74AUP1G18

Low-power 1-of-2 demultiplexer with 3-state deselected output

Rev. 8 — 17 July 2023 **Product data sheet**

1. General description

The 74AUP1G18 is a 1-to-2 demultiplexer with a 3-state outputs. The device buffers the data on input A and passes it to output 1Y or 2Y, depending on whether the state of the select input (S) is LOW or HIGH. The unused output assumes the high impedence OFF-state. 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
- 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)
  - JESD8C (2.7 V to 3.6 V)
- Low static power consumption; I_{CC} = 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_{CC}
- I_{OFF} circuitry provides partial Power-down mode operation
- 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

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3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G18GW	-40 °C to +125 °C	TSSOP6	plastic thin shrink small outline package; 6 leads; body width 1.25 mm	SOT363-2
74AUP1G18GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP1G18GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AUP1G18GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202

4. Marking

Table 2. Marking

Type number	Marking code [1]
74AUP1G18GW	pW
74AUP1G18GM	pW
74AUP1G18GN	pW
74AUP1G18GS	pW

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

5. Functional diagram

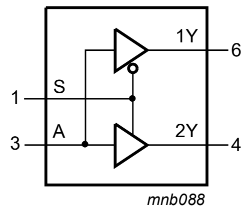
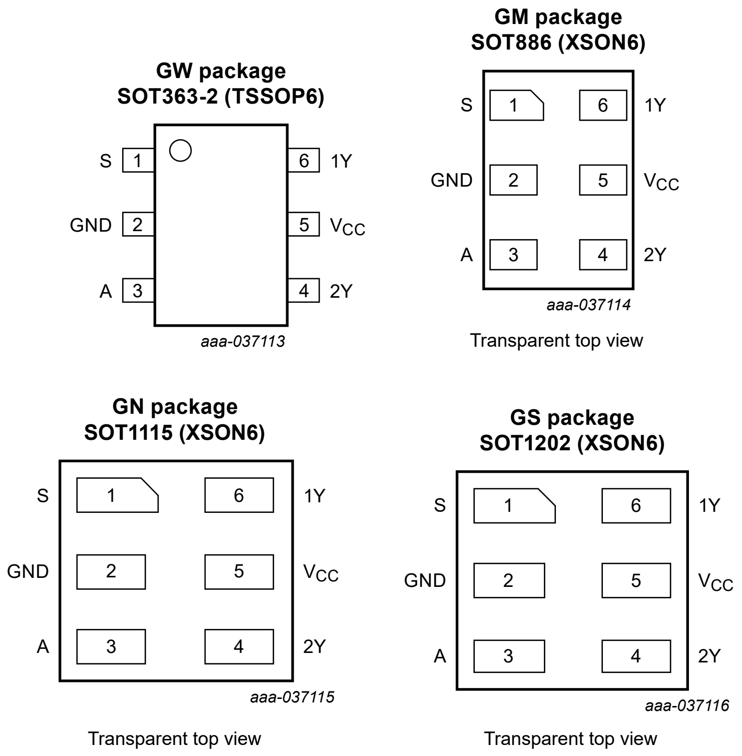


Fig. 1. Logic symbol

6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

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

7. Functional description

Table 4. Function table

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

Input		Output	
S	A	1Y	2Y
L	L	L	Z
L	H	H	Z
H	L	Z	L
H	H	Z	H

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_{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}	-	±20	mA
I_{CC}	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 °C to +125 °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 SOT363-2 (TSSOP6) package: P_{tot} derates linearly with 3.7 mW/K above 83 °C.
For SOT886 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT1115 (XSON6) package: P_{tot} derates linearly with 3.2 mW/K above 71 °C.
For SOT1202 (XSON6) package: P_{tot} 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_{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

10. Static characteristics

Table 7. 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-level input voltage	V_{CC} = 0.8 V	0.70 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.65 × 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-level input voltage	V_{CC} = 0.8 V	-	-	0.30 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.35 × 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-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = -20 μA; 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 × 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
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.31	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.31	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.31	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.44	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.31	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.44	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	μA
I_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.1	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.2	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.2	μA
I_{CC}	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_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	40	μA
C_I	input capacitance	V_{CC} = 0 V to 3.6 V; V_I = GND or V_{CC}	-	0.8	-	pF
C_O	output capacitance	V_O = GND; V_{CC} = 0 V	-	1.7	-	pF

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +85 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V	0.70 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.65 × 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-level input voltage	V_{CC} = 0.8 V	-	-	0.30 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.35 × 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-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = -20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.1	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.7 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	1.03	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.30	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.97	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.85	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.67	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.55	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.37	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.35	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.33	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.45	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.33	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.45	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.5	μA
I_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.5	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.5	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.6	μA
I_{CC}	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_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 V [1]	-	-	50	μA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = -40 °C to +125 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V	0.75 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.70 × 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-level input voltage	V_{CC} = 0.8 V	-	-	0.25 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.30 × 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-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = -20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} - 0.11	-	-	V
		I_O = -1.1 mA; V_{CC} = 1.1 V	0.6 × V_{CC}	-	-	V
		I_O = -1.7 mA; V_{CC} = 1.4 V	0.93	-	-	V
		I_O = -1.9 mA; V_{CC} = 1.65 V	1.17	-	-	V
		I_O = -2.3 mA; V_{CC} = 2.3 V	1.77	-	-	V
		I_O = -3.1 mA; V_{CC} = 2.3 V	1.67	-	-	V
		I_O = -2.7 mA; V_{CC} = 3.0 V	2.40	-	-	V
		I_O = -4.0 mA; V_{CC} = 3.0 V	2.30	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.11	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.33 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.41	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.39	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.36	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.50	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.36	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.50	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.75	μA
I_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V	-	-	±0.75	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V	-	-	±0.75	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V	-	-	±0.75	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V	-	-	1.4	μA
ΔI_{CC}	additional supply current	V_I = V_{CC} - 0.6 V; I_O = 0 A; V_{CC} = 3.3 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. 4.

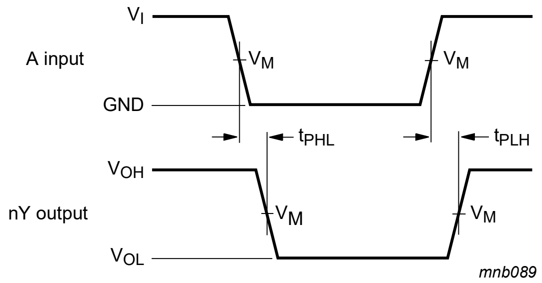
Symbol	Parameter	Conditions	25 °C			T_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
C_L = 5 pF										
t_{pd}	propagation delay	A to nY; see Fig. 2 [2]								
		V_{CC} = 0.8 V	-	20.4	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.7	5.6	10.6	2.4	10.7	2.4	10.7	ns
		V_{CC} = 1.4 V to 1.6 V	2.4	3.9	6.1	2.2	6.5	2.2	6.7	ns
		V_{CC} = 1.65 V to 1.95 V	1.8	3.1	4.7	1.6	5.3	1.6	5.6	ns
		V_{CC} = 2.3 V to 2.7 V	1.6	2.4	3.6	1.4	4.0	1.4	4.2	ns
		V_{CC} = 3.0 V to 3.6 V	1.4	2.2	3.1	1.2	3.4	1.2	3.5	ns
t_{en}	enable time	S to nY; see Fig. 3 [3]		-						
		V_{CC} = 0.8 V	-	46.1	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.1	5.6	9.7	2.9	10.1	2.9	11.1	ns
		V_{CC} = 1.4 V to 1.6 V	2.5	4.0	6.2	2.2	6.6	2.2	7.3	ns
		V_{CC} = 1.65 V to 1.95 V	2.1	3.3	5.1	1.8	5.5	1.8	6.1	ns
		V_{CC} = 2.3 V to 2.7 V	1.7	2.7	3.9	1.4	4.2	1.4	4.6	ns
		V_{CC} = 3.0 V to 3.6 V	1.5	2.4	3.5	1.2	3.7	1.2	4.1	ns
t_{dis}	disable time	S to nY; see Fig. 3 [4]								
		V_{CC} = 0.8 V	-	12.6	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.0	4.7	7.5	2.9	7.9	2.9	8.7	ns
		V_{CC} = 1.4 V to 1.6 V	2.3	3.5	5.2	2.2	5.5	2.2	6.1	ns
		V_{CC} = 1.65 V to 1.95 V	2.3	3.4	4.8	2.1	5.1	2.1	5.6	ns
		V_{CC} = 2.3 V to 2.7 V	1.7	2.5	3.6	1.5	3.9	1.5	4.3	ns
		V_{CC} = 3.0 V to 3.6 V	2.0	2.9	3.8	1.8	4.1	1.8	4.5	ns
C_L = 10 pF										
t_{pd}	propagation delay	A to nY; see Fig. 2 [2]								
		V_{CC} = 0.8 V	-	23.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	2.9	6.4	12.2	2.9	12.3	2.9	12.3	ns
		V_{CC} = 1.4 V to 1.6 V	2.7	4.5	7.1	2.4	7.6	2.4	7.9	ns
		V_{CC} = 1.65 V to 1.95 V	2.3	3.7	5.5	2.1	6.0	2.1	6.3	ns
		V_{CC} = 2.3 V to 2.7 V	1.9	3.0	4.2	1.8	4.6	1.8	4.9	ns
		V_{CC} = 3.0 V to 3.6 V	1.8	2.7	3.9	1.6	4.1	1.6	4.3	ns
t_{en}	enable time	S to nY; see Fig. 3 [3]								
		V_{CC} = 0.8 V	-	50.1	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.6	6.5	11.1	3.3	11.6	3.3	12.8	ns
		V_{CC} = 1.4 V to 1.6 V	2.9	4.6	7.0	2.6	7.6	2.6	8.4	ns
		V_{CC} = 1.65 V to 1.95 V	2.5	3.9	5.8	2.2	6.3	2.2	6.9	ns
		V_{CC} = 2.3 V to 2.7 V	2.1	3.2	4.6	1.7	4.9	1.7	5.4	ns
		V_{CC} = 3.0 V to 3.6 V	2.0	2.9	4.2	1.6	4.4	1.6	4.8	ns

Symbol	Parameter	Conditions	25 °C			T_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
t_{dis}	disable time	S to nY; see Fig. 3 [4]								
		V_{CC} = 0.8 V	-	14.5	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.1	5.8	8.7	3.9	9.1	3.9	10.0	ns
		V_{CC} = 1.4 V to 1.6 V	3.2	4.4	6.1	3.0	6.5	3.0	7.2	ns
		V_{CC} = 1.65 V to 1.95 V	3.3	4.5	6.0	3.2	6.3	3.2	6.9	ns
		V_{CC} = 2.3 V to 2.7 V	2.4	3.3	4.4	2.2	4.7	2.2	5.2	ns
		V_{CC} = 3.0 V to 3.6 V	3.1	4.1	5.2	3.0	5.5	3.0	6.1	ns
C_L = 15 pF										
t_{pd}	propagation delay	A to nY; see Fig. 2 [2]								
		V_{CC} = 0.8 V	-	27.4	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	3.4	7.2	13.7	3.2	13.9	3.2	13.9	ns
		V_{CC} = 1.4 V to 1.6 V	3.2	5.0	7.9	2.8	8.7	2.8	9.1	ns
		V_{CC} = 1.65 V to 1.95 V	2.5	4.2	6.3	2.4	7.0	2.4	7.4	ns
		V_{CC} = 2.3 V to 2.7 V	2.3	3.4	4.9	2.2	5.3	2.2	5.7	ns
		V_{CC} = 3.0 V to 3.6 V	2.2	3.2	4.4	1.9	4.8	1.9	5.0	ns
t_{en}	enable time	S to nY; see Fig. 3 [3]								
		V_{CC} = 0.8 V	-	53.9	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.1	7.3	12.4	3.6	12.9	3.6	14.2	ns
		V_{CC} = 1.4 V to 1.6 V	3.3	5.2	7.8	2.9	8.4	2.9	9.2	ns
		V_{CC} = 1.65 V to 1.95 V	2.9	4.4	6.4	2.5	7.0	2.5	7.7	ns
		V_{CC} = 2.3 V to 2.7 V	2.5	3.6	5.2	2.1	5.5	2.1	6.1	ns
		V_{CC} = 3.0 V to 3.6 V	2.3	3.4	4.8	1.9	4.9	1.9	5.4	ns
t_{dis}	disable time	S to nY; see Fig. 3 [4]								
		V_{CC} = 0.8 V	-	16.3	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	5.1	6.9	10.0	4.9	10.4	4.9	11.4	ns
		V_{CC} = 1.4 V to 1.6 V	4.0	5.3	7.1	3.8	7.4	3.8	8.1	ns
		V_{CC} = 1.65 V to 1.95 V	4.3	5.6	7.3	4.2	7.6	4.2	8.4	ns
		V_{CC} = 2.3 V to 2.7 V	3.1	4.1	5.3	3.0	5.6	3.0	6.2	ns
		V_{CC} = 3.0 V to 3.6 V	4.2	5.3	6.6	4.1	6.9	4.1	7.6	ns
C_L = 30 pF										
t_{pd}	propagation delay	A to nY; see Fig. 2 [2]								
		V_{CC} = 0.8 V	-	37.8	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	4.1	9.5	18.0	4.1	18.5	4.1	18.9	ns
		V_{CC} = 1.4 V to 1.6 V	3.7	6.6	10.4	3.8	11.5	3.8	12.1	ns
		V_{CC} = 1.65 V to 1.95 V	3.4	5.5	8.3	3.3	9.2	3.3	9.8	ns
		V_{CC} = 2.3 V to 2.7 V	3.2	4.5	6.3	3.0	6.8	3.0	7.3	ns
		V_{CC} = 3.0 V to 3.6 V	3.1	4.2	5.8	2.9	6.6	2.9	7.0	ns

Symbol	Parameter	Conditions	25 °C			T_{amb} = -40 °C to +85 °C		T_{amb} = -40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
t_{en}	enable time	S to nY; see Fig. 3 [3]								
		V_{CC} = 0.8 V	-	66.3	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	5.3	9.6	16.4	4.7	17.0	4.7	18.7	ns
		V_{CC} = 1.4 V to 1.6 V	4.4	6.8	10.0	3.9	10.9	3.9	12.0	ns
		V_{CC} = 1.65 V to 1.95 V	4.0	5.7	8.2	3.4	8.9	3.4	9.8	ns
		V_{CC} = 2.3 V to 2.7 V	3.4	4.8	6.6	2.9	7.0	2.9	7.7	ns
		V_{CC} = 3.0 V to 3.6 V	3.2	4.5	6.1	2.8	6.5	2.8	7.2	ns
t_{dis}	disable time	S to nY; see Fig. 3 [4]								
		V_{CC} = 0.8 V	-	21.8	-	-	-	-	-	ns
		V_{CC} = 1.1 V to 1.3 V	8.2	10.4	14.3	8.0	14.7	8.0	16.2	ns
		V_{CC} = 1.4 V to 1.6 V	6.5	8.0	10.0	6.3	10.4	6.3	11.4	ns
		V_{CC} = 1.65 V to 1.95 V	7.4	9.0	11.0	7.3	11.3	7.3	12.4	ns
		V_{CC} = 2.3 V to 2.7 V	5.3	6.5	7.9	5.2	8.2	5.2	9.0	ns
		V_{CC} = 3.0 V to 3.6 V	7.6	9.0	10.7	7.4	11.0	7.4	12.1	ns
C_L = 5 pF, 10 pF, 15 pF and 30 pF										
C_{PD}	power dissipation capacitance	f_i = 1 MHz; V_I = GND to V_{CC} [5]								
		V_{CC} = 0.8 V	-	2.8	-	-	-	-	-	pF
		V_{CC} = 1.1 V to 1.3 V	-	2.9	-	-	-	-	-	pF
		V_{CC} = 1.4 V to 1.6 V	-	3.0	-	-	-	-	-	pF
		V_{CC} = 1.65 V to 1.95 V	-	3.2	-	-	-	-	-	pF
		V_{CC} = 2.3 V to 2.7 V	-	3.7	-	-	-	-	-	pF
		V_{CC} = 3.0 V to 3.6 V	-	4.2	-	-	-	-	-	pF

[1] All typical values are measured at nominal V_{CC}.
[2] t_{pd} is the same as t_{PLH} and t_{PHL}.
[3] t_{en} is the same as t_{PZH} and t_{PZL}.
[4] t_{dis} is the same as t_{PHZ} and t_{PLZ}.
[5] 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.

11.1. Waveforms and test circuit



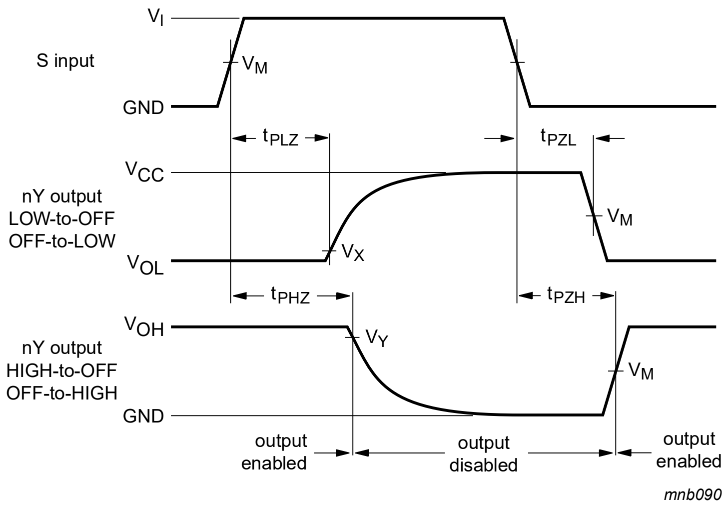
Measurement points are given in Table 9.

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 2. The data input (A) to output (nY) propagation delays

Table 9. Measurement points

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



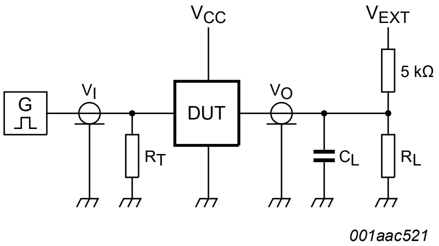
Measurement points are given in Table 10.

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 3. Enable and disable times

Table 10. Measurement points

Supply voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
0.8 V to 1.6 V	0.5 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.1 V	V_{OH} - 0.1 V
1.65 V to 2.7 V	0.5 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.15 V	V_{OH} - 0.15 V
3.0 V to 3.6 V	0.5 × V_{CC}	0.5 × V_{CC}	V_{OL} + 0.3 V	V_{OH} - 0.3 V



Test data is given in Table 11.

Definitions for test circuit:

R_L = Load resistance;

C_L = 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_{EXT} = External voltage for measuring switching times.

Fig. 4. Test circuit for measuring switching times

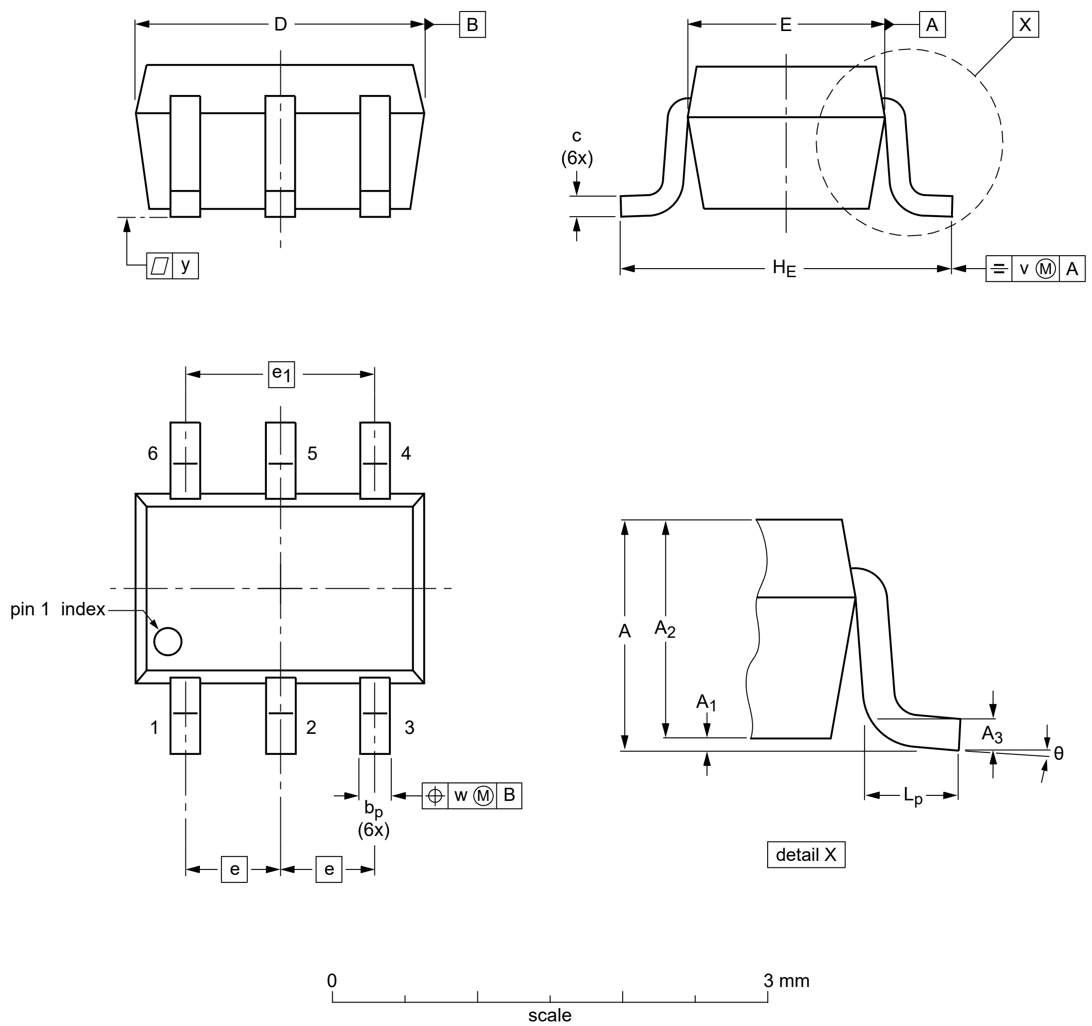
Table 11. Test data

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 × V_{CC}

[1] For measuring enable and disable times R_L = 5 kΩ.
For measuring propagation delays, setup and hold times and pulse width R_L = 1 MΩ.

12. Package outline

TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm **SOT363-2**



Dimensions (mm are the original dimensions)

Unit		A	A_1	A_2	A_3	b_p	c	D(1)	E(1)	e	e_1	H_E	L_p	v	w	y	θ
mm	max	1.1	0.1	1.0	0.15	0.30	0.25	2.2	1.35	0.65	1.3	2.4	0.46	0.3	0.1	0.1	8°
	min	0.8	0	0.8		0.15	0.08	1.8	1.15			1.8	0.26				0°

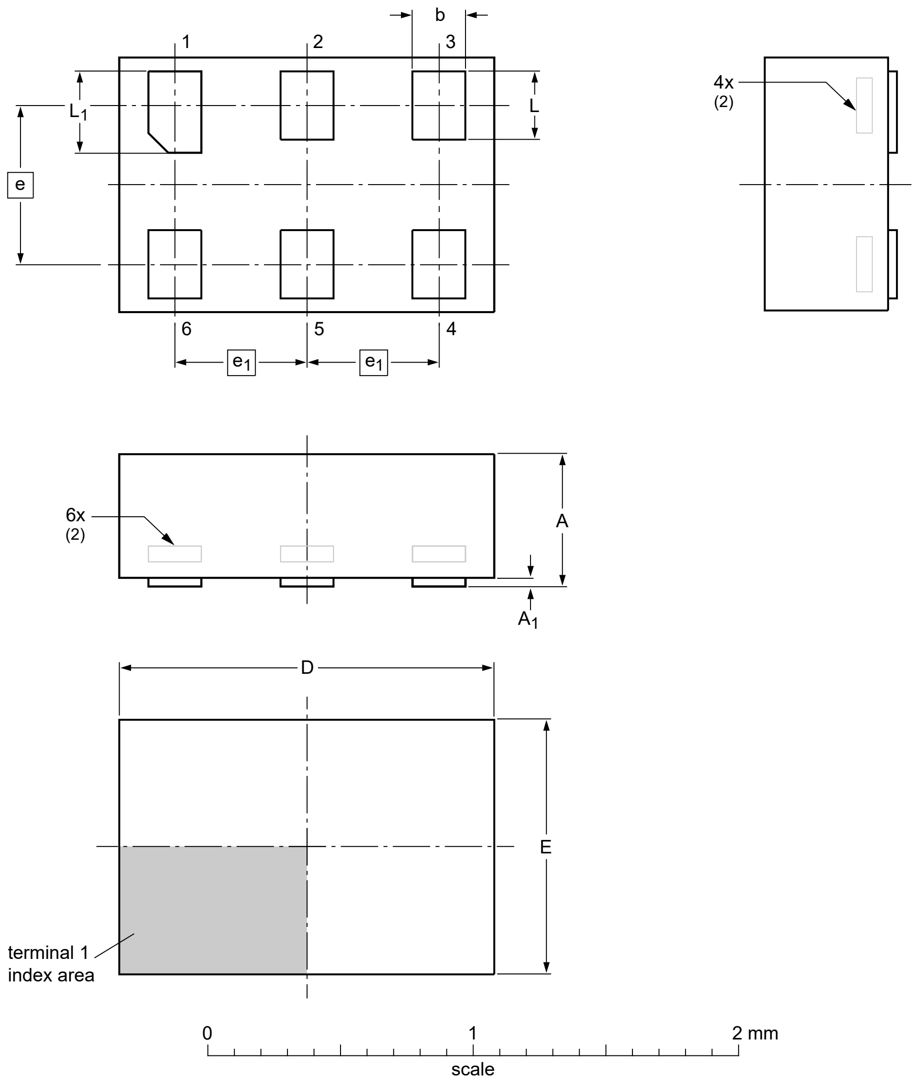
Note
1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

sot363-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT363-2		MO-203	SC-88A			~~21-12-15~~ 21-12-16

Fig. 5. Package outline SOT363-2 (TSSOP6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm SOT886



Dimensions (mm are the original dimensions)

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.5	0.04	0.25	1.50	1.05			0.35	0.40
	nom			0.20	1.45	1.00	0.6	0.5	0.30	0.35
	min			0.17	1.40	0.95			0.27	0.32

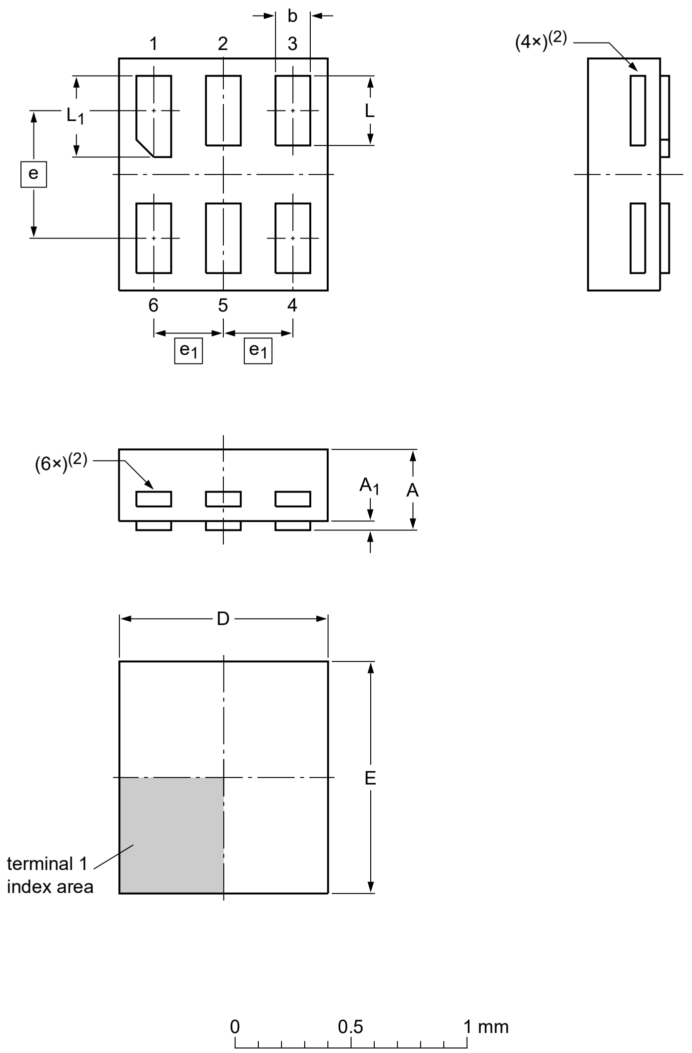
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT886		MO-252				~~04-07-22~~ 12-01-05

Fig. 6. Package outline SOT886 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 0.9 x 1.0 x 0.35 mm **SOT1115**



Dimensions

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	0.95	1.05			0.35	0.40
	nom			0.15	0.90	1.00	0.55	0.3	0.30	0.35
	min			0.12	0.85	0.95			0.27	0.32

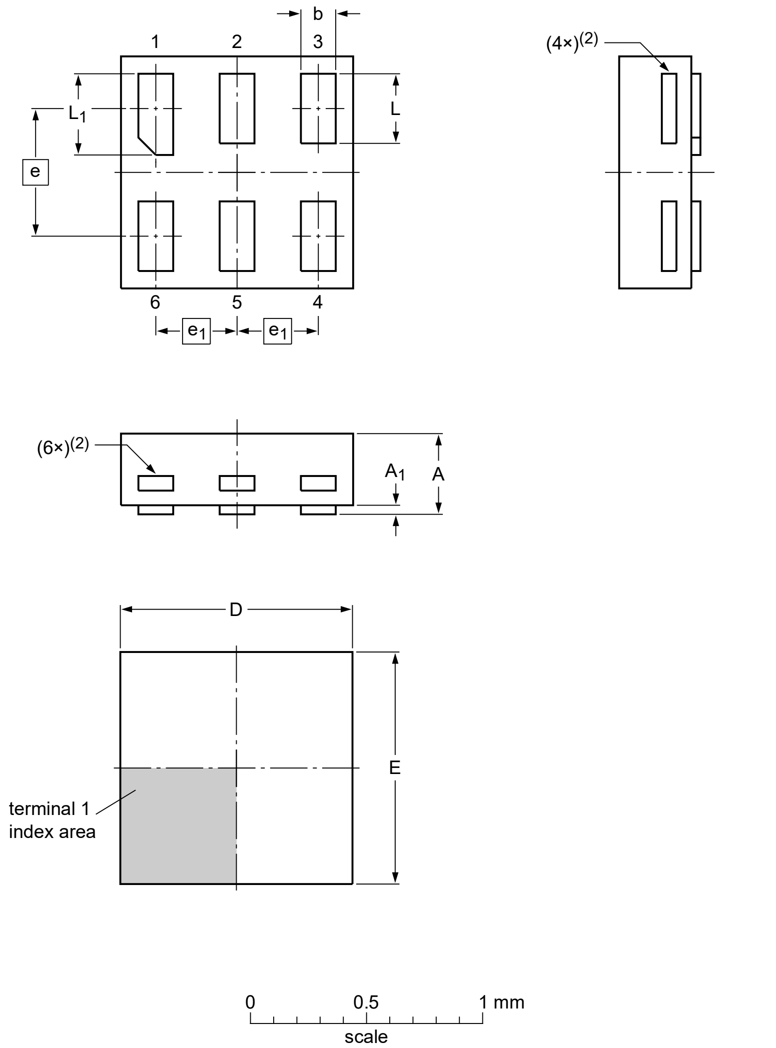
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1115_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1115						~~10-04-02~~ 10-04-07

Fig. 7. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 1.0 x 1.0 x 0.35 mm **SOT1202**



Dimensions

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
	max	0.35	0.04	0.20	1.05	1.05			0.35	0.40
mm	nom			0.15	1.00	1.00	0.55	0.35	0.30	0.35
	min			0.12	0.95	0.95			0.27	0.32

Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1202_po

Outline version	References: IEC	References: JEDEC	References: JEITA		European projection	Issue date
SOT1202						~~10-04-02~~ 10-04-06

Fig. 8. Package outline SOT1202 (XSON6)

13. Abbreviations

Table 12. Abbreviations

Acronym	Description
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model

14. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G18 v.8	20230717	Product data sheet	-	74AUP1G18 v.7
Modifications:	• Section 2: ESD specification updated according to the latest JEDEC standard.			
74AUP1G18 v.7	20220118	Product data sheet	-	74AUP1G18 v.6
Modifications:	• Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6).			
74AUP1G18 v.6	20201028	Product data sheet	-	74AUP1G18 v.5
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Type number 74AUP1G18GF (SOT891 / XSON6) removed. • Table 5: Derating values for P_{tot} total power dissipation updated.			
74AUP1G18 v.5	20120703	Product data sheet	-	74AUP1G18 v.4
Modifications:	• Package outline drawing of SOT886 (Fig. 6) modified.			
74AUP1G18 v.4	20111124	Product data sheet	-	74AUP1G18 v.3
Modifications:	• Legal pages updated.			
74AUP1G18 v.3	20100927	Product data sheet	-	74AUP1G18 v.2
74AUP1G18 v.2	20080403	Product data sheet	-	74AUP1G18 v.1
74AUP1G18 v.1	20061013	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.

[1] 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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