

74AUP2G17

Low-power dual Schmitt trigger

Rev. 03 — 6 July 2009

Product data sheet

1. General description

The 74AUP2G17 provides two Schmitt trigger buffers. It is 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 I_{OFF} . The I_{OFF} 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 .

2. Features

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- ESD protection:
 - ◆ HBM JESD22-A114E Class 3A exceeds 5000 V
 - ◆ MM JESD22-A115-A exceeds 200 V
 - ◆ CDM JESD22-C101C 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 $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ and $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP2G17GW	−40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74AUP2G17GM	−40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP2G17GF	−40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm	SOT891

4. Marking

Table 2. Marking

Type number	Marking code ^[1]
74AUP2G17GW	pV
74AUP2G17GM	pV
74AUP2G17GF	pV

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

5. Functional diagram

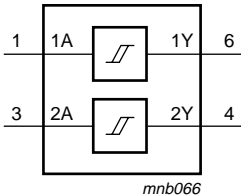


Fig 1. Logic symbol

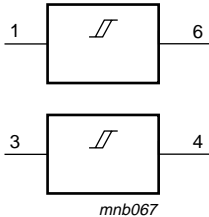


Fig 2. IEC logic symbol

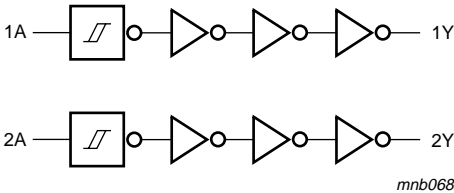


Fig 3. Logic diagram

6. Pinning information

6.1 Pinning

Fig 4. Pin configuration SOT363 (SC-88)

Fig 5. Pin configuration SOT886 (XSON6)

Fig 6. Pin configuration SOT891 (XSON6)

6.2 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

7. Functional description

Table 4. Function table^[1]

Input	Output
nA	nY
L	L
H	H

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

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{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 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.

9. 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

10. 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-}				
		$I_O = -20$ μ A; $V_{CC} = 0.8$ V to 3.6 V	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1$ mA; $V_{CC} = 1.1$ V	$0.75 \times V_{CC}$	-	-	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

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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
I_I	input leakage current	$V_I = \text{GND}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$	-	-	± 0.1	μA
I_{OFF}	power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$	-	-	± 0.2	μA
ΔI_{OFF}	additional power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $0.2\ \text{V}$	-	-	± 0.2	μA
I_{CC}	supply current	$V_I = \text{GND}$ or V_{CC} ; $I_O = 0\ \text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	-	-	0.5	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC} - 0.6\ \text{V}$; $I_O = 0\ \text{A}$; $V_{CC} = 3.3\ \text{V}$	-	-	40	μA
C_I	input capacitance	$V_I = \text{GND}$ or V_{CC} ; $V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$	-	1.1	-	pF
C_O	output capacitance	$V_O = \text{GND}$; $V_{CC} = 0\ \text{V}$	-	1.7	-	pF
$T_{amb} = -40\ ^\circ\text{C}$ to $+85\ ^\circ\text{C}$						
V_{OH}	HIGH-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		$I_O = -20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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-}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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
		$I_O = 1.7\ \text{mA}$; $V_{CC} = 1.4\ \text{V}$	-	-	0.37	V
		$I_O = 1.9\ \text{mA}$; $V_{CC} = 1.65\ \text{V}$	-	-	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_I	input leakage current	$V_I = \text{GND}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$	-	-	± 0.5	μA
I_{OFF}	power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$	-	-	± 0.5	μA

Table 7. Static characteristics ...continued

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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
$T_{amb} = -40$ °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	$0.6 \times V_{CC}$	-	-	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	-	-	$0.33 \times V_{CC}$	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

11. 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
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C _L = 5 pF									
t _{pd}	propagation delay	nA to nY; see Figure 7	[2]						
		V _{CC} = 0.8 V	-	19.0	-	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V	2.6	5.7	10.6	2.5	10.9	11.1	ns
		V _{CC} = 1.4 V to 1.6 V	2.4	4.2	6.5	2.3	7.1	7.4	ns
		V _{CC} = 1.65 V to 1.95 V	2.0	3.6	5.5	1.9	6.1	6.3	ns
		V _{CC} = 2.3 V to 2.7 V	1.9	3.0	4.2	1.8	4.6	4.8	ns
		V _{CC} = 3.0 V to 3.6 V	1.8	2.7	3.6	1.5	3.8	4.0	ns
C _L = 10 pF									
t _{pd}	propagation delay	nA to nY; see Figure 7	[2]						
		V _{CC} = 0.8 V	-	22.5	-	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V	2.9	6.6	12.4	2.7	12.9	13.0	ns
		V _{CC} = 1.4 V to 1.6 V	2.6	4.8	7.8	2.4	8.3	8.7	ns
		V _{CC} = 1.65 V to 1.95 V	2.5	4.2	6.3	2.4	6.8	7.1	ns
		V _{CC} = 2.3 V to 2.7 V	2.3	3.5	4.8	2.1	5.3	5.6	ns
		V _{CC} = 3.0 V to 3.6 V	2.1	3.3	4.4	2.0	4.6	4.8	ns
C _L = 15 pF									
t _{pd}	propagation delay	nA to nY; see Figure 7	[2]						
		V _{CC} = 0.8 V	-	26.0	-	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V	3.2	7.4	14.1	3.1	14.7	14.9	ns
		V _{CC} = 1.4 V to 1.6 V	3.1	5.4	8.7	2.8	9.5	9.9	ns
		V _{CC} = 1.65 V to 1.95 V	2.7	4.7	7.1	2.7	7.8	8.2	ns
		V _{CC} = 2.3 V to 2.7 V	2.6	4.0	5.6	2.5	6.0	6.3	ns
		V _{CC} = 3.0 V to 3.6 V	2.5	3.7	4.9	2.2	5.2	5.5	ns
C _L = 30 pF									
t _{pd}	propagation delay	nA to nY; see Figure 7	[2]						
		V _{CC} = 0.8 V	-	36.3	-	-	-	-	ns
		V _{CC} = 1.1 V to 1.3 V	3.9	9.7	19.0	3.7	19.8	20.1	ns
		V _{CC} = 1.4 V to 1.6 V	3.5	7.0	11.2	3.6	12.4	13.0	ns
		V _{CC} = 1.65 V to 1.95 V	3.5	6.0	9.2	3.4	10.1	10.7	ns
		V _{CC} = 2.3 V to 2.7 V	3.4	5.1	7.0	3.2	7.5	7.9	ns
		V _{CC} = 3.0 V to 3.6 V	3.3	4.8	6.2	3.1	7.1	7.5	ns

Table 8. Dynamic characteristics ...continued

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	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	
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]							
		V _{CC} = 0.8 V	-	2.5	-	-	-	-	pF
		V _{CC} = 1.1 V to 1.3 V	-	2.7	-	-	-	-	pF
		V _{CC} = 1.4 V to 1.6 V	-	2.8	-	-	-	-	pF
		V _{CC} = 1.65 V to 1.95 V	-	3.0	-	-	-	-	pF
		V _{CC} = 2.3 V to 2.7 V	-	3.5	-	-	-	-	pF
		V _{CC} = 3.0 V to 3.6 V	-	4.0	-	-	-	-	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_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;

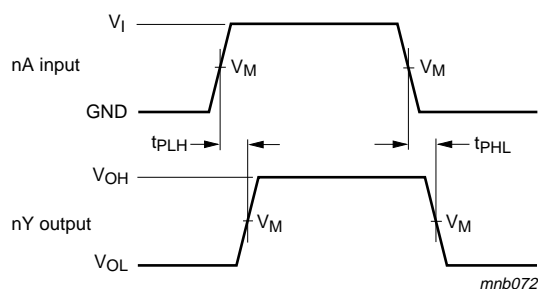
C_L = output load capacitance in pF;

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

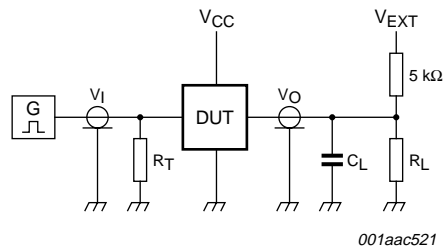


Measurement points are given in [Table 9](#).

Logic levels: V_{OL} and V_{OH} are typical output voltage drop 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}	$\leq 3.0 \text{ ns}$



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 8. Load circuitry for 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	$2 \times V_{CC}$

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

13. Transfer characteristics

Table 11. Transfer characteristics

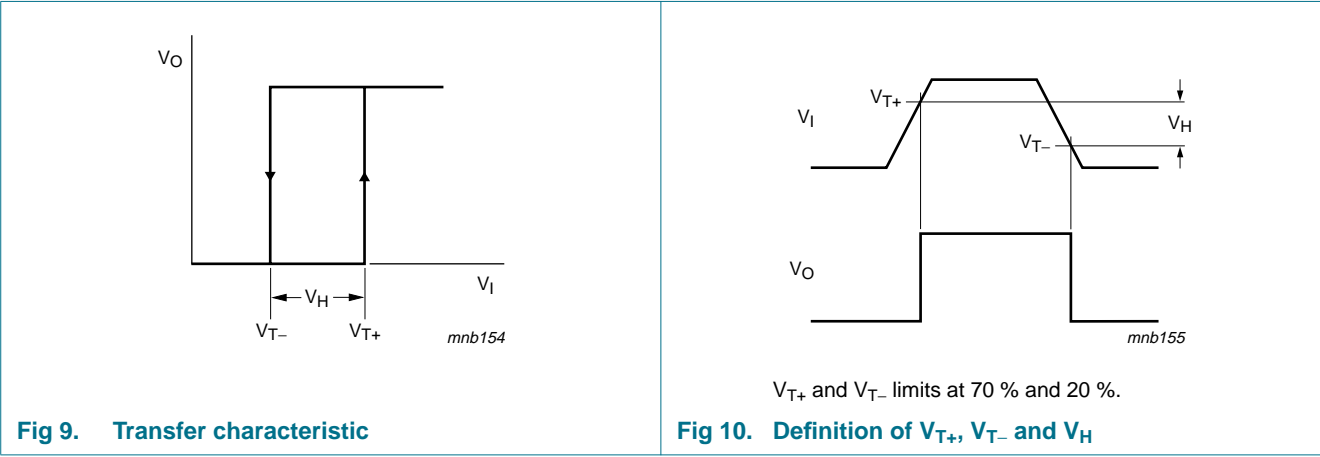
Voltages are referenced to GND (ground = 0 V; for test circuit see [Figure 8](#)).

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ	Max	Min	Max (85 °C)	Max (125 °C)	
V_{T+}	positive-going threshold voltage	see Figure 9 and Figure 10							
		$V_{CC} = 0.8 \text{ V}$	0.30	-	0.60	0.30	0.60	0.62	V
		$V_{CC} = 1.1 \text{ V}$	0.53	-	0.90	0.53	0.90	0.92	V
		$V_{CC} = 1.4 \text{ V}$	0.74	-	1.11	0.74	1.11	1.13	V
		$V_{CC} = 1.65 \text{ V}$	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
		$V_{CC} = 3.0 \text{ V}$	1.88	-	2.29	1.88	2.29	2.32	V
V_{T-}	negative-going threshold voltage	see Figure 9 and Figure 10							
		$V_{CC} = 0.8 \text{ V}$	0.10	-	0.60	0.10	0.60	0.60	V
		$V_{CC} = 1.1 \text{ V}$	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
		$V_{CC} = 1.65 \text{ V}$	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

Table 11. Transfer characteristics ...continued
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	Typ	Max	Min	Max (85 °C)	Max (125 °C)	
V _H	hysteresis voltage	(V _{T+} – V _{T–}); see Figure 9, Figure 10, Figure 11 and Figure 12							
		V _{CC} = 0.8 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 V	0.79	-	1.31	0.79	1.31	1.31	V

14. Waveforms transfer characteristics



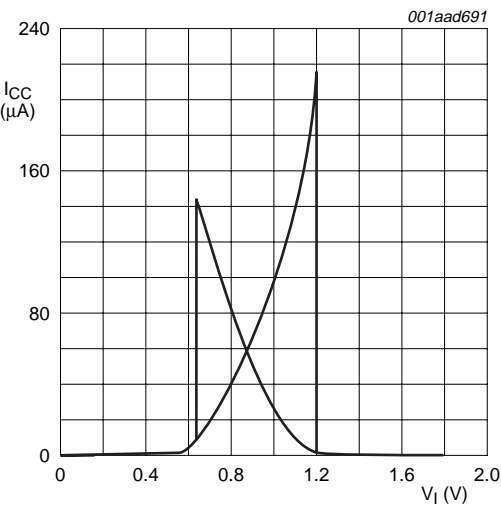


Fig 11. Typical transfer characteristics; $V_{CC} = 1.8$ V

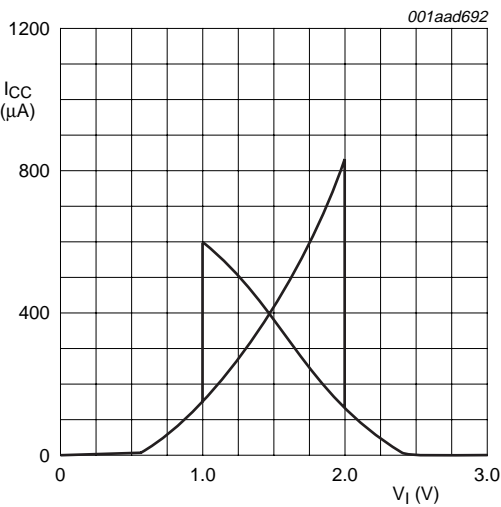


Fig 12. Typical transfer characteristics; $V_{CC} = 3.0$ V

15. Application information

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

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

P_{add} = additional power dissipation (μW);

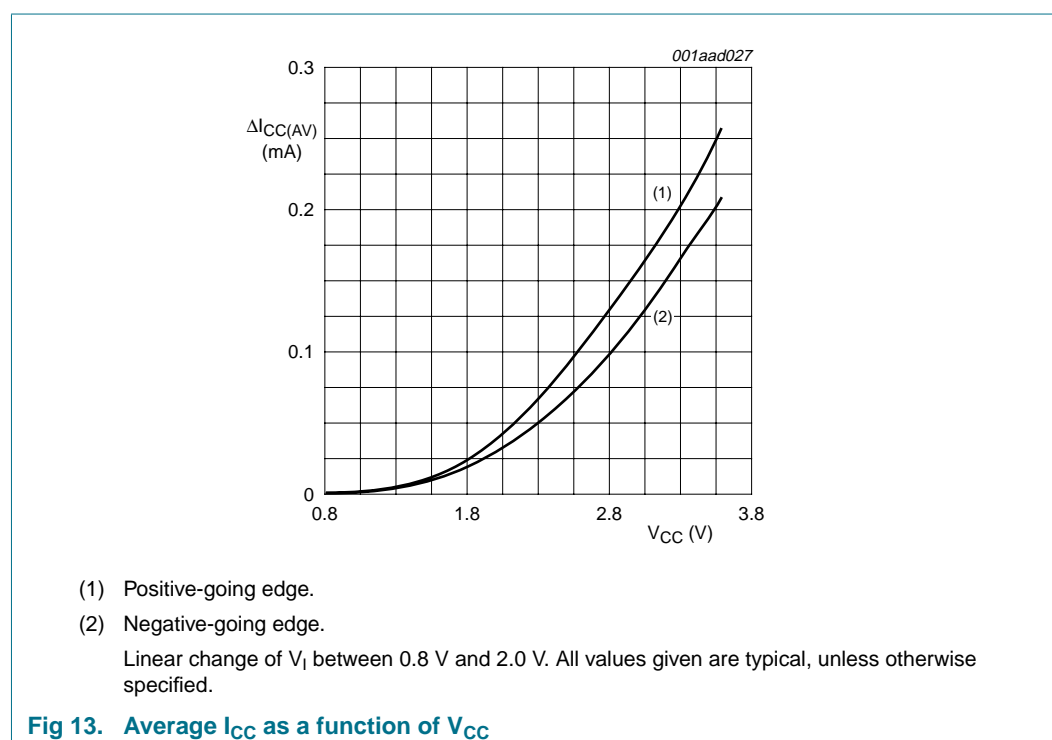
f_i = input frequency (MHz);

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

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

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

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



16. Package outline

Plastic surface-mounted package; 6 leadsSOT363

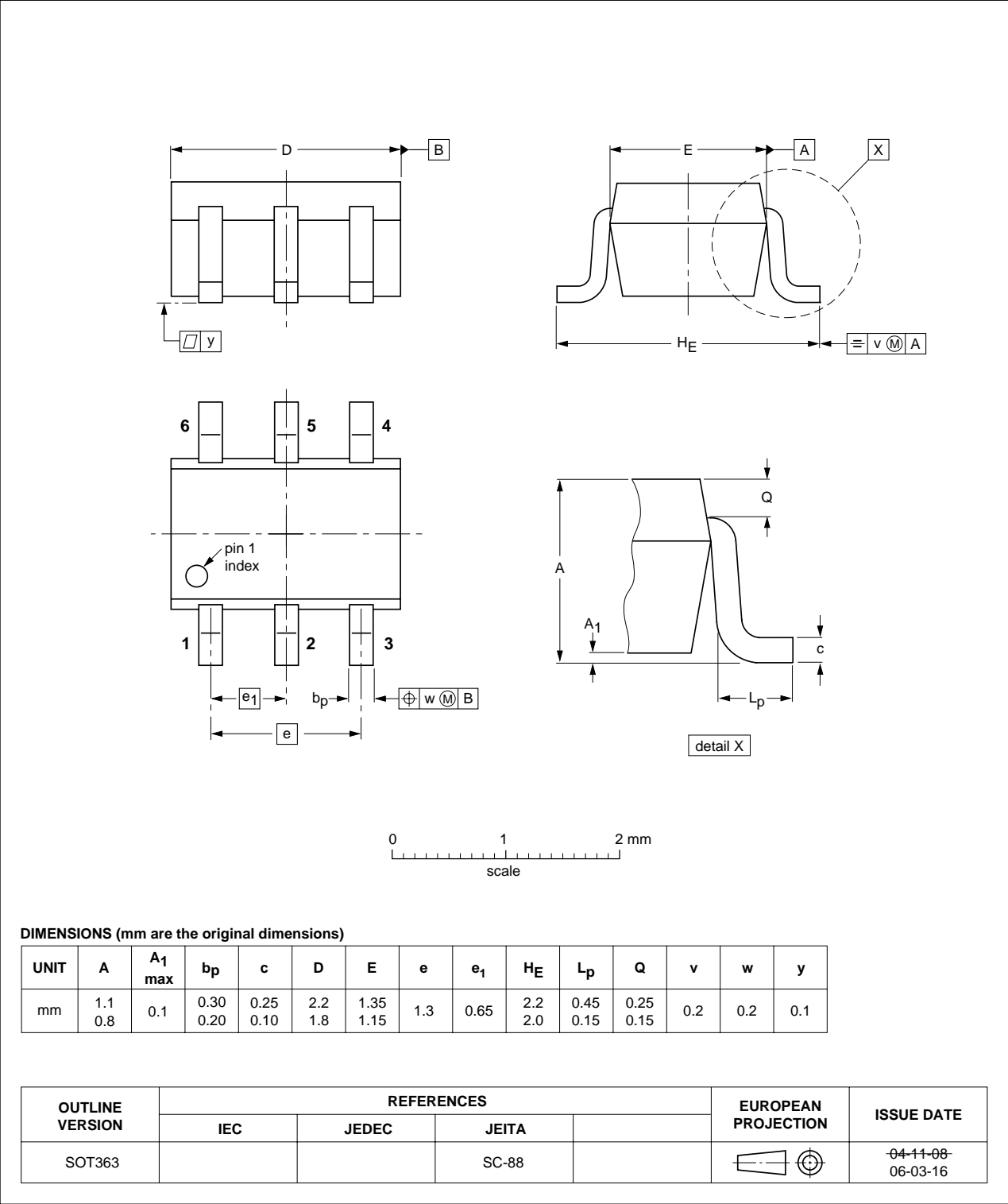


Fig 14. Package outline SOT363 (SC-88)

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

SOT886

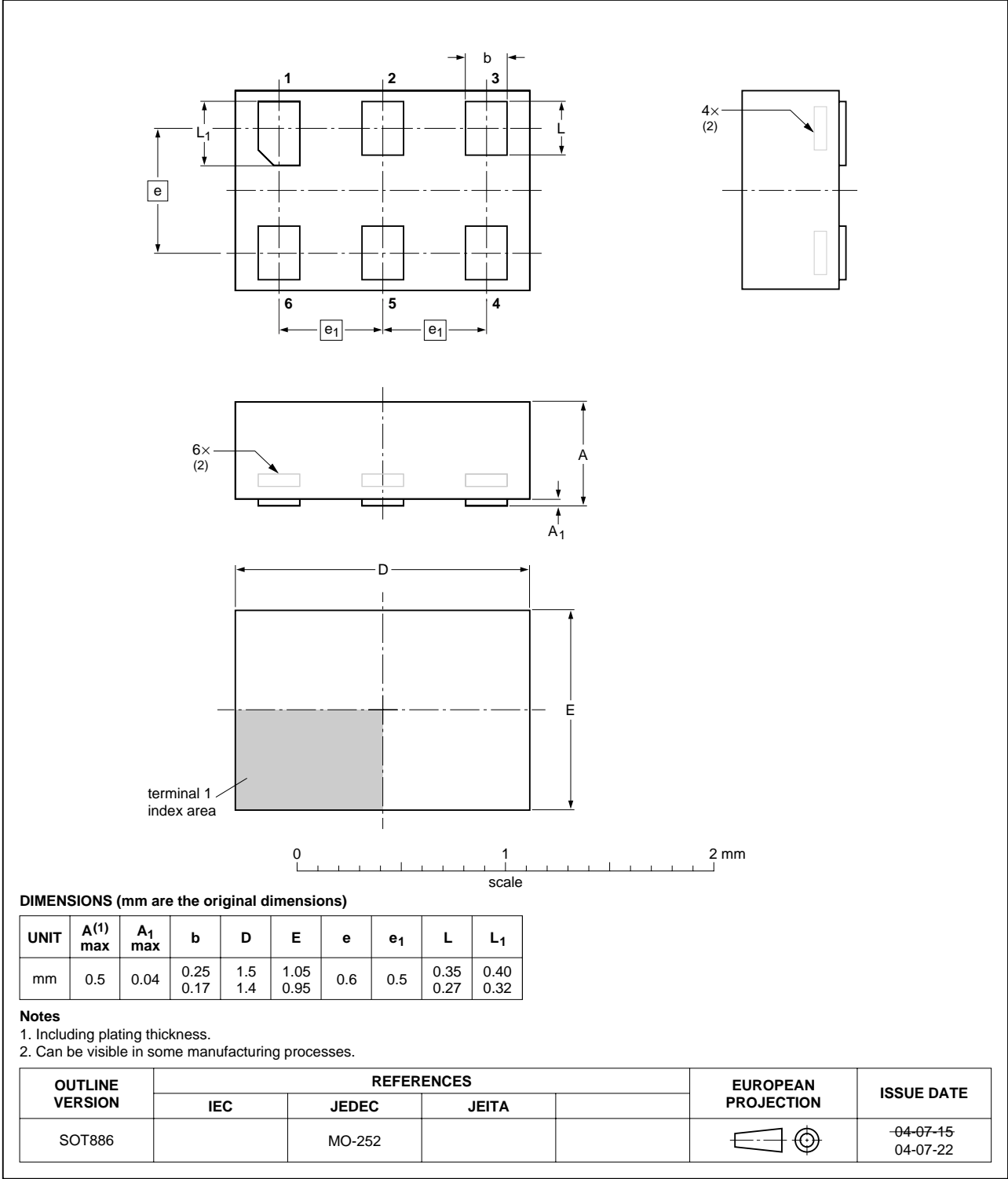


Fig 15. Package outline SOT886 (XSON6)

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

SOT891

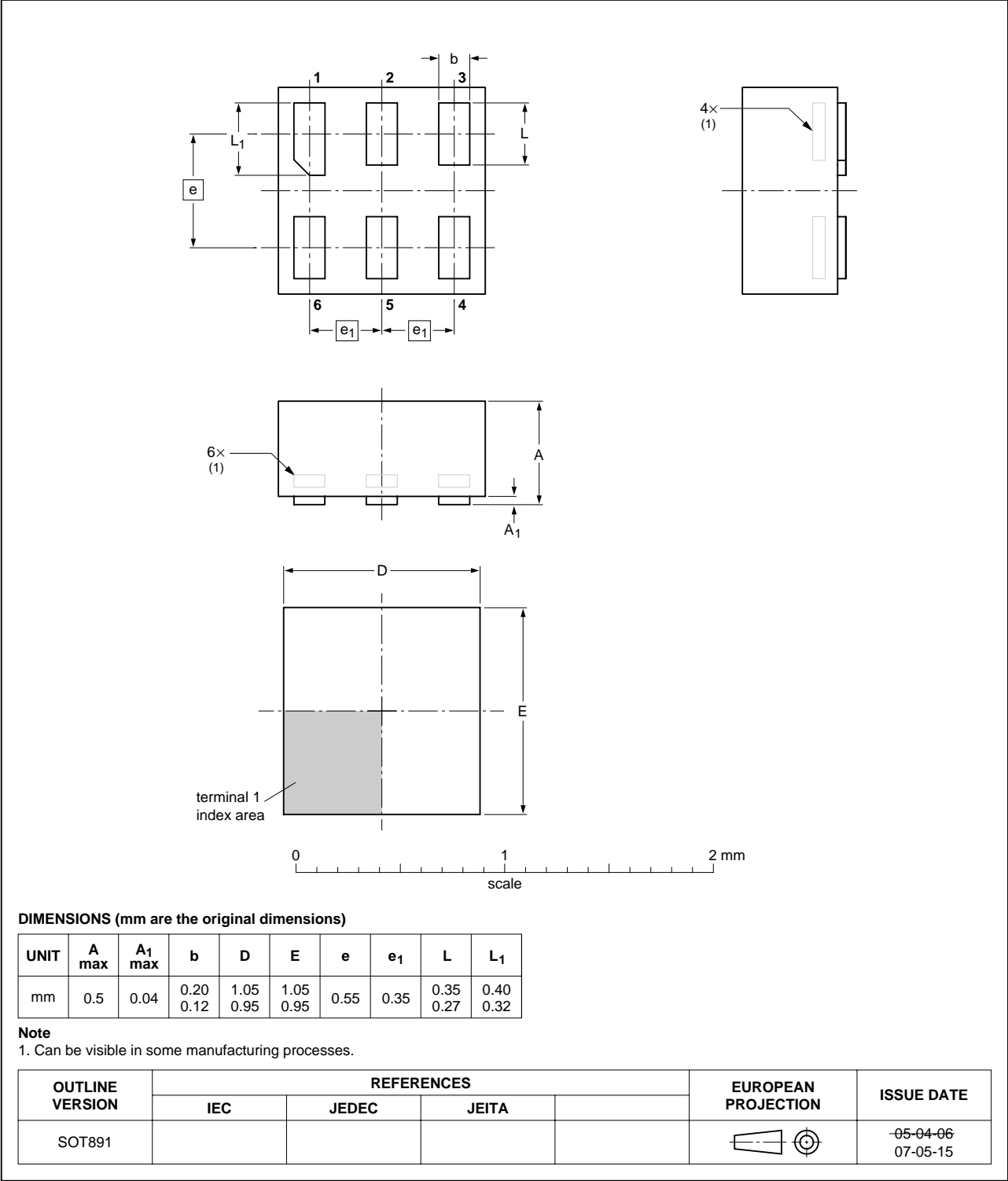


Fig 16. Package outline SOT891 (XSON6)

17. Abbreviations

Table 12. 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
TTL	Transistor-Transistor Logic

18. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G17_3	20090706	Product data sheet	-	74AUP2G17_2
Modifications:	<ul style="list-style-type: none">• Changed Section 8 “Limiting values”: derating factor XSON6 packages.• Changed Section 10 “Static characteristics”: conditions for HIGH-level output voltage and LOW-level output voltage.• Changed Section 11 “Dynamic characteristics”: typical power dissipation capacitance.			
74AUP2G17_2	20080110	Product data sheet	-	74AUP2G17_1
74AUP2G17_1	20061107	Product data sheet	-	-

19. Legal information

19.1 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".

[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 URL <http://www.nxp.com>.

19.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

19.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental

damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

19.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

20. Contact information

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

21. Contents

1	General description	1
2	Features	1
3	Ordering information	2
4	Marking	2
5	Functional diagram	2
6	Pinning information	3
6.1	Pinning	3
6.2	Pin description	3
7	Functional description	3
8	Limiting values	4
9	Recommended operating conditions	4
10	Static characteristics	4
11	Dynamic characteristics	7
12	Waveforms	8
13	Transfer characteristics	9
14	Waveforms transfer characteristics	10
15	Application information	12
16	Package outline	13
17	Abbreviations	16
18	Revision history	16
19	Legal information	17
19.1	Data sheet status	17
19.2	Definitions	17
19.3	Disclaimers	17
19.4	Trademarks	17
20	Contact information	17
21	Contents	18

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

founded by

PHILIPS

© NXP B.V. 2009.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 6 July 2009

Document identifier: 74AUP2G17_3