

74AUP1G3208

Low-power 3-input OR-AND gate

Rev. 01.00 — 17 January 2006

Preliminary data sheet

1. General description

The 74AUP1G3208 is a high-performance, low-power, low-voltage, Si-gate CMOS device, superior to most advanced CMOS compatible TTL families.

Schmitt-trigger action at all inputs makes the circuit tolerant to slower input rise and fall times across the entire V_{CC} range from 0.8 V to 3.6 V.

This device ensures a very low static and dynamic power consumption across the entire V_{CC} range from 0.8 V to 3.6 V.

This device is fully specified for partial Power-down applications using I_{OFF} . The I_{OFF} circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

The 74AUP1G3208 provides the Boolean function: $Y = (A + B) \times C$. The user can choose the logic functions OR, AND and OR-AND. All inputs can be connected to V_{CC} or GND.

2. Features

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
 - ◆ JESD8-12 (0.8 V to 1.3 V)
 - ◆ JESD8-11 (0.9 V to 1.65 V)
 - ◆ JESD8-7 (1.2 V to 1.95 V)
 - ◆ JESD8-5 (1.8 V to 2.7 V)
 - ◆ JESD8-B (2.7 V to 3.6 V)
- ESD protection:
 - ◆ HBM JESD22-A114-C Class 3A. Exceeds 5000 V
 - ◆ MM JESD22-A115-A exceeds 200 V
 - ◆ CDM JESD22-C101-C 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 $+125\text{ }^{\circ}\text{C}$

PHILIPS

3. Quick reference data

Table 1: Quick reference data

$GND = 0\text{ V}$; $T_{amb} = 25\text{ °C}$; $t_r = t_f \leq 3\text{ ns}$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_{PHL} , t_{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 0.8\text{ V}$	-	18.5	-	ns
		$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 1.1\text{ V to }1.3\text{ V}$	2.2	5.4	10.6	ns
		$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 1.4\text{ V to }1.6\text{ V}$	1.9	3.8	6.4	ns
		$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 1.65\text{ V to }1.95\text{ V}$	1.5	3.1	5.1	ns
		$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 2.3\text{ V to }2.7\text{ V}$	1.3	2.4	3.7	ns
		$C_L = 5\text{ pF}$; $R_L = 1\text{ M}\Omega$; $V_{CC} = 3.0\text{ V to }3.6\text{ V}$	1.2	2.2	3.2	ns
C_I	input capacitance		-	1.0	-	pF
C_{PD}	power dissipation capacitance	$V_{CC} = 1.8\text{ V}$; $f = 1\text{ MHz}$	[1] [2] -	3.2	-	pF
		$V_{CC} = 3.3\text{ V}$; $f = 1\text{ MHz}$	[1] [2] -	4.2	-	pF

[1] 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.

[2] The condition is $V_I = GND$ to V_{CC} .

4. Ordering information

Table 2: Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G3208GW	-40 °C to +125 °C	SC-88	plastic surface mounted package; 6 leads	SOT363
74AUP1G3208GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body $1 \times 1.45 \times 0.5\text{ mm}$	SOT886
74AUP1G3208GF	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body $1 \times 1 \times 0.5\text{ mm}$	SOT891

5. Marking

Table 3: Marking

Type number	Marking code
74AUP1G3208GW	a2
74AUP1G3208GM	a2
74AUP1G3208GF	a2

6. Functional diagram

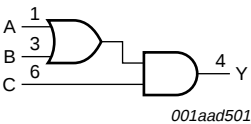


Fig 1. Logic symbol

7. Pinning information

7.1 Pinning

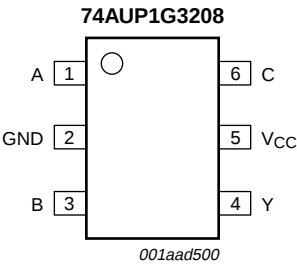


Fig 2. Pin configuration SOT363 (SC-88)

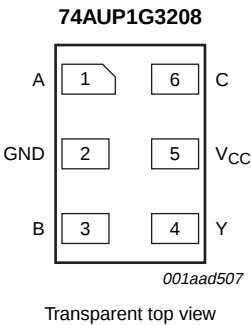


Fig 3. Pin configuration SOT886 (XSON6)

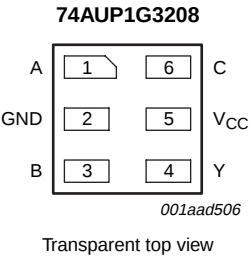


Fig 4. Pin configuration SOT891 (XSON6)

7.2 Pin description

Table 4: Pin description

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

8. Functional description

8.1 Function table

Table 5: Function table ^[1]

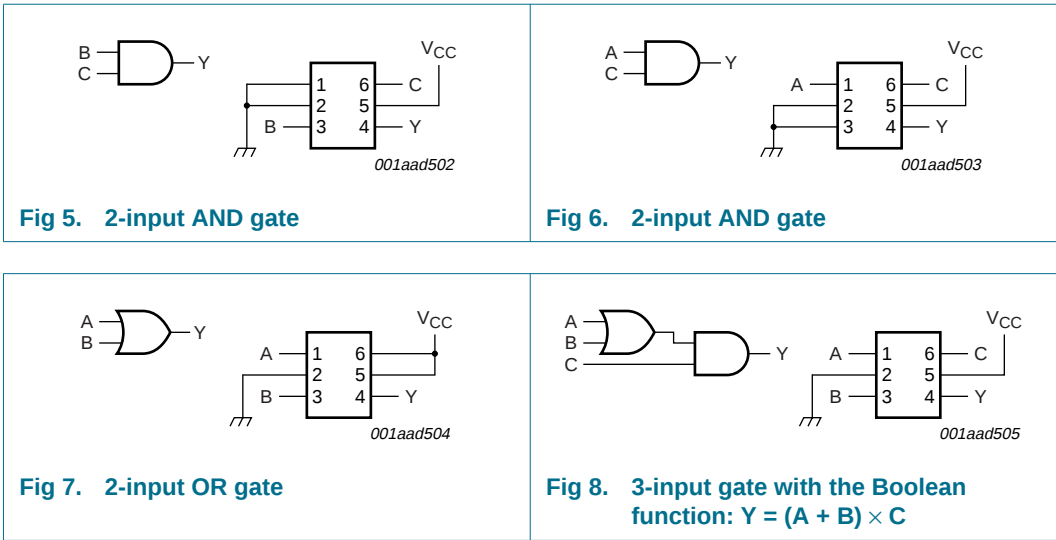
Input			Output
C	B	A	Y
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	H
H	H	L	H
H	H	H	H

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

8.2 Logic configurations

Table 6: Function selection table

Logic function	Figure
2-input AND	see Figure 5 and 6
2-input OR	see Figure 7
3-input gate with the Boolean function: $Y = (A + B) \times C$	see Figure 8



9. Limiting values

Table 7: 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	$V_I < 0\text{ V}$	-	-50	mA
V_I	input voltage		[1] -0.5	+4.6	V
I_{OK}	output clamping current	$V_O < 0\text{ V}$	-	-50	mA
V_O	output voltage	active mode and Power-down mode	[1] -0.5	+4.6	V
I_O	output current	$V_O = 0\text{ V to } V_{CC}$	-	± 20	mA
I_{CC}	quiescent supply current		-	+50	mA
I_{GND}	ground current		-	-50	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	$T_{amb} = -40\text{ °C to } +125\text{ °C}$	[2] -	250	mW

[1] The minimum 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 45 °C the value of P_{tot} derates linearly with 2.4 mW/K.

10. Recommended operating conditions

Table 8: 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
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 0.8$ V to 3.6 V	0	200	ns/V

11. Static characteristics

Table 9: 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_{IH}	HIGH-state input voltage	$V_{CC} = 0.8$ V	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9$ V to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3$ V to 2.7 V	1.6	-	-	V
		$V_{CC} = 3.0$ V to 3.6 V	2.0	-	-	V
V_{IL}	LOW-state input voltage	$V_{CC} = 0.8$ V	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9$ V to 1.95 V	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3$ V to 2.7 V	-	-	0.7	V
		$V_{CC} = 3.0$ V to 3.6 V	-	-	0.9	V
V_{OH}	HIGH-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = -20$ 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 9: 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-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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}	quiescent 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 quiescent supply current	$V_I = V_{CC} - 0.6\ \text{V}$; $I_O = 0\ \text{A}$; $V_{CC} = 3.3\ \text{V}$	[1] -	-	40	μA
C_I	input capacitance	$V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$; $V_I = \text{GND}$ or V_{CC}	-	1.0	-	pF
C_O	output capacitance	$V_O = \text{GND}$; $V_{CC} = 0\ \text{V}$	-	1.8	-	pF
$T_{amb} = -40\ ^\circ\text{C}$ to $+85\ ^\circ\text{C}$						
V_{IH}	HIGH-state input voltage	$V_{CC} = 0.8\ \text{V}$	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	1.6	-	-	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	2.0	-	-	V
V_{IL}	LOW-state input voltage	$V_{CC} = 0.8\ \text{V}$	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	-	-	0.7	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	-	-	0.9	V
V_{OH}	HIGH-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = -20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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

Table 9: 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-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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
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 $0.2\ \text{V}$	-	-	± 0.6	μA
I_{CC}	quiescent supply current	$V_I = \text{GND}$ or V_{CC} ; $I_O = 0\ \text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	-	-	0.9	μA
ΔI_{CC}	additional quiescent supply current	$V_I = V_{CC} - 0.6\ \text{V}$; $I_O = 0\ \text{A}$; $V_{CC} = 3.3\ \text{V}$	[1] -	-	50	μA
$T_{amb} = -40\ ^\circ\text{C}$ to $+125\ ^\circ\text{C}$						
V_{IH}	HIGH-state input voltage	$V_{CC} = 0.8\ \text{V}$	$0.75 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	1.6	-	-	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	2.0	-	-	V
V_{IL}	LOW-state input voltage	$V_{CC} = 0.8\ \text{V}$	-	-	$0.25 \times V_{CC}$	V
		$V_{CC} = 0.9\ \text{V}$ to $1.95\ \text{V}$	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 2.3\ \text{V}$ to $2.7\ \text{V}$	-	-	0.7	V
		$V_{CC} = 3.0\ \text{V}$ to $3.6\ \text{V}$	-	-	0.9	V
V_{OH}	HIGH-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = -20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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
		$I_O = -4.0\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	2.30	-	-	V

Table 9: 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-state output voltage	$V_I = V_{IH}$ or V_{IL}				
		$I_O = 20\ \mu\text{A}$; $V_{CC} = 0.8\ \text{V}$ 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
		$I_O = 4.0\ \text{mA}$; $V_{CC} = 3.0\ \text{V}$	-	-	0.50	V
I_I	input leakage current	$V_I = \text{GND}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$ to $3.6\ \text{V}$	-	-	± 0.75	μA
I_{OFF}	power-off leakage current	V_I or $V_O = 0\ \text{V}$ to $3.6\ \text{V}$; $V_{CC} = 0\ \text{V}$	-	-	± 0.75	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 $0.2\ \text{V}$	-	-	± 0.75	μA
I_{CC}	quiescent supply current	$V_I = \text{GND}$ or V_{CC} ; $I_O = 0\ \text{A}$; $V_{CC} = 0.8\ \text{V}$ to $3.6\ \text{V}$	-	-	1.4	μA
ΔI_{CC}	additional quiescent supply current	$V_I = V_{CC} - 0.6\ \text{V}$; $I_O = 0\ \text{A}$; $V_{CC} = 3.3\ \text{V}$	[1] -	-	75	μA

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

12. Dynamic characteristics

Table 10: Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#)

Symbol	Parameter	Conditions	Min	Typ [1]	Max	Unit
T _{amb} = 25 °C; C _L = 5 pF						
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9				
		V _{CC} = 0.8 V	-	18.5	-	ns
		V _{CC} = 1.1 V to 1.3 V	2.2	5.4	10.6	ns
		V _{CC} = 1.4 V to 1.6 V	1.9	3.8	6.4	ns
		V _{CC} = 1.65 V to 1.95 V	1.5	3.1	5.1	ns
		V _{CC} = 2.3 V to 2.7 V	1.3	2.4	3.7	ns
		V _{CC} = 3.0 V to 3.6 V	1.2	2.2	3.2	ns
T _{amb} = 25 °C; C _L = 10 pF						
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9				
		V _{CC} = 0.8 V	-	22.1	-	ns
		V _{CC} = 1.1 V to 1.3 V	2.6	6.3	12.4	ns
		V _{CC} = 1.4 V to 1.6 V	2.3	4.4	7.4	ns
		V _{CC} = 1.65 V to 1.95 V	2.0	3.6	5.9	ns
		V _{CC} = 2.3 V to 2.7 V	1.7	3.0	4.4	ns
		V _{CC} = 3.0 V to 3.6 V	1.6	2.7	3.9	ns
T _{amb} = 25 °C; C _L = 15 pF						
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9				
		V _{CC} = 0.8 V	-	25.6	-	ns
		V _{CC} = 1.1 V to 1.3 V	3.0	7.1	14.1	ns
		V _{CC} = 1.4 V to 1.6 V	2.6	5.0	8.4	ns
		V _{CC} = 1.65 V to 1.95 V	2.2	4.1	6.7	ns
		V _{CC} = 2.3 V to 2.7 V	2.0	3.4	5.0	ns
		V _{CC} = 3.0 V to 3.6 V	1.9	3.2	4.5	ns
T _{amb} = 25 °C; C _L = 30 pF						
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9				
		V _{CC} = 0.8 V	-	34.1	-	ns
		V _{CC} = 1.1 V to 1.3 V	3.9	9.3	18.9	ns
		V _{CC} = 1.4 V to 1.6 V	3.4	6.5	11.0	ns
		V _{CC} = 1.65 V to 1.95 V	3.0	5.4	8.9	ns
		V _{CC} = 2.3 V to 2.7 V	2.8	4.5	6.5	ns
		V _{CC} = 3.0 V to 3.6 V	2.6	4.3	5.8	ns

Table 10: Dynamic characteristics ...continuedVoltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#)

Symbol	Parameter	Conditions	Min	Typ ^[1]	Max	Unit
T_{amb} = 25 °C						
C _{PD}	power dissipation capacitance	f = 1 MHz ^{[2] [3]}				
		V _{CC} = 0.8 V	-	3.1	-	pF
		V _{CC} = 1.1 V to 1.3 V	-	3.1	-	pF
		V _{CC} = 1.4 V to 1.6 V	-	3.1	-	pF
		V _{CC} = 1.65 V to 1.95 V	-	3.2	-	pF
		V _{CC} = 2.3 V to 2.7 V	-	3.6	-	pF
		V _{CC} = 3.0 V to 3.6 V	-	4.2	-	pF

[1] All typical values are measured at nominal V_{CC}.[2] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).P_D = C_{PD} × V_{CC}² × f_i × N + Σ(C_L × V_{CC}² × 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;

Σ(C_L × V_{CC}² × f_o) = sum of the outputs.[3] The condition is V_I = GND to V_{CC}.**Table 11: Dynamic characteristics**Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 10](#)

Symbol	Parameter	Conditions	−40 °C to +85 °C		−40 °C to +125 °C		Unit
			Min	Max	Min	Max	
C _L = 5 pF							
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9					
		V _{CC} = 1.1 V to 1.3 V	2.2	10.9	2.2	11.1	ns
		V _{CC} = 1.4 V to 1.6 V	1.8	6.9	1.8	7.2	ns
		V _{CC} = 1.65 V to 1.95 V	1.4	5.6	1.4	5.9	ns
		V _{CC} = 2.3 V to 2.7 V	1.2	4.1	1.2	4.4	ns
		V _{CC} = 3.0 V to 3.6 V	1.1	3.4	1.1	3.6	ns
C _L = 10 pF							
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9					
		V _{CC} = 1.1 V to 1.3 V	2.5	12.8	2.5	13.1	ns
		V _{CC} = 1.4 V to 1.6 V	2.1	8.0	2.1	8.4	ns
		V _{CC} = 1.65 V to 1.95 V	1.8	6.4	1.8	6.8	ns
		V _{CC} = 2.3 V to 2.7 V	1.6	4.8	1.6	5.1	ns
		V _{CC} = 3.0 V to 3.6 V	1.4	4.2	1.4	4.4	ns

Table 11: Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 10

Symbol	Parameter	Conditions	−40 °C to +85 °C		−40 °C to +125 °C		Unit
			Min	Max	Min	Max	
C _L = 15 pF							
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9					
		V _{CC} = 1.1 V to 1.3 V	2.8	14.6	2.8	14.9	ns
		V _{CC} = 1.4 V to 1.6 V	2.4	9.1	2.4	9.5	ns
		V _{CC} = 1.65 V to 1.95 V	2.1	7.4	2.1	7.8	ns
		V _{CC} = 2.3 V to 2.7 V	1.9	5.5	1.9	5.9	ns
		V _{CC} = 3.0 V to 3.6 V	1.7	4.8	1.7	5.0	ns
C _L = 30 pF							
t _{PHL} , t _{PLH}	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see Figure 9					
		V _{CC} = 1.1 V to 1.3 V	3.7	19.7	3.7	20.1	ns
		V _{CC} = 1.4 V to 1.6 V	3.2	12.1	3.2	12.7	ns
		V _{CC} = 1.65 V to 1.95 V	2.9	9.7	2.9	10.3	ns
		V _{CC} = 2.3 V to 2.7 V	2.6	7.1	2.6	7.5	ns
		V _{CC} = 3.0 V to 3.6 V	2.4	6.4	2.4	6.7	ns

13. Waveforms

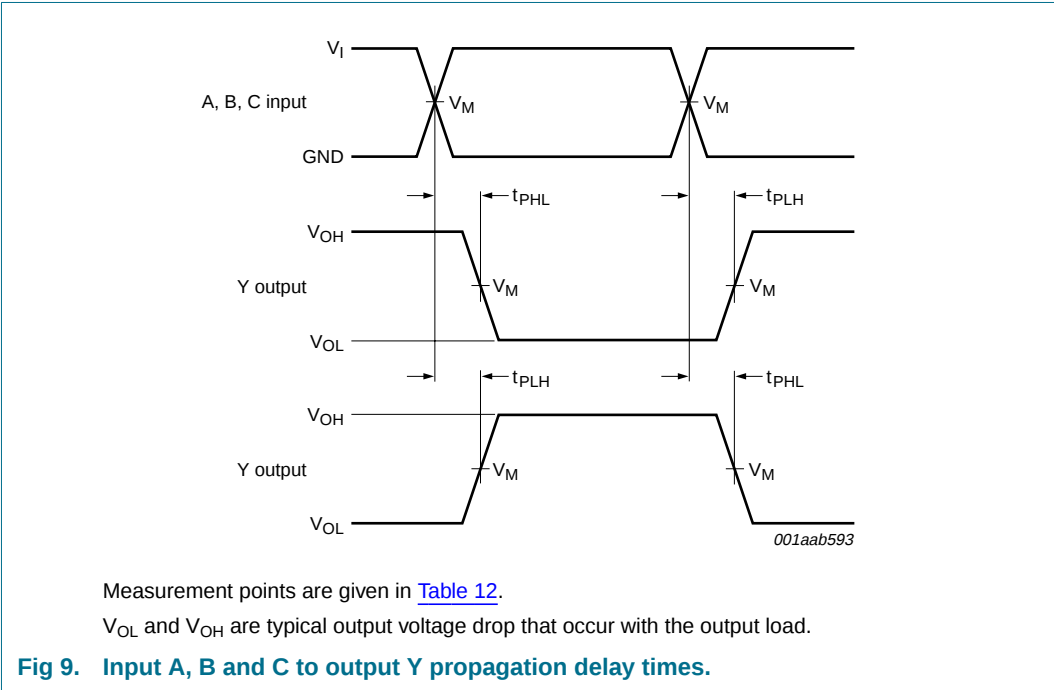


Table 12: Measurement points

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

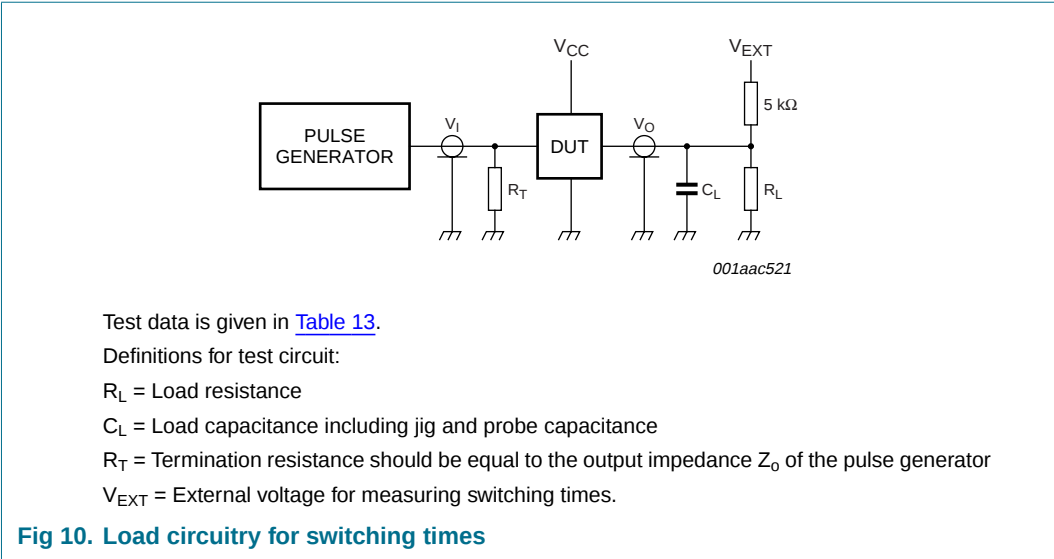


Table 13: Test data

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 $R_L = 1\text{ M}\Omega$.

14. Package outline

Plastic surface mounted package; 6 leads

SOT363

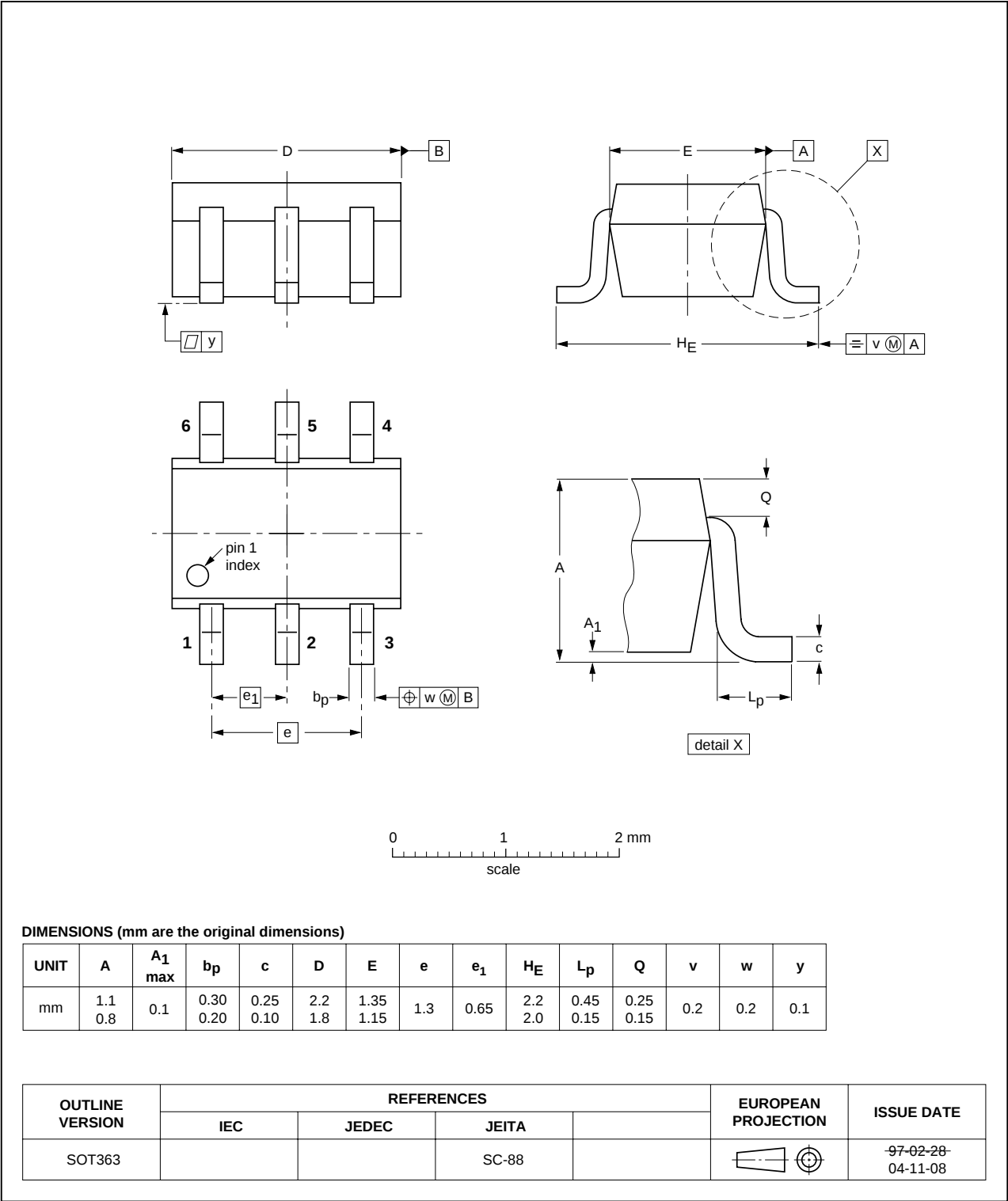


Fig 11. Package outline SOT363 (SC-88)

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

SOT886

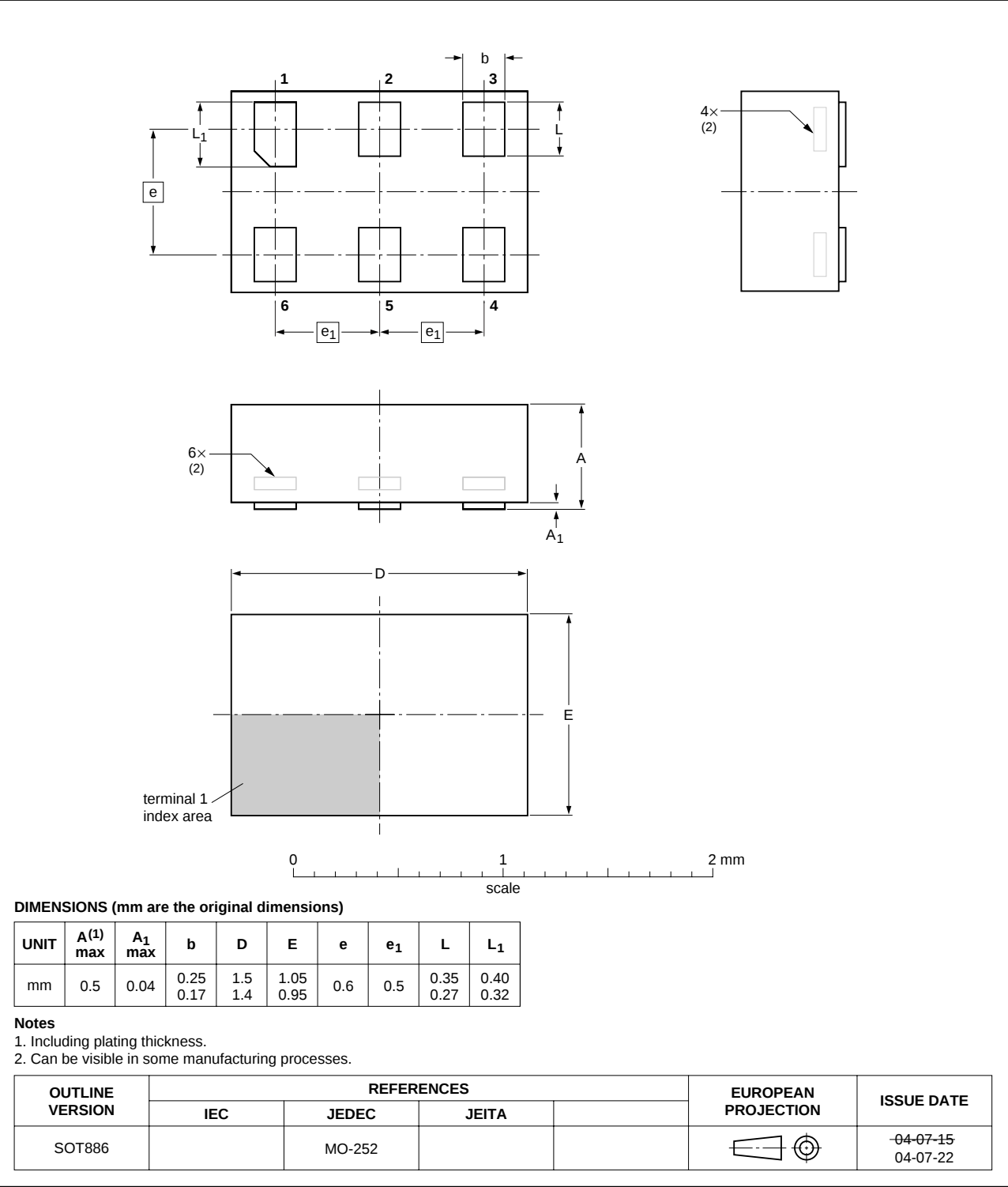
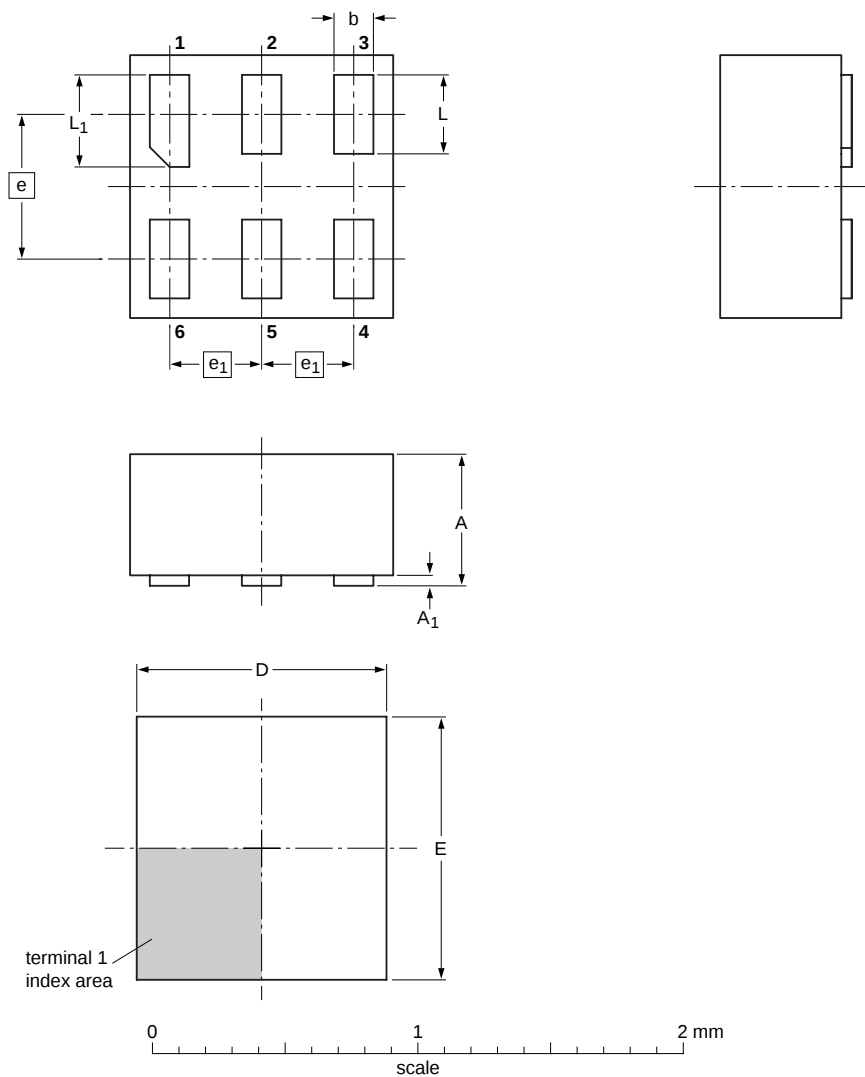


Fig 12. Package outline SOT886 (XSON6)

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

SOT891



DIMENSIONS (mm are the original dimensions)

UNIT	A max	A ₁ max	b	D	E	e	e ₁	L	L ₁
mm	0.5	0.04	0.20 0.12	1.05 0.95	1.05 0.95	0.55	0.35	0.35 0.27	0.40 0.32

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT891						05-03-11 05-04-06

Fig 13. Package outline SOT891 (XSON6)

15. Abbreviations

Table 14: 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

16. Revision history

Table 15: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
74AUP1G3208_1	<tbd>	Preliminary data sheet	-	-	-

17. Data sheet status

Level	Data sheet status ^[1]	Product status ^{[2] [3]}	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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

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Date of release: 17 January 2006
Document number: 74AUP1G3208_1

Published in The Netherlands