74AUP1G58

Low-power configurable multiple function gate Rev. 6 — 15 August 2012 P

Product data sheet

General description 1.

The 74AUP1G58 provides configurable multiple functions. The output state is determined by eight patterns of 3-bit input. The user can choose the logic functions AND, OR, NAND, NOR, XOR, inverter and buffer. All inputs can be connected to V_{CC} or GND.

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.

The 74AUP1G58 has Schmitt trigger inputs making it capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

The inputs switch at different points for positive and negative-going signals. The difference between the positive voltage V_{T+} and the negative voltage V_{T-} is defined as the input hysteresis voltage V_H.

Features and benefits 2.

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- ESD protection:
 - ◆ HBM JESD22-A114F exceeds 5000 V
 - MM JESD22-A115-A exceeds 200 V
 - CDM JESD22-C101E exceeds 1000 V
- Low static power consumption; $I_{CC} = 0.9 \mu A$ (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- I_{OFF} circuitry provides partial power-down mode operation
- Multiple package options
- Specified from -40 °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					
74AUP1G58GW	–40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363					
74AUP1G58GM	–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					
74AUP1G58GF	–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					
74AUP1G58GN	–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					
74AUP1G58GS	–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					

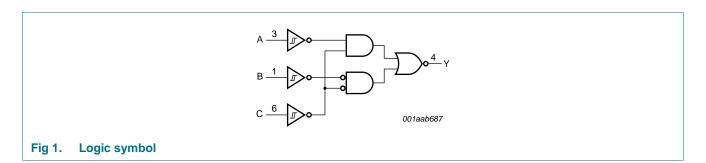
4. Marking

Table 2. Marking

Type number	Marking code ^[1]
74AUP1G58GW	аК
74AUP1G58GM	аК
74AUP1G58GF	аК
74AUP1G58GN	аК
74AUP1G58GS	аК

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

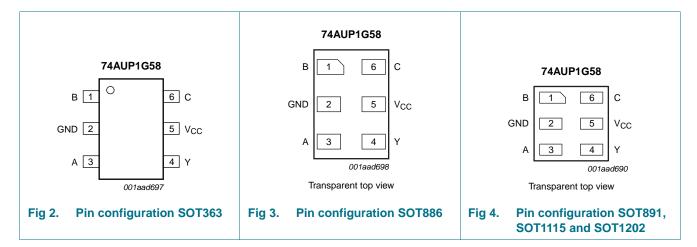
5. Functional diagram



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6. Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
В	1	data input
GND	2	ground (0 V)
Α	3	data input
Υ	4	data output
V _{CC}	5	supply voltage
С	6	data input

7. Functional description

Table 4. Function table[1]

Input			Output
С	В	Α	Υ
L	L	L	L
L	L	Н	Н
L	Н	L	L
L	Н	Н	Н
Н	L	L	Н
Н	L	Н	Н
Н	Н	L	L
Н	Н	Н	L

^[1] H = HIGH voltage level; L = LOW voltage level.

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7.1 Logic configurations

Table 5. Function selection table

Logic function	Figure
2-input NAND	see Figure 5
2-input NAND with both inputs inverted	see Figure 8
2-input AND with inverted input	see Figure 6 and Figure 7
2-input NOR with inverted input	see Figure 6 and Figure 7
2-input OR	see Figure 8
2-input OR with both inputs inverted	see Figure 5
2-input XOR	see Figure 9
Buffer	see Figure 10
Inverter	see Figure 11

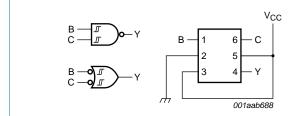


Fig 5. 2-input NAND gate or 2-input OR with both inputs inverted

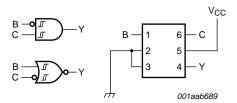


Fig 6. 2-input AND gate with inverted B input or 2-input NOR gate with inverted C input

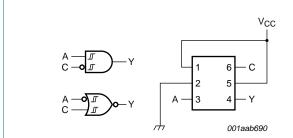


Fig 7. 2-input AND gate with inverted C input or 2-input NOR gate with inverted A input

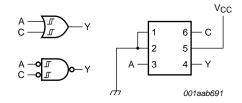
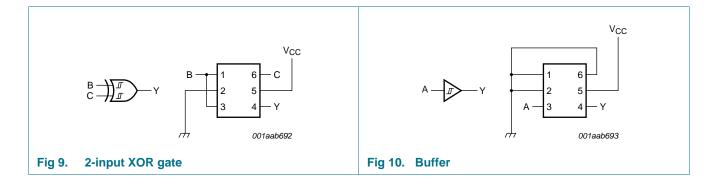
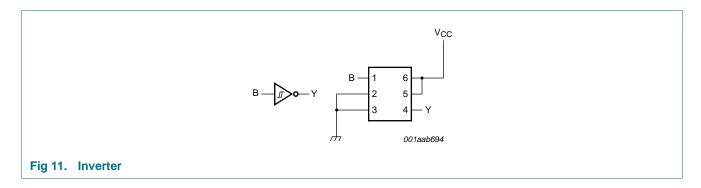


Fig 8. 2-input OR gate or 2-input NAND gate with both inputs inverted



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8. Limiting values

Table 6. 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
VI	input voltage		<u>[1]</u> –0.5	+4.6	V
I _{OK}	output clamping current	V _O < 0 V	-50	-	mA
Vo	output voltage	Active mode and Power-down mode	[<u>1</u>] -0.5	+4.6	V
I _O	output current	$V_O = 0 V \text{ to } V_{CC}$	-	±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	$T_{amb} = -40 ^{\circ}\text{C} \text{ to } +125 ^{\circ}\text{C}$	[2] _	250	mW

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

9. Recommended operating conditions

Table 7. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		0.8	3.6	V
VI	input voltage		0	3.6	V
Vo	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

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

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10. Static characteristics

Table 8. Static characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = 2	5 °C					
V _{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_{O} = -20 \mu A$; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	V _{CC} - 0.1	-	-	V
		$I_{O} = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.75 \times V_{CC}$	-	-	V
		$I_{O} = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	1.11	-	-	V
		$I_{O} = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.32	-	-	V
		$I_{O} = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	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 _{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_O = 20 \mu A$; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.1	V
		$I_{O} = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3 \times V_{CC}$	V
		$I_{O} = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	-	-	0.31	V
		$I_{O} = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	-	-	0.31	V
		$I_{O} = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.31	V
		$I_{O} = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.44	V
		$I_{O} = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.31	V
		$I_{O} = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.44	V
l _l	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	μΑ
I _{OFF}	power-off leakage current	V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.2	μΑ
ΔI_{OFF}	additional power-off leakage current	$V_1 \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.2	μΑ
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	μΑ
Δl _{CC}	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}$	-	-	40	μΑ
Cı	input capacitance	$V_I = GND \text{ or } V_{CC}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	1.1	-	pF
Co	output capacitance	$V_O = GND; V_{CC} = 0 V$	-	1.8	-	pF
T _{amb} = -	40 °C to +85 °C					
V _{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_{O} = -20 \mu A$; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	$V_{CC}-0.1$	-	-	V
		$I_{O} = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.7 \times V_{CC}$	-	-	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
		$I_O = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.55	-	-	V
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Table 8. Static characteristics ...continued
At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 μ A; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I _O = 1.1 mA; V _{CC} = 1.1 V	-	-	$0.3 \times V_{CC}$	V
		$I_{O} = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	-	-	0.37	V
		$I_{O} = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	0.1	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
l _l	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.5	μΑ
l _{OFF}	power-off leakage current	V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.5	μΑ
Δl _{OFF}	additional power-off leakage current	$V_1 \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.6	μΑ
lcc	supply current	V_I = GND or V_{CC} ; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.9	μΑ
Δl _{CC}	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}$	-	-	50	μΑ
T _{amb} = -	40 °C to +125 °C					
V _{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_{O} = -20 \mu A$; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	V _{CC} – 0.11	-	-	V
		$I_{O} = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.6 \times V_{CC}$	-	-	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
		$\begin{array}{c} \text{-off leakage} V_1 \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; \\ V_{CC} = 0 \text{ V to } 0.2 \text{ V} \\ \hline V_1 = \text{GND or } V_{CC}; \ I_O = 0 \text{ A}; \\ V_{CC} = 0.8 \text{ V to } 3.6 \text{ V} \\ \hline \text{current} \\ \hline V_1 = V_{CC} - 0.6 \text{ V}; \ I_O = 0 \text{ A}; \\ V_{CC} = 3.3 \text{ V} \\ \hline \\ \text{ut voltage} \\ \hline V_1 = V_{T+} \text{ or } V_{T-} \\ \hline I_O = -20 \ \mu\text{A}; \ V_{CC} = 0.8 \text{ V to } 3.6 \text{ V} \\ \hline I_O = -1.1 \ \text{mA}; \ V_{CC} = 1.1 \text{ V} \\ \hline I_O = -1.7 \ \text{mA}; \ V_{CC} = 1.4 \text{ V} \\ \hline I_O = -1.9 \ \text{mA}; \ V_{CC} = 1.65 \text{ V} \\ \hline I_O = -2.3 \ \text{mA}; \ V_{CC} = 2.3 \text{ V} \\ \hline I_O = -3.1 \ \text{mA}; \ V_{CC} = 2.3 \text{ V} \\ \hline I_O = -2.7 \ \text{mA}; \ V_{CC} = 3.0 \text{ V} \\ \hline I_O = -4.0 \ \text{mA}; \ V_{CC} = 3.0 \text{ V} \\ \hline I_O = -4.0 \ \text{mA}; \ V_{CC} = 3.0 \text{ V} \\ \hline I_O = 20 \ \mu\text{A}; \ V_{CC} = 0.8 \text{ V to } 3.6 \text{ V} \\ \hline I_O = 1.1 \ \text{mA}; \ V_{CC} = 1.1 \text{ V} \\ \hline I_O = 1.7 \ \text{mA}; \ V_{CC} = 1.4 \text{ V} \\ \hline \end{array}$	V			
V _{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_O = 20 \mu A$; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.11	V
		$I_{O} = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.33 \times V_{CC}$	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 _O = 4.0 mA; V _{CC} = 3.0 V	-	-	0.50	V
l _l	input leakage current	$V_1 = GND \text{ to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	±0.75	μΑ
I _{OFF}	power-off leakage current	V_{I} or $V_{O} = 0$ V to 3.6 V; $V_{CC} = 0$ V			±0.75	μA

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 Table 8.
 Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
ΔI_{OFF}	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 _{CC}	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_{CC}	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A};$ $V_{CC} = 3.3 \text{ V}$	-	-	75	μΑ

11. Dynamic characteristics

Table 9. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13.

Symbol	Parameter	Conditions	25 °C			-40 °C to +125 °C				
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C _L = 5 pl	F						,			
t _{pd} propaga	propagation delay	A, B and C to Y; see Figure 12	[2]							
		$V_{CC} = 0.8 \text{ V}$		-	22.8	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		2.8	6.6	12.9	2.6	13.1	13.3	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.4	4.8	7.6	2.4	8.3	8.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.1	4.0	6.3	2.0	6.9	7.3	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.0	3.2	4.6	1.8	5.1	5.4	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		1.9	2.9	3.9	1.6	4.2	4.4	ns
C _L = 10	o F									
t _{pd} prop	propagation delay	A, B and C to Y; see Figure 12	[2]							
		$V_{CC} = 0.8 \text{ V}$		-	26.4	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.2	7.4	14.5	3.0	14.9	15.2	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		2.7	5.4	8.7	2.7	9.4	9.8	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.5	4.5	7.1	2.3	7.9	8.3	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.4	3.8	5.3	2.2	5.9	6.2	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.3	3.5	4.6	1.9	4.9	5.1	ns
C _L = 15	o F									
pd	propagation delay	A, B and C to Y; see Figure 12	[2]							
		$V_{CC} = 0.8 \text{ V}$		-	29.9	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		3.6	8.3	16.1	3.3	16.7	17.0	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.0	5.9	9.7	3.0	10.5	11.0	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		2.8	5.0	7.9	2.5	8.7	9.2	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		2.7	4.2	5.9	2.5	6.6	6.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		2.5	3.9	5.2	2.2	5.5	5.8	ns

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 Table 9.
 Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13.

Symbol	Parameter	Conditions			25 °C		-4	0 °C to +1	125 °C	Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
$C_L = 30$	pF					,				
t _{pd}	propagation delay	A, B and C to Y; see Figure 12	[2]							
		$V_{CC} = 0.8 \text{ V}$		-	38.0	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		4.5	10.5	20.8	4.1	21.9	24.1	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		3.8	7.5	12.2	3.8	13.5	14.1	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		3.4	6.3	10.0	3.1	11.2	11.9	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		3.4	5.3	7.5	3.1	8.4	8.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		3.3	5.0	6.6	2.9	7.1	7.4	ns
$C_L = 5 p$	F, 10 pF, 15 pF and	30 pF								
C_{PD}	power dissipation	f_i = 1 MHz; V_I = GND to V_{CC}	[3][4]							
	capacitance	$V_{CC} = 0.8 \text{ V}$		-	2.7	-	-	-	-	pF
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		-	2.8	-	-	-	-	pF
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		-	3.0	-	-	-	-	pF
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		-	3.2	-	-	-	-	pF
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		-	3.8	-	-	-	-	pF
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		-	4.4	-	-	-	-	pF

^[1] All typical values are measured at nominal V_{CC} .

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

 f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = 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.

^[2] t_{pd} is the same as t_{PLH} and t_{PHL} .

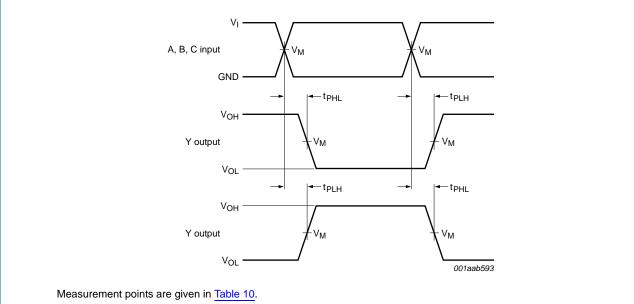
^[3] All specified values are the average typical values over all stated loads.

^[4] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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12. Waveforms



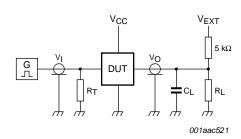
 $\ensuremath{V_{OL}}$ and $\ensuremath{V_{OH}}$ are typical output voltage drop that occur with the output load.

Fig 12. Input A, B and C to output Y propagation delay times

Table 10. 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}	≤ 3.0 ns	

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Test data is given in Table 11.

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 13. Test circuit for measuring switching times

Table 11. Test data

Supply voltage	Load		V _{EXT}		
V _{CC}	CL	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 k Ω or 1 M Ω	open	GND	$2 \times V_{CC}$

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

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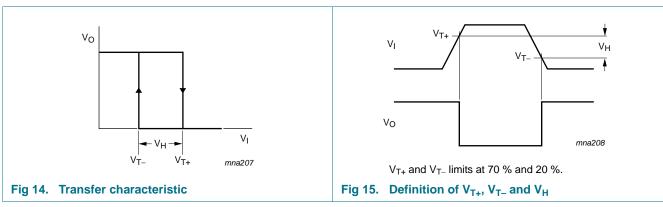
13. Transfer characteristics

Table 12. Transfer characteristics

Voltages are referenced to GND (ground = 0 V; for test circuit see Figure 13.

Symbol	Parameter	Conditions		25 °C		-40 °C to +125 °C		Unit	
			Min	Тур	Max	Min	Max (85 °C)	Max (125 °C)	
V_{T+}	positive-going threshold voltage	see <u>Figure 14</u> and <u>Figure 15</u>	·						
		$V_{CC} = 0.8 \text{ V}$	0.30	-	0.60	0.30	0.60	0.62	V
		V _{CC} = 1.1 V	0.53	-	0.90	0.53	0.90	0.92	V
		V _{CC} = 1.4 V	0.74	-	1.11	0.74	1.11	1.13	V
		V _{CC} = 1.65 V	0.91	-	1.29	0.91	1.29	1.31	V
		$V_{CC} = 2.3 \text{ V}$	1.37	-	1.77	1.37	1.77	1.80	V
		V _{CC} = 3.0 V	1.88	-	2.29	1.88	2.29	2.32	V
V_{T-}	V _T negative-going threshold voltage	see <u>Figure 14</u> and <u>Figure 15</u>							
		$V_{CC} = 0.8 \text{ V}$	0.10	-	0.60	0.10	0.60	0.60	V
		V _{CC} = 1.1 V	0.26	-	0.65	0.26	0.65	0.65	V
		V _{CC} = 1.4 V	0.39	-	0.75	0.39	0.75	0.75	V
	V _{CC} = 1.65 V	0.47	-	0.84	0.47	0.84	0.84	V	
	$V_{CC} = 2.3 \text{ V}$	0.69	-	1.04	0.69	1.04	1.04	V	
	$V_{CC} = 3.0 \text{ V}$	0.88	-	1.24	0.88	1.24	1.24	V	
V _H hysteresis voltage	(V _{T+} – V _{T-}); see <u>Figure 14</u> , <u>Figure 15</u> , <u>Figure 16</u> and <u>Figure 17</u>								
	$V_{CC} = 0.8 \text{ V}$	0.07	-	0.50	0.07	0.50	0.50	V	
	V _{CC} = 1.1 V	0.08	-	0.46	0.08	0.46	0.46	V	
		V _{CC} = 1.4 V	0.18	-	0.56	0.18	0.56	0.56	V
		V _{CC} = 1.65 V	0.27	-	0.66	0.27	0.66	0.66	V
		V _{CC} = 2.3 V	0.53	-	0.92	0.53	0.92	0.92	V
		$V_{CC} = 3.0 \text{ V}$	0.79	-	1.31	0.79	1.31	1.31	V

14. Waveforms transfer characteristics



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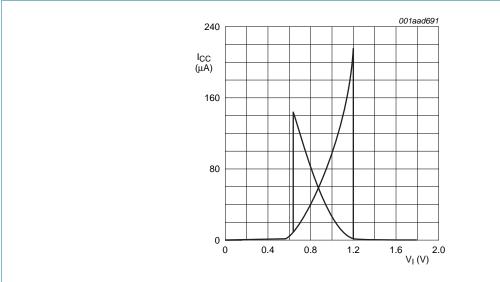


Fig 16. Typical transfer characteristics; $V_{CC} = 1.8 \text{ V}$

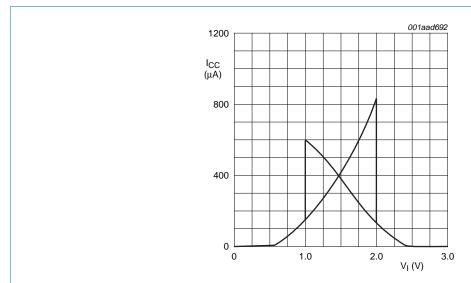


Fig 17. Typical transfer characteristics; $V_{CC} = 3.0 \text{ V}$

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15. Package outline

Plastic surface-mounted package; 6 leads

SOT363

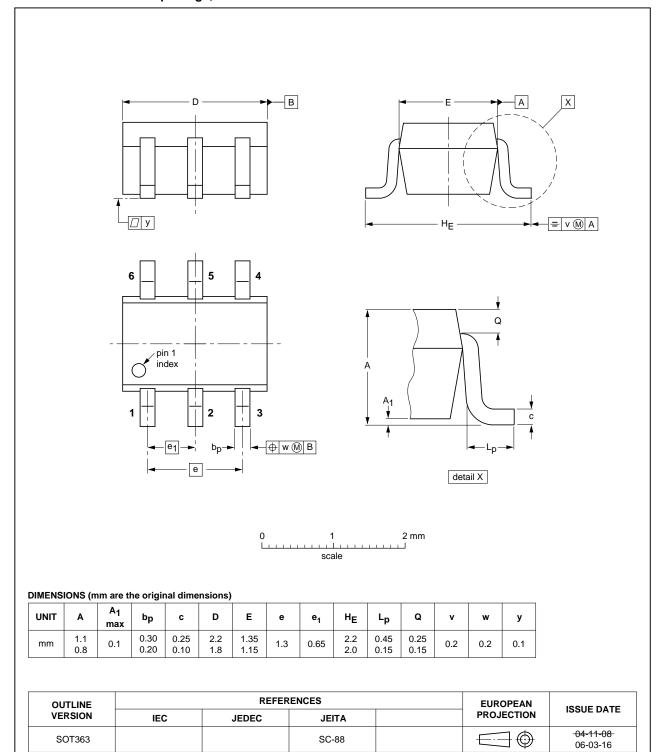


Fig 18. Package outline SOT363 (SC-88)

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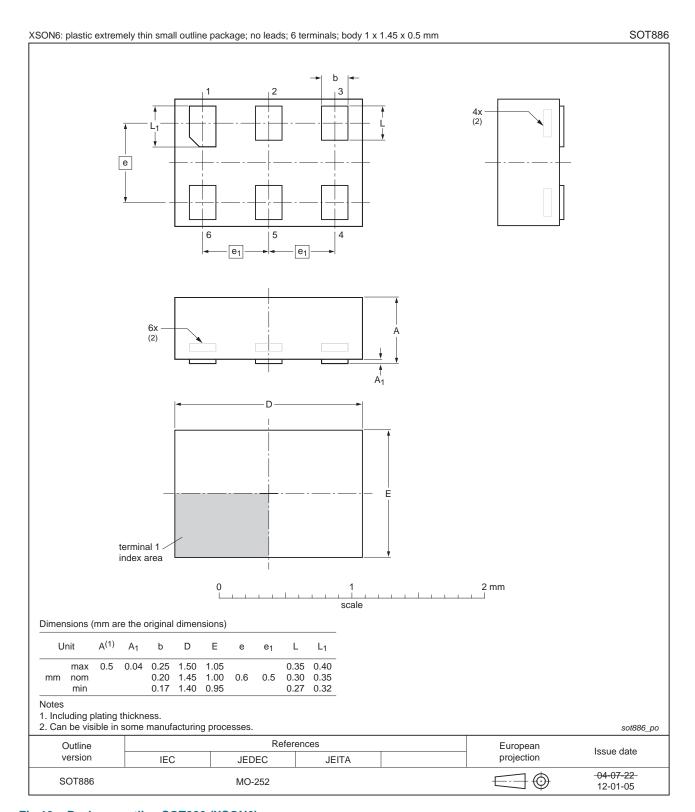


Fig 19. Package outline SOT886 (XSON6)

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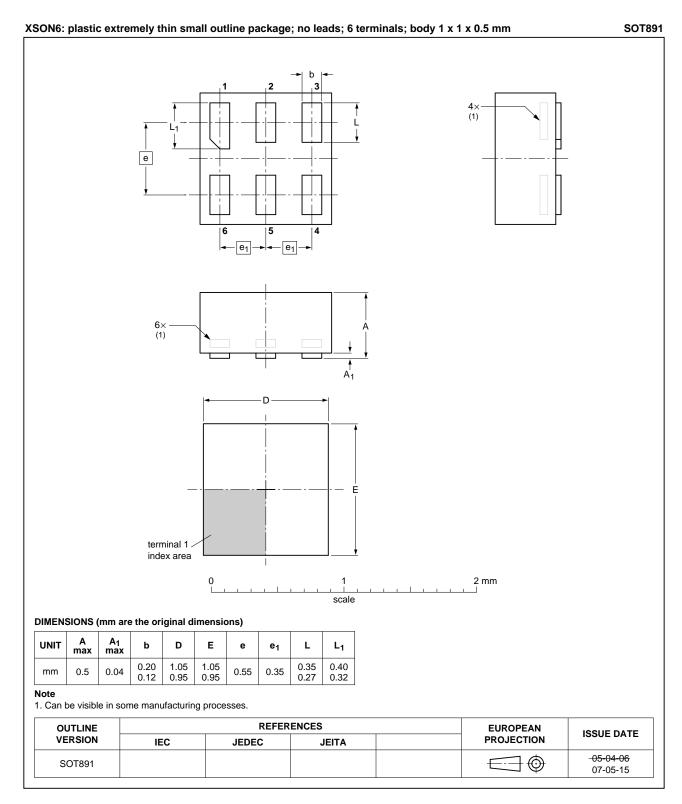


Fig 20. Package outline SOT891 (XSON6)

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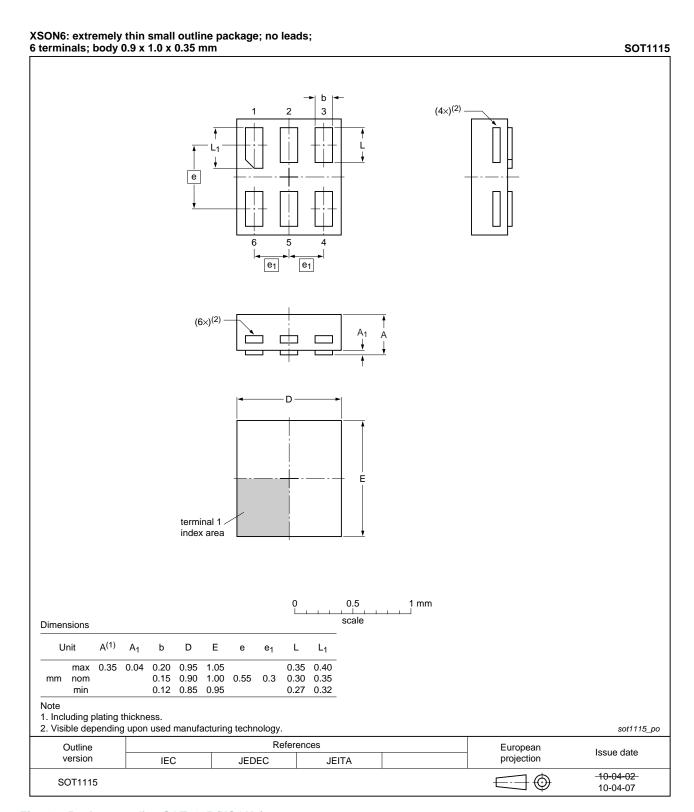


Fig 21. Package outline SOT1115 (XSON6)

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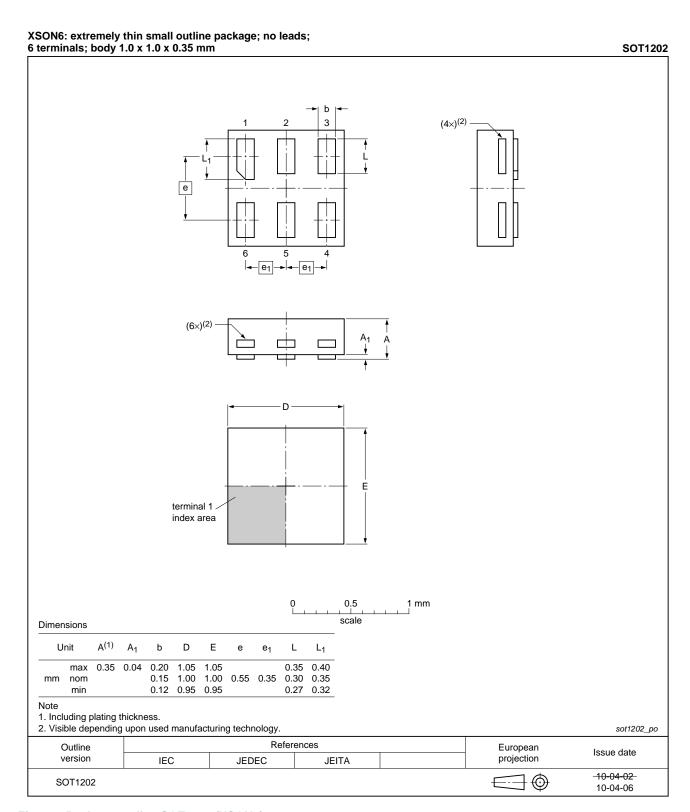


Fig 22. Package outline SOT1202 (XSON6)

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16. Abbreviations

Table 13. Abbreviations

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

17. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G58 v.6	20120815	Product data sheet	-	74AUP1G58 v.5
Modifications:	 Package outl 	ine drawing of SOT886 (<u>Figur</u>	e 19) modified.	
74AUP1G58 v.5	20111129	Product data sheet	-	74AUP1G58 v.4
74AUP1G58 v.4	20101011	Product data sheet	-	74AUP1G58 v.3
74AUP1G58 v.3	20090622	Product data sheet	-	74AUP1G58 v.2
74AUP1G58 v.2	20090326	Product data sheet	-	74AUP1G58 v.1
74AUP1G58 v.1	20070131	Product data sheet	-	-

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18. Legal information

18.1 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"
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