74ABT126

Quad buffer; 3-state

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

- 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
  - Machine model: exceeds 200 V

3. Quick reference data

Table 1: Quick reference data

T_{amb} = 25 °C; GND = 0 V.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_{PLH}	propagation delay nA to nY	C_L = 50 pF; V_{CC} = 5 V	-	2.9	-	ns
t_{PHL}	propagation delay nA to nY	C_L = 50 pF; V_{CC} = 5 V	-	3.0	-	ns
C_I	input capacitance	V_I = 0 V or V_{CC}	-	4	-	pF
C_O	output capacitance	outputs disabled; V_O = 0 V or V_{CC}	-	7	-	pF
I_{CC}	quiescent supply current	outputs 3-state; V_{CC} = 5.5 V	-	65	-	µA

PHILIPS

4. Ordering information

Table 2: 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

5. Functional diagram

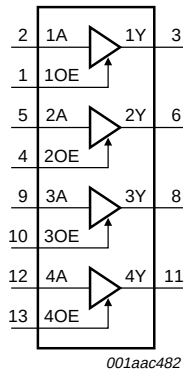


Fig 1. Logic symbol

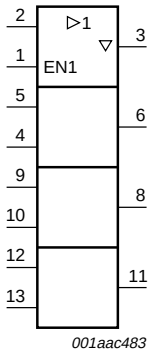


Fig 2. IEC logic symbol

6. Pinning information

6.1 Pinning

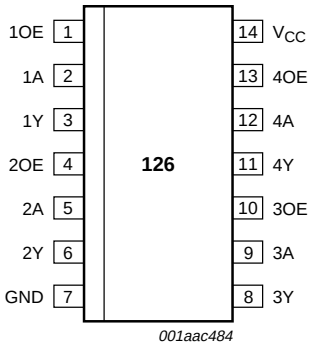


Fig 3. Pin configuration

8. Limiting values

Table 5: Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CC}	supply voltage			–0.5	+7.0	V
V_I	input voltage		[1]	–1.2	+7.0	V
V_O	output voltage	output in OFF-state or HIGH-state	[1]	–0.5	+5.5	V
I_{IK}	input diode current	$V_I < 0$ V		-	–18	mA
I_{OK}	output diode current	$V_O < 0$ V		-	–50	mA
I_O	output current	output in LOW-state		-	128	mA
T_j	junction temperature		[2]	-	150	°C
T_{stg}	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.

9. Recommended operating conditions

Table 6: Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC}	supply voltage		4.5	-	5.5	V
V_I	input voltage		0	-	V_{CC}	V
V_{IH}	HIGH-level input voltage		2.0	-	-	V
V_{IL}	LOW-level input voltage		-	-	0.8	V
I_{OH}	HIGH-level output current		-	-	–32	mA
I_{OL}	LOW-level output current		-	-	64	mA
$\Delta t/\Delta V$	input transition rise or fall rate		0	-	10	ns/V
T_{amb}	ambient temperature	in free air	–40	-	+85	°C

10. Static characteristics

Table 7: Static characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
T_{amb} = 25 °C							
V_{IK}	input clamp voltage	V_{CC} = 4.5 V; I_{IK} = –18 mA		-	–0.9	–1.2	V
V_{OH}	HIGH-level output voltage	V_{CC} = 4.5 V; V_I = V_{IL} or V_{IH}					
		I_{OH} = –3 mA		2.5	2.9	-	V
		I_{OH} = –32 mA		2.0	2.4	-	V
		V_{CC} = 5.0 V; V_I = V_{IL} or V_{IH}					
		I_{OH} = –3 mA		3.0	3.4	-	V
V_{OL}	LOW-level output voltage	V_{CC} = 4.5 V; V_I = V_{IL} or V_{IH}					
		I_{OL} = 64mA		-	0.35	0.55	V
I_{LI}	input leakage current	V_{CC} = 5.5 V; V_I = GND or 5.5 V		-	±0.01	±1.0	μA
I_{OFF}	power-off leakage current	V_{CC} = 0 V; V_O or V_I ≤ 4.5 V		-	±5.0	±100	μA
I_{PU}, I_{PD}	power-up or power-down down 3-state output current	V_{CC} = 2.1 V; V_O = 0.5 V; V_I = GND or V_{CC}; V_{OE} = don't care	[1]	-	±5.0	±50	μA
I_{OZ}	3-state output current	V_{CC} = 5.5 V; V_I = V_{IL} or V_{IH}					
		output HIGH-state at V_O = 2.7 V		-	1.0	50	μA
		output LOW-state at V_O = 0.5 V		-	–1.0	–50	μA
I_{CEX}	output HIGH-state leakage current	V_{CC} = 5.5 V; V_O = 5.5 V; V_I = GND or V_{CC}		-	5.0	50	μA
I_O	output current	V_{CC} = 5.5 V; V_O = 2.5 V	[2]	–50	–100	–180	mA
I_{CC}	quiescent supply current	V_{CC} = 5.5 V; V_I = GND or V_{CC}					
		outputs HIGH-state		-	65	250	μA
		outputs LOW-state		-	12	15	mA
		outputs 3-state		-	65	250	μA
ΔI_{CC}	additional supply current						
	per data input pin	one data input at 3.4 V and other inputs at V_{CC} or GND; V_{CC} = 5.5 V	[3]				
		outputs enabled		-	0.5	1.5	mA
		outputs 3-state		-	50	250	μA
	per enable input pin	one enable input at 3.4 V and other inputs at V_{CC} or GND; V_{CC} = 5.5 V	[3]				
		outputs 3-state		-	0.5	1.5	mA
C_I	input capacitance	V_I = 0 V or V_{CC}		-	4	-	pF
C_O	output capacitance	outputs disabled; V_O = 0 V or V_{CC}		-	7	-	pF
T_{amb} = –40 °C to +85 °C							
V_{IK}	input clamp voltage	V_{CC} = 4.5 V; I_{IK} = –18 mA		-	-	–1.2	V

Table 7: Static characteristics *...continued*

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_{CC} = 4.5 V; V_I = V_{IL} or V_{IH}					
		I_{OH} = –3 mA		2.5	-	-	V
		I_{OH} = –32 mA		2.0	-	-	V
		V_{CC} = 5.0 V; V_I = V_{IL} or V_{IH}					
		I_{OH} = –3 mA		3.0	-	-	V
V_{OL}	LOW-level output voltage	V_{CC} = 4.5 V; V_I = V_{IL} or V_{IH}					
		I_{OL} = 64 mA		-	-	0.55	V
I_{LI}	input leakage current	V_{CC} = 5.5 V; V_I = GND or 5.5 V		-	-	±1.0	μA
I_{OFF}	power-off leakage current	V_{CC} = 0.0 V; V_O or V_I ≤ 4.5 V		-	-	±100	μA
I_{PU}, I_{PD}	power-up or power-down down 3-state output current	V_{CC} = 2.1 V; V_O = 0.5 V; V_I = GND or V_{CC}; V_{nOE} = don't care	[1]	-	-	±50	μA
I_{OZ}	3-state output current	V_{CC} = 5.5 V; V_I = V_{IL} or V_{IH}					
		output HIGH-state at V_O = 2.7 V		-	-	50	μA
		output LOW-state at V_O = 0.5 V		-	-	–50	μA
I_{CEX}	output HIGH-state leakage current	V_{CC} = 5.5 V; V_O = 5.5 V; V_I = GND or V_{CC}		-	-	50	μA
I_O	output current	V_{CC} = 5.5 V; V_O = 2.5 V	[2]	–50	-	–180	mA
I_{CC}	quiescent supply current	V_{CC} = 5.5 V; V_I = GND or V_{CC}					
		outputs HIGH-state		-	-	250	μA
		outputs LOW-state		-	-	15	mA
		outputs 3-state		-	-	250	μA
ΔI_{CC}	additional supply current						
	per data input pin	one data input at 3.4 V and other inputs at V_{CC} or GND; V_{CC} = 5.5 V	[3]				
		outputs enabled		-	-	1.5	mA
		outputs 3-state		-	-	250	μA
	per enable input pin	one enable input at 3.4 V and other inputs at V_{CC} or GND; V_{CC} = 5.5 V	[3]				
		outputs 3-state		-	-	1.5	mA

[1] This parameter is valid for any V_{CC} between 0 V and 2.1 V, with a transition time of up to 10 ms. From V_{CC} = 2.1 V to V_{CC} = 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.

11. Dynamic characteristics

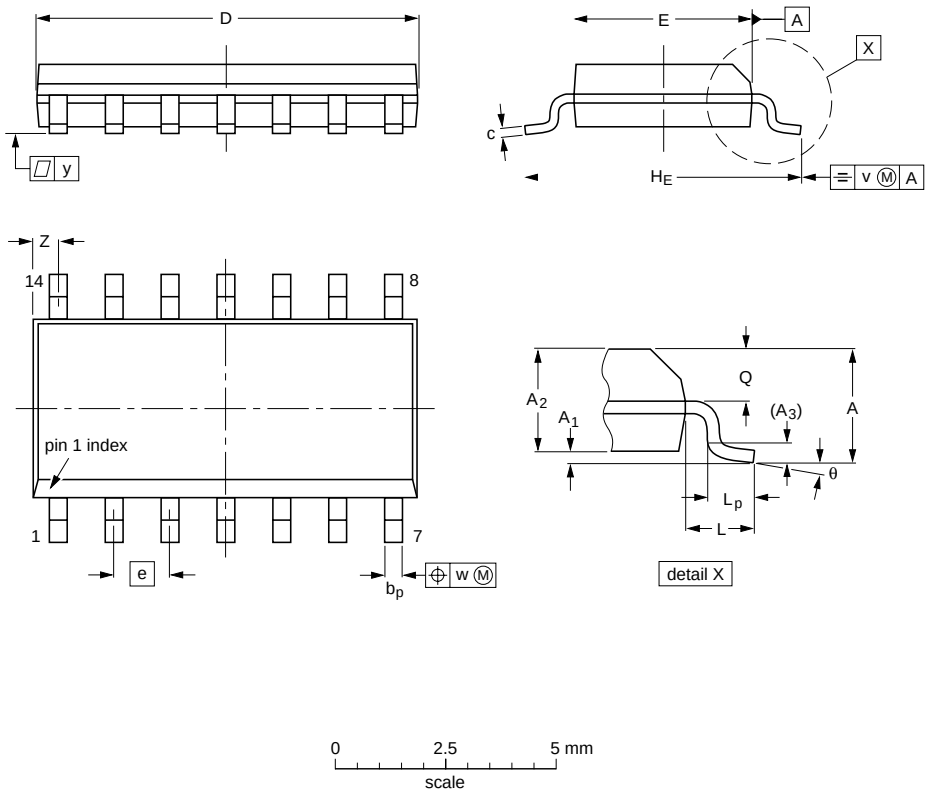
Table 8: Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 6.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = 25 °C; V_{CC} = 5.0 V						
t_{PLH}	propagation delay nA to nY	see Figure 4	1.0	2.9	4.2	ns
t_{PHL}	propagation delay nA to nY	see Figure 4	1.0	3.0	4.3	ns
t_{PZH}	output enable time to HIGH-level	see Figure 5	1.5	3.2	5.8	ns
t_{PZL}	output enable time to LOW-level	see Figure 5	1.9	4.4	5.9	ns
t_{PHZ}	output disable time from HIGH-level	see Figure 5	1.0	4.2	5.2	ns
t_{PLZ}	output disable time from LOW-level	see Figure 5	1.0	2.9	4.9	ns
T_{amb} = −40 °C to +85 °C; V_{CC} = 5.0 V ± 0.5 V						
t_{PLH}	propagation delay nA to nY	see Figure 4	1.0	-	4.4	ns
t_{PHL}	propagation delay nA to nY	see Figure 4	1.0	-	4.6	ns
t_{PZH}	output enable time to HIGH-level	see Figure 5	1.5	-	6.5	ns
t_{PZL}	output enable time to LOW-level	see Figure 5	1.9	-	6.5	ns
t_{PHZ}	output disable time from HIGH-level	see Figure 5	1.0	-	5.8	ns
t_{PLZ}	output disable time from LOW-level	see Figure 5	1.0	-	5.5	ns

13. 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_1	A_2	A_3	b_p	c	D(1)	E(1)	e	H_E	L	L_p	Q	v	w	y	Z(1)	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	
	IEC	JEDEC	JEITA			
SOT108-1	076E06	MS-012				

Fig 7. Package outline SOT108-1 (SO14)