



# 74LVC2G34 DUAL BUFFERS

#### Description

The 74LVC2G34 is a dual buffer gate with standard push-pull outputs. 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.

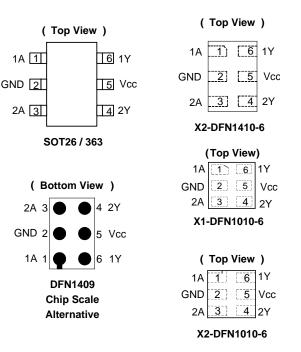
The gate performs the positive Boolean function:

 $\mathsf{Y}=\mathsf{A}$ 

#### 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
- Exceeds 200-V Machine Model (A115)
- Exceeds 2000-V Human Body Model (A114)
- Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- DFN1409 Package Designed as a Direct Replacement for Chip Scale Packaging
- Range of Package Options SOT26, SOT363, X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, and X2-DFN1410-6
- Leadless Packages Named per JESD30E
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

### Pin Assignments



#### Applications

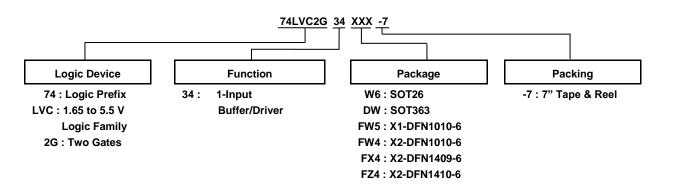
- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide Array of Products Such as:
  - PCs, Networking, Notebooks, Netbooks, Tablets
  - Computer Peripherals, Hard Drives, SSD, CD/DVD ROM
  - TV, DVD, DVR, Set Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

- 2. See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and < 1000 ppm antimony compounds.



#### **Ordering Information**



Devries	Package	Package	Package	7" Tape and Reel (Note 5)		
Device	Code	(Note 4)	Size	Quantity	Part Number Suffix	
74LVC2G34W6-7	W6	SOT26	2.8mm X 2.2mm X 1.1mm 0.95mm lead pitch	3000/Tape & Reel	-7	
74LVC2G34DW-7	DW	SOT363	2.0mm X 2.0mm X 1.1mm 0.65mm lead pitch	3000/Tape & Reel	-7	
74LVC2G34FW5-7	FW5	X1-DFN1010-6	1.0mm X 1.0mm X 0.5mm 0.35mm pad pitch	5000/Tape & Reel	-7	
74LVC2G34FW4-7	FW4	X2-DFN1010-6	1.0mm X 1.0mm X 0.4mm 0.35mm pad pitch	5000/Tape & Reel	-7	
74LVC2G34FX4-7	FX4	X2-DFN1409-6 Chip Scale Alternative	1.4mm X 0.9mm X 0.4mm 0.5mm pad pitch	5000/Tape & Reel	-7	
74LVC2G34FZ4-7	FZ4	X2-DFN1410-6	1.4mm X 1.0mm X 0.4mm 0.5mm pad pitch	5000/Tape & Reel	-7	

Notes: 4. 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.

5. The taping orientation is located on our website at http://www.diodes.com/datasheets/ap02007.pdf

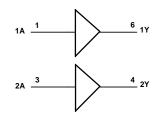
### **Pin Descriptions**

Pin Number	Pin Name	Function	
1	1A	Data Input	
2	GND	Ground	
3	2A	Data Input	
4	2Y	Data Output	
5	Vcc	Supply Voltage	
6	1Y	Data Output	

#### **Function Table**

Inputs	Output
Α	Y
Н	н
L	L

#### Logic Diagram





#### Absolute Maximum Ratings (Notes 6, 7) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	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
Vcc	Supply Voltage Range	-0.5 to +6.5	V
VI	Input Voltage Range	-0.5 to +6.5	V
Vo	Voltage Applied to Output in High Impedance or IOFF State	-0.5 to +6.5	V
Vo	Voltage Applied to Output in High or Low State	-0.3 to V <sub>CC</sub> +0.5	V
I <sub>IK</sub>	Input Clamp Current VI < 0	-50	mA
Ι <sub>ΟΚ</sub>	Output Clamp Current V <sub>O</sub> < 0	-50	mA
lo	Continuous Output Current	-50	mA
_	Continuous Current through V <sub>DD</sub> or GND	±100	mA
TJ	Operating Junction Temperature	-40 to +150	°C
T <sub>STG</sub>	Storage Temperature	-65 to +150	°C

Notes: 6. 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.

7. Forcing the maximum allowed voltage could cause a condition exceeding the maximum current or conversely forcing the maximum current could cause a condition exceeding the maximum voltage. The ratings of both current and voltage must be maintained within the controlled range.

#### Recommended Operating Conditions (Note 8) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol		Parameter	Min	Max	Unit	
	Operating		1.65	5.5	V	
Vcc	Operating Voltage	Data Retention Only	1.5	_	V	
		$V_{CC} = 1.65V$ to 1.95V	0.65 X V <sub>CC</sub>			
	L Park Langel Jamest Maltana	V <sub>CC</sub> = 2.3V to 2.7V	1.7	_		
VIH	High-Level Input Voltage	$V_{CC} = 3V$ to 3.6V	2	_	V	
		$V_{CC} = 4.5V$ to 5.5V	0.7 X V <sub>CC</sub>	_		
		$V_{CC} = 1.65V$ to 1.95V	—	0.35 X V <sub>CC</sub>		
	Low-Level Input Voltage	$V_{CC} = 2.3 V \text{ to } 2.7 V$	_	0.7	V	
VIL		$V_{CC} = 3V$ to 3.6V	_	0.8		
		$V_{CC} = 4.5V$ to 5.5V	_	0.3 X V <sub>CC</sub>		
VI	Input Voltage		0	5.5	V	
Vo	Output Voltage		0	Vcc	V	
		V <sub>CC</sub> = 1.65V	_	-4		
		$V_{CC} = 2.3 V$	_	-8	mA	
Юн	High-Level Output Current		_	-16		
		$V_{CC} = 3V$	_	-24		
		$V_{CC} = 4.5V$	_	-32		



# Recommended Operating Conditions (Note 8) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol		Parameter	Min	Мах	Unit	
I <sub>OL</sub>		V <sub>CC</sub> = 1.65V	_	4		
		$V_{CC} = 2.3 V$	—	— 8		
	Low-Level Output Current		_	16	mA	
		$V_{CC} = 3V$	_	24		
		$V_{CC} = 4.5 V$	_	32		
		$V_{CC} = 1.8V \pm 0.15V, 2.5V \pm 0.2V$	_	20		
Δt/ΔV	Input Transition Rise or Fall Rate	$V_{CC} = 3.3V \pm 0.3V$	_	10	ns/V	
		$V_{CC} = 5V \pm 0.5V$	_	5		
TA	Operating Free-air Temperature	—	-40	+125	°C	

Note: 8. Unused inputs should be held at  $V_{CC}$  or Ground.

#### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

0 milest	Description	Test Osnalitiens		+40°C to	o +85°C	-40°C to	+125°C	Unit	
Symbol	Parameter	Test Conditions	Vcc	Min	Max	Min	Max	Onit	
		I <sub>OH</sub> = -100μA	1.65V to 5.5V	V <sub>CC</sub> – 0.1		V <sub>CC</sub> – 0.1			
	V <sub>OH</sub> High-Level Output Voltage	$I_{OH} = -4mA$	1.65V	1.2		0.95			
		I <sub>OH</sub> = -8mA	2.3V	1.9		1.7	_		
VOH		I <sub>OH</sub> = -16mA	2)/	2.4		1.9		V	
		I <sub>OH</sub> = -24mA	3V	2.3	_	2.0	_		
	I <sub>OH</sub> = -32mA	4.5V	3.8		3.4	_			
		I <sub>OL</sub> = 100μA	1.65V to 5.5V	_	0.1	—	0.1	V	
		$I_{OL} = 4mA$	1.65V	_	0.45	—	0.70		
	Low-Level Output	I <sub>OL</sub> = 8mA	2.3V	_	0.3	_	0.45		
Vol	Voltage	I <sub>OL</sub> = 16mA	2)/	_	0.4	_	0.60		
		$I_{OL} = 24 \text{mA}$	3V	_	0.55	—	0.80		
		$I_{OL} = 32mA$	4.5V	_	0.55	_	0.80		
l <sub>l</sub>	Input Current	$V_1 = 5.5V$ or GND	0 to 5.5V	_	±5	—	±20	μA	
IOFF	Power Down Leakage Current	$V_{I}$ or $V_{O} = 5.5V$	0	_	±10	_	±20	μΑ	
I <sub>CC</sub>	Supply Current	$V_{I} = 5.5V$ or GND, $I_{O} = 0$	1.65V to 5.5V	_	10	_	40	μA	
ΔI <sub>CC</sub>	Additional Supply Current	Input at V <sub>CC</sub> –0.6V	3V to 5.5V	_	500	_	5000	μA	



#### Package Characteristics (@T<sub>A</sub> = +25°C, V<sub>CC</sub> = 3.3V, unless otherwise specified.)

Symbol	Parameter	Package	Conditions	Min	Тур	Max	Unit
Cı	Input Capacitance	Typical of All Packages	$V_{CC} = 3.3V$ $V_{I} = V_{CC}$ or GND	_	3.5	_	pF
	SOT26		_	204	_		
	Thermal Resistance Junction-	SOT363		_	371	_	
		X2-DFN1410-6		_	430	_	
θ <sub>JA</sub> to-Ambient	X2-DFN1409-6	(Note 9)	_	450	_	°C/W	
		X1-DFN1010-6			495		
		X2-DFN1010-6		_	510		
		SOT26		_	52	_	
		SOT363		_	143	_	
	Thermal Resistance Junction-	X2-DFN1410-6		_	190		°C/W
θ <sub>JC</sub> to-Case	to-Case	X2-DFN1409-6	(Note 9)	_	225		
		X1-DFN1010-6			245		
		X2-DFN1010-6	1	_	250	_	1

Note: 9. Test condition for all packages: Device mounted on FR-4 substrate PC board, 2oz copper with minimum recommended pad layout.

#### **Switching Characteristics**

#### **T<sub>A</sub> = -40°C to +85°C**, C<sub>L</sub> = 30 or 50pF (see Figure 1)

Parameter From	-			V <sub>CC</sub> = 1.8V ±0.15V		V <sub>CC</sub> = 2.5V ±0.2V		V <sub>CC</sub> = 3.3V ±0.3V		V <sub>CC</sub> = 5V ±0.5V	
	(Input) (Output)	Min	Max	Min	Мах	Min	Мах	Min	Max		
t <sub>PD</sub>	A	Y	0.5	8.6	0.5	4.4	0.5	4.1	0.5	3.2	ns

 $T_A = -40^{\circ}C \text{ to } +125^{\circ}C$ ,  $C_L = 30 \text{ or } 50\text{pF}$  (see Figure 1)

Parameter (Insuct)	To V <sub>CC</sub> = 1.8V ±0.15V			V <sub>CC</sub> = 2.5V ±0.2V		V <sub>CC</sub> = 3.3V ±0.3V		V <sub>CC</sub> = 5V ±0.5V		Unit	
	(Input) (Output)	(Output)	Min	Max	Min	Max	Min	Max	Min	Max	
t <sub>PD</sub>	А	Y	0.5	10.8	0.5	5.5	0.5	5.1	0.5	4.0	ns

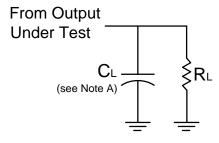
### **Operating Characteristics**

T<sub>A</sub> = +25°C

Parameter		Test Conditions	V <sub>CC</sub> = 1.8V Typ	V <sub>CC</sub> = 2.5V Typ	V <sub>CC</sub> = 3.3V Typ	V <sub>CC</sub> = 5V Typ	Unit
C <sub>PD</sub>	Power Dissipation Capacitance	f = 10MHz	17	19	20	21	pF



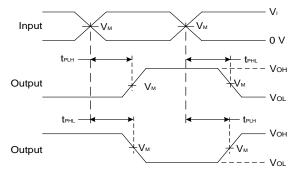
#### **Parameter Measurement Information**



V	Inp	outs	V	0	P	
V <sub>cc</sub>	VI	t <sub>r</sub> /t <sub>f</sub>	V <sub>M</sub>	UL UL	RL	
1.8V±0.15V	Vcc	≤2ns	V <sub>CC</sub> /2	30pF	1kΩ	
2.5V±0.2V	Vcc	≤2ns	V <sub>CC</sub> /2	30pF	500Ω	
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω	
5V±0.5V	V <sub>CC</sub>	≤2.5ns	V <sub>CC</sub> /2	50pF	500Ω	



**Voltage Waveform Pulse Duration** 



Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

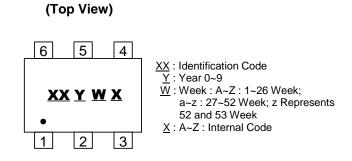
#### Figure 1. Load Circuit and Voltage Waveforms

- Notes: A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate  $\leq$  10 MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{\mathsf{PLH}}$  and  $t_{\mathsf{PHL}}$  are the same as  $t_{\mathsf{PD}}.$



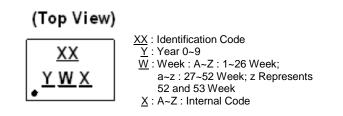
# **Marking Information**

#### (1) SOT26, SOT363



Part Number	Package	Identification Code
74LVC2G34W6-7	SOT26	Z7
74LVC2G34DW-7	SOT363	Z7

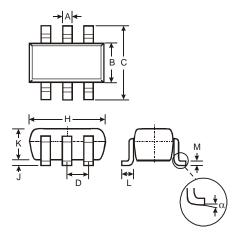
#### (2) X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, X2-DFN1410-6



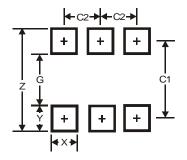
Part Number	Package	Identification Code
74LVC2G34FW4-7	X2-DFN1010-6	Z7
74LVC2G34FW5-7	X1-DFN1010-6	W7
74LVC2G34FX4-7	X2-DFN1409-6	Х7
74LVC2G34FZ4-7	X2-DFN1410-6	Z7



### SOT26 Package Outline Dimensions and Suggested Pad Layout



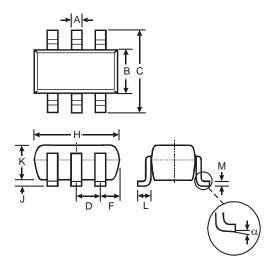
	SOT26				
Dim	Min	Max	Тур		
Α	0.35	0.50	0.38		
В	1.50	1.70	1.60		
С	2.70	3.00	2.80		
D		—	0.95		
н	2.90	3.10	3.00		
J	0.013	0.10	0.05		
κ	1.00	1.30	1.10		
L	0.35	0.55	0.40		
М	0.10	0.20	0.15		
α	0°	8°			
All Dimensions in mm					



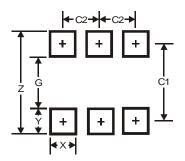
Dimensions	Value (in mm)
Z	3.20
G	1.60
Х	0.55
Y	0.80
C1	2.40
C2	0.95



# SOT363 Package Outline Dimensions and Suggested Pad Layout



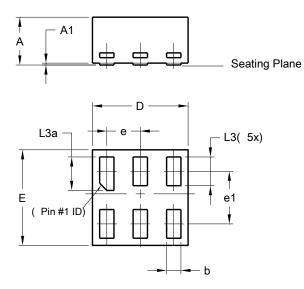
	SOT363				
Dim	Min	Max	Тур		
Α	0.10	0.30	0.25		
В	1.15	1.35	1.30		
С	2.00	2.20	2.10		
D	0.65 Typ				
F	0.40	0.45	0.425		
Н	1.80	2.20	2.15		
J	0	0.10	0.05		
Κ	0.90	1.00	1.00		
L	0.25	0.40	0.30		
Μ	0.10	0.22	0.11		
α	0°	8°	-		
All	All Dimensions in mm				



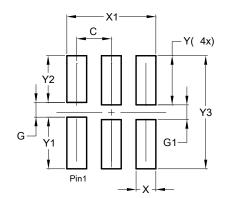
Dimensions	Value (in mm)
Z	2.5
G	1.3
Х	0.42
Y	0.6
C1	1.9
C2	0.65



# X1-DFN1010-6 (Type B) Package Outline Dimensions and Suggested Pad Layout



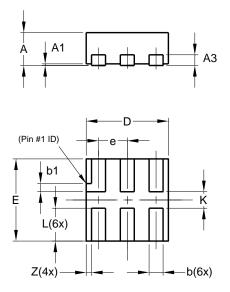
X1-DFN1010-6 (Type B)			
Dim	Min	Max	Тур
Α	-	0.50	0.39
A1	-	0.04	-
b	0.12	0.20	0.15
D	0.95	1.050	1.00
Е	0.95	1.050	1.00
е	0.35 BSC		
e1		0.55 BSC	
L3	0.27	0.30	0.30
L3a	0.32	0.40	0.35
All	All Dimensions in mm		



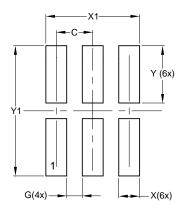
Dimensions	Value (in mm)
С	0.350
G	0.150
G1	0.150
Х	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150



#### X2-DFN1010-6 Package Outline Dimensions and Suggested Pad Layout



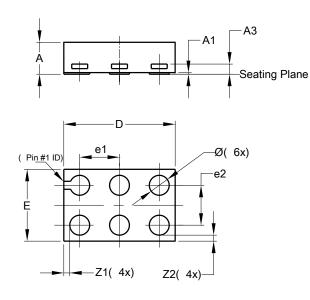
-		14040	•	
	X2-DFN1010-6			
Dim	Min	Max	Тур	
Α		0.40	0.39	
A1	0.00	0.05	0.02	
A3			0.13	
b	0.14	0.20	0.17	
b1	0.05	0.15	0.10	
D	0.95	1.05	1.00	
Е	0.95	1.05	1.00	
е			0.35	
L	0.35	0.45	0.40	
κ	0.15	_		
Z	_	_	0.065	
All	All Dimensions in mm			



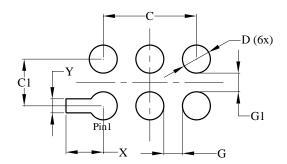
Dimensions	Value (in mm)
С	0.350
G	0.150
Х	0.200
X1	0.900
Y	0.550
Y1	1.250



#### X2-DFN1409-6 Package Outline Dimensions and Suggested Pad Layout



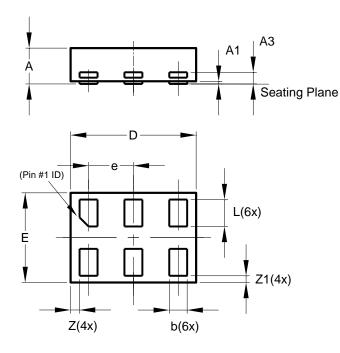
)	X2-DFN1409-6			
Dim	Min	Max	Тур	
Α		0.40	0.39	
A1	0	0.05	0.02	
A3			0.13	
Ø	0.20	0.30	0.25	
D	1.35	1.45	1.40	
E	0.85	0.95	0.90	
e1	_		0.50	
e2	_		0.50	
Z1	_		0.075	
Z2	_		0.075	
All Dimensions in mm				



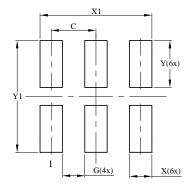
Dimensions	Value (in mm)
С	1.000
C1	0.500
D	0.300
G	0.200
G1	0.200
Х	0.400
Ŷ	0.150



#### X2-DFN1410-6 Package Outline Dimensions and Suggested Pad Layout



X2-DFN1410-6				
Dim	Min	Max	Тур	
Α		0.40	0.39	
A1	0.00	0.05	0.02	
A3			0.13	
b	0.15	0.25	0.20	
D	1.35	1.45	1.40	
Е	0.95	1.05	1.00	
е			0.50	
L	0.25	0.35	0.30	
Z			0.10	
Z1	0.045	0.105	0.075	
All Dimensions in mm				



Dimensions	Value (in mm)	
С	0.500	
G	0.250	
Х	0.250	
X1	1.250	
Y	0.525	
Y1	1.250	



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  - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

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