



U74LVC125A

CMOS IC

QUADRUPLE BUS BUFFER GATE WITH 3-STATE OUTPUTS

■ **DESCRIPTION**

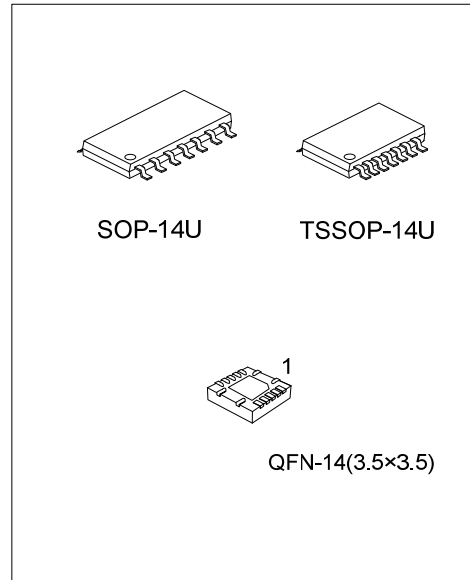
The **U74LVC125A** consists of four bus buffers with 3-state output controlled by output enable input (\overline{OE}), when \overline{OE} is high, the output is disable.

Inputs can be driven from either 3.3V or 5V devices, so the device can be used in a mix 3.3V/5V system.

■ **FEATURES**

- * Operation Voltage Range: 1.65~3.6V
- * Low Power Dissipation
- * Input Accept Voltage to 5.5V

■ **ORDERING INFORMATION**



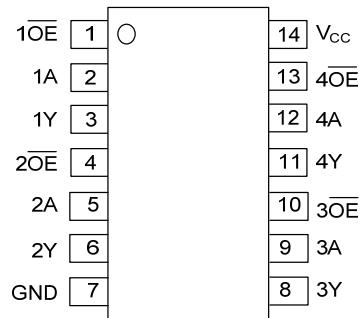
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC125AL-UEA-R	U74LVC125AG-UEA-R	SOP-14U	Tape Reel
U74LVC125AL-UEB-R	U74LVC125AG-UEB-R	TSSOP-14U	Tape Reel
U74LVC125AL-QAJ-R	U74LVC125AG-QAJ-R	QFN-14(3.5x3.5)	Tape Reel

<p>U74LVC125AG-UEA-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) UEA: SOP-14U, UEB: TSSOP-14U QAJ: QFN-14(3.5x3.5) (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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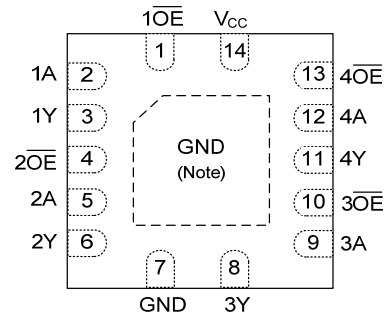
■ **MARKING**

SOP-14U	TSSOP-14U
<p>14 13 12 11 10 9 8 → Date Code UTC □□□□ LVC125A □ □ □ → Lot Code 1 2 3 4 5 6 7</p> <p>L: Lead Free G: Halogen Free</p>	<p>14 13 12 11 10 9 8 → Date Code UTC □□□□ LVC125A □ □ □ → Lot Code 1 2 3 4 5 6 7</p> <p>L: Lead Free G: Halogen Free</p>
<p>QFN-14(3.5x3.5)</p> <p>UTC LVC125A □ ● □□□□□□ → Date Code □ □ □ □ □ □ → Lot Code</p> <p>L: Lead Free G: Halogen Free</p>	-

■ PIN CONFIGURATION



SOP-14U / TSSOP-14U



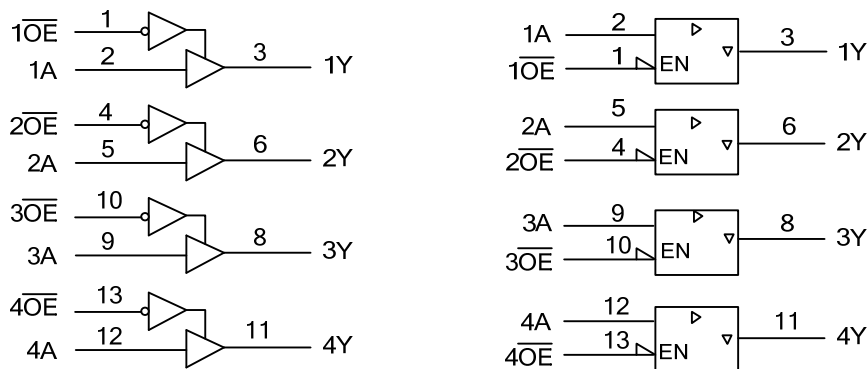
QFN-14(3.5x3.5)
(TOP View)

Note: Connect exposed pad to GND

■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 6.5	V
Input Voltage	V_{IN}	-0.5 ~ 6.5	V
Output Voltage(active mode)	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	V
Input Clamp Current ($V_{IN}<0$)	I_{IK}	-50	mA
Output Clamp Current ($V_O<0$)	I_{OK}	-50	mA
Output Current	I_{OUT}	±50	mA
V_{CC} or GND Current	I_{CC}	±100	mA
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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		3.6	V
		Data retention only	1.5			
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F				8	ns/V
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14U	130	°C/W
	TSSOP-14U	155	°C/W
	QFN-14(3.5×3.5)	95	°C/W

■ STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A = -40~+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	2.0			2			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
High-Level Output Voltage	V _{OH}	V _{CC} =1.65V ~ 3.6V, I _{OH} =-100μA	V _{CC} -0.2			V _{CC} -0.2			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.29			0.9			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9			1.55			V
		V _{CC} =2.7V, I _{OH} =-12mA	2.2			2			V
		V _{CC} =3V, I _{OH} =-12mA	2.4			2.2			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65V ~ 3.6V, I _{OL} =100μA			0.1			0.3	V
		V _{CC} =1.65V, I _{OL} =4mA			0.24			0.65	V
		V _{CC} =2.3V, I _{OL} =8mA			0.3			0.9	V
		V _{CC} =2.7V, I _{OL} =12mA			0.4			0.6	V
		V _{CC} =3V, I _{OL} =24mA			0.55			0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =3.6V, V _{IN} =5.5V or GND			±1			±20	μA
Output OFF-State current	I _{OZ}	V _{CC} =3.6V, V _{OUT} =V _{CC} or GND			±1			±20	μA
Quiescent Supply Current	I _Q	V _{CC} =3.6V, V _{IN} =V _{CC} or GND I _{OUT} =0			1			40	μA
Additional Quiescent Supply Current	Δ I _Q	V _{CC} =2.7V~3.6V, One input at V _{CC} - 0.6V, other inputs at V _{CC} or GND			0.5			5	mA

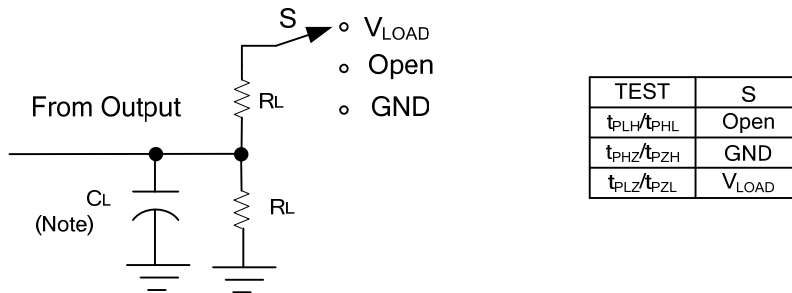
■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

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 or B) to Output (Y)	t _{PLH} / t _{PHL}	V _{CC} = 1.8V±0.15V	1	9	13	1		22	ns
		V _{CC} = 2.5V±0.2V	1	6	10	1		13	ns
		V _{CC} = 2.7V	1	6	9	1		11	ns
		V _{CC} = 3.3V±0.3V	1	5	8	1		10	ns
Output Enable Time From Input (OE) to Output (Y)	t _{PZL} / t _{PZH}	V _{CC} = 1.8V±0.15V	1	9.5	14	1		33	ns
		V _{CC} = 2.5V±0.2V	1	5.5	8	1		11	ns
		V _{CC} = 2.7V	1	5	7	1		9	ns
		V _{CC} = 3.3V±0.3V	1	4	6	1		8	ns
Output Disable Time From Input (OE) to Output (Y)	t _{PLZ} / t _{PHZ}	V _{CC} = 1.8V±0.15V	1	5	11	1		31	ns
		V _{CC} = 2.5V±0.2V	1	4	7	1		10	ns
		V _{CC} = 2.7V	1	3	6	1		8	ns
		V _{CC} = 3.3V±0.3V	1	3	5	1		7	ns

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

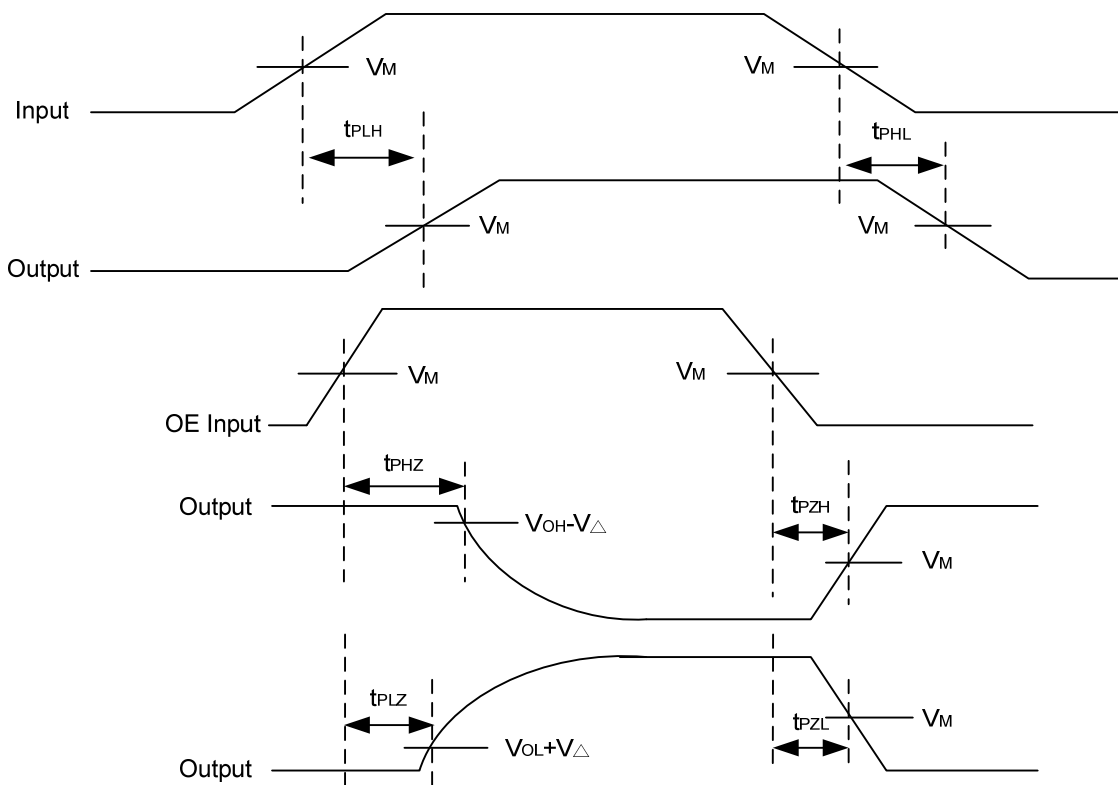
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		5		pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V, f=10MHz		7.4		pF
		V _{CC} =2.5V, f=10MHz		11.3		pF
		V _{CC} =3.3V, f=10MHz		15		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

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



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