

Four independent Buffer with 3-state Output

General Description

The ET74LVC125AV is a four independent high performance non-inverting buffer operating from a 1.65V to 5.5V supply. This device is fabricated with advanced CMOS technology to achieve ultra-high speed with high output drive.

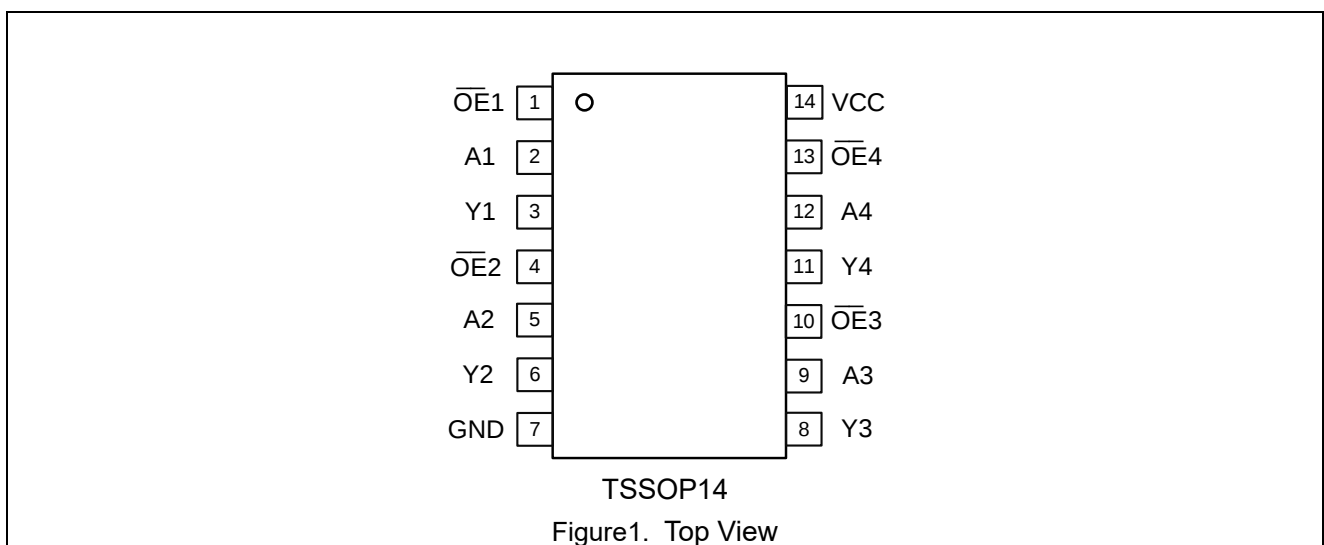
Features

- Designed for 1.65V to 5.5V VCC Operation
- Over-voltage Tolerant Inputs
- 24 mA Balanced Output Sink and Source Capability
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- These Devices are Pb-Free and are RoHS Compliant
- 3-State OE Input is Active-Low
- Offered TSSOP14 Package

Device Information

Part No.	Package	MSL
ET74LVC125AV	TSSOP14	3

Pin Configuration

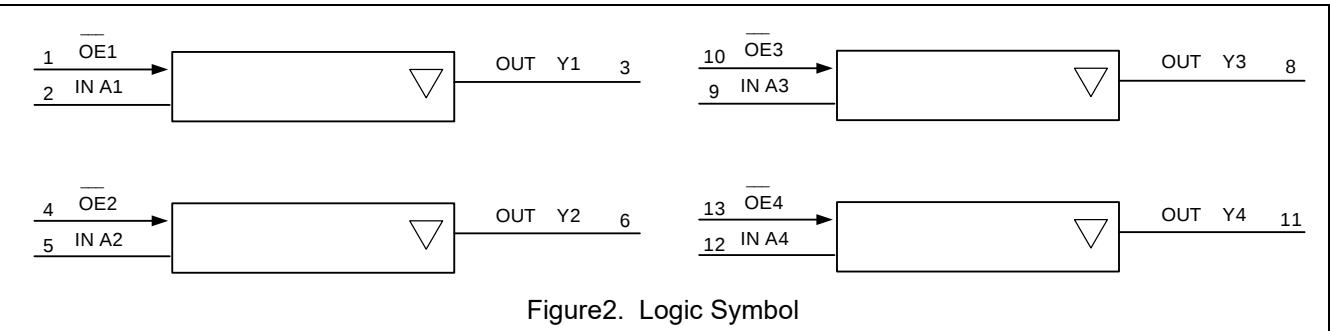


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Pin Function

Pin No.	Pin Name	Function
1	$\overline{\text{OE1}}$	Data Enable Input (active low)
2	A1	Data Input
3	Y1	Data Output
4	$\overline{\text{OE2}}$	Data Enable Input (active low)
5	A2	Data Input
6	Y2	Data Output
7	GND	Ground
8	Y3	Data Output
9	A3	Data Input
10	$\overline{\text{OE3}}$	Data Enable Input (active low)
11	Y4	Data Output
12	A4	Data Input
13	$\overline{\text{OE4}}$	Data Enable Input (active low)
14	VCC	Supply Voltage

Block Diagram



Functional Description

Function Table

Input		Output
	A	Y
L	L	L
L	H	H
H	X	Z

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Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to 7.0	V
V _I	DC Input Voltage		-0.5 ≤ V _I ≤ +7.0	V
V _O	DC Output Voltage Output in Higher or Low State ⁽¹⁾		-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current V _I < GND		-50	mA
I _{OK}	DC Output Diode Current V _O < GND		-50	mA
I _O	DC Output Sink Current		±50	mA
I _{CC}	DC Supply Current per Supply Pin		±100	mA
I _{GND}	DC Ground Current per Supply Pin		±100	mA
T _{STG}	Storage Temperature Range		-65 to 150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T _J	Junction Temperature Under Bias		150	°C
θ _{JA}	Thermal Resistance		250	°C /W
P _D	Total Power Dissipation		500	mW
V _{ESD}	ESD Classification	Human Body Model ⁽²⁾	±4000	V
		Charged Device Model ⁽³⁾	±1000	
I _{LU}	Max Latch up Current Above V _{CC} and GND at 125°C ⁽⁴⁾		±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Notes:

1. IO absolute maximum rating must be observed.
2. Tested to EIA/JESD22-A114-A, rated to EIA/JESD22-A114-B.
3. Tested to JESD22-C101-A.
4. Tested to EIA/JESD78.

Recommended Operating Conditions

Symbol	Parameter		Min	Max	Unit
V _{CC}	DC Supply Voltage Operating		1.65	5.5	V
	Data Retention		1.5	5.5	
V _{IN}	DC Input Voltage		0	5.5	V
V _{OUT}	DC Output Voltage (High or Low State)		0	5.5	V
T _A	Operating Temperature Range		-40	85	°C
t _r , t _f	Input Rise and Fall Time	V _{CC} = 2.5 V ± 0.2 V	0	20	ns/V
		V _{CC} = 3.0 V ± 0.3 V	0	10	
		V _{CC} = 5.0 V ± 0.5 V	0	5	

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied.

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Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25 °C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		1.65 to 5.5	0.9V _{CC}			0.9V _{CC}		V
V _{IL}	Low-Level Input Voltage		1.65 to 5.5			0.1V _{CC}		0.1V _{CC}	V
V _{OH}	High-Level Output Voltage	I _{OH} = -100uA	1.65 to 5.5	V _{CC} -0.1	V _{CC}		V _{CC} -0.1		V
		I _{OH} = -3mA	1.65	1.29	1.55		1.29		
		I _{OH} = -8mA	2.3	1.9	2.1		1.9		
		I _{OH} = -12mA	2.7	2.2	2.4		2.2		
		I _{OH} = -16mA	3.0	2.4	2.7		2.4		
		I _{OH} = -24mA	3.0	2.3	2.5		2.3		
		I _{OH} = -32mA	4.5	3.8	4.0		3.8		
V _{OL}	Low-Level Output Voltage	I _{OH} = 100uA	1.65 to 5.5		0.0	0.1		0.1	V
		I _{OL} = 3mA	1.65		0.05	0.24		0.24	
		I _{OL} = 8mA	2.3		0.10	0.3		0.3	
		I _{OL} = 12mA	2.7		0.13	0.4		0.4	
		I _{OL} = 16mA	3.0		0.17	0.4		0.4	
		I _{OL} = 24mA	3.0		0.24	0.55		0.55	
		I _{OL} = 32mA	4.5		0.26	0.55		0.55	
I _{IN}	Input Leakage Current	V _{IN} = 5.5V or GND	0 to 5.5			±0.1		±1.0	uA
I _{OFF}	Power Off Leakage Current	V _{IN} = 5.5V or V _{OUT} = 5.5V	0			1		10	uA
I _{CC}	Quiescent Supply Current	V _{IN} = 5.5V or GND	5.5			1		10	uA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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AC Electrical Characteristics

$t_r = t_f = 2.5\text{ns}$

Symbol	Parameter	Condition	$V_{CC}(V)$	$T_A = 25^\circ\text{C}$			$-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		Unit
				Min	Typ	Max	Min	Max	
t_{PD}	Propagation Delay (Figure 3 and 4)	$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	1.65	2.0	6.0	9.0	2.0	12.0	ns
			1.8	2.0	5.0	8.0	2.0	11.0	
			2.5	0.2	3.6	6.6	0.8	8.6	
		$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	3.3	0.8	3.0	5.0	0.5	7.0	
				1.2	4.7	7.7	1.5	8.7	
		$R_L = 1\text{M}\Omega$ $C_L = 15\text{pF}$	5.0	0.5	2.6	4.6	0.5	6.6	
		$R_L = 500\Omega$ $C_L = 50\text{pF}$		0.8	4.1	6.1	0.8	7.6	
t_{PZL} , t_{PZH}	Output Enable Time (Figure 5 and 6)	$R_L = 500\Omega$ $C_L = 50\text{pF}$	1.65	2.0	9.5	20	2.0	22.0	ns
			1.8	2.0	8.5	18	2.0	20.0	
			2.5	1.5	6.2	12	1.5	14.0	
			3.3	1.5	5.3	8	1.5	10.0	
			5.0	0.8	4.8	6	0.8	8.0	
t_{PLZ} , t_{PHZ}	Output Disable Time (Figure 5 and 6)	$R_L = 500\Omega$ $C_L = 50\text{pF}$	1.65	2.0	9.5	20	2.0	22.0	ns
			1.8	2.0	8.5	18	2.0	20.0	
			2.5	1.5	6.2	12	1.5	14.0	
			3.3	1.0	5.3	8	1.0	10.0	
			5.0	0.5	4.8	6	0.5	8.0	

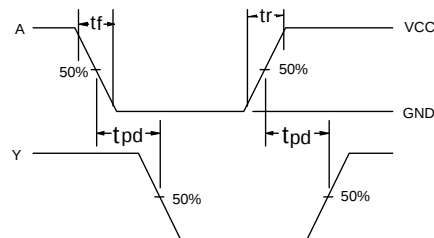
Capacitance Characteristics

Symbol	Parameter	Condition	Typ	Unit
C_{IN}	Input Capacitance	$V_{CC} = 5.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	4	pF
C_{PD}	Power Dissipation Capacitance ⁽⁵⁾	10MHz, $V_{CC} = 3.3\text{V}$, $V_I = 0\text{V}$ or V_{CC}	30	pF
		10MHz, $V_{CC} = 5.5\text{V}$, $V_I = 0\text{V}$ or V_{CC}	40	

Note5. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $I_{CC(OPR)} = C_{PD} \times V_{CC} \times f_{in} + I_{CC} \times C_{PD}$ is used to determine the no-load dynamic power consumption; $P_D = C_{PD} \times V_{CC}^2 \times f_{in} + I_{CC} \times V_{CC} \times Fig.$

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AC Test Circuit



PROPAGATION DELAYS:
 $t_R=t_F=2.5\text{ns}$, 10% to 90%; $f=1\text{MHz}$;

Figure3. Switch Waveform

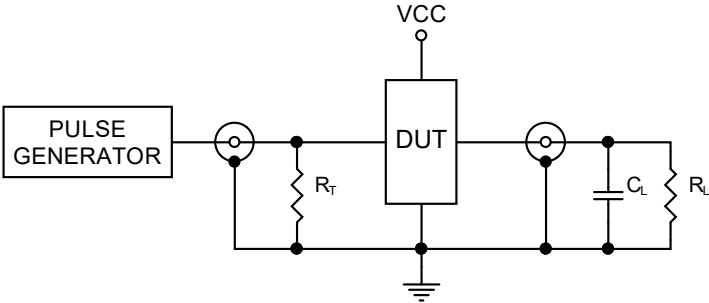


Figure4. Test Circuit $R_T=50\Omega(\text{typ})$

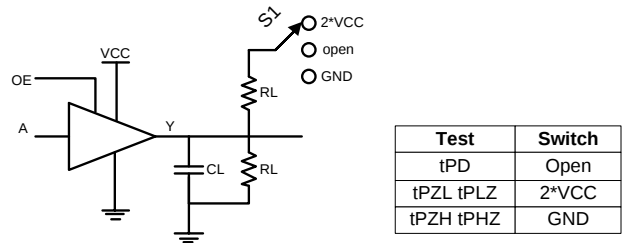


Figure5. Output Enable/Disable Time Test Circuit

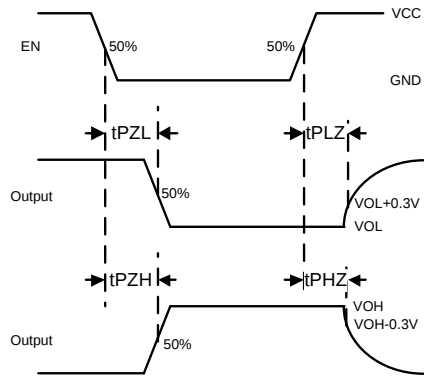
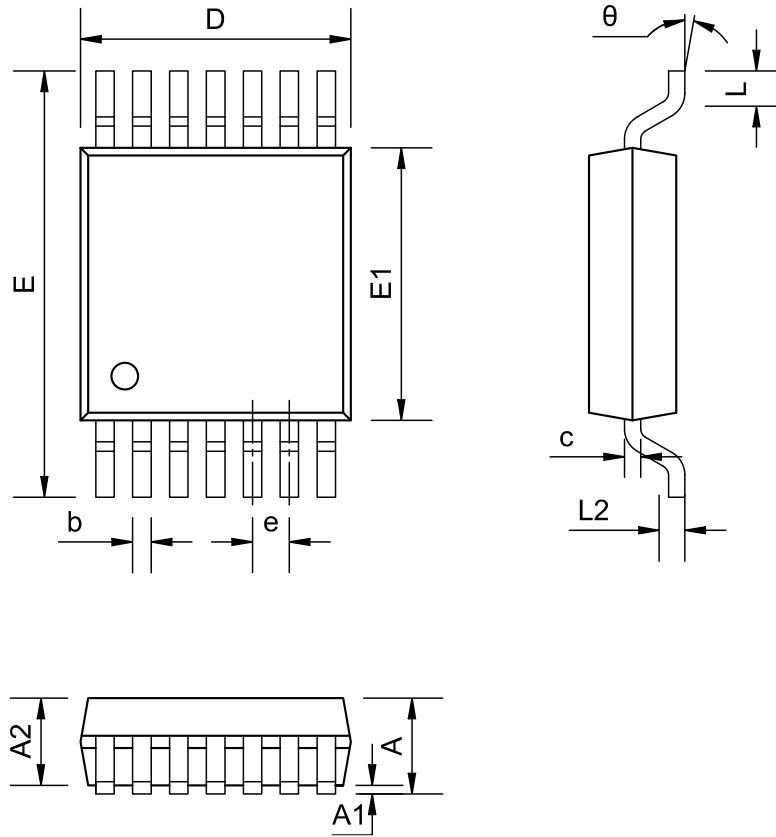


Figure6. Output Enable/Disable Waveform

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Package Dimension

TSSOP14



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	MAX
A	--	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
D	4.90	5.10
E	6.20	6.60
E1	4.30	4.50
e	0.65 TYP	
L	0.45	0.75
L2	0.25TYP	
θ	0°	8°

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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2023-09-02	Original Version	Yangxx	Yangxx	Liu Jia Ying
1.1	2024-1-26	Update package picture	Shibo	Yangxx	Liu Jia Ying