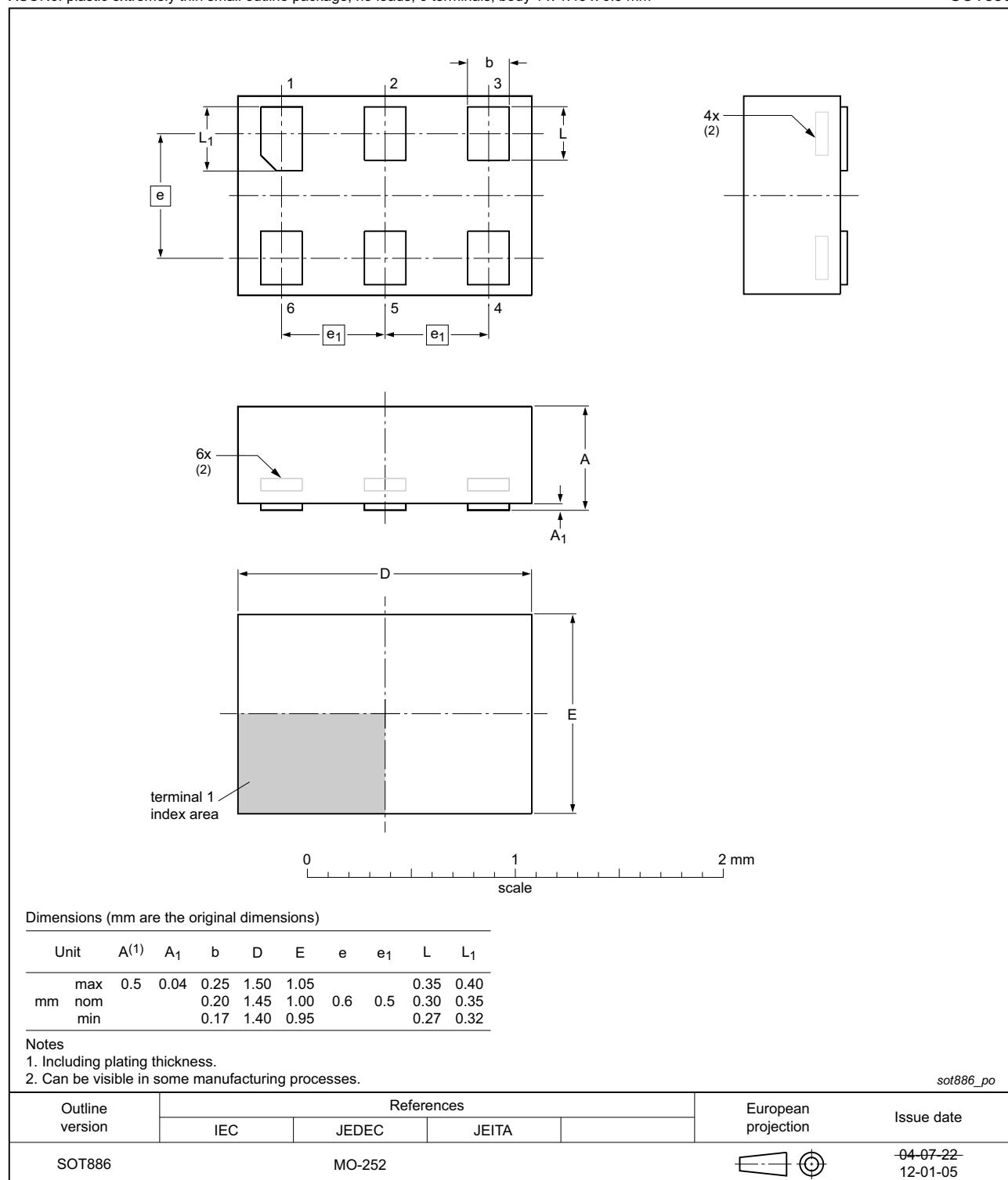
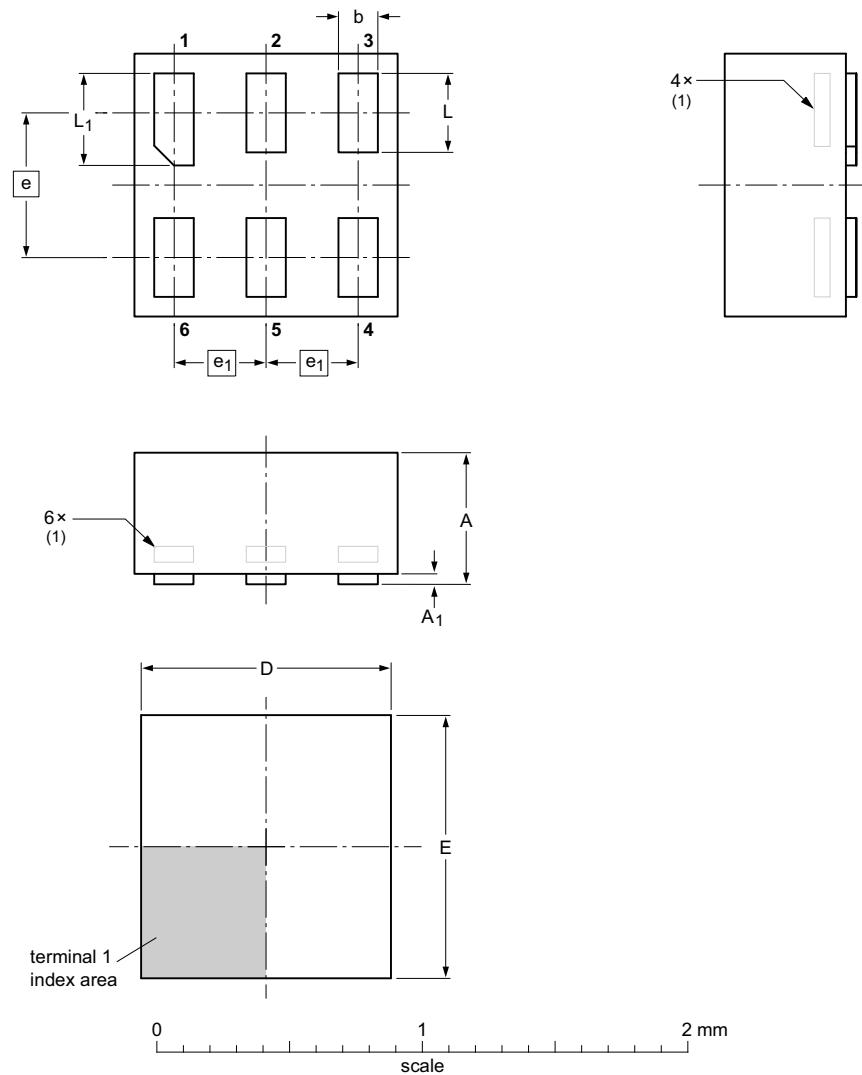


Fig 12. Package outline SOT886 (XSON6)

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

SOT891



## DIMENSIONS (mm are the original dimensions)

UNIT	A <sub>max</sub>	A <sub>1max</sub>	b	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
mm	0.5	0.04	0.20 0.12	1.05 0.95	1.05 0.95	0.55	0.35	0.35 0.27	0.40 0.32

## Note

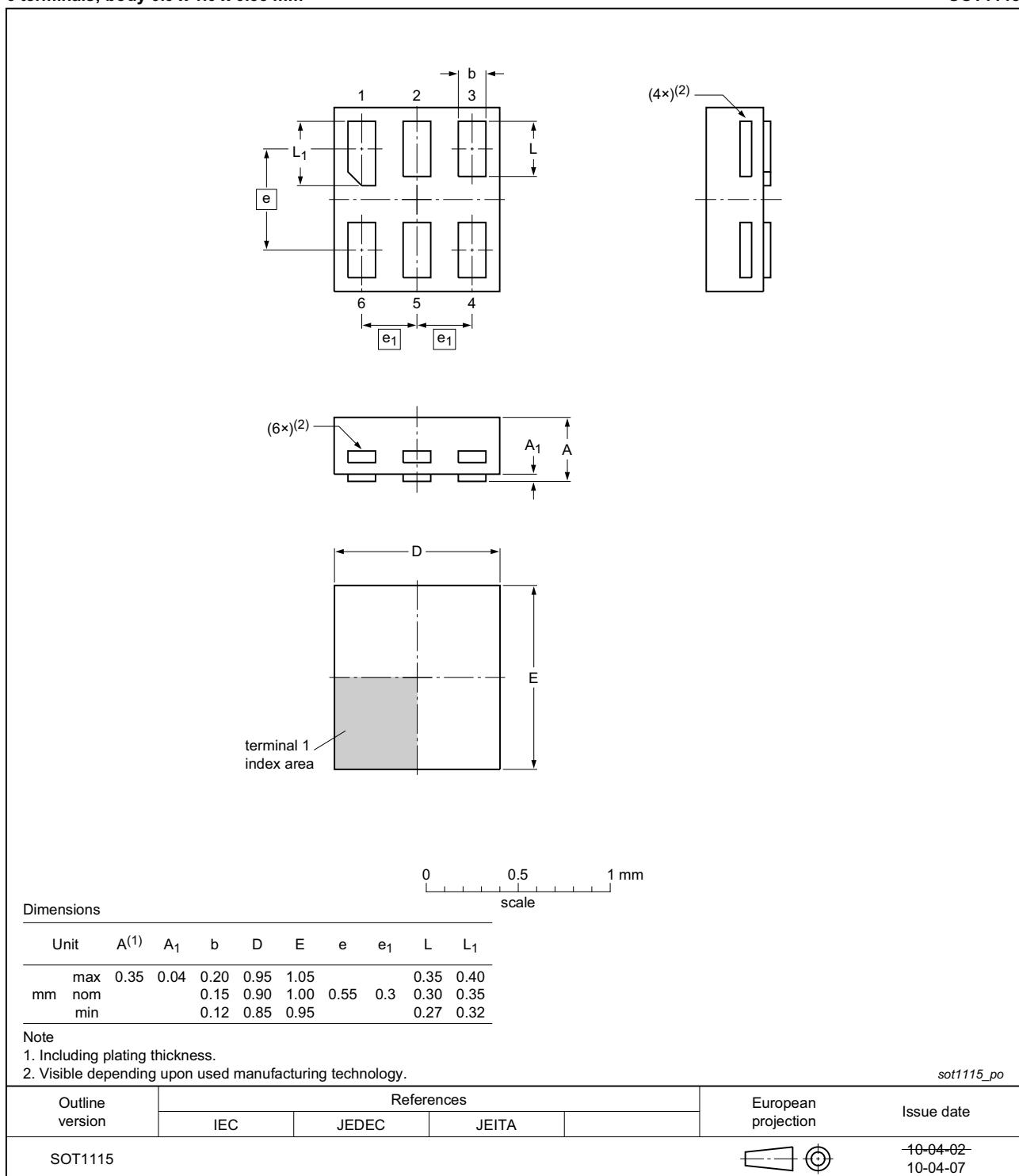
1. Can be visible in some manufacturing processes.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT891						05-04-06 07-05-15

Fig 13. Package outline SOT891 (XSON6)

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

SOT1115



**Fig 14. 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

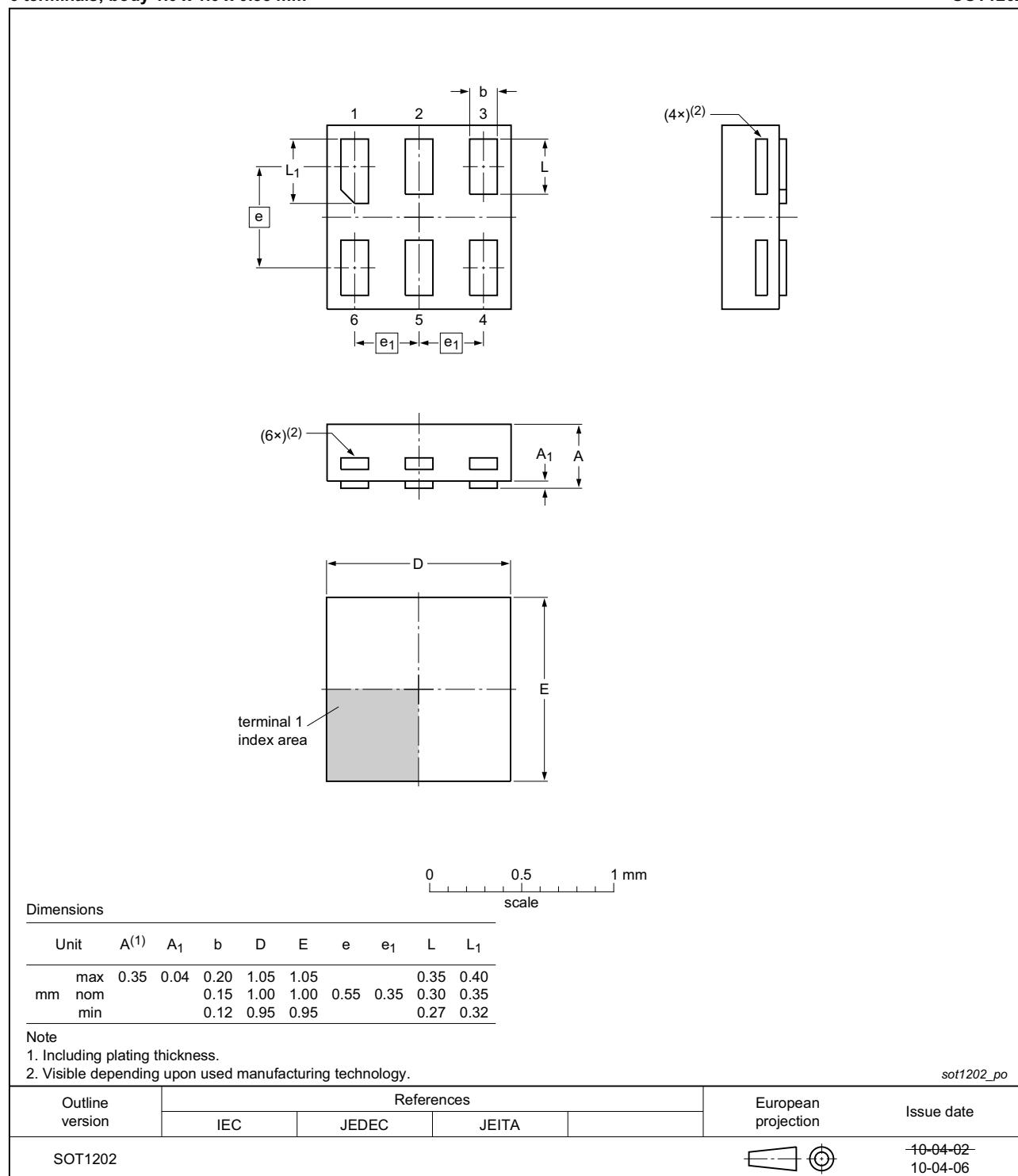


Fig 15. Package outline SOT1202 (XSON6)

X2SON6: plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.0 x 0.8 x 0.35 mm

SOT1255

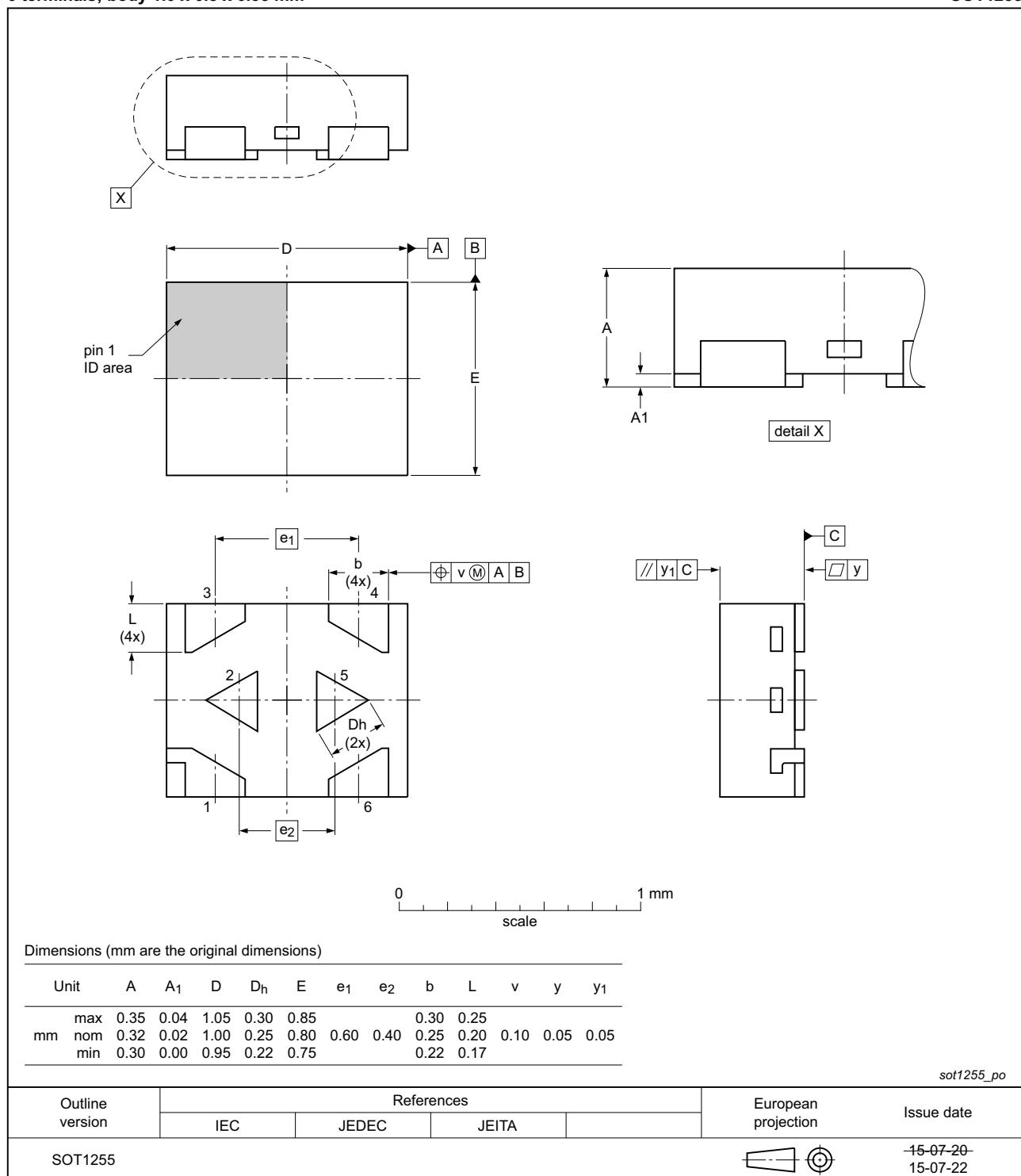


Fig 16. Package outline SOT1255 (X2SON6)

## 14. Abbreviations

**Table 11. Abbreviations**

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

## 15. Revision history

**Table 12. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G157 v.6	20150916	Product data sheet	-	74AUP1G157 v.5
Modifications:	• Added type number 74AUP1G157GX (SOT1255/X2SON6).			
74AUP1G157 v.5	20120622	Product data sheet	-	74AUP1G157 v.4
Modifications:	• Package outline drawing of SOT886 ( <a href="#">Figure 12</a> ) modified.			
74AUP1G157 v.4	20111129	Product data sheet	-	74AUP1G157 v.3
Modifications:	• Legal pages updated.			
74AUP1G157 v.3	20101028	Product data sheet	-	74AUP1G157 v.2
74AUP1G157 v.2	20080205	Product data sheet	-	74AUP1G157 v.1
74AUP1G157 v.1	20061109	Product data sheet	-	-

## 16. Legal information

### 16.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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 URL <http://www.nexperia.com>.

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