# 74AUP1G157

# Low-power 2-input multiplexer

Rev. 7 — 28 January 2019

**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<sub>CC</sub> = 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<sub>CC</sub>
- 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



Low-power 2-input multiplexer

# 3. Ordering information

**Table 1. Ordering information** 

Type number	Package	Package								
	Temperature range	Name	Description	Version						
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						

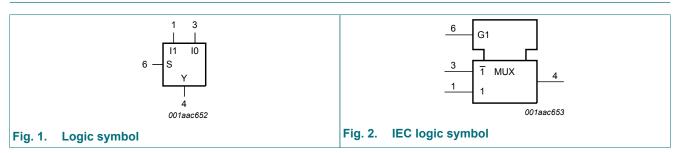
## 4. Marking

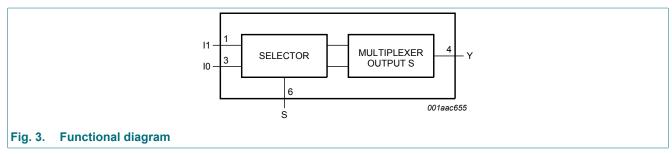
Table 2. Marking

Marking code [1]
аР

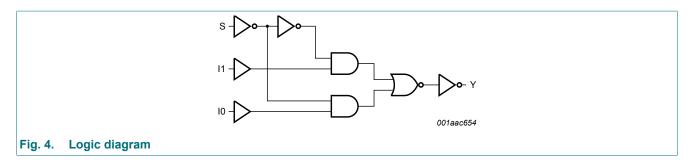
<sup>[1]</sup> The pin 1 indicator is located on the lower left corner of the device, below the marking code.

# 5. Functional diagram



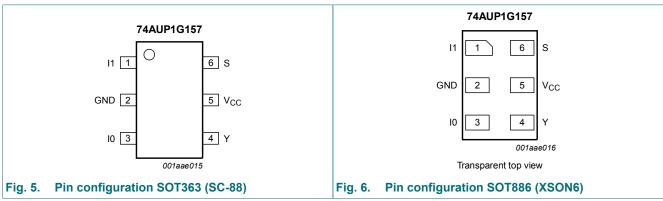


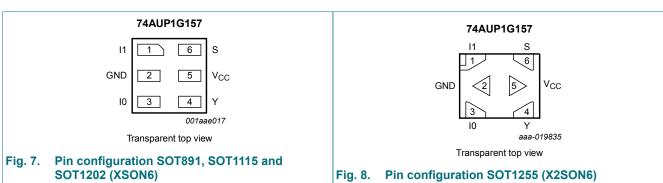
### Low-power 2-input multiplexer



# 6. Pinning information

## 6.1. Pinning





## 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
11	1	data input from source 1
GND	2	ground (0 V)
10	3	data input from source 0
Υ	4	multiplexer output
V <sub>CC</sub>	5	supply voltage
S	6	common data select input

Low-power 2-input multiplexer

## 7. Functional description

#### **Table 4. Function table**

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

Input	Output		
S	l1	10	Υ
L	X	L	L
L	Х	Н	Н
Н	L	X	L
Н	Н	X	Н

# 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
VI	input voltage	[1]	-0.5	+4.6	V
lok	output clamping current	V <sub>O</sub> < 0 V	-50	-	mA
Vo	output voltage	Active mode and Power-down mode [1]	-0.5	+4.6	V
Io	output current	$V_O = 0 \text{ V to } V_{CC}$	-	±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	$T_{amb} = -40  ^{\circ}\text{C} \text{ to } +125  ^{\circ}\text{C}$ [2]	-	250	mW

<sup>1]</sup> The minimum 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 <sub>CC</sub>	supply voltage		8.0	3.6	V
VI	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

<sup>[2]</sup> For SC-88 packages: above 87.5  $^{\circ}$ 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 Ptot derates linearly with 7.8 mW/K.

Low-power 2-input multiplexer

## 10. Static characteristics

### **Table 7. Static characteristics**

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

Symbo	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 2	25 °C					
V <sub>IH</sub>	HIGH-level input	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V
	voltage	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	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V
	voltage	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	$V_{I} = V_{IH}$ or $V_{IL}$				
	voltage	$I_{O}$ = -20 $\mu$ A; $V_{CC}$ = 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
		$I_{O}$ = -3.1 mA; $V_{CC}$ = 2.3 V	1.9	-	-	V
		$I_{\rm O}$ = -2.7 mA; $V_{\rm CC}$ = 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	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
	voltage	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
l <sub>l</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	μΑ
l <sub>OFF</sub>	power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.2	μΑ
Δl <sub>OFF</sub>	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 or $V_{CC}$ ; $I_{O}$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V	-	-	0.5	μΑ
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC}$ - 0.6 V; $I_O = 0$ A; $V_{CC} = 3.3$ V; One input at $V_{CC}$ - 0.6 V, other inputs at $V_{CC}$ or GND.	-	-	40	μА
Cı	input capacitance	$V_{CC}$ = 0 V to 3.6 V; $V_I$ = GND or $V_{CC}$	-	0.8	-	pF
Co	output capacitance	$V_O = GND; V_{CC} = 0 V$	-	1.7	-	pF

Symbo	I Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> =	-40 °C to +85 °C					
V <sub>IH</sub>	HIGH-level input	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V
	voltage	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	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V
	voltage	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	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
	voltage	$I_{O}$ = -20 $\mu$ A; $V_{CC}$ = 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
		$I_{O}$ = -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 <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.55	-	-	V
V <sub>OL</sub>	LOW-level output	$V_I = V_{IH}$ or $V_{IL}$				
02	voltage	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
		$I_0 = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.33	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-		0.45	V
		$I_0 = 2.7 \text{ mA; } V_{CC} = 3.0 \text{ V}$	-		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 <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	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.5	μA
ΔI <sub>OFF</sub>	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 <sub>CC</sub>	supply current	$V_{I} = GND \text{ or } V_{CC}; I_{O} = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.9	μA
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}; \text{ One input at } V_{CC} - 0.6 \text{ V},$ other inputs at $V_{CC}$ or GND.	-	-	50	μA
T <sub>amb</sub> =	-40 °C to +125 °C					
V <sub>IH</sub>	HIGH-level input	V <sub>CC</sub> = 0.8 V	0.75 × V <sub>CC</sub>	-	-	V
""	voltage	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	V <sub>CC</sub> = 0.8 V	-		0.25 × V <sub>CC</sub>	
- IL	voltage	V <sub>CC</sub> = 0.9 V to 1.95 V	_	_	0.30 × V <sub>CC</sub>	
		V <sub>CC</sub> = 2.3 V to 2.7 V	_		0.30 × VCC	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$ $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	_		0.7	V

## Low-power 2-input multiplexer

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>OH</sub>	HIGH-level output	$V_I = V_{IH}$ or $V_{IL}$				
	voltage	$I_{O}$ = -20 $\mu$ A; $V_{CC}$ = 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
		$I_{O}$ = -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 <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 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 <sub>OL</sub>	LOW-level output	$V_{I} = V_{IH}$ or $V_{IL}$				
	voltage	$I_O = 20 \ \mu A; \ V_{CC} = 0.8 \ V \ to \ 3.6 \ V$	-	-	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	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 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
Δl <sub>OFF</sub>	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	$V_{I}$ = GND or $V_{CC}$ ; $I_{O}$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V	-	-	1.4	μΑ
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}; \text{ One input at } V_{CC} - 0.6 \text{ V},$ other inputs at $V_{CC}$ or GND.	-	-	75	μΑ

# 11. Dynamic characteristics

## **Table 8. Dynamic characteristics**

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

Symbol	Parameter	Conditions	25 °C		-40 °C to +125 °C			Unit	
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
C <sub>L</sub> = 5 pl	F								
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see Fig. 9 [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

## Low-power 2-input multiplexer

Symbol	Parameter	Conditions		25 °C		-40	°C to +12	.5 °C	Unit
			Min	Typ [1]	Max	Min	Max (85 °C)	Max (125 °C)	
C <sub>L</sub> = 10	pF								
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see Fig. 9 [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
C <sub>L</sub> = 15	pF						'		
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see Fig. 9 [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
C <sub>L</sub> = 30	pF								
t <sub>pd</sub>	propagation delay	I0, I1 or S to Y; see Fig. 9 [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
C <sub>L</sub> = 5 p	F, 10 pF, 15 pF and	I 30 pF							
C <sub>PD</sub>	power dissipation capacitance	$f_i$ = 1 MHz; [3] $V_I$ = GND to $V_{CC}$							
		V <sub>CC</sub> = 0.8 V	-	2.6	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.7	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	2.8	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	2.9	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.4	-	-	-	-	рF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.0	-	-	-	-	pF

<sup>[1]</sup> All typical values are measured at nominal  $V_{\text{CC}}$ .

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;

 $\Sigma(C_L \times V_{CC}^2 \times f_0)$  = sum of the outputs.

 <sup>[2]</sup> 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<sub>D</sub> = C<sub>PD</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>i</sub> × N + Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) where:

Low-power 2-input multiplexer

### 11.1. Waveforms and test circuit

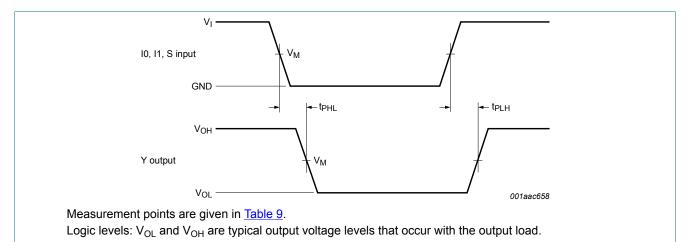
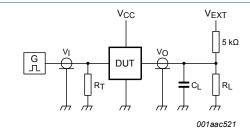


Fig. 9. The data inputs (I0, I1) and common data select input (S) to output (Y) propagation delays

**Table 9. Measurement points** 

Supply voltage	Output	Input				
V <sub>CC</sub>	V <sub>M</sub>	V <sub>M</sub>	V <sub>I</sub>	$t_r = t_f$		
0.8 V to 3.6 V	0.5 × V <sub>CC</sub>	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns		



Test data is given in Table 10.

Definitions for test circuit:

 $R_L$  = Load resistance.

C<sub>L</sub> = Load capacitance including jig and probe capacitance.

 $R_T$  = Termination resistance should be equal to the output impedance  $Z_0$  of the pulse generator.

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

Fig. 10. Test circuit for measuring switching times

Table 10. 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 kΩ or 1 MΩ	open	GND	2 × V <sub>CC</sub>

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

Low-power 2-input multiplexer

# 12. Package outline

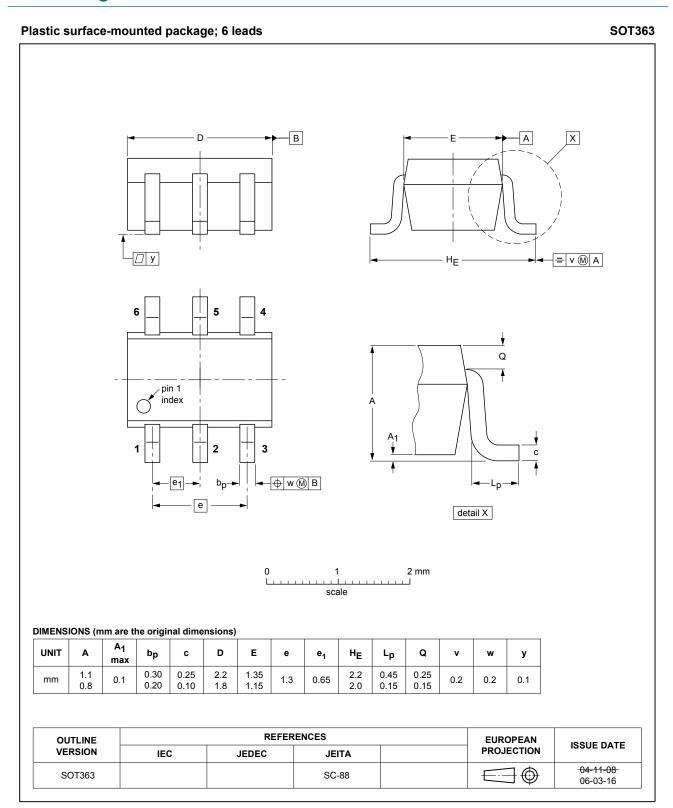


Fig. 11. Package outline SOT363 (SC-88)

**Product data sheet** 

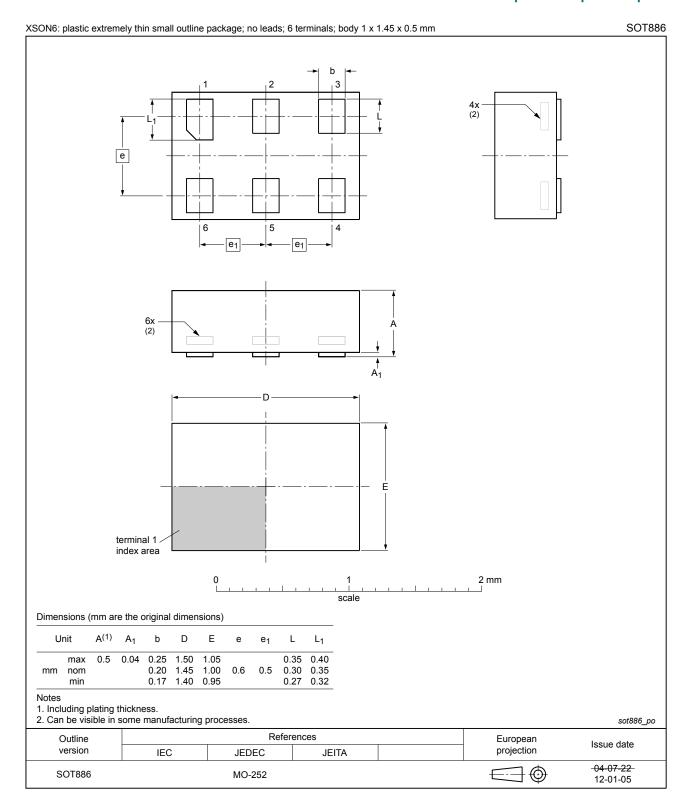


Fig. 12. Package outline SOT886 (XSON6)

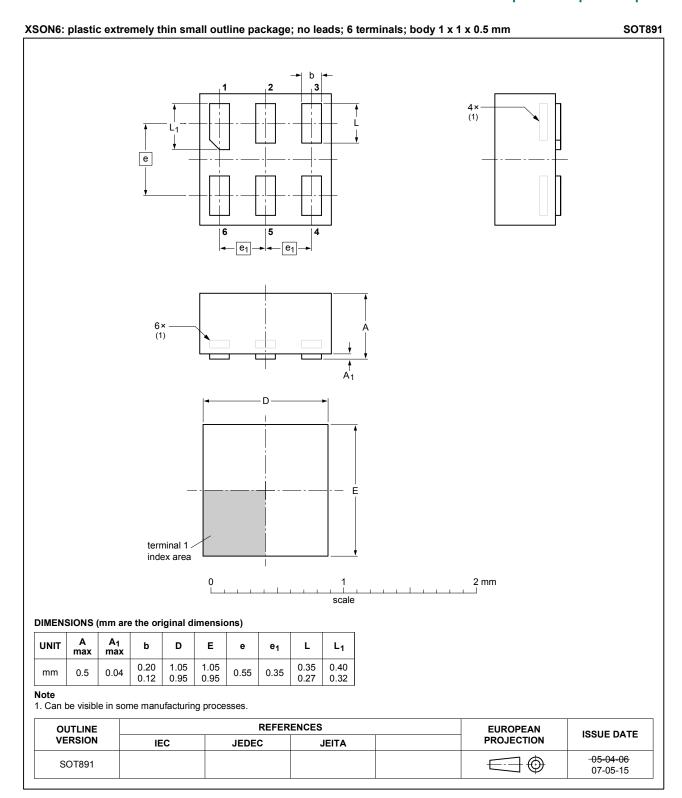


Fig. 13. Package outline SOT891 (XSON6)

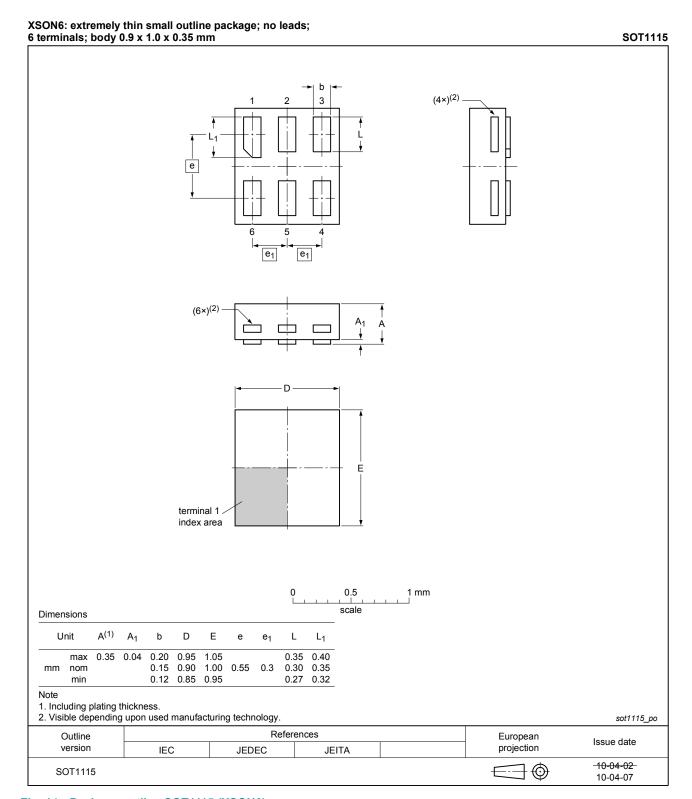


Fig. 14. Package outline SOT1115 (XSON6)

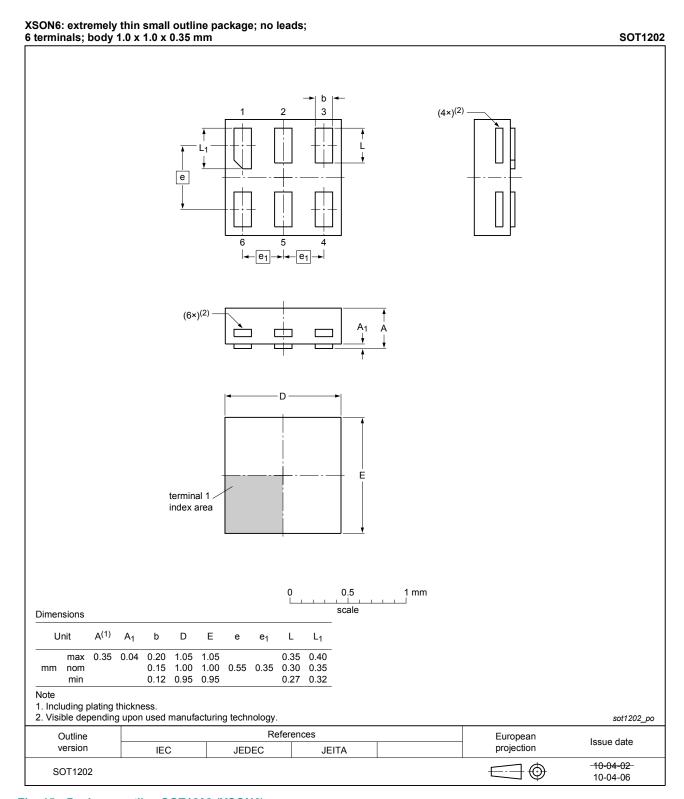


Fig. 15. Package outline SOT1202 (XSON6)

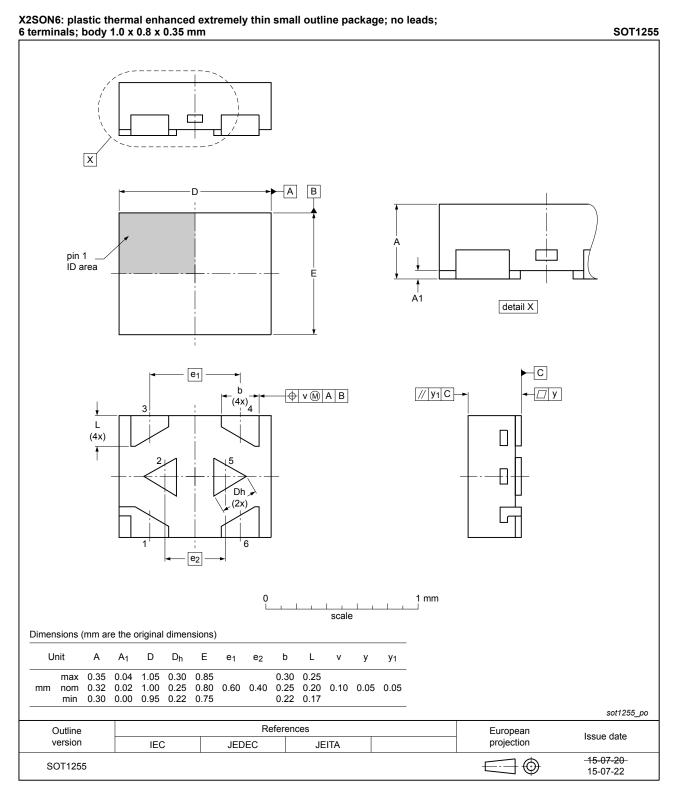


Fig. 16. Package outline SOT1255 (X2SON6)

Low-power 2-input multiplexer

## 13. Abbreviations

### **Table 11. Abbreviations**

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

# 14. Revision history

### **Table 12. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes	
74AUP1G157 v.7	20190128	Product data sheet	-	74AUP1G157 v.6	
Modifications:	<ul> <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> </ul>				
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 (Fig. 12) 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	-	-	

### Low-power 2-input multiplexer

## 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.

- 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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