



U74AUC1G125

Preliminary

CMOS IC

SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

DESCRIPTION

The **U74AUC1G125** is a single line driver with a 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.

FEATURES

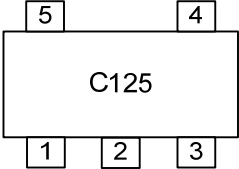
- * Operate from 0.9V to 2.7V
- * Low power dissipation: $I_{CC}=10\mu A$ (Max.)
- * $\pm 8mA$ Output Driver : $V_{CC}=1.8V$
- * I_{OFF} Supports partial-Power-Down Mode Operation and back drive protection

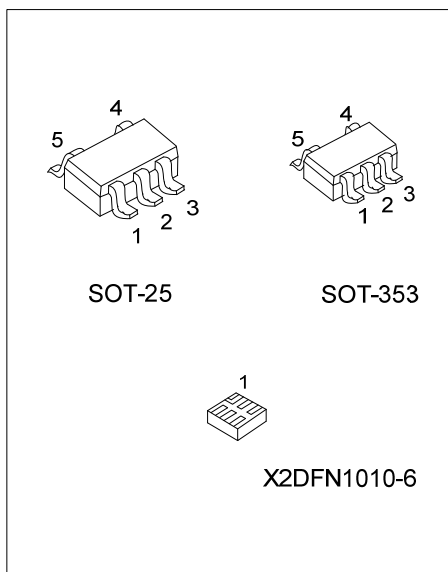
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AUC1G125L-AF5-R	U74AUC1G125G-AF5-R	SOT-25	Tape Reel
U74AUC1G125L-AL5-R	U74AUC1G125G-AL5-R	SOT-353	Tape Reel
U74AUC1G125L-K06-1010X2-R	U74AUC1G125G-K06-1010X2-R	X2DFN1010-6	Tape Reel

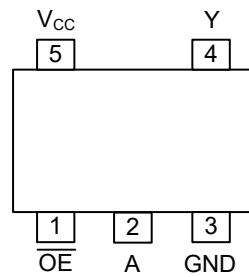
U74AUC1G125G-AF5-R 	(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 K06-1010X2: X2DFN1010-6 (3) G: Halogen Free and Lead Free
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MARKING

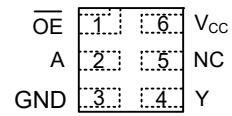
SOT-25 / SOT-353	X2DFN1010-6
	



PIN CONFIGURATION



SOT-25 / SOT-353

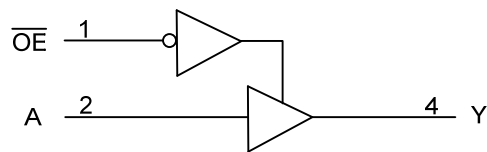
X2DFN1010-6
(TOP VIEW)

FUNCTION TABLE

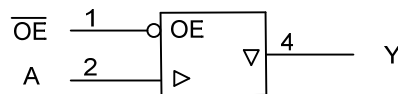
INPUT($\overline{OE}$)	INPUT(A)	OUTPUT(Y)
L	H	H
L	L	L
H	X	Z

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

LOGIC DIAGRAM (positive logic)



Logic Symbol



IEC Logic Symbol

■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +3.6	V
Input Voltage	V_{IN}		-0.5 ~ +3.6	V
Output Voltage	V_{OUT}	Enable mode	-0.5 ~ $V_{CC} + 0.5$	V
		Power-down mode	-0.5 ~ +3.6	V
V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}	$V_{OUT}=0 \sim V_{CC}$	±20	mA
Input Clamp Current	I_{IK}	$V_{IN}<0$	-50	mA
Output Clamp Current	I_{OK}	$V_{OUT}<0$	-50	mA
Storage Temperature Range	T_{STG}		-65 ~ +150	°C

Note: 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 CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	0.9		2.7	V
Input Voltage	V_{IN}		0		3.6	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Operating Temperature	T_A		-40		+125	°C
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=0.9V \sim 1.6V$			20	ns/V
		$V_{CC}=1.65V \sim 1.95V$			10	ns/V
		$V_{CC}=2.3V \sim 2.7V$			3	ns/V

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^\circ\text{C}$			$T_A=-40\sim+125^\circ\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-level Input Voltage	V_{IH}	$V_{CC}=0.9V$	V_{CC}			V_{CC}			V
		$V_{CC}=1.1V \sim 1.95V$	$0.65 \times V_{CC}$			$0.65 \times V_{CC}$			V
		$V_{CC}=2.3V \sim 2.7V$	1.7			1.7			V
Low-level Input Voltage	V_{IL}	$V_{CC}=0.9V$			0			0	V
		$V_{CC}=1.1V \sim 1.95V$			$0.35 \times V_{CC}$			$0.35 \times V_{CC}$	V
		$V_{CC}=2.3V \sim 2.7V$			0.7			0.7	V
High-Level Output Voltage	V_{OH}	$V_{CC}=0.9V \sim 2.7V, I_{OH}=-100\mu\text{A}$	$V_{CC}-0.1$			$V_{CC}-0.1$			V
		$V_{CC}=0.9V, I_{OH}=-0.7\text{mA}$		0.45			0.45		V
		$V_{CC}=1.1V, I_{OH}=-3\text{mA}$	0.8			0.6			V
		$V_{CC}=1.4V, I_{OH}=-5\text{mA}$	1			0.8			V
		$V_{CC}=1.65V, I_{OH}=-8\text{mA}$	1.2			1			V
		$V_{CC}=2.3V, I_{OH}=-9\text{mA}$	1.8			1.6			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=0.9V \sim 2.7V, I_{OL}=100\mu\text{A}$			0.2			0.2	V
		$V_{CC}=0.9V, I_{OL}=0.7\text{mA}$		0.25			0.35		V
		$V_{CC}=1.1V, I_{OL}=3\text{mA}$			0.3			0.4	V
		$V_{CC}=1.4V, I_{OL}=5\text{mA}$			0.4			0.5	V
		$V_{CC}=1.65V, I_{OL}=8\text{mA}$			0.45			0.6	V
		$V_{CC}=2.3V, I_{OL}=9\text{mA}$			0.6			0.8	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Leakage Current A or OE Input	I _{I(LEAK)}	V _{CC} =2.7V, V _{IN} = V _{CC} or GND			±5			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =2.7V			±10			±10	μA
3-state Output OFF-state Current	I _{OZ}	V _{CC} =2.7V, V _{OUT} =V _{CC} or GND			±10			±10	μA
Quiescent Supply Current	I _{CC}	V _{CC} =0.9V to 2.7V, V _{IN} =V _{CC} or GND, I _{OUT} =0			10			10	μA

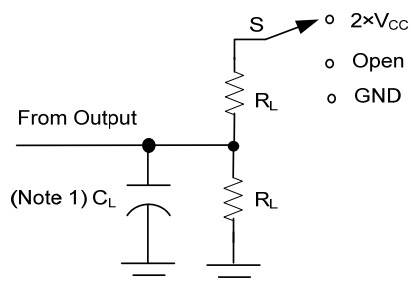
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		T _A =25°C			T _A =-40~-+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay from Input (A) to Output (Y)	t _{PLH} / t _{PHL}	C _L =15pF, R _L =2kΩ	V _{CC} =0.9V		25			25		ns
			V _{CC} =1.2±0.1V	6.1		10.5	5.5		12.5	ns
			V _{CC} =1.5±0.1V	4.5		8.5	3.5		10.5	ns
			V _{CC} =1.8±0.15V	2.5		5.5	1.5		7.5	ns
			V _{CC} =2.5±0.2V	1		3.1	0.5		5	ns
		C _L =30pF, R _L =1kΩ	V _{CC} =1.8±0.15V	2.5		5.5	1.8		7.5	ns
		C _L =30pF, R _L =500Ω	V _{CC} =2.5±0.2V	1.5		3.5	0.8		5.5	ns
3-State Output Enable time from Input ($\overline{\text{OE}}$) to Output (Y)	t _{PZH} / t _{PZL}	C _L =15pF, R _L =2kΩ	V _{CC} =0.9V		25			25		ns
			V _{CC} =1.2±0.1V	8.5		13	7.5		14.5	ns
			V _{CC} =1.5±0.1V	6		10	5.5		11.5	ns
			V _{CC} =1.8±0.15V	4		7	3.5		8.5	ns
			V _{CC} =2.5±0.2V	0.5		3.3	0.2		4.5	ns
		C _L =30pF, R _L =1kΩ	V _{CC} =1.8±0.15V	4.5		7.5	3.5		8.5	ns
		C _L =30pF, R _L =500Ω	V _{CC} =2.5±0.2V	0.8		4	0.4		5.5	ns
3-State Output Disable time from Input ($\overline{\text{OE}}$) to Output (Y)	t _{PLZ} / t _{PHZ}	C _L =15pF, R _L =2kΩ	V _{CC} =0.9V		25			25		ns
			V _{CC} =1.2±0.1V	3.8		9.5	2.5		12.5	ns
			V _{CC} =1.5±0.1V	2.3		8.6	1.8		10.5	ns
			V _{CC} =1.8±0.15V	1.5		7.2	1		9.2	ns
			V _{CC} =2.5±0.2V	0.9		5	0.5		6.5	ns
		C _L =30pF, R _L =1kΩ	V _{CC} =1.8±0.15V	1.8		7.2	1.1		8.5	ns
		C _L =30pF, R _L =500Ω	V _{CC} =2.5±0.2V	0.8		4	0.4		5.5	ns

■ OPERATING CHARACTERISTICS (f=10MHz, T_A=25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{CC} =2.5V, V _{IN} =V _{CC} or GND		5		pF
Output Capacitance	C _O	V _{CC} =2.5V, V _{IN} =V _{CC} or GND		7.6		pF
Power Dissipation Capacitance (Outputs enabled)	C _{PD}	V _{CC} =0.9V		14		pF
		V _{CC} =1.2V		14		pF
		V _{CC} =1.5V		14		pF
		V _{CC} =1.8V		15		pF
		V _{CC} =2.5V		16		pF
Power Dissipation Capacitance (Outputs Disabled)	C _{PD}	V _{CC} =0.9V		1.5		pF
		V _{CC} =1.2V		1.5		pF
		V _{CC} =1.5V		1.5		pF
		V _{CC} =1.8V		2		pF
		V _{CC} =2.5V		2.5		pF

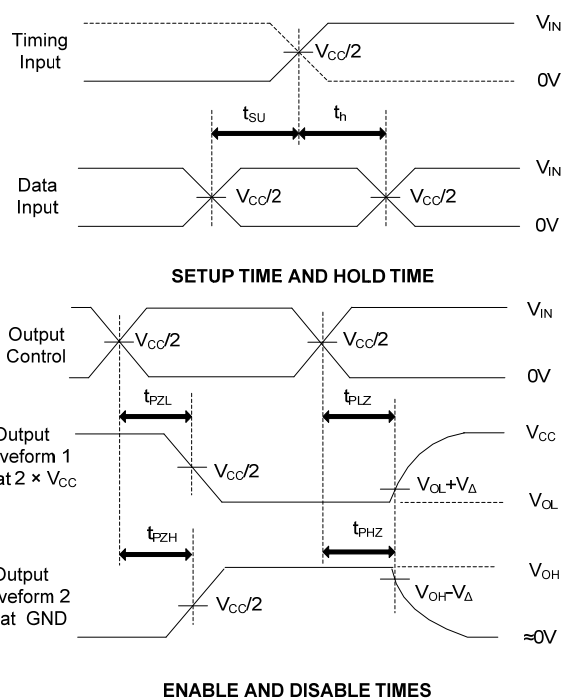
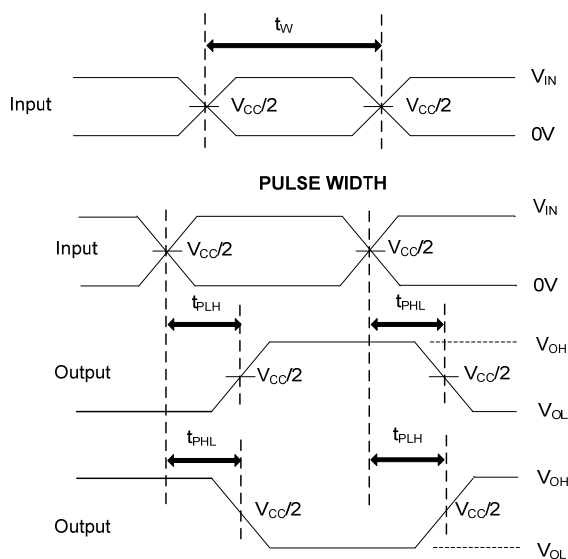
■ TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$

TEST CIRCUIT

V_{CC}	C_L	R_L	V_{Δ}
0.9V	15pF	2k Ω	0.1V
1.2V $\pm$ 0.1V	15pF	2k Ω	0.1V
1.5V $\pm$ 0.1V	15pF	2k Ω	0.1V
1.8V $\pm$ 0.15V	15pF	2k Ω	0.15V
2.5V $\pm$ 0.2V	15pF	2k Ω	0.15V
1.8V $\pm$ 0.15V	30pF	1k Ω	0.15V
2.5V $\pm$ 0.2V	30pF	500 Ω	0.15V



■ TEST CIRCUIT AND WAVEFORMS (Cont.)

Notes: 1. C_L includes probe and jig capacitance.

2. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control

3. All input pulses are supplied by generators having the following characteristics: PRR 10 MHz, $Z = 50\ \Omega$, slew rate 1 V/ns.

4. The outputs are measured one at a time, with one transition per measurement.

5. t_{PLZ} and t_{PHZ} are the same as t_{dis} .

6. t_{PZL} and t_{PZH} are the same as t_{en} .

7. t_{PLH} and t_{PHL} are the same as t_{PD}

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