# Low-power 2-input multiplexer; inverting Rev. 5 — 3 August 2012

**Product data sheet** 

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

The 74AUP1G158 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) presents the selected data in the complement (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<sub>OFF</sub>. The I<sub>OFF</sub> 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<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

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### 3. Ordering information

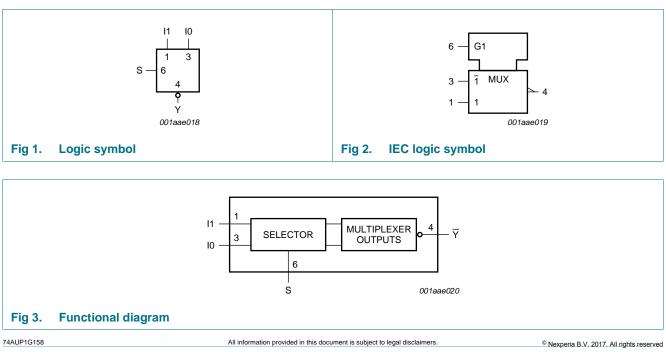
Table 1. Ordering	g information										
Type number Package											
	Temperature range	Name	ame Description								
74AUP1G158GW	–40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363							
74AUP1G158GM	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 $\times$ 1.45 $\times$ 0.5 mm	SOT886							
74AUP1G158GF	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 $\times$ 1 $\times$ 0.5 mm	SOT891							
74AUP1G158GN	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body $0.9 \times 1.0 \times 0.35$ mm	SOT1115							
74AUP1G158GS	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body $1.0 \times 1.0 \times 0.35$ mm	SOT1202							

### 4. Marking

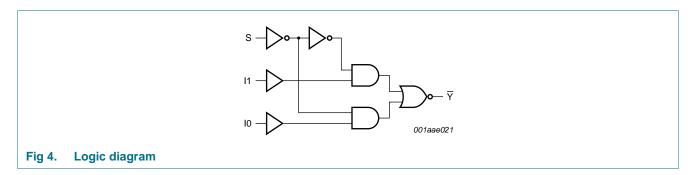
Table 2. Marking	
Type number	Marking code <sup>[1]</sup>
74AUP1G158GW	aU
74AUP1G158GM	aU
74AUP1G158GF	aU
74AUP1G158GN	aU
74AUP1G158GS	aU

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

### 5. Functional diagram

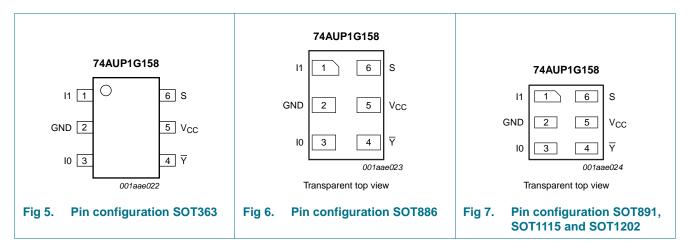


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### 6. Pinning information

### 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
Y	4	multiplexer output
V <sub>CC</sub>	5	supply voltage
S	6	common data select input

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#### **Functional description** 7.

Table 4.	Function table <sup>[1]</sup>		
Input			Output
S	11	10	Ÿ
L	X	L	Н
L	Х	Н	L
Н	L	Х	Н
Н	Н	Х	L

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

#### **Limiting values** 8.

#### **Limiting values** Table 5.

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

$V_{CC}$ supply voltage $-0.5$ $+4.6$ V $I_{IK}$ input clamping current $V_1 < 0$ V $-50$ $-$ mA $V_1$ input voltage $11$ $-0.5$ $+4.6$ V $I_{OK}$ output clamping current $V_O < 0$ V $-50$ $-$ mA $V_O$ output voltageActive mode and Power-down mode $11$ $-0.5$ $+4.6$ V $I_O$ output voltageActive mode and Power-down mode $11$ $-0.5$ $+4.6$ V $I_O$ output current $V_O = 0$ V to $V_{CC}$ $ \pm20$ mA $I_{CC}$ supply current $V_O = 0$ V to $V_{CC}$ $ 50$ mA $I_{GND}$ ground current $-50$ $-$ mA $T_{stg}$ storage temperature $-65$ $+150$ °C						
$ \begin{array}{cccc} I_{IK} & \mbox{ input clamping current } & V_{I} < 0 \ V & & -50 & - & \mbox{ mA} \\ V_{I} & \mbox{ input voltage } & & \mbox{ input voltage } & V_{O} < 0 \ V & -50 & - & \mbox{ mA} \\ V_{O} & \mbox{ output clamping current } & V_{O} < 0 \ V & -50 & - & \mbox{ mA} \\ V_{O} & \mbox{ output voltage } & \mbox{ Active mode and Power-down mode } & \mbox{ 1 } -0.5 & +4.6 & V \\ I_{O} & \mbox{ output current } & V_{O} = 0 \ V \ to \ V_{CC} & - & \mbox{ 20 mA} \\ I_{CC} & \mbox{ supply current } & V_{O} = 0 \ V \ to \ V_{CC} & - & \mbox{ 50 mA} \\ I_{GND} & \mbox{ ground current } & -50 & - & \mbox{ mA} \\ I_{Stg} & \mbox{ storage temperature } & -65 & +150 & \mbox{ °C} \\ \end{array} $	Symbol	Parameter	Conditions	Min	Max	Unit
N1input voltage11 $-0.5$ $+4.6$ V $I_{OK}$ output clamping current $V_O < 0$ V $-50$ $-$ mA $V_O$ output voltageActive mode and Power-down mode11 $-0.5$ $+4.6$ V $I_O$ output current $V_O = 0$ V to $V_{CC}$ $ \pm 20$ mA $I_{CC}$ supply current $ 50$ mA $I_{GND}$ ground current $-50$ $-$ mA $T_{stg}$ storage temperature $-65$ $+150$ °C	V <sub>CC</sub>	supply voltage		-0.5	+4.6	V
$I_{OK}$ output clamping current $V_O < 0 V$ $-50$ $-$ mA $V_O$ output voltageActive mode and Power-down mode $11$ $-0.5$ $+4.6$ $V$ $I_O$ output current $V_O = 0 V$ to $V_{CC}$ $ \pm 20$ mA $I_{CC}$ supply current $ 50$ mA $I_{GND}$ ground current $-50$ $-$ mA $T_{stg}$ storage temperature $-65$ $+150$ $^{\circ}C$	I <sub>IK</sub>	input clamping current	V <sub>1</sub> < 0 V	-50	-	mA
Vooutput voltageActive mode and Power-down mode11 $-0.5$ $+4.6$ VIooutput currentVo = 0 V to Vcc- $\pm 20$ mAIccsupply current-50mAIgNDground current-50-mATstgstorage temperature-65+150°C	VI	input voltage		<u>[1]</u> –0.5	+4.6	V
$I_O$ output current $V_O = 0 V \text{ to } V_{CC}$ - $\pm 20$ mA $I_{CC}$ supply current-50mA $I_{GND}$ ground current-50-mA $T_{stg}$ storage temperature-65+150°C	I <sub>OK</sub>	output clamping current	V <sub>O</sub> < 0 V	-50	-	mA
$I_{CC}$ supply current-50mA $I_{GND}$ ground current-50-mA $T_{stg}$ storage temperature-65+150°C	Vo	output voltage	Active mode and Power-down mode	<u>[1]</u> –0.5	+4.6	V
$I_{GND}$ ground current $-50$ -mA $T_{stg}$ storage temperature $-65$ +150°C	lo	output current	$V_{O} = 0 V \text{ to } V_{CC}$	-	±20	mA
$T_{stg}$ storage temperature $-65$ +150 °C	I <sub>CC</sub>	supply current		-	50	mA
	I <sub>GND</sub>	ground current		-50	-	mA
$P_{tot}$ total power dissipation $T_{amb} = -40 \text{ °C to } +125 \text{ °C}$ [2] - 250 mW	T <sub>stg</sub>	storage temperature		-65	+150	°C
	P <sub>tot</sub>	total power dissipation	$T_{amb} = -40 \ ^{\circ}C \ to +125 \ ^{\circ}C$	[2] _	250	mW

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

For SC-88 packages: above 87.5 °C the value of Ptot derates linearly with 4.0 mW/K. [2] For XSON6 packages: above 118 °C the value of Ptot derates linearly with 7.8 mW/K.

#### **Recommended operating conditions** 9.

Table 6.	Recommended operating condition	ons			
Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	supply voltage		0.8	3.6	V
VI	input voltage		0	3.6	V
Vo	output voltage	Active mode	0	V <sub>CC</sub>	V
		Power-down mode; $V_{CC} = 0 V$	0	3.6	V
T <sub>amb</sub>	ambient temperature		-40	+125	°C
$\Delta t / \Delta V$	input transition rise and fall rate	$V_{CC} = 0.8 V \text{ to } 3.6 V$	0	200	ns/V

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## **10. Static characteristics**

#### Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 2	5 °C					
V <sub>IH</sub>	HIGH-level input voltage	$V_{CC} = 0.8 V$	$0.70\times V_{CC}$	-	-	V
		$V_{CC} = 0.9 V$ to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		$V_{CC}$ = 2.3 V to 2.7 V	1.6	-	-	V
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$	2.0	-	-	V
VIL	LOW-level input voltage	$V_{CC} = 0.8 V$	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9 V$ to 1.95 V	-	-	$0.35 \times V_{CC}$	V
		$V_{CC}$ = 2.3 V to 2.7 V	-	-	0.7	V
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$	-	-	0.9	V
V <sub>он</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = –20 $\mu A;$ $V_{CC}$ = 0.8 V to 3.6 V	$V_{CC}-0.1$	-	-	V
		$I_0 = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.75 \times V_{CC}$	-	-	V
		$I_0 = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	1.11	-	-	V
		$I_{O} = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.32	-	-	V
		$I_{O}$ = -2.3 mA; $V_{CC}$ = 2.3 V	2.05	-	-	V
		$I_{O} = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.9	-	-	V
		$I_{O} = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.72	-	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.6	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = 20 $\mu A;$ $V_{CC}$ = 0.8 V to 3.6 V	-	-	0.1	V
		$I_0 = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3 \times V_{CC}$	V
		$I_0 = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	-	-	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
		$I_0 = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.44	V
		$I_0 = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.31	V
		$I_{O}$ = 4.0 mA; $V_{CC}$ = 3.0 V	-	-	0.44	V
I <sub>I</sub>	input leakage current	$V_I = GND$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V	-	-	±0.1	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_{I}$ or $V_{O}$ = 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
lcc	supply current	$\label{eq:VI} \begin{array}{l} V_{I} = GND \text{ or } V_{CC};  I_{O} = 0 \; A; \\ V_{CC} = 0.8 \; V \; to \; 3.6 \; V \end{array}$	-	-	0.5	μΑ
∆l <sub>CC</sub>	additional supply current		<u>[1]</u> -	-	40	μΑ
CI	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

### Low-power 2-input multiplexer; inverting

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = –	40 °C to +85 °C					
VIH	HIGH-level input voltage	$V_{CC} = 0.8 V$	$0.70\times V_{CC}$	-	-	V
		$V_{CC} = 0.9 V$ to 1.95 V	$0.65 \times V_{CC}$	-	-	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 <sub>IL</sub>	LOW-level input voltage	$V_{CC} = 0.8 V$	-	-	$0.30\times V_{CC}$	V
		$V_{CC} = 0.9 V$ to 1.95 V	-	-	$0.35\times V_{CC}$	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 <sub>ОН</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = –20 $\mu\text{A};V_{CC}$ = 0.8 V to 3.6 V	$V_{CC}-0.1$	-	-	V
		$I_0 = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.7\times V_{CC}$	-	-	V
		$I_0 = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	1.03	-	-	V
		$I_{O} = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.30	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.97	-	-	V
		$I_{O} = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.85	-	-	V
		$I_{O} = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.67	-	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.55	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_O$ = 20 $\mu A;V_{CC}$ = 0.8 V to 3.6 V	-	-	0.1	V
		$I_{O} = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3\times V_{CC}$	V
		$I_{O}$ = 1.7 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
		$I_{O} = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	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
l <sub>l</sub>	input leakage current	$V_{\rm I}$ = GND to 3.6 V; $V_{\rm CC}$ = 0 V to 3.6 V	-	-	±0.5	μΑ
OFF	power-off leakage current	$V_{\rm I}~{\rm or}~V_{\rm O}$ = 0 V to 3.6 V; $V_{\rm CC}$ = 0 V	-	-	±0.5	μΑ
$\Delta I_{OFF}$	additional power-off leakage current	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.6	μΑ
lcc	supply current	$\label{eq:VI} \begin{array}{l} V_{I} = GND \text{ or } V_{CC};  I_{O} = 0 \; A; \\ V_{CC} = 0.8 \; V \; to \; 3.6 \; V \end{array}$	-	-	0.9	μΑ
∆l <sub>CC</sub>	additional supply current	$V_{I} = V_{CC} - 0.6 \text{ V}; I_{O} = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}$	<u>[1]</u> -	-	50	μΑ

### Table 7. Static characteristics ...continued

### Low-power 2-input multiplexer; inverting

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = –	40 °C to +125 °C					
V <sub>IH</sub>	HIGH-level input voltage	$V_{CC} = 0.8 V$	$0.75 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9 V$ to 1.95 V	$0.70\times V_{CC}$	-	-	V
		$V_{CC}$ = 2.3 V to 2.7 V	1.6	-	-	V
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	$V_{CC} = 0.8 V$	-	-	$0.25\times V_{CC}$	V
		$V_{CC} = 0.9 V$ to 1.95 V	-	-	$0.30\times V_{CC}$	V
		$V_{CC}$ = 2.3 V to 2.7 V	-	-	0.7	V
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$	-	-	0.9	V
/ <sub>он</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = –20 $\mu A; V_{CC}$ = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.11	-	-	V
		$I_{O} = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.6\times V_{CC}$	-	-	V
		$I_{O} = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	0.93	-	-	V
		$I_{O} = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.17	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.77	-	-	V
		$I_{O} = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.67	-	-	V
		$I_{O} = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.40	-	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.30	-	-	V
/ <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = 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	-	-	$0.33\times V_{CC}$	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
		$I_0 = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.36	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V
		$I_0 = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.36	V
		$I_0 = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.50	V
I	input leakage current	$V_I = GND$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V	-	-	±0.75	μΑ
OFF	power-off leakage current	$V_{I}$ or $V_{O}$ = 0 V to 3.6 V; $V_{CC}$ = 0 V	-	-	±0.75	μΑ
Al <sub>OFF</sub>	additional power-off leakage current	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.75	μA
сс	supply current	$\label{eq:VI} \begin{array}{l} V_{I} = GND \text{ or } V_{CC};  I_{O} = 0 \; A; \\ V_{CC} = 0.8 \; V \; to \; 3.6 \; V \end{array}$	-	-	1.4	μA
VI <sub>CC</sub>	additional supply current	$V_{I} = V_{CC} - 0.6 \text{ V}; I_{O} = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}$	<u>[1]</u> -	-	75	μA

#### Table 7. Static characteristics ...continued

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

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## **11. Dynamic characteristics**

#### Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see <u>Figure 9</u>.

Symbol	Parameter	Conditions			25 °C		-40	) °C to +1	25 °C	Unit
				Min	Typ <mark>[1]</mark>	Мах	Min	Мах (85 °С)	Max (125 °C)	
C <sub>L</sub> = 5 pl	F							1	1	
t <sub>pd</sub>	propagation delay	I0, I1 or S to $\overline{Y}$ ; see Figure 8	[2]							
		$V_{CC} = 0.8 V$		-	20.0	-	-	-	-	ns
		$V_{CC}$ = 1.1 V to 1.3 V		2.4	5.7	11.2	2.2	11.6	11.8	ns
		$V_{CC}$ = 1.4 V to 1.6 V		1.8	4.0	6.6	1.9	7.2	7.5	ns
		$V_{CC}$ = 1.65 V to 1.95 V		1.6	3.2	5.2	1.4	5.9	6.2	ns
		$V_{CC}$ = 2.3 V to 2.7 V		1.4	2.5	3.7	1.2	4.2	4.4	ns
		$V_{CC}$ = 3.0 V to 3.6 V		1.2	2.2	3.2	0.9	3.5	3.6	ns
C <sub>L</sub> = 10 p	pF									
pd	propagation delay	I0, I1 or S to $\overline{Y}$ ; see Figure 8	[2]							
		$V_{CC} = 0.8 V$		-	23.6	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V		2.6	6.6	13.0	2.5	13.6	13.8	ns
		$V_{CC}$ = 1.4 V to 1.6 V		2.2	4.6	7.9	2.0	8.5	8.8	ns
		$V_{CC}$ = 1.65 V to 1.95 V		2.1	3.8	6.1	1.9	6.7	7.0	ns
		$V_{CC}$ = 2.3 V to 2.7 V		1.7	3.1	4.4	1.5	4.9	5.2	ns
		$V_{CC}$ = 3.0 V to 3.6 V		1.5	2.8	4.0	1.4	4.2	4.4	ns
C <sub>L</sub> = 15 p	pF									
pd	propagation delay	I0, I1 or S to $\overline{Y}$ ; see Figure 8	[2]							
		$V_{CC} = 0.8 V$		-	27.1	-	-	-	-	ns
		$V_{CC}$ = 1.1 V to 1.3 V		3.0	7.4	14.7	2.8	15.4	15.7	ns
		$V_{CC}$ = 1.4 V to 1.6 V		2.5	5.2	8.8	2.4	9.7	10.1	ns
		$V_{CC}$ = 1.65 V to 1.95 V		2.2	4.3	6.8	2.2	7.7	8.1	ns
		$V_{CC}$ = 2.3 V to 2.7 V		2.1	3.5	5.1	1.9	5.6	5.9	ns
		$V_{CC}$ = 3.0 V to 3.6 V		1.9	3.2	4.5	1.6	4.9	5.1	ns
C <sub>L</sub> = 30 p	pF									
pd	propagation delay	I0, I1 or S to $\overline{Y}$ ; see Figure 8	[2]							
		$V_{CC} = 0.8 V$		-	35.6	-	-	-	-	ns
		$V_{CC}$ = 1.1 V to 1.3 V		3.6	9.7	19.6	3.5	20.5	21.0	ns
		$V_{CC}$ = 1.4 V to 1.6 V		3.2	6.7	11.4	3.2	12.6	13.2	ns
		$V_{CC}$ = 1.65 V to 1.95 V		3.0	5.6	8.9	2.9	10.0	10.5	ns
		$V_{CC}$ = 2.3 V to 2.7 V		2.9	4.6	6.5	2.6	7.1	7.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V		2.7	4.3	5.8	2.5	6.7	7.1	ns

#### Low-power 2-input multiplexer; inverting

# Table 8. Dynamic characteristics ...continued Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 9. Symbol Parameter Conditions 29

Symbol	Parameter	Conditions	25 °C		-40	°C to +12	25 °C	Unit		
				Min	Typ <mark>[1]</mark>	Мах	Min	Max (85 °C)	Max (125 °C)	
C <sub>L</sub> = 5 pl	F, 10 pF, 15 pF and	30 pF								
C <sub>PD</sub>	power dissipation	$f_i = 1 \text{ MHz}; V_I = \text{GND to } V_{\text{CC}}$	<u>[3]</u>							
	capacitance	$V_{CC} = 0.8 V$		-	2.6	-	-	-	-	pF
		$V_{CC}$ = 1.1 V to 1.3 V		-	2.8	-	-	-	-	pF
		$V_{CC}$ = 1.4 V to 1.6 V		-	2.9	-	-	-	-	pF
		$V_{CC}$ = 1.65 V to 1.95 V		-	3.1	-	-	-	-	pF
		$V_{CC}$ = 2.3 V to 2.7 V		-	3.6	-	-	-	-	pF
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$		-	4.2	-	-	-	-	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<sub>D</sub> in  $\mu$ W).

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

 $f_i$  = input frequency in MHz;

 $f_o = output frequency in MHz;$ 

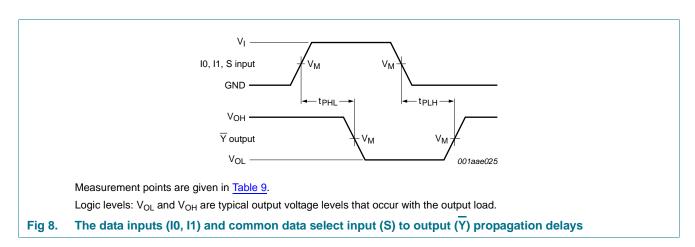
 $C_L$  = output load capacitance in pF;

 $V_{CC}$  = supply voltage in V;

N = number of inputs switching;

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

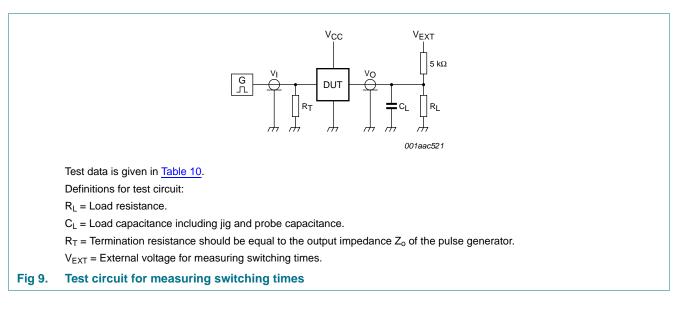
### 12. Waveforms



#### Table 9. Measurement points

Supply voltage	Output	Input						
V <sub>CC</sub>	V <sub>M</sub>	V <sub>M</sub>	VI	t <sub>r</sub> = t <sub>f</sub>				
0.8 V to 3.6 V	$0.5  imes V_{CC}$	$0.5  imes V_{CC}$	V <sub>CC</sub>	≤ 3.0 ns				

#### Low-power 2-input multiplexer; inverting



#### 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 <sub>PZL</sub> , t <sub>PLZ</sub>
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 k $\Omega$ or 1 M $\Omega$	open	GND	$2 \times V_{CC}$

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

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### 13. Package outline

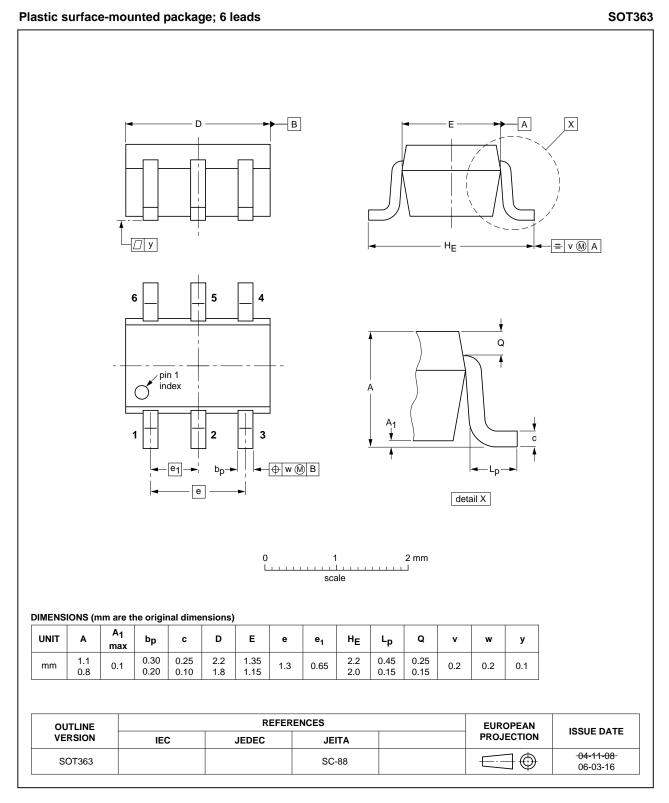
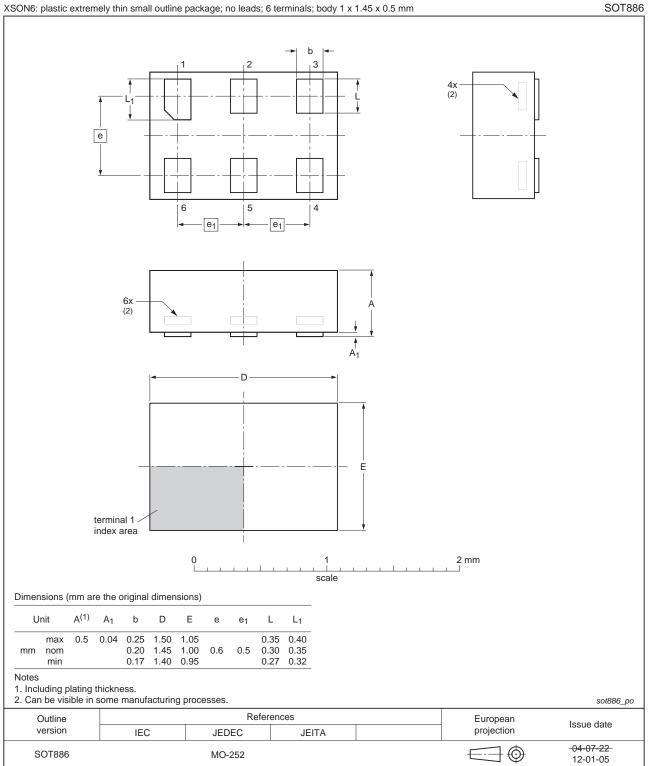


Fig 10. Package outline SOT363 (SC-88)

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#### Fig 11. Package outline SOT886 (XSON6)

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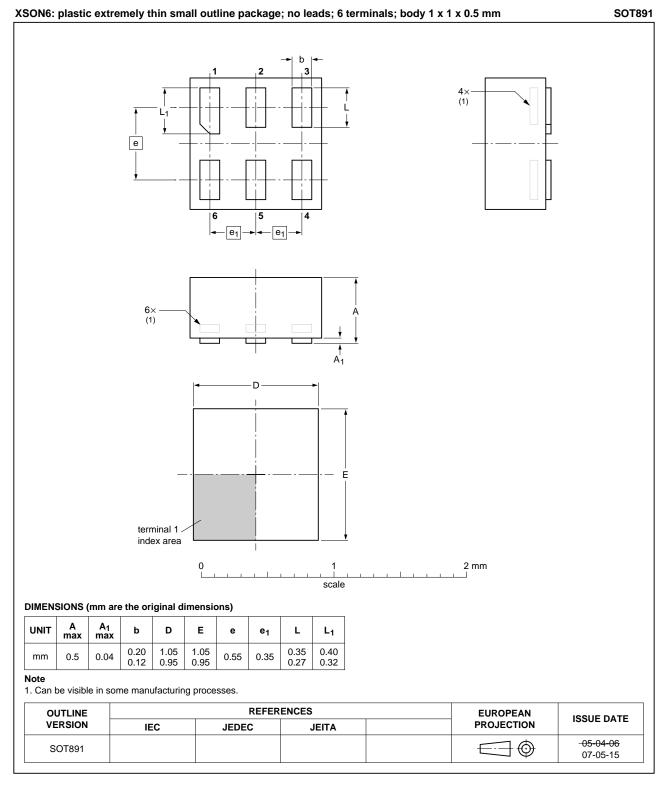
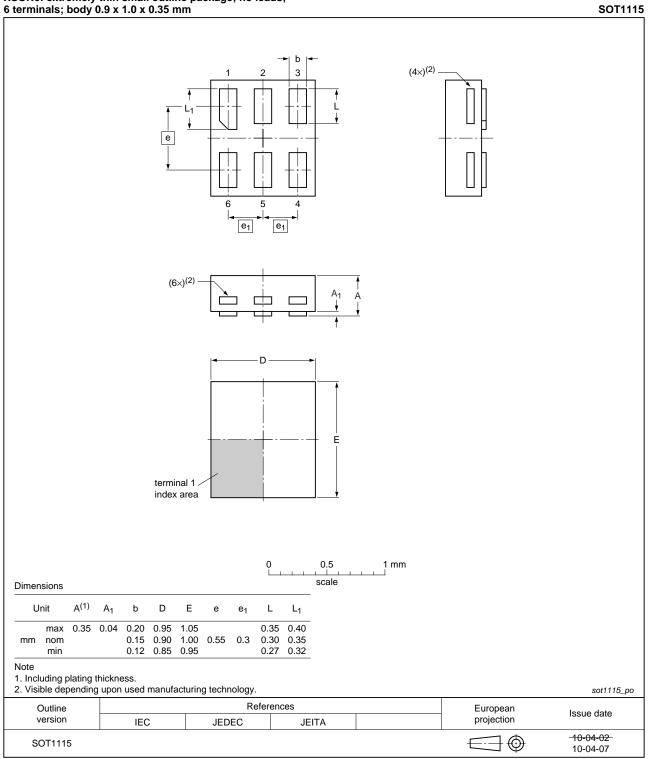


Fig 12. Package outline SOT891 (XSON6)

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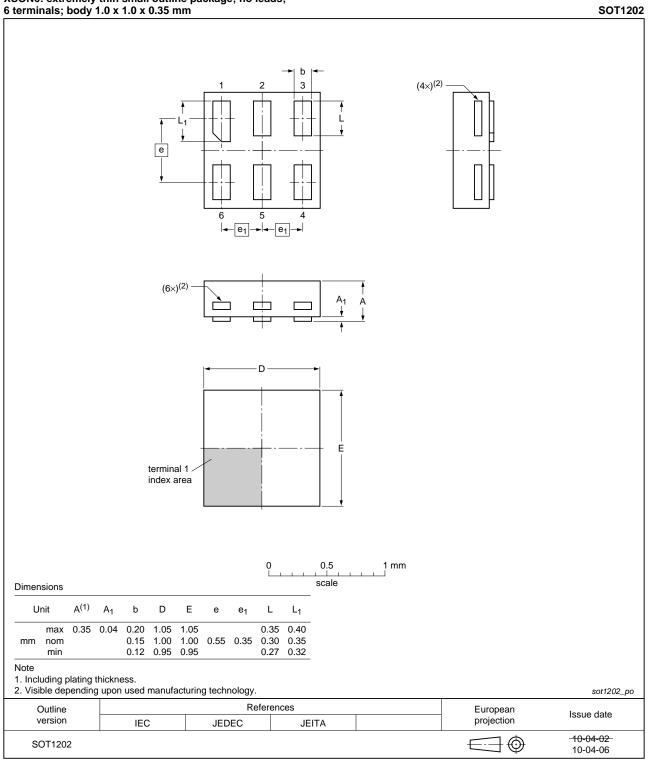


# XSON6: extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm

Fig 13. Package outline SOT1115 (XSON6)

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

Fig 14. Package outline SOT1202 (XSON6)

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## 14. Abbreviations

## **15. Revision history**

#### Table 12.Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G158 v.5	20120803	Product data sheet	-	74AUP1G158 v.4
Modifications:	<ul> <li>Package ou</li> </ul>	tline drawing of SOT886 (F	Figure 11) modified.	
74AUP1G158 v.4	20111124	Product data sheet	-	74AUP1G158 v.3
Modifications:	<ul> <li>Legal pages</li> </ul>	s updated.		
74AUP1G158 v.3	20100713	Product data sheet	-	74AUP1G158 v.2
74AUP1G158 v.2	20090702	Product data sheet	-	74AUP1G158 v.1
74AUP1G158 v.1	20061107	Product data sheet	-	-

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### **16. Legal information**

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Document status[1][2]	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".

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#### Nexperia

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