



U74LVC1G125

CMOS IC

BUS BUFFER/LINE DRIVER 3-STATE

DESCRIPTION

The **U74LVC1G125** is a single bus buffer/line driver with 3-state output. When the output enable (\overline{OE}) is high the output will be disabled. In contrast, when the \overline{OE} is low, true data will pass from A input to the Y output.

This device has power-down protective circuit to prevent the device from destruction when it is powered down.

FEATURES

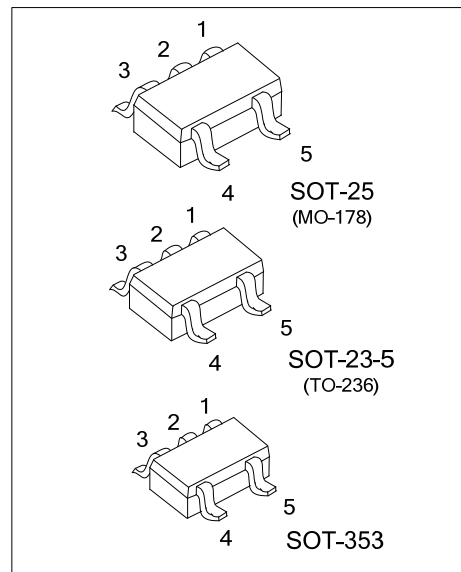
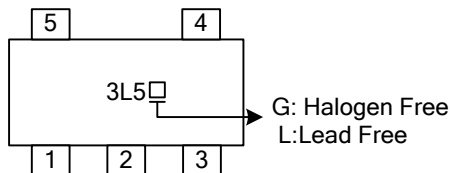
- * Operate From 1.65V to 5.5V
- * Inputs Accept Voltages to 5.5V
- * High Noise Immunity
- * Low Power Dissipation
- * Direct Interface With TTL Level

ORDERING INFORMATION

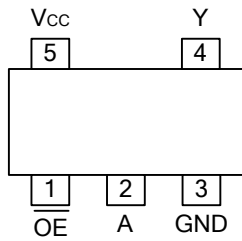
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G125L-AE5-R	U74LVC1G125G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G125L-AF5-R	U74LVC1G125G-AF5-R	SOT-25	Tape Reel
U74LVC1G125L-AL5-R	U74LVC1G125G-AL5-R	SOT-353	Tape Reel

<p>U74LVC1G125L-AL5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353, AF5: SOT-25 (3) G: Halogen Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

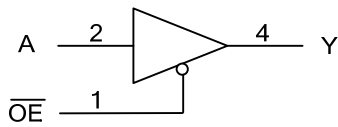


■ FUNCTION TABLE

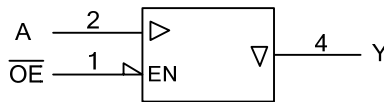
INPUT(\overline{OE})	INPUT(A)	OUTPUT(Y)
L	L	L
L	H	H
H	X	Z

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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +6.5	V
Input Voltage	V_{IN}	-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	Enable mode	-0.5 ~ $V_{CC} + 0.5$
		Disable mode	-0.5 ~ +6.5
		Power-down mode	-0.5 ~ +6.5
V_{CC} or GND Current	I_{CC}	±100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})	I_{OUT}	±50	mA
Input Clamp Current ($V_{IN}<0$)	I_{IK}	-50	mA
Output Clamp Current ($V_{OUT}>V_{CC}$ or $V_{OUT}<0$)	I_{OK}	±50	mA
Power Dissipation ($T_A=-40^{\circ}C \sim +125^{\circ}C$)	P_D	SOT-23-5	300
		SOT-25	360
		SOT-353	250
Operating Temperature	T_{OPR}	-40 ~ +125	$^{\circ}C$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}C$

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	1.65		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	$V_{CC}=1.65V \sim 5.5V$; Enable mode	0		V_{CC}	V
		$V_{CC}=1.65V \sim 5.5V$; Disable mode	0		5.5	V
		$V_{CC}=0V$; Power-down mode	0		5.5	V
Input Transition Rise or Fall Rate	t_R/t_F	$V_{CC}=1.65V \sim 2.7V$			20	ns/V
		$V_{CC}=2.7V \sim 5.5V$			10	ns/V

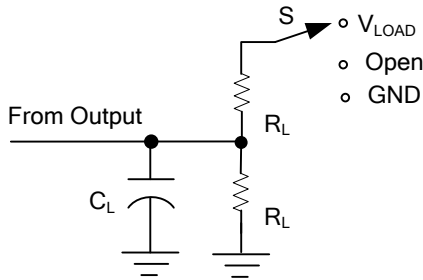
■ ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65*V _{CC}			V
		V _{CC} =2.3V ~ 2.7V	1.7			V
		V _{CC} =2.7V ~ 3.6V	2			V
		V _{CC} =4.5V ~ 5.5V	0.7*V _{CC}			V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V			0.35*V _{CC}	V
		V _{CC} =2.3V ~ 2.7V			0.7	V
		V _{CC} =2.7V ~ 3.6V			0.8	V
		V _{CC} =4.5V ~ 5.5V			0.3*V _{CC}	V
High-Level Output Voltage	V _{OH}	I _{OH} =-100μA, V _{CC} =1.65 ~ 5.5V	V _{CC} -0.1			V
		I _{OH} =-4mA, V _{CC} =1.65V	1.2			V
		I _{OH} =-8mA, V _{CC} =2.3V	1.9			V
		I _{OH} =-12mA, V _{CC} =2.7V	2.2			V
		I _{OH} =-24mA, V _{CC} =3.0V	2.3			V
		I _{OH} =-32mA, V _{CC} =4.5V	3.8			V
Low-Level Output Voltage	V _{OL}	I _{OL} =100μA, V _{CC} =1.65 ~ 5.5V			0.1	V
		I _{OL} =4mA, V _{CC} =1.65V			0.45	V
		I _{OL} =8mA, V _{CC} =2.3V			0.3	V
		I _{OL} =12mA, V _{CC} =2.7V			0.4	V
		I _{OL} =24mA, V _{CC} =3.0V			0.55	V
		I _{OL} =32mA, V _{CC} =4.5V			0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{IN} =5.5V or GND, V _{CC} =5.5V		±0.1	±5	μA
Power OFF Leakage Current	I _{OFF}	V _{IN} or V _{OUT} =5.5V, V _{CC} =0V		±0.1	±10	μA
3-State Output OFF-State Current	I _{OZ}	V _{IN} =V _{IH} or V _{IL} , V _{OUT} =V _{CC} or GND, V _{CC} =5.5V		±0.1	±10	μA
Quiescent Supply Current	I _Q	V _{IN} =V _{CC} or GND, I _{OUT} =0, V _{CC} =5.5V		0.1	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =2.3 ~ 5.5V, V _{IN} =V _{CC} -0.6V, I _{OUT} =0		5	500	μA

■ SWITCHING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay From Input A to Output Y	t _{PLH} / t _{PHL}	V _{CC} =1.8±0.15V, R _L =1KΩ	C _L =30pF	1.0	3.3	8.0	ns
		V _{CC} =2.5±0.2V, R _L =500Ω		0.5	2.2	5.5	ns
		V _{CC} =2.7V,	C _L =50pF, R _L =500Ω	0.5	2.5	5.5	ns
		V _{CC} =3.3±0.3V		0.5	2.1	4.5	ns
		V _{CC} =5±0.5V		0.5	1.7	4.0	ns
3-State Output Enable Time From Input OE to Output Y	t _{PZH} / t _{PZL}	V _{CC} =1.8±0.15V, R _L =1KΩ	C _L =30pF	1.0	4.1	9.4	ns
		V _{CC} =2.5±0.2V, R _L =500Ω		0.5	2.8	6.6	ns
		V _{CC} =2.7V	C _L =50pF, R _L =500Ω	0.5	3.3	6.6	ns
		V _{CC} =3.3±0.3V		0.5	2.4	5.3	ns
		V _{CC} =5±0.5V		0.5	2.1	5.0	ns
3-State Output Disable Time From Input OE to Output Y	t _{PLZ} / t _{PHZ}	V _{CC} =1.8±0.15V, R _L =1KΩ	C _L =30pF	1.0	4.3	9.2	ns
		V _{CC} =2.5±0.2V, R _L =500Ω		0.5	2.7	5.0	ns
		V _{CC} =2.7V	C _L =50pF, R _L =500Ω	0.5	3.0	5.0	ns
		V _{CC} =3.3±0.3V		0.5	3.1	5.0	ns
		V _{CC} =5±0.5V		0.5	2.2	4.2	ns

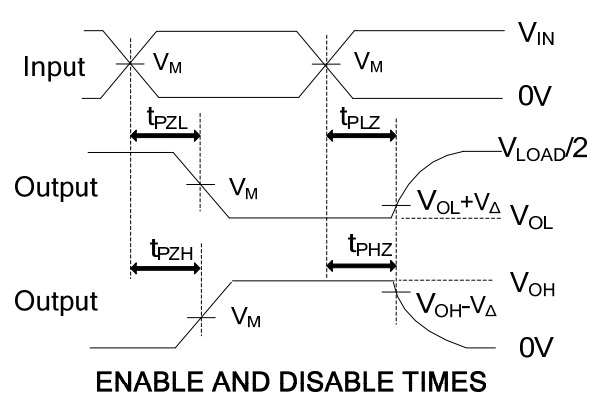
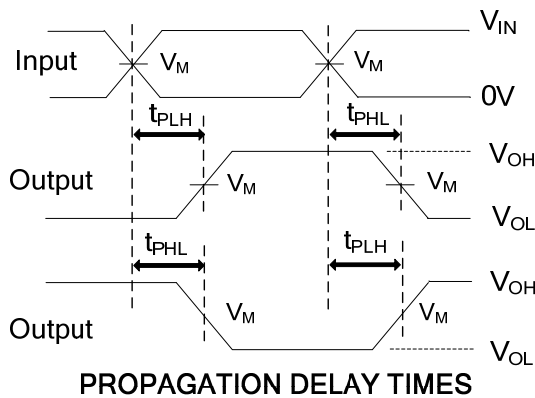
TEST CIRCUIT AND WAVEFORMS



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

TEST CIRCUIT

V_{CC}	INPUTS		V_M	V_{LOAD}	V_{Δ}	C_L	R_L
	V_{IN}	t_R, t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	0.15V	30pF	1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	0.15V	30pF	500 Ω
2.7V	2.7V	$\leq 2.5ns$	1.5V	6V	0.3V	50pF	500 Ω
$3.3V \pm 0.3V$	2.7V	$\leq 2.5ns$	1.5V	6V	0.3V	50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	0.3V	50pF	500 Ω



Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 10MHz$, $Z_O = 50\Omega$.

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