



U74AHC1G125

CMOS IC

SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

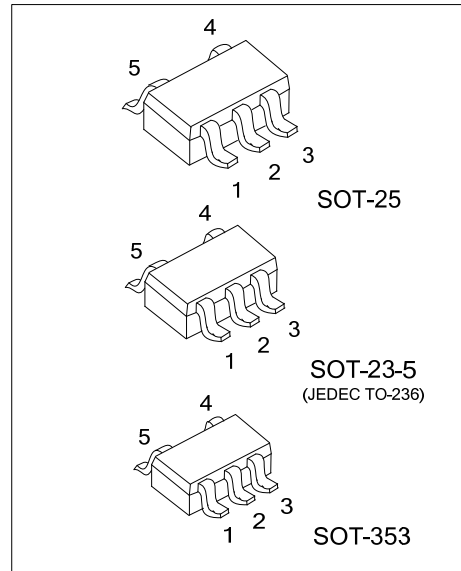
DESCRIPTION

The **U74AHC1G125** is a single bus buffer gate/line driver with 3-state output. When \overline{OE} is high, the Y output are in a high-impedance state. When \overline{OE} is low, 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, \overline{OE} should be tied to V_{CC} through a pull-up 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
- * $\pm 8mA$ output driver at 5V

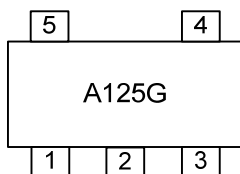


ORDERING INFORMATION

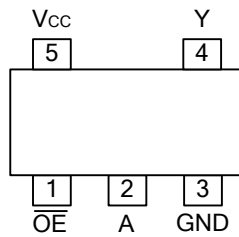
Ordering Number	Package	Packing
U74AHC1G125G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G125G-AF5-R	SOT-25	Tape Reel
U74AHC1G125G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G125G-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free</p>
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MARKING



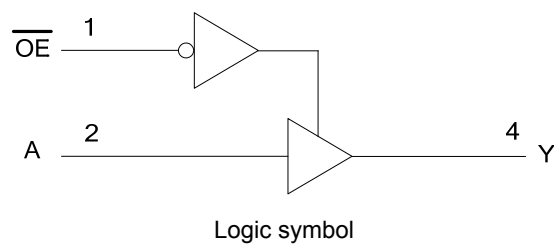
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUT		OUTPUT
$\overline{\text{OE}}$	A	Y
L	H	H
L	L	L
H	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. 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-5	280	°C/W
	SOT-25	230	
	SOT-353	350	

■ 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			
		$V_{CC} = 5.5V$	3.85			
Low-Level Input Voltage	V_{IL}	$V_{CC} = 2V$			0.5	V
		$V_{CC} = 3V$			0.9	
		$V_{CC} = 5.5V$			1.65	
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
		$V_{CC} = 3.3±0.3V$			-4	mA
		$V_{CC} = 5±0.5V$			-8	
Low-Level Output Current	I_{OL}	$V_{CC} = 2V$			50	μA
		$V_{CC} = 3.3±0.3V$			4	mA
		$V_{CC} = 5±0.5V$			8	
Input Transition Rise or Fall Rate	$\Delta t/\Delta V$	$V_{CC} = 3.3±0.3V$			100	ns/V
		$V_{CC} = 5±0.5V$			20	
Operating Temperature	T_A		-40		125	°C

■ ELECTRICAL CHARACTERISTICS (T_A =25°C , unless otherwise specified)

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

■ SWITCHING CHARACTERISTICS (V_{CC} = 3.3V ± 0.3V, T_A =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t _{PD}	t _{PLH}	C _L =15pF, R _L =1kΩ		5.6	8	ns
		C _L =50pF, R _L =1kΩ		8.1	11.5	
	t _{PHL}	C _L =15pF, R _L =1kΩ		5.6	8	ns
		C _L =50pF, R _L =1kΩ		8.1	11.5	
Propagation delay from input \overline{OE} to output Y, t _{EN}	t _{PZH}	C _L =15pF, R _L =1kΩ		5.4	8	ns
		C _L =50pF, R _L =1kΩ		7.9	11.5	
	t _{PZL}	C _L =15pF, R _L =1kΩ		5.4	8	ns
		C _L =50pF, R _L =1kΩ		7.9	11.5	
Propagation delay from input \overline{OE} to output Y, t _{DIS}	t _{PHZ}	C _L =15pF, R _L =1kΩ		7	9.7	ns
		C _L =50pF, R _L =1kΩ		9.5	13.2	
	t _{PLZ}	C _L =15pF, R _L =1kΩ		7	9.7	ns
		C _L =50pF, R _L =1kΩ		9.5	13.2	

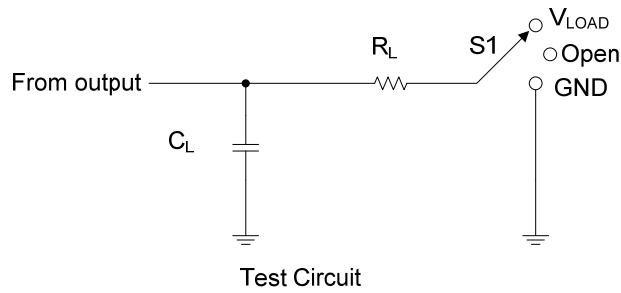
■ SWITCHING CHARACTERISTICS (V_{CC} = 5V ± 0.5V, T_A =25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input A to output Y, t _{PD}	t _{PLH}	C _L =15pF, R _L =1kΩ		3.8	5.5	ns
		C _L =50pF, R _L =1kΩ		5.3	7.5	
	t _{PHL}	C _L =15pF, R _L =1kΩ		3.8	5.5	ns
		C _L =50pF, R _L =1kΩ		5.3	7.5	
Output enable time from input \overline{OE} to output Y, t _{EN}	t _{PZH}	C _L =15pF, R _L =1kΩ		3.6	5.1	ns
		C _L =50pF, R _L =1kΩ		5.1	7.1	
	t _{PZL}	C _L =15pF, R _L =1kΩ		3.6	5.1	ns
		C _L =50pF, R _L =1kΩ		5.1	7.1	
Output disable time from input \overline{OE} to output Y, t _{DIS}	t _{PHZ}	C _L =15pF, R _L =1kΩ		4.6	6.8	ns
		C _L =50pF, R _L =1kΩ		6.1	8.8	
	t _{PLZ}	C _L =15pF, R _L =1kΩ		4.6	6.8	ns
		C _L =50pF, R _L =1kΩ		6.1	8.8	

■ OPERATING CHARACTERISTICS (T_A =25°C)

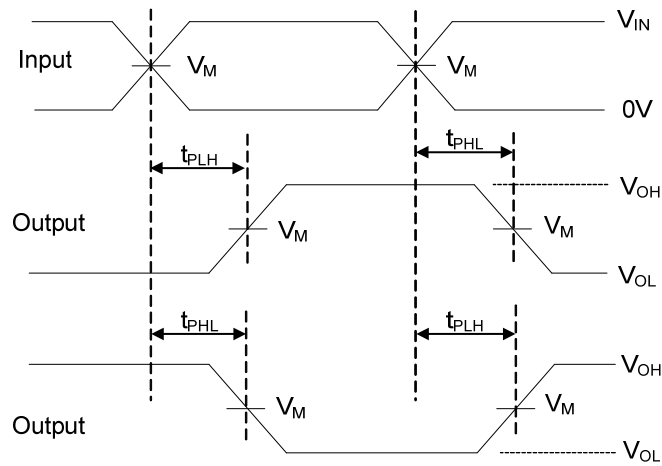
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power dissipation capacitance	C _{PD}	V _{CC} = 5V, f=1MHz, No load		14		pF

■ TEST CIRCUIT AND WAVEFORMS



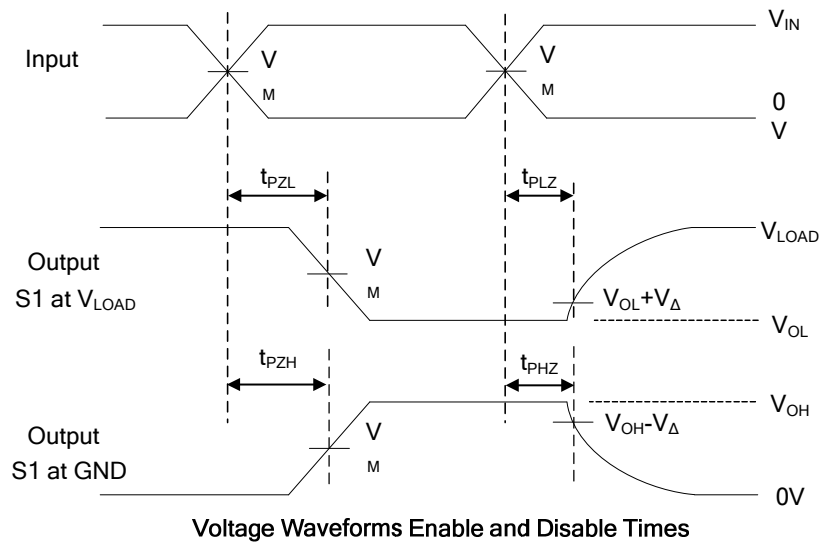
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R, t_F					
3.3V±0.3V	V_{CC}	≤3ns	$V_{CC}/2$	V_{CC}	15pF	1kΩ	0.3V
					50pF		
5V±0.5V	V_{CC}	≤3ns	$V_{CC}/2$	V_{CC}	15pF	1kΩ	0.5V
					50pF		



Voltage Waveforms Propagation Delay Times

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



- Notes: 1. C_L includes probe and jig capacitance.
 2. All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 1\text{MHz}$, $Z_O = 50\Omega$.

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