

Description

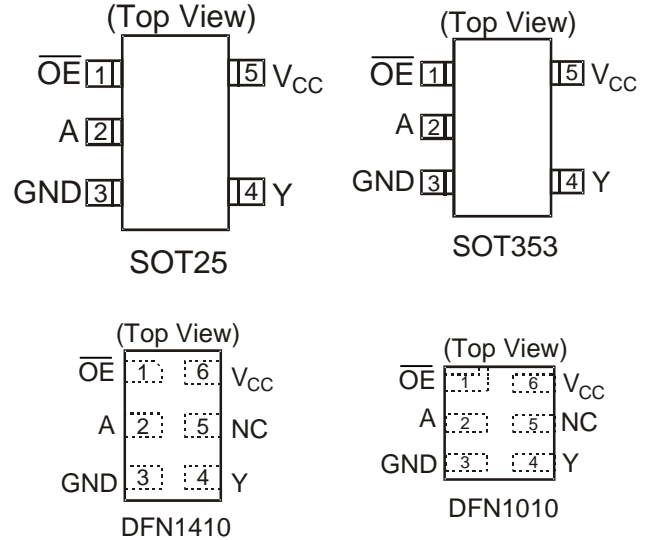
The 74LVC1G125 is a single non-inverting buffer/bus driver with a 3-state output. The output enters a high impedance state when a HIGH-level is applied to the output enable (\overline{OE}) pin. The device is designed for operation with a power supply range of 1.65V to 5.5V. The inputs are tolerant to 5.5V allowing this device to be used in a mixed voltage environment. The device is fully specified for partial power down applications using I_{OFF} . The I_{OFF} circuitry disables the output preventing damaging current backflow when the device is powered down.

Features

- Wide Supply Voltage Range from 1.65 to 5.5V
- $\pm 24\text{mA}$ Output Drive at 3.3V
- CMOS low power consumption
- I_{OFF} Supports Partial-Power-Down Mode Operation
- Inputs accept up to 5.5V
- ESD Protection Tested per JESD 22
 - Exceeds 200-V Machine Model (A115-A)
 - Exceeds 2000-V Human Body Model (A114-A)
 - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options
- Direct Interface with TTL Levels
- All packages Assembled with "Green" Molding Compound (no Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html

Pin Assignments



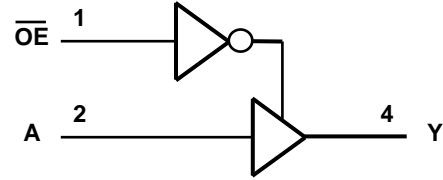
Applications

- Voltage Level Shifting
- Bus Driver / Repeater
- Power Down Signal Isolation
- General Purpose Logic
- Wide array of products such as:
 - PCs, networking, notebooks, netbooks, PDAs
 - Tablet Computers, E-readers
 - Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box
 - Cell Phones, Personal Navigation / GPS
 - MP3 players, Cameras, Video Recorders

Pin Descriptions

Pin Name	Description
\overline{OE}	Output Enable
A	Data Input
GND	Ground
Y	Data Output
V _{CC}	Supply Voltage
NC	No Connection

Logic Diagram



Function Table

Inputs		Output
\overline{OE}	A	Y
L	H	H
L	L	L
H	X	Z

Absolute Maximum Ratings (Note 2)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD CDM	Charged Device Model ESD Protection	1	KV
ESD MM	Machine Model ESD Protection	200	V
V _{CC}	Supply Voltage Range	-0.5 to 6.5	V
V _I	Input Voltage Range	-0.5 to 6.5	V
V _O	Voltage applied to output in high impedance or I _{OFF} state	-0.5 to 6.5	V
V _O	Voltage applied to output in high or low state	-0.3 to V _{CC} +0.5	V
I _{IK}	Input Clamp Current V _I <0	-50	mA
I _{OK}	Output Clamp Current	-50	mA
I _O	Continuous output current	±50	mA
I _{CC} , I _{GND}	Continuous current through V _{CC} or GND	±100	mA
T _J	Operating Junction Temperature	-40 to 150	°C
T _{STG}	Storage Temperature	-65 to 150	°C

Notes: 2. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

Recommended Operating Conditions (Note 3)

Symbol	Parameter	Min	Max	Unit	
V _{CC}	Operating Voltage	Operating	1.65	5.5	V
		Data retention only	1.5		V
V _{IH}	High-level Input Voltage	V _{CC} = 1.65V to 1.95V	0.65 X V _{CC}		V
		V _{CC} = 2.3V to 2.7V	1.7		
		V _{CC} = 3V to 3.6V	2		
		V _{CC} = 4.5V to 5.5V	0.7 X V _{CC}		
V _{IL}	Low-level input voltage	V _{CC} = 1.65V to 1.95V		0.35 X V _{CC}	V
		V _{CC} = 2.3V to 2.7V		0.7	
		V _{CC} = 3V to 3.6V		0.8	
		V _{CC} = 4.5V to 5.5V		0.3 X V _{CC}	
V _I	Input Voltage	0	5.5	V	
V _O	Output Voltage	0	V _{CC}	V	
I _{OH}	High-level output current	V _{CC} = 1.65V		-4	mA
		V _{CC} = 2.3V		-8	
		V _{CC} = 3V		-16	
		V _{CC} = 4.5V		-32	
I _{OL}	Low-level output current	V _{CC} = 1.65V		4	mA
		V _{CC} = 2.3V		8	
		V _{CC} = 3V		16	
		V _{CC} = 4.5V		32	
Δt/ΔV	Input transition rise or fall rate	V _{CC} = 1.8V ± 0.15V, 2.5V ± 0.2V		20	ns/V
		V _{CC} = 3.3V ± 0.3V		10	
		V _{CC} = 5V ± 0.5V		5	
T _A	Operating free-air temperature	-40	125	°C	

Notes: 3. Unused inputs should be held at V_{CC} or Ground.

Electrical Characteristics (All typical values are at $V_{CC} = 3.3V$, $T_A = 25^\circ C$)

Symbol	Parameter	Test Conditions	V_{CC}	-40°C to 85°C			-40°C to 125°C		Unit
				Min	Typ.	Max	Min	Max	
V_{OH}	High Level Output Voltage	$I_{OH} = -100\mu A$	1.65V to 5.5V	$V_{CC} - 0.1$			$V_{CC} - 0.1$		V
		$I_{OH} = -4mA$	1.65V	1.2		0.95			
		$I_{OH} = -8mA$	2.3V	1.9		1.7			
		$I_{OH} = -16mA$	3V	2.4		2.2			
		$I_{OH} = -24mA$		2.3		2.0			
		$I_{OH} = -32mA$	4.5V	3.8		3.4			
V_{OL}	Low Level Output Voltage	$I_{OL} = 100\mu A$	1.65V to 5.5V			0.1		0.1	V
		$I_{OL} = 4mA$	1.65V			0.45		0.7	
		$I_{OL} = 8mA$	2.3V			0.3		0.45	
		$I_{OL} = 16mA$	3V			0.4		0.6	
		$I_{OL} = 24mA$				0.55		0.8	
		$I_{OL} = 32mA$	4.5V			0.55		.8	
I_I	Input Current	$V_I = 5.5V$ or GND	0 to 5.5V		± 0.1	± 5		± 100	μA
I_{OFF}	Power Down Leakage Current	V_I or $V_O = 5.5V$	0V			± 10		± 200	μA
I_{OZ}	Z State Leakage Current	$V_O = 0$ to 5.5V	3.6V		0.1	10		20	μA
I_{CC}	Supply Current	$V_I = 5.5V$ or GND $I_O = 0$	5.5V		0.1	10		200	μA
ΔI_{CC}	Additional Supply Current	One input at $V_{CC} - 0.6V$ Other inputs at V_{CC} or GND	3V to 5.5V			500		5000	μA
C_i	Input Capacitance	$V_i = V_{CC}$ - or GND	3.3V		5				pF

Operating Characteristics

$T_A = 25^\circ C$

Parameter		Test Conditions	$V_{CC} = 1.8V$	$V_{CC} = 2.5V$	$V_{CC} = 3.3V$	$V_{CC} = 5V$	Unit	
			Typ.	Typ.	Typ.	Typ.		
C_{pd}	Power dissipation capacitance	Outputs enabled	f = 10 MHz	19	19	19	21	pF
		Outputs disabled		2	2	3	4	

Package Characteristics (All typical values are at $V_{CC} = 3.3V$, $T_A = 25^\circ C$)

Symbol	Parameter	Test Conditions	V_{CC}	Min	Typ.	Max	Unit
θ_{JA}	Thermal Resistance Junction-to-Ambient	SOT25	(Note 4)		204		$^\circ C/W$
		SOT353			371		
		DFN1010			445		
		DFN1410			460		
θ_{JC}	Thermal Resistance Junction-to-Case	SOT25	(Note 4)		52		$^\circ C/W$
		SOT35			143		
		DFN1010			250		
		DFN1410			265		

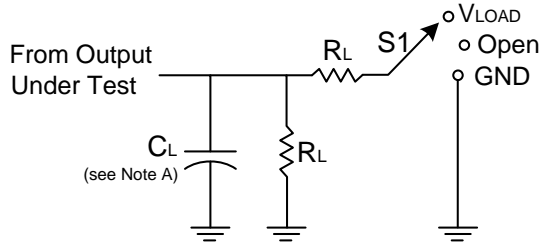
Notes: 4. Test condition for SOT25, SOT353, DFN1410 and DFN1010: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Switching Characteristics

Figure 1 Typical Values at $T_A = 25^\circ C$ and nominal voltages 1.8V, 2.5V, 2.7V, 3.3V, and 5.0V.

Parameter	From Input	To Output	V_{CC}	$T_A = -40^\circ C$ to $85^\circ C$			$T_A = -40^\circ C$ to $125^\circ C$		Unit
				Min	Typ	Max	Min	Max	
t_{pd}	A	Y	$1.8V \pm 0.15V$	1.0	3.3	8.0	1.0	10.5	ns
			$2.5V \pm 0.2V$	0.5	2.2	5.5	0.5	7.0	
			2.7V	0.5	2.5	5.5	0.5	7.5	
			$3.3V \pm 0.3V$	0.5	2.1	4.5	0.5	6.0	
			$5.0V \pm 0.5V$	0.5	1.7	4.0	0.5	5.5	
t_{en}	\overline{OE}	Y	$1.8V \pm 0.15V$	1.0	4.1	9.4	1.0	12.0	ns
			$2.5V \pm 0.2V$	0.5	2.8	6.6	0.5	8.5	
			2.7V	0.5	3.3	6.6	0.5	8.5	
			$3.3V \pm 0.3V$	0.5	2.4	5.3	0.5	7.0	
			$5.0V \pm 0.5V$	0.5	2.1	5.0	0.5	6.5	
t_{dis}	\overline{OE}	Y	$1.8V \pm 0.15V$	1.0	4.3	9.2	1.0	12.0	ns
			$2.5V \pm 0.2V$	0.5	2.7	5.0	0.5	6.5	
			2.7V	0.5	3.0	5.0	0.5	6.5	
			$3.3V \pm 0.3V$	0.5	3.1	5.0	0.5	6.5	
			$5.0V \pm 0.5V$	0.5	2.2	4.2	0.5	5.5	

Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_I	t_r/t_f					
$1.8V \pm 0.15V$	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
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V

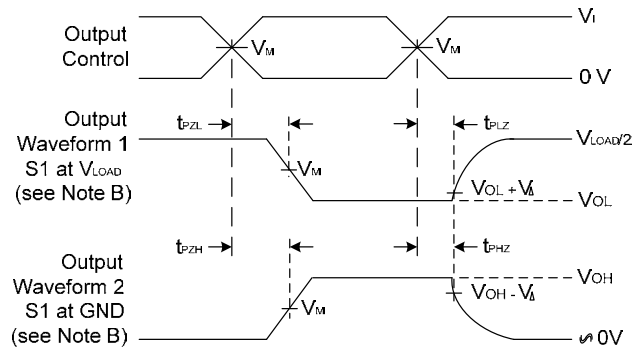
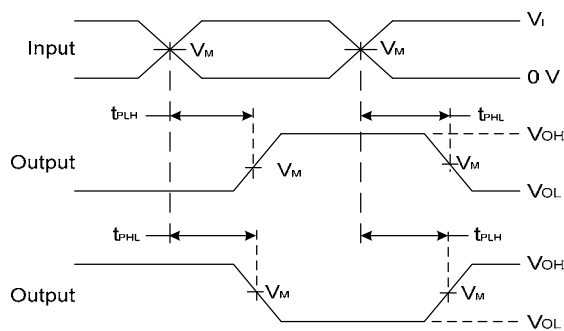
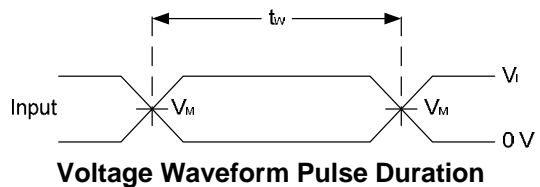
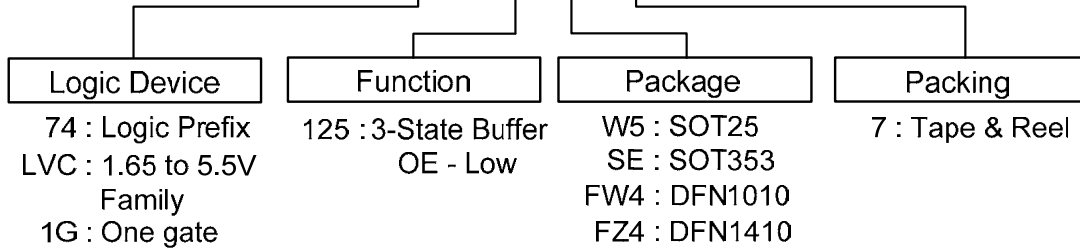


Figure 1. Load Circuit and Voltage Waveforms

- Notes:
- A. Includes test lead and test apparatus capacitance.
 - B. All pulses are supplied at pulse repetition rate ≤ 10 MHz.
 - C. Inputs are measured separately one transition per measurement.
 - D. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - E. t_{PZL} and t_{PZH} are the same as t_{EN} .
 - F. t_{PLH} and t_{PHL} are the same as t_{PD} .

Ordering Information

74LVC1G 125 XXX - 7



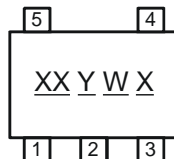
Device	Package Code	Packaging (Note 6)	7" Tape and Reel	
			Quantity	Part Number Suffix
74LVC1G125W5-7	W5	SOT25	3000/Tape & Reel	-7
74LVC1G125SE-7	SE	SOT353	3000/Tape & Reel	-7
74LVC1G125FW4-7	FW4	DFN1010	5000/Tape & Reel	-7
74LVC1G125FZ4-7	FZ4	DFN1410	5000/Tape & Reel	-7

Notes: 5. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>
 6. The taping orientation is located on our website at <http://www.diodes.com/datasheets/ap02007.pdf>

Marking Information

(1) SOT25 and SOT353

(Top View)

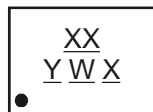


XX : Identification Code
 Y : Year 0~9
 W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
 X : A~Z : Internal Code

Part Number	Package	Identification Code
74LVC1G125W5	SOT25	UY
74LVC1G125SE	SOT353	UY

(2) DFN1010 and DFN1410

(Top View)

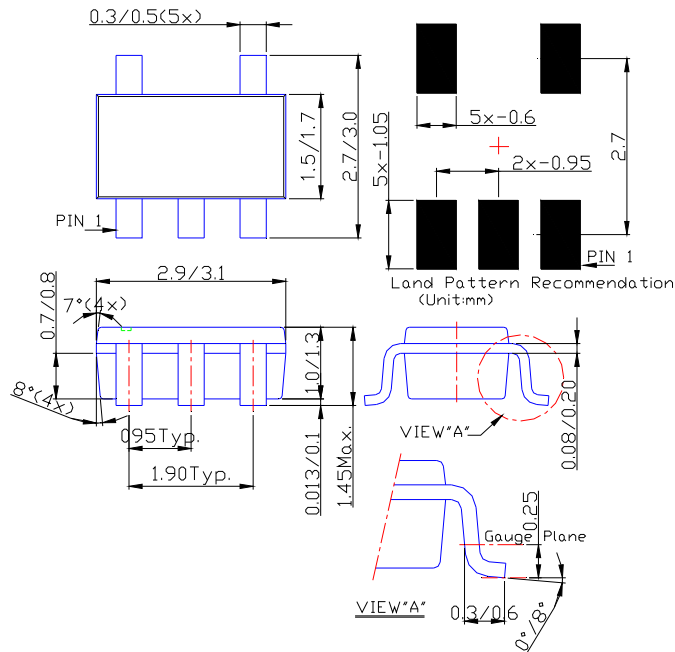


XX : Identification Code
 Y : Year 0~9
 W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
 X : A~Z : Internal Code

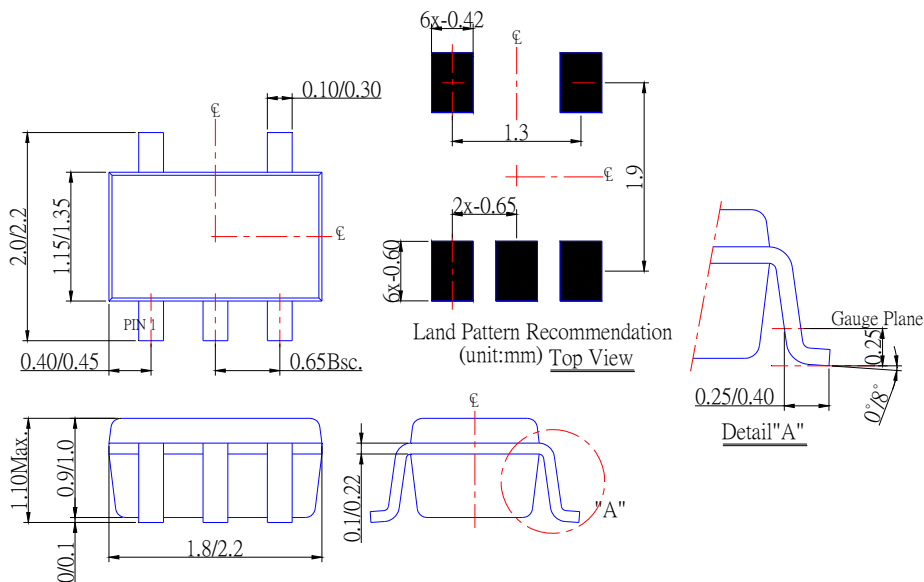
Part Number	Package	Identification Code
74LVC1G125FW4	DFN1010	UY
74LVC1G125FZ4	DFN1410	UY

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25

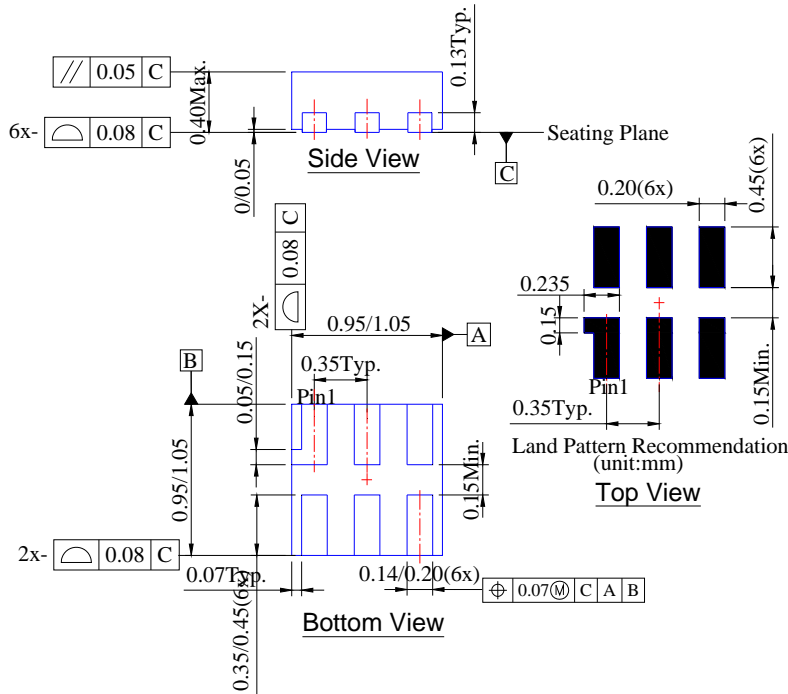


(2) Package Type: SOT353

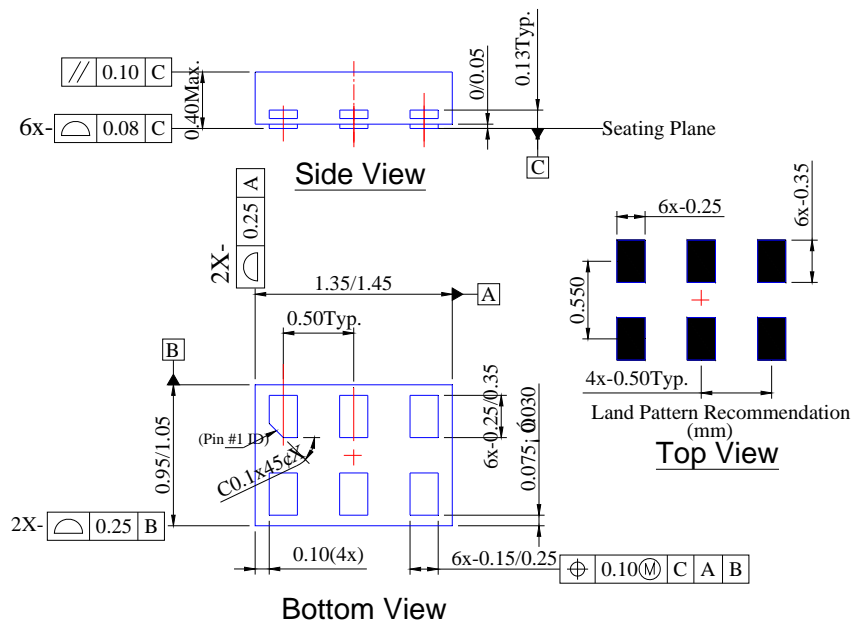


Package Outline Dimensions (cont.)

(3) Package Type DFN1010



(4) Package Type: DFN1410



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