Important notice

Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

Instead of http://www.nxp.com, http://www.philips.com/ or http://www.semiconductors.philips.com/, use **http://www.nexperia.com**

Instead of sales.addresses@www.nxp.com or sales.addresses@www.semiconductors.philips.com, use **salesaddresses@nexperia.com** (email)

Replace the copyright notice at the bottom of each page or elsewhere in the document, depending on the version, as shown below:
- © NXP N.V. (year). All rights reserved or © Koninklijke Philips Electronics N.V. (year). All rights reserved
Should be replaced with:
- **© Nexperia B.V. (year). All rights reserved**.

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **salesaddresses@nexperia.com**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

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
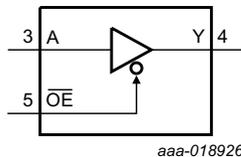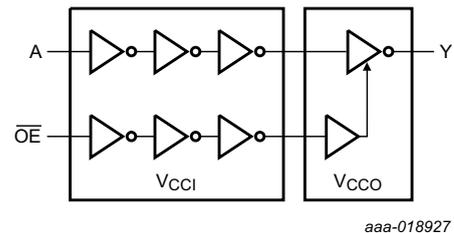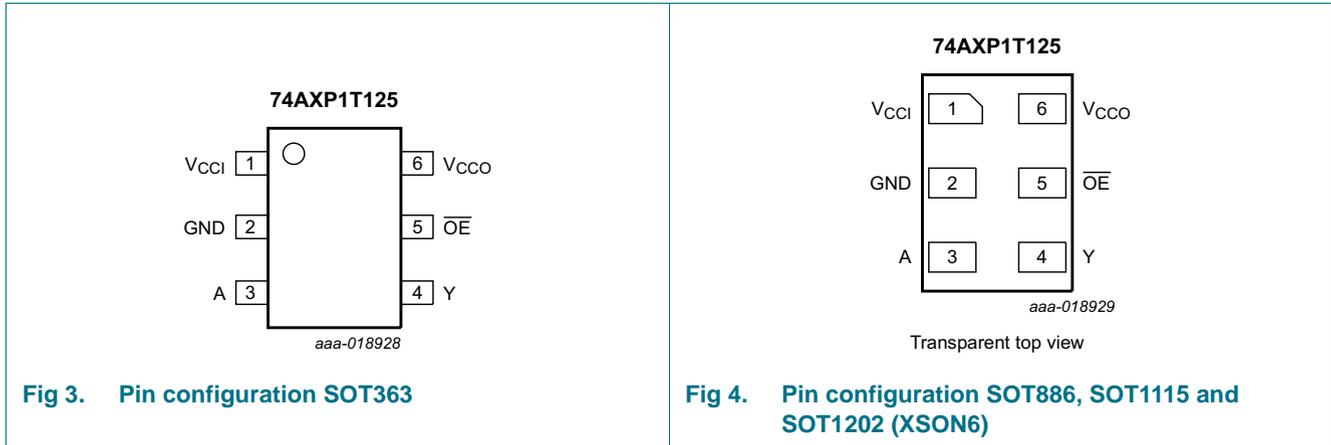

Fig 2.   Logic diagram

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

2 of 22

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

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

4 of 22

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.

74AXP1T125
All information provided in this document is subject to legal disclaimers.
© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet
Rev. 1 — 21 December 2015
5 of 22

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

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

6 of 22

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	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	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	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

74AXP1T125

Product data sheet **Rev. 1 — 21 December 2015** **8 of 22**

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})

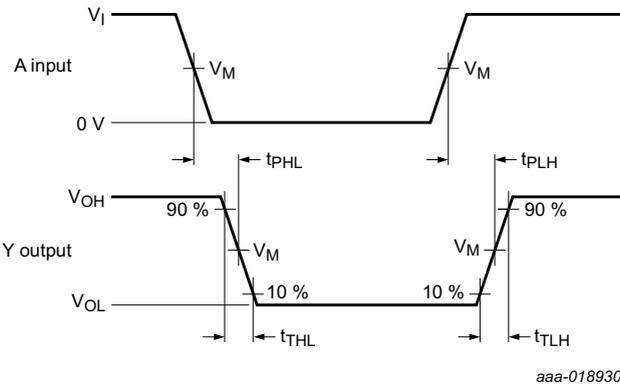$P_D = (C_L + C_{PD}) \times V_{CCO}^2 \times f_o$ where:

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;

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

10 of 22

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.

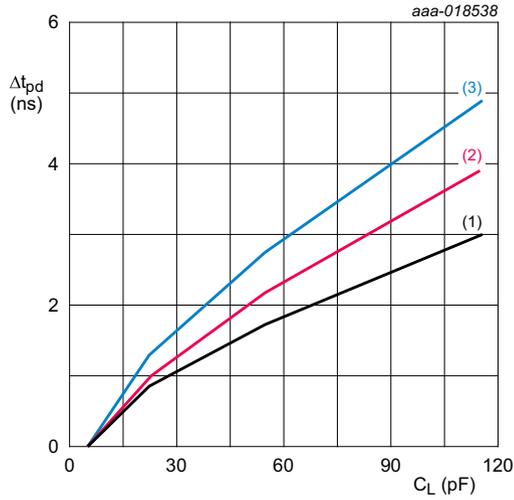**Fig 5.** **Input A to output Y propagation delay times and output transition times**
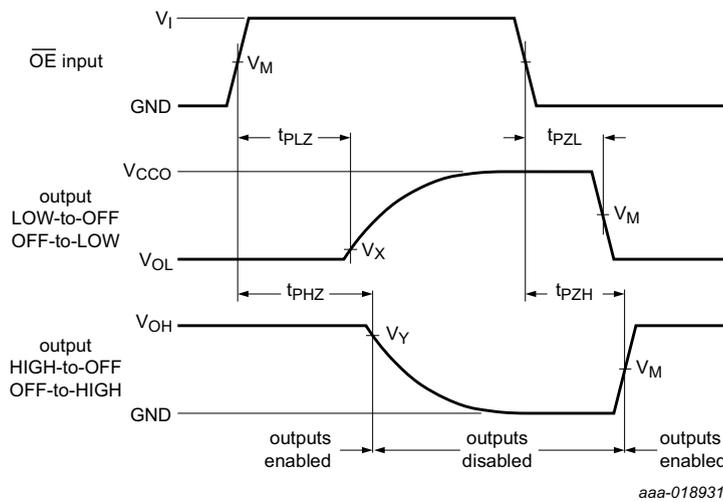
Measurement points are given in Table 13.

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}

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

11 of 22

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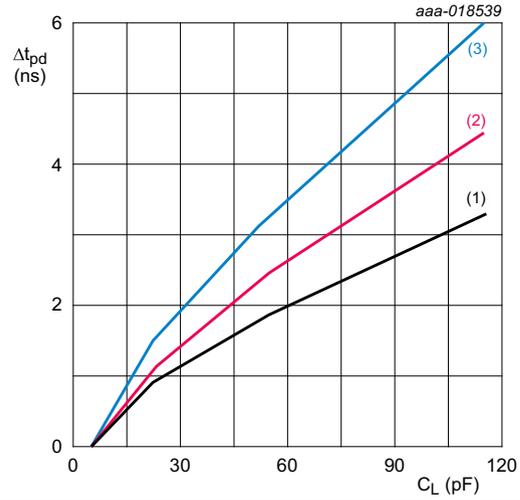
T_{amb} = −40 °C to +85 °C unless otherwise specified.

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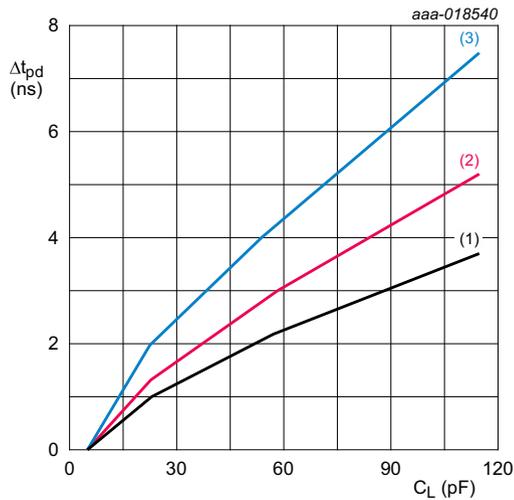
T_{amb} = −40 °C to +85 °C unless otherwise specified.

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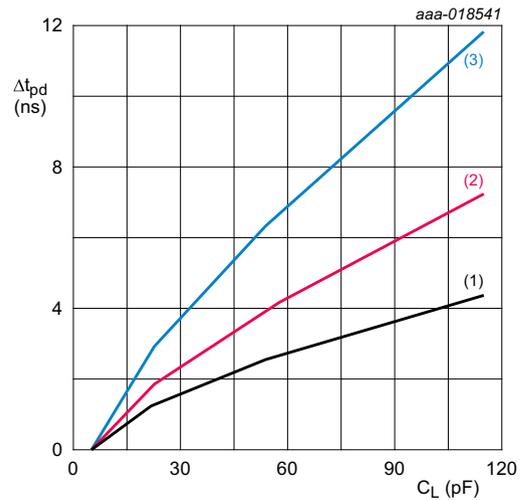
T_{amb} = −40 °C to +85 °C unless otherwise specified.

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**

74AXP1T125

Product data sheet   **Rev. 1 — 21 December 2015**   **12 of 22**
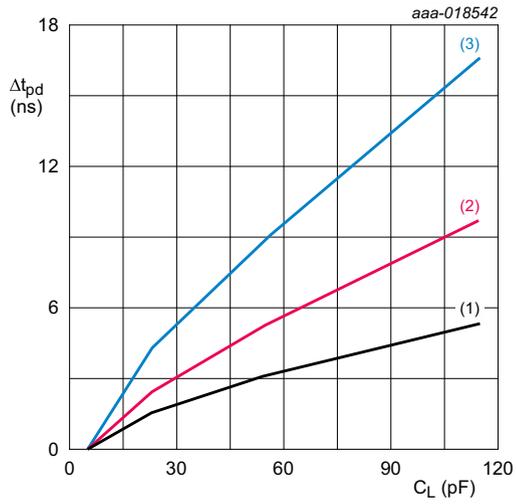
T_{amb} = −40 °C to +85 °C unless otherwise specified.

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
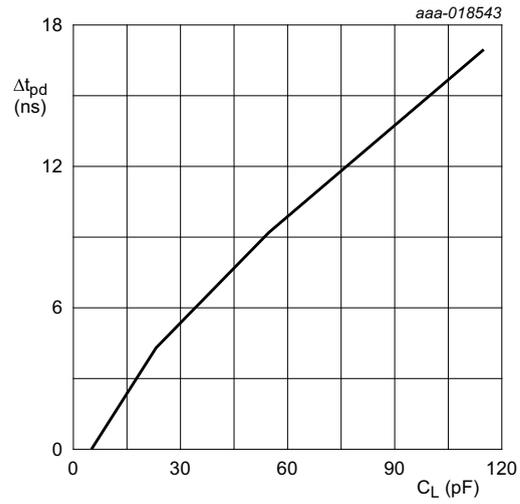
T_{amb} = 25 °C; V_{CCO} = 1.2 V.

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

Fig 12. Additional propagation delay versus load capacitance

aaa-018932
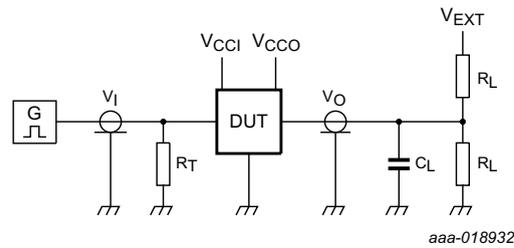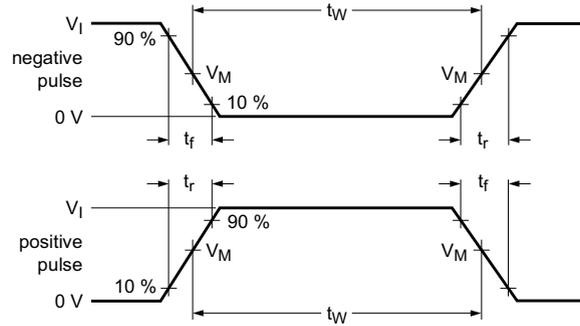
Test data is given in Table 14.

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	$2V_{CCO}$

74AXP1T125

Product data sheet **Rev. 1 — 21 December 2015** 14 of 22

12. Package outline

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

DIMENSIONS (mm are the original dimensions)

UNIT	A	A₁ max	bp	c	D	E	e	e₁	HE	Lp	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

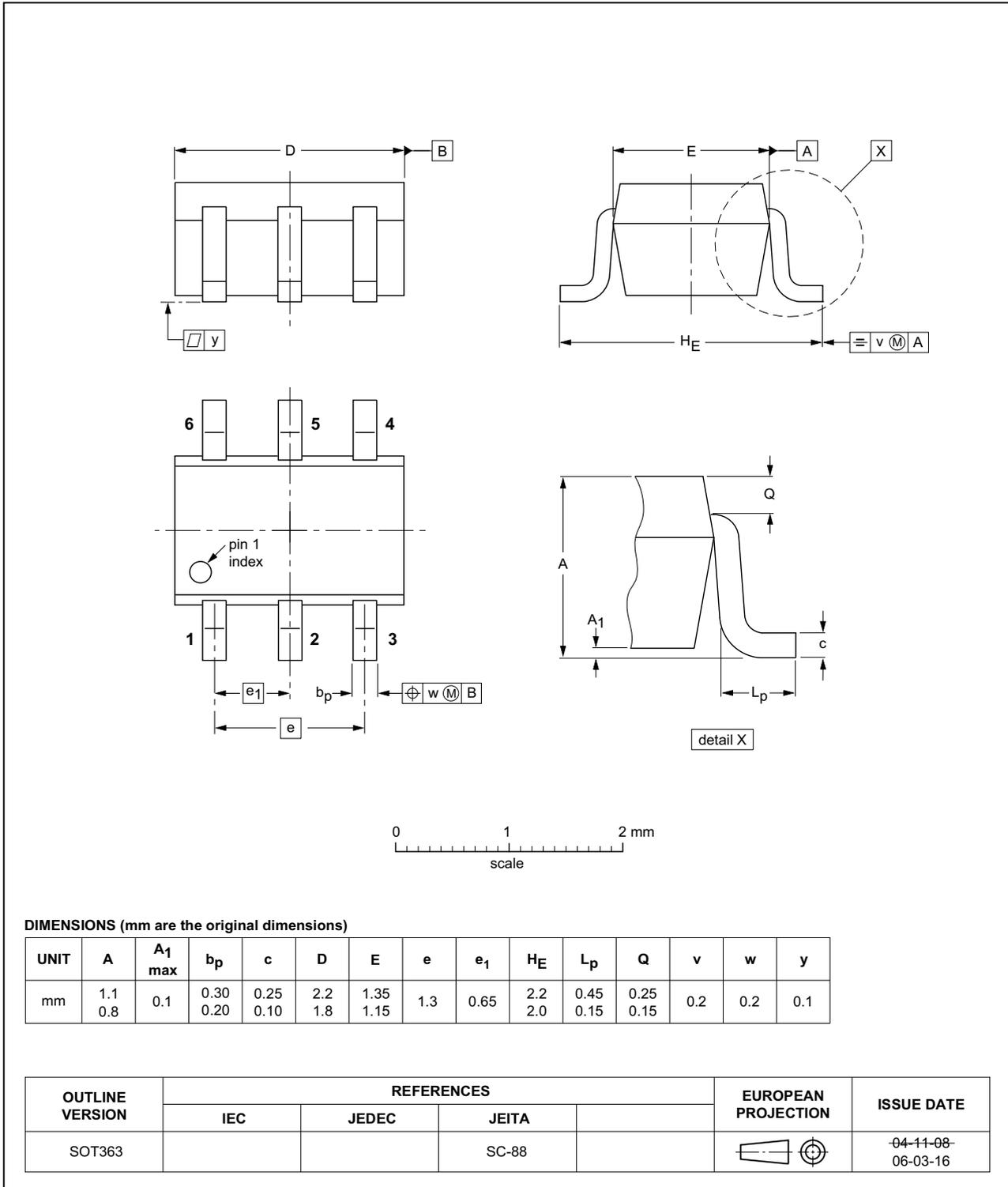| OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT363			SC-88			~~04-11-08~~ 06-03-16

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
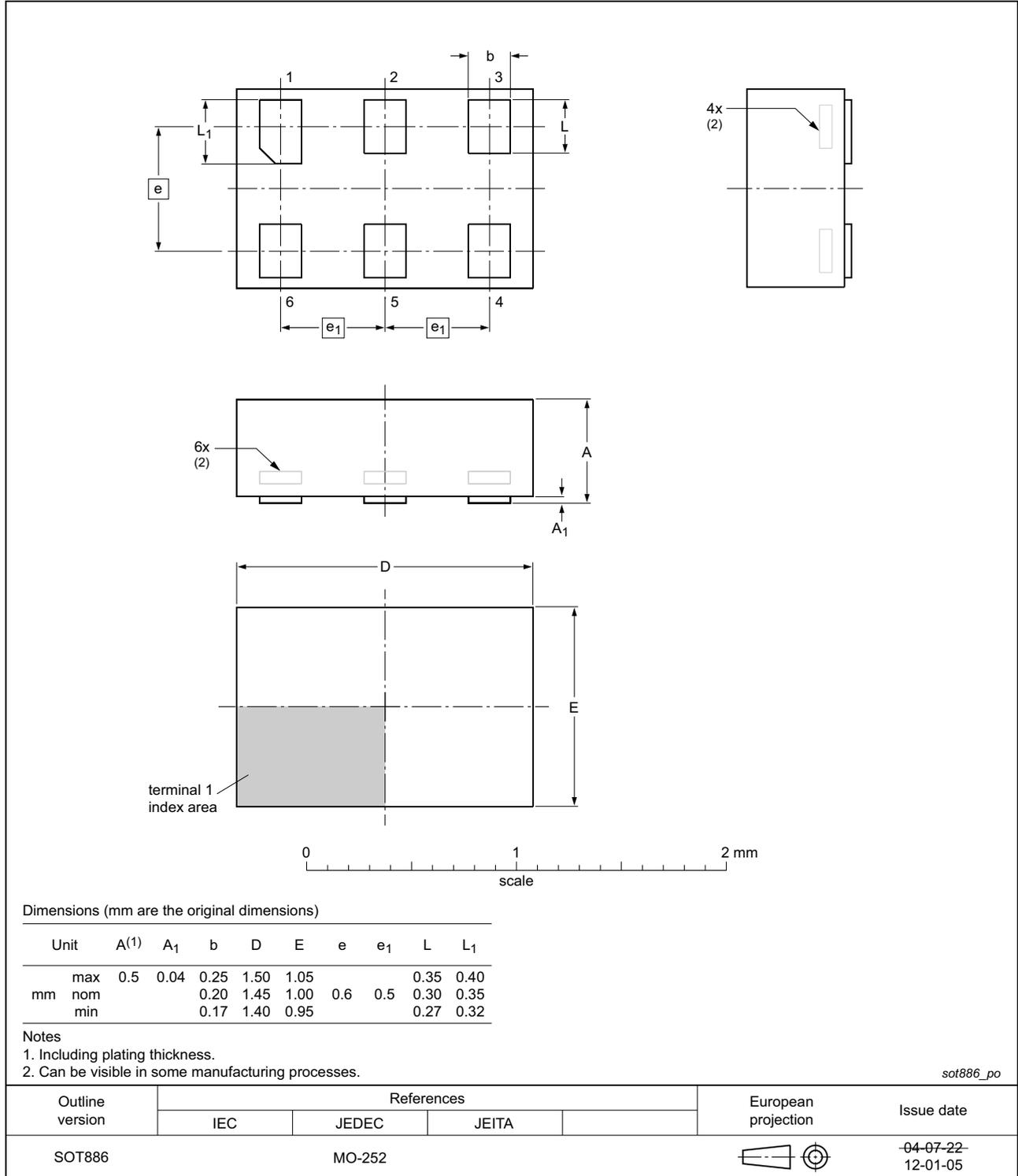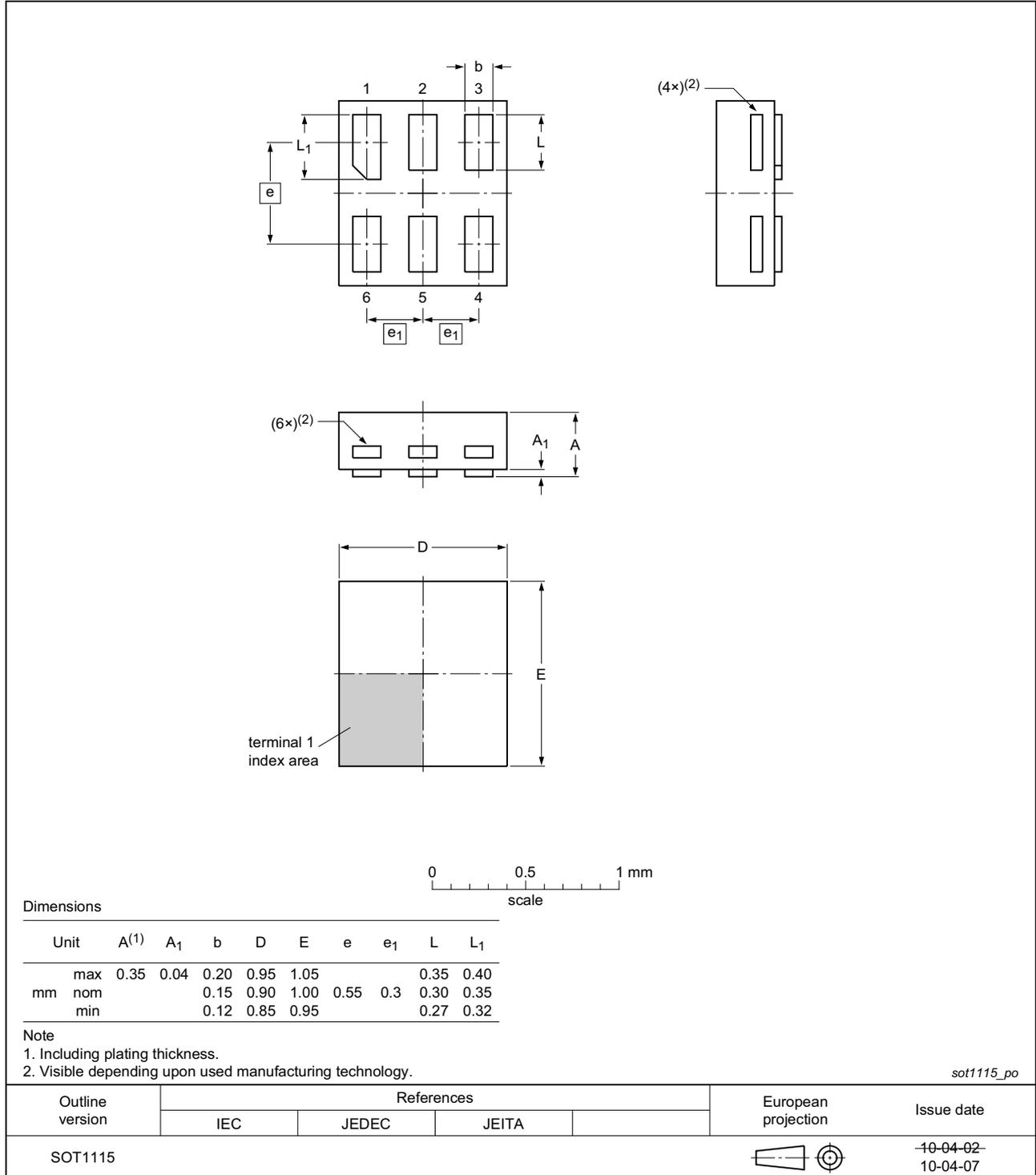
SOT886

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;
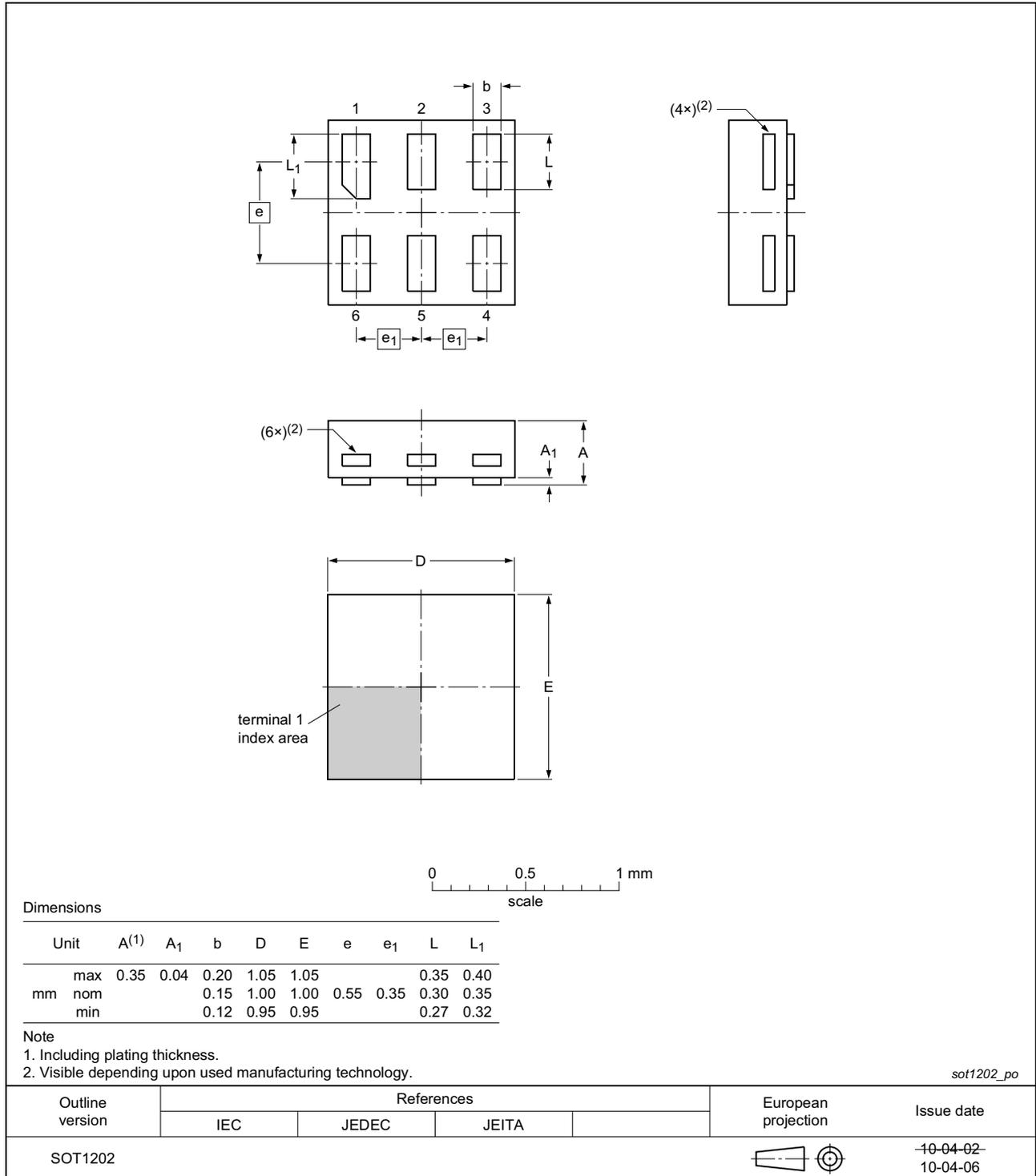**6 terminals; body 0.9 x 1.0 x 0.35 mm**

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)

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

17 of 22

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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

15.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

15.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

20 of 22

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond

NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

15.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

16. Contact information

For more information, please visit: **http://www.nxp.com**

For sales office addresses, please send an email to: **salesaddresses@nxp.com**

74AXP1T125

All information provided in this document is subject to legal disclaimers.

© NXP Semiconductors N.V. 2015. All rights reserved.

Product data sheet

Rev. 1 — 21 December 2015

21 of 22

17. Contents