

**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.

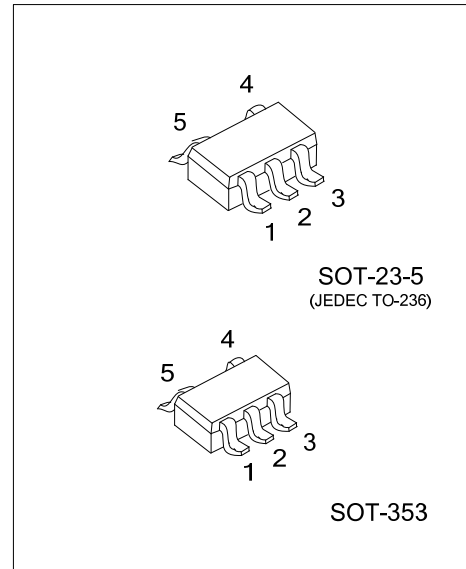
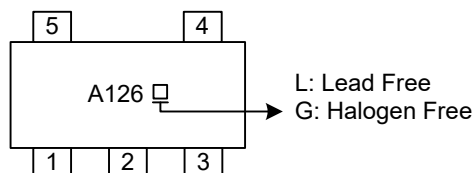
FEATURES

- * 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
- * ± 8 mA output driver at 5V

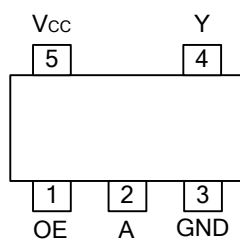
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G126L-AE5-R	U74AHC1G126G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G126L-AL5-R	U74AHC1G126G-AL5-R	SOT-353	Tape Reel

U74AHC1G126G-AE5-R	(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

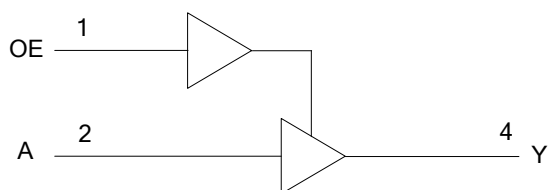
■ PIN CONFIGURATION



■ FUNCTION TABLE

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

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. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

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		+125	°C

■ THERMAL DATA

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

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

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

■ SWITCHING CHARACTERISTICS ($V_{CC}=3.3V\pm 0.3V$, $R_L=1k\Omega$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t_{pd}	t_{PLH}	$C_L=15pF$		5.6	8	ns
		$C_L=50pF$		8.1	11.5	
	t_{PHL}	$C_L=15pF$		5.6	8	ns
		$C_L=50pF$		8.1	11.5	
Propagation delay from input OE to output Y, t_{en}	t_{PZH}	$C_L=15pF$		5.4	8	ns
		$C_L=50pF$		7.9	11.5	
	t_{PZL}	$C_L=15pF$		5.4	8	ns
		$C_L=50pF$		7.9	11.5	
Propagation delay from input OE to output Y, t_{dis}	t_{PHZ}	$C_L=15pF$		7	9.7	ns
		$C_L=50pF$		9.5	13.2	
	t_{PLZ}	$C_L=15pF$		7	9.7	ns
		$C_L=50pF$		9.5	13.2	

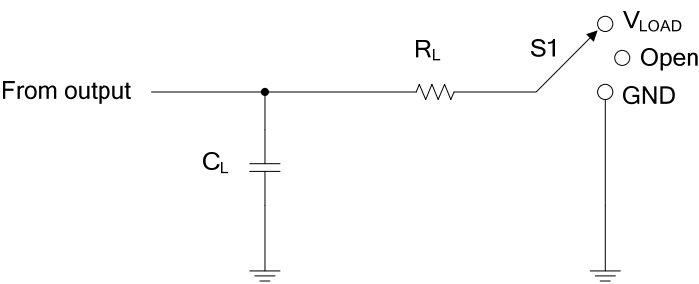
■ SWITCHING CHARACTERISTICS ($V_{CC}=5V\pm 0.5V$, $R_L=1k\Omega$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t_{pd}	t_{PLH}	$C_L=15pF$		3.8	5.5	ns
		$C_L=50pF$		5.3	7.5	
	t_{PHL}	$C_L=15pF$		3.8	5.5	ns
		$C_L=50pF$		5.3	7.5	
Propagation delay from input OE to output Y, t_{en}	t_{PZH}	$C_L=15pF$		3.6	5.1	ns
		$C_L=50pF$		5.1	7.1	
	t_{PZL}	$C_L=15pF$		3.6	5.1	ns
		$C_L=50pF$		5.1	7.1	
Propagation delay from input OE to output Y, t_{dis}	t_{PHZ}	$C_L=15pF$		4.6	6.8	ns
		$C_L=50pF$		6.1	8.8	
	t_{PLZ}	$C_L=15pF$		4.6	6.8	ns
		$C_L=50pF$		6.1	8.8	

■ OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power dissipation capacitance	C_{PD}	$V_{CC}=5V$, $f=1MHz$, No load		14		pF

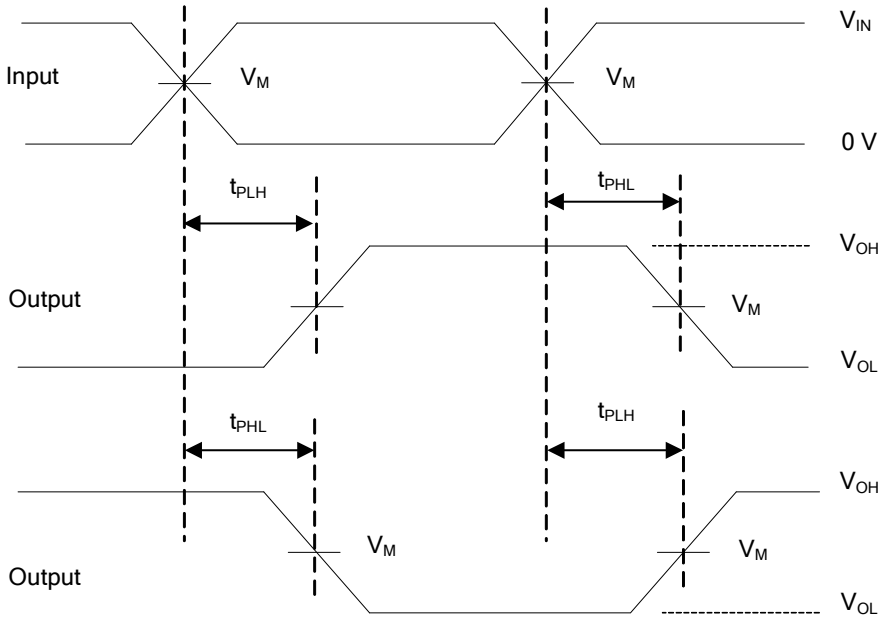
■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

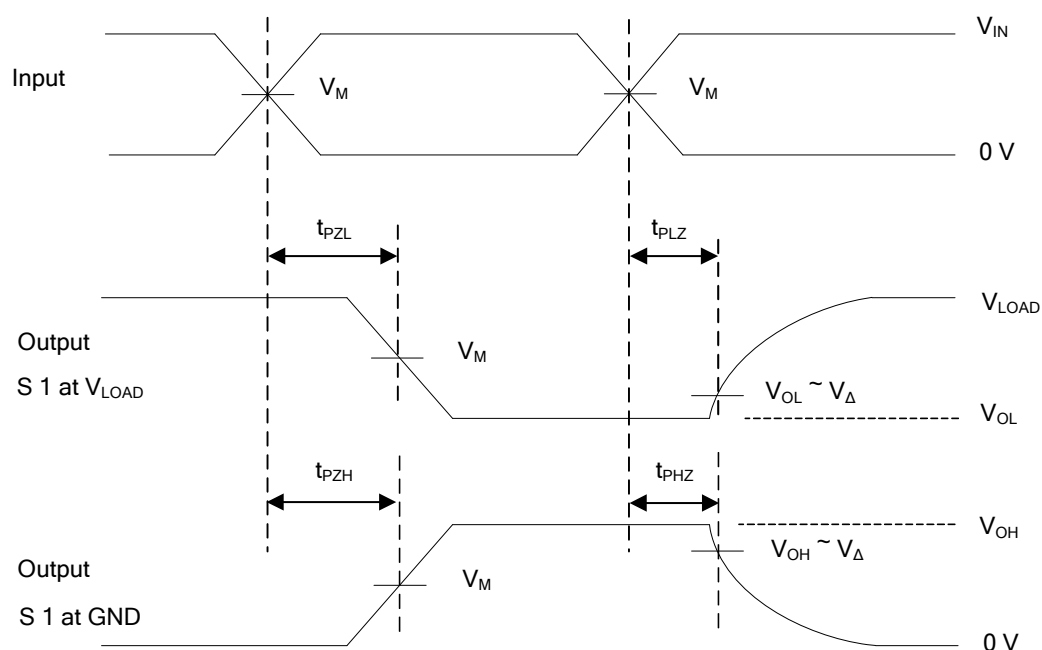
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

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



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES

■ TEST CIRCUIT AND WAVEFORMS (Cont.)



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES

NoteS: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{MHz}$, $Z_O = 50\Omega$.

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