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 select 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, $\overline{Y}$) presents the selected data in the true (non-inverted) and complement form. The enable input ($\overline{E}$) is active LOW. When $\overline{E}$ is HIGH, the output Y is forced LOW and the output $\overline{Y}$ 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 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}
- 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

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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

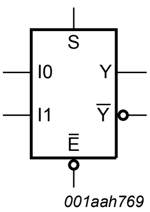


Fig. 1. Logic symbol

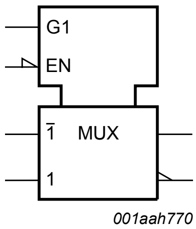


Fig. 2. IEC logic symbol

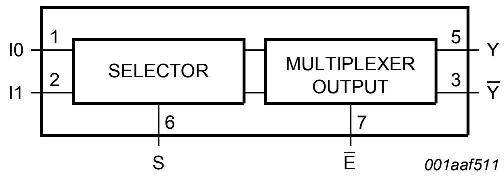


Fig. 3. Logic diagram

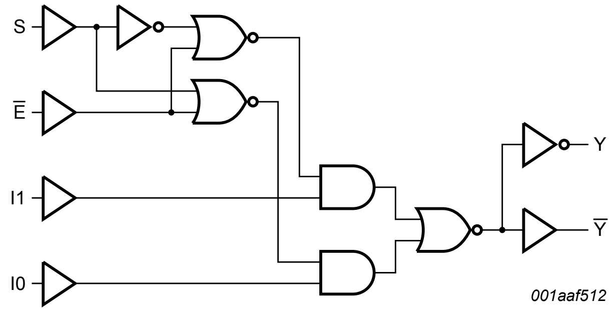


Fig. 4. Functional diagram

6. Pinning information

6.1. Pinning

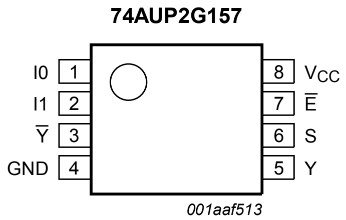
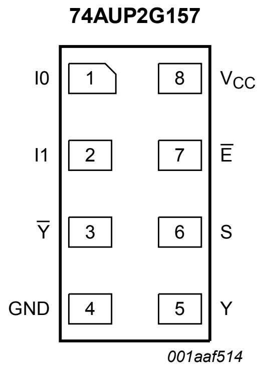
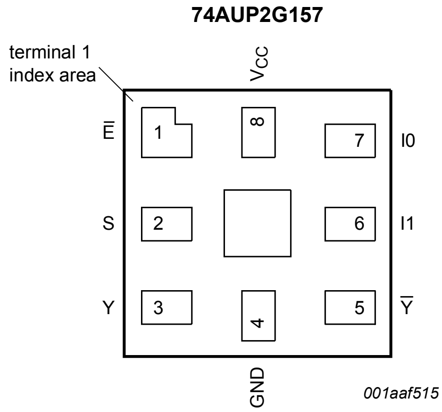


Fig. 5. Pin configuration SOT765-1 (VSSOP8)



Transparent top view

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



Transparent top view

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
$\overline{Y}$	3	5	complement multiplexer output
GND	4	4	ground (0 V)
Y	5	3	true multiplexer output
S	6	2	data select input
$\overline{E}$	7	1	enable input (active LOW)
V_{CC}	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	
$\overline{E}$	S	I0	I1	Y	$\overline{Y}$
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_{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 and Power-down mode	[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 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_{tot} derates linearly with 8.0 mW/K.
For XSON8 and XQFN8 packages: above 118 °C the value of P_{tot} 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
Δt/ΔV	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	0.70V_{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 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	0.75V_{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 μA; 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 = GND 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	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	40	μA
C_I	input capacitance	V_{CC} = 0 V to 3.6 V; V_I = GND or V_{CC}		-	0.6	-	pF
C_O	output capacitance	V_O = GND; V_{CC} = 0 V		-	1.3	-	pF
T_{amb} = -40 °C to +85 °C							
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 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		$0.7V_{CC}$	-	-	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		-	-	$0.3V_{CC}$	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_{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	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	50	μA
T_{amb} = -40 °C to +125 °C							
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V		0.75V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V		0.70V_{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		-	-	0.25V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V		-	-	0.30V_{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		0.6V_{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		-	-	0.33V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V		-	-	0.41	V
		I_O = 1.9 mA; V_{CC} = 1.65 V		-	-	0.39	V
		I_O = 2.3 mA; V_{CC} = 2.3 V		-	-	0.36	V
		I_O = 3.1 mA; V_{CC} = 2.3 V		-	-	0.50	V
		I_O = 2.7 mA; V_{CC} = 3.0 V		-	-	0.36	V
		I_O = 4.0 mA; V_{CC} = 3.0 V		-	-	0.50	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.75	μA
I_{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	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	75	μA

[1] One input at V_{CC} - 0.6 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_{amb} = 25 °C			T_{amb} = -40 °C to +125 °C			Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
C_L = 5 pF									
t_{pd}	propagation delay	I0, I1 to Y, $\overline{Y}$; see Fig. 8 [2]							
		V_{CC} = 0.8 V	-	21.2	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.5	6.1	13.3	2.2	13.8	13.9	ns
		V_{CC} = 1.4 V to 1.6 V	1.9	4.2	7.8	2.0	8.4	8.8	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	3.4	6.2	1.6	6.9	7.3	ns
		V_{CC} = 2.3 V to 2.7 V	1.5	2.7	4.3	1.2	4.9	5.2	ns
		V_{CC} = 3.0 V to 3.6 V	1.3	2.4	3.7	1.0	4.0	4.2	ns
		S to Y, $\overline{Y}$; see Fig. 8 [2]							
		V_{CC} = 0.8 V	-	23.6	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.6	6.6	13.8	2.2	14.3	14.5	ns
		V_{CC} = 1.4 V to 1.6 V	1.9	4.5	8.0	2.1	8.7	9.1	ns
		V_{CC} = 1.65 V to 1.95 V	1.7	3.6	6.3	1.6	7.0	7.4	ns
		V_{CC} = 2.3 V to 2.7 V	1.6	2.8	4.4	1.2	5.0	5.3	ns
		V_{CC} = 3.0 V to 3.6 V	1.3	2.5	3.7	1.0	4.0	4.2	ns
		$\overline{E}$ to Y, $\overline{Y}$; see Fig. 9 [2]							
		V_{CC} = 0.8 V	-	22.6	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.7	6.4	13.7	2.5	14.3	14.5	ns
		V_{CC} = 1.4 V to 1.6 V	2.1	4.4	8.0	2.1	8.7	9.1	ns
		V_{CC} = 1.65 V to 1.95 V	1.8	3.6	6.3	1.6	7.0	7.4	ns
		V_{CC} = 2.3 V to 2.7 V	1.6	2.8	4.2	1.4	4.8	5.1	ns
		V_{CC} = 3.0 V to 3.6 V	1.4	2.5	3.6	1.1	3.9	4.2	ns

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

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

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

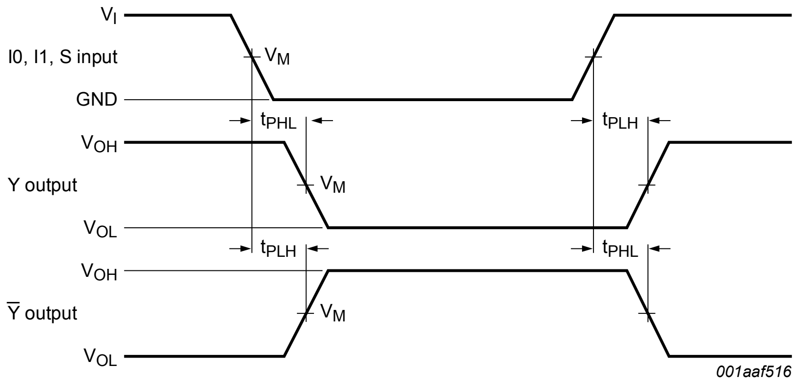
C_L = output load capacitance in pF;

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.

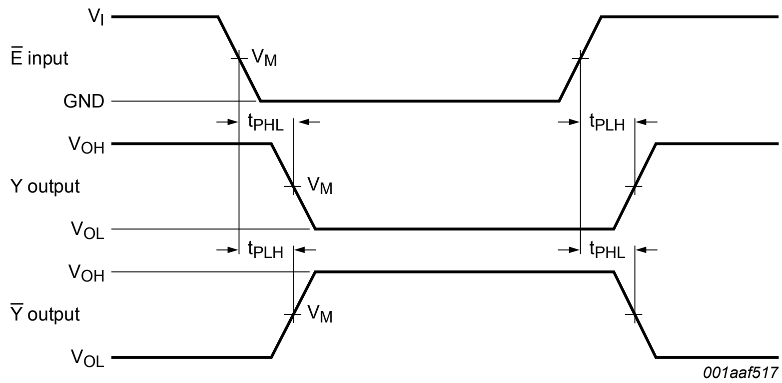
11.1. Waveforms and test circuit



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, $\overline{Y}$) propagation delays



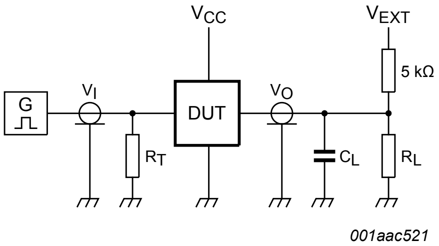
Measurement points are given in Table 9.

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

Fig. 9. The enable input ($\overline{E}$) to output (Y, $\overline{Y}$) 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 × V_{CC}	0.5 × V_{CC}	V_{CC}	≤ 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

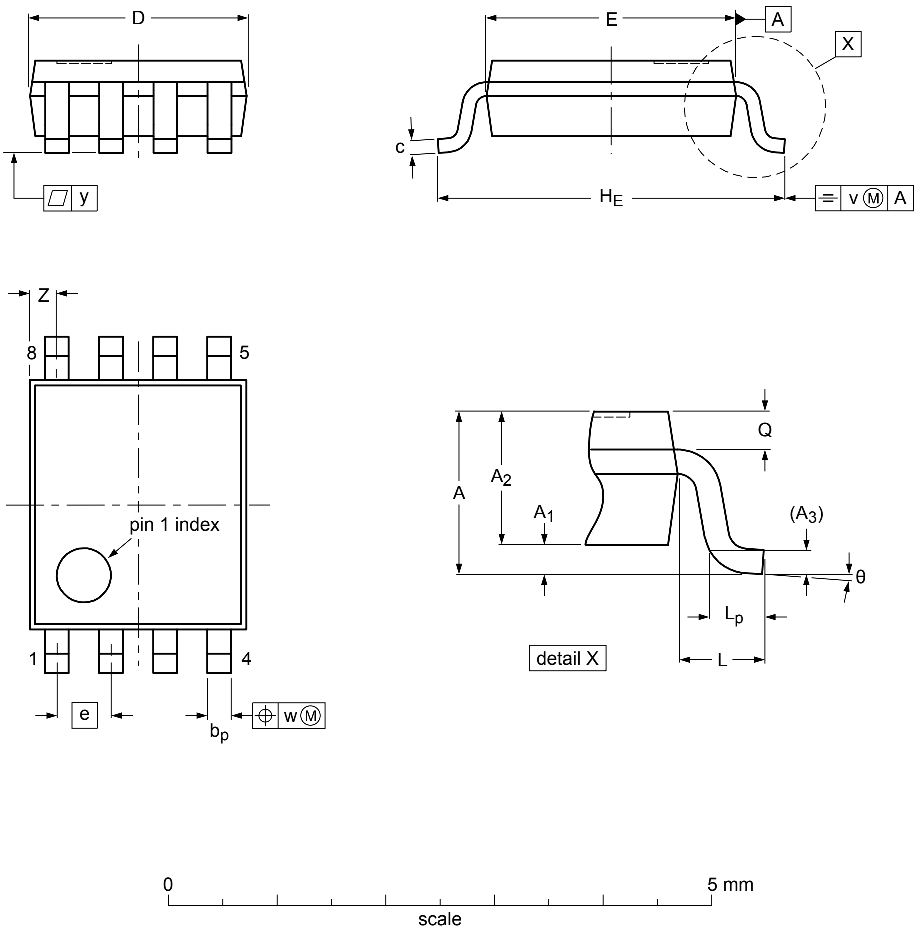
Table 10. Test data

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 × V_{CC}

[1] For measuring enable and disable times R_L = 5 kΩ.
For measuring propagation delays, setup and hold times and pulse width R_L = 1 MΩ.

12. Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm **SOT765-1**



Dimensions (mm are the original dimensions)

Unit		A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(2)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	max		0.15	0.85		0.27	0.23	2.1	2.4		3.2		0.40	0.21				0.4	8°
	nom	1			0.12					0.5		0.4			0.2	0.08	0.1		
	min		0.00	0.60		0.17	0.08	1.9	2.2		3.0		0.15	0.19				0.1	0°

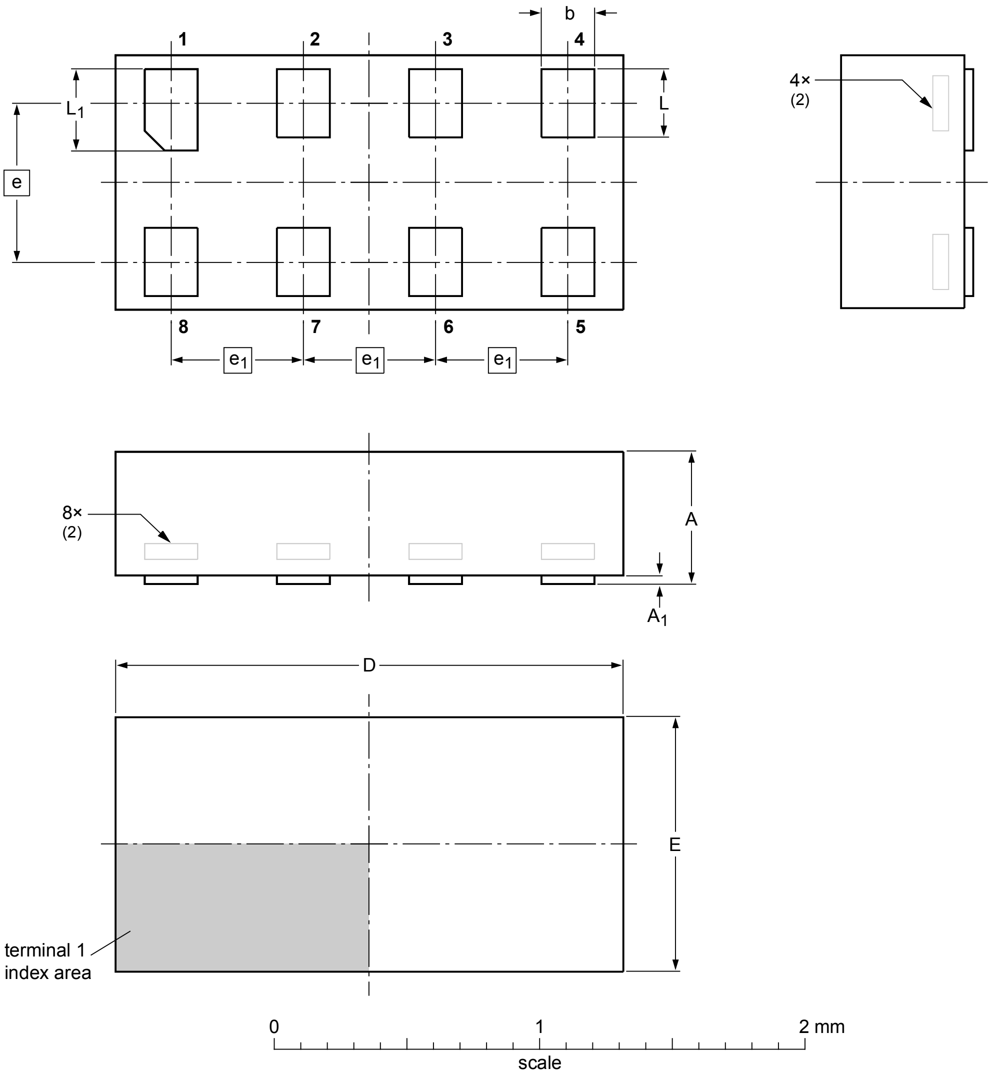
Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

sot765-1_po

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

Fig. 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**



DIMENSIONS (mm are the original dimensions)

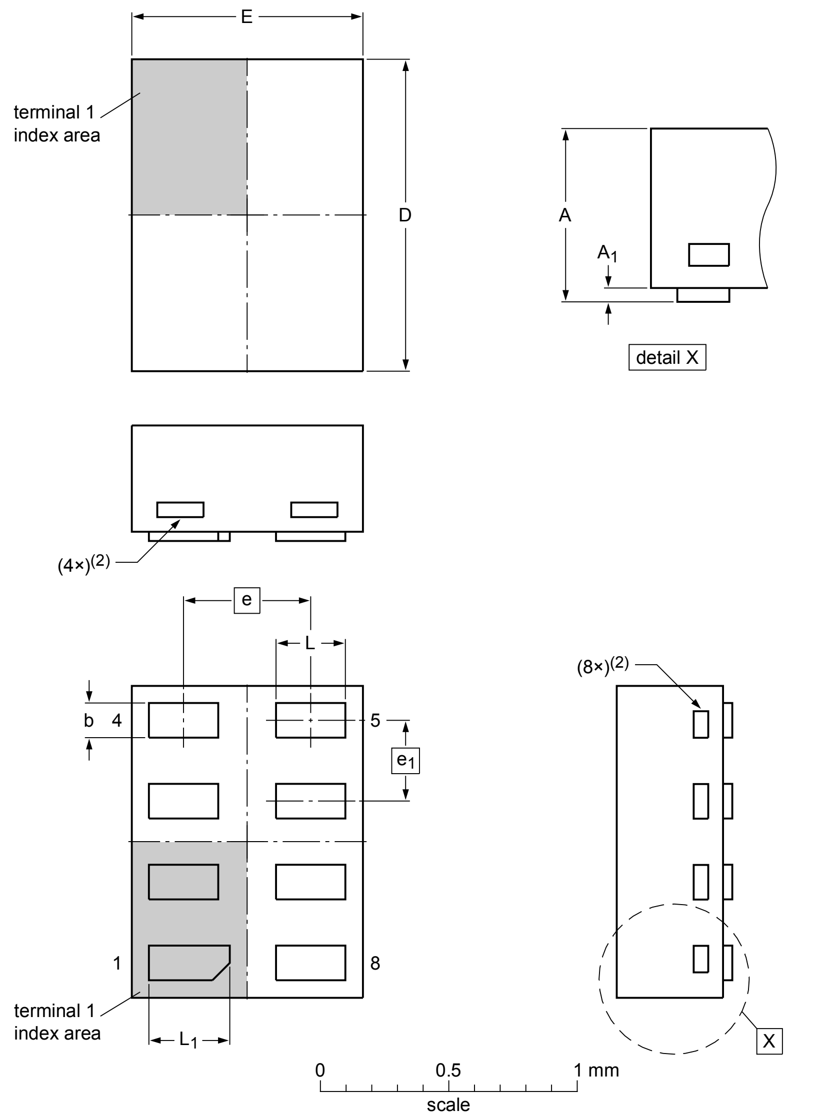
UNIT	A(1) max	A_1 max	b	D	E	e	e_1	L	L_1
mm	0.5	0.04	0.25 0.17	2.0 1.9	1.05 0.95	0.6	0.5	0.35 0.27	0.40 0.32

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

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

Fig. 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**



Dimensions

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
	max	0.5	0.04	0.20	1.40	1.05			0.35	0.40
mm	nom			0.15	1.35	1.00	0.55	0.35	0.30	0.35
	min			0.12	1.30	0.95			0.27	0.32

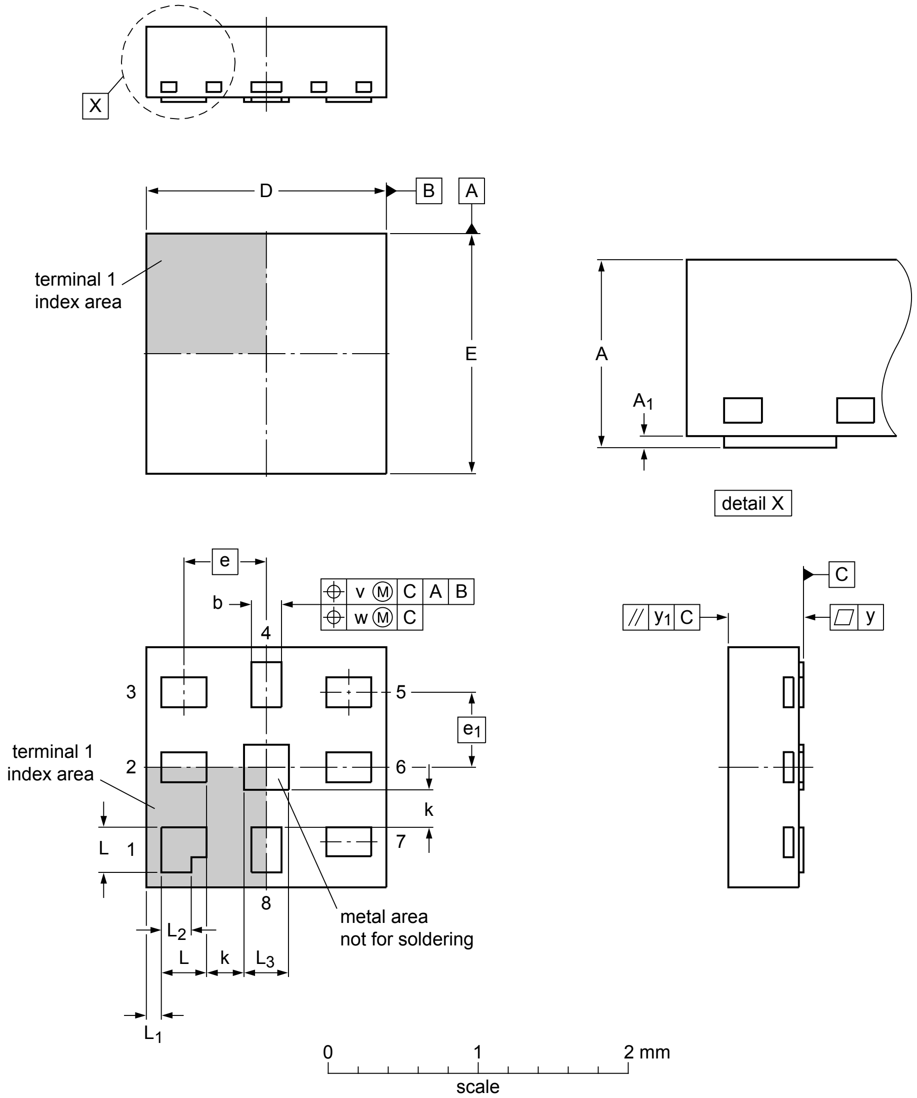
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1089_po

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

Fig. 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**



Dimensions

Unit[1]		A	A_1	b	D	E	e	e_1	k	L	L_1	L_2	L_3	v	w	y	y_1
	max	0.5	0.05	0.25	1.65	1.65				0.35	0.15	0.25	0.35				
mm	nom			0.20	1.60	1.60	0.55	0.5		0.30	0.10	0.20	0.30	0.1	0.05	0.05	0.05
	min		0.00	0.15	1.55	1.55			0.2	0.25	0.05	0.15	0.25				

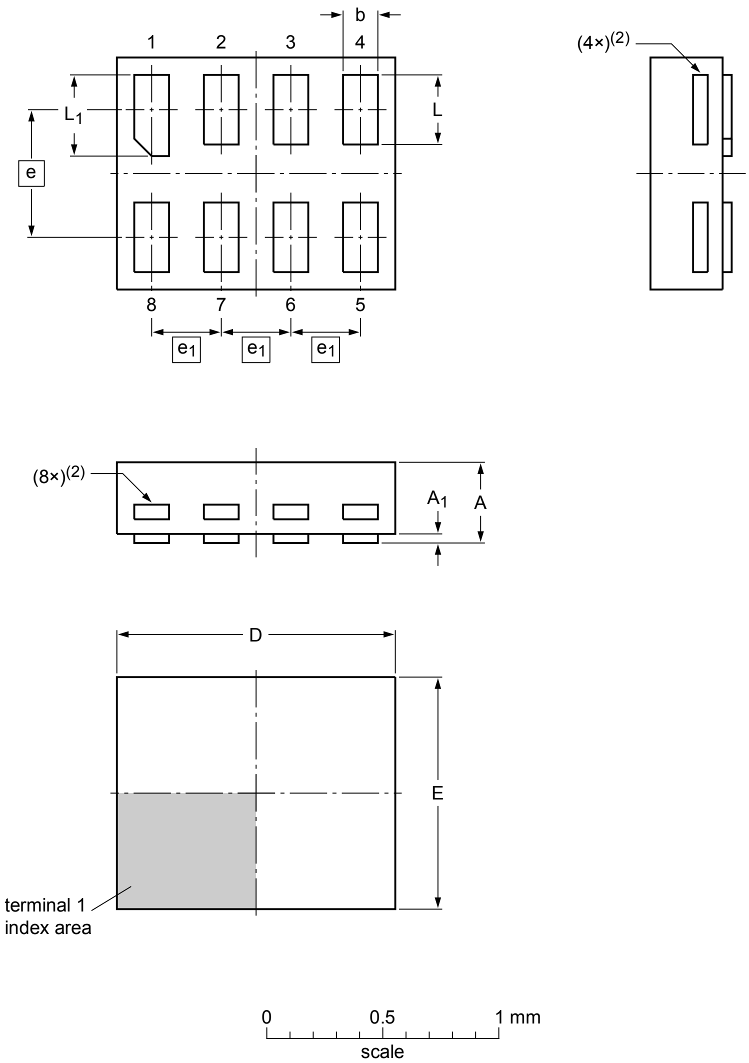
Note
1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot902-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT902-2	- - -	MO-255	- - -			~~16-07-14~~ 16-11-08

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**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	1.25	1.05			0.35	0.40
	nom			0.15	1.20	1.00	0.55	0.3	0.30	0.35
	min			0.12	1.15	0.95			0.27	0.32

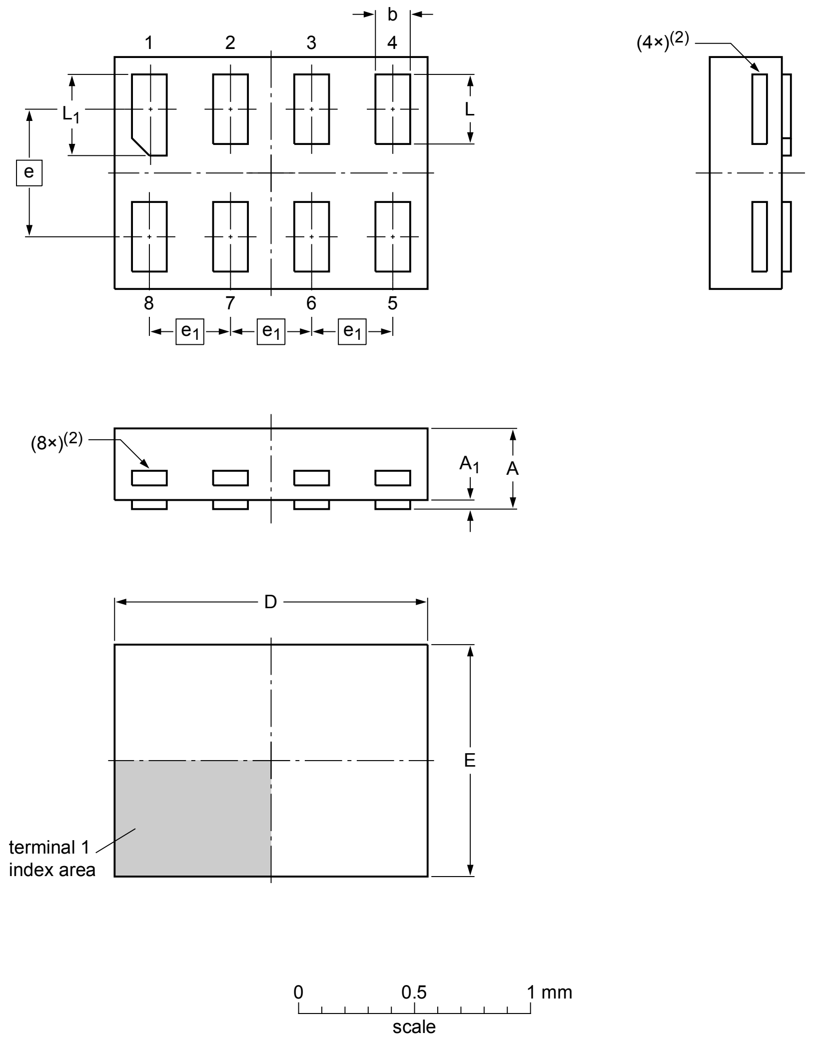
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1116_po

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

Fig. 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**



Dimensions

Unit		A(1)	A1	b	D	E	e	e1	L	L1
	max	0.35	0.04	0.20	1.40	1.05			0.35	0.40
mm	nom			0.15	1.35	1.00	0.55	0.35	0.30	0.35
	min			0.12	1.30	0.95			0.27	0.32

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

sot1203_po

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

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:	• 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. • Type number 74AUP2G157GD (SOT996-2) removed. • Package outline drawing SOT765-1 (VSSOP8) updated. • Package outline drawing SOT902-2 (XQFN8) updated.			
74AUP2G157 v.7	20130118	Product data sheet	-	74AUP2G157 v.6
Modifications:	• For type number 74AUP2G157GD XSON8U has changed to XSON8.			
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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