74AUP2G14

Low-power dual Schmitt trigger inverterRev. 5 — 4 December 2012

Product data sheet

General description

The 74AUP2G14 provides two inverting buffers with Schmitt trigger action which accept standard input signals. They are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

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 IOFF. The IOFF circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

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

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- 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

3. Applications

- Wave and pulse shaper
- Astable multivibrator
- Monostable multivibrator



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4. Ordering information

Table 1. Ordering information

Type number	Package								
	Temperature range	Name	Description	Version					
74AUP2G14GW	−40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363					
74AUP2G14GM	–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					
74AUP2G14GF	–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					
74AUP2G14GN	–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					
74AUP2G14GS	–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					

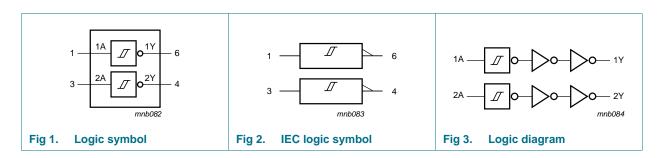
5. Marking

Table 2. Marking

Type number	Marking code ^[1]
74AUP2G14GW	pK
74AUP2G14GM	рК
74AUP2G14GF	рК
74AUP2G14GN	рК
74AUP2G14GS	pK

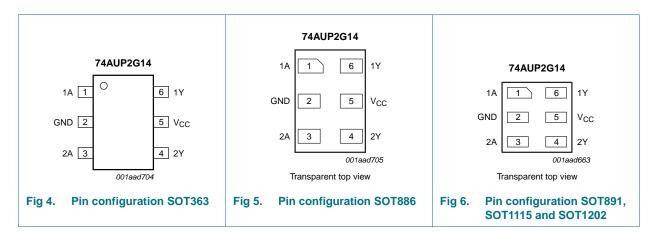
^[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

6. Functional diagram



7. Pinning information

7.1 Pinning



7.2 Pin description

Table 3. Pin description

	In the second	
Symbol	Pin	Description
1A	1	data input
GND	2	ground (0 V)
2A	3	data input
2Y	4	data output
V _{CC}	5	supply voltage
1Y	6	data output

8. Functional description

Table 4. Function table[1]

Input	Output
nA	nY
L	Н
Н	L

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

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9. 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		<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
Io	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.

10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		8.0	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

11. Static characteristics

Table 7. Static characteristics

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

Symbol	l Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = 2	25 °C					
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = $-20~\mu A;~V_{CC}$ = 0.8 V to 3.6 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
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^[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.

Table 7. 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
		$I_{O} = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3 \times V_{CC}$	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	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±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	$V_O = GND; V_{CC} = 0 V$	-	1.7	-	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
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 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 mA; V _{CC} = 1.65 V	-	-	0.35	V
		$I_{O} = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.33	V
		$I_{O} = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.45	V
		$I_{O} = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.33	V
		$I_O = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.45	V
I.	input leakage current	$V_{I} = GND \text{ to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	±0.5	μΑ
l _l	input roundge ourroin					•

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Table 7. 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	-	-	±0.6	μΑ
I _{CC}	supply current	V_I = GND or V_{CC} ; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.9	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 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
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.30	-	-	V
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	-	-	0.11	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
		$I_{O} = 4.0 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	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	μΑ
I_{OFF}	power-off leakage current	V_I or $V_O = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.75	μΑ
ΔI_{OFF}	additional power-off leakage current	$V_1 \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.75	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	μА
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

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12. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C		-40 °C to +125 °C			Unit
				Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C _L = 5 pl	F		•	1	•	•			
t _{pd}	propagation delay	nA to nY; see Figure 7							
		$V_{CC} = 0.8 V$	-	19.9	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	2.7	5.9	11.0	2.4	11.1	11.2	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	2.6	4.3	6.6	2.4	7.1	7.4	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	2.1	3.7	5.4	2.0	6.0	6.2	ns
		V_{CC} = 2.3 V to 2.7 V	2.0	3.0	4.1	1.7	4.5	4.7	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	1.9	2.8	3.6	1.5	3.9	4.0	ns
C _L = 10 p	ρF								
t_{pd}	propagation delay	nA to nY; see Figure 7							
		$V_{CC} = 0.8 V$	-	23.4	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	2.9	6.8	12.7	2.8	12.8	12.9	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	2.8	5.0	7.7	2.6	8.2	8.6	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	2.7	4.2	6.2	2.5	6.7	7.1	ns
		V_{CC} = 2.3 V to 2.7 V	2.3	3.6	4.8	2.1	5.2	5.5	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	2.1	3.3	4.3	2.0	4.5	4.7	ns
C _L = 15 p	ρF								
t_{pd}	propagation delay	nA to nY; see Figure 7							
		$V_{CC} = 0.8 V$	-	26.9	-	-	-	-	ns
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$	3.3	7.6	14.3	3.0	14.5	14.7	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	3.3	5.5	8.6	2.9	9.4	9.8	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	2.8	4.7	7.0	2.8	7.7	8.1	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	2.7	4.0	5.5	2.4	5.9	6.2	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	2.6	3.8	4.8	2.2	5.2	5.4	ns
$C_L = 30 \text{p}$	oF								
t_{pd}	propagation delay	nA to nY; see Figure 7							
		$V_{CC} = 0.8 V$	-	37.3	-	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V	4.0	9.8	18.7	3.9	19.6	20.0	ns
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$	3.7	7.1	11.2	3.8	12.3	12.9	ns
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	3.6	6.0	9.1	3.6	10.0	10.6	ns
		V_{CC} = 2.3 V to 2.7 V	3.5	5.2	6.9	3.2	7.5	7.9	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	3.3	4.8	6.1	3.1	7.1	7.4	ns

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Table 8. Dynamic characteristics ... continued

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions	Conditions 25 °C -40 °C to +125 °C	25 °C		25 °C -40 °C to +12		125 °C	Unit	
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)		
$C_L = 5 pl$	F, 10 pF, 15 pF and	30 pF								
C_{PD}	power dissipation capacitance	$f_i = 1 \text{ MHz}; V_I = \text{GND to } V_{CC}$	[3][4]							
		V _{CC} = 0.8 V		-	2.6	-	-	-	-	pF
		$V_{CC} = 1.1 \text{ V to } 1.3 \text{ V}$		-	2.7	-	-	-	-	pF
		$V_{CC} = 1.4 \text{ V to } 1.6 \text{ V}$		-	2.9	-	-	-	-	pF
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		-	3.1	-	-	-	-	pF
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		-	3.7	-	-	-	-	pF
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		-	4.3	-	-	-	-	pF

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

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

 f_i = input frequency in MHz;

fo = output frequency in MHz;

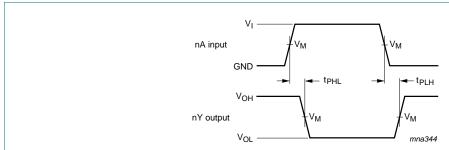
C_L = load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

13. Waveforms



Measurement points are given in Table 9.

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

Fig 7. The data input (nA) to output (nY) propagation delays

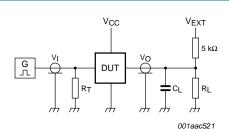
Table 9. Measurement points

Supply voltage	Output	Input		
V _{CC}	V _M	V _M	V _I	$t_r = t_f$
0.8 V to 3.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	V _{CC}	≤ 3.0 ns

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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_0 of the pulse generator.

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

Fig 8. Test circuit for measuring switching times

Table 10. 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 Ω , for measuring propagation delays, set-up and hold times and pulse width R_L = 1 M Ω .

14. Transfer characteristics

Table 11. Transfer characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C		–40 °C to +125 °C			Unit
			Min	Тур	Max	Min	Max (85 °C)	Max (125 °C)	
V_{T+}	V _{T+} positive-going	see Figure 9 and Figure 10							
	threshold voltage	$V_{CC} = 0.8 \text{ V}$	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 negative-going threshold voltage	0 0	see Figure 9 and Figure 10							
	threshold voltage	$V_{CC} = 0.8 \text{ V}$	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
	$V_{CC} = 1.4 \text{ V}$	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	

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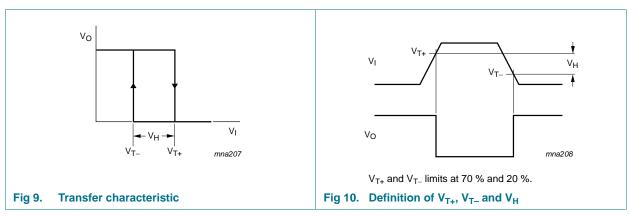
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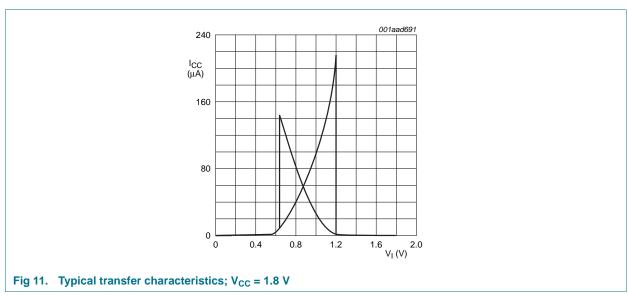
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Table 11. Transfer characteristics ...continued Voltages are referenced to GND (ground = 0 V); for test circuit see <u>Figure 8</u>.

Symbol	Parameter	Conditions	25 °C		-40 °C to +125 °C			Unit	
		Min	Тур	Max	Min	Max (85 °C)	Max (125 °C)		
V _H hysteresis voltage	$(V_{T+} - V_{T-})$; see <u>Figure 9</u> , <u>Figure 10</u> , <u>Figure 11</u> and <u>Figure 12</u>								
	$V_{CC} = 0.8 \text{ V}$	0.07	-	0.50	0.07	0.50	0.50	V	
	V _{CC} = 1.1 V	80.0	-	0.46	0.08	0.46	0.46	V	
	$V_{CC} = 1.4 \text{ V}$	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 V	0.79	-	1.31	0.79	1.31	1.31	V

15. Waveforms transfer characteristics

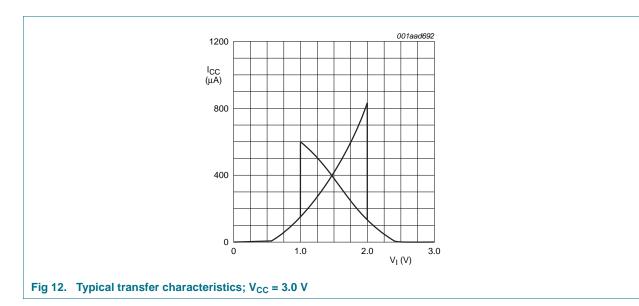




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16. Application information

The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

 $P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC}$ where:

 P_{add} = additional power dissipation (μ W);

 $f_i = input frequency (MHz);$

 t_r = rise time (ns); 10 % to 90 %;

 $t_f = fall time (ns); 90 \% to 10 \%;$

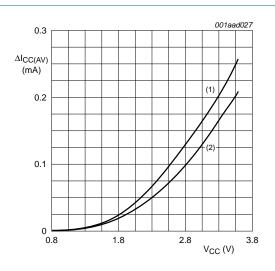
 $\Delta I_{CC(AV)}$ = average additional supply current (μA).

Average $\Delta I_{CC(AV)}$ differs with positive or negative input transitions, as shown in Figure 13.

An example of a relaxation circuit using the 74AUP2G14 is shown in Figure 14.

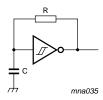
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- (1) Positive-going edge.
- (2) Negative-going edge.

Fig 13. Average I_{CC} as a function of V_{CC}



$$f = \frac{1}{T} \approx \frac{1}{a \times RC}$$

Average values for variable a are given in Table 12.

Fig 14. Relaxation oscillator

Table 12. Variable values

Supply voltage	Variable a
1.1 V	1.28
1.5 V	1.22
1.8 V	1.24
2.8 V	1.34
3.3 V	1.45

17. Package outline

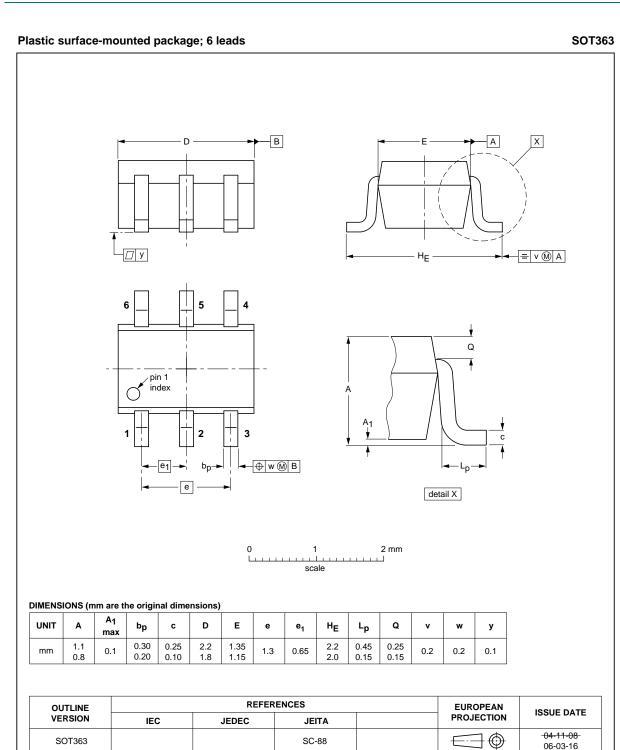


Fig 15. Package outline SOT363 (SC-88)

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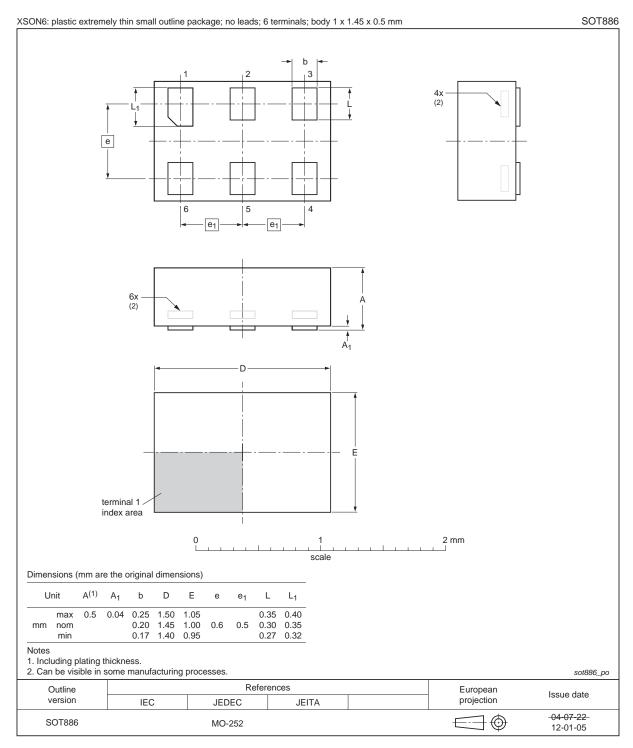


Fig 16. Package outline SOT886 (XSON6)

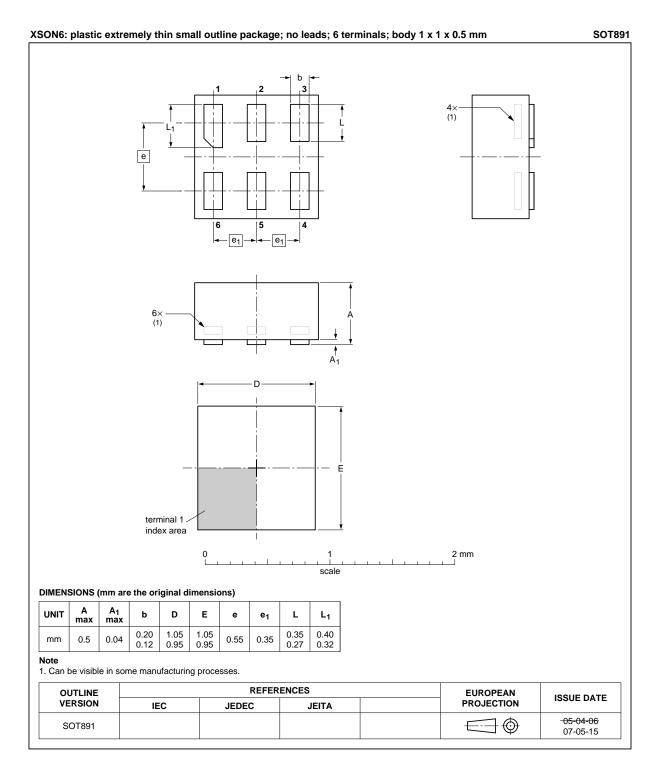


Fig 17. Package outline SOT891 (XSON6)

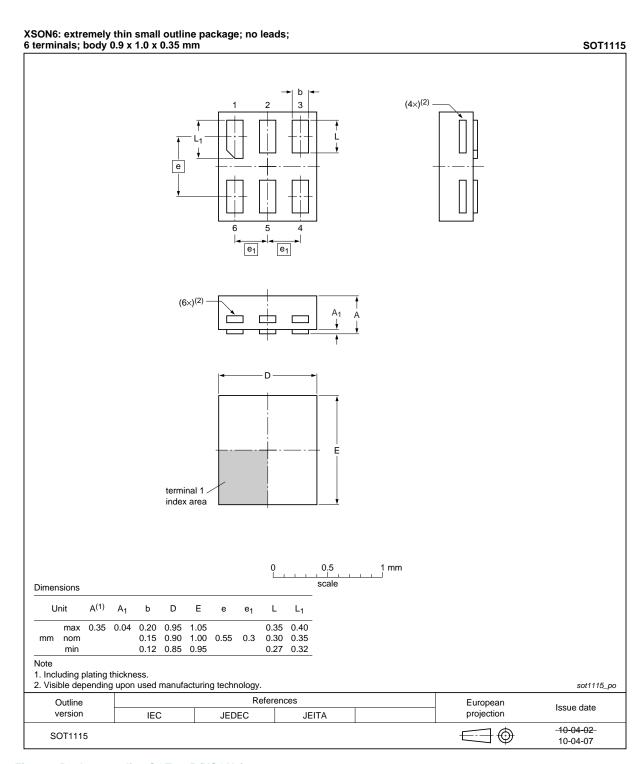


Fig 18. Package outline SOT1115 (XSON6)

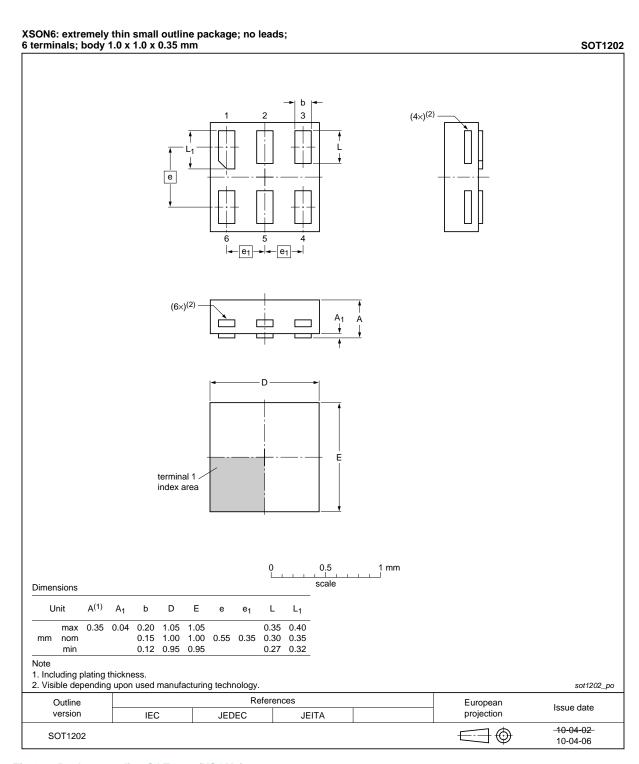


Fig 19. Package outline SOT1202 (XSON6)

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18. Abbreviations

Table 13. Abbreviations

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

19. Revision history

Table 14. Revision history

	-			
Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G14 v.5	20121204	Product data sheet	-	74AUP2G14 v.4
Modifications:	 Package out 	line drawing of SOT886 (Figur	e 16) modified.	
74AUP2G14 v.4	20111201	Product data sheet	-	74AUP2G14 v.3
74AUP2G14 v.3	20100722	Product data sheet	-	74AUP2G14 v.2
74AUP2G14 v.2	20090703	Product data sheet	-	74AUP2G14 v.1
74AUP2G14 v.1	20061219	Product data sheet	-	-

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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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