

# 74AUP1G0832

Low-power 3-input AND-OR gate

Rev. 01.00 — 26 January 2006

Preliminary data sheet

## 1. General description

The 74AUP1G0832 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 74AUP1G0832 provides the Boolean function:  $Y = (A \times B) + C$ . The user can choose the logic functions OR, AND and AND-OR. 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;  $I_{CC} = 0.9 \mu\text{A}$  (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	$C_L = 5\text{ pF}$ ; $R_L = 1\text{ M}\Omega$ ; $V_{CC} = 0.8\text{ V}$	-	19.5	-	ns	
		$C_L = 5\text{ pF}$ ; $R_L = 1\text{ M}\Omega$ ; $V_{CC} = 1.1\text{ V to }1.3\text{ V}$	2.5	5.6	11.1	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	3.9	6.4	ns	
		$C_L = 5\text{ pF}$ ; $R_L = 1\text{ M}\Omega$ ; $V_{CC} = 1.65\text{ V to }1.95\text{ V}$	1.6	3.1	5.1	ns	
		$C_L = 5\text{ pF}$ ; $R_L = 1\text{ M}\Omega$ ; $V_{CC} = 2.3\text{ V to }2.7\text{ V}$	1.4	2.4	3.7	ns	
		$C_L = 5\text{ pF}$ ; $R_L = 1\text{ M}\Omega$ ; $V_{CC} = 3.0\text{ V to }3.6\text{ V}$	1.3	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]	-	3.3	-	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  $\mu\text{W}$ ).

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

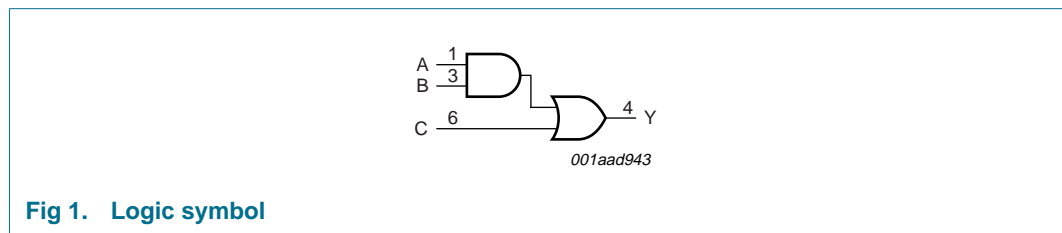
Type number	Package			Version
	Temperature range	Name	Description	
74AUP1G0832GW	-40 °C to +125 °C	SC-88	plastic surface mounted package; 6 leads	SOT363
74AUP1G0832GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body $1 \times 1.45 \times 0.5\text{ mm}$	SOT886
74AUP1G0832GF	-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
74AUP1G0832GW	aY
74AUP1G0832GM	aY
74AUP1G0832GF	aY

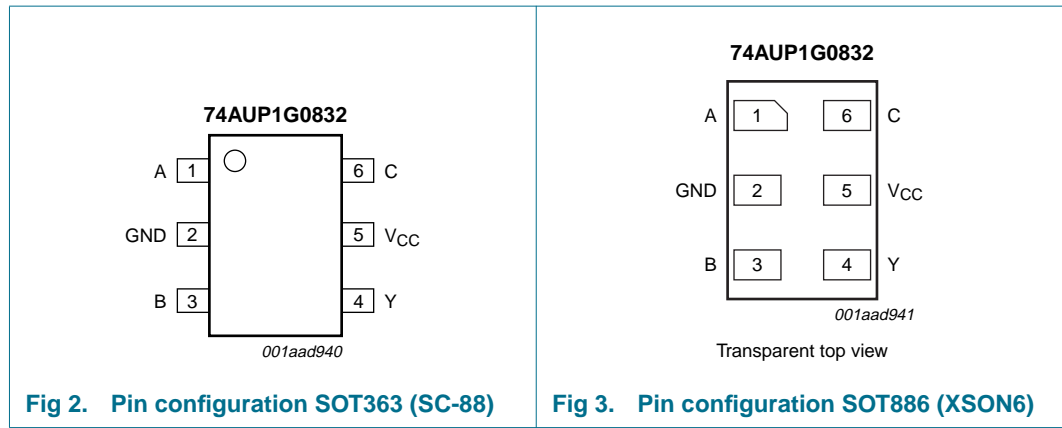
**6. Functional diagram**



**Fig 1. Logic symbol**

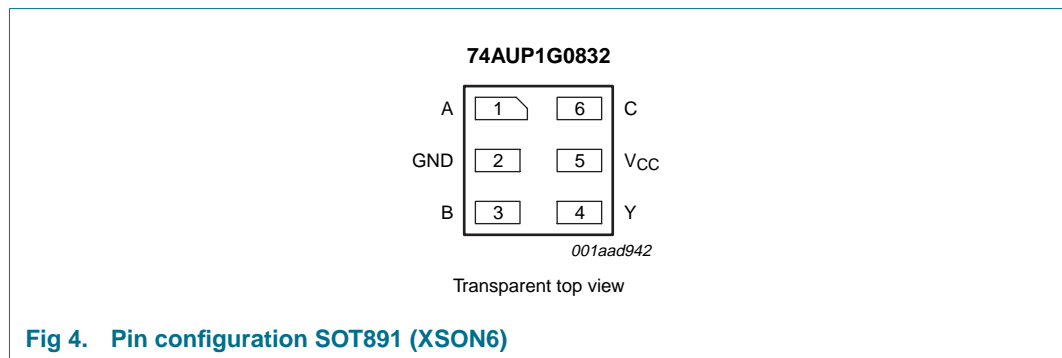
**7. Pinning information**

**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 <sub>CC</sub>	5	supply voltage
C	6	data input C

## 8. Functional description

### 8.1 Function table

Table 5: Function table [\[1\]](#)

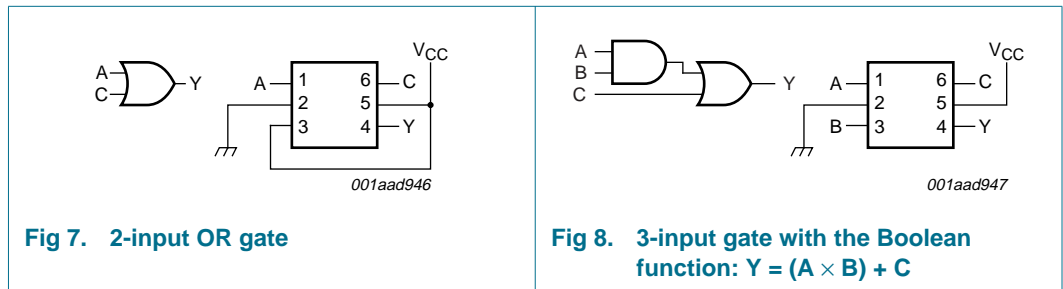
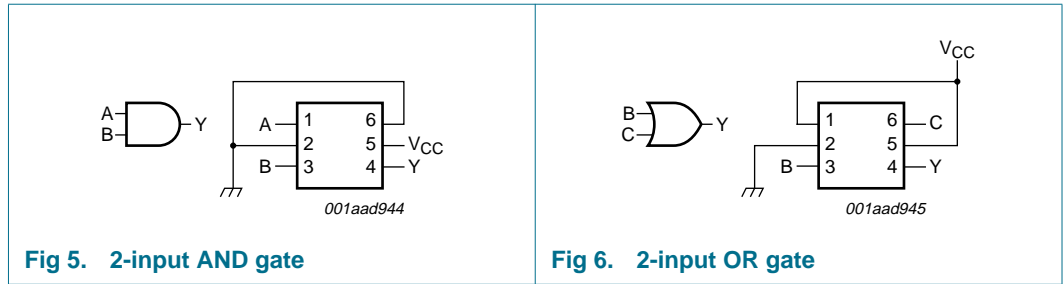
Input			Output
C	B	A	Y
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	H

[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 <a href="#">Figure 5</a>
2-input OR	see <a href="#">Figure 6</a> and <a href="#">7</a>
3-input gate with the Boolean function: $Y = (A \times B) + C$	see <a href="#">Figure 8</a>



## 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	$V_I < 0$ 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 $V_{CC}$	-	$\pm 20$	mA
$I_{CC}$	quiescent supply current		-	+50	mA
$I_{GND}$	ground current		-	-50	mA
$T_{stg}$	storage temperature		-65	+150	$^{\circ}$ C
$P_{tot}$	total power dissipation	$T_{amb} = -40$ $^{\circ}$ C to +125 $^{\circ}$ 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  $^{\circ}$ C the value of  $P_{tot}$  derates linearly with 4.0 mW/K.  
For XSON6 packages: above 45  $^{\circ}$ 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
<b><math>T_{amb} = 25</math> °C</b>						
$V_{IH}$	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 $V_{IL}$				
		$I_O = -20$ $\mu$ 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	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.1$	$\mu\text{A}$
$I_{OFF}$	power-off leakage current	$V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$\Delta I_{OFF}$	additional power-off leakage current	$V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.2$	$\mu\text{A}$
$I_{CC}$	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	$\mu\text{A}$
$\Delta I_{CC}$	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	$\mu\text{A}$
$C_I$	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
<b><math>T_{amb} = -40 \text{ }^\circ\text{C to } +85 \text{ }^\circ\text{C}</math></b>						
$V_{IH}$	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	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$I_{OFF}$	power-off leakage current	$V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$\Delta I_{OFF}$	additional power-off leakage current	$V_I$ or $V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.6$	$\mu\text{A}$
$I_{CC}$	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	$\mu\text{A}$
$\Delta I_{CC}$	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	$\mu\text{A}$
<b><math>T_{amb} = -40 \text{ }^\circ\text{C to } +125 \text{ }^\circ\text{C}</math></b>						
$V_{IH}$	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 <sub>OL</sub>	LOW-state output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.11	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.33 × V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.41	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.39	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.36	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.36	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.50	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.75	μA
I <sub>CC</sub>	quiescent supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1.4	μA
ΔI <sub>CC</sub>	additional quiescent supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	75	μA

[1] One input at V<sub>CC</sub> - 0.6 V, other input at V<sub>CC</sub> 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
<b>T<sub>amb</sub> = 25 °C; C<sub>L</sub> = 5 pF</b>						
t <sub>PHL</sub> , t <sub>PLH</sub>	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>				
		V <sub>CC</sub> = 0.8 V	-	19.5	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.5	5.6	11.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.9	3.9	6.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.6	3.1	5.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	2.4	3.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.2	3.2	ns
<b>T<sub>amb</sub> = 25 °C; C<sub>L</sub> = 10 pF</b>						
t <sub>PHL</sub> , t <sub>PLH</sub>	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>				
		V <sub>CC</sub> = 0.8 V	-	23.1	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.8	6.5	12.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	4.5	7.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.7	5.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.0	4.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.6	2.7	3.9	ns

**Table 10: Dynamic characteristics ...continued**

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

Symbol	Parameter	Conditions	Min	Typ [1]	Max	Unit
<b>T<sub>amb</sub> = 25 °C; C<sub>L</sub> = 15 pF</b>						
t <sub>PHL</sub> , t <sub>PLH</sub>	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>				
		V <sub>CC</sub> = 0.8 V	-	26.6	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.2	7.3	14.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	5.1	8.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.2	6.7	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.4	5.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.9	3.2	4.5	ns
<b>T<sub>amb</sub> = 25 °C; C<sub>L</sub> = 30 pF</b>						
t <sub>PHL</sub> , t <sub>PLH</sub>	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>				
		V <sub>CC</sub> = 0.8 V	-	34.8	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.1	9.5	19.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.3	6.6	11.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	5.5	8.8	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.8	4.5	6.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.6	4.3	5.9	ns
<b>T<sub>amb</sub> = 25 °C</b>						
C <sub>PD</sub>	power dissipation capacitance	f = 1 MHz				
		<a href="#">[2]</a> <a href="#">[3]</a>				
		V <sub>CC</sub> = 0.8 V	-	3.0	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	3.1	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	3.1	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	3.3	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.7	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.2	-	pF

- [1] All typical values are measured at nominal V<sub>CC</sub>.
- [2] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> 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<sub>i</sub> = input frequency in MHz;  
 f<sub>o</sub> = output frequency in MHz;  
 C<sub>L</sub> = output load capacitance in pF;  
 V<sub>CC</sub> = supply voltage in V;  
 N = number of inputs switching;  
 Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) = sum of the outputs.
- [3] The condition is V<sub>I</sub> = GND to V<sub>CC</sub>.

**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	
<b><math>C_L = 5 \text{ pF}</math></b>							
$t_{\text{PHL}}, t_{\text{PLH}}$	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>					
		$V_{\text{CC}} = 1.1 \text{ V to } 1.3 \text{ V}$	2.2	11.3	2.2	12.4	ns
		$V_{\text{CC}} = 1.4 \text{ V to } 1.6 \text{ V}$	2.0	6.9	2.0	7.6	ns
		$V_{\text{CC}} = 1.65 \text{ V to } 1.95 \text{ V}$	1.5	5.7	1.5	6.3	ns
		$V_{\text{CC}} = 2.3 \text{ V to } 2.7 \text{ V}$	1.3	4.2	1.3	4.6	ns
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	1.2	3.5	1.2	3.9	ns
<b><math>C_L = 10 \text{ pF}</math></b>							
$t_{\text{PHL}}, t_{\text{PLH}}$	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>					
		$V_{\text{CC}} = 1.1 \text{ V to } 1.3 \text{ V}$	2.5	12.9	2.5	14.2	ns
		$V_{\text{CC}} = 1.4 \text{ V to } 1.6 \text{ V}$	2.3	8.0	2.3	8.8	ns
		$V_{\text{CC}} = 1.65 \text{ V to } 1.95 \text{ V}$	1.8	6.6	1.8	7.3	ns
		$V_{\text{CC}} = 2.3 \text{ V to } 2.7 \text{ V}$	1.6	4.9	1.6	5.4	ns
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	1.5	4.2	1.5	4.6	ns
<b><math>C_L = 15 \text{ pF}</math></b>							
$t_{\text{PHL}}, t_{\text{PLH}}$	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>					
		$V_{\text{CC}} = 1.1 \text{ V to } 1.3 \text{ V}$	2.8	14.7	2.8	16.2	ns
		$V_{\text{CC}} = 1.4 \text{ V to } 1.6 \text{ V}$	2.6	9.1	2.6	10.0	ns
		$V_{\text{CC}} = 1.65 \text{ V to } 1.95 \text{ V}$	2.0	7.5	2.0	8.3	ns
		$V_{\text{CC}} = 2.3 \text{ V to } 2.7 \text{ V}$	1.9	5.6	1.9	6.2	ns
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	1.8	4.8	1.8	5.3	ns
<b><math>C_L = 30 \text{ pF}</math></b>							
$t_{\text{PHL}}, t_{\text{PLH}}$	HIGH-to-LOW and LOW-to-HIGH propagation delay A, B or C to Y	see <a href="#">Figure 9</a>					
		$V_{\text{CC}} = 1.1 \text{ V to } 1.3 \text{ V}$	3.6	19.8	3.6	21.8	ns
		$V_{\text{CC}} = 1.4 \text{ V to } 1.6 \text{ V}$	3.3	12.1	3.3	13.3	ns
		$V_{\text{CC}} = 1.65 \text{ V to } 1.95 \text{ V}$	2.6	10.0	2.6	11.0	ns
		$V_{\text{CC}} = 2.3 \text{ V to } 2.7 \text{ V}$	2.5	7.4	2.5	8.3	ns
		$V_{\text{CC}} = 3.0 \text{ V to } 3.6 \text{ V}$	2.4	6.4	2.4	7.0	ns

13. Waveforms

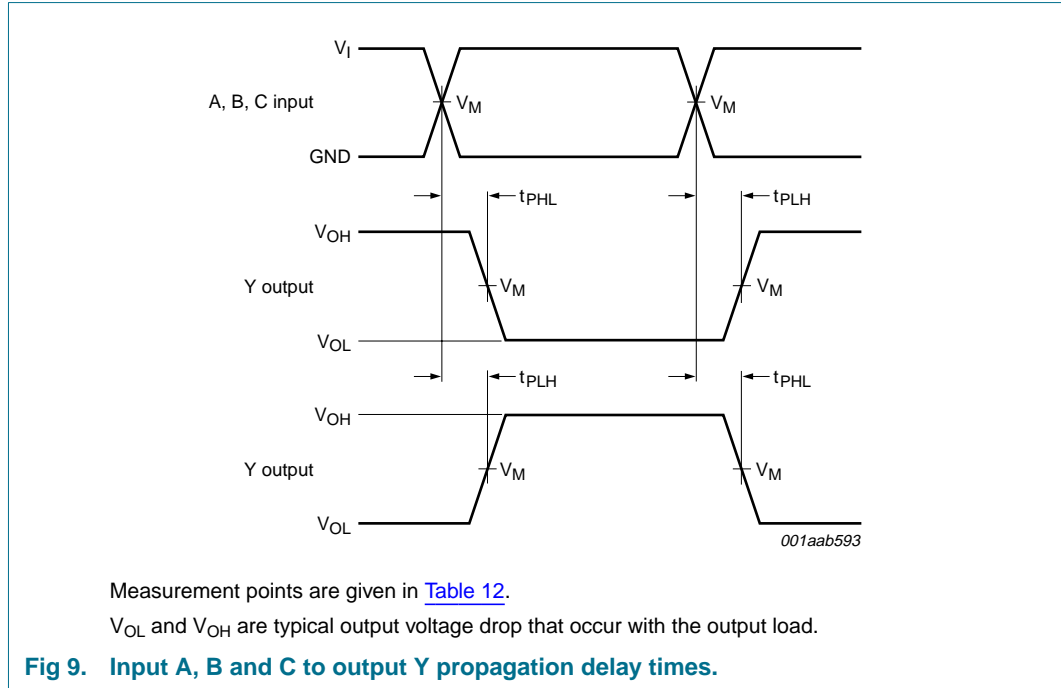
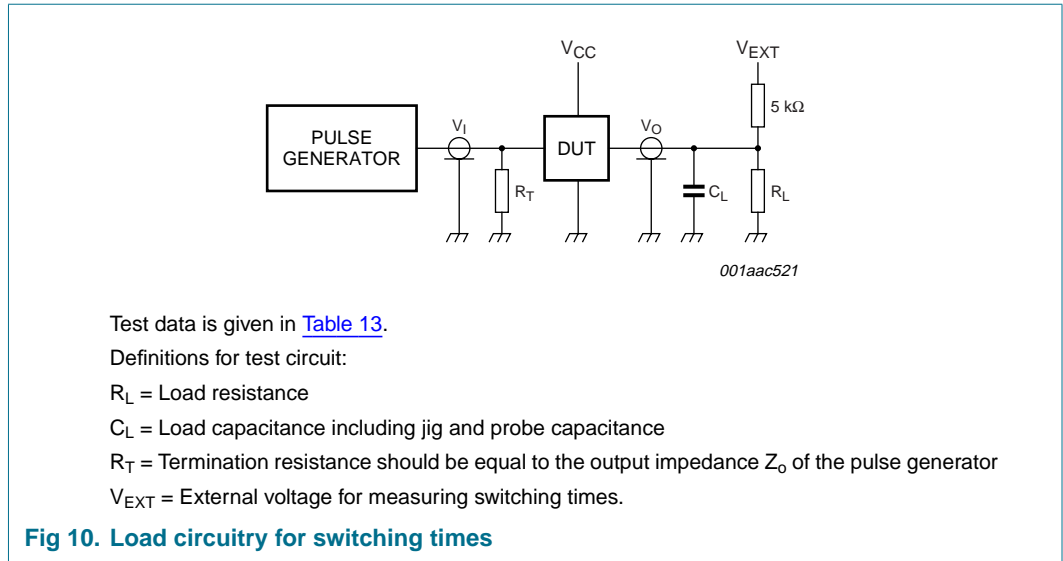


Table 12: Measurement points

Supply voltage	Output	Input		
$V_{CC}$	$V_M$	$V_M$	$V_I$	$t_r = t_f$
0.8 V to 3.6 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns



**Fig 10. Load circuitry for switching times**

**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

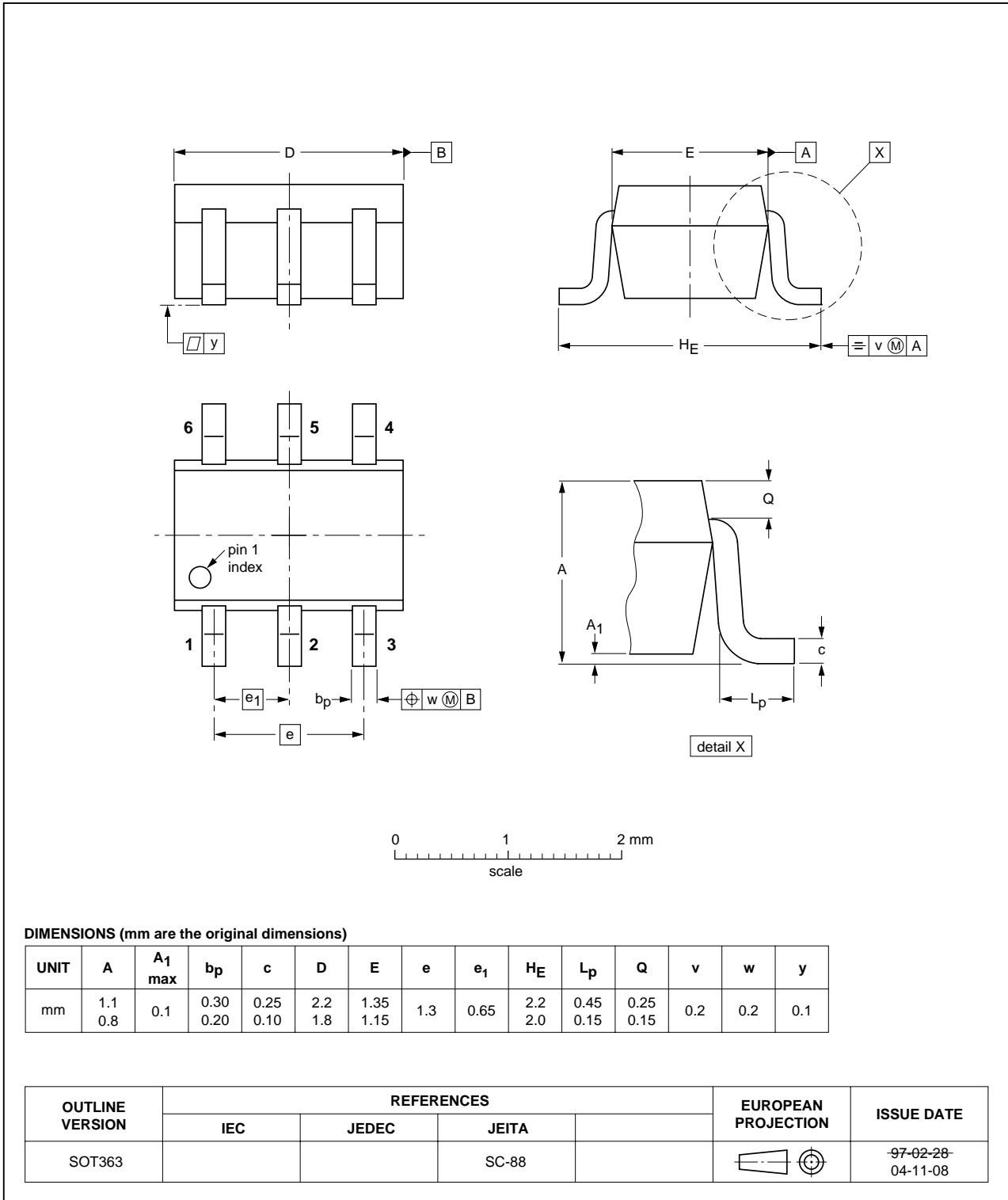


Fig 11. Package outline SOT363 (SC-88)

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

SOT886

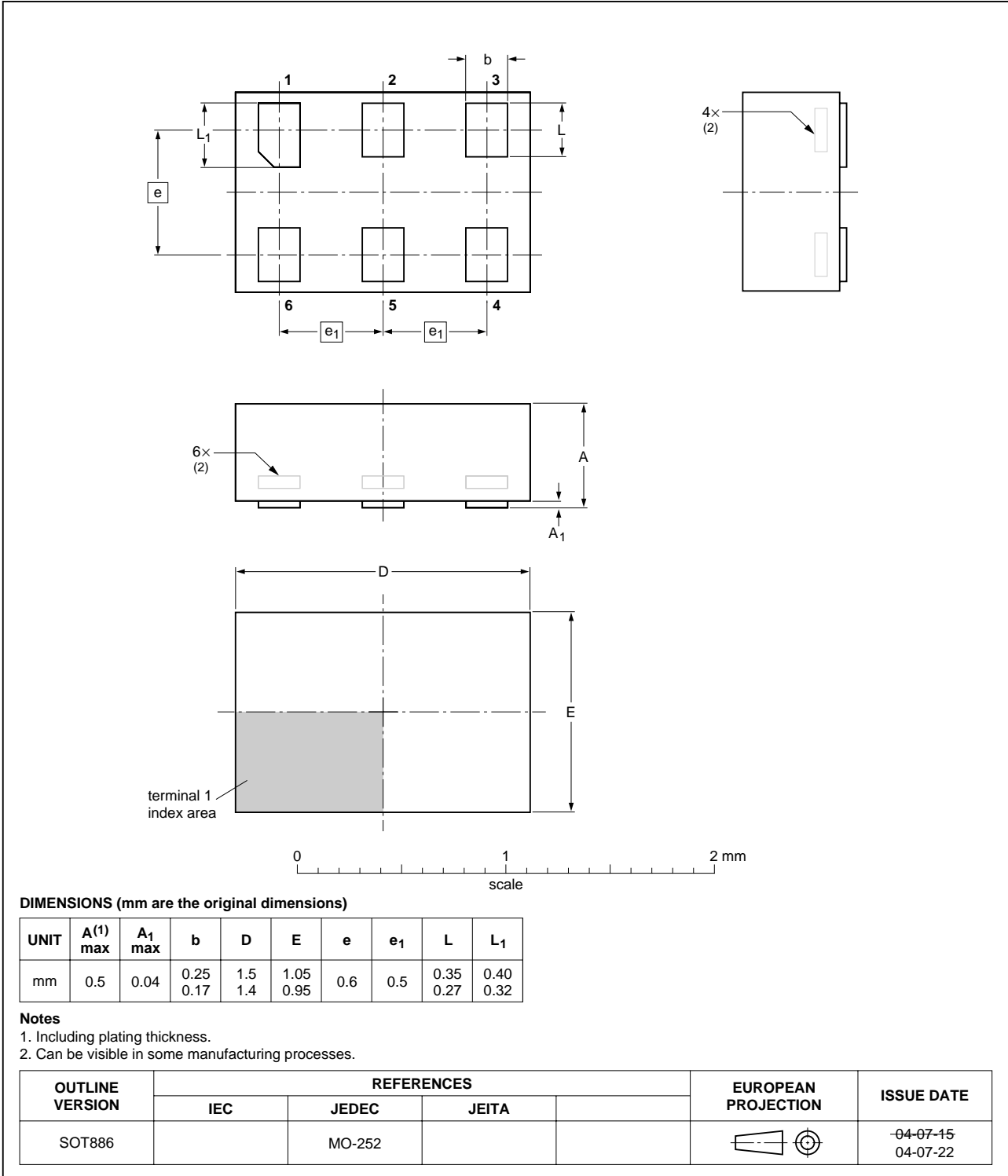


Fig 12. Package outline SOT886 (XSON6)

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

SOT891

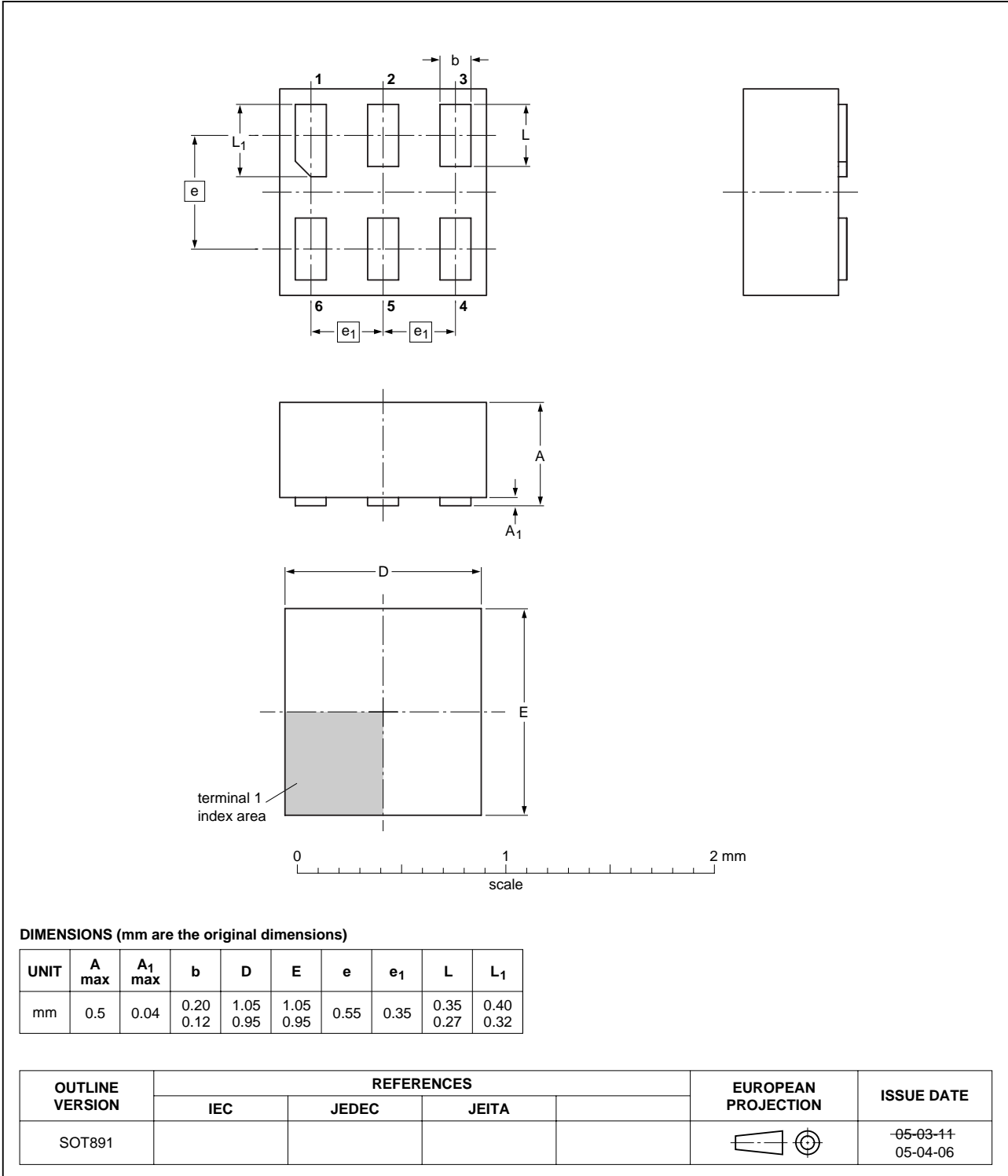


Fig 13. Package outline SOT891 (XSON6)



## 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
74AUP1G0832_1	<tbd>	Preliminary data sheet	-	-	-

## 17. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	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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[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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