74AHC2G126; 74AHCT2G126

Dual buffer/line driver; 3-state Rev. 8 — 19 November 2018

1. General description

The 74AHC2G126 and 74AHCT2G126 are high-speed Si-gate CMOS devices. They provide a dual non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (nOE). A LOW at nOE causes the output to assume a high-impedance OFF-state.

The AHC device has CMOS input switching levels and supply voltage range 2 V to 5.5 V.

The AHCT device has TTL input switching levels and supply voltage range 4.5 V to 5.5 V.

2. Features and benefits

- Symmetrical output impedance
- High noise immunity
- Low power dissipation
- Balanced propagation delays
- ESD protection:
 - HBM JESD22-A114E: exceeds 2 000 V
 - MM JESD22-A115-A: exceeds 200 V
 - CDM JESD22-C101C: exceeds 1 000 V
- Specified from -40 °C to +125 °C

3. Ordering information

Table 1. Ordering information

Type number	Package									
	Temperature range	Name	Description	Version						
74AHC2G126DP	-40 °C to +125 °C	TSSOP8	plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm	SOT505-2						
74AHC2G126DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package;	SOT765-1						
74AHCT2G126DC			8 leads; body width 2.3 mm							

4. Marking

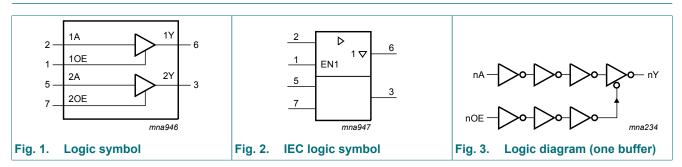
Table 2. Marking codes

Type number	Marking[1]
74AHC2G126DP	A26
74AHC2G126DC	A26
74AHCT2G126DC	C26

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

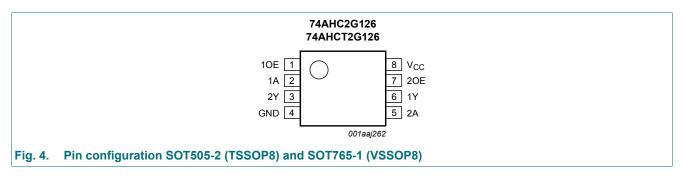
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5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description									
Symbol	Pin	Description							
10E, 20E	1, 7	output enable input (active HIGH)							
1A, 2A	2, 5	data input							
GND	4	ground (0 V)							
1Y, 2Y	6, 3	data output							
V _{CC}	8	supply voltage							

7. Functional description

Table 4. Function table

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

Control	Input	Output
nOE	nA	nY
Н	L	L
Н	Н	Н
L	X	Z

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
VI	input voltage			-0.5	+7.0	V
I _{IK}	input clamping current	V _I < -0.5 V	[1]	-20	-	mA
I _{ОК}	output clamping current	$V_{\rm O}$ < -0.5 V or $V_{\rm O}$ > $V_{\rm CC}$ + 0.5 V	[1]	-	±20	mA
I _O	output current	$-0.5 V < V_O < V_{CC} + 0.5 V$		-	±25	mA
I _{CC}	supply current			-	75	mA
I _{GND}	ground current			-75	-	mA
T _{stg}	storage temperature			-65	+150	°C
P _{tot}	total power dissipation	T _{amb} = -40 °C to +125 °C	[2]	-	250	mW

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

[2] For TSSOP8 package: above 55 °C the value of Ptot derates linearly with 2.5 mW/K.

For VSSOP8 package: above 110 °C the value of Ptot derates linearly with 8 mW/K.

9. Recommended operating conditions

Table 6. Recommended operating conditions

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

Symbol	Parameter	Conditions	74	AHC2G1	26	74	Unit		
			Min	Тур	Мах	Min	Тур	Max	
V _{CC}	supply voltage		2.0	5.0	5.5	4.5	5.0	5.5	V
VI	input voltage		0	-	5.5	0	-	5.5	V
Vo	output voltage		0	-	V _{CC}	0	-	V _{CC}	V
T _{amb}	ambient temperature		-40	+25	+125	-40	+25	+125	°C
Δt/ΔV	input transition rise and	V_{CC} = 3.3 V ± 0.3 V	-	-	100	-	-	-	ns/V
fall rate		V_{CC} = 5.0 V ± 0.5 V	-	-	20	-	-	20	ns/V

10. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions		25 °C		-40 °C	to +85 °C	-40 °C t	o +125 °C	Unit
			Min	Тур	Max	Min	Мах	Min	Max	
74AHC2	G126									
V _{IH}	HIGH-level	V _{CC} = 2.0 V	1.5	-	-	1.5	-	1.5	-	V
	input voltage	V _{CC} = 3.0 V	2.1	-	-	2.1	-	2.1	-	V
		V _{CC} = 5.5 V	3.85	-	-	3.85	-	3.85	-	V
V _{IL}	LOW-level	V _{CC} = 2.0 V	-	-	0.5	-	0.5	-	0.5	V
	input voltage	V _{CC} = 3.0 V	-	-	0.9	-	0.9	-	0.9	V
		V _{CC} = 5.5 V	-	-	1.65	-	1.65	-	1.65	V
V _{OH} HIGH-level		V _I = V _{IH} or V _{IL}								
	output voltage	I_0 = -50 µA; V_{CC} = 2.0 V	1.9	2.0	-	1.9	-	1.9	-	V
		I _O = -50 μA; V _{CC} = 3.0 V	2.9	3.0	-	2.9	-	2.9	-	V
		I _O = -50 μA; V _{CC} = 4.5 V	4.4	4.5	-	4.4	-	4.4	-	V
		I_0 = -4.0 mA; V_{CC} = 3.0 V	2.58	-	-	2.48	-	2.40	-	V
		I _O = -8.0 mA; V _{CC} = 4.5 V	3.94	-	-	3.8	-	3.70	-	V
V _{OL}	LOW-level	V _I = V _{IH} or V _{IL}								
	output voltage	I _O = 50 μA; V _{CC} = 2.0 V	-	0	0.1	-	0.1	-	0.1	V
		I _O = 50 μA; V _{CC} = 3.0 V	-	0	0.1	-	0.1	-	0.1	V
		I _O = 50 μA; V _{CC} = 4.5 V	-	0	0.1	-	0.1	-	0.1	V
		I _O = 4.0 mA; V _{CC} = 3.0 V	-	-	0.36	-	0.44	-	0.55	V
		I _O = 8.0 mA; V _{CC} = 4.5 V	-	-	0.36	-	0.44	-	0.55	V
I _{OZ}	OFF-state output current	$V_{I} = V_{CC}$ or GND; $V_{CC} = 5.5 V$	-	-	0.25	-	2.5	-	10	μA
I	input leakage current	V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V	-	-	0.1	-	1.0	-	2.0	μA
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	1.0	-	10	-	40	μA
CI	input capacitance		-	1.5	10	-	10	-	10	pF

Symbol	Parameter	Conditions		25 °C		-40 °C	to +85 °C	-40 °C t	o +125 °C	Unit
			Min	Тур	Мах	Min	Max	Min	Max	1
74AHCT	2G126							1		
V _{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	2.0	-	2.0	-	V
V _{IL}	LOW-level input voltage	V_{CC} = 4.5 V to 5.5 V	-	-	0.8	-	0.8	-	0.8	V
V _{OH}	HIGH-level	$V_{I} = V_{IH} \text{ or } V_{IL}; V_{CC} = 4.5 \text{ V}$								
	output voltage	I _O = -50 μA	4.4	4.5	-	4.4	-	4.4	-	V
		I _O = -8.0 mA	3.94	-	-	3.8	-	3.70	-	V
V _{OL}		$V_{I} = V_{IH} \text{ or } V_{IL}; V_{CC} = 4.5 \text{ V}$								
	output voltage	I _O = 50 μA	-	0	0.1	-	0.1	-	0.1	V
		I _O = 8.0 mA	-	-	0.36	-	0.44	-	0.55	V
I _{OZ}	OFF-state output current	$V_{I} = V_{CC}$ or GND; $V_{CC} = 5.5 V$	-	-	0.25	-	2.5	-	10	μA
lı	input leakage current	V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V	-	-	0.1	-	1.0	-	2.0	μA
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	1.0	-	10	-	40	μA
ΔI _{CC}	additional supply current	per input pin; V _I = 3.4 V; other inputs at V _{CC} or GND; I _O = 0 A; V _{CC} = 5.5 V	-	-	1.35	-	1.5	-	1.5	mA
CI	input capacitance		-	1.5	10	-	10	-	10	pF

11. Dynamic characteristics

Table 8. Dynamic characteristics

GND = 0 V; for test circuit see Fig. 7.

Symbol	Parameter	Conditions		25 °C		-40 °C	to +85 °C	-40 °C t	o +125 °C	Unit
			Min	Тур	Max	Min	Max	Min	Max	1
74AHC2	G126					1	1			
t _{pd}	propagation	nA to nY; see Fig. 5 [1]							
	delay	V _{CC} = 3.0 V to 3.6 V [2]							
		C _L = 15 pF	-	4.7	8.0	1.0	9.5	1.0	11.5	ns
	C _L = 50 pF	-	6.6	11.5	1.0	13.0	1.0	14.5	ns	
		V _{CC} = 4.5 V to 5.5 V [3]							
		C _L = 15 pF	-	3.4	5.5	1.0	6.5	1.0	7.0	ns
		C _L = 50 pF	-	4.8	7.5	1.0	8.5	1.0	9.5	ns
t _{en}	enable time	nOE to nY; see Fig. 6 [1]							
		V _{CC} = 3.0 V to 3.6 V [2]							
		C _L = 15 pF	-	5.0	8.0	1.0	9.5	1.0	11.5	ns
		C _L = 50 pF	-	6.9	11.5	1.0	13.0	1.0	14.5	ns
		V _{CC} = 4.5 V to 5.5 V [3]							
		C _L = 15 pF	-	3.6	5.1	1.0	6.0	1.0	6.5	ns
		C _L = 50 pF	-	4.9	7.5	1.0	9.0	1.0	9.5	ns

Symbol	Parameter	Conditions			25 °C		-40 °C	to +85 °C	-40 °C to +125 °C		Unit
				Min	Тур	Max	Min	Мах	Min	Мах	1
t _{dis}	disable time	nOE to nY; see Fig. 6	[1]								
		V _{CC} = 3.0 V to 3.6 V	[2]								
		C _L = 15 pF		-	6.0	9.7	1.0	11.5	1.0	12.5	ns
		C _L = 50 pF		-	8.3	13.2	1.0	15.0	1.0	16.5	ns
		V _{CC} = 4.5 V to 5.5 V	[3]								
		C _L = 15 pF		-	4.1	6.8	1.0	8.0	1.0	8.5	ns
		C _L = 50 pF		-	5.7	8.8	1.0	10.0	1.0	11.0	ns
C _{PD}	power dissipation capacitance	per buffer; C_L = 50 pF; [4] f_i = 1 MHz; V_I = GND to V_{CC}		-	10	-	-	-	-	-	pF
74AHCT	2G126	1									
t _{pd}	propagation	nA to nY; see Fig. 5	[1]								
	delay	V _{CC} = 4.5 V to 5.5 V	[3]								
		C _L = 15 pF		-	3.4	5.5	1.0	6.5	1.0	7.0	ns
		C _L = 50 pF		-	4.8	7.5	1.0	8.5	1.0	9.5	ns
t _{en}	enable time	nOE to nY; see Fig. 6	[1]								
		V _{CC} = 4.5 V to 5.5 V	[3]								
		C _L = 15 pF		-	3.9	5.1	1.0	6.0	1.0	6.5	ns
		C _L = 50 pF		-	5.1	7.5	1.0	9.0	1.0	9.5	ns
t _{dis}	disable time	nOE to nY; see Fig. 6	[1]								
		V _{CC} = 4.5 V to 5.5 V	[3]								
		C _L = 15 pF		-	4.5	6.8	1.0	8.0	1.0	8.5	ns
		C _L = 50 pF		-	6.1	8.8	1.0	10.0	1.0	11.0	ns
C _{PD}	power dissipation capacitance	per buffer; C_L = 50 pF; f _i = 1 MHz; V _I = GND to V _{CC}	[4]	-	10	-	-	-	-	-	pF

 t_{pd} is the same as t_{PLH} and t_{PHL} ; t_{en} is the same as t_{PZL} and t_{PZH} ; t_{dis} is the same as t_{PLZ} and t_{PHZ} . Typical values are measured at V_{CC} = 3.3 V. [1]

[2]

[3] Typical values are measured at $V_{CC} = 5.0 \text{ V}$. [4] C_{PD} is used to determine the dynamic power dissipation $P_D (\mu W)$. $P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o)$ where:

f_i = input frequency in MHz;

 f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in Volts.



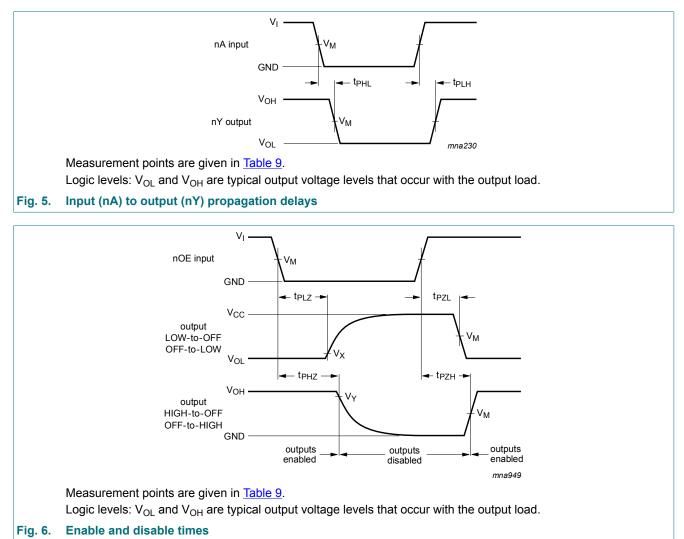


Table 9. Measurement points

Table 5. Measurement point											
Туре	Input	Output									
	V _M	V _M	V _X	V _Y							
74AHC2G126	0.5V _{CC}	0.5V _{CC}	V _{OL} + 0.3 V	V _{OH} - 0.3 V							
74AHCT2G126	1.5 V	0.5V _{CC}	V _{OL} + 0.3 V	V _{OH} - 0.3 V							

74AHC2G126; 74AHCT2G126

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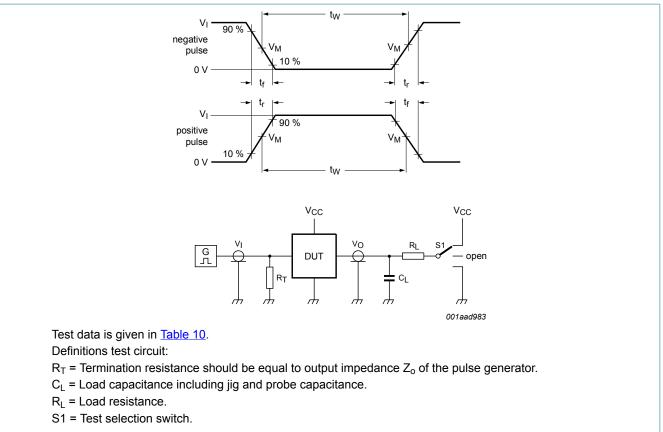
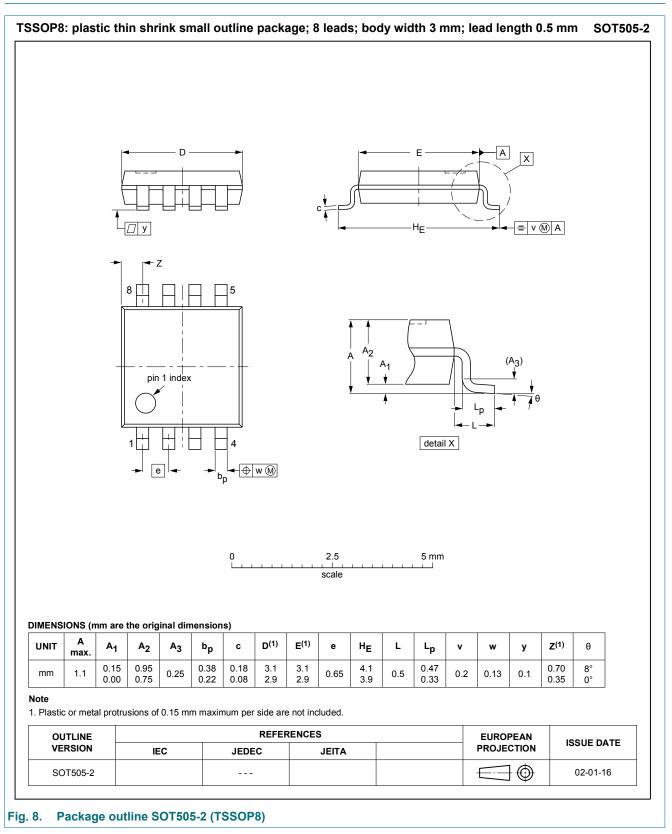


Fig. 7. Test circuit for measuring switching times

Table 10. Test data

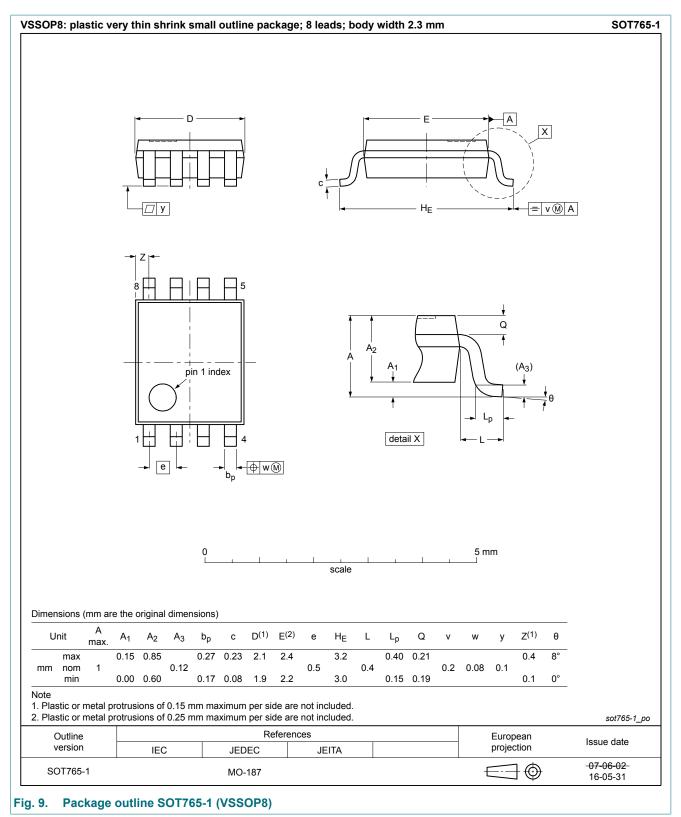
Туре	Input		Load		S1 position			
	VI	t _r , t _f	CL	RL	t _{PHL} , t _{PLH}	t _{PZH} , t _{PHZ}	t _{PZL} , t _{PLZ}	
74AHC2G126	V _{CC}	≤ 3 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}	
74AHCT2G126	3 V	≤ 3 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}	

12. Package outline



74AHC2G126; 74AHCT2G126

Dual buffer/line driver; 3-state



13. Abbreviations

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes			
74AHC_AHCT2G126 v.8	20181119	Product data sheet	-	74AHC_AHCT2G126 v.7			
Modifications:	 The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. 						
	 Type numbers 74AHCT2G126DP (SOT505-2/TSSOP8), 74AHC2G126GD and 74AHCT2G126GD (SOT996-2/XSON8) removed. 						
74AHC_AHCT2G126 v.7	20130506	Product data sheet	-	74AHC_AHCT2G126 v.6			
Modifications:	For type num XSON8.	To type humber 14A10201200D and 14A101201200D A00100 has changed to					
74AHC_AHCT2G126 v.6	20111108	Product data sheet	-	74AHC_AHCT2G126 v.5			
Modifications:	Legal pages updated.						
74AHC_AHCT2G126 v.5	20110324	Product data sheet	-	74AHC_AHCT2G126 v.4			
74AHC_AHCT2G126 v.4	20090427	Product data sheet	-	74AHC_AHCT2G126 v.3			
74AHC_AHCT2G126 v.3	20090115	Product data sheet	-	74AHC_AHCT2G126 v.2			
74AHC_AHCT2G126 v.2	20040921	Product data sheet	-	74AHC_AHCT2G126 v.1			
74AHC_AHCT2G126 v.1	20040113	Product specification	-	-			

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

 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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