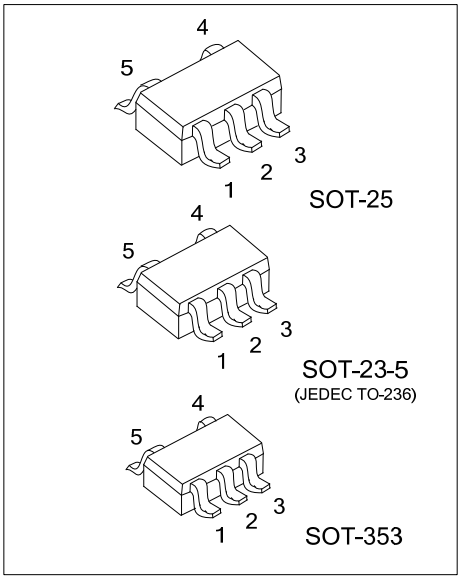
U74LVC1G125

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

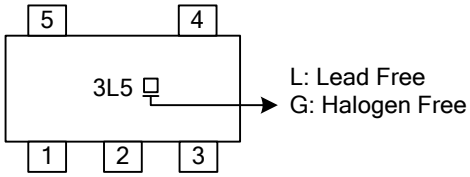
* Operate From 1.65V to 5.5V
* Inputs Accept Voltages to 5.5V
* High Noise Immunity
* Low Power Dissipation
* Direct Interface With TTL Level

■ ORDERING INFORMATION

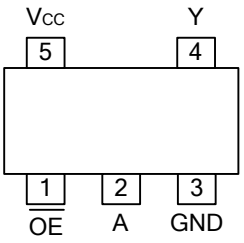
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G125L-AE5-R	U74LVC1G125G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G125L-AF5-R	U74LVC1G125G-AF5-R	SOT-25	Tape Reel
U74LVC1G125L-AL5-R	U74LVC1G125G-AL5-R	SOT-353	Tape Reel

U74LVC1G125G-AE5-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

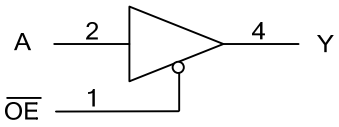


■ FUNCTION TABLE

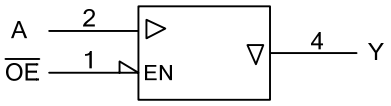
INPUT($\overline{OE}$)	INPUT(A)	OUTPUT(Y)
L	L	L
L	H	H
H	X	Z

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	Enable mode	V_{OUT}	-0.5 ~ V_{CC} + 0.5	V
	Disable mode		-0.5 ~ +6.5	V
	Power-down mode		-0.5 ~ +6.5	V
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°C ~ +125°C)	SOT-23-5	P_D	300	mW
	SOT-25		360	mW
	SOT-353		250	mW
Operating Temperature		T_{OPR}	-40 ~ +125	°C
Storage Temperature		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.

■ THERMAL DATA

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

■ 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 ~ 5.5V; Enable mode	0		V_{CC}	V
		V_{CC}=1.65V ~ 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 ~ 2.7V			20	ns/V
		V_{CC}=2.7V ~ 5.5V			10	ns/V

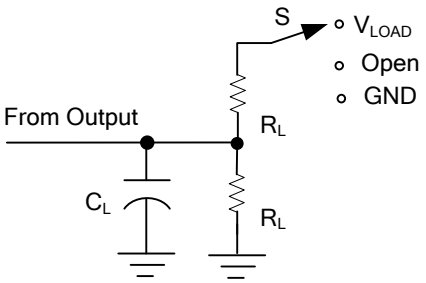
■ ELECTRICAL CHARACTERISTICS (T_A=25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	V_{CC}=1.65V ~ 1.95V	0.65×V_{CC}			0.65×V_{CC}			V
		V_{CC}=2.3V ~ 2.7V	1.7			1.7			V
		V_{CC}=2.7V ~ 3.6V	2			2			V
		V_{CC}=4.5V ~ 5.5V	0.7×V_{CC}			0.7×V_{CC}			V
Low-Level Input Voltage	V_{IL}	V_{CC}=1.65V ~ 1.95V			0.35×V_{CC}			0.35×V_{CC}	V
		V_{CC}=2.3V ~ 2.7V			0.7			0.7	V
		V_{CC}=2.7V ~ 3.6V			0.8			0.8	V
		V_{CC}=4.5V ~ 5.5V			0.3×V_{CC}			0.3×V_{CC}	V
High-Level Output Voltage	V_{OH}	V_{CC}=1.65 ~ 5.5V, I_{OH}=-100μA	V_{CC} -0.1			V_{CC} -0.1			V
		V_{CC}=1.65V, I_{OH}=-4mA	1.2			0.95			V
		V_{CC}=2.3V, I_{OH}=-8mA	1.9			1.7			V
		V_{CC}=2.7V, I_{OH}=-12mA	2.2			1.9			V
		V_{CC}=3.0V, I_{OH}=-24mA	2.3			2			V
		V_{CC}=4.5V, I_{OH}=-32mA	3.8			3.4			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65 ~ 5.5V, I_{OL}=100μA			0.1			0.1	V
		V_{CC}=1.65V, I_{OL}=4mA			0.45			0.7	V
		V_{CC}=2.3V, I_{OL}=8mA			0.3			0.45	V
		V_{CC}=2.7V, I_{OL}=12mA			0.4			0.6	V
		V_{CC}=3.0V, I_{OL}=24mA			0.55			0.8	V
		V_{CC}=4.5V, I_{OL}=32mA			0.55			0.8	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=5.5V, V_{IN}=5.5V or GND		±0.1	±5			±5	μA
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V		±0.1	±10			±10	μA
3-State Output OFF-State Current	I_{OZ}	V_{CC} =5.5V, V_{IN}=V_{IH} or V_{IL}, V_{OUT}=V_{CC} or GND		±0.1	±10			±10	μA
Quiescent Supply Current	I_Q	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0		0.1	10			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			500	μA

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

PARAMETER	SYMBOL	TEST CONDITIONS		T_A=25°C			T_A=-40°C~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input A to Output Y	t_{PLH} / t_{PHL}	C_L=30pF	V_{CC}=1.8±0.15V, R_L=1KΩ	1	12	19			21	ns
			V_{CC}=2.5±0.2V, R_L=500Ω	0.5	8	15			17	ns
		C_L=50pF, R_L=500Ω	V_{CC}=2.7V	0.5	6	12			14	ns
			V_{CC}=3.3±0.3V	0.5	5	9			11	ns
			V_{CC}=5±0.5V	0.5	3	7			9	ns
3-State Output Enable Time From Input $\overline{OE}$ to Output Y	t_{PZH} / t_{PZL}	C_L=30pF	V_{CC}=1.8±0.15V, R_L=1KΩ	1	10	19			21	ns
			V_{CC}=2.5±0.2V, R_L=500Ω	0.5	7	15			17	ns
		C_L=50pF, R_L=500Ω	V_{CC}=2.7V	0.5	6	12			14	ns
			V_{CC}=3.3±0.3V	0.5	5	9			11	ns
			V_{CC}=5±0.5V	0.5	4	7			9	ns
3-State Output Disable Time From Input $\overline{OE}$ to Output Y	t_{PLZ} / t_{PHZ}	C_L=30pF	V_{CC}=1.8±0.15V, R_L=1KΩ	1	5	10			12	ns
			V_{CC}=2.5±0.2V, R_L=500Ω	0.5	4	8			10	ns
		C_L=50pF, R_L=500Ω	V_{CC}=2.7V	0.5	4	7			9	ns
			V_{CC}=3.3±0.3V	0.5	3	6			8	ns
			V_{CC}=5±0.5V	0.5	3	5			7	ns

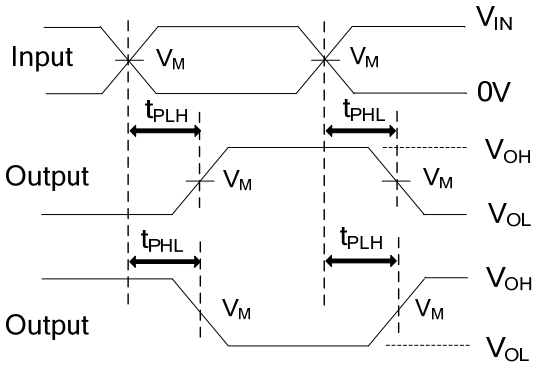
■ TEST CIRCUIT AND WAVEFORMS



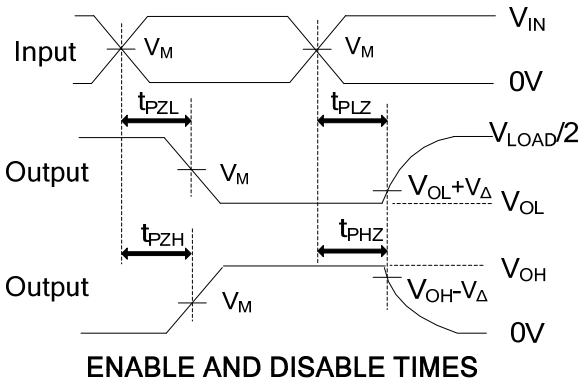
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{LOAD}

TEST CIRCUIT

V_{CC}	INPUTS		V_M	V_{LOAD}	V_Δ	C_L	R_L
	V_{IN}	t_R, t_F					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	0.15V	30pF	1KΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	0.15V	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	6V	0.3V	50pF	500Ω
3.3V±0.3V	2.7V	≤2.5ns	1.5V	6V	0.3V	50pF	500Ω
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2 x V_{CC}	0.3V	50pF	500Ω



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: P_{RR} ≤10MHz, Z_O = 50Ω.

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