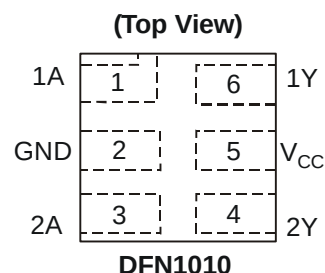
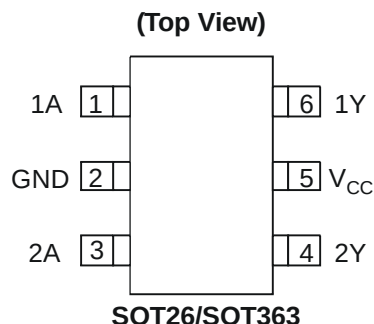


Description

The 74LVC2G06 is a dual inverter gate with open drain outputs. The device is designed for operation with a power supply range of 1.65V to 5.5V. The input is 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. The open-drain output 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 32 mA.

Pin Assignments



Features

- Wide Supply Voltage Range from 1.65V to 5.5V
- -24mA Output Drive at 3.0V
- CMOS low power consumption
- IOFF Supports Partial-Power-Down Mode Operation
- Inputs accept up to 5.5V
- ESD Protection Tested per JESD 22
 - o Exceeds 200-V Machine Model (A115-A)
 - o Exceeds 2000-V Human Body Model (A114-A)
 - o Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options
- SOT26, SOT363, and DFN1010 Available in "Green" Molding Compound (no Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

Applications

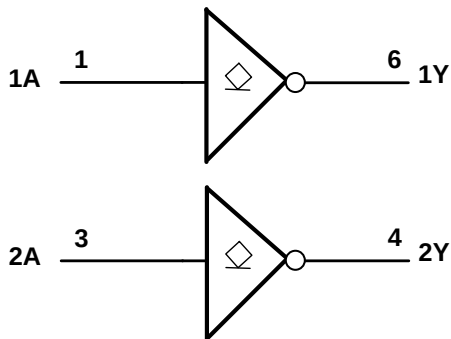
- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
 - o PCs, networking, notebooks, netbooks, PDAs
 - o Computer peripherals, hard drives, CD/DVD ROM
 - o TV, DVD, DVR, set top box
 - o Cell Phones, Personal Navigation / GPS
 - o MP3 players ,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
1A	1	Data Input
GND	2	Ground
2A	3	Data Input
2Y	4	Data Output Open Drain
V _{CC}	5	Supply Voltage
1Y	6	Data Output Open Drain

Logic Diagram



Function Table

Inputs	Output
A	Y
H	L
L	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 V _O <0	-50	mA
I _O	Continuous output current	-50	mA
	Continuous current through V _{DD} 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 _{OL}	Low-level output current	V _{CC} = 1.65V		4	mA
		V _{CC} = 2.3V		8	
		V _{CC} = 3V		16	
				24	
		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		10	
T _A	Operating free-air temperature		-40	125	°C

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

Electrical Characteristics

Symbol	Parameter	Test Conditions	V _{CC}	40°C to 85°C		-40°C to 125°C		Unit
				Min	Max	Min	Max	
V _{OL}	Low Level Output Voltage	I _{OL} = 100µA	1.65V to 5.5V		0.1		0.1	V
		I _{OL} = 4mA	1.65V		0.45		0.70	
		I _{OL} = 8mA	2.3V		0.3		0.45	
		I _{OL} = 16mA	3V		0.4		0.60	
		I _{OL} = 24mA			0.55		0.80	
		I _{OL} = 32mA	4.5V		0.55		0.80	
I _I	Input Current	V _I = 5.5 V or GND	0 to 5.5V		± 5		± 20	µA
I _{OZ}	Z State Leakage Current	V _O = 0 to 5.5V	3.6V		± 10		± 10	µA
I _{OFF}	Power Down Leakage Current	V _I or V _O = 5.5V	0		± 10		± 20	µA
I _{CC}	Supply Current	V _I = 5.5V of GND I _O = 0	1.65V to 5.5V		10		40	µA
ΔI _{CC}	Additional Supply Current	Input at V _{CC} - 0.6V	3V to 5.5V		500		5000	µA

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

Symbol	Parameter	Test Conditions	V _{CC}	Min	Typ.	Max	Unit
C _I	Input Capacitance	V _I = V _{CC} – or GND	3.3		3.5		pF
θ _{JA}	Thermal Resistance Junction-to-Case	SOT26	(Note 4)		204		°C/W
		SOT363			371		
		DFN1010			430		
θ _{JC}	Thermal Resistance Junction-to-Case	SOT26	(Note 4)		52		°C/W
		SOT363			143		
		DFN1010			190		

Notes: 4. Test condition for SOT26, SOT363 and DFN1010: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Switching Characteristics

 T_A = -40°C to 85°C, CL = 30 or 50pF (see Figure 1)

Parameter	From (Input)	TO (OUTPUT)	V _{CC} = 1.8V ± 0.15V		V _{CC} = 2.5V ± 0.2V		V _{CC} = 3.3V ± 0.3V		V _{CC} = 5V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	A	Y	0.5	6.5	0.5	3.9	0.5	3.4	0.5	2.9	ns

 T_A = -40°C to 125°C, CL = 30 or 50pF (see Figure 1)

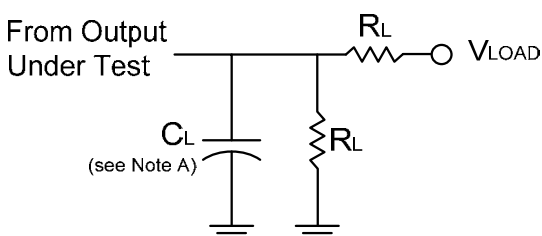
Parameter	From (Input)	TO (OUTPUT)	V _{CC} = 1.8V ± 0.15V		V _{CC} = 2.5V ± 0.2V		V _{CC} = 3.3V ± 0.3V		V _{CC} = 5V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{pd}	A	Y	0.5	8.2	0.5	4.9	0.5	4.3	0.5	3.7	ns

Operating Characteristics

$T_A = 25^\circ\text{C}$

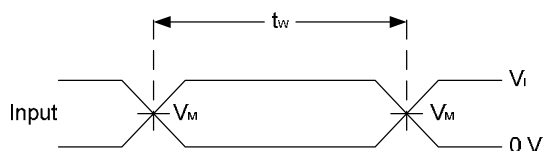
Parameter	Test Conditions	$V_{CC} = 1.8\text{V}$	$V_{CC} = 2.5\text{V}$	$V_{CC} = 3.3\text{V}$	$V_{CC} = 5\text{V}$	Unit
		Typ.	Typ.	Typ.	Typ.	
C_{pd}	Power dissipation capacitance $f = 10\text{ MHz}$	3	3	4	6	pF

Parameter Measurement Information

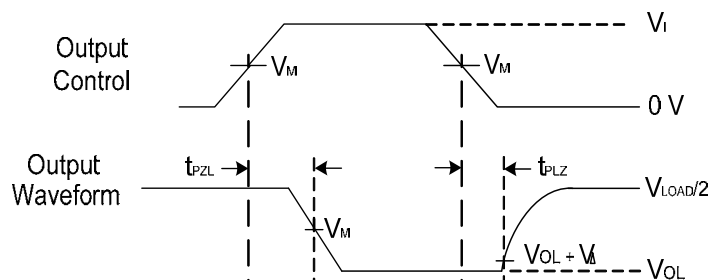


TEST	Condition
t_{PLZ} (see Notes D and E)	V_{load}
t_{PZL} (see Notes D and F)	V_{load}

V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_I	t_r/t_f					
$1.8\text{V} \pm 0.15\text{V}$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	$1\text{ K}\Omega$	0.15 V
$2.5\text{V} \pm 0.2\text{V}$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	$500\ \Omega$	0.15 V
$3.3\text{V} \pm 0.3\text{V}$	3 V	$\leq 2.5\text{ns}$	1.5 V	6 V	50 pF	$500\ \Omega$	0.3 V
$5\text{V} \pm 0.5\text{V}$	V_{CC}	$\leq 2.5\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	50 pF	$500\ \Omega$	0.3 V



**Voltage Waveform
Pulse Duration**

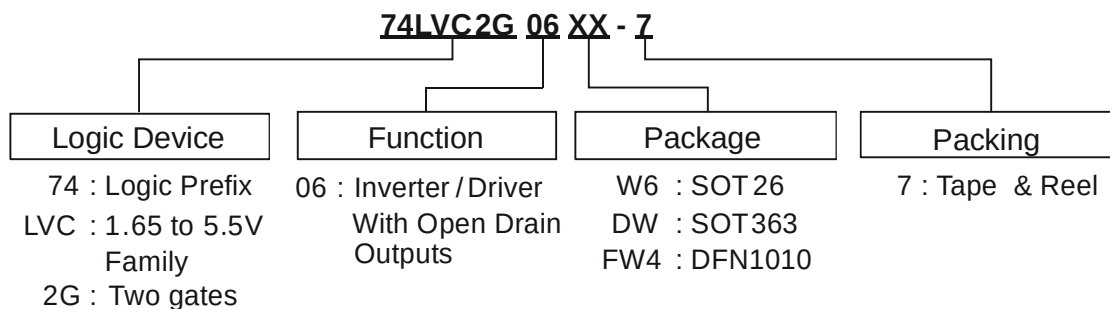


**Voltage Waveform
Propagation Delay Times**

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 $\leq 10\text{ MHz}$
 - 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 $V_{OL} + V_{\Delta}$

Ordering Information

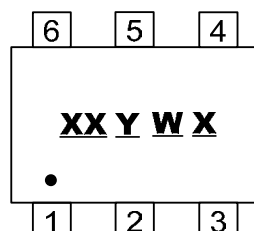


Device	Package Code	Packaging (Note 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
 74LVC2G06W6-7	W6	SOT26	3000/Tape & Reel	-7
 74LVC2G06DW-7	DW	SOT363	3000/Tape & Reel	-7
 74LVC2G06FW4-7	FW4	DFN1010	5000/Tape & Reel	-7

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) SOT26, SOT363



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
74LVC2G06W6	SOT26	Z3
74LVC2G06DW	SOT363	Z3

(2) DFN1010

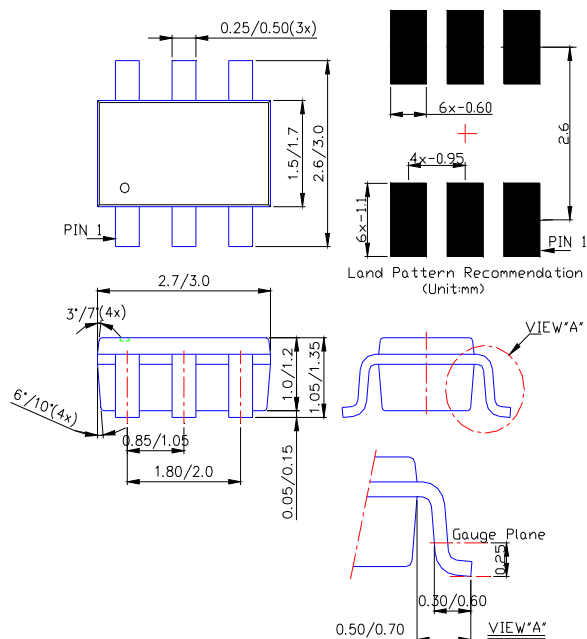
$$\begin{array}{r} \underline{XX} \\ Y \quad \underline{W} \quad \underline{X} \\ \bullet \end{array}$$

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
74LVC2G06FW4	DFN1010	Z3

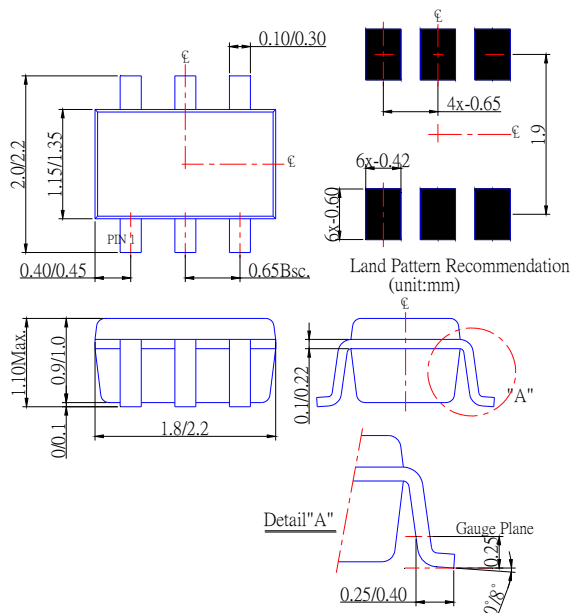
Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT26

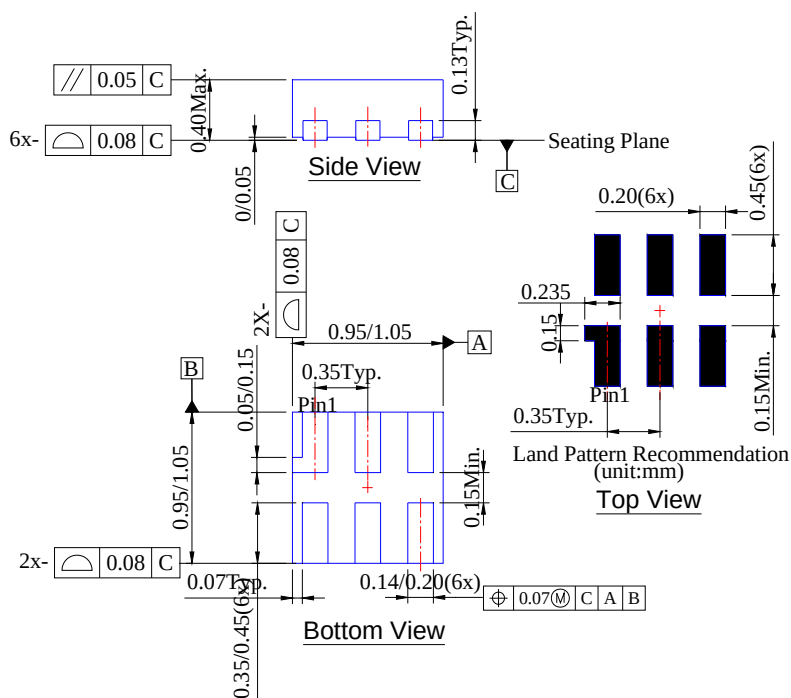


Package Outline Dimensions (cont.) (All Dimensions in mm)

(2) Package Type: SOT363



(3) Package Type: DFN1010



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