74AXP1T125

Dual supply buffer/line driver; 3-state

Rev. 1 — 21 December 2015 Product data sheet

1. General description

The 74AXP1T125 is a dual supply non-inverting buffer/line driver with 3-state output. It features one input (A), an output (Y), an output enable input ($\overline{OE}$) and dual supply pins (V_{CCI} and V_{CCO}). A HIGH level at pin $\overline{OE}$ causes the output to assume a high-impedance OFF-state. The inputs are referenced to V_{CCI} and the output is referenced to V_{CCO}. All inputs can be connected directly to V_{CCI} or GND. V_{CCI} can be supplied at any voltage between 0.7 V and 2.75 V and V_{CCO} can be supplied at any voltage between 1.2 V and 5.5 V. This feature allows voltage level translation.

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 supply range and 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:
  - V_{CCI}: 0.7 V to 2.75 V
  - V_{CCO}: 1.2 V to 5.5 V
- Low input capacitance; C_I = 0.6 pF (typical)
- Low output capacitance; C_O = 1.8 pF (typical)
- Low dynamic power consumption; C_{PD} = 0.4 pF at V_{CCI} = 1.2 V (typical)
- Low dynamic power consumption; C_{PD} = 7.1 pF at V_{CCO} = 3.3 V (typical)
- Low static power consumption; I_{CCI} = 0.5 μA (85 °C maximum)
- Low static power consumption; I_{CCO} = 1.8 μA (85 °C maximum)
- High noise immunity
- Complies with JEDEC standard:
  - JESD8-12A.01 (1.1 V to 1.3 V; A, $\overline{OE}$ inputs)
  - JESD8-11A.01 (1.4 V to 1.6 V)
  - JESD8-7A (1.65 V to 1.95 V)
  - JESD8-5A.01 (2.3 V to 2.7 V)
  - JESD8-C (2.7 V to 3.6 V; Y output)
  - JESD12-6 (4.5 V to 5.5 V; Y output)
- ESD protection:
  - HBM ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 2 kV
  - CDM JESD22-C101E exceeds 1000 V

- Latch-up performance exceeds 100 mA per JESD78D Class II
- Inputs accept voltages up to 2.75 V
- Low noise overshoot and undershoot < 10% of V_{CCO}
- I_{OFF} circuitry provides partial power-down mode operation
- Multiple package options
- Specified from −40 °C to +85 °C

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AXP1T125GW	−40 °C to +85 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74AXP1T125GM	−40 °C to +85 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AXP1T125GN	−40 °C to +85 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AXP1T125GS	−40 °C to +85 °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]
74AXP1T125GW	rN
74AXP1T125GM	rN
74AXP1T125GN	rN
74AXP1T125GS	rN

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

5. Functional diagram

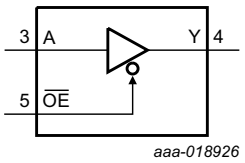


Fig 1. Logic symbol

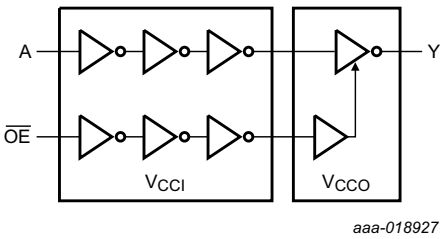


Fig 2. Logic diagram

6. Pinning information

6.1 Pinning

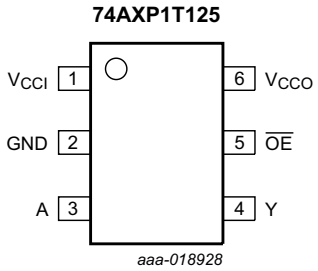
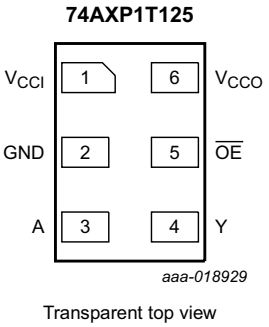


Fig 3. Pin configuration SOT363



Transparent top view

Fig 4. Pin configuration SOT886, SOT1115 and SOT1202 (XSON6)

6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
V_{CCI}	1	input supply voltage
GND	2	ground (0 V)
A	3	data input A
Y	4	data output Y
$\overline{OE}$	5	output enable input
V_{CCO}	6	output supply voltage

7. Functional description

Table 4. Function table[1]

Supply voltage		Input		Output
V_{CCI}	**V_{CCO}**	**$\overline{OE}$**	**A**	**Y**
0.7 V to 2.75 V	1.2 V to 5.5 V	L	L	L
0.7 V to 2.75 V	1.2 V to 5.5 V	L	H	H
0.7 V to 2.75 V	1.2 V to 5.5 V	H	X	Z
GND	1.2 V to 5.5 V	X	X	Z
0.7 V to 2.75 V	GND	X	X	Z
GND	GND	X	X	Z

[1] H = HIGH voltage level;
L = LOW voltage level;
X = Don't care;
Z = high-impedance OFF-state.

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_{CCI}	input supply voltage		−0.5	3.3	V
V_{CCO}	output supply voltage		−0.5	6.0	V
I_{IK}	input clamping current	V_I < 0 V	−50	-	mA
V_I	input voltage	[1]	−0.5	3.3	V
I_{OK}	output clamping current	V_O < 0 V	−50	-	mA
V_O	output voltage	Active mode [1][2]	−0.5	V_{CCO} + 0.5	V
		Power-down or 3-state mode [1]	−0.5	6.0	V
I_O	output current	V_O = 0 V to V_{CCO}	-	±25	mA
I_{CCI}	input supply current		-	50	mA
I_{CCO}	output 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 +85 °C	-	250	mW

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

[2] V_{CCO} + 0.5 V should not exceed 6.0 V.

[3] For SOT363 package: above 82.5 °C the value of P_{tot} derates linearly with 3.7 mW/K.
For SOT886 package: above 75 °C the value of P_{tot} derates linearly with 3.3 mW/K.
For SOT1115 package: above 70 °C the value of P_{tot} derates linearly with 3.2 mW/K.
For SOT1202 package: above 75 °C the value of P_{tot} derates linearly with 3.3 mW/K.

9. Recommended operating conditions

Table 6. Recommended operating conditions

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CCI}	input supply voltage		0.7	2.75	V
V_{CCO}	output supply voltage		1.2	5.5	V
V_I	input voltage		0	2.75	V
V_O	output voltage	Active mode	0	V_{CCO}	V
		Power-down or 3-state mode	0	5.5	V
T_{amb}	ambient temperature		−40	+85	°C
$\Delta t/\Delta V$	input transition rise and fall rate	V_{CCI} = 0.7 V to 2.75 V	0	200	ns/V

10. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	T_{amb} = –40 °C to +85 °C				Unit
			Min	Typ 25 °C	Max 25 °C	Max 85 °C	
V_{IH}	HIGH-level input voltage	V_{CCI} = 0.75 V to 0.85 V	$0.75V_{CCI}$	-	-	-	V
		V_{CCI} = 1.1 V to 1.95 V	$0.65V_{CCI}$	-	-	-	V
		V_{CCI} = 2.3 V to 2.7 V	1.6	-	-	-	V
V_{IL}	LOW-level input voltage	V_{CCI} = 0.75 V to 0.85 V	-	-	$0.25V_{CCI}$	$0.25V_{CCI}$	V
		V_{CCI} = 1.1 V to 1.95 V	-	-	$0.35V_{CCI}$	$0.35V_{CCI}$	V
		V_{CCI} = 2.3 V to 2.7 V	-	-	0.7	0.7	V
V_{OH}	HIGH-level output voltage	I_O = –2 mA; V_{CCO} = 1.2 V [1]	-	1.05	-	-	V
		I_O = –3 mA; V_{CCO} = 1.4 V	1.05	-	-	-	V
		I_O = –4.5 mA; V_{CCO} = 1.65 V	1.2	-	-	-	V
		I_O = –8 mA; V_{CCO} = 2.3 V	1.7	-	-	-	V
		I_O = –10 mA; V_{CCO} = 3.0 V	2.2	-	-	-	V
		I_O = –12 mA; V_{CCO} = 4.5 V	3.7	-	-	-	V
V_{OL}	LOW-level output voltage	I_O = 2 mA; V_{CCO} = 1.2 V [1]	-	0.18	-	-	V
		I_O = 3 mA; V_{CCO} = 1.4 V	-	-	0.35	0.35	V
		I_O = 4.5 mA; V_{CCO} = 1.65 V	-	-	0.45	0.45	V
		I_O = 8 mA; V_{CCO} = 2.3 V	-	-	0.7	0.7	V
		I_O = 10 mA; V_{CCO} = 3.0 V	-	-	0.8	0.8	V
		I_O = 12 mA; V_{CCO} = 4.5 V	-	-	0.8	0.8	V
I_I	input leakage current	V_I = 0 V to 2.75 V; V_{CCI} = 0 V to 2.75 V [1]	-	±0.001	±0.1	±0.5	µA
I_{OZ}	OFF-state output current	V_O = 0 V to 5.5 V; V_{CCO} = 1.2 V to 5.5 V	-	±0.001	±0.1	±0.5	µA
I_{OFF}	power-off leakage current	inputs; V_I = 0 V to 2.75 V; V_{CCI} = 0 V; V_{CCO} = 0 V to 5.5 V [1]	-	±0.01	±0.1	±0.5	µA
		output; V_O = 0 V to 5.5 V; V_{CCO} = 0 V; V_{CCI} = 0 V to 2.75 V; V_I = 0 V to 2.75 V [1]	-	±0.01	±0.1	±0.5	µA
ΔI_{OFF}	additional power-off leakage current	inputs; V_I = 0 V or 2.75 V; V_{CCI} = 0 V to 0.1 V; V_{CCO} = 0 V to 5.5 V [1]	-	±0.02	±0.1	±0.5	µA
		output; V_O = 0 V or 5.5 V; V_{CCO} = 0 V to 0.1 V; V_{CCI} = 0 V to 2.75 V; V_I = 0 V or 2.75 V [1]	-	±0.02	±0.1	±0.5	µA

[1] Typical values are measured at V_{CCI} = V_{CCO} = 1.2 V unless otherwise specified.

Table 8. Static characteristics supply current

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

Symbol	Parameter	Conditions	T_{amb} = –40 °C to +85 °C				Unit
			Typ 25 °C	Max 25 °C	Typ 85 °C	Max 85 °C	
I_{CCI}	input supply current	V_I = 0 V or V_{CCI};					
		V_{CCI} = 0.7 V to 1.3 V [1]	1	100	10	300	nA
		V_{CCI} = 1.3 V to 2.75 V [2]	1	100	20	500	nA
		V_{CCI} = 2.75 V; V_{CCO} = 0 V	1	100	20	500	nA
		V_{CCI} = 0 V; V_{CCO} = 5.5 V	1	100	1	100	nA
I_{CCO}	output supply current	V_I = 0 V or V_{CCI}; I_O = 0 A; see Table 9					
		V_{CCO} = 1.2 V to 3.6 V [1]	0.001	1.0	0.01	1.2	µA
		V_{CCO} = 3.6 V to 5.5 V [3]	0.8	1.5	1.0	1.8	µA
		V_{CCI} = 2.75 V; V_{CCO} = 0 V	0.001	0.1	0.003	0.2	µA
		V_{CCI} = 0 V; V_{CCO} = 3.6 V	0.2	0.6	0.3	0.8	µA
		V_{CCI} = 0 V; V_{CCO} = 5.5 V	0.4	0.8	0.5	1.0	µA
ΔI_{CCI}	additional input supply current	V_I = V_{CCI} – 0.5 V; V_{CCI} = 2.5 V	2	100	14	150	µA

[1] Typical values are measured at V_{CCI} = V_{CCO} = 1.2 V.

[2] Typical values are measured at V_{CCI} = V_{CCO} = 2.5 V.

[3] Typical values are measured at V_{CCI} = 1.2 V and V_{CCO} = 5.0 V.

Table 9. Typical output supply current (I_{CCO})

V_{CCI}	V_{CCO}							Unit
	0 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
0 V	0	1	5	20	100	200	400	nA
0.8 V	1	10	150	200	300	500	800	nA
1.2 V	1	1	5	200	300	500	800	nA
1.5 V	1	1	5	100	300	500	800	nA
1.8 V	1	1	5	100	300	500	800	nA
2.5 V	1	1	5	100	100	500	800	nA

11. Dynamic characteristics

Table 10. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13; for wave form see Figure 5 and Figure 6.

Symbol	Parameter	Conditions	V_{CCO}							Unit
			1.2 V	1.5 V ± 0.1 V			1.8 V ± 0.15 V			
			Typ[1]	Min	Typ[1]	Max	Min	Typ[1]	Max	
T_{amb} = 25 °C										
t_{pd}	propagation delay	A to Y [2]								
		V_{CCI} = 0.75 V to 0.85 V	22	3	16	61	3	15	57	ns
		V_{CCI} = 1.1 V to 1.3 V	16.2	3.1	10.3	19.8	2.8	8.2	15.8	ns
		V_{CCI} = 1.4 V to 1.6 V	15.4	2.8	9.5	18.2	2.5	7.4	13.2	ns
		V_{CCI} = 1.65 V to 1.95 V	15.0	2.7	9.1	17.4	2.4	7.0	11.9	ns
		V_{CCI} = 2.3 V to 2.7 V	14.7	2.5	8.7	16.9	2.2	6.6	11.1	ns
t_{en}	enable time	$\overline{OE}$ to Y [3]								
		V_{CCI} = 0.75 V to 0.85 V	25	3	20	76	3	18	72	ns
		V_{CCI} = 1.1 V to 1.3 V	17.9	3.1	11.3	18.9	2.8	9.0	15.5	ns
		V_{CCI} = 1.4 V to 1.6 V	16.9	2.8	10.3	17.5	2.5	8.1	13.9	ns
		V_{CCI} = 1.65 V to 1.95 V	16.5	2.7	9.9	16.9	2.4	7.6	13.3	ns
		V_{CCI} = 2.3 V to 2.7 V	16.0	2.5	9.4	16.4	2.2	7.1	12.7	ns
t_{dis}	disable time	$\overline{OE}$ to Y [4]								
		V_{CCI} = 0.75 V to 0.85 V	25	3	20	76	3	20	72	ns
		V_{CCI} = 1.1 V to 1.3 V	17.1	3.1	12.0	18.3	2.8	11.3	17.4	ns
		V_{CCI} = 1.4 V to 1.6 V	16.1	2.8	11.1	17.4	2.5	10.3	16.0	ns
		V_{CCI} = 1.65 V to 1.95 V	15.6	2.7	10.6	16.5	2.4	9.9	15.5	ns
		V_{CCI} = 2.3 V to 2.7 V	15.0	2.5	10.0	16.3	2.2	9.4	15.0	ns
T_{amb} = –40 °C to +85 °C										
t_{pd}	propagation delay	A to Y [2]								
		V_{CCI} = 0.75 V to 0.85 V	22	3	16	136	3	15	133	ns
		V_{CCI} = 1.1 V to 1.3 V	16.2	3.1	10.3	19.8	2.8	8.2	15.8	ns
		V_{CCI} = 1.4 V to 1.6 V	15.4	2.8	9.5	18.2	2.5	7.4	13.2	ns
		V_{CCI} = 1.65 V to 1.95 V	15.0	2.7	9.1	17.4	2.4	7.0	11.9	ns
		V_{CCI} = 2.3 V to 2.7 V	14.7	2.5	8.7	16.9	2.2	6.6	11.1	ns
t_{en}	enable time	$\overline{OE}$ to Y [3]								
		V_{CCI} = 0.75 V to 0.85 V	25	3	20	151	3	18	148	ns
		V_{CCI} = 1.1 V to 1.3 V	17.9	3.1	11.3	18.9	2.8	9.0	15.5	ns
		V_{CCI} = 1.4 V to 1.6 V	16.9	2.8	10.3	17.5	2.5	8.1	13.9	ns
		V_{CCI} = 1.65 V to 1.95 V	16.5	2.7	9.9	16.9	2.4	7.6	13.3	ns
		V_{CCI} = 2.3 V to 2.7 V	16.0	2.5	9.4	16.4	2.2	7.1	12.7	ns

Table 10. Dynamic characteristics *…continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13; for wave form see Figure 5 and Figure 6.

Symbol	Parameter	Conditions	V_{CCO}							Unit
			1.2 V	1.5 V ± 0.1 V			1.8 V ± 0.15 V			
			Typ[1]	Min	Typ[1]	Max	Min	Typ[1]	Max	
t_{dis}	disable time	$\overline{OE}$ to Y [4]								
		V_{CCI} = 0.75 V to 0.85 V	25	3	20	151	3	20	148	ns
		V_{CCI} = 1.1 V to 1.3 V	17.1	3.1	12.0	18.3	2.8	11.3	17.4	ns
		V_{CCI} = 1.4 V to 1.6 V	16.1	2.8	11.1	17.4	2.5	10.3	16.0	ns
		V_{CCI} = 1.65 V to 1.95 V	15.6	2.7	10.6	16.5	2.4	9.9	15.5	ns
		V_{CCI} = 2.3 V to 2.7 V	15.0	2.5	10.0	16.3	2.2	9.4	15.0	ns
t_t	transition time	V_{CCI} = 0.75 V to 2.7 V [5]	-	1.0	-	-	1.0	-	-	ns

[1] Typical values are measured at nominal supply voltages and T_{amb} = +25 °C.

[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] t_t is the same as t_{THL} and t_{TLH}.

Table 11. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13; for wave form see Figure 5 and Figure 6.

Symbol	Parameter	Conditions	V_{CCO}									Unit
			2.5 V ± 0.2 V			3.3 V ± 0.3 V			5.0 V ± 0.5 V			
			Min	Typ[1]	Max	Min	Typ[1]	Max	Min	Typ[1]	Max	
T_{amb} = 25 °C												
t_{pd}	propagation delay	A to Y [2]										
		V_{CCI} = 0.75 V to 0.85 V	2	13	57	2	13	65	2	14	77	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	6.5	10.8	2.2	5.9	9.5	2.1	5.6	9.0	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	5.7	9.1	2.0	5.1	8.2	1.9	4.8	7.7	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	5.3	8.7	1.8	4.7	7.7	1.8	4.4	7.3	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	4.9	8.1	1.7	4.3	7.1	1.6	4.0	6.6	ns
t_{en}	enable time	$\overline{OE}$ to Y [3]										
		V_{CCI} = 0.75 V to 0.85 V	2	17	72	2	17	80	2	20	92	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	7.2	12.5	2.2	6.7	11.4	2.1	6.5	11.2	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	6.3	11.0	2.0	5.7	10.2	1.9	5.5	9.8	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	5.8	10.5	1.8	5.2	9.8	1.8	5.0	9.2	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	5.3	9.9	1.7	4.7	9.1	1.6	4.5	8.6	ns
t_{dis}	disable time	$\overline{OE}$ to Y [4]										
		V_{CCI} = 0.75 V to 0.85 V	2	17	72	2	18	80	2	16	92	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	9.2	14.2	2.2	9.9	15.2	2.1	8.3	13.2	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	8.2	13.1	2.0	9.1	14.1	1.9	7.4	12.1	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	7.8	12.6	1.8	8.6	13.7	1.8	7.0	11.7	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	7.2	12.1	1.7	8.1	13.2	1.6	6.5	11.2	ns

Table 11. Dynamic characteristics *…continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13; for wave form see Figure 5 and Figure 6.

Symbol	Parameter	Conditions	V_{CCO}									Unit
			2.5 V ± 0.2 V			3.3 V ± 0.3 V			5.0 V ± 0.5 V			
			Min	Typ[1]	Max	Min	Typ[1]	Max	Min	Typ[1]	Max	
T_{amb} = –40 °C to +85 °C												
t_{pd}	propagation delay	A to Y [2]										
		V_{CCI} = 0.75 V to 0.85 V	2	13	152	2	13	179	2	14	210	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	6.5	10.8	2.2	5.9	9.5	2.1	5.6	9.0	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	5.7	9.1	2.0	5.1	8.2	1.9	4.8	7.7	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	5.3	8.7	1.8	4.7	7.7	1.8	4.4	7.3	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	4.9	8.1	1.7	4.3	7.1	1.6	4.0	6.6	ns
t_{en}	enable time	$\overline{OE}$ to Y [3]										
		V_{CCI} = 0.75 V to 0.85 V	2	17	167	2	17	194	2	20	225	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	7.2	12.5	2.2	6.7	11.4	2.1	6.5	11.2	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	6.3	11.0	2.0	5.7	10.2	1.9	5.5	9.8	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	5.8	10.5	1.8	5.2	9.8	1.8	5.0	9.2	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	5.3	9.9	1.7	4.7	9.1	1.6	4.5	8.6	ns
t_{dis}	disable time	$\overline{OE}$ to Y [4]										
		V_{CCI} = 0.75 V to 0.85 V	2	17	167	2	18	194	2	16	225	ns
		V_{CCI} = 1.1 V to 1.3 V	2.4	9.2	14.2	2.2	9.9	15.2	2.1	8.3	13.2	ns
		V_{CCI} = 1.4 V to 1.6 V	2.1	8.2	13.1	2.0	9.1	14.1	1.9	7.4	12.1	ns
		V_{CCI} = 1.65 V to 1.95 V	2.0	7.8	12.6	1.8	8.6	13.7	1.8	7.0	11.7	ns
		V_{CCI} = 2.3 V to 2.7 V	1.9	7.2	12.1	1.7	8.1	13.2	1.6	6.5	11.2	ns
t_t	transition time	V_{CCO} = 5.5 V [5]	1.0	-	-	1.0	-	-	1.0	-	-	ns

[1] Typical values are measured at nominal supply voltages and t_{amb} = +25 °C.

[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] t_t is the same as t_{THL} and t_{TLH}.

Table 12. Typical dynamic characteristics at T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 13; for wave form see Figure 5 and Figure 6.

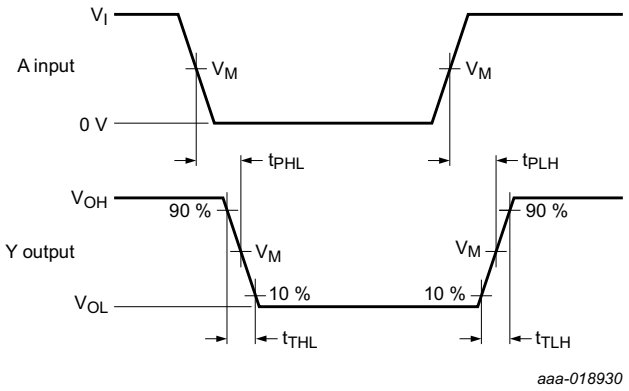
Symbol	Parameter	Conditions	V_{CCO}						Unit
			1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
C_{PD}	power dissipation capacitance	f_i = 1 MHz; R_L = ∞ Ω; V_I = 0 V to V_{CCI} [1]							
		input supply [2]							
		V_{CCI} = 0.8 V	0.4	0.4	0.4	0.4	0.4	0.4	pF
		V_{CCI} = 1.2 V	0.4	0.4	0.4	0.4	0.4	0.4	pF
		V_{CCI} = 1.5 V	0.5	0.5	0.5	0.5	0.5	0.5	pF
		V_{CCI} = 1.8 V	0.5	0.5	0.5	0.5	0.5	0.5	pF
		V_{CCI} = 2.5 V	0.7	0.7	0.7	0.7	0.7	0.7	pF
		output supply [3]							
		V_{CCI} = 0.8 V	6.7	6.8	6.8	6.9	7.5	9.5	pF
		V_{CCI} = 1.2 V	6.8	6.9	7.0	7.0	7.1	7.6	pF
		V_{CCI} = 1.5 V	6.9	6.9	6.9	7.0	7.1	7.6	pF
		V_{CCI} = 1.8 V	6.9	6.9	6.9	7.0	7.2	7.6	pF
		V_{CCI} = 2.5 V	6.9	7.0	7.0	7.0	7.2	7.6	pF
C_I	input capacitance	V_I = 0 V or V_{CCI}; V_{CCI} = 0 V to 2.7 V	0.6	0.6	0.6	0.6	0.6	0.6	pF
C_O	output capacitance	V_O = 0 V; V_{CCO} = 0 V	1.8	1.8	1.8	1.8	1.8	1.8	pF

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

[2] Power dissipated from input supply (V_{CCI})
$P_D = C_{PD} \times V_{CCI}^2 \times f_i \times N$ where:
C_{PD} = power dissipation capacitance of the input supply.
V_{CCI} = input supply voltage in V;
f_i = input frequency in MHz;
N = number of inputs switching;

[3] Power dissipated from output supply (V_{CCO})
$P_D = (C_L + C_{PD}) \times V_{CCO}^2 \times f_o$ where:
C_L = load capacitance in pF;
C_{PD} = power dissipation capacitance of the output supply.
V_{CCO} = output supply voltage in V;
f_o = output frequency in MHz;

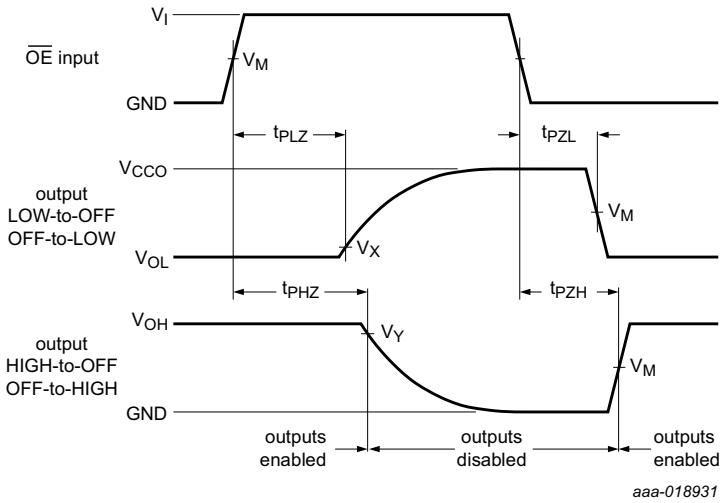
11.1 Waveforms and graphs



Measurement points are given in Table 13.

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

Fig 5. Input A to output Y propagation delay times and output transition times



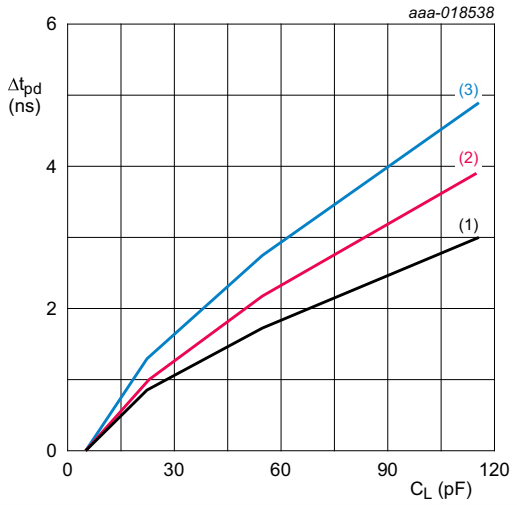
Measurement points are given in Table 13.

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

Fig 6. Enable and disable times

Table 13. Measurement points

Supply voltage		Output			Input	
V_{CCI}	V_{CCO}	V_M	V_X	V_Y	V_M	V_I
0.75 V to 2.7 V	1.2 V to 1.6 V	$0.5V_{CCO}$	V_{OL} + 0.1 V	V_{OH} − 0.1 V	$0.5V_{CCI}$	V_{CCI}
0.75 V to 2.7 V	1.65 V to 2.7 V	$0.5V_{CCO}$	V_{OL} + 0.15 V	V_{OH} − 0.15 V	$0.5V_{CCI}$	V_{CCI}
0.75 V to 2.7 V	3.0 V to 5.5 V	$0.5V_{CCO}$	V_{OL} + 0.3 V	V_{OH} − 0.3 V	$0.5V_{CCI}$	V_{CCI}



T_{amb} = –40 °C to +85 °C unless otherwise specified.

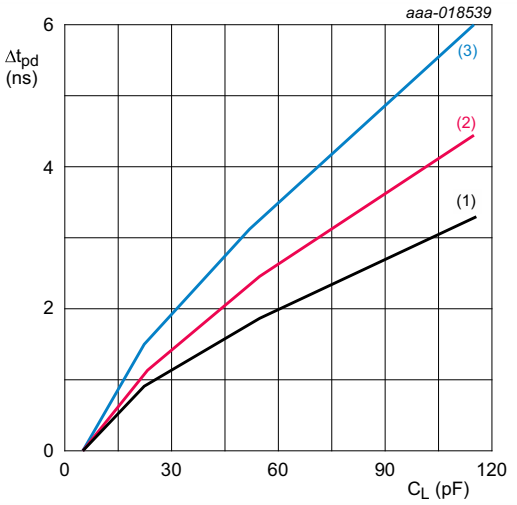
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

(1) Minimum: V_{CCO} = 5.5 V

(2) Typical: T_{amb} = 25 °C; V_{CCO} = 5 V

(3) Maximum: V_{CCO} = 4.5 V

Fig 7. Additional propagation delay versus load capacitance



T_{amb} = –40 °C to +85 °C unless otherwise specified.

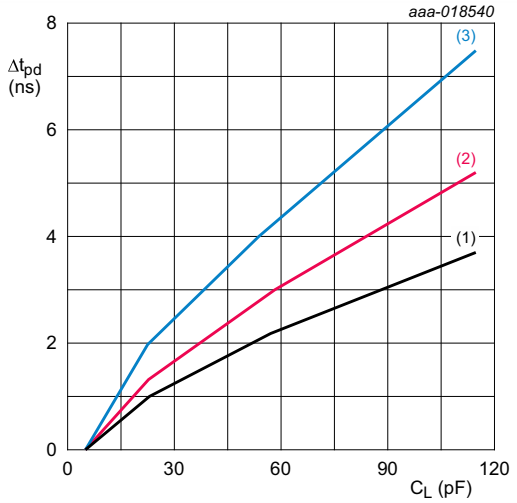
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

(1) Minimum: V_{CCO} = 3.6 V

(2) Typical: T_{amb} = 25 °C; V_{CCO} = 3.3 V

(3) Maximum: V_{CCO} = 3 V

Fig 8. Additional propagation delay versus load capacitance



T_{amb} = –40 °C to +85 °C unless otherwise specified.

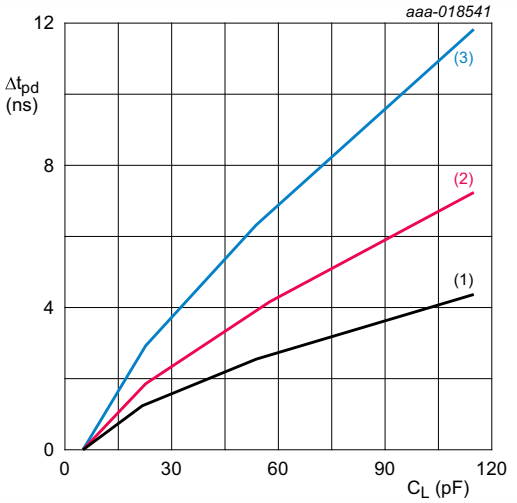
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

(1) Minimum: V_{CCO} = 2.7 V

(2) Typical: T_{amb} = 25 °C; V_{CCO} = 2.5 V

(3) Maximum: V_{CCO} = 2.3 V

Fig 9. Additional propagation delay versus load capacitance



T_{amb} = –40 °C to +85 °C unless otherwise specified.

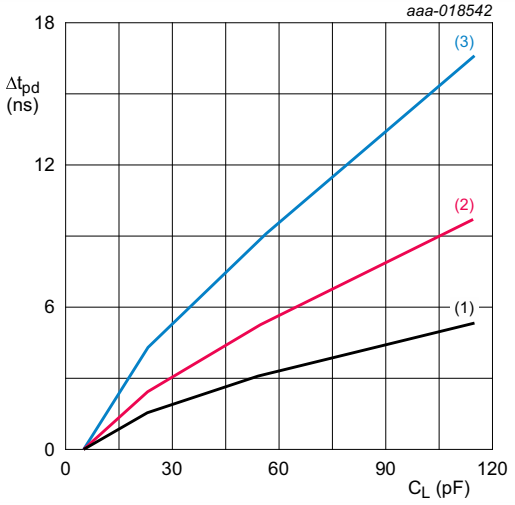
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

(1) Minimum: V_{CCO} = 1.95 V

(2) Typical: T_{amb} = 25 °C; V_{CCO} = 1.8 V

(3) Maximum: V_{CCO} = 1.65 V

Fig 10. Additional propagation delay versus load capacitance



T_{amb} = −40 °C to +85 °C unless otherwise specified.

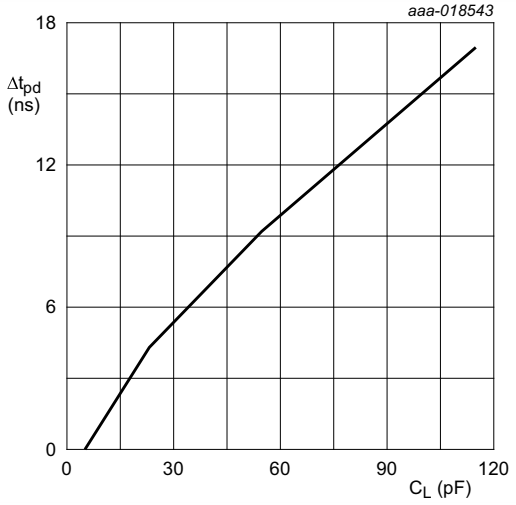
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

(1) Minimum: V_{CCO} = 1.6 V

(2) Typical: T_{amb} = 25 °C; V_{CCO} = 1.5 V

(3) Maximum: V_{CCO} = 1.4 V

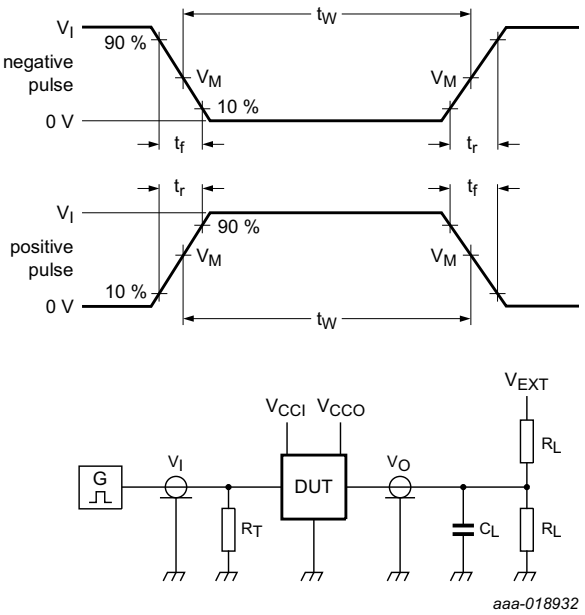
Fig 11. Additional propagation delay versus load capacitance



T_{amb} = 25 °C; V_{CCO} = 1.2 V.

For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}

Fig 12. Additional propagation delay versus load capacitance



Test data is given in Table 14.

Definitions test circuit:

R_T = termination resistance should be equal to output impedance Z_o of the pulse generator.

C_L = load capacitance including jig and probe capacitance.

R_L = Load resistance.

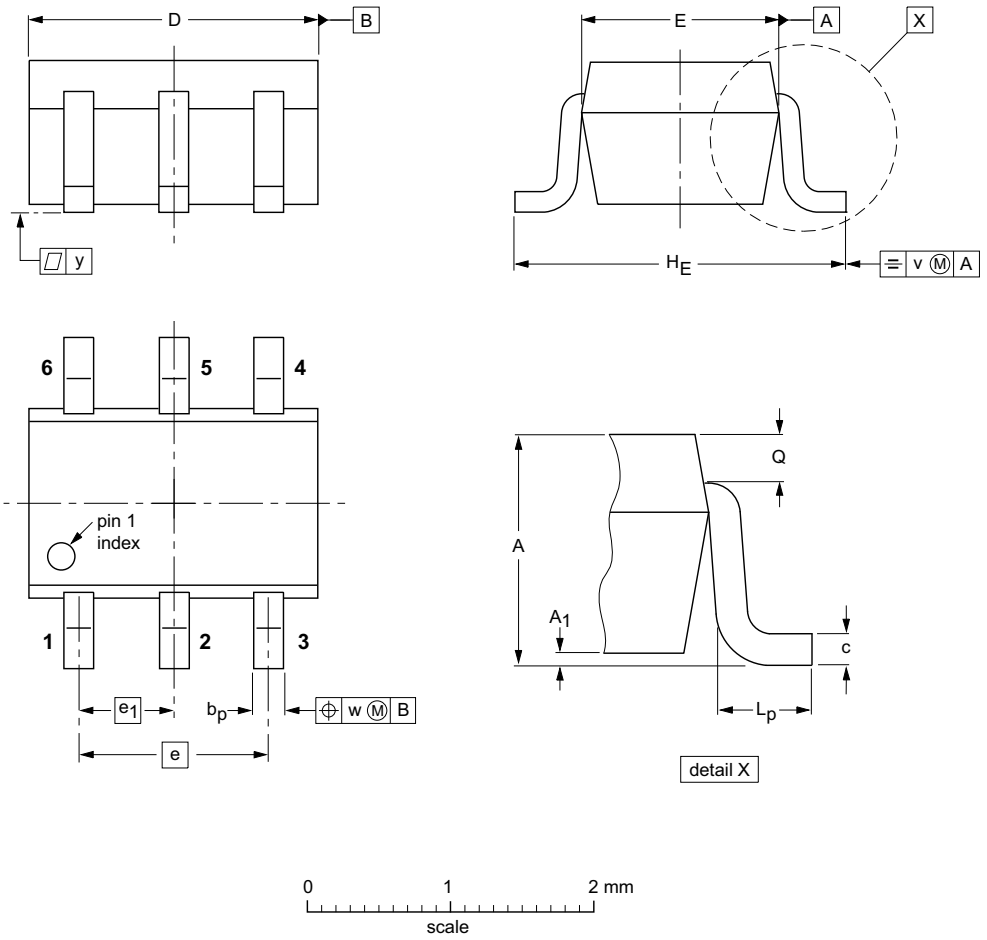
Fig 13. Test circuit for measuring switching times

Table 14. Test data

Supply voltage		Load		Input		V_{EXT}		
V_{CCI}	V_{CCO}	C_L	R_L	t_r, t_f	V_I	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
0.75 V to 2.7 V	1.2 V to 5.5 V	5 pF	10 kΩ	≤3.0 ns	V_{CCI}	GND	GND	$2V_{CCO}$

12. Package outline

Plastic surface-mounted package; 6 leads **SOT363**



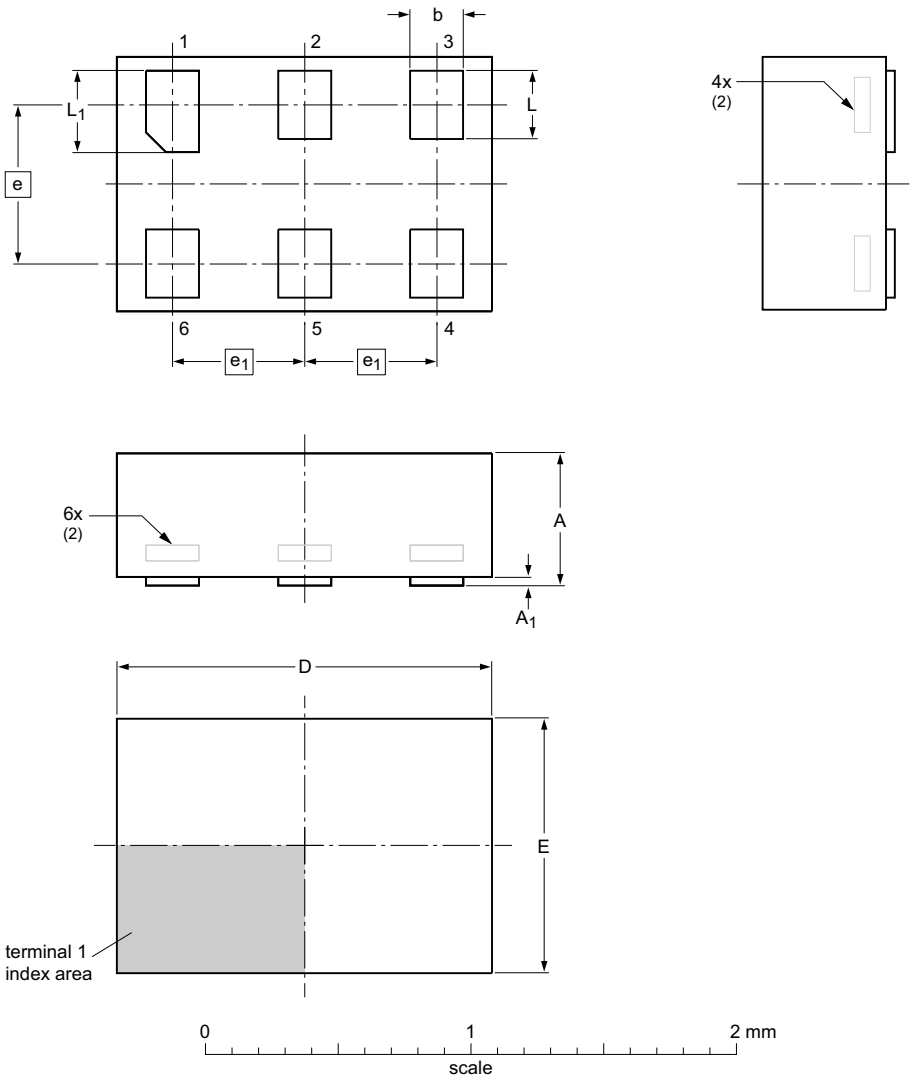
DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT363			SC-88			~~04-11-08~~ 06-03-16

Fig 14. Package outline SOT363 (SC-88)

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

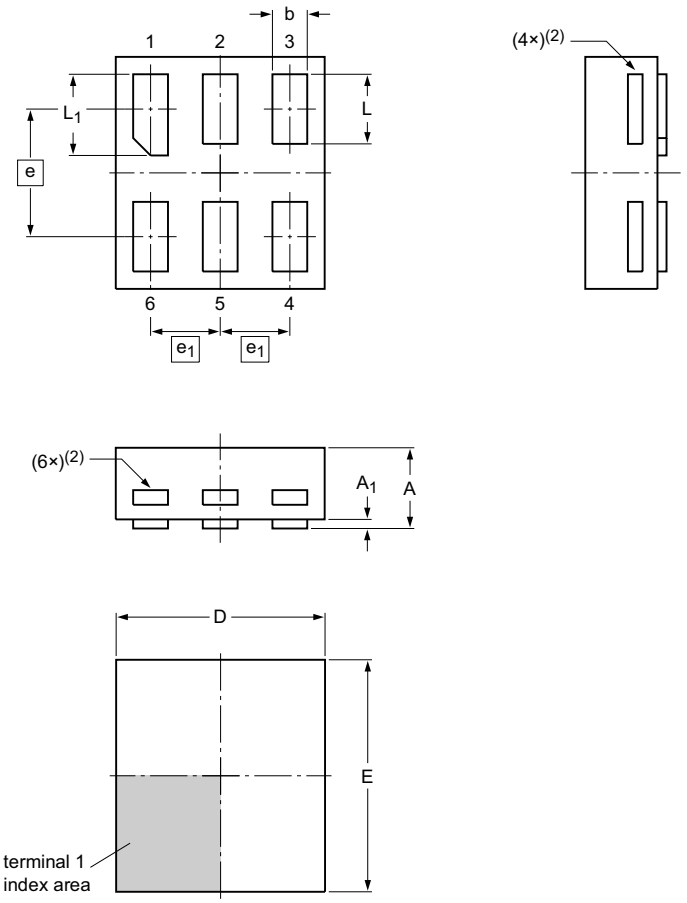
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

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

Fig 15. 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

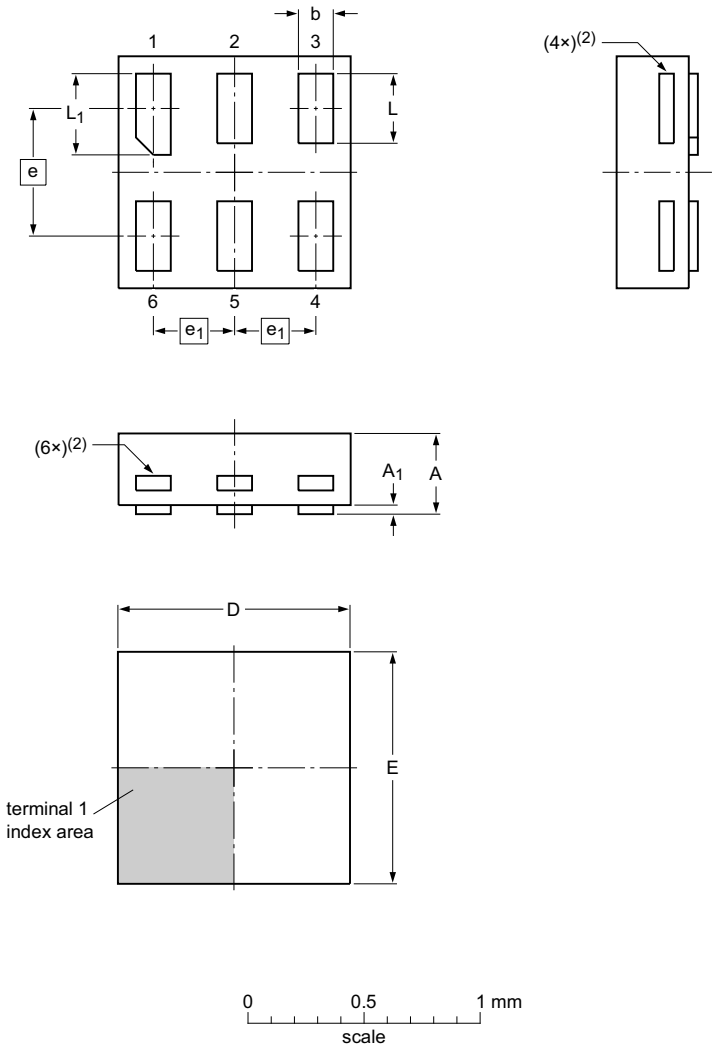
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1115_po

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

Fig 16. 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
mm	max	0.35	0.04	0.20	1.05	1.05			0.35	0.40
	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				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1202						~~10-04-02~~ 10-04-06

Fig 17. Package outline SOT1202 (XSON6)

13. Abbreviations

Table 15. Abbreviations

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

14. Revision history

Table 16. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AXP1T125 v.1	20151221	Product data sheet	-	-

15. Legal information

15.1 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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