Low-power 2-input OR-gate Rev. 4 — 23 April 2021

### 1. General description

The 74AUP1G32-Q100 provides the single 2-input OR function.

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.

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
- 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:
  - MIL-STD-883, method 3015 Class 3A. Exceeds 5000 V
  - HBM JESD22-A114F Class 3A. Exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V (C = 200 pF, R = 0 Ω)
- Low static power consumption; I<sub>CC</sub> = 0.9 μA (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<sub>CC</sub>
- IOFF circuitry provides partial power-down mode operation

### 3. Ordering information

#### Table 1. Ordering information

Type number	Package						
	Temperature range	Name	Description	Version			
74AUP1G32GW-Q100	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1			
74AUP1G32GM-Q100	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886			

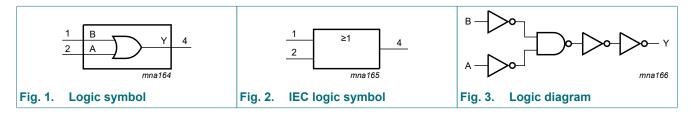
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### 4. Marking

Table 2. Marking			
Type number	Marking code [1]		
74AUP1G32GW-Q100	pG		
74AUP1G32GM-Q100	pG		

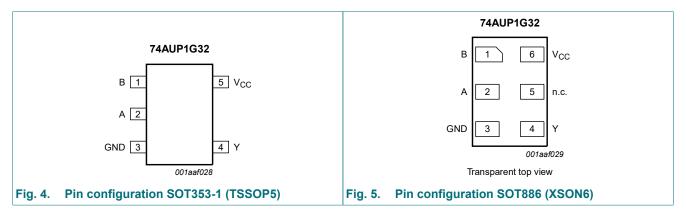
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

### 5. Functional diagram



### 6. Pinning information

### 6.1. Pinning



### 6.2. Pin description

Table 3. Pin description	on		
Symbol	Pin		Description
	TSSOP5	XSON6	
В	1	1	data input
A	2	2	data input
GND	3	3	ground (0 V)
Y	4	4	data output
n.c.	-	5	not connected
V <sub>CC</sub>	5	6	supply voltage

74AUP1G32\_Q100

### 7. Functional description

#### Table 4. Function table

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

Input C		Output
Α	В	Y
L	L	L
L	Н	Н
Н	L	Н
Н	Н	Н

### 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 and Power-down mode [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 <sub>GND</sub>	ground current		-50	-	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	total power dissipation	$T_{amb} = -40 \text{ °C to } +125 \text{ °C}$ [2]	-	250	mW

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SOT353-1 (TSSOP5) package: P<sub>tot</sub> derates linearly with 3.3 mW/K above 74 °C.

For SOT886 (XSON6) package: P<sub>tot</sub> derates linearly with 3.3 mW/K above 74 °C.

### 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; $V_{CC}$ = 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

# **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	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V
	voltage	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
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ 2.0	-	V		
V <sub>IL</sub>	LOW-level input	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V
	voltage	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
	HIGH-level output	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
	voltage	$I_{O}$ = -20 µA; $V_{CC}$ = 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 <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 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 <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		$I_{O}$ = 20 µA; $V_{CC}$ = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	$0.3 \times V_{CC}$	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
lı	input leakage current	$V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V	-	-	±0.1	μA
I <sub>OFF</sub>	power-off leakage current	$V_1$ or $V_0 = 0$ V to 3.6 V; $V_{CC} = 0$ V	-	-	±0.2	μA
∆I <sub>OFF</sub>	additional power-off leakage current	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.2	μA
I <sub>CC</sub>	supply current	$V_{I} = GND \text{ or } V_{CC}; I_{O} = 0 \text{ A};$ $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.5	μA
ΔI <sub>CC</sub>	additional supply current	$V_{I} = V_{CC} - 0.6 V; I_{O} = 0 A; V_{CC} = 3.3 V$ [1]	-	-	40	μA
CI	input capacitance	$V_{CC}$ = 0 V to 3.6 V; V <sub>I</sub> = GND or V <sub>CC</sub>	-	0.8	-	pF
Co	output capacitance	$V_0 = GND; V_{CC} = 0 V$	-	1.7	-	pF

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Symbo	l Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> =	-40 °C to +85 °C		·			
V <sub>IH</sub>	HIGH-level input	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V
	voltage	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	V <sub>CC</sub> = 0.8 V	-	-	$0.30 \times V_{CC}$	V
	voltage	V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	$0.35 \times V_{CC}$	V
	voltage	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	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
	voltage	$I_{O}$ = -20 µA; $V_{CC}$ = 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	0.7 × 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	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = 20 µA; $V_{CC}$ = 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	μA
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
ΔI <sub>OFF</sub>	additional power-off leakage current	$V_{I} \text{ or } V_{O} = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.6	μA
I <sub>CC</sub>	supply current	$V_{I} = GND \text{ or } V_{CC}; I_{O} = 0 \text{ A};$ $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.9	μA
ΔI <sub>CC</sub>	additional 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 <sub>amb</sub> =	-40 °C to +125 °C					
V <sub>IH</sub>	HIGH-level input	V <sub>CC</sub> = 0.8 V	0.75 × V <sub>CC</sub>	-	-	V
	voltage	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
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	2.0	-	-	V
VIL	LOW-level input	V <sub>CC</sub> = 0.8 V	-	-	0.25 × V <sub>CC</sub>	V
	voltage	$V_{\rm CC} = 0.9$ V to 1.95 V	-	-	0.30 × V <sub>CC</sub>	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	-	0.7	V
		$V_{\rm CC} = 3.0 \text{ V to } 3.6 \text{ V}$	-	-	0.9	V

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Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>OH</sub>	HIGH-level output	$V_{I} = V_{IH} \text{ or } V_{IL}$				
	voltage	$I_{O}$ = -20 µA; $V_{CC}$ = 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	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = 20 µA; $V_{CC}$ = 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	$V_{I}$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V	-	-	±0.75	μA
I <sub>OFF</sub>	power-off leakage current	$V_{I}$ or $V_{O}$ = 0 V to 3.6 V; $V_{CC}$ = 0 V	-	-	±0.75	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	$V_{I} \text{ or } V_{O} = 0 \text{ V to } 3.6 \text{ V};$ $V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	±0.75	μA
I <sub>CC</sub>	supply current	$V_I = GND \text{ or } V_{CC}; I_O = 0 \text{ A};$ $V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	1.4	μA
ΔI <sub>CC</sub>	additional 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 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. 7

Symbol	Parameter	Conditions	Min	Тур [1]	Мах	Unit
T <sub>amb</sub> = 2	5 °C; C <sub>L</sub> = 5 pF				<u> </u>	
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [2]				
		V <sub>CC</sub> = 0.8 V	-	16.8	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.4	5.1	10.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.6	3.6	6.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.4	3.0	5.2	ns
		$V_{CC}$ = 2.3 V to 2.7 V	1.1	2.4	3.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.0	2.1	3.5	ns

### Low-power 2-input OR-gate

Symbol	Parameter	Conditions	Min	Тур <mark>[1]</mark>	Max	Unit
T <sub>amb</sub> = 2	25 °C; C <sub>L</sub> = 10 pF					
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [2]				
		V <sub>CC</sub> = 0.8 V	-	20.3	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.3	5.9	12.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.9	4.2	7.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.7	3.5	6.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.4	2.9	4.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.7	4.3	ns
T <sub>amb</sub> = 2	25 °C; C <sub>L</sub> = 15 pF					
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [2]				
		V <sub>CC</sub> = 0.8 V	-	23.8	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.3	6.7	14.3	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	4.8	8.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	4.0	6.7	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	3.3	5.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.5	3.1	4.9	ns
T <sub>amb</sub> = 2	25 °C; C <sub>L</sub> = 30 pF	· · ·				
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [2]				
		V <sub>CC</sub> = 0.8 V	-	34.1	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.5	9.0	19.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.4	6.3	11.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.6	5.3	8.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.3	4.4	7.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.2	4.2	6.4	ns
T <sub>amb</sub> = 2	25 °C	· · ·				
C <sub>PD</sub>	power dissipation	$f = 1 \text{ MHz}; V_I = GND \text{ to } V_{CC}$ [3]				
	capacitance	V <sub>CC</sub> = 0.8 V	-	2.5	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.6	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	2.8	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	2.9	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.4	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	3.9	-	pF

[1] All typical values are measured at nominal V<sub>CC</sub>.

[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  $\mu$ W).

 $P_{D} = C_{PD} \times V_{CC}^{2} \times f_{i} \times N + \Sigma(C_{L} \times V_{CC}^{2} \times f_{o}) \text{ where:}$   $f_{i} = \text{input frequency in MHz;}$ 

 $f_o$  = 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.

### Low-power 2-input OR-gate

#### Table 9. Dynamic characteristics

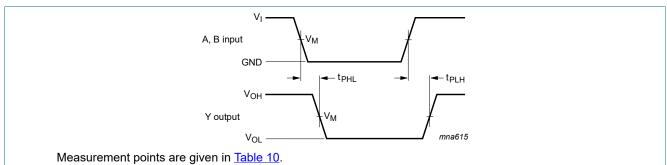
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7

Symbol	Parameter	Conditions	-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Max	Min	Max	1
C <sub>L</sub> = 5 p	F			1	1		
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.1	11.9	2.1	13.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.4	7.5	1.4	8.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.2	6.0	1.2	6.6	ns
		$V_{CC}$ = 2.3 V to 2.7 V	1.0	4.6	1.0	5.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	0.9	4.1	0.9	4.6	ns
C <sub>L</sub> = 10	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.1	13.8	2.1	15.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.7	8.7	1.7	9.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.5	6.9	1.5	7.7	ns
		$V_{CC}$ = 2.3 V to 2.7 V	1.3	5.5	1.3	6.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.2	5.0	1.2	5.5	ns
C <sub>L</sub> = 15	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.0	15.6	3.0	17.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.0	9.8	2.0	10.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.8	7.9	1.8	8.7	ns
		$V_{CC}$ = 2.3 V to 2.7 V	1.6	6.3	1.6	6.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.5	5.8	1.5	6.4	ns
C <sub>L</sub> = 30	pF						
t <sub>pd</sub>	propagation delay	A, B to Y; see <u>Fig. 6</u> [1]					
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.0	21.5	4.0	23.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.9	13.3	2.9	14.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.4	10.7	2.4	11.8	ns
		$V_{CC}$ = 2.3 V to 2.7 V	2.2	8.4	2.2	9.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	7.7	2.1	8.5	ns

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

### Low-power 2-input OR-gate

### 11.1. Waveforms and test circuit

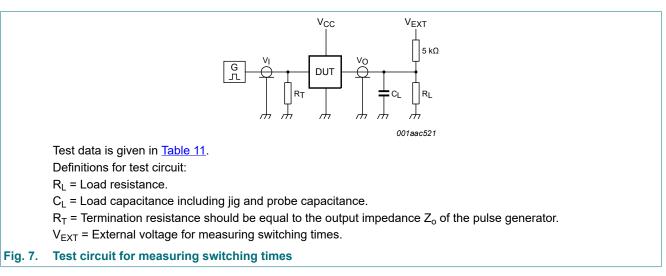


Logic levels: V<sub>OL</sub> and V<sub>OH</sub> are typical output voltage drop that occur with the output load.

#### Fig. 6. The data input (A or B) to output (Y) propagation delays

### Table 10. Measurement points

Supply voltage	Output	Input		
V <sub>cc</sub>	V <sub>M</sub>	V <sub>M</sub>	VI	$t_r = t_f$
0.8 V to 3.6 V	0.5 × V <sub>CC</sub>	0.5 × V <sub>CC</sub>	V <sub>CC</sub>	≤ 3.0 ns



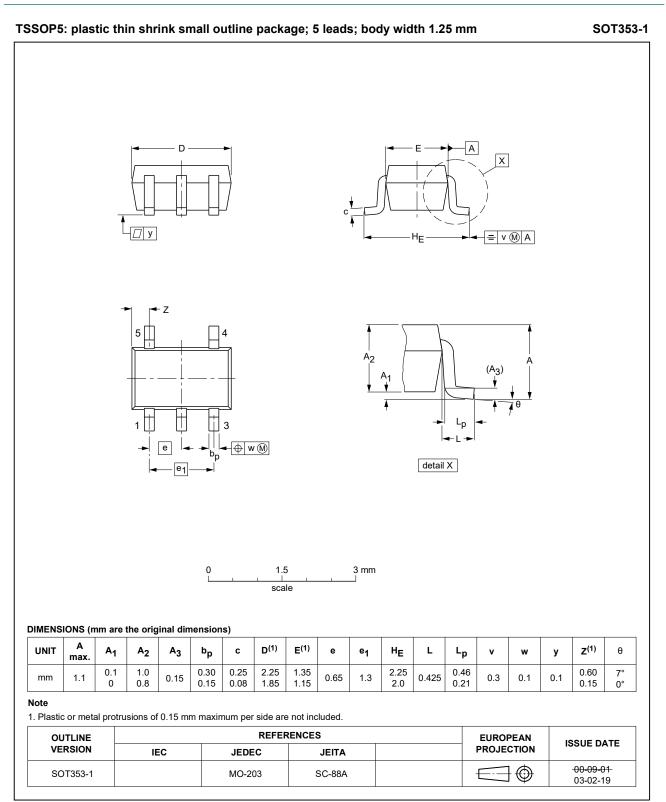
#### Table 11. Test data

Supply voltage	Load		V <sub>EXT</sub>		
V <sub>cc</sub>	CL	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. 8. Package outline SOT353-1 (TSSOP5)

### Low-power 2-input OR-gate

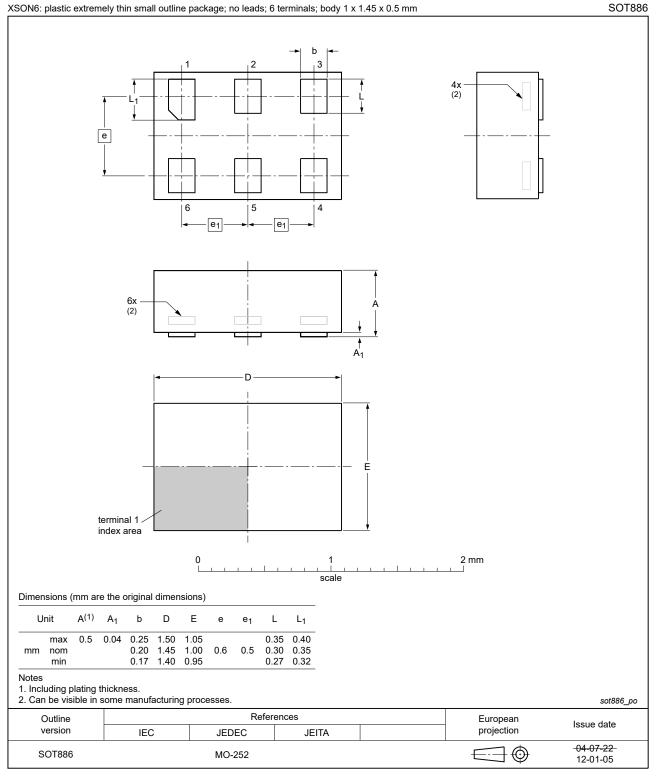


Fig. 9. Package outline SOT886 (XSON6)

# 13. Abbreviations

Acronym	Description
DUT	Device Under Test
ESD	ElectroStatic Discharge
НВМ	Human Body Model
MIL	Military
MM	Machine Model

### 14. Revision history

#### Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G32_Q100 v.4	20210423	Product data sheet	-	74AUP1G32_Q100 v.3
Modifications:	• <u>Table 5</u> : Derating values for P <sub>tot</sub> total power dissipation updated.			
74AUP1G32_Q100 v.3	20190128	Product data sheet	-	74AUP1G32_Q100 v.2
Modifications:	<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> <li>Type number 74AUP1G32GM-Q100 (SOT886) added.</li> </ul>			
74AUP1G32_Q100 v.2	20130704	Product data sheet	-	74AUP1G32_Q100 v.1
Modifications:	Typical values C <sub>I</sub> and C <sub>O</sub> corrected (errata).			
74AUP1G32_Q100 v.1	20130320	Product data sheet	-	-

74AUP1G32\_Q100

# 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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