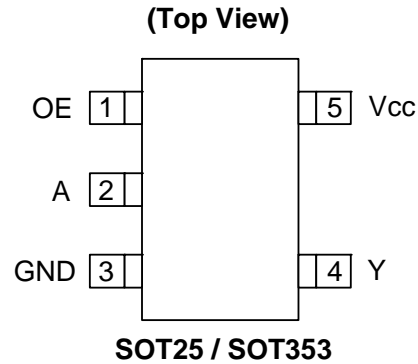


Description

The 74LVCE1G126 is a single non-inverting buffer/bus driver with a 3-state output. The output enters a high impedance state when a LOW-level is applied to the output enable (OE) pin. The device is designed for operation with a power supply range of 1.4V 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.

Pin Assignments



Features

- Extended Supply Voltage Range from 1.4 to 5.5V
- Switching speed characterized for operation at 1.5V
- Offers 30% speed improvement over LVC at 1.8V.
- ± 24mA Output Drive at 3.3V
- CMOS low power consumption
- IOFF Supports Partial-Power-Down Mode Operation
- Inputs accept up to 5.5V
- ESD Protection Exceeds JESD 22
- 200-V Machine Model (A115-A)
- 2000-V Human Body Model (A114-A)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options
- Direct Interface with TTL Levels
- SOT25 and SOT353: Assembled with “Green” Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

Applications

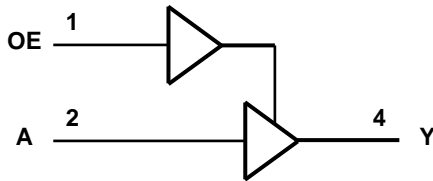
- Voltage Level Shifting
- Bus Driver / Repeater
- Power Down Signal Isolation
- General Purpose Logic
- Wide array of products such as.
 - PCs, networking, notebooks, netbooks, PDAs
 - Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box
 - Cell Phones, Personal Navigation / GPS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

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 Descriptions

Pin Name	Pin NO.	Description
OE	1	Output Enable (active high)
A	2	Data Input
GND	3	Ground
Y	4	Data Output
Vcc	5	Supply Voltage

Logic Diagram



Function Table

Inputs		Output
OE	A	Y
H	H	H
H	L	L
L	X	Z

Absolute Maximum Ratings (Note 2)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	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
	Continuous current through Vdd or GND	± 100	mA
T_J	Operating Junction Temperature	-40 to 150	$^{\circ}C$
T_{STG}	Storage Temperature	-65 to 150	$^{\circ}C$

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	1.4	5.5	V
		Data retention only	1.2		V
V _{IH}	High-level Input Voltage	V _{CC} = 1.4 V to 1.95 V	0.65 X V _{CC}		V
		V _{CC} = 2.3 V to 2.7 V	1.7		
		V _{CC} = 3 V to 3.6 V	2		
		V _{CC} = 4.5 V to 5.5 V	0.7 X V _{CC}		
V _{IL}	Low-level input voltage	V _{CC} = 1.4 V to 1.95 V		0.35 X V _{CC}	V
		V _{CC} = 2.3 V to 2.7 V		0.7	
		V _{CC} = 3 V to 3.6 V		0.8	
		V _{CC} = 4.5 V to 5.5 V		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} =1.4 V		-3	mA
		V _{CC} = 1.65 V		-4	
		V _{CC} = 2.3 V		-8	
		V _{CC} = 3 V		-16	
		V _{CC} = 4.5 V		-24	
I _{OL}	Low-level output current	V _{CC} =1.4 V		3	mA
		V _{CC} = 1.65 V		4	
		V _{CC} = 2.3 V		8	
		V _{CC} = 3 V		16	
		V _{CC} = 4.5 V		24	
Δt/ΔV	Input transition rise or fall rate	V _{CC} = 1.4 to 3V		20	ns/V
		V _{CC} = 3.3 V ± 0.3 V		10	
		V _{CC} = 5 V ± 0.5 V		5	
T _A	Operating free-air temperature	-40	85	°C	

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

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

Over recommended free-air temperature range (unless otherwise noted)

Symbol	Parameter	Test Conditions	Vcc	Min	Typ.	Max	Unit
V_{OH}	High Level Output Voltage	$I_{OH} = -100\mu A$	1.4 V to 5.5V	$V_{CC} - 0.1$			V
		$I_{OH} = -3mA$	1.4 V	1.05			
		$I_{OH} = -4mA$	1.65 V	1.2			
		$I_{OH} = -8mA$	2.3V	1.9			
		$I_{OH} = -16mA$	3 V	2.4			
		$I_{OH} = -24mA$		2.3			
		$I_{OH} = -32mA$	4.5 V	3.8			
V_{OL}	High-level Input Voltage	$I_{OL} = 100\mu A$	1.4 V to 5.5V			0.1	V
		$I_{OL} = 3mA$	1.4V			.4	
		$I_{OL} = 4mA$	1.65 V			0.45	
		$I_{OL} = 8mA$	2.3V			0.3	
		$I_{OL} = 16mA$	3 V			0.4	
		$I_{OL} = 24mA$				0.55	
		$I_{OL} = 32mA$	4.5			0.55	
I_I	Input Current	$V_I = 5.5 V$ or GND	0 to 5.5 V			± 5	μA
I_{OFF}	Power Down Leakage Current	V_I or $V_O = 5.5V$	0			± 10	μA
I_{OZ}	Z State Leakage Current	$V_O = 0$ to 5.5V	3.6V			10	μA
I_{CC}	Supply Current	$V_I = 5.5V$ of GND $I_O = 0$	1.4 V to 5.5V			10	μA
ΔI_{CC}	Additional Supply Current	One input at $V_{CC} - 0.6 V$ Other inputs at V_{CC} or GND	3 V to 5.5V			500	μA
C_i	Input Capacitance	$V_i = V_{CC} -$ or GND	3.3		3.5		pF
θ_{JA}	Thermal Resistance Junction-to-Ambient	SOT25	(Note 4)		204		$^\circ C/W$
		SOT353	(Note 4)		371		$^\circ C/W$
θ_{JC}	Thermal Resistance Junction-to-Case	SOT25	(Note 4)		52		$^\circ C/W$
		SOT353	(Note 4)		143		$^\circ C/W$

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

Switching Characteristics

Over recommended free-air temperature range, CL = 15pF (see Figure 1)

Parameter	From (Input)	TO (OUTPUT)	Vcc = 1.5 V ± 0.1V		Vcc = 1.8 V ± 0.15V		Vcc = 2.5 V ± 0.2V		Vcc = 3.3 V ± 0.3V		Vcc = 5 V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	A	Y	1.7	6.9	1.1	4.8	0.4	3.6	0.4	3	0.4	3	ns

Over recommended free-air temperature range, CL = 30 or 50pF as noted (see Figure 2)

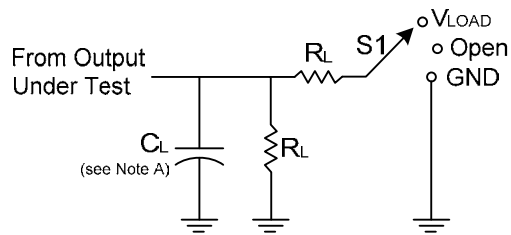
Parameter	From (Input)	TO (OUTPUT)	Vcc = 1.5 V ± 0.1V		Vcc = 1.8 V ± 0.15V		Vcc = 2.5 V ± 0.2V		Vcc = 3.3 V ± 0.3V		Vcc = 5 V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	A	Y	2.6	8	1.8	5.6	0.8	4.4	0.8	3.6	0.9	3.6	ns
t _{en}	$\overline{\text{OE}}$	Y	2.8	9.4	1.9	6.5	1	5.2	0.9	4.3	0.9	4.3	
t _{dis}	$\overline{\text{OE}}$	Y	1.6	9.8	1.1	6.8	0.8	4.4	0.8	4.5	0.9	3.7	

Operating Characteristics

T_A = 25 °C

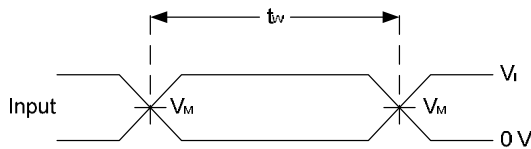
Parameter			Test Conditions	Vcc = 1.5 V	Vcc = 1.8 V	Vcc = 2.5 V	Vcc = 3.3 V	Vcc = 5 V	Unit
				TYP	TYP	TYP	TYP	TYP	
C _{pd}	Power dissipation capacitance	Outputs enabled	f = 10 MHz	19	19	19	19	19	pF
		Outputs disabled		2	2	2	3	4	

Parameter Measurement Information

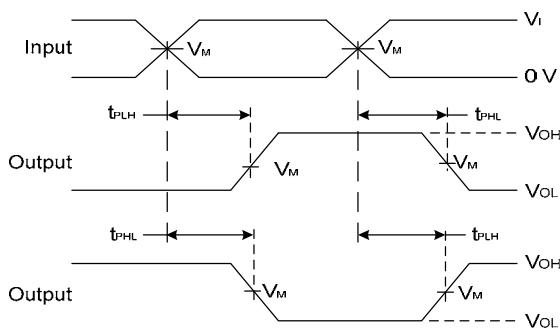


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

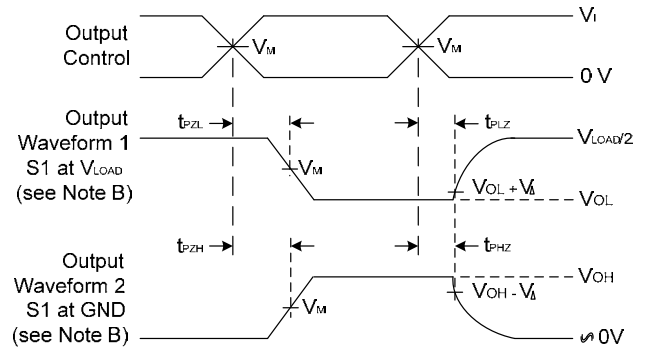
V_{CC}	Inputs		V_M	C_L	R_L
	V_i	t_r/t_f			
$1.5V \pm 0.1V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF	1M Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	15pF	1M Ω



Voltage Waveform Pulse Duration



Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

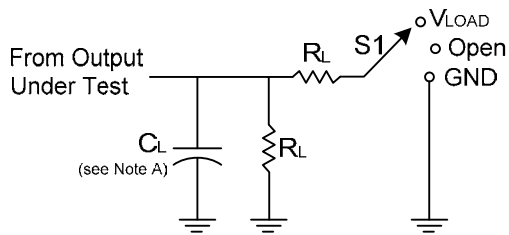


Voltage Waveform Enable and Disable Times Low and High Level Enabling

- 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} .

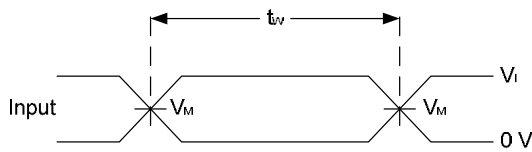
Figure 1. Load Circuit and Voltage Waveforms

Parameter Measurement Information (Continued)

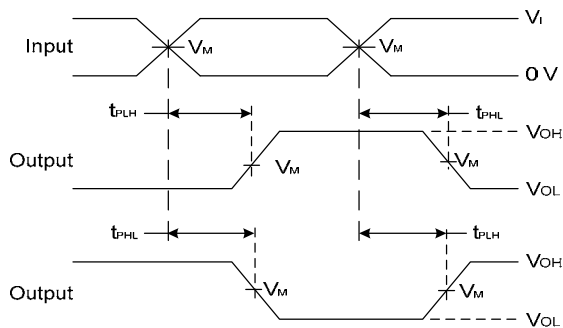


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	Vload
t_{PHZ}/t_{PZH}	GND

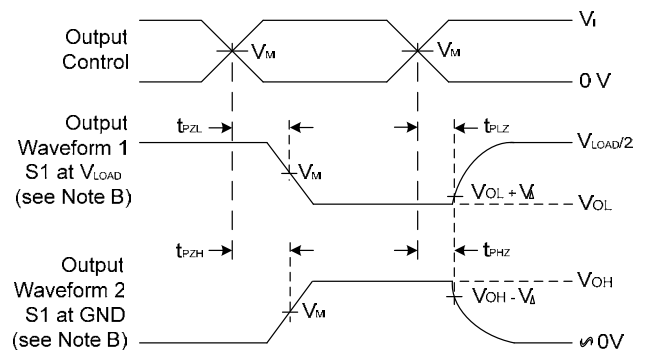
Vcc	Inputs		VM	CL	RL
	VI	tr/td			
1.5V±0.1V	VCC	≤2ns	VCC/2	30pF	1KΩ
1.8V±0.15V	VCC	≤2ns	VCC/2	30pF	1KΩ
2.5V±0.2V	VCC	≤2ns	VCC/2	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	VCC	≤2.5ns	VCC/2	50pF	500Ω



Voltage Waveform Pulse Duration



Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

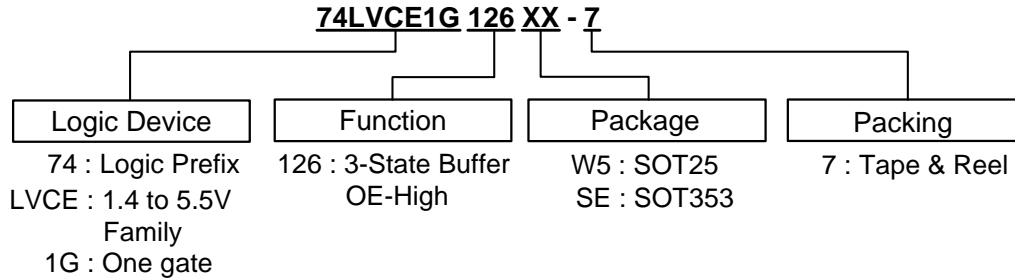


Voltage Waveform Enable and Disable Times Low and High Level Enabling

- 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_{EN0}
 - F. t_{PLH} and t_{PHL} are the same as t_{PD} .

Figure 2. Load Circuit and Voltage Waveforms

Ordering Information

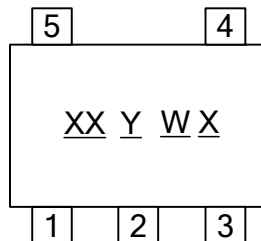


Device	Package Code	Packaging (Note 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
74LVCE1G126W5-7	W6	SOT25	3000/Tape & Reel	-7
74LVCE1G126SE-7	SE	SOT353	3000/Tape & Reel	-7

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>.

Marking Information

(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
74LVCE1G126W5	SOT25	PZ
74LVCE1G126SE	SOT353	PZ

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