



74AVC1T8832

Single dual-supply translating 2-input OR with strobe

Rev. 2 — 25 June 2024

Product data sheet

1. General description

The 74AVC1T8832 is a single dual-supply translating 2-input OR with strobe inputs. It features two data input pins (A, B), two strobe input pins (STRA, STRB), one data output pin (Y) and dual-supply pins ($V_{CC(A)}$ and $V_{CC(B)}$). Both $V_{CC(A)}$ and $V_{CC(B)}$ can be supplied at any voltage between 0.8 V and 3.6 V making the device suitable for translating between any of the low voltage nodes (0.8 V, 1.2 V, 1.5 V, 1.8 V, 2.5 V and 3.3 V). Pins A, B, STRA and STRB are referenced to $V_{CC(A)}$ and pin Y is referenced to $V_{CC(B)}$.

The logic equation provided at the Y output is:

$$Y = \overline{\text{STRA}} \cdot A + \overline{\text{STRB}} \cdot B$$

The device is fully specified for partial power-down applications using I_{OFF} . The I_{OFF} circuitry disables the output, preventing any damaging backflow current through the device when it is powered down. In Suspend mode when either $V_{CC(A)}$ or $V_{CC(B)}$ are at GND level, the Y output is in the high-impedance OFF-state.

2. Features and benefits

- Wide supply voltage range:
 - $V_{CC(A)}$: 0.8 V to 3.6 V
 - $V_{CC(B)}$: 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)
- Maximum data rates:
 - 500 Mbit/s (1.8 V to 3.3 V translation)
 - 320 Mbit/s (<1.8 V to 3.3 V translation)
 - 320 Mbit/s (translate to 2.5 V or 1.8 V)
 - 280 Mbit/s (translate to 1.5 V)
 - 240 Mbit/s (translate to 1.2 V)
- Suspend mode
- 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
- ESD protection:
 - HBM: ANSI/ESDA/JEDEC JS-001 class 3B exceeds 8000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AVC1T8832GS	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	SOT1203

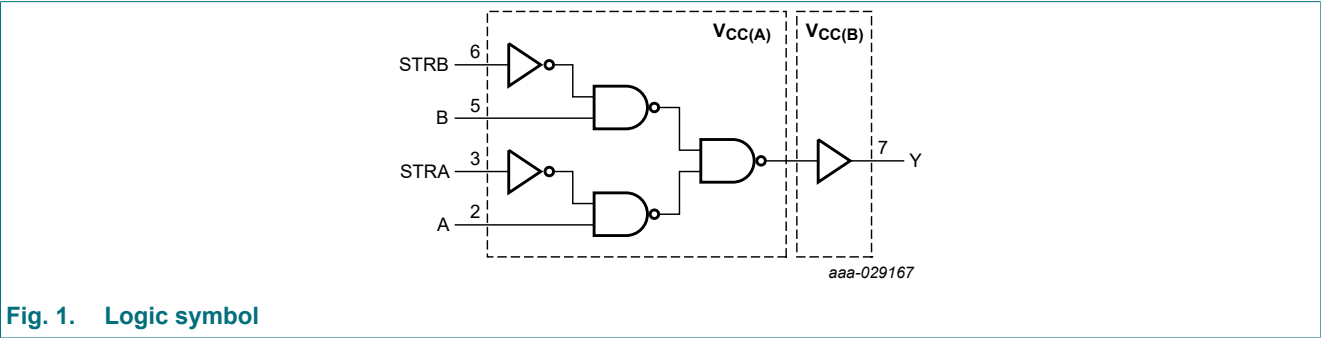
4. Marking

Table 2. Marking

Type number	Marking code[1]
74AVC1T8832GS	Bf

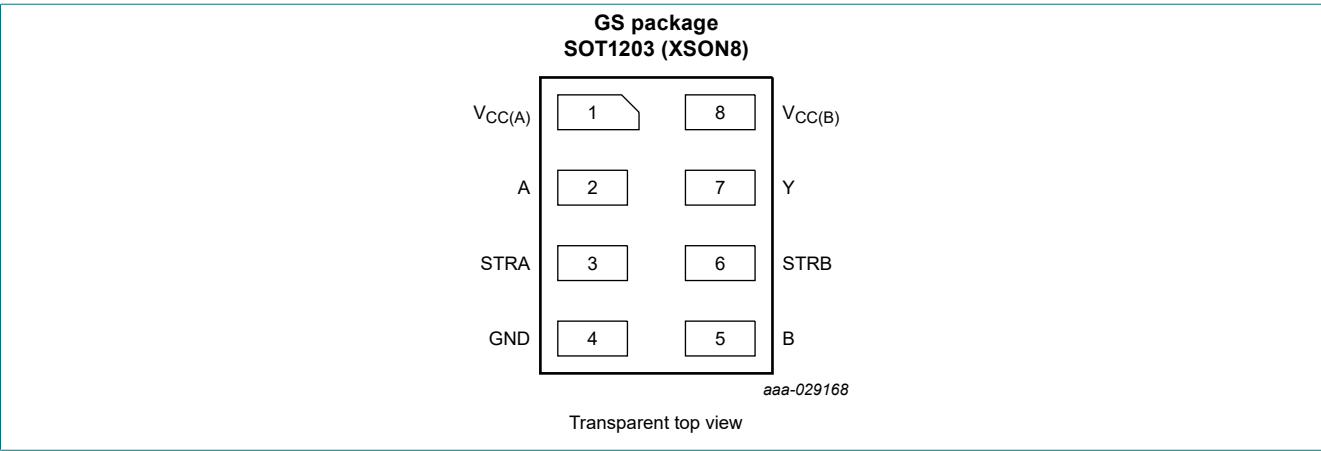
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
V _{CC(A)}	1	supply voltage A (referenced to pins A, B, STRA and STRB)
A	2	data input
STRA	3	strobe A input
GND	4	ground (0 V)
B	5	data input
STRB	6	strobe B input
Y	7	data output
V _{CC(B)}	8	supply voltage B (referenced to pin Y)

7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

Supply voltage	Inputs[1]				Output[2]
V _{CC(A)} , V _{CC(B)}	STRB	B	STRA	A	Y
0.8 V to 3.6 V	L	L	L	L	L
0.8 V to 3.6 V	L	L	L	H	H
0.8 V to 3.6 V	L	L	H	L	L
0.8 V to 3.6 V	L	L	H	H	L
0.8 V to 3.6 V	L	H	L	L	H
0.8 V to 3.6 V	L	H	L	H	H
0.8 V to 3.6 V	L	H	H	L	H
0.8 V to 3.6 V	L	H	H	H	H
0.8 V to 3.6 V	H	L	L	L	L
0.8 V to 3.6 V	H	L	L	H	H
0.8 V to 3.6 V	H	L	H	L	L
0.8 V to 3.6 V	H	L	H	H	L
0.8 V to 3.6 V	H	H	L	L	L
0.8 V to 3.6 V	H	H	L	H	H
0.8 V to 3.6 V	H	H	H	L	L
0.8 V to 3.6 V	H	H	H	H	L
GND [3]	X	X	X	X	Z

[1] The A, B, STRA and STRB inputs are referenced to V_{CC(A)}.
[2] The Y output is referenced to V_{CC(B)}.
[3] If V_{CC(A)} is at GND level, the device goes into Suspend mode.

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
$V_{CC(A)}$	supply voltage A		-0.5	+4.6	V
$V_{CC(B)}$	supply voltage B		-0.5	+4.6	V
I_{IK}	input clamping current	$V_I < 0\text{ V}$	-50	-	mA
V_I	input voltage	[1]	-0.5	+4.6	V
I_{OK}	output clamping current	$V_O < 0\text{ V}$	-50	-	mA
V_O	output voltage	Active mode [1] [2]	-0.5	$V_{CC(B)} + 0.5$	V
		Suspend mode [1]	-0.5	+4.6	V
I_O	output current	$V_O = 0\text{ V to }V_{CC(B)}$	-	±50	mA
I_{CC}	supply current	$I_{CC(A)}$ or $I_{CC(B)}$	-	100	mA
I_{GND}	ground current		-100	-	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	$T_{amb} = -40\text{ °C to }+125\text{ °C}$ [3]	-	250	mW

- [1] The minimum input voltage rating and output voltage ratings may be exceeded if the input and output current ratings are observed.
[2] $V_{CC(B)} + 0.5\text{ V}$ should not exceed 4.6 V.
[3] For SOT1203 (XSON8) package: P_{tot} derates linearly with 3.6 mW/K above 81 °C.

9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC(A)}$	supply voltage A		0.8	3.6	V
$V_{CC(B)}$	supply voltage B		0.8	3.6	V
V_I	input voltage		0	3.6	V
V_O	output voltage	Active mode	0	$V_{CC(B)}$	V
		Suspend mode	0	3.6	V
T_{amb}	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC(A)} = 0.8\text{ V to }3.6\text{ V}$	-	5	ns/V

10. Static characteristics

Table 7. Typical static characteristics at T_{amb} = 25 °C

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{OH}	HIGH-level output voltage	V _I = V _{IH} or V _{IL}				
		I _O = -1.5 mA; V _{CC(A)} = V _{CC(B)} = 0.8 V	-	0.69	-	V
V _{OL}	LOW-level output voltage	V _I = V _{IH} or V _{IL}				
		I _O = 1.5 mA; V _{CC(A)} = V _{CC(B)} = 0.8 V	-	0.07	-	V
I _I	input leakage current	inputs; V _I = 0 V or 3.6 V; V _{CC(A)} = 0 V to 3.6 V	-	±0.025	±0.25	µA
I _{OZ}	OFF-state output current	Y output; V _O = 0 V or V _{CC(B)} ; V _{CC(A)} = 0 V; V _{CC(B)} = 0.8 V to 3.6 V	-	±0.5	±2.5	µA
I _{OFF}	power-off leakage current	output; V _I or V _O = 0 V to 3.6 V; V _{CC(B)} = 0 V; V _{CC(A)} = 0.8 V to 3.6 V	-	±0.1	±1	µA
C _I	input capacitance	V _I = 0 V or 3.3 V; V _{CC(A)} = V _{CC(B)} = 3.3 V	-	1.0	-	pF
C _O	output capacitance	Y output; Suspend mode; V _O = V _{CC(B)} or GND; V _{CC(A)} = V _{CC(B)} = 3.3 V	-	4.0	-	pF

Table 8. Static characteristics

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

Symbol	Parameter	Conditions	-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Max	Min	Max	
V _{IH}	HIGH-level input voltage	inputs					
		V _{CC(A)} = 0.8 V	0.70V _{CC(A)}	-	0.70V _{CC(A)}	-	V
		V _{CC(A)} = 1.1 V to 1.95 V	0.65V _{CC(A)}	-	0.65V _{CC(A)}	-	V
		V _{CC(A)} = 2.3 V to 2.7 V	1.6	-	1.6	-	V
		V _{CC(A)} = 3.0 V to 3.6 V	2	-	2	-	V
V _{IL}	LOW-level input voltage	inputs					
		V _{CC(A)} = 0.8 V	-	0.30V _{CC(A)}	-	0.30V _{CC(A)}	V
		V _{CC(A)} = 1.1 V to 1.95 V	-	0.35V _{CC(A)}	-	0.35V _{CC(A)}	V
		V _{CC(A)} = 2.3 V to 2.7 V	-	0.7	-	0.7	V
		V _{CC(A)} = 3.0 V to 3.6 V	-	0.9	-	0.9	V
V _{OH}	HIGH-level output voltage	V _I = V _{IH} or V _{IL}					
		I _O = -100 µA; V _{CC(B)} = 0.8 V to 3.6 V	V _{CC(B)} - 0.1	-	V _{CC(B)} - 0.1	-	V
		I _O = -3 mA; V _{CC(B)} = 1.1 V	0.85	-	0.85	-	V
		I _O = -6 mA; V _{CC(B)} = 1.4 V	1.05	-	1.05	-	V
		I _O = -8 mA; V _{CC(B)} = 1.65 V	1.2	-	1.2	-	V
		I _O = -9 mA; V _{CC(B)} = 2.3 V	1.75	-	1.75	-	V
		I _O = -12 mA; V _{CC(B)} = 3.0 V	2.3	-	2.3	-	V

Single dual-supply translating 2-input OR with strobe

Symbol	Parameter	Conditions	-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Max	Min	Max	
V _{OL}	LOW-level output voltage	V _I = V _{IH} or V _{IL}					
		I _O = 100 µA; V _{CC(B)} = 0.8 V to 3.6 V	-	0.1	-	0.1	V
		I _O = 3 mA; V _{CC(B)} = 1.1 V	-	0.25	-	0.25	V
		I _O = 6 mA; V _{CC(B)} = 1.4 V	-	0.35	-	0.35	V
		I _O = 8 mA; V _{CC(B)} = 1.65 V	-	0.45	-	0.45	V
		I _O = 9 mA; V _{CC(B)} = 2.3 V	-	0.55	-	0.55	V
		I _O = 12 mA; V _{CC(B)} = 3.0 V	-	0.7	-	0.7	V
I _I	input leakage current	inputs; V _I = 0 V or 3.6 V; V _{CC(A)} = 0 V to 3.6 V	-	±1	-	±1.5	µA
I _{OZ}	OFF-state output current	output; V _O = 0 V or V _{CC(B)} ; V _{CC(A)} = 0 V; V _{CC(B)} = 3.6 V	-	±5	-	±7.5	µA
I _{OFF}	power-off leakage current	output; V _I or V _O = 0 V to 3.6 V; V _{CC(B)} = 0 V; V _{CC(A)} = 0.8 V to 3.6 V	-	±5	-	±35	µA
I _{CC}	supply current	V _{CC(A)} ; V _I = 0 V or V _{CC(A)} ; I _O = 0 A					
		V _{CC(A)} = 0.8 V to 3.6 V; V _{CC(B)} = 0.8 V to 3.6 V	-	8	-	11.5	µA
		V _{CC(A)} = 3.6 V; V _{CC(B)} = 0 V	-	8	-	11.5	µA
		V _{CC(A)} = 0 V; V _{CC(B)} = 3.6 V	-2	-	-8	-	µA
		V _{CC(B)} ; V _I = 0 V or V _{CC(A)} ; I _O = 0 A					
		V _{CC(A)} = 0.8 V to 3.6 V; V _{CC(B)} = 0.8 V to 3.6 V	-	8	-	11.5	µA
		V _{CC(A)} = 3.6 V; V _{CC(B)} = 0 V	-2	-	-8	-	µA
		V _{CC(A)} = 0 V; V _{CC(B)} = 3.6 V	-	8	-	11.5	µA

11. Dynamic characteristics

Table 9. Typical dynamic characteristics at T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 3; for waveform see Fig. 2.

Symbol [1]	Parameter	Conditions	V _{CC(B)}			Unit
			1.8 V	2.5 V	3.3 V	
t _{pd}	propagation delay	A, B, STRA and STRB to Y				
		V _{CC(A)} = 1.8 V	3.2	2.8	2.8	ns
		V _{CC(A)} = 2.5 V	2.6	2.2	2.1	ns
		V _{CC(A)} = 3.3 V	2.4	2.0	1.9	ns

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

Table 10. Typical power dissipation capacitance at V_{CC(A)} = V_{CC(B)} and T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V).

Symbol [1] [2]	Parameter	Conditions	V _{CC(A)} and V _{CC(B)}						Unit
			0.8 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	
C _{PD}	power dissipation capacitance	inputs	0.7	0.75	0.80	0.90	1.2	1.5	pF
		output	10	11	11	11	14	18	pF

[1] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

Σ(C_L × V_{CC}² × f_o) = sum of the outputs.

[2] f_i = 10 MHz; V_i = GND to V_{CC}; t_r = t_f = 1 ns; C_L = 0 pF; R_L = ∞ Ω.

Table 11. Dynamic characteristics for temperature range -40 °C to +85 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 3; for waveform see Fig. 2.

Symbol [1]	Parameter	Conditions	V _{CC(B)}										Unit
			1.2 V ± 0.1 V		1.5 V ± 0.1 V		1.8 V ± 0.15 V		2.5 V ± 0.2 V		3.3 V ± 0.3 V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	propagation delay	A, B, STRA and STRB to Y											
		V _{CC(A)} = 1.1 V to 1.3 V	2.2	15.6	2.0	12.8	1.9	12.0	1.9	11.6	1.8	11.9	ns
		V _{CC(A)} = 1.4 V to 1.6 V	1.7	12.3	1.6	9.2	1.5	8.2	1.4	7.4	1.4	7.3	ns
		V _{CC(A)} = 1.65 V to 1.95 V	1.6	11.1	1.4	8.0	1.4	7.0	1.3	6.1	1.3	5.8	ns
		V _{CC(A)} = 2.3 V to 2.7 V	1.4	9.8	1.2	6.6	1.1	5.5	1.1	4.5	1.0	4.2	ns
		V _{CC(A)} = 3.0 V to 3.6 V	1.3	9.3	1.2	6.2	1.0	5.1	0.9	4.0	0.9	3.7	ns

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

Table 12. Dynamic characteristics for temperature range -40 °C to +125 °C
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 3; for waveform see Fig. 2.

Symbol [1]	Parameter	Conditions	V _{CC(B)}										Unit
			1.2 V ± 0.1 V		1.5 V ± 0.1 V		1.8 V ± 0.15 V		2.5 V ± 0.2 V		3.3 V ± 0.3 V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	propagation delay	A, B, STRA and STRB to Y											
		V _{CC(A)} = 1.1 V to 1.3 V	2.2	16.0	2.0	13.2	1.9	12.4	1.9	12.0	1.8	12.4	ns
		V _{CC(A)} = 1.4 V to 1.6 V	1.7	12.8	1.6	9.8	1.5	8.8	1.4	7.9	1.4	7.8	ns
		V _{CC(A)} = 1.65 V to 1.95 V	1.6	11.6	1.4	8.5	1.4	7.4	1.3	6.4	1.3	6.1	ns
		V _{CC(A)} = 2.3 V to 2.7 V	1.4	10.2	1.2	7.0	1.1	6.0	1.1	4.8	1.0	4.5	ns
		V _{CC(A)} = 3.0 V to 3.6 V	1.3	9.6	1.2	6.6	1.0	5.4	0.9	4.3	0.9	3.9	ns

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

12. Waveforms and test circuit

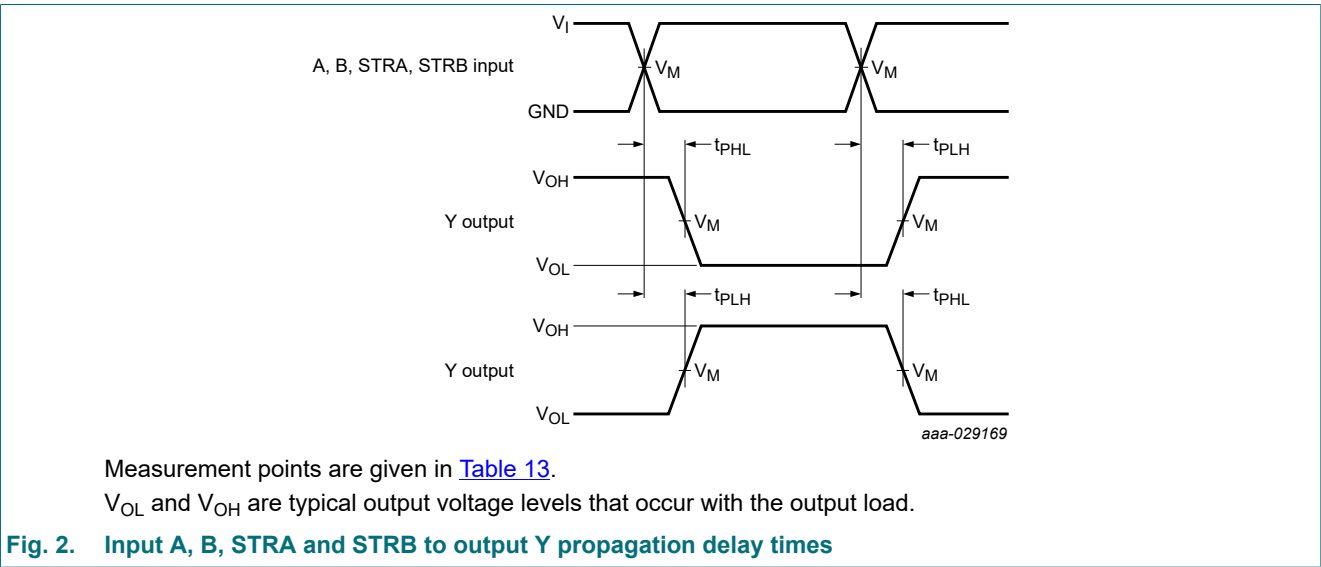
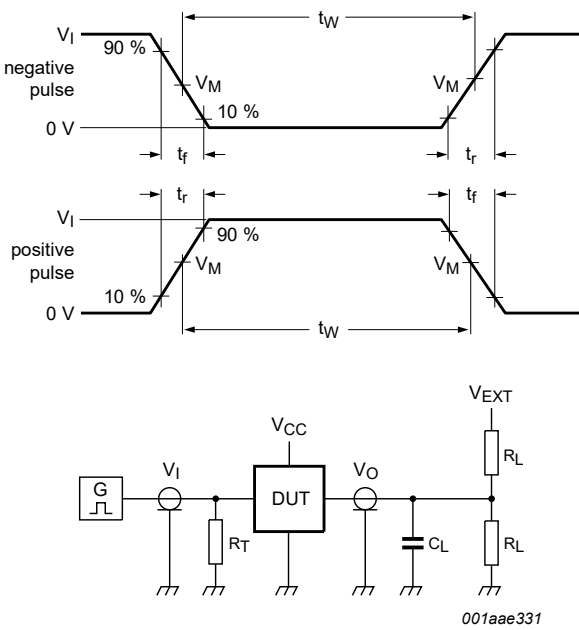


Table 13. Measurement points

Supply voltage	Inputs	Output
V _{CC(A)} , V _{CC(B)}	V _M	V _M
0.8 V to 1.6 V	0.5 × V _{CC(A)}	0.5 × V _{CC(B)}
1.65 V to 2.7 V	0.5 × V _{CC(A)}	0.5 × V _{CC(B)}
3.0 V to 3.6 V	0.5 × V _{CC(A)}	0.5 × V _{CC(B)}



Test data is given in [Table 14](#).
Definitions test circuit:
 R_L = Load resistance;
 C_L = Load capacitance including jig and probe capacitance;
 R_T = Termination resistance;
 V_{EXT} = External voltage for measuring switching times.

Fig. 3. Test circuit for measuring switching times

Table 14. Test data

Supply voltage	Input		Load		V_{EXT}
$V_{CC(A)}, V_{CC(B)}$	V_I	$\Delta t/\Delta V$ [1]	C_L	R_L	t_{PLH}, t_{PHL}
0.8 V to 1.6 V	$V_{CC(A)}$	$\leq 1.0 \text{ ns/V}$	15 pF	2 k Ω	open
1.65 V to 2.7 V	$V_{CC(A)}$	$\leq 1.0 \text{ ns/V}$	15 pF	2 k Ω	open
3.0 V to 3.6 V	$V_{CC(A)}$	$\leq 1.0 \text{ ns/V}$	15 pF	2 k Ω	open

[1] $dV/dt \geq 1.0 \text{ V/ns}$

13. Package outline

XSON8: extremely thin small outline package; no leads;
8 terminals; body 1.35 x 1.0 x 0.35 mm

SOT1203

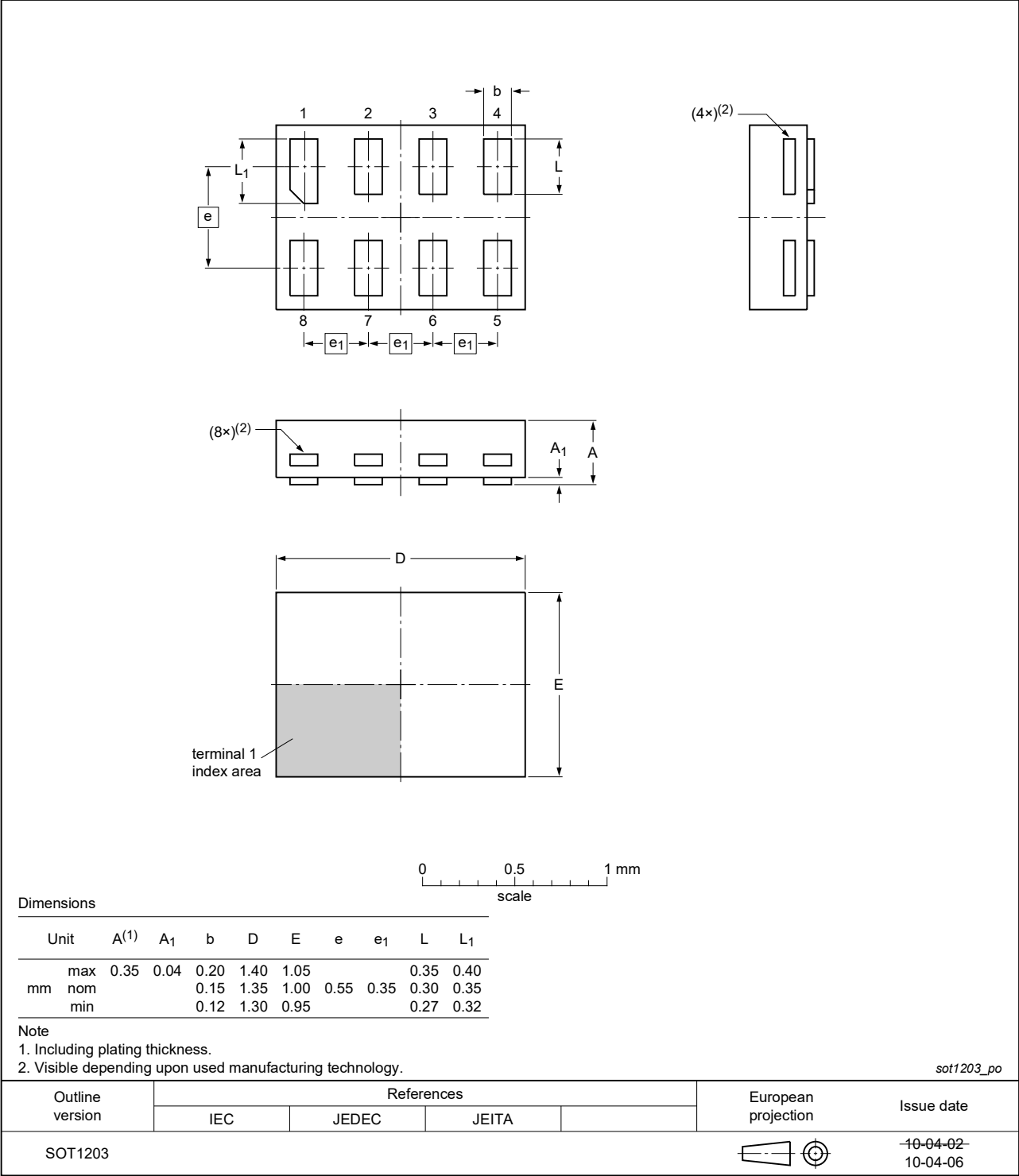


Fig. 4. Package outline SOT1203 (XSON8)

14. Abbreviations

Table 15. Abbreviations

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

15. Revision history

Table 16. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AVC1T8832 v.2	20240625	Product data sheet	-	74AVC1T8832 v.1
Modifications:	• Section 2 : ESD specification updated according to the latest JEDEC standard.			
74AVC1T8832 v.1	20181010	Product data sheet	-	-

16. 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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