



## U74AHC1G126

CMOS IC

### SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

#### DESCRIPTION

The **U74AHC1G126** is a single bus buffer gate/line driver with 3-state output. When OE is low, the Y output are in a high-impedance state. When OE is high, the device passes noninverted data from the A input to the Y output.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pull-down resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

#### FEATURES

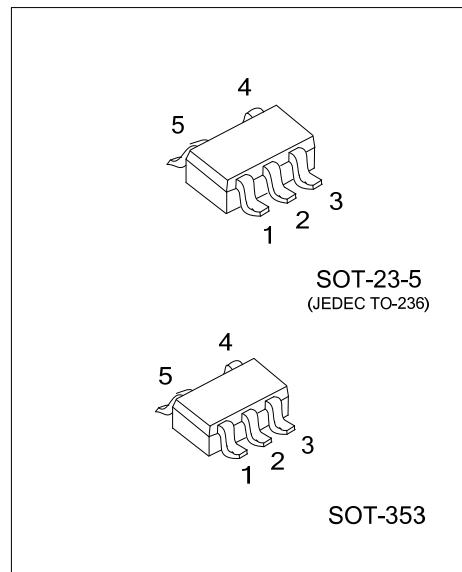
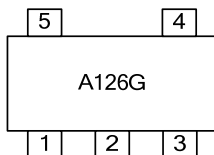
- \* Wide supply voltage range from 2V to 5.5V
- \* Max  $t_{pd}$  of 6 ns from A to Y at 5V
- \* Low power consumption,  $I_{CC} = 1 \mu A$  (Max.) at 5.5V
- \*  $\pm 8$  mA output driver at 5V

#### ORDERING INFORMATION

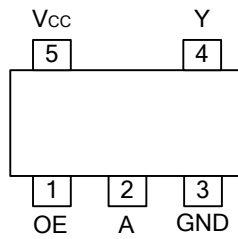
Order Number	Package	Packing
U74AHC1G34G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G126G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G126G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353 (3) G: Halogen Free and Lead Free</p>
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#### MARKING



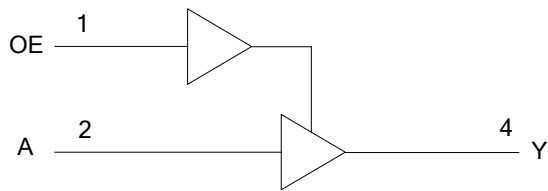
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUT		OUTPUT
OE	A	Y
H	H	H
H	L	L
L	X	Z

■ LOGIC DIAGRAM (positive logic)



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	$V_{CC}$	-0.5~7	V
Input Voltage Range	$V_{IN}$	-0.5~7	V
Output Voltage Range	$V_{OUT}$	-0.5~ $V_{CC}$ +0.5	V
Input Clamp Current ( $V_{IN}<0$ )	$I_{IK}$	-20	mA
Output Clamp Current ( $V_{OUT}<0$ , or $V_{OUT}>V_{CC}$ )	$I_{OK}$	±20	mA
Output Current	$I_{OUT}$	±25	mA
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
Storage Temperature	$T_{STG}$	-65 ~ +150	°C

Notes: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.  
 2. Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
 Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2		5.5	V
High-Level Input Voltage	$V_{IH}$	$V_{CC} = 2V$	1.5			V
		$V_{CC} = 3V$	2.1			V
		$V_{CC} = 5.5V$	3.85			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC} = 2V$			0.5	V
		$V_{CC} = 3V$			0.9	V
		$V_{CC} = 5.5V$			1.65	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
High-level Output Current	$I_{OH}$	$V_{CC} = 2V$			-50	μA
		$V_{CC} = 3.3\pm 0.3V$			-4	mA
		$V_{CC} = 5\pm 0.5V$			-8	mA
Low-level Output Current	$I_{OL}$	$V_{CC} = 2V$			50	μA
		$V_{CC} = 3.3\pm 0.3V$			4	mA
		$V_{CC} = 5\pm 0.5V$			8	mA
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC} = 3.3\pm 0.3V$			100	ns/V
		$V_{CC} = 5\pm 0.5V$			20	ns/V
Operating Temperature	$T_A$		-40		85	°C

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-5	280	°C/W
	SOT-353	350	

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -50 μA, V <sub>CC</sub> = 2V	1.9	2		V
		I <sub>OH</sub> = -50 μA, V <sub>CC</sub> = 3V	2.9	3		
		I <sub>OH</sub> = -50 μA, V <sub>CC</sub> = 4.5V	4.4	4.5		
		I <sub>OH</sub> = -4 mA, V <sub>CC</sub> = 3V	2.58			
		I <sub>OH</sub> = -8 mA, V <sub>CC</sub> = 4.5V	3.94			
Low-Level Output Voltage	V <sub>OL</sub>	I <sub>OH</sub> = 50 μA, V <sub>CC</sub> = 2V			0.1	V
		I <sub>OH</sub> = 50 μA, V <sub>CC</sub> = 3V			0.1	
		I <sub>OH</sub> = 50 μA, V <sub>CC</sub> = 4.5V			0.1	
		I <sub>OH</sub> = 4 mA, V <sub>CC</sub> = 3V			0.36	
		I <sub>OH</sub> = 8 mA, V <sub>CC</sub> = 4.5V			0.36	
Input Leakage Current (A or OE input)	I <sub>I(LEAK)</sub>	V <sub>IN</sub> = 5.5V or GND, V <sub>CC</sub> = 0 to 5.5V			±0.1	μA
High-impedance state Current	I <sub>OZ</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND, V <sub>CC</sub> = 5.5V			±0.25	μA
Quiescent Supply Current	I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND, I <sub>OUT</sub> = 0, V <sub>CC</sub> = 5.5V			1	μA
Input Capacitance	C <sub>IN</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND, V <sub>CC</sub> =5V		4	10	pF
Output Capacitance	C <sub>OUT</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND, V <sub>CC</sub> =5V		10		pF

■ SWITCHING CHARACTERISTICS (V<sub>CC</sub> = 3.3V ± 0.3V, T<sub>A</sub> =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t <sub>pd</sub>	t <sub>PLH</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		5.6	8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		8.1	11.5	
	t <sub>PHL</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		5.6	8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		8.1	11.5	
Propagation delay from input OE to output Y, t <sub>en</sub>	t <sub>PZH</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		5.4	8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		7.9	11.5	
	t <sub>PZL</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		5.4	8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		7.9	11.5	
Propagation delay from input OE to output Y, t <sub>dis</sub>	t <sub>PHZ</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		7	9.7	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		9.5	13.2	
	t <sub>PLZ</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		7	9.7	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		9.5	13.2	

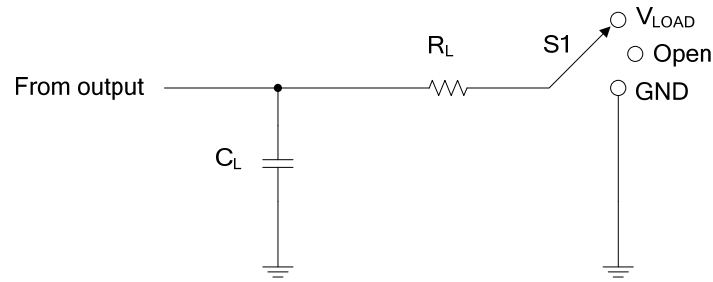
■ SWITCHING CHARACTERISTICS (V<sub>CC</sub> = 5V ± 0.5V, T<sub>A</sub> =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t <sub>pd</sub>	t <sub>PLH</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		3.8	5.5	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		5.3	7.5	
	t <sub>PHL</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		3.8	5.5	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		5.3	7.5	
Propagation delay from input OE to output Y, t <sub>en</sub>	t <sub>PZH</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		3.6	5.1	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		5.1	7.1	
	t <sub>PZL</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		3.6	5.1	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		5.1	7.1	
Propagation delay from input OE to output Y, t <sub>dis</sub>	t <sub>PHZ</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		4.6	6.8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		6.1	8.8	
	t <sub>PLZ</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1kΩ		4.6	6.8	ns
		C <sub>L</sub> =50pF, R <sub>L</sub> =1kΩ		6.1	8.8	

■ OPERATING CHARACTERISTICS (T<sub>A</sub> =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	TYP	UNIT
Power dissipation capacitance	C <sub>pd</sub>	V <sub>CC</sub> = 5V, f=1MHz, No load	14	pF

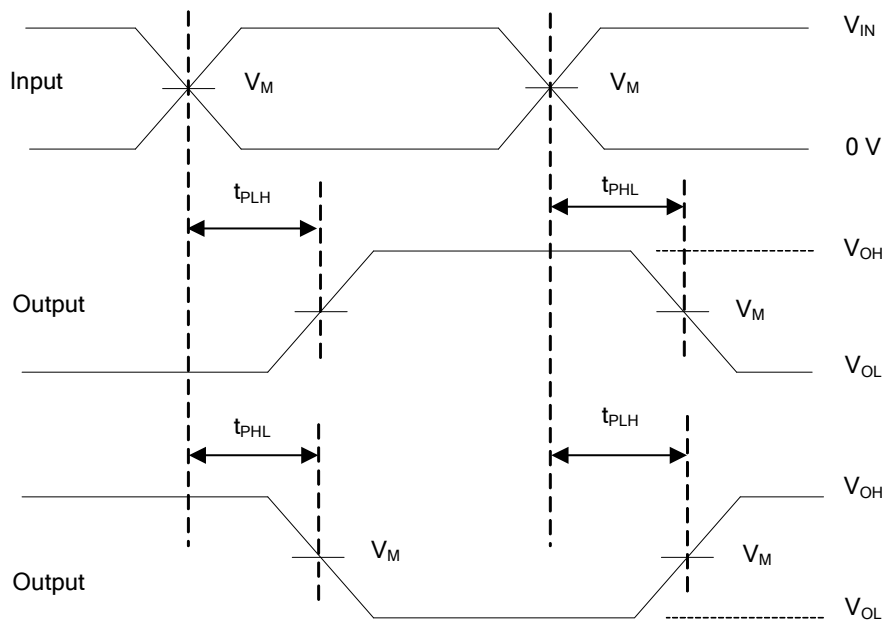
## TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

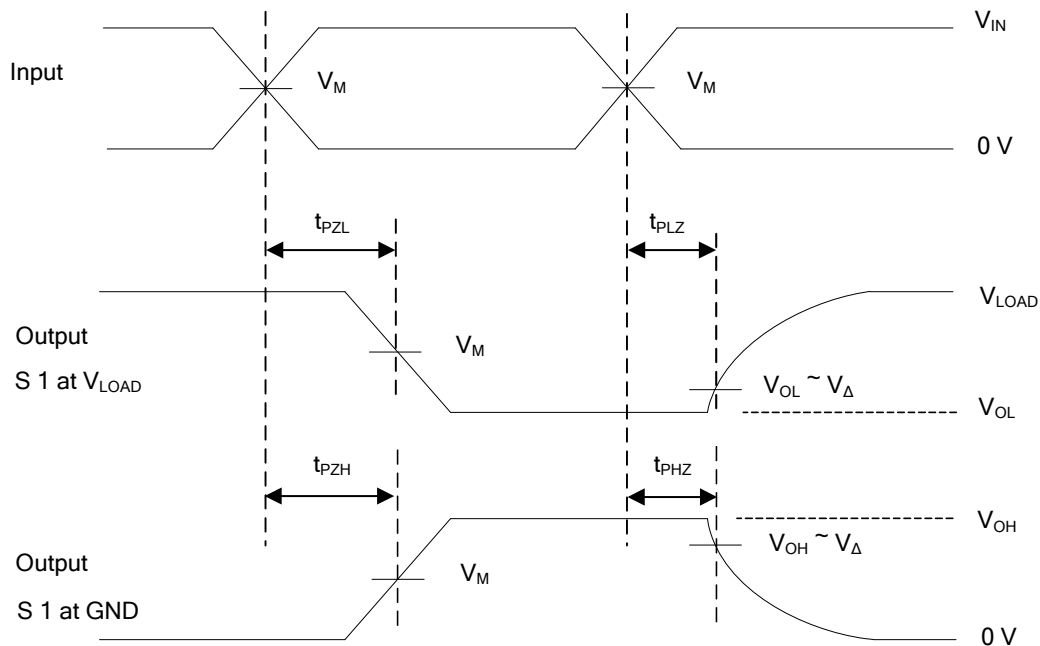
TEST	S1
$t_{PLH}/t_{PHL}$	Open
$t_{PLZ}/t_{PZL}$	$V_{LOAD}$
$t_{PHZ}/t_{PZH}$	GND

$V_{CC}$	Input		$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
	$V_{IN}$	$t_r, t_f$					
$3.3V \pm 0.3V$	$V_{CC}$	$\leq 3ns$	$V_{CC}/2$	$V_{CC}$	15pF	1k $\Omega$	0.3V
					50pF		
$5V \pm 0.5V$	$V_{CC}$	$\leq 3ns$	$V_{CC}/2$	$V_{CC}$	15pF	1k $\Omega$	0.5V
					50pF		



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES

NoteS: 1. C<sub>L</sub> includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR ≤1MHz, Z<sub>O</sub> = 50Ω.

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