# **74AUP1G09**

# Low-power 2-input AND gate with open-drain

Rev. 9 — 20 September 2024

**Product data sheet** 

## 1. General description

The 74AUP1G09 is a single 2-input AND gate with open-drain output. Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times. 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 static power consumption; I<sub>CC</sub> = 0.9 μA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Low noise overshoot and undershoot < 10 % of V<sub>CC</sub>
- I<sub>OFF</sub> circuitry provides partial Power-down mode operation
- · Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8C (2.7 V to 3.6 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 3A exceeds 5000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C



## Low-power 2-input AND gate with open-drain

## 3. Ordering information

**Table 1. Ordering information** 

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G09GW	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1
74AUP1G09GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP1G09GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	<u>SOT1115</u>
74AUP1G09GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74AUP1G09GX	-40 °C to +125 °C	X2SON5	plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 × 0.8 × 0.32 mm	SOT1226-3
74AUP1G09GZ	-40 °C to +125 °C	XSON5	plastic thermal enhanced extremely thin small outline package with side-wettable flanks (SWF); no leads; 5 terminals; body 1.1 × 0.85 × 0.5 mm	SOT8065-1

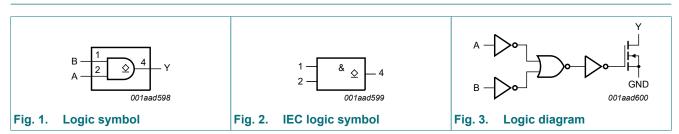
## 4. Marking

Table 2. Marking

- casio 21 marking						
Type number	Marking code [1]					
74AUP1G09GW	p9					
74AUP1G09GM	p9					
74AUP1G09GN	p9					
74AUP1G09GS	p9					
74AUP1G09GX	p9					
74AUP1G09GZ	p9					

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

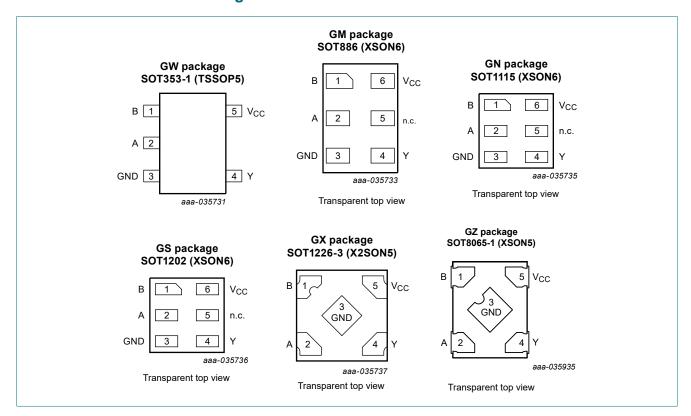
# 5. Functional diagram



#### Low-power 2-input AND gate with open-drain

## 6. Pinning information

## 6.1. Pinning



## 6.2. Pin description

Table 3. Pin description

Symbol	Pin		Description
	TSSOP5, XSON5 and X2SON5	XSON6	
В	1	1	data input
A	2	2	data input
GND	3	3	ground (0 V)
Υ	4	4	data output
n.c.	-	5	not connected
V <sub>CC</sub>	5	6	supply voltage

**Product data sheet** 

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## 7. Functional description

#### **Table 4. Function table**

H = HIGH voltage level; L = LOW voltage level; Z = high-impedance OFF state.

Input	Output	
A	В	Υ
L	L	L
L	Н	L
Н	L	L
Н	Н	Z

## 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 <sub>CC</sub>	supply voltage			-0.5	+4.6	V
I <sub>IK</sub>	input clamping current	V <sub>I</sub> < 0 V		-50	-	mA
VI	input voltage		[1]	-0.5	+4.6	V
lok	output clamping current	V <sub>O</sub> < 0 V		-50	-	mA
Vo	output voltage	Active mode and Power-down mode	[1]	-0.5	+4.6	V
Io	output current	V <sub>O</sub> = 0 V to V <sub>CC</sub>		-	+20	mA
I <sub>CC</sub>	supply current			-	+50	mA
I <sub>GND</sub>	ground current			-50	-	mA
T <sub>stg</sub>	storage temperature			-65	+150	°C
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = -40 °C to +125 °C	[2]	-	250	mW

<sup>[1]</sup> The minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

## 9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	supply voltage		0.8	3.6	V
VI	input voltage		0	3.6	V
V <sub>O</sub>	output voltage	Active mode and Power-down mode	0	3.6	V
T <sub>amb</sub>	ambient temperature		-40	+125	°C
Δt/ΔV	input transition rise and fall rate	V <sub>CC</sub> = 0.8 V to 3.6 V	0	200	ns/V

<sup>[2]</sup> For SOT353-1 (TSSOP5) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

For SOT886 (XSON6) package: Ptot derates linearly with 3.3 mW/K above 74 °C.

For SOT1115 (XSON6) package: Ptot derates linearly with 3.2 mW/K above 71 °C.

For SOT1202 (XSON6) package: Ptot derates linearly with 3.3 mW/K above 74 °C.

For SOT1226-3 (X2SON5) package: Ptot derates linearly with 3.0 mW/K above 67 °C.

For SOT8065-1 (XSON5) package:  $P_{tot}$  derates linearly with 3.2 mW/K above 72  $^{\circ}\text{C}.$ 

Low-power 2-input AND gate with open-drain

## 10. Static characteristics

**Table 7. Static characteristics** 

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 2	25 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.7 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.3 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3 × V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.31	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.31	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.31	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.44	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.31	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.44	V
I <sub>I</sub>	input leakage current	$V_{I}$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V	-	-	±0.1	μA
l <sub>OZ</sub>	OFF-state output current	$V_{I} = V_{IH} \text{ or } V_{IL}; V_{O} = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 3.6 \text{ V}$	-	-	±0.1	μA
I <sub>OFF</sub>	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
Δl <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	-	-	±0.2	μA
I <sub>CC</sub>	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 <sub>CC</sub>	additional supply current	$V_1 = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$	-	-	40	μA
Cı	input capacitance	$V_{CC} = 0 \text{ V to } 3.6 \text{ V; } V_I = \text{GND or } V_{CC}$	-	0.8	-	pF
Co	output capacitance	output enabled; V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V	-	1.7	-	pF
		output disabled; V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V	-	1.1	-	pF
T <sub>amb</sub> = -	40 °C to +85 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.7 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V		-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.3 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3 × V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.37	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.35	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.33	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.45	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.33	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.45	V
I <sub>I</sub>	input leakage current	$V_{I}$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V	-	-	±0.5	μΑ
l <sub>OZ</sub>	OFF-state output current	FF-state output current $V_I = V_{IH}$ or $V_{IL}$ ; $V_O = 0$ V to 3.6 V; $V_{CC} = 3.6$ V		-	±0.5	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_{I}$ or $V_{O} = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.5	μA
$\Delta I_{OFF}$	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	-	-	±0.6	μΑ
I <sub>CC</sub>	supply current	$V_I$ = GND or $V_{CC}$ ; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V	-	-	0.9	μΑ
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$	-	-	50	μΑ
T <sub>amb</sub> = -	40 °C to +125 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.75 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.7 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.25 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.3 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = 20 \mu A; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	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
II	input leakage current	$V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V	-	-	±0.75	μΑ
l <sub>OZ</sub>	OFF-state output current	$V_I = V_{IH} \text{ or } V_{IL}; V_O = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 3.6 \text{ V}$	-	-	±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	μΑ
Δl <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	μΑ
I <sub>CC</sub>	supply current	$V_I$ = GND or $V_{CC}$ ; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V	-	-	1.4	μΑ
$\Delta I_{CC}$	additional supply current	$V_1 = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$	-	-	75	μΑ

## Low-power 2-input AND gate with open-drain

# 11. Dynamic characteristics

### **Table 8. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V; for test circuit see Fig. 5.

Symbol	Parameter	Conditions		25 °C		-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
$C_L = 5 p$	F									
t <sub>pd</sub>	propagation delay	A or B to Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	13.5	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	1.9	4.6	10.4	1.8	11.4	1.8	12.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.5	3.3	6.5	1.4	7.4	1.4	8.2	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.2	2.9	5.1	1.1	5.9	1.1	6.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.0	2.2	3.8	0.9	4.5	0.9	4.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	0.9	2.3	4.0	8.0	4.5	8.0	4.9	ns
C <sub>L</sub> = 10	pF									
t <sub>pd</sub>	propagation delay	A or B to Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	16.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.3	5.6	12.3	2.1	13.7	2.1	15.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.8	4.1	7.6	1.7	8.8	1.7	9.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.6	3.8	6.1	1.4	7.1	1.4	7.8	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	2.9	4.6	1.2	5.4	1.2	5.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	3.2	5.7	1.1	6.4	1.1	7.0	ns
C <sub>L</sub> = 15	pF									
t <sub>pd</sub>	propagation delay	A or B to Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	19.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.6	6.6	14.2	2.4	15.8	2.4	17.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	4.8	8.7	1.9	10.1	1.9	11.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.9	4.6	7.6	1.7	8.5	1.7	9.3	ns
		$V_{CC}$ = 2.3 V to 2.7 V	1.6	3.6	5.6	1.5	6.3	1.5	6.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.6	4.1	7.5	1.4	8.3	1.4	9.1	ns
C <sub>L</sub> = 30	pF									
t <sub>pd</sub>	propagation delay	A or B to Y; see Fig. 4 [2]								
		V <sub>CC</sub> = 0.8 V	-	27.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.6	9.5	19.5	3.2	21.8	3.2	24.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.9	7.0	11.5	2.6	13.6	2.6	15.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.6	7.0	12.1	2.3	13.3	2.3	14.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.4	5.4	8.9	2.1	9.9	2.1	10.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.3	6.5	12.7	2.1	13.9	2.1	15.3	ns

### Low-power 2-input AND gate with open-drain

Symbol	Parameter	Conditions	25 °C								Unit
			Min	Typ[1]	Max	Min	Max	Min	Max		
$C_L = 5 p$	F, 10 pF, 15 pF and	30 pF									
C <sub>PD</sub> pov	1.	$f_i = 1 \text{ MHz}; V_I = \text{GND to } V_{CC}$ [3]									
	capacitance	V <sub>CC</sub> = 0.8 V	-	0.6	-	-	-	-	-	pF	
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	0.7	-	-	-	-	-	pF	
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	8.0	-	-	-	-	-	pF	
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	0.9	-	-	-	-	-	pF	
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	1.1	-	-	-	-	-	pF	
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	1.4	-	-	-	-	-	pF	

- [1] All typical values are measured at nominal V<sub>CC</sub>.
- [2]  $t_{pd}$  is the same as  $t_{PZL}$  and  $t_{PLZ}$ .
- [3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu$ W).

 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N$  where:

 $f_i$  = input frequency in MHz;

V<sub>CC</sub> = supply voltage in V;

N = number of inputs switching.

## 11.1. Waveform and test circuit

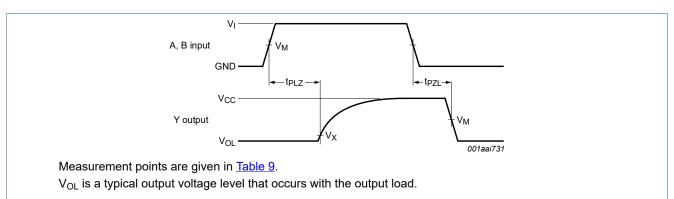
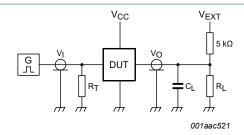


Fig. 4. The data input (A or B) to output (Y) propagation delays

**Table 9. Measurement points** 

Supply voltage	Input			Output	
V <sub>CC</sub>	V <sub>M</sub>	V <sub>I</sub>	$t_r = t_f$	V <sub>M</sub>	V <sub>X</sub>
0.8 V to 1.6 V	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns	0.5 × V <sub>CC</sub>	V <sub>OL</sub> + 0.1 V
1.65 V to 2.7 V	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns	0.5 × V <sub>CC</sub>	V <sub>OL</sub> + 0.15 V
3.0 V to 3.6 V	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns	0.5 × V <sub>CC</sub>	V <sub>OL</sub> + 0.3 V

### Low-power 2-input AND gate with open-drain



Test data is given in Table 10.

Definitions for test circuit:

R<sub>L</sub> = Load resistance;

C<sub>L</sub> = Load capacitance including jig and probe capacitance;

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

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

### Fig. 5. Test circuit for measuring switching times

#### Table 10. Test data

Supply voltage	Load	V <sub>EXT</sub>			
V <sub>CC</sub>	CL	t <sub>PLH</sub> , t <sub>PHL</sub> t <sub>PZH</sub> , t <sub>PHZ</sub> t <sub>PZL</sub> , t <sub>PLZ</sub>			
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 <sub>CC</sub>

[1] For measuring enable and disable times  $R_L$  = 5 k $\Omega$ . For measuring propagation delays, set-up and hold times, and pulse width,  $R_L$  = 1 M $\Omega$ .

#### Low-power 2-input AND gate with open-drain

## 12. Package outline

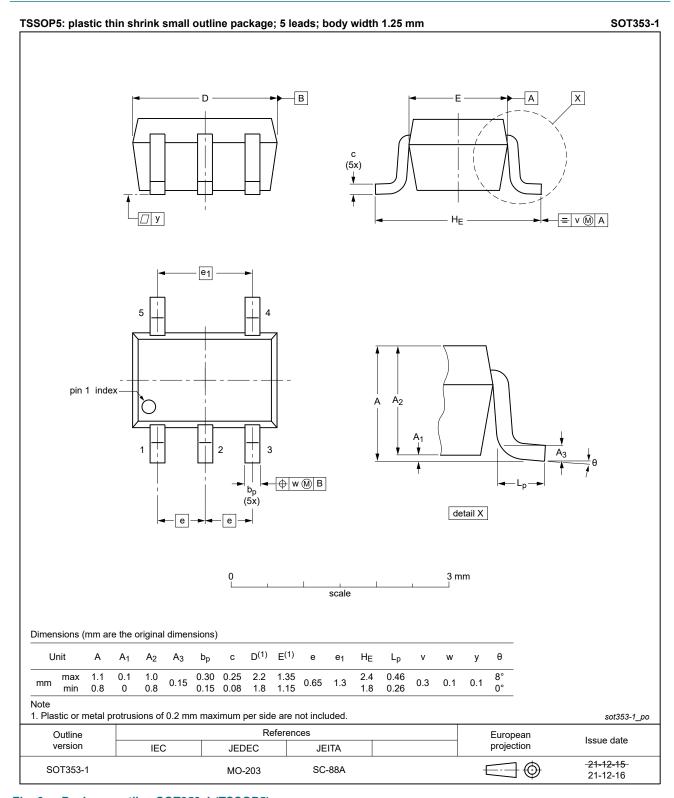


Fig. 6. Package outline SOT353-1 (TSSOP5)

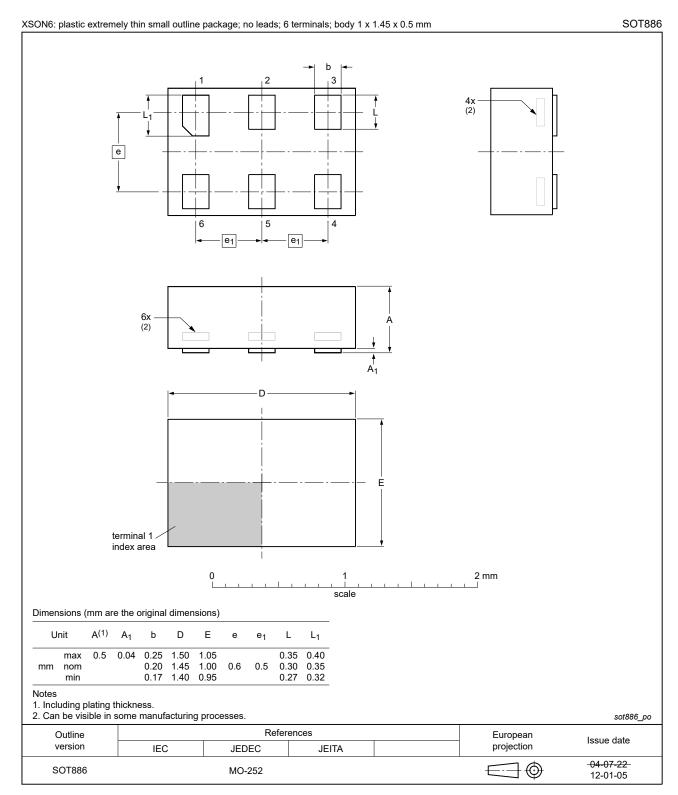


Fig. 7. Package outline SOT886 (XSON6)

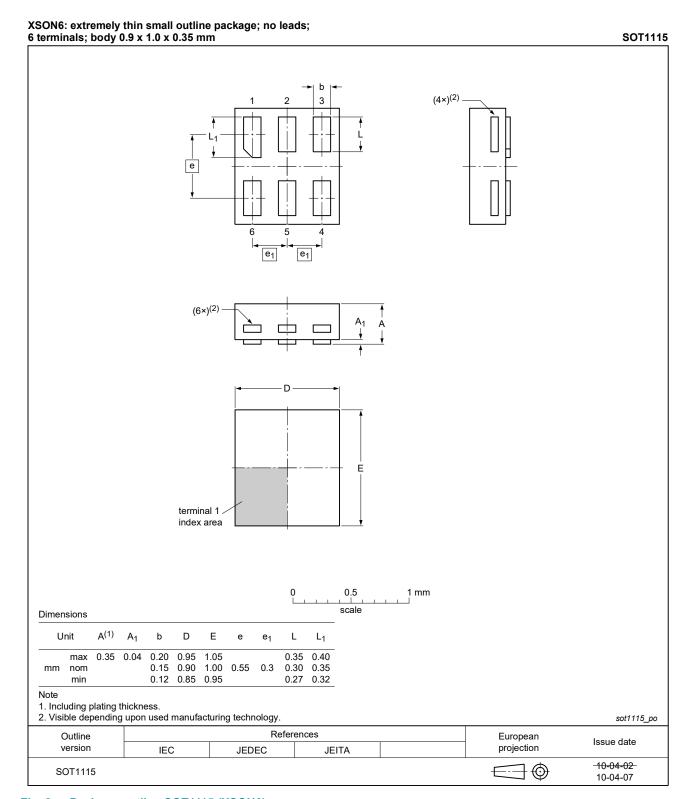


Fig. 8. Package outline SOT1115 (XSON6)

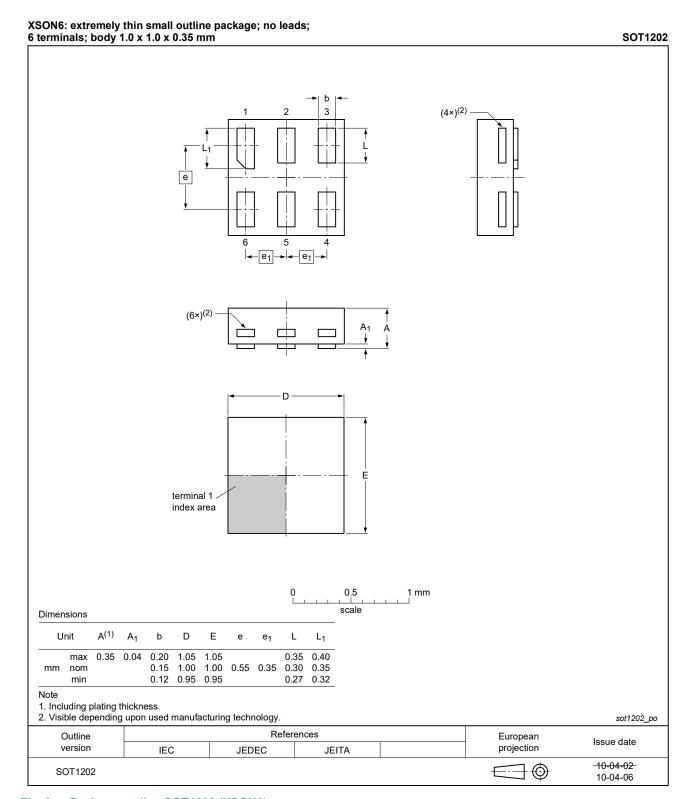


Fig. 9. Package outline SOT1202 (XSON6)

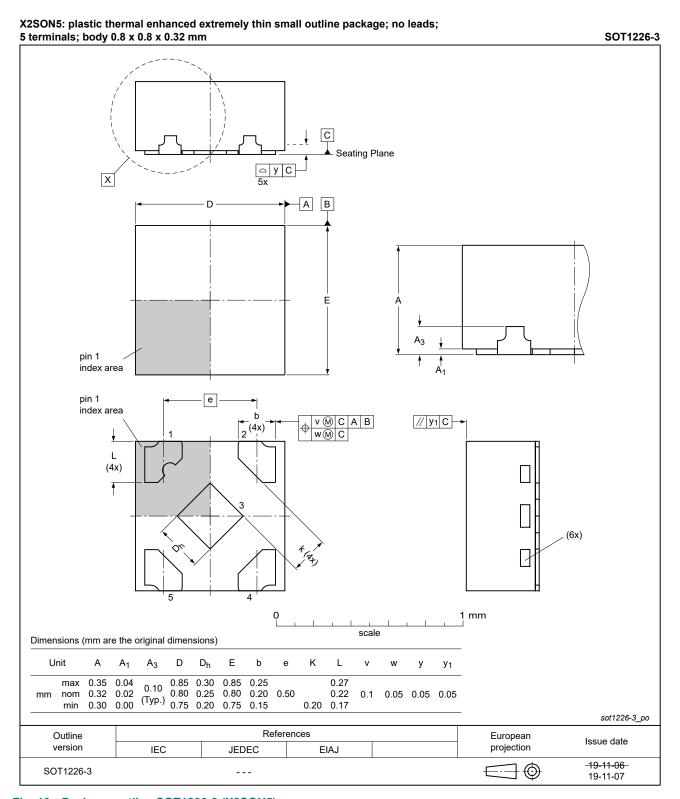


Fig. 10. Package outline SOT1226-3 (X2SON5)

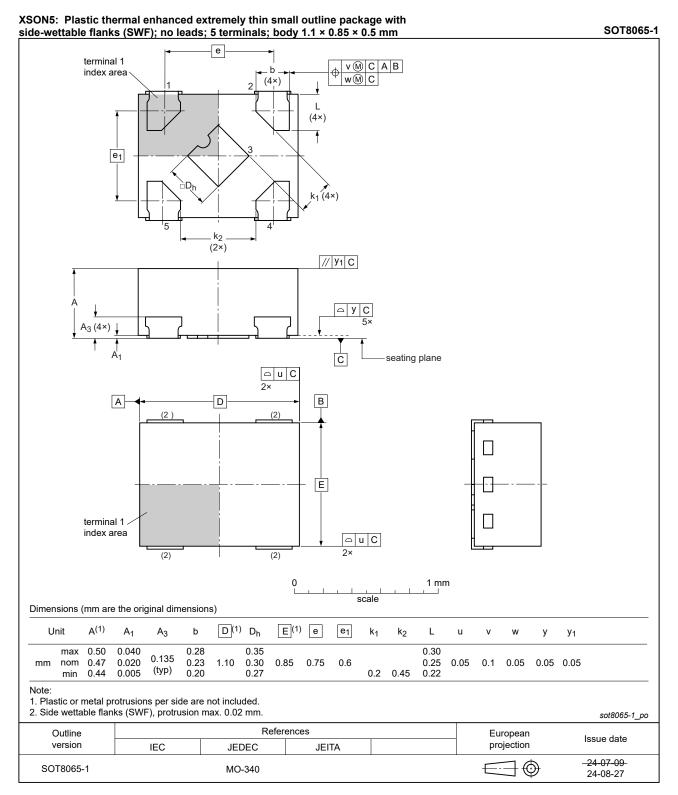


Fig. 11. Package outline SOT8065-1 (XSON5)

## Low-power 2-input AND gate with open-drain

## 13. Abbreviations

### **Table 11. Abbreviations**

Acronym	Description
ANSI	American National Standards Institute
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
ESDA	ElectroStatic Discharge Association
НВМ	Human Body Model
JEDEC	Joint Electron Device Engineering Council

## 14. Revision history

#### **Table 12. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes		
74AUP1G09 v.9	20240920	Product data sheet	-	74AUP1G09 v.8.1		
Modifications:	Type numb	Type number 74AUP1G09GZ (SOT8065-1/XSON5) added.				
74AUP1G09 v.8.1	20230711	Product data sheet	-	74AUP1G09 v.7		
Modifications:	Section 2: I	<u>Section 2</u> : ESD specification updated according to the latest JEDEC standard.				
74AUP1G09 v.7	20220114	Product data sheet	-	74AUP1G09 v.6		
Modifications:	• <u>Fig. 6</u> : Pack	Fig. 6: Package outline drawing for SOT353-1 (TSSOP5) has changed.				
74AUP1G09 v.6	20210623	Product data sheet	-	74AUP1G09 v.5		
	<ul><li>Type numb</li><li><u>Section 1</u> a</li><li><u>Table 5</u>: De</li></ul>	Table 5: Derating values for P <sub>tot</sub> total power dissipation updated.				
74AUP1G09 v.5	20170929	Product data sheet	-	74AUP1G09 v.4		
Modifications:	guidelines	<ul> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>				
74AUP1G09 v.4	20120628	Product data sheet	-	74AUP1G09 v.3		
Modifications:		<ul> <li>Added type number 74AUP1G09GX (SOT1226)</li> <li>Package outline drawing of SOT886 (Fig. 7) modified.</li> </ul>				
74AUP1G09 v.3	20111128	Product data sheet	-	74AUP1G09 v.2		
Modifications:	Legal page	Legal pages updated.				
74AUP1G09 v.2	20100709	Product data sheet	-	74AUP1G09 v.1		
74AUP1G09 v.1	20090115	Product data sheet	-	-		

## 15. 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.

- Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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## Low-power 2-input AND gate with open-drain

## **Contents**

General description		
2. Features and benefits	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	4	
8. Limiting values	4	
9. Recommended operating conditions	4	
10. Static characteristics	5	
11. Dynamic characteristics	7	
11.1. Waveform and test circuit	8	
12. Package outline	10	
13. Abbreviations	16	
14. Revision history	16	
15. Legal information	17	

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