

CL74LVC1G06 Single Inverter Buffer/Driver With Open-Drain Output

General Description

This single inverter buffer and driver is designed for 1.65-V to 5.5-V V_{CC} operation.

The output of the CL74LVC1G06 device is open-drain and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions. The maximum sink current is 32mA

This device is fully specified for partial-power-down applications using I_{OFF} circuitry disables the outputs when the device is powered down. This inhibits current backflow into the device which prevents damage to the device.

Ordering Information

Part Number	Package	
CL74LVC1G06	SOT-23-5	
	SOT-25	
	SOT-353	
	SOT-553	
	DFN1X1-4L	

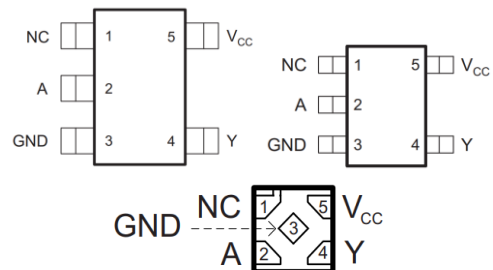
Features

- Available in the Ultra Small DFN1X1
- Supports 5-V V_{CC} Operation
- Input and Open-Drain Output Accept Voltage up to 5.5V
- Max T_{pd} of 4.5 ns at 3.3 V
- Low Power Consumption, 10- μ A Max I_{CC}
- ± 24 -mA Output Drive at 3.3 V for open-drain devices
- I_{OFF} Supports Partial-Power-Down Mode and Back-Drive
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- Can Be Used For Up or Down Translation
- Schmitt Trigger Action on All Ports
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)

Applications

- AV Receiver
- Blu-ray Player and Home Theater
- DVD Recorders and Players
- Desktop or Notebook PCs
- Digital Radio or Internet Radio Players
- Digital Video Cameras (DVC)
- Embedded PC
- GPS: Personal Navigation Devices
- Mobile Internet Devices
- Network Projector Front-Ends
- Portable Media Players
- Pro Audio Mixers
- Smoke Detectors
- Solid State Drive (SSD): Enterprise
- High-Definition (HDTV)
- Tablet: Enterprise
- Audio Dock: Portable
- DLP Front Projection Systems
- DVR and DVS
- Digital Picture Frame (DPF)
- Digital Still Cameras

Pin Configuration



Simplified Schematic



Pin Name	Pin No.	Pin Function
NC	1	No connect
A	2	Input
GND	3	Ground
Y	4	Output
V _{CC}	5	Power pin

Absolute Maximum Ratings (Note1)

- V_{CC} ----- -0.5V to +6.5V
- V_I----- -0.5V to +6.5V
- V_O(Voltage applied to any output in the high-impedance or power-off state) ----- -0.5V to +6.5V
- V_O(Voltage applied to any output in the high or slow state)----- -0.5V to +6.5V
- Input clamp current ----- -50mA
- Output clamp current ----- -50mA
- Continuous output current ----- ±50mA
- Storage Temperature ----- -65°C to 150°C

Recommended Operating Conditions

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply voltage	V _{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			
Input voltage	V _I		0		5.5	V
Output voltage	V _O				5.5	V
High- level input voltage	V _{IH}	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}			
Low- level input voltage	V _{IL}	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}	

Low- level output current	I_{OL}	$V_{CC} = 1.65V$			4	mA
		$V_{CC} = 2.3V$			8	
		$V_{CC} = 3V$			16	
		$V_{CC} = 3V$			24	
		$V_{CC} = 4.5V$			32	
Input transition rise or fall rate	$\Delta T/\Delta V$	$V_{CC} = 1.8V \pm 0.15V, 2.5V \pm 0.2V$			20	ns/V
		$V_{CC} = 3.3V \pm 0.3V$			10	
		$V_{CC} = 5V \pm 0.5V$			5	
Operating temperature	T_A		-40		125	$^{\circ}C$

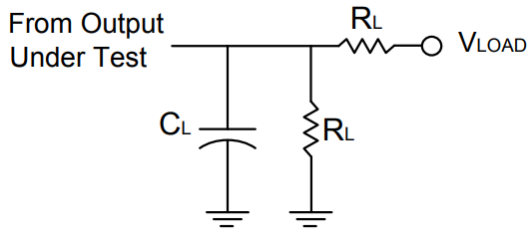
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Low- level output voltage	V_{OL}	$V_{CC} = 1.65 \sim 5.5V, I_{OL} = 100\mu A$			0.1	V
		$V_{CC} = 1.65V, I_{OL} = 4mA$			0.45	
		$V_{CC} = 2.3V, I_{OL} = 8mA$			0.3	
		$V_{CC} = 3V, I_{OL} = 16mA$			0.4	
		$V_{CC} = 3V, I_{OL} = 24mA$			0.55	
		$V_{CC} = 4.5V, I_{OL} = 32mA$			0.55	
Inflection-point current	I_I	$V_{IN} = 5.5V$ or GND, $V_{CC} = 0 \sim 5.5V$			± 1	μA
Power off leakage current	I_{OFF}	V_I or $V_O = 5.5V, V_{CC} = 0V$			± 10	μA
Supply current	I_{CC}	$V_I = 5.5V$ or GND, $I_{OUT} = 0, V_{CC} = 1.65 \sim 5.5V$			10	μA
Additional supply current per input pin	ΔI_{CC}	$V_{CC} = 3 \sim 5.5V$, one input at $V_{CC} - 0.6V$, other input at V_{CC} or GND			500	μA

Switching Characteristics

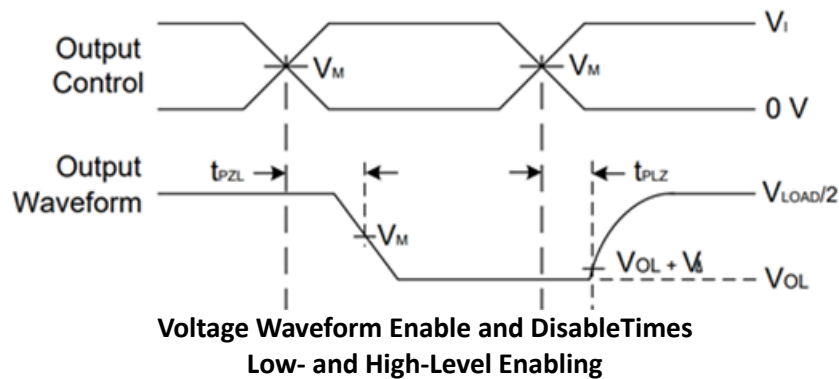
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Propagation delay from input(A) to output(Y)	T_{PD}	$V_{CC} = 1.8V \pm 0.15V,$	2.2		7	ns
		$V_{CC} = 2.5V \pm 0.2V$	1.1		4.5	
		$V_{CC} = 3.3V \pm 0.3V$	1.2		4.5	
		$V_{CC} = 5V \pm 0.5V$	1		3.5	

Parameter Measurement Information



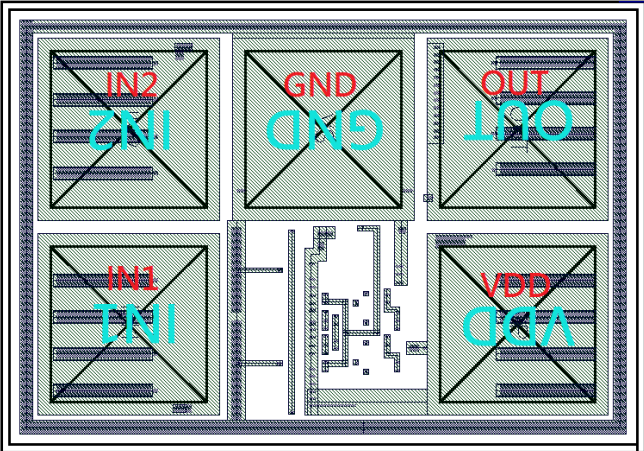
TEST	Condition
t_{PLZ}	V_{LOAD}
t_{PZL}	V_{LOAD}

VCC	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
$3.3V \pm 0.3V$	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



- Notes:
- A. C_L includes probe and jig capacitance
 - B. All pulses and supplied at pulse repetition rate $\leq 10MHz$
 - C. The Inputs are measured one at a time with one transition per measurement
 - D. For the open drain device t_{PLZ} and t_{PZL} are the same as t_{PD}
 - E. t_{PZL} is measured at V_M
 - F. t_{PLZ} is measured at $V_{OL} + V_{\Delta}$

PAD Location and Coordinates

PHYSICAL CHARACTERISTICS		UNIT	CHIP DRAWING
Wafer Size	200	mm	
Die Size (with S/L)	0.308 * 0.233	mm ²	
Scribe line width	60	um	
TOP Metal thickness	3	um	
Top Metallization	Al-Cu		
Wafer Thickness	726	um	
CUP (circuit under PAD) or not	YES		
Bonding Wire Diameter	20	um	

PAD NAME	PAD SIZE (μm ²)	Coordinate
IN 1	60*60	(49,49)
IN 2	60*60	(49,124)
GND	60*60	(124,124)
OUT (Y)	60*60	(199,124)
VDD	60*60	(199,49)

Bonding Diagram Example

