# 74AUP1G00-Q100

# Low-power 2-input NAND gate

Rev. 4 — 19 September 2024

**Product data sheet** 

### 1. General description

The 74AUP1G00-Q100 is a single 2-input NAND gate. 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 damaging backflow current through the device when it is powered down.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

### 2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 0.8 V to 3.6 V
- · CMOS low power dissipation
- 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 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 Vto 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
- Low static power consumption; I<sub>CC</sub> = 0.9 μA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Overvoltage tolerant inputs to 3.6 V
- Low noise overshoot and undershoot < 10 % of V<sub>CC</sub>
- I<sub>OFF</sub> circuitry provides partial Power-down mode operation

# 3. Ordering information

**Table 1. Ordering information** 

Table 1. Ordering inton	nation						
Type number	Package						
	Temperature range	Name	Description	Version			
74AUP1G00GW-Q100	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1			
74AUP1G00GZ-Q100	-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			



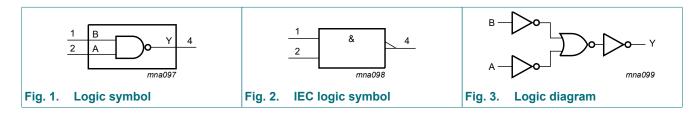
## 4. Marking

#### Table 2. Marking

Type number	Marking code [1]
74AUP1G00GW-Q100	pA
74AUP1G00GZ-Q100	pA

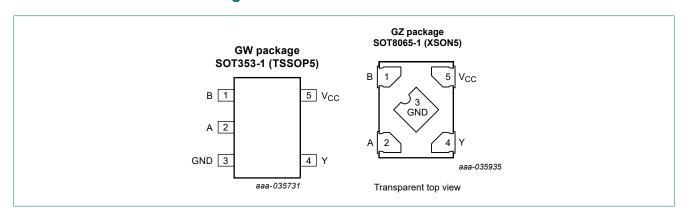
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

## 5. Functional diagram



# 6. Pinning information

### 6.1. Pinning



### 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
В	1	data input
A	2	data input
GND	3	ground (0 V)
Υ	4	data output
V <sub>CC</sub>	5	supply voltage

## 7. Functional description

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

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

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

## 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
I <sub>OK</sub>	output clamping current	V <sub>O</sub> < 0 V	-50	-	mA
Vo	output voltage	Active mode [1]	-0.5	V <sub>CC</sub> + 0.5	V
		Power-down mode; V <sub>CC</sub> = 0 V [1]	-0.5	+4.6	V
I <sub>O</sub>	output current	$V_O = 0 V \text{ to } V_{CC}$	-	±20	mA
I <sub>CC</sub>	supply current		-	+50	mA
$I_{GND}$	ground current		-50	-	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	total power dissipation	$T_{amb} = -40  ^{\circ}\text{C} \text{ to } +125  ^{\circ}\text{C}$ [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
Vo	output voltage	Active mode	0	V <sub>CC</sub>	V
		Power-down mode; V <sub>CC</sub> = 0 V	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<sub>tot</sub> derates linearly with 3.3 mW/K above 74 °C. For SOT8065-1 (XSON5) package: P<sub>tot</sub> derates linearly with 3.2 mW/K above 72 °C.

## 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	0.70×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	-	-	0.30×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>OH</sub>	HIGH-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	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.75×V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.11	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.32	-	-	V
		$I_{O}$ = -2.3 mA; $V_{CC}$ = 2.3 V	2.05	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.72	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.6	-	-	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 <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_{I}$ or $V_{O} = 0 \text{ V}$ to 3.6 V; $V_{CC} = 0 \text{ V}$	-	-	±0.2	μΑ
$\Delta I_{OFF}$	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	-	-	±0.2	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	-	-	0.5	μΑ
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	40	μA
Cı	input capacitance	$V_{CC}$ = 0 V to 3.6 V; $V_{I}$ = GND or $V_{CC}$	-	0.8	-	pF
Co	output capacitance	$V_O = GND; V_{CC} = 0 V$	-	1.7	-	pF

Symbo	l Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> =	-40 °C to +85 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70×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	-	-	0.30×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>OH</sub>	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_O = -20 \mu A$ ; $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.7×V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.03	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.30	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.97	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.85	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.67	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.55	-	-	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	-	-	0.37	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
l <sub>l</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.5	μA
I <sub>OFF</sub>	power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.5	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	-	-	±0.6	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	-	-	0.9	μA
ΔI <sub>CC</sub>	additional supply current	$V_1 = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	50	μA
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	0.70×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	-	-	0.30×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>OH</sub>	HIGH-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	V <sub>CC</sub> - 0.11	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.6×V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	0.93	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.17	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.77	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.67	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.40	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.30	-	-	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	-	-	0.11	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
l <sub>l</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	μΑ
I <sub>OFF</sub>	power-off leakage current	$V_1$ or $V_0 = 0 V$ to 3.6 V; $V_{CC} = 0 V$	-	-	±0.75	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	-	-	±0.75	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
ΔI <sub>CC</sub>	additional supply current	$V_1 = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	75	μA

<sup>[1]</sup> One input at  $V_{CC}$  - 0.6 V, other input at  $V_{CC}$  or GND.

# 11. Dynamic characteristics

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

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

Symbol	Parameter	Conditions	Min	Typ [1]	Max	Unit
T <sub>amb</sub> = 2	5 °C; C <sub>L</sub> = 5 pF					
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 4</u> [2]				
		V <sub>CC</sub> = 0.8 V	-	17.5	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.5	5.3	11.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.0	3.8	6.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.6	3.1	5.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.3	2.5	4.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.0	2.2	3.6	ns

Symbo	l Parameter	Conditions	Min	Typ [1]	Max	Unit
T <sub>amb</sub> =	25 °C; C <sub>L</sub> = 10 pF	,				
t <sub>pd</sub>	propagation delay	A, B to Y; see Fig. 4	2]			
		V <sub>CC</sub> = 0.8 V	-	21.0	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.4	6.1	13.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.4	4.4	7.9	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.7	6.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	3.0	4.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.8	4.3	ns
T <sub>amb</sub> =	25 °C; C <sub>L</sub> = 15 pF					
t <sub>pd</sub>	propagation delay	A, B to Y; see Fig. 4	2]			
		V <sub>CC</sub> = 0.8 V	-	24.5	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.4	6.9	14.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.8	5.0	8.9	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	4.1	7.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	3.5	5.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.6	3.2	4.9	ns
T <sub>amb</sub> =	25 °C; C <sub>L</sub> = 30 pF	,	"			
t <sub>pd</sub>	propagation delay	A, B to Y; see Fig. 4	2]			
		V <sub>CC</sub> = 0.8 V	-	34.8	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.6	9.2	20.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	6.5	11.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.6	5.4	9.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.4	4.6	7.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.3	4.3	6.5	ns
T <sub>amb</sub> =	25 °C	,				
C <sub>PD</sub>	power dissipation	$f = 1 \text{ MHz}; V_I = \text{GND to } V_{CC}$	3]			
	capacitance	V <sub>CC</sub> = 0.8 V	-	2.6	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.8	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	2.9	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	3.1	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.6	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.2	-	pF

<sup>[1]</sup> All typical values are measured at nominal  $V_{CC}$ .

f<sub>i</sub> = input frequency in MHz;

 $f_o$  = output frequency in MHz;

 $C_L$  = output load capacitance in pF;

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

N = number of inputs switching;

 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs.

 <sup>[2]</sup> t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
 [3] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).
 P<sub>D</sub> = C<sub>PD</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>i</sub> × N + Σ(C<sub>L</sub> × V<sub>CC</sub><sup>2</sup> × f<sub>o</sub>) where:

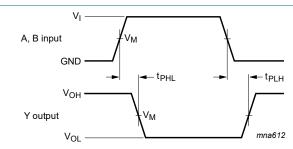
**Table 9. Dynamic characteristics** 

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

Symbol	Parameter	Conditions	-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Max	Min	Max	
C <sub>L</sub> = 5 p	F						<u>'</u>
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 4</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.1	12.2	2.1	13.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.8	7.8	1.8	8.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.4	6.2	1.4	6.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.1	4.7	1.1	5.2	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.0	4.2	1.0	4.7	ns
C <sub>L</sub> = 10	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 4</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.2	14.4	2.2	15.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	9.2	2.2	10.2	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.9	7.3	1.9	8.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.3	5.6	1.3	6.2	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.2	4.9	1.2	5.4	ns
C <sub>L</sub> = 15	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 4</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.1	16.5	3.1	18.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	10.5	2.5	11.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	8.3	2.0	9.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.5	6.4	1.5	7.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.4	5.7	1.4	6.3	ns
C <sub>L</sub> = 30	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 4</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.1	22.6	4.1	24.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.9	14.0	2.9	15.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	11.1	2.3	12.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	8.5	2.1	9.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	7.6	2.1	8.4	ns

<sup>[1]</sup>  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

### 11.1. Waveforms and test circuit



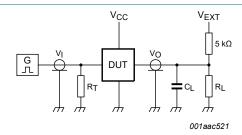
Measurement points are given in Table 10.

Logic levels: V<sub>OL</sub> and V<sub>OH</sub> are typical output voltage drop that occur with the output load.

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

**Table 10. 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>
0.8 V to 3.6 V	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns	0.5 × V <sub>CC</sub>



Test data is given in <u>Table 11</u>.

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  $Z_0$  of the pulse generator;

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

Fig. 5. Test circuit for measuring switching times

Table 11. Test data

Supply voltage	Load		nge Load V <sub>EXT</sub>		
V <sub>CC</sub>	C <sub>L</sub>	R <sub>L</sub> [1]	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, setup and hold times and pulse width  $R_L$  = 1 M $\Omega$ .

# 12. Package outline

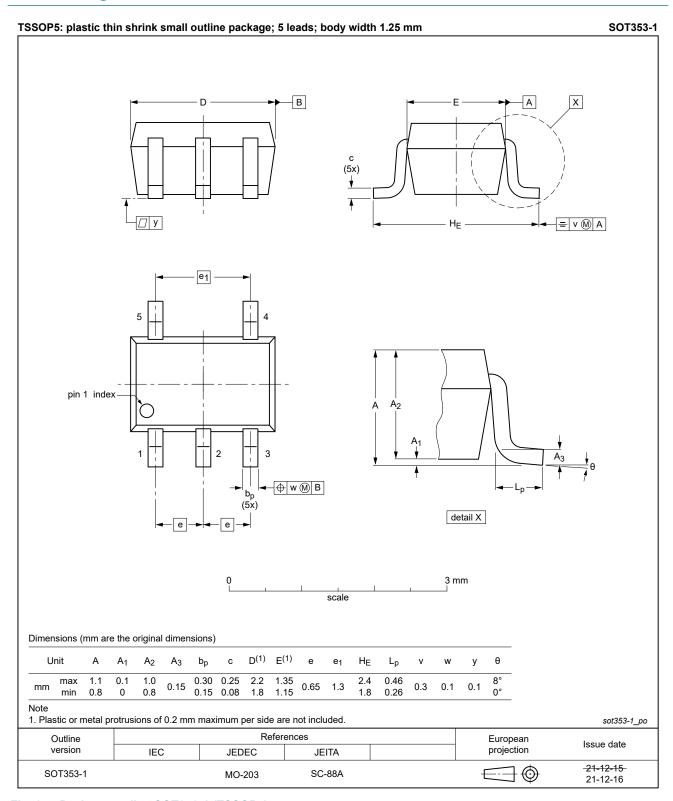


Fig. 6. Package outline SOT353-1 (TSSOP5)

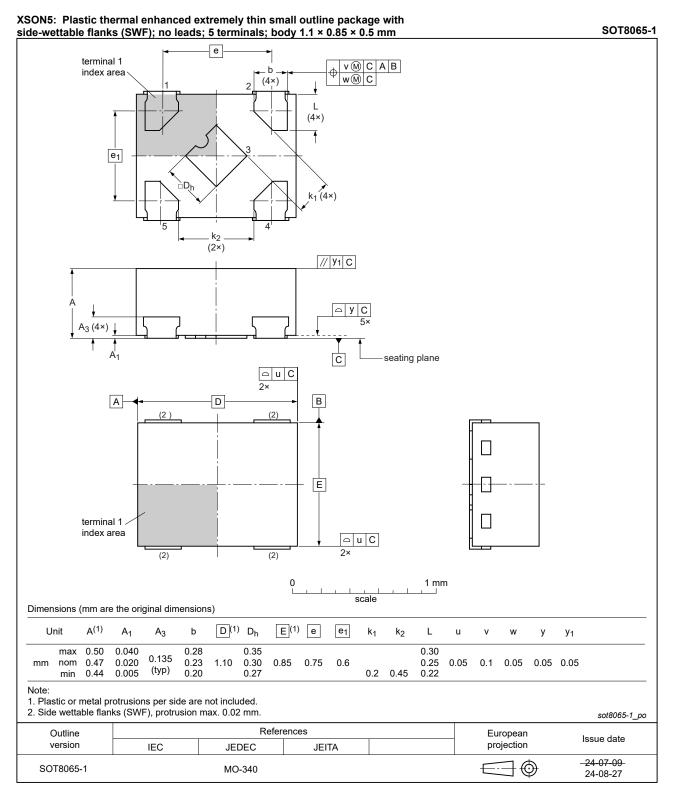


Fig. 7. Package outline SOT8065-1 (XSON5)

### 13. Abbreviations

#### **Table 12. 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 13. Revision history**

Table 15. Nevision history					
Document ID	Release date	Data sheet status	Change notice	Supersedes	
74AUP1G00_Q100 v.4	20240919	Product data sheet	-	74AUP1G00_Q100 v.3.1	
Modifications:	Type number 74AUP1G00GZ-Q100 (SOT8065-1/XSON5) added.				
74AUP1G00_Q100 v.3.1	20230711	Product data sheet	-	74AUP1G00_Q100 v.2	
Modifications:	<u>Section 2</u> : ESD specification updated according to the latest JEDEC standard.				
74AUP1G00_Q100 v.2	20220113	Product data sheet	-	74AUP1G00_Q100 v.1	
Modifications:	<ul> <li><u>Section 1</u> and <u>Section 2</u> updated.</li> <li><u>Table 5</u>: Derating values for P<sub>tot</sub> total power dissipation updated.</li> <li><u>Fig. 6</u>: Package outline drawing for SOT353-1 (TSSOP5) has changed.</li> </ul>				
74AUP1G00_Q100 v.1	20190404	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.

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**Product data sheet** 

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