74AUP2G14

Low-power dual Schmitt trigger inverter

Rev. 8 — 31 January 2022 Product data sheet

1. General description

The 74AUP2G14 is a dual inverter with Schmitt-trigger inputs. This device ensures 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 potentially 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
- CMOS low power dissipation
- High noise immunity
- Overvoltage tolerant inputs to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- I_{OFF} circuitry provides partial Power-down mode operation
- Latch-up performance exceeds 100 mA per JESD 78B Class II
- Low static power consumption; I_{CC} = 0.9 µA (maximum)
- 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
- 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

nexperia

4. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP2G14GW	-40 °C to +125 °C	TSSOP6	plastic thin shrink small outline package; 6 leads; body width 1.25 mm	SOT363-2
74AUP2G14GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP2G14GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AUP2G14GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74AUP2G14GX	-40 °C to +125 °C	X2SON6	plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.0 × 0.8 × 0.32 mm	SOT1255-2

5. Marking

Table 2. Marking

Type number	Marking code[1]
74AUP2G14GW	pK
74AUP2G14GM	pK
74AUP2G14GN	pK
74AUP2G14GS	pK
74AUP2G14GX	pK

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

6. Functional diagram

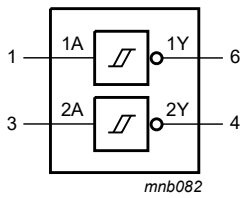


Fig. 1. Logic symbol

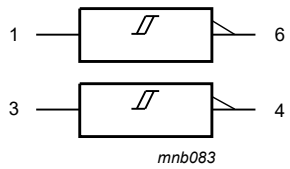


Fig. 2. IEC logic symbol

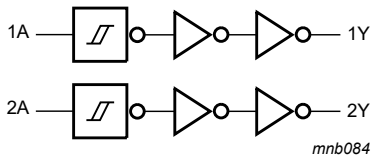


Fig. 3. Logic diagram

7. Pinning information

7.1. Pinning

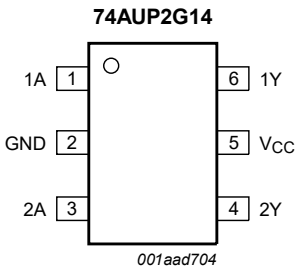
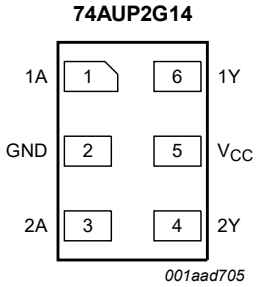
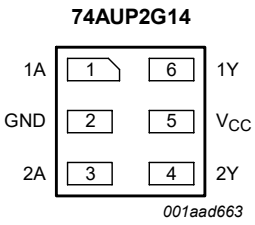


Fig. 4. Pin configuration SOT363-2 (TSSOP6)



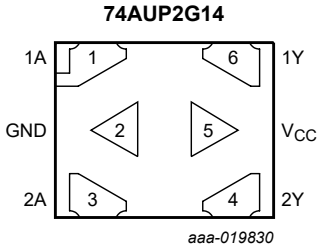
Transparent top view

Fig. 5. Pin configuration SOT886 (XSON6)



Transparent top view

Fig. 6. Pin configuration SOT1115 and SOT1202 (XSON6)



Transparent top view

Fig. 7. Pin configuration SOT1255-2 (X2SON6)

7.2. Pin description

Table 3. Pin description

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

H = HIGH voltage level; L = LOW voltage level.

Input	Output
nA	**nY**
L	H
H	L

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	[1]	-0.5	+4.6	V
I_{OK}	output clamping current	$V_O < 0$ V	-50	-	mA
V_O	output voltage	Active mode and Power-down mode [1]	-0.5	+4.6	V
I_O	output current	V_O = 0 V to V_{CC}	-	±20	mA
I_{CC}	supply current		-	50	mA
I_{GND}	ground current		-50	-	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	T_{amb} = -40 °C to +125 °C [2]	-	250	mW

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

[2] For SOT363-2 (TSSOP6) package: P_{tot} derates linearly with 3.7 mW/K above 83 °C.
For SOT886 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT1115 (XSON6) package: P_{tot} derates linearly with 3.2 mW/K above 71 °C.
For SOT1202 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT1255-2 (X2SON6) package: P_{tot} derates linearly with 3.3 mW/K above 75 °C.

10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		0.8	3.6	V
V_I	input voltage		0	3.6	V
V_O	output voltage	Active mode	0	V_{CC}	V
		Power-down mode; V_{CC} = 0 V	0	3.6	V
T_{amb}	ambient temperature		-40	+125	°C

11. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = 25 °C						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = -20 µA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.1	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.75 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	1.11	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.32	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	2.05	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.9	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.72	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.6	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 µA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.31	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.31	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.31	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.44	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.31	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.44	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	µA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.2	µA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V;V_{CC} = 0 V to 0.2 V	-	-	±0.2	µA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.5	µA
ΔI_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	-	-	40	µA
C_I	input capacitance	V_I = GND or V_{CC}; V_{CC} = 0 V to 3.6 V	-	1.1	-	pF
C_O	output capacitance	V_O = GND; V_{CC} = 0 V	-	1.7	-	pF

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +85 °C						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = -20 µA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.1	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.7 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	1.03	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.30	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.97	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.85	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.67	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.55	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_O = 20 µA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × 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 mA; V_{CC} = 2.3 V	-	-	0.45	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.33	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.45	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.5	µA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.5	µA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.6	µA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	0.9	µA
ΔI_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	-	-	50	µA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +125 °C						
V_{OH}	HIGH-level output voltage	V_I = V_{T+} or V_{T-}				
		I_O = -20 µA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.11	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.6 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	0.93	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.17	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.77	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.67	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.40	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.30	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{T+} or V_{T-}				
		I_O = 20 µA; V_{CC} = 0.8 V to 3.6 V	-	-	0.11	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.33 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.41	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.39	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.36	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.50	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.36	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.50	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.75	µA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.75	µA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.75	µA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	1.4	µA
ΔI_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	-	-	75	µA

12. Dynamic characteristics

Table 8. Dynamic characteristics

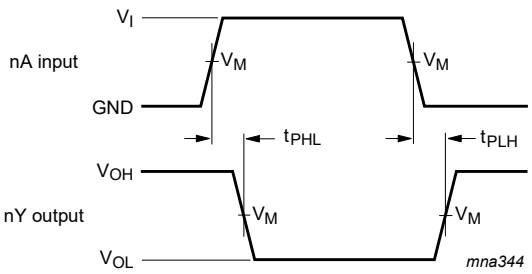
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 9.

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 5 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 8 [2]								
		V_{CC} = 0.8 V	-	19.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.7	5.9	11.0	2.4	11.1	2.4	11.2	ns
		V_{CC} = 1.4 V to 1.6 V	2.6	4.3	6.6	2.4	7.1	2.4	7.4	ns
		V_{CC} = 1.65 V to 1.95 V	2.1	3.7	5.4	2.0	6.0	2.0	6.2	ns
		V_{CC} = 2.3 V to 2.7 V	2.0	3.0	4.1	1.7	4.5	1.7	4.7	ns
		V_{CC} = 3.0 V to 3.6 V	1.9	2.8	3.6	1.5	3.9	1.5	4.0	ns
C_L = 10 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 8 [2]								
		V_{CC} = 0.8 V	-	23.4	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.9	6.8	12.7	2.8	12.8	2.8	12.9	ns
		V_{CC} = 1.4 V to 1.6 V	2.8	5.0	7.7	2.6	8.2	2.6	8.6	ns
		V_{CC} = 1.65 V to 1.95 V	2.7	4.2	6.2	2.5	6.7	2.5	7.1	ns
		V_{CC} = 2.3 V to 2.7 V	2.3	3.6	4.8	2.1	5.2	2.1	5.5	ns
		V_{CC} = 3.0 V to 3.6 V	2.1	3.3	4.3	2.0	4.5	2.0	4.7	ns
C_L = 15 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 8 [2]								
		V_{CC} = 0.8 V	-	26.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.3	7.6	14.3	3.0	14.5	3.0	14.7	ns
		V_{CC} = 1.4 V to 1.6 V	3.3	5.5	8.6	2.9	9.4	2.9	9.8	ns
		V_{CC} = 1.65 V to 1.95 V	2.8	4.7	7.0	2.8	7.7	2.8	8.1	ns
		V_{CC} = 2.3 V to 2.7 V	2.7	4.0	5.5	2.4	5.9	2.4	6.2	ns
		V_{CC} = 3.0 V to 3.6 V	2.6	3.8	4.8	2.2	5.2	2.2	5.4	ns
C_L = 30 pF										
t_{pd}	propagation delay	nA to nY; see Fig. 8 [2]								
		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	3.9	20.0	ns
		V_{CC} = 1.4 V to 1.6 V	3.7	7.1	11.2	3.8	12.3	3.8	12.9	ns
		V_{CC} = 1.65 V to 1.95 V	3.6	6.0	9.1	3.6	10.0	3.6	10.6	ns
		V_{CC} = 2.3 V to 2.7 V	3.5	5.2	6.9	3.2	7.5	3.2	7.9	ns
		V_{CC} = 3.0 V to 3.6 V	3.3	4.8	6.1	3.1	7.1	3.1	7.4	ns

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
C_L = 5 pF, 10 pF, 15 pF and 30 pF										
C_{PD}	power dissipation capacitance	f_i = 1 MHz; V_I = GND to V_{CC} [3][4]								
		V_{CC} = 0.8 V	-	2.6	-	-	-	-	-	pF
		V_{CC} = 1.1 V to 1.3 V	-	2.7	-	-	-	-	-	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	-	3.7	-	-	-	-	-	pF
		V_{CC} = 3.0 V to 3.6 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).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ 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.

12.1. Waveform and test circuit

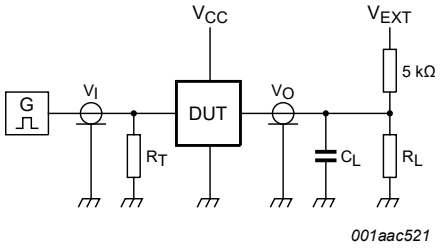


Measurement points are given in Table 9.
Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 8. 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 × V_{CC}	0.5 × V_{CC}	V_{CC}	≤ 3.0 ns



Test data is given in Table 10.

Definitions for test circuit:

R_L = Load resistance;

C_L = Load capacitance including jig and probe capacitance;

R_T = Termination resistance should be equal to the output impedance Z_o of the pulse generator;

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

Fig. 9. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Load		V_{EXT}		
V_{CC}	C_L	R_L [1]	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	2 × V_{CC}

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

13. Transfer characteristics

Table 11. Transfer characteristics

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

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
V_{T+}	positive-going threshold voltage	see Fig. 10 and Fig. 11								
		V_{CC} = 0.8 V	0.30	-	0.60	0.30	0.60	0.30	0.62	V
		V_{CC} = 1.1 V	0.53	-	0.90	0.53	0.90	0.53	0.92	V
		V_{CC} = 1.4 V	0.74	-	1.11	0.74	1.11	0.74	1.13	V
		V_{CC} = 1.65 V	0.91	-	1.29	0.91	1.29	0.91	1.31	V
		V_{CC} = 2.3 V	1.37	-	1.77	1.37	1.77	1.37	1.80	V
		V_{CC} = 3.0 V	1.88	-	2.29	1.88	2.29	1.88	2.32	V
V_{T-}	negative-going threshold voltage	see Fig. 10 and Fig. 11								
		V_{CC} = 0.8 V	0.10	-	0.60	0.10	0.60	0.10	0.60	V
		V_{CC} = 1.1 V	0.26	-	0.65	0.26	0.65	0.26	0.65	V
		V_{CC} = 1.4 V	0.39	-	0.75	0.39	0.75	0.39	0.75	V
		V_{CC} = 1.65 V	0.47	-	0.84	0.47	0.84	0.47	0.84	V
		V_{CC} = 2.3 V	0.69	-	1.04	0.69	1.04	0.69	1.04	V
		V_{CC} = 3.0 V	0.88	-	1.24	0.88	1.24	0.88	1.24	V

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
V_H	hysteresis voltage	(V_{T+} - V_{T-}); see Fig. 10, Fig. 11 and Fig. 12.								
		V_{CC} = 0.8 V	0.07	-	0.50	0.07	0.50	0.07	0.50	V
		V_{CC} = 1.1 V	0.08	-	0.46	0.08	0.46	0.08	0.46	V
		V_{CC} = 1.4 V	0.18	-	0.56	0.18	0.56	0.18	0.56	V
		V_{CC} = 1.65 V	0.27	-	0.66	0.27	0.66	0.27	0.66	V
		V_{CC} = 2.3 V	0.53	-	0.92	0.53	0.92	0.53	0.92	V
		V_{CC} = 3.0 V	0.79	-	1.31	0.79	1.31	0.79	1.31	V

13.1. Waveforms transfer characteristics

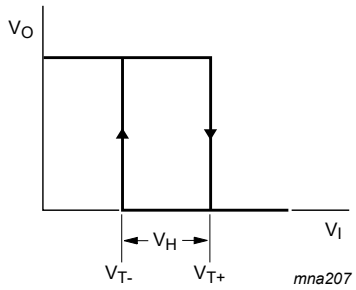
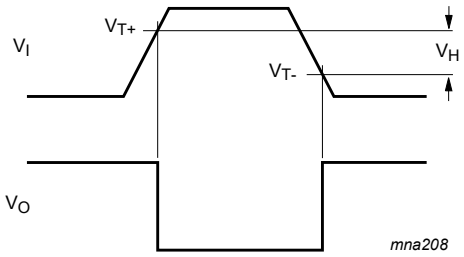
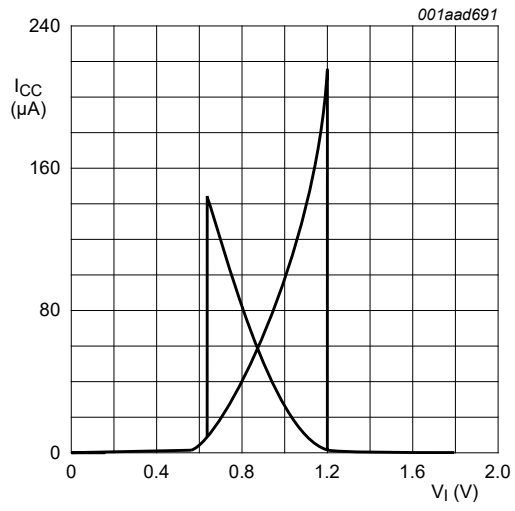


Fig. 10. Transfer characteristic

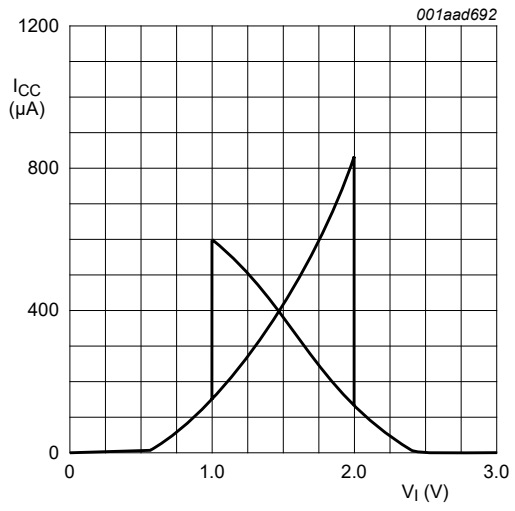


V_{T+} and V_{T-} limits at 70 % and 20 %.

Fig. 11. Definition of V_{T+}, V_{T-} and V_H



V_{CC} = 1.8 V



V_{CC} = 3.0 V

Fig. 12. Typical transfer characteristics

14. Application information

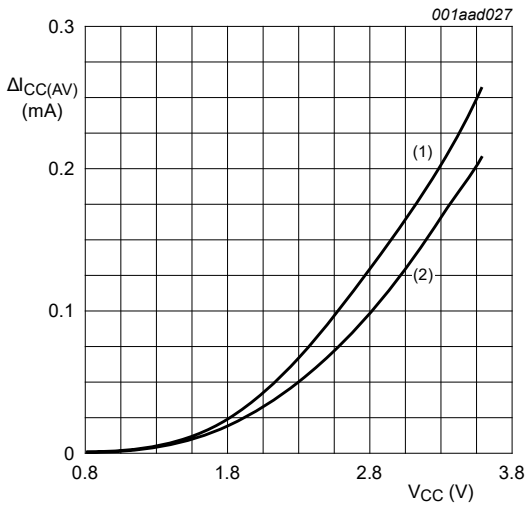
The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

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

- P_{add} = additional power dissipation (µW);
- 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 Fig. 13.

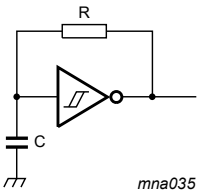
An example of a relaxation circuit using the 74AUP2G14 is shown in Fig. 14.



(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.

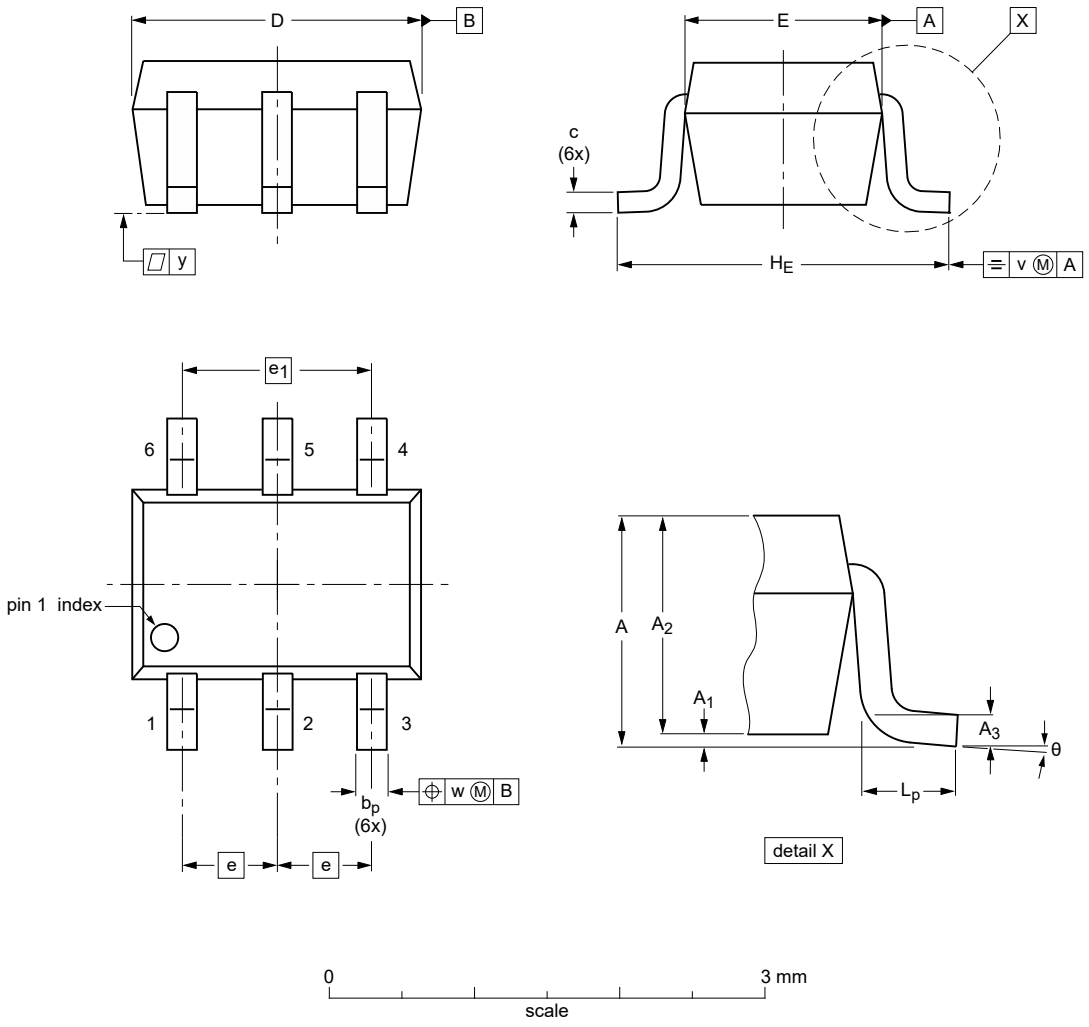
Fig. 14. Relaxation oscillator

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

15. Package outline

TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm **SOT363-2**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	e_1	H_E	L_p	v	w	y	θ
mm	max	1.1	0.1	1.0	0.15	0.30	0.25	2.2	1.35	0.65	1.3	2.4	0.46	0.3	0.1	0.1	8°
	min	0.8	0	0.8		0.15	0.08	1.8	1.15			1.8	0.26				0°

Note

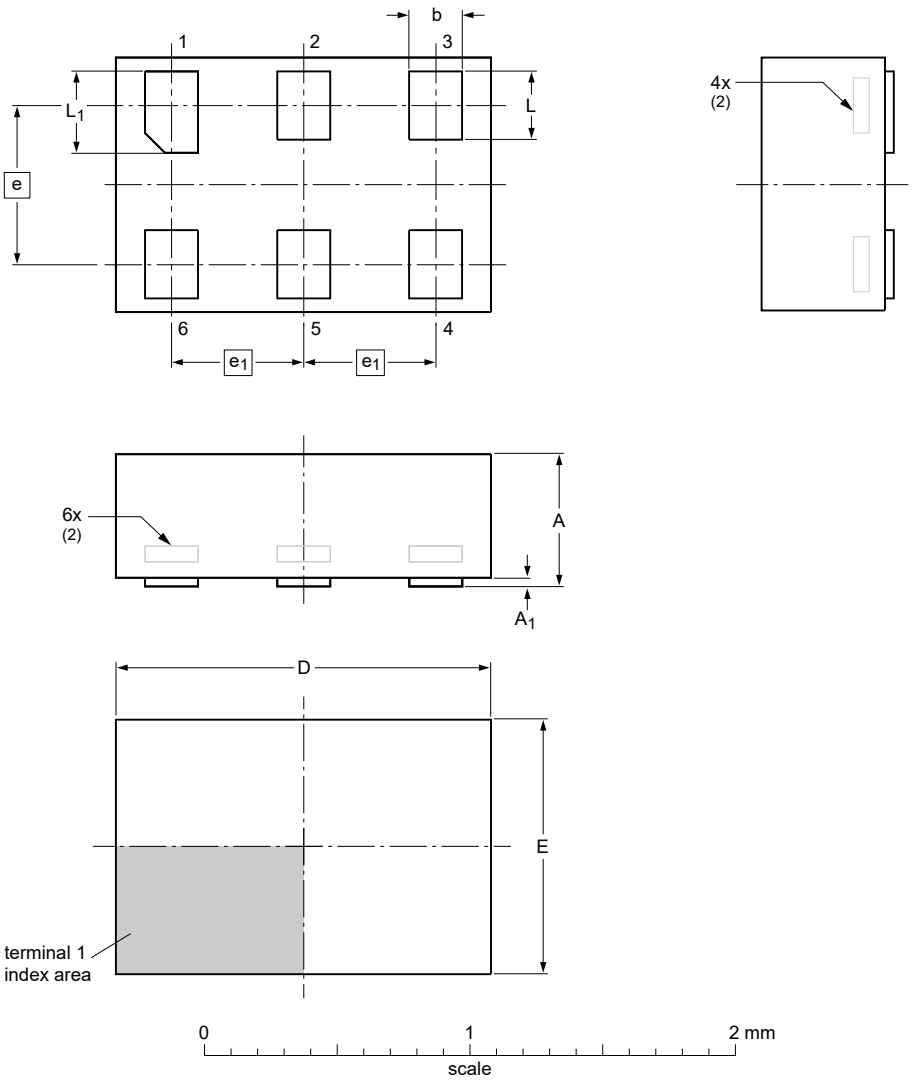
1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

sot363-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT363-2		MO-203	SC-88A			~~21-12-15~~ 21-12-16

Fig. 15. Package outline SOT363-2 (TSSOP6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm SOT886



Dimensions (mm are the original dimensions)

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.5	0.04	0.25	1.50	1.05			0.35	0.40
	nom			0.20	1.45	1.00	0.6	0.5	0.30	0.35
	min			0.17	1.40	0.95			0.27	0.32

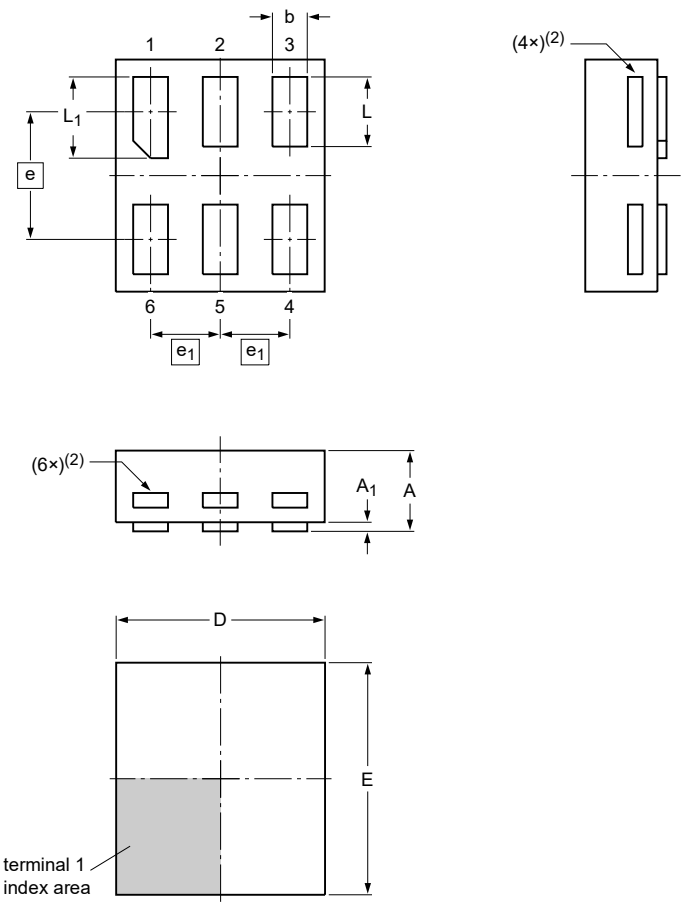
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT886		MO-252				~~04-07-22~~ 12-01-05

Fig. 16. Package outline SOT886 (XSON6)

XSON6: extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm **SOT1115**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	0.95	1.05			0.35	0.40
	nom			0.15	0.90	1.00	0.55	0.3	0.30	0.35
	min			0.12	0.85	0.95			0.27	0.32

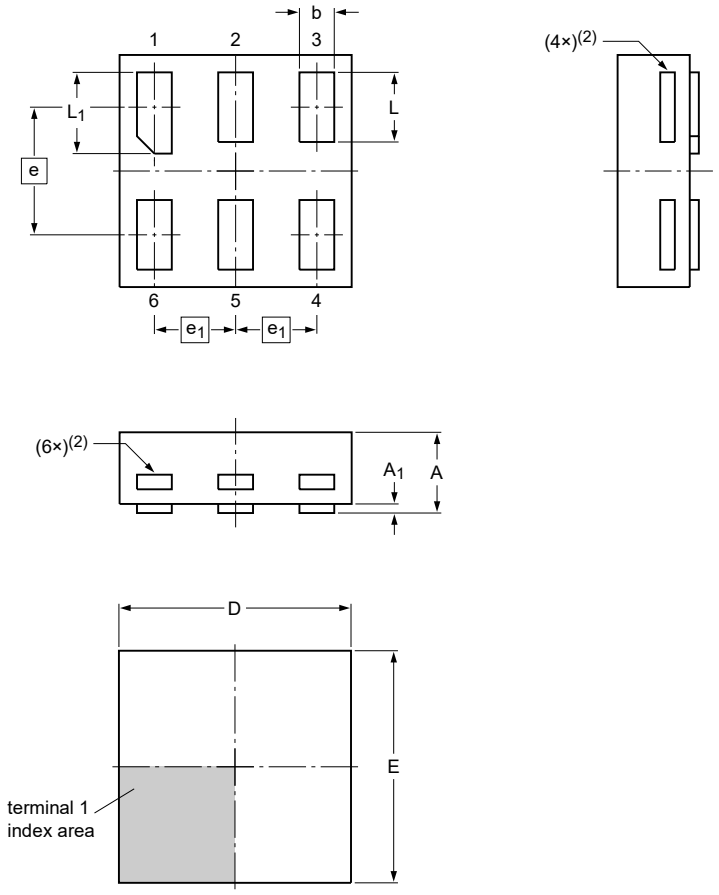
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1115_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1115						~~10-04-02~~ 10-04-07

Fig. 17. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm **SOT1202**



Dimensions

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

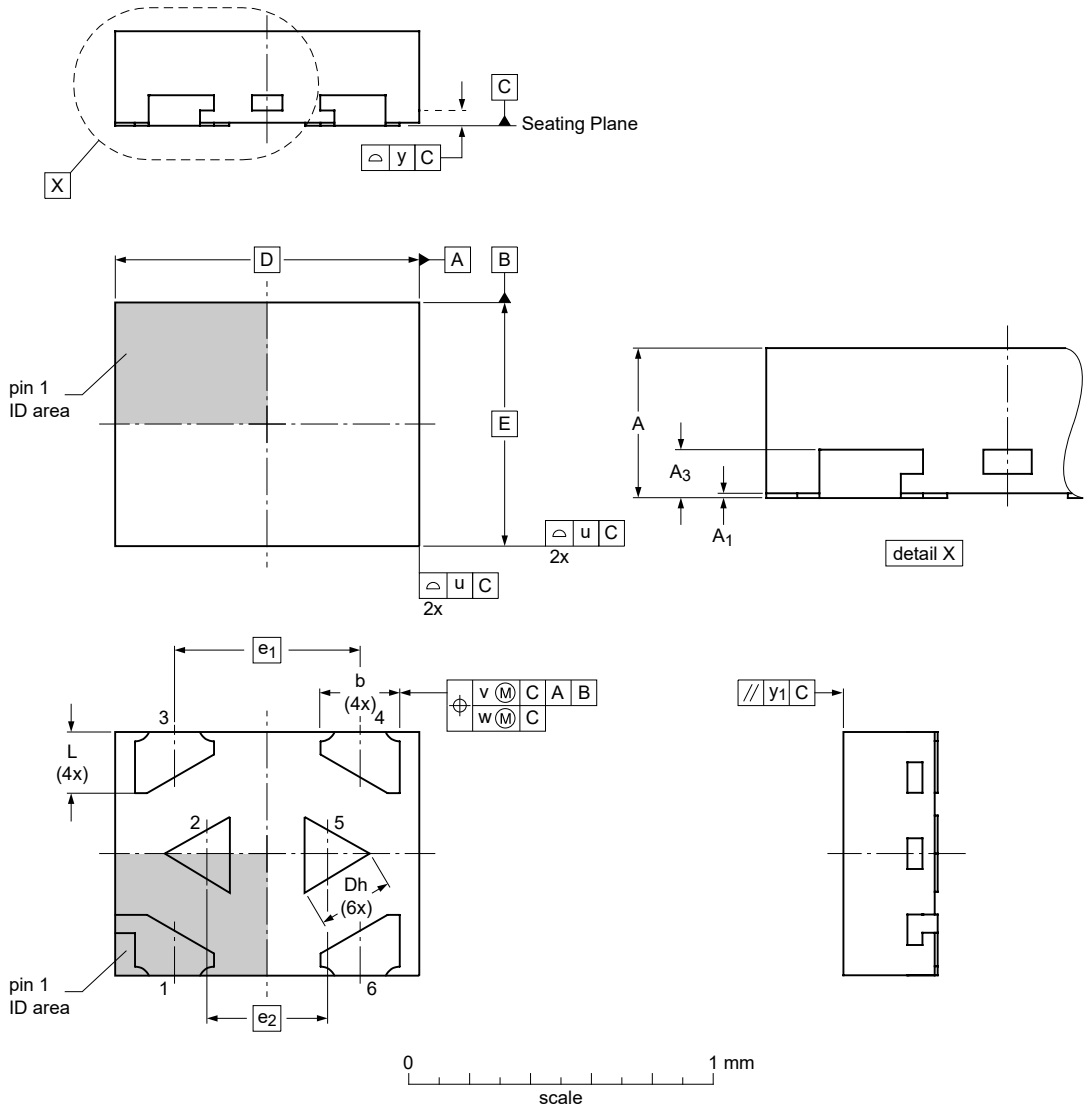
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1202_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1202						~~10-04-02~~ 10-04-06

Fig. 18. Package outline SOT1202 (XSON6)

X2SON6: plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.0 x 0.8 x 0.32 mm **SOT1255-2**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_3	b	D	D_h	E	e_1	e_2	L	y	y_1	u	v	w
mm	max	0.35	0.04	0.10 (Typ.)	0.31	1.00	0.30	0.80	0.60	0.40	0.25	0.05	0.05	0.05	0.10	0.05
	nom	0.32	0.02		0.26		0.25				0.20					
	min	0.30	0.00		0.21		0.20				0.15					

sot1255-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1255-2		---				~~19-11-07~~ 19-11-08

Fig. 19. Package outline SOT1255-2 (X2SON6)

16. Abbreviations

Table 13. Abbreviations

Acronym	Description
CDM	Charged Device Model
CMOS	Complementary Metal-Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model

17. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G14 v.8	20220131	Product data sheet	-	74AUP2G14 v.7
Modifications:	• Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6).			
74AUP2G14 v.7	20210705	Product data sheet	-	74AUP2G14 v.6
Modifications:	• Section 1 and Section 2 updated. • SOT1255 (X2SON6) package changed to SOT1255-2 (X2SON6) package. • Type number 74AUP2G14GF (SOT891/XSON6) removed. • Table 5: Derating values for P_{tot} total power dissipation updated.			
74AUP2G14 v.6	20150917	Product data sheet	-	74AUP2G14 v.5
Modifications:	• Added type number 74AUP2G14GX (SOT1255/X2SON6).			
74AUP2G14 v.5	20121204	Product data sheet	-	74AUP2G14 v.4
Modifications:	• Package outline drawing of SOT886 (Fig. 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	-	-

18. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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