

# 74AUP2G157

## Low-power 2-input multiplexer

Rev. 8 — 15 March 2019

Product data sheet

## 1. General description

The 74AUP2G157 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,  $\bar{Y}$ ) presents the selected data in the true (non-inverted) and complement form. The enable input ( $\bar{E}$ ) is active LOW. When  $\bar{E}$  is HIGH, the output Y is forced LOW and the output  $\bar{Y}$  is forced HIGH regardless of all other input conditions.

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;  $I_{CC} = 0.9 \mu\text{A}$  (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 °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
74AUP2G157DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74AUP2G157GT	-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
74AUP2G157GF	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1 × 0.5 mm	SOT1089
74AUP2G157GM	-40 °C to +125 °C	XQFN8	plastic, extremely thin quad flat package; no leads; 8 terminals; body 1.6 × 1.6 × 0.5 mm	SOT902-2
74AUP2G157GN	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	SOT1116
74AUP2G157GS	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	SOT1203

### 4. Marking

Table 2. Marking codes

Type number	Marking code [1]
74AUP2G157DC	a2P
74AUP2G157GT	a2P
74AUP2G157GF	aP
74AUP2G157GM	a2P
74AUP2G157GN	aP
74AUP2G157GS	aP

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

### 5. Functional diagram

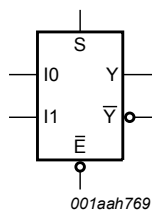


Fig. 1. Logic symbol

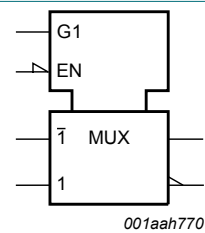


Fig. 2. IEC logic symbol

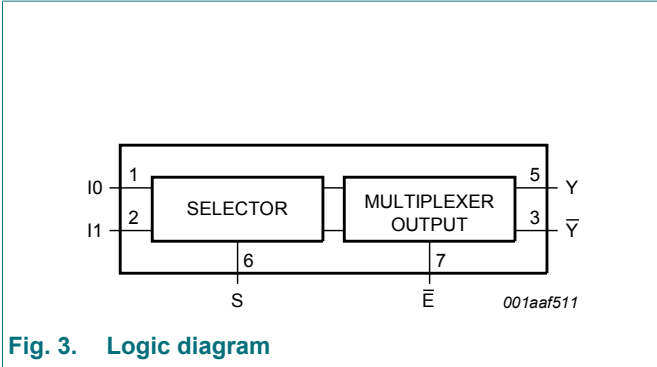


Fig. 3. Logic diagram

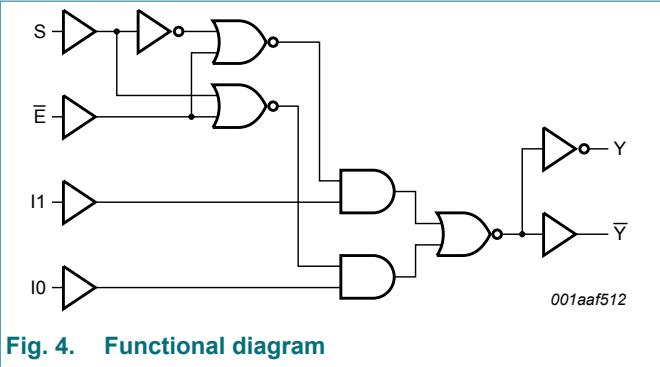


Fig. 4. Functional diagram

## 6. Pinning information

### 6.1. Pinning

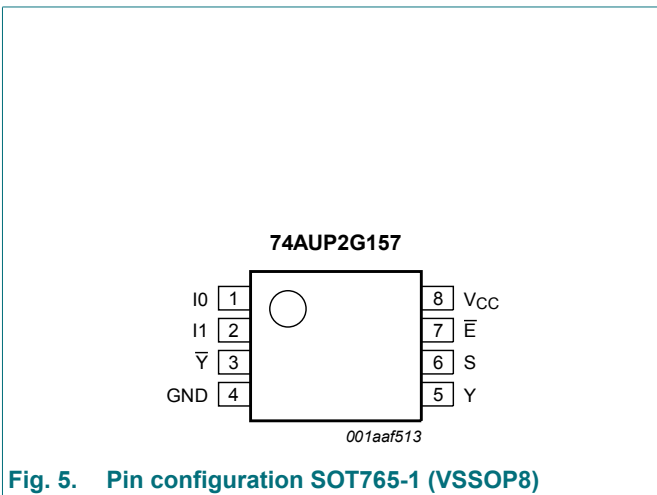


Fig. 5. Pin configuration SOT765-1 (VSSOP8)

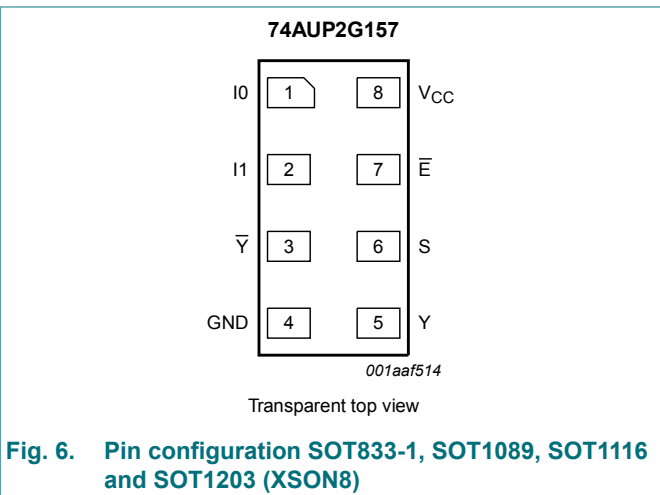


Fig. 6. Pin configuration SOT833-1, SOT1089, SOT1116 and SOT1203 (XSON8)

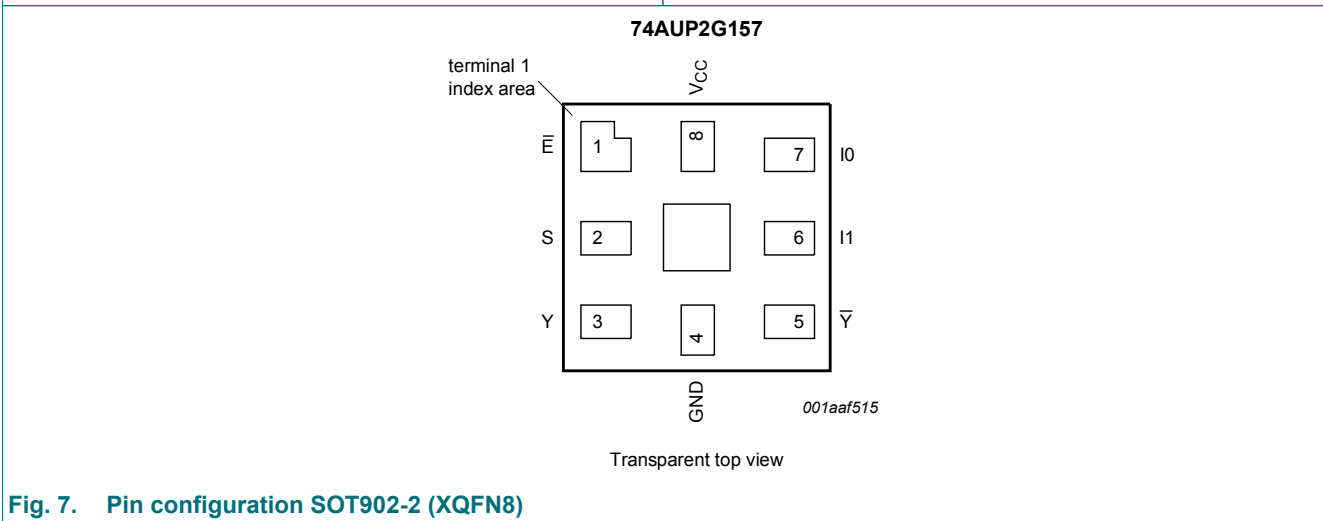


Fig. 7. Pin configuration SOT902-2 (XQFN8)

## 6.2. Pin description

Table 3. Pin description

Symbol	Pin		Description
	SOT765-1, SOT833-1, SOT1089, SOT1116 and SOT1203	SOT902-2	
I0	1	7	data input from source 0
I1	2	6	data input from source 1
$\bar{Y}$	3	5	complement multiplexer output
GND	4	4	ground (0 V)
Y	5	3	true multiplexer output
S	6	2	data select input
$\bar{E}$	7	1	enable input (active LOW)
V <sub>CC</sub>	8	8	supply voltage

## 7. Functional description

Table 4. Function table

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

Input				Output	
$\bar{E}$	S	I0	I1	Y	$\bar{Y}$
H	X	X	X	L	H
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

## 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	[1]	-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 [1]	-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 [2]	-	250	mW

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

[2] For VSSOP8 packages: above 110 °C the value of P<sub>tot</sub> derates linearly with 8.0 mW/K.  
For XSON8 and XQFN8 packages: above 118 °C the value of P<sub>tot</sub> derates linearly with 7.8 mW/K.

## 9. Recommended operating conditions

Table 6. Operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	supply voltage		0.8	3.6	V
$V_I$	input voltage		0	3.6	V
$V_O$	output voltage	Active mode	0	$V_{CC}$	V
		Power-down mode; $V_{CC} = 0$ V	0	3.6	V
$T_{amb}$	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 0.8$ V to 3.6 V	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><math>T_{amb} = 25</math> °C</b>						
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 0.8$ V	$0.70V_{CC}$	-	-	V
		$V_{CC} = 0.9$ V to 1.95 V	$0.65V_{CC}$	-	-	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	-	-	$0.30V_{CC}$	V
		$V_{CC} = 0.9$ V to 1.95 V	-	-	$0.35V_{CC}$	V
		$V_{CC} = 2.3$ V to 2.7 V	-	-	0.7	V
		$V_{CC} = 3.0$ V to 3.6 V	-	-	0.9	V
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = -20$ $\mu$ A; $V_{CC} = 0.8$ V to 3.6 V	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1$ mA; $V_{CC} = 1.1$ V	$0.75V_{CC}$	-	-	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 $V_{IL}$				
		$I_O = 20$ $\mu$ A; $V_{CC} = 0.8$ V to 3.6 V	-	-	0.1	V
		$I_O = 1.1$ mA; $V_{CC} = 1.1$ V	-	-	$0.3V_{CC}$	V
		$I_O = 1.7$ mA; $V_{CC} = 1.4$ V	-	-	0.31	V
		$I_O = 1.9$ mA; $V_{CC} = 1.65$ V	-	-	0.31	V
		$I_O = 2.3$ mA; $V_{CC} = 2.3$ V	-	-	0.31	V
		$I_O = 3.1$ mA; $V_{CC} = 2.3$ V	-	-	0.44	V
		$I_O = 2.7$ mA; $V_{CC} = 3.0$ V	-	-	0.31	V
$I_O = 4.0$ mA; $V_{CC} = 3.0$ V	-	-	0.44	V		

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_I$	input leakage current	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.1$	$\mu\text{A}$
$I_{\text{OFF}}$	power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$\Delta I_{\text{OFF}}$	additional power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.5	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	40	$\mu\text{A}$
$C_I$	input capacitance	$V_{CC} = 0 \text{ V to } 3.6 \text{ V}; V_I = \text{GND or } V_{CC}$	-	0.6	-	pF
$C_O$	output capacitance	$V_O = \text{GND}; V_{CC} = 0 \text{ V}$	-	1.3	-	pF
<b><math>T_{\text{amb}} = -40 \text{ }^\circ\text{C to } +85 \text{ }^\circ\text{C}</math></b>						
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 0.8 \text{ V}$	$0.70V_{CC}$	-	-	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	$0.65V_{CC}$	-	-	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	$V_{CC} = 0.8 \text{ V}$	-	-	$0.30V_{CC}$	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	-	-	$0.35V_{CC}$	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
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = -20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.7V_{CC}$	-	-	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
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = 20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.1	V
		$I_O = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3V_{CC}$	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	

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_I$	input leakage current	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$I_{\text{OFF}}$	power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$\Delta I_{\text{OFF}}$	additional power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.6$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.9	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	50	$\mu\text{A}$
<b><math>T_{\text{amb}} = -40 \text{ }^\circ\text{C to } +125 \text{ }^\circ\text{C}</math></b>						
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 0.8 \text{ V}$	$0.75V_{CC}$	-	-	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	$0.70V_{CC}$	-	-	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	$V_{CC} = 0.8 \text{ V}$	-	-	$0.25V_{CC}$	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	-	-	$0.30V_{CC}$	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
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = -20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	$V_{CC} - 0.11$	-	-	V
		$I_O = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.6V_{CC}$	-	-	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
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = 20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.11	V
		$I_O = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.33V_{CC}$	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
$I_I$	input leakage current	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	1.4	$\mu\text{A}$
		$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	75	$\mu\text{A}$
		$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.75$	$\mu\text{A}$
		$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	1.4	$\mu\text{A}$

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

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

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

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +125 °C			Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
<b>C<sub>L</sub> = 5 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	21.2	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.5	6.1	13.3	2.2	13.8	13.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.9	4.2	7.8	2.0	8.4	8.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.7	3.4	6.2	1.6	6.9	7.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.5	2.7	4.3	1.2	4.9	5.2	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.4	3.7	1.0	4.0	4.2	ns
		S to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	23.6	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.6	6.6	13.8	2.2	14.3	14.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.9	4.5	8.0	2.1	8.7	9.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.7	3.6	6.3	1.6	7.0	7.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	2.8	4.4	1.2	5.0	5.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.5	3.7	1.0	4.0	4.2	ns
		$\bar{E}$ to Y, $\bar{Y}$ ; see Fig. 9 [2]							
		V <sub>CC</sub> = 0.8 V	-	22.6	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.7	6.4	13.7	2.5	14.3	14.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	4.4	8.0	2.1	8.7	9.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.8	3.6	6.3	1.6	7.0	7.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	2.8	4.2	1.4	4.8	5.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.4	2.5	3.6	1.1	3.9	4.2	ns



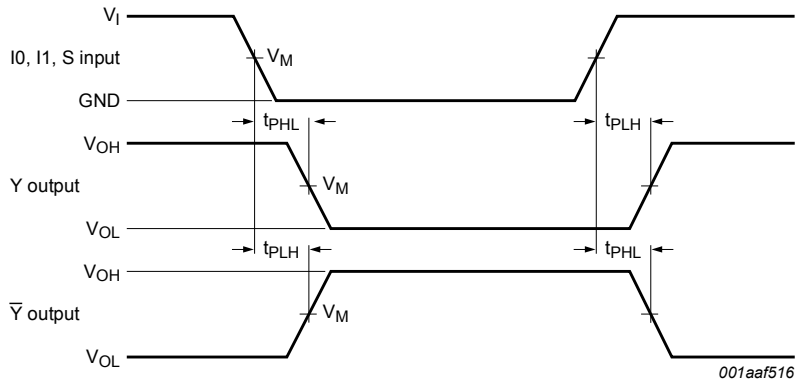
Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +125 °C			Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
<b>C<sub>L</sub> = 10 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	24.5	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.9	6.9	15.1	2.5	15.6	15.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	4.8	8.9	2.4	9.6	10.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.1	4.0	7.1	1.9	7.9	8.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.9	3.2	5.0	1.6	5.7	6.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	2.9	4.4	1.3	4.7	5.0	ns
		S to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	27.2	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.0	7.4	15.5	2.6	16.1	16.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	5.1	9.0	2.4	9.8	10.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.1	4.2	7.2	1.9	8.0	8.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.9	3.4	5.1	1.6	5.7	6.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	3.0	4.4	1.4	4.7	5.0	ns
		$\bar{E}$ to Y, $\bar{Y}$ ; see Fig. 9 [2]							
		V <sub>CC</sub> = 0.8 V	-	25.9	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.1	7.2	15.5	2.8	16.1	16.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	5.0	9.0	2.4	9.8	10.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	4.1	7.1	1.9	8.0	8.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.9	3.3	4.9	1.7	5.5	5.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	3.0	4.2	1.5	4.6	4.8	ns

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +125 °C			Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
<b>C<sub>L</sub> = 15 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	27.8	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.3	7.7	16.8	2.8	17.4	17.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	5.4	9.8	2.7	10.6	11.2	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.4	4.4	7.8	2.2	8.7	9.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.2	3.7	5.6	1.9	6.4	6.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	3.4	4.9	1.6	5.3	5.6	ns
		S to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	30.7	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.3	8.2	17.2	2.9	17.9	18.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.6	5.7	10.0	2.7	10.9	11.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.4	4.7	7.9	2.2	8.9	9.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.2	3.8	5.7	1.9	6.5	6.8	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	3.5	5.0	1.6	5.4	5.7	ns
		$\bar{E}$ to Y, $\bar{Y}$ ; see Fig. 9 [2]							
		V <sub>CC</sub> = 0.8 V	-	29.1	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.5	8.0	17.2	3.1	17.9	18.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.8	5.6	9.9	2.7	10.9	11.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.4	4.6	7.9	2.2	8.9	9.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.2	3.8	5.5	2.0	6.2	6.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	3.4	4.7	1.8	5.1	5.4	ns

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +125 °C			Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
<b>C<sub>L</sub> = 30 pF</b>									
t <sub>pd</sub>	propagation delay	I0, I1 to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	35.4	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.3	9.8	21.6	3.7	22.5	22.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.3	6.9	12.4	3.4	13.6	14.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.1	5.7	10.0	2.8	11.3	11.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.9	4.8	7.2	2.6	8.2	8.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.8	4.4	6.4	2.3	6.9	7.3	ns
		S to Y, $\bar{Y}$ ; see Fig. 8 [2]							
		V <sub>CC</sub> = 0.8 V	-	38.8	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.4	10.5	22.0	3.7	23.0	23.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.3	7.2	12.6	3.5	13.9	14.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.1	5.9	10.1	2.8	11.4	12.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.9	4.9	7.3	2.6	8.3	8.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.7	4.5	6.4	2.3	6.9	7.3	ns
		$\bar{E}$ to Y, $\bar{Y}$ ; see Fig. 9 [2]							
		V <sub>CC</sub> = 0.8 V	-	36.8	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.4	10.1	22.1	3.9	23.0	23.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.6	7.1	12.6	3.5	13.8	14.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.1	5.8	10.0	2.8	11.3	12.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.9	4.9	7.1	2.7	8.0	8.5	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.7	4.5	6.2	2.4	6.7	7.0	ns
<b>C<sub>L</sub> = 5 pF, 10 pF, 15 pF and 30 pF</b>									
C <sub>PD</sub>	power dissipation capacitance	f <sub>i</sub> = 1 MHz; V <sub>i</sub> = GND to V <sub>CC</sub> [3]							
		V <sub>CC</sub> = 0.8 V	-	5.2	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	5.5	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	5.7	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	6.0	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	6.9	-	-	-	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	7.9	-	-	-	-	pF

[1] All typical values are measured at nominal V<sub>CC</sub>.  
 [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.  
 [3] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  where:  
 f<sub>i</sub> = input frequency in MHz;  
 f<sub>o</sub> = output frequency in MHz;  
 C<sub>L</sub> = output load capacitance in pF;  
 V<sub>CC</sub> = supply voltage in V;  
 N = number of inputs switching;  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

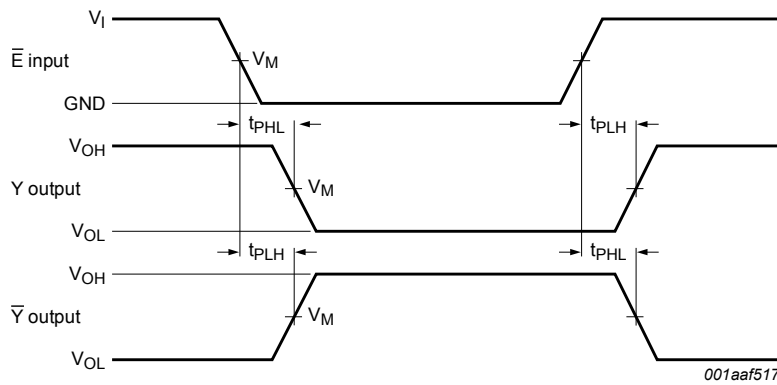
11.1. Waveforms and test circuit



Measurement points are given in Table 9.

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

Fig. 8. The data inputs (I0, I1) and data select input (S) to output (Y, Y-bar) propagation delays



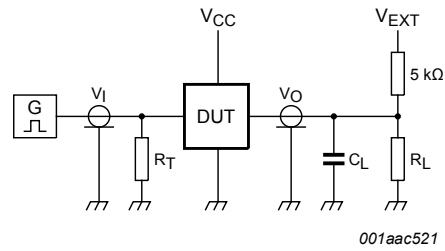
Measurement points are given in Table 9.

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

Fig. 9. The enable input (E-bar) to output (Y, Y-bar) propagation delays

Table 9. Measurement points

Supply voltage	Output	Input		
$V_{CC}$	$V_M$	$V_M$	$V_I$	$t_r = t_f$
0.8 V to 3.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ 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		$V_{EXT}$		
$V_{CC}$	$C_L$	$R_L$ [1]	$t_{PLH}$ , $t_{PHL}$	$t_{PZH}$ , $t_{PHZ}$	$t_{PZL}$ , $t_{PLZ}$	
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	$2 \times V_{CC}$	

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

## 12. Package outline

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

SOT765-1

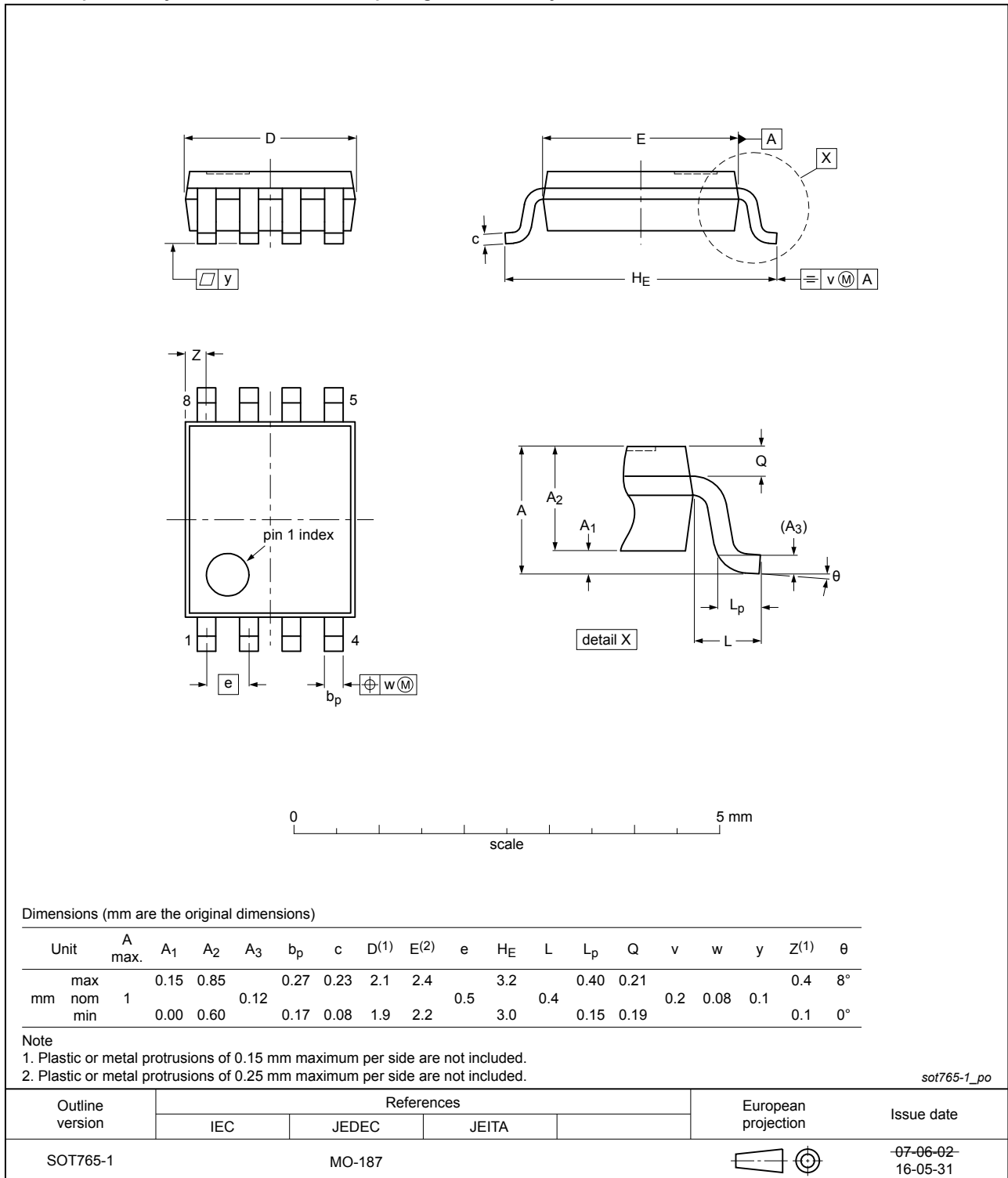


Fig. 11. Package outline SOT765-1 (VSSOP8)

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

SOT833-1

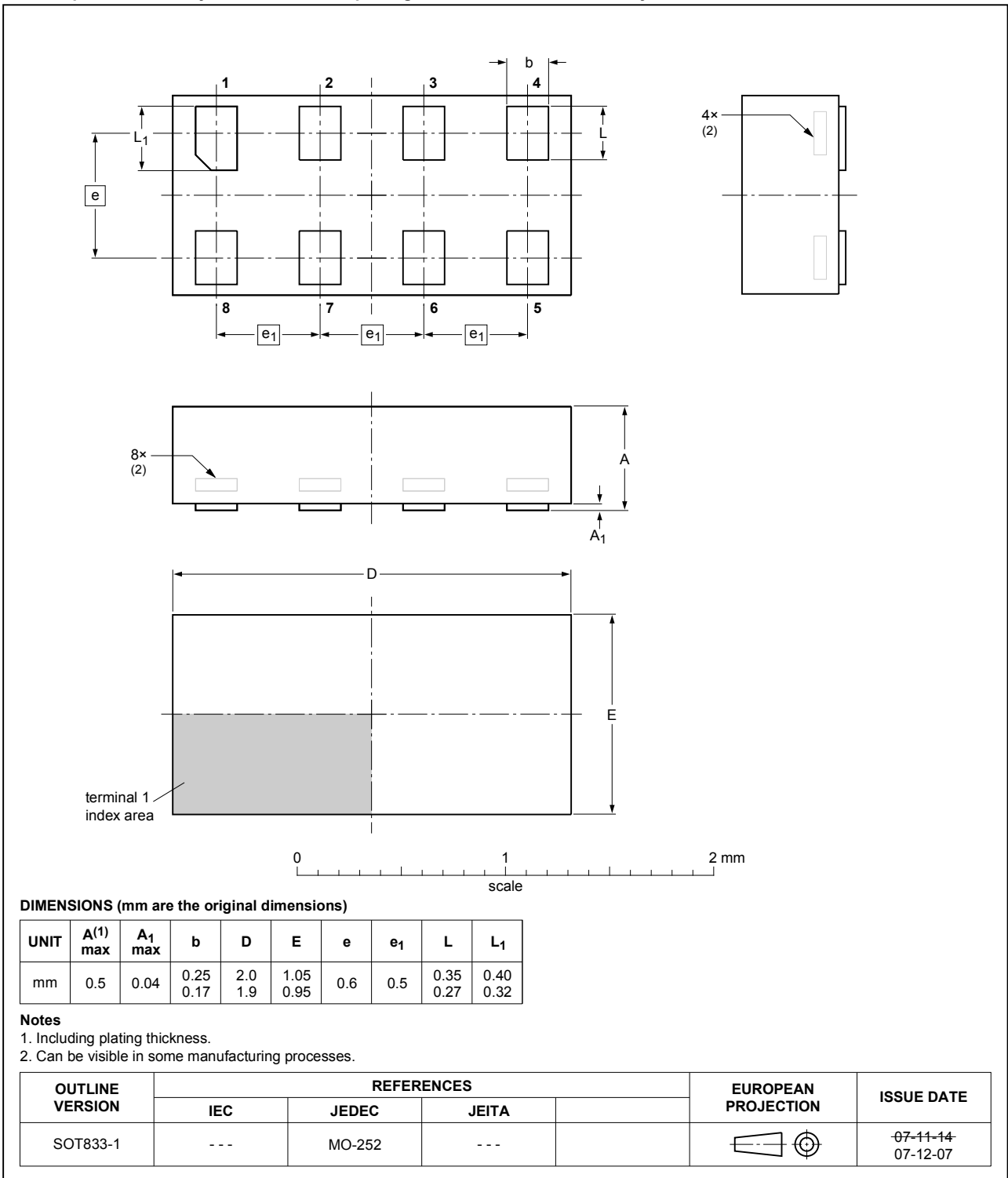


Fig. 12. Package outline SOT833-1 (XSON8)

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

SOT1089

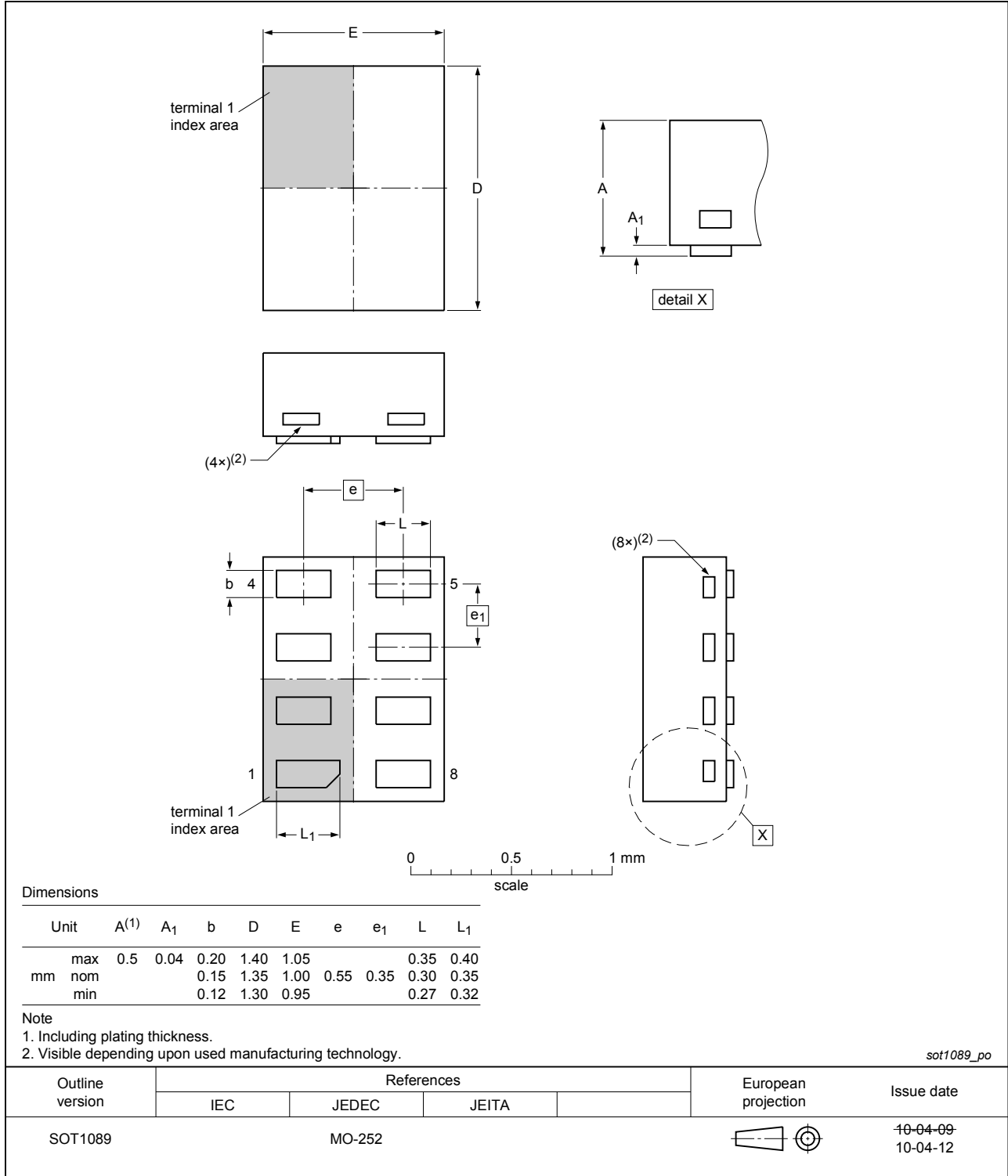


Fig. 13. Package outline SOT1089 (XSON8)



XQFN8: plastic, extremely thin quad flat package; no leads;  
8 terminals; body 1.6 x 1.6 x 0.5 mm

SOT902-2

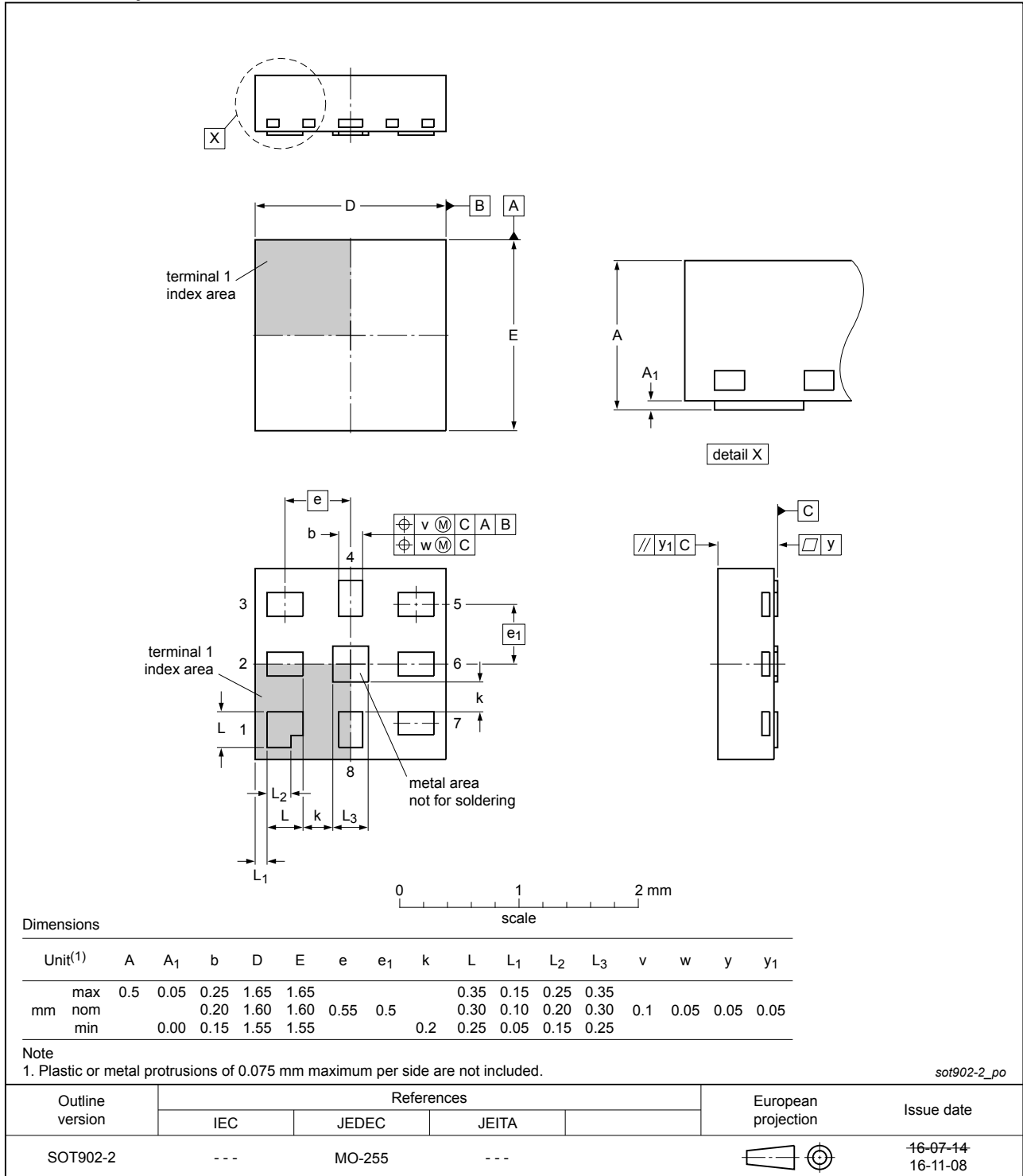


Fig. 14. Package outline SOT902-2 (XQFN8)

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

SOT1116

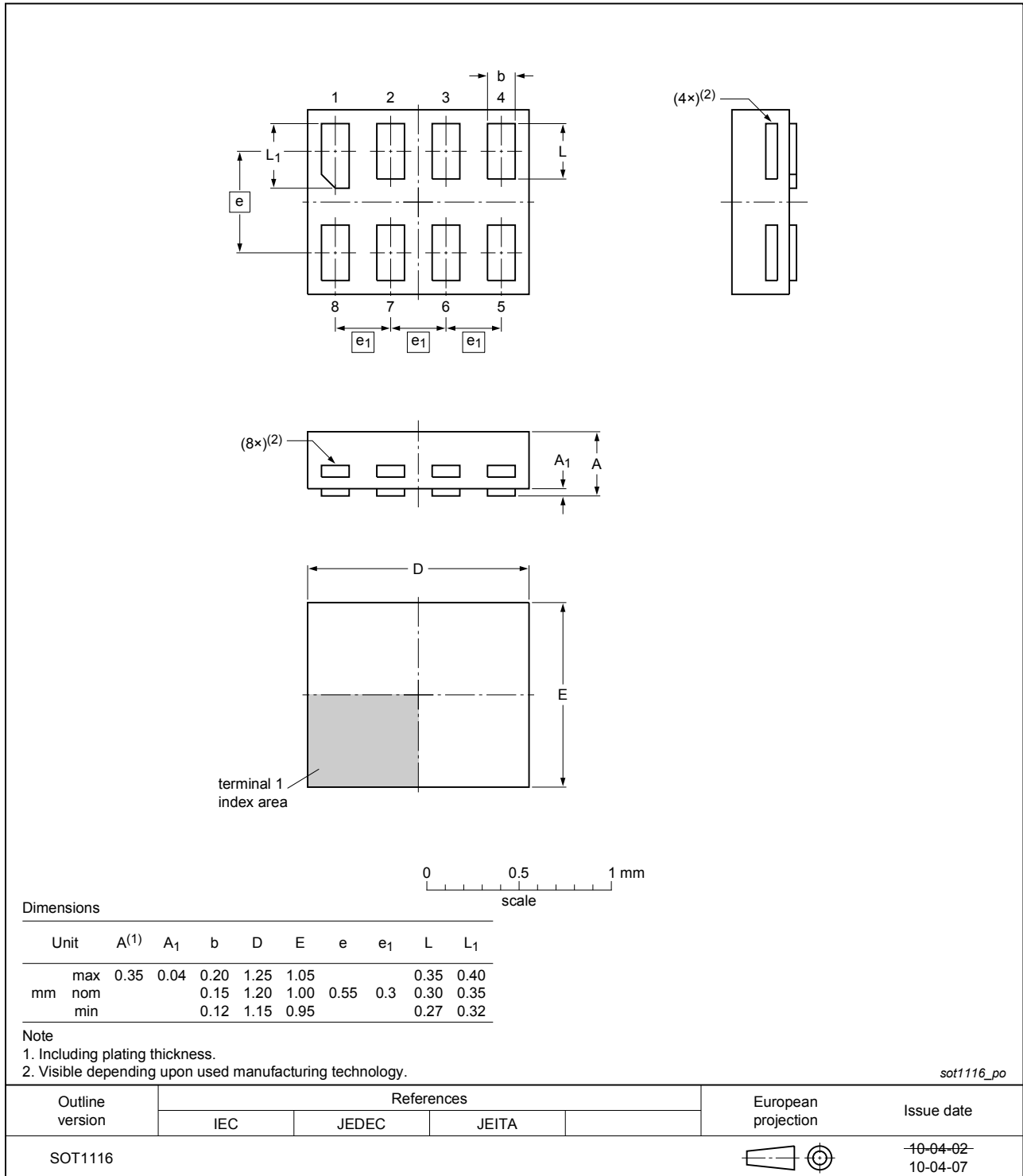


Fig. 15. Package outline SOT1116 (XSON8)

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

SOT1203

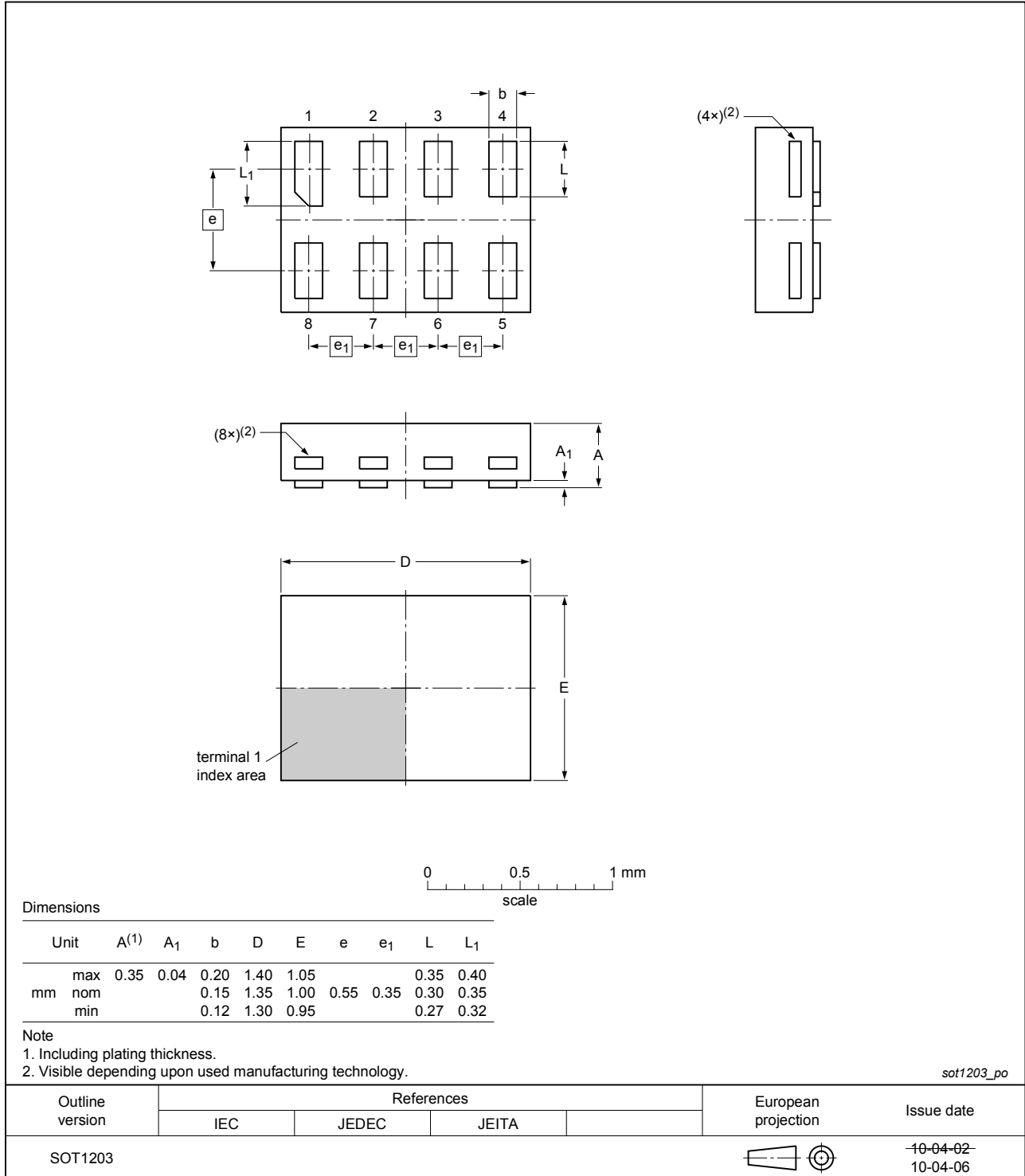


Fig. 16. Package outline SOT1203 (XSON8)

## 13. Abbreviations

Table 11. 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 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G157 v.8	20190315	Product data sheet	-	74AUP2G157 v.7
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Type number 74AUP2G157GD (SOT996-2) removed.</li> <li>Package outline drawing <a href="#">SOT765-1</a> (VSSOP8) updated.</li> <li>Package outline drawing <a href="#">SOT902-2</a> (XQFN8) updated.</li> </ul>			
74AUP2G157 v.7	20130118	Product data sheet	-	74AUP2G157 v.6
Modifications:	<ul style="list-style-type: none"> <li>For type number 74AUP2G157GD XSON8U has changed to XSON8.</li> </ul>			
74AUP2G157 v.6	20120606	Product data sheet	-	74AUP2G157 v.5
74AUP2G157 v.5	20111205	Product data sheet	-	74AUP2G157 v.4
74AUP2G157 v.4	20100730	Product data sheet	-	74AUP2G157 v.3
74AUP2G157 v.3	20080702	Product data sheet	-	74AUP2G157 v.2
74AUP2G157 v.2	20080219	Product data sheet	-	74AUP2G157 v.1
74AUP2G157 v.1	20061006	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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## Данный компонент на территории Российской Федерации

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