

# 74ABT126

Quad buffer; 3-state

Rev. 5 — 4 April 2017

Product data sheet

## 1 General description

The 74ABT126 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The 74ABT126 device is a quad buffer that is ideal for driving bus lines. The device features four output enable inputs (nOE) each controlling one of the 3-state outputs (nY).

## 2 Features and benefits

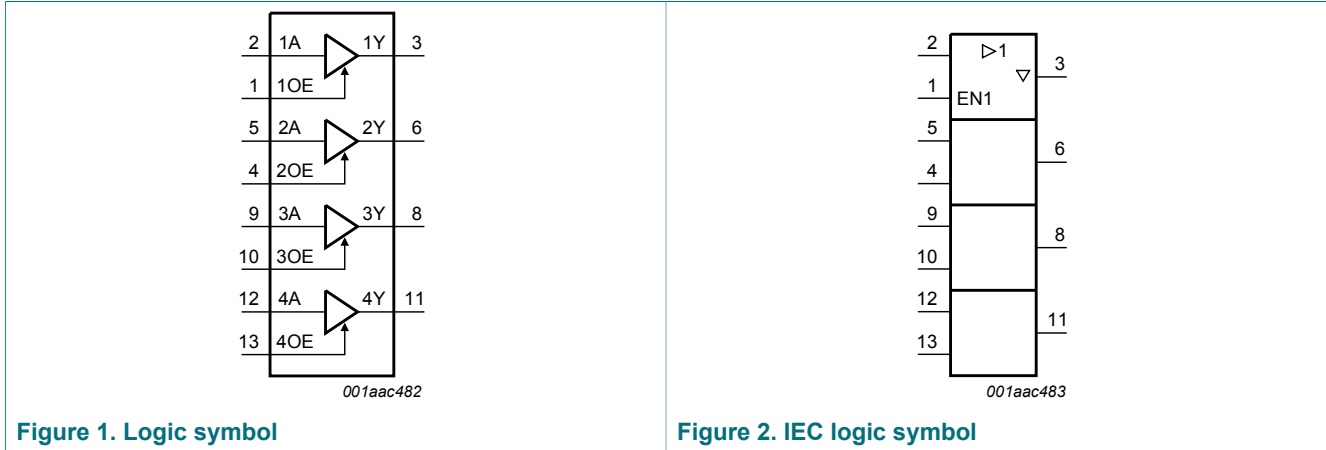
- Quad bus interface
- 3-state buffers
- Live insertion and extraction permitted
- Output capability: +64 mA and -32 mA
- Inputs are disabled during 3-state mode
- Power-up 3-state
- Latch-up protection:
  - JESD78: exceeds 500 mA
- ESD protection:
  - MIL STD 883 method 3015: exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V

## 3 Ordering information

Table 1. Ordering information

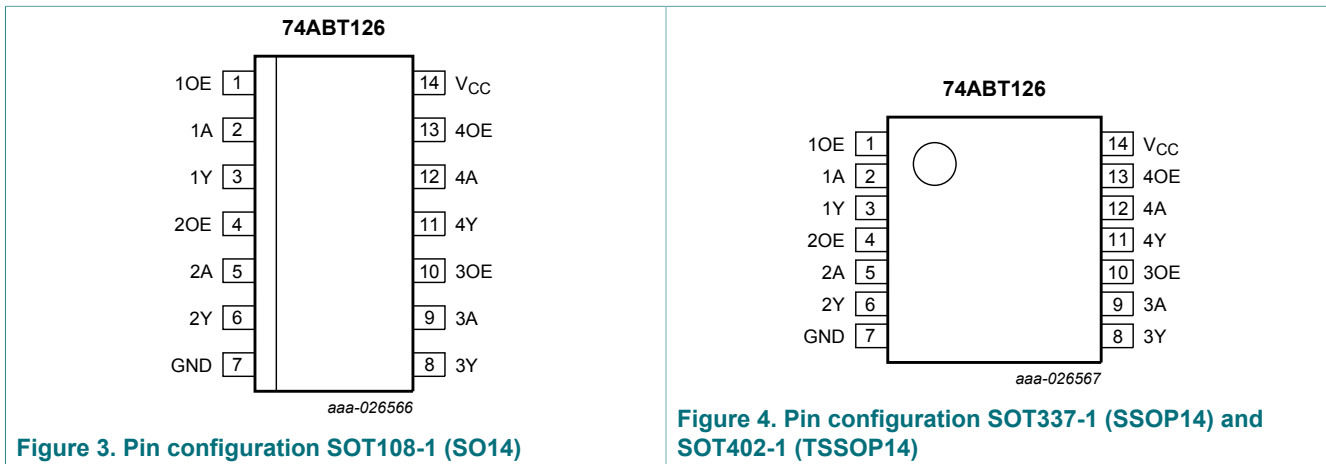
Type number	Package			
	Temperature range	Name	Description	Version
74ABT126D	-40 °C to +85 °C	SO14	plastic small outline package; 14 leads; body width 3.9 mm	SOT108-1
74ABT126DB	-40 °C to +85 °C	SSOP14	plastic shrink small outline package; 14 leads; body width 5.3 mm	SOT337-1
74ABT126PW	-40 °C to +85 °C	TSSOP14	plastic thin small outline package; 14 leads; body width 4.4 mm	SOT402-1

## 4 Functional diagram



## 5 Pinning information

### 5.1 Pinning



### 5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
1OE, 2OE, 3OE, 4OE	1, 4, 10, 13	output enable inputs
1A, 2A, 3A, 4A	2, 5, 9, 12	data inputs
1Y, 2Y, 3Y, 4Y	3, 6, 8, 11	data outputs
GND	7	ground (0 V)
V <sub>CC</sub>	14	supply voltage

## 6 Functional description

Table 3. Function table <sup>[1]</sup>

Input		Output
nOE	nA	nY
H	L	L
H	H	H
L	X	Z

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

## 7 Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	supply voltage		-0.5	+7.0	V
V <sub>I</sub>	input voltage		<sup>[1]</sup> -1.2	+7.0	V
V <sub>O</sub>	output voltage	output in OFF-state or HIGH-state	<sup>[1]</sup> -0.5	+5.5	V
I <sub>IK</sub>	input clamping current	V <sub>I</sub> < 0 V	-18	-	mA
I <sub>OK</sub>	output clamping current	V <sub>O</sub> < 0 V	-50	-	mA
I <sub>O</sub>	output current	output in LOW-state	-	128	mA
T <sub>j</sub>	junction temperature		<sup>[2]</sup> -	150	°C
T <sub>stg</sub>	storage temperature		-65	+150	°C

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

- [2] The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.

## 8 Recommended operating conditions

Table 5. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CC</sub>	supply voltage		4.5	-	5.5	V
V <sub>I</sub>	input voltage		0	-	V <sub>CC</sub>	V
I <sub>OH</sub>	HIGH-level output current		-32	-	-	mA
I <sub>OL</sub>	LOW-level output current		-	-	64	mA
Δt/ΔV	input transition rise and fall rate		0	-	10	ns/V
T <sub>amb</sub>	ambient temperature	in free air	-40	-	+85	°C

## 9 Static characteristics

**Table 6. Static characteristics**

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

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -45 °C to +85 °C		Unit	
			Min	Typ	Max	Min	Max		
V <sub>IK</sub>	input clamping voltage	V <sub>CC</sub> = 4.5 V; I <sub>IK</sub> = -18 mA	-1.2	-0.9	-	-1.2	-	V	
V <sub>IH</sub>	HIGH-level input voltage		2.0	-	-	2.0	-	V	
V <sub>IL</sub>	LOW-level input voltage		-	-	0.8	-	0.8	V	
V <sub>OH</sub>	HIGH-level output voltage	V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub>							
		I <sub>OH</sub> = -3 mA	2.5	2.9	-	2.5	-	V	
		I <sub>OH</sub> = -32 mA	2.0	2.4	-	2.0	-	V	
		V <sub>CC</sub> = 5.0 V; V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub>							
		I <sub>OH</sub> = -3 mA	3.0	3.4	-	3.0	-	V	
V <sub>OL</sub>	LOW-level output voltage	V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub>							
		I <sub>OL</sub> = 64 mA	-	0.35	0.55	-	0.55	V	
I <sub>I</sub>	input leakage current	V <sub>CC</sub> = 5.5 V; V <sub>I</sub> = GND or 5.5 V	-	±0.01	±1.0	-	±1.0	µA	
I <sub>OFF</sub>	power-off leakage current	V <sub>CC</sub> = 0 V; V <sub>O</sub> or V <sub>I</sub> ≤ 4.5 V	-	±5.0	±100	-	±100	µA	
I <sub>O(pu/pd)</sub>	power-up/power-down output current	V <sub>CC</sub> = 2.1 V; V <sub>O</sub> = 0.5 V; V <sub>I</sub> = GND or V <sub>CC</sub> ; nOE = don't care <sup>[1]</sup>	-	±5.0	±50	-	±50	µA	
I <sub>OZ</sub>	OFF-state output current	V <sub>CC</sub> = 5.5 V; V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub>							
		output HIGH-state at V <sub>O</sub> = 2.7 V	-	1.0	50	-	50	µA	
		output LOW-state at V <sub>O</sub> = 0.5 V	-50	-1.0	-	-50	-	µA	
I <sub>CEX</sub>	output high leakage current	V <sub>CC</sub> = 5.5 V; V <sub>O</sub> = 5.5 V; V <sub>I</sub> = GND or V <sub>CC</sub>	-	5.0	50	-	50	µA	
I <sub>O</sub>	output current	V <sub>CC</sub> = 5.5 V; V <sub>O</sub> = 2.5 V <sup>[2]</sup>	-180	-100	-50	-180	-50	mA	
I <sub>CC</sub>	supply current	V <sub>CC</sub> = 5.5 V; V <sub>I</sub> = GND or V <sub>CC</sub>							
		outputs HIGH-state	-	65	250	-	250	µA	
		outputs LOW-state	-	12	15	-	15	mA	
		outputs 3-state	-	65	250	-	250	µA	
ΔI <sub>CC</sub>	additional supply current								
		per data input pin	one data input at 3.4 V and other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V <sup>[3]</sup>						
		outputs enabled	-	0.5	1.5	-	1.5	mA	
		outputs 3-state	-	50	250	-	250	µA	

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -45 °C to +85 °C		Unit
			Min	Typ	Max	Min	Max	
	per enable input pin	one enable input at 3.4 V and other inputs at V <sub>CC</sub> or GND; V <sub>CC</sub> = 5.5 V <sup>[3]</sup>						
		outputs 3-state	-	0.5	1.5	-	1.5	mA
C <sub>I</sub>	input capacitance	V <sub>I</sub> = 0 V or V <sub>CC</sub>	-	4	-	-	-	pF
C <sub>O</sub>	output capacitance	outputs disabled; V <sub>O</sub> = 0 V or V <sub>CC</sub>	-	7	-	-	-	pF

- [1] This parameter is valid for any V<sub>CC</sub> between 0 V and 2.1 V, with a transition time of up to 10 ms. From V<sub>CC</sub> = 2.1 V to V<sub>CC</sub> = 5 V ± 10 % a transition time of up to 100 μs is permitted.
- [2] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.
- [3] This is the increase in supply current for each input at 3.4 V.

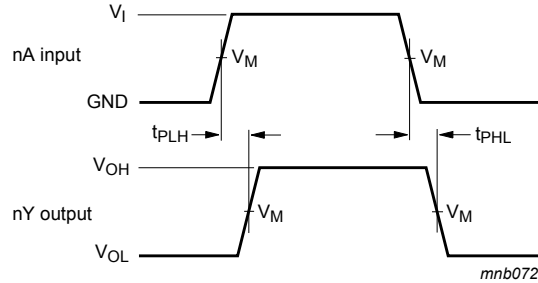
## 10 Dynamic characteristics

**Table 7. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 7](#).

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C; V <sub>CC</sub> = 5.0 V			T <sub>amb</sub> = -40 °C to +85 °C; V <sub>CC</sub> = 5.0 V ± 0.5 V		Unit
			Min	Typ	Max	Min	Max	
t <sub>PLH</sub>	LOW to HIGH propagation delay	nA to nY; see <a href="#">Figure 5</a>	1.0	2.9	4.2	1.0	4.4	ns
t <sub>PHL</sub>	HIGH to LOW propagation delay	nA to nY; see <a href="#">Figure 5</a>	1.0	3.0	4.3	1.0	4.6	ns
t <sub>PZH</sub>	OFF-state to HIGH propagation delay	see <a href="#">Figure 6</a>	1.5	3.2	5.8	1.5	6.5	ns
t <sub>PZL</sub>	OFF-state to LOW propagation delay	see <a href="#">Figure 6</a>	1.9	4.4	5.9	1.9	6.5	ns
t <sub>PHZ</sub>	HIGH to OFF-state propagation delay	see <a href="#">Figure 6</a>	1.0	4.2	5.2	1.0	5.8	ns
t <sub>PLZ</sub>	LOW to OFF-state propagation delay	see <a href="#">Figure 6</a>	1.0	2.9	4.9	1.0	5.5	ns

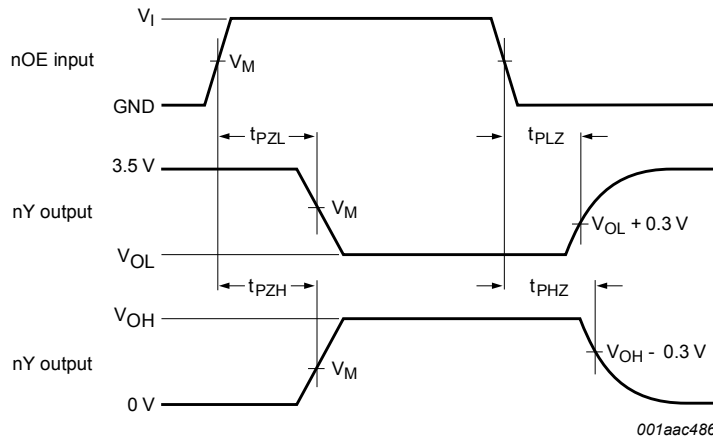
10.1 Waveforms and test circuit



Measurement points are given in [Table 8](#).

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

**Figure 5. Propagation delay input (nA) to output (nY)**



Measurement points are given in [Table 8](#).

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

**Figure 6. Enable and disable times of 3-state outputs**

**Table 8. Measurement points**

Input	Output
$V_M$	$V_M$
1.5 V	1.5 V

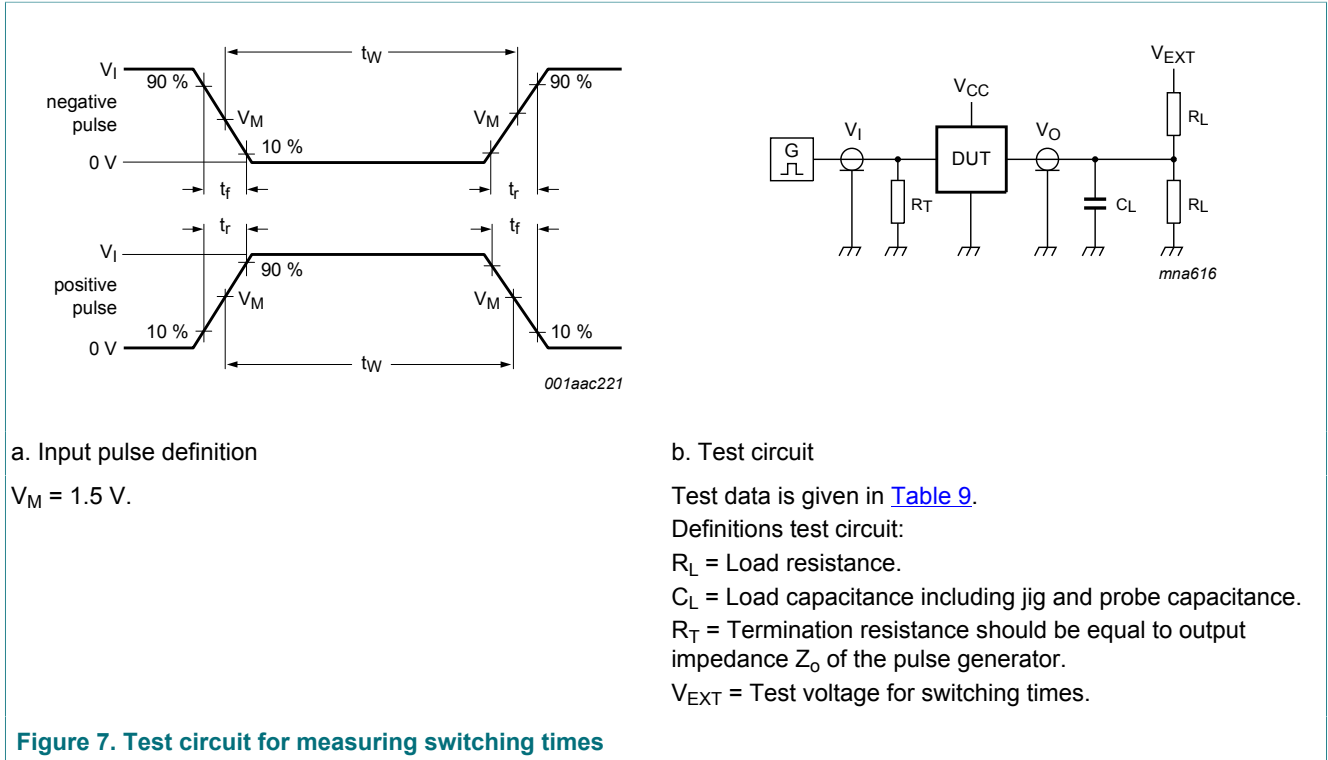


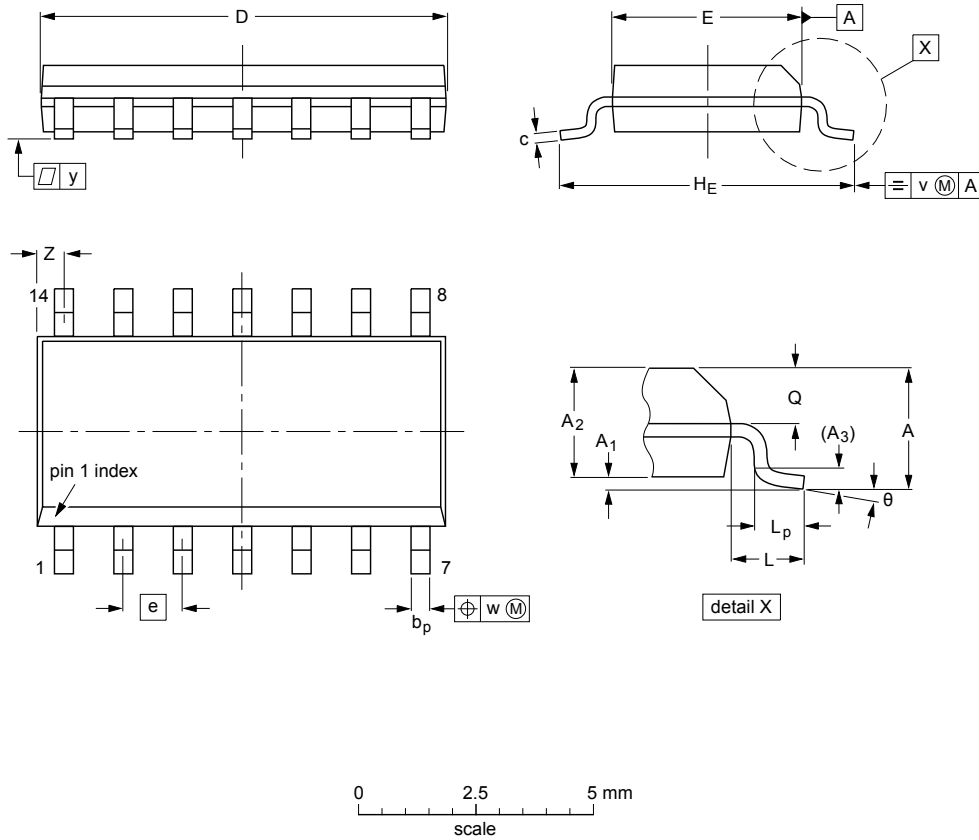
Table 9. Test data

Input				Load		$V_{EXT}$		
$V_I$	$f_i$	$t_W$	$t_r, t_f$	$C_L$	$R_L$	$t_{PHZ}, t_{PZH}$	$t_{PLZ}, t_{PZL}$	$t_{PLH}, t_{PHL}$
3.0 V	$\leq 1 \text{ MHz}$	500 ns	$\leq 2.5 \text{ ns}$	50 pF	500 $\Omega$	open	7.0 V	open

11 Package outline

SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	Z <sup>(1)</sup>	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	8.75 8.55	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.35 0.34	0.16 0.15	0.05	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Note

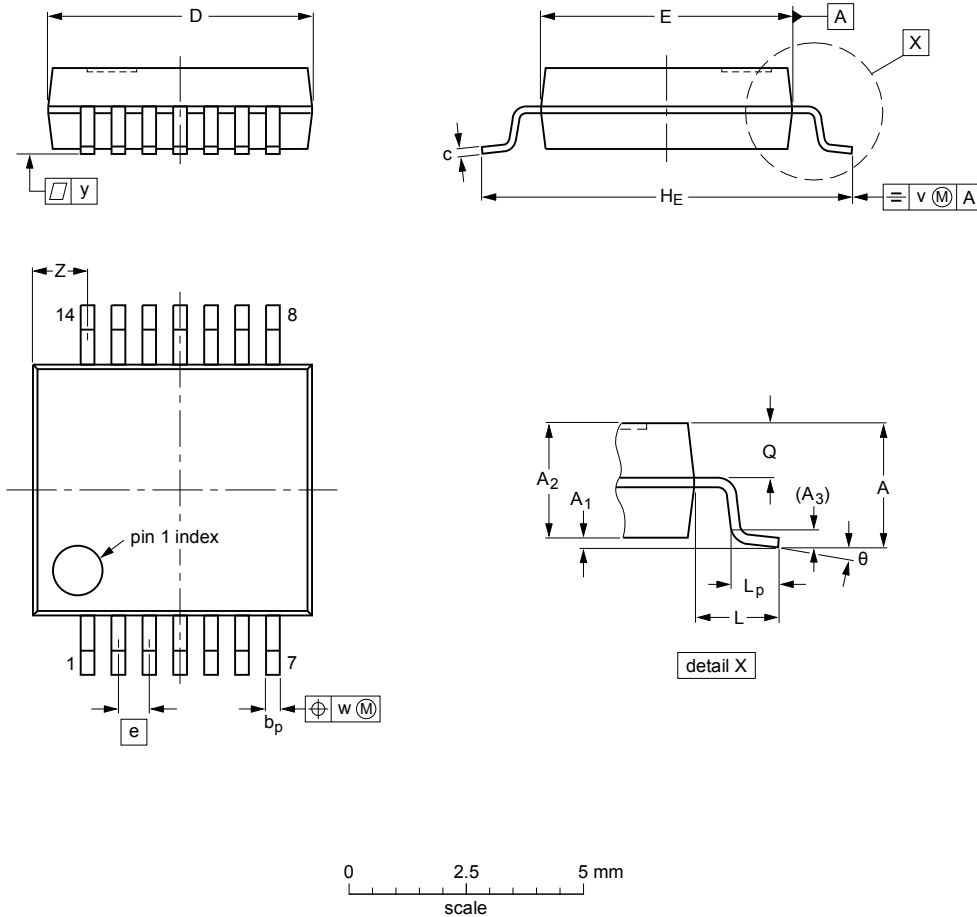
1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT108-1	076E06	MS-012			99-12-27 03-02-19

Figure 8. Package outline SOT108-1 (SO14)

SSOP14: plastic shrink small outline package; 14 leads; body width 5.3 mm

SOT337-1



**DIMENSIONS (mm are the original dimensions)**

UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	Z <sup>(1)</sup>	θ
mm	2	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	6.4 6.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	1.4 0.9	8° 0°

**Note**

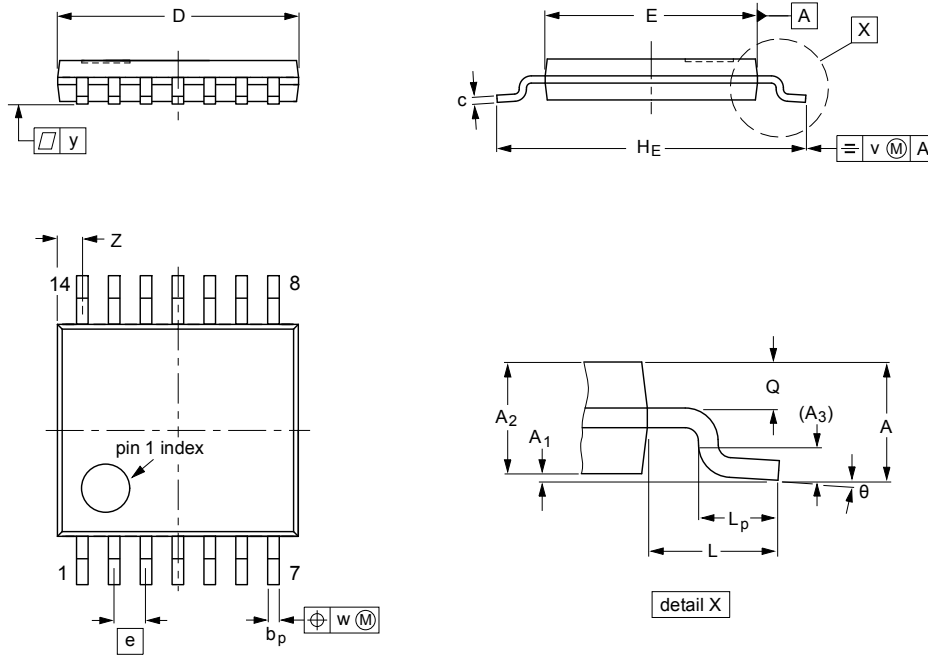
1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT337-1		MO-150				-99-12-27 03-02-19

Figure 9. Package outline SOT337-1 (SSOP14)

TSSOP14: plastic thin shrink small outline package; 14 leads; body width 4.4 mm

SOT402-1



**DIMENSIONS (mm are the original dimensions)**

UNIT	A <sub>max.</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(2)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	Z <sup>(1)</sup>	θ
mm	1.1	0.15 0.05	0.95 0.80	0.25	0.30 0.19	0.2 0.1	5.1 4.9	4.5 4.3	0.65	6.6 6.2	1	0.75 0.50	0.4 0.3	0.2	0.13	0.1	0.72 0.38	8° 0°

**Notes**

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT402-1		MO-153				-99-12-27 03-02-18

Figure 10. Package outline SOT402-1 (TSSOP14)

## 12 Abbreviations

Table 10. Abbreviations

Acronym	Description
BiCMOS	Bipolar Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
MIL	Military
MM	Machine Model

## 13 Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74ABT126 v.5	20170404	Product data sheet	-	74ABT126 v.4
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>			
74ABT126 v.4	20050217	Product data sheet	-	74ABT126 v.3
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors.</li> <li><a href="#">Section 2</a>: modified 'JEDEC Std 17' into 'JESD78'.</li> <li><a href="#">Table 7</a>: changed min value of <math>t_{PZH}</math> from 1.9 ns into 1.5 ns for both conditions <math>V_{CC} = 5.0</math> V at <math>T_{amb} = 25</math> °C and <math>V_{CC} = 5.0</math> V <math>\pm</math> 0.5 V at <math>T_{amb} = -40</math> °C to +85 °C.</li> </ul>			
74ABT126 v.3	20021213	Product specification	-	74ABT126 v.2
74ABT126 v.2	19980116	Product specification	-	74ABT126 v.1
74ABT126 v.1	-	-	-	-

## 14 Legal information

### 14.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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.nexperia.com>.

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Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

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