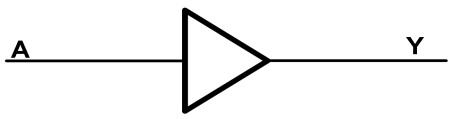
Single Buffer Gate

1 Features	2 Application
- Low Power Consumption, 10-μA Max I_{CC}	- AV Receivers
- Supports 5 V V_{CC} Operation	- Audio Docks: Portable
- Inputs Accept Voltages to 5.5 V	- Blu-ray Players and Home Theater
- Max t_{pd} of 3.3 ns at 3.3 V	- Embedded PC
- ±24-mA Output Drive at 3.3 V	- MP3 Player/Recorder (Portable Audio)
- I_{off} Supports Partial-Power-Down Mode	- Personal Digital Assistant (PDA)
- Typical V_{OHV} > 2 V at V_{CC} = 3.3 V, T_A = 25°C	- Power: Telecom/Server AC/DC Supply
- Typical V_{OLP} < 0.8 V at V_{CC} = 3.3 V, T_A = 25°C	- Solid State Drive (SSD): Client and Enterprise
	- TV: LCD/Digital and High-Definition (HDTV)
	- Tablet: Enterprise
	- Video Analytics: Server
	- Wireless Headset, Keyboard, and Mouse

3 Description	Circuit Diagram
The operating voltage range of the single buffer gate is 1.65 V to 5.5 V. The 74LVC1G34 device contains one buffer and performs the Boolean function Y=A. The CMOS device has high output drive while maintaining low static power dissipation over a broad VCC operating range. This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.	

4 Device Summary, Pin and Packages

Table 4-1. Device Summary(1)

Serial Name	Part Name	Package	MSL(2)	Package Qty
74LVC1G34	74LVC1G34S5	SOT23-5	3	Tape and Reel 3000
	74LVC1G34C5	SC70-5	3	Tape and Reel 3000

(1) For all available packages, please contact product sales.

(2) MSL, The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications.

4 Device Summary, Pin and Packages(Continued)

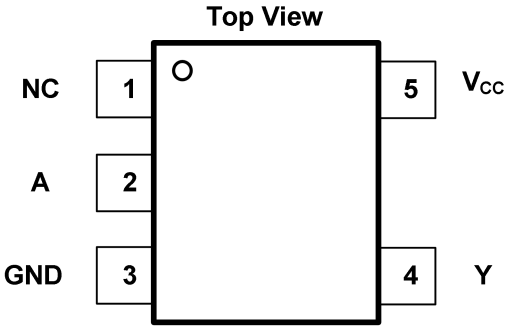


Fig.5-1. 74LVC1G34: S5 (SOT23-5) Package
74LVC1G34: C5 (SC70-5) Package

Table 4-2 Pin Definition

Pin		Pin	Description
Name	S5 C5		
NC	1	—	No internal connection
A	2	I	Input
GND	3	—	Ground
Y	4	O	Output
V_{CC}	5	—	Positive Supply

5 Voltage, Temperature, ESD and Thermal Ratings

5.1 Absolute Maximum Ratings

Parameters			Min	Max.	Unit
V_{CC}	Supply voltage range		-0.5	6.5	V
V_I	Input voltage range		-0.5	6.5	V
V_O	Voltage range applied to any output in the high-impedance or power-off state		-0.5	6.5	V
V_O	Voltage range applied to any output in the high or low state		-0.5	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_{CC} or GND				±100	mA
T_J	Junction temperature under bias			150	˚C
T_{stg}	Storage temperature range		-65	150	˚C

(1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

5.2 ESD Ratings

ESD			Value	Unit
V(ESD)	Electrostatic discharge	Human-body model (HBM)	4 K	V
		Charge device model (CDM)	2 K	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5 Voltage, Temperature, ESD and Thermal Ratings(Continued)

5.3 Recommended Operating Conditions

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

Symbol	Parameter		Min	Max	Unit
V_{CC}	Supply voltage		1.65	5.5	V
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	
				-24	
		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	
				24	
		V_{CC}=4.5V		32	
T_A	Operating free-air temperature		-40	125	℃

5.4 Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOT23-5	250	81	°C/W
SC70-5	400	150	°C/W

6 Electrical Specifications

Vcc=5.0V or 3.3V, FULL=–40°C to +125°C, Typical values are at T_A=+25°C. (unless otherwise noted)

Parameter	Test Conditions	V_{CC}	–40°C to 85°C			–40°C to 125°C			Unit
			Min	Typ	Max	Min	Typ	Max	
V_{OH}	I_{OH}=–100 μA	1.65 V to 5.5 V	V_{CC}-0.1			V_{CC}-0.1			V
	I_{OH}=–4 mA	1.65 V	1.2			1.2			
	I_{OH}=–8 mA	2.3 V	1.9			1.9			
	I_{OH}=–16 mA	3 V	2.4			2.4			
	I_{OH}=–24 mA		2.3			2.3			
	I_{OH}=–32 mA	4.5 V	3.8			3.8			
V_{OL}	I_{OL}=100 μA	1.65 V to 5.5 V			0.1			0.1	V
	I_{OL}=4 mA	1.65 V			0.45			0.45	
	I_{OL}=8 mA	2.3 V			0.3			0.3	
	I_{OL}=16 mA	3 V			0.4			0.4	
	I_{OL}=24 mA				0.55			0.55	
	I_{OL}=32 mA	4.5 V			0.55			0.55	
I_I A input	V_I=5.5 V or GND	0 to 5.5 V			±5			±5	μA
I_{off}	V_I or V_O=5.5 V	0			±10			±10	μA
I_{CC}	V_I=5.5 V or GND, I_O=0	1.65 V to 5.5 V			10			10	μA
ΔI_{CC}	One input at V_{CC} – 0.6 V, Other inputs at V_{CC} or GND	3 V to 5.5 V			500			500	μA
C_i	V_I=V_{CC} or GND	3.3 V		5			5		pF

(1) All unused digital inputs of the device must be held at V_{cc} or GND to ensure proper device operation

6 Electrical Specifications (Continued)

Vcc=5.0V or 3.3V, FULL=–40°C to +125°C, Typical values are at T_A=+25°C. (unless otherwise noted)

Parameter	From (Input)	To (Output)	–40°C to 125°C								Unit
			V_{CC}=1.8 V ± 0.15 V		V_{CC}=2.5 V ± 0.2 V		V_{CC}=3.3 V ± 0.3 V		V_{CC}=5 V ± 0.5 V		
			Min	Max	Min	Max	Min	Max	Min	Max	
t_{pd}	A	Y	3.9	9.5	1.4	4.5	1	3.3	1	3.0	ns

T_A=25°C

Parameter		Test Conditions	V_{CC}=1.8 V	V_{CC}=2.5 V	V_{CC}=3.3 V	V_{CC}=5 V	Unit
			Typ	Typ	Typ	Typ	
C_{pd}	Power dissipation capacitance	f=10 MHz	17	28	33	47	pF

7 Typical Characteristics

Over recommended operating free-air temperature range, C_L=30 pF or 50 pF (unless otherwise noted).

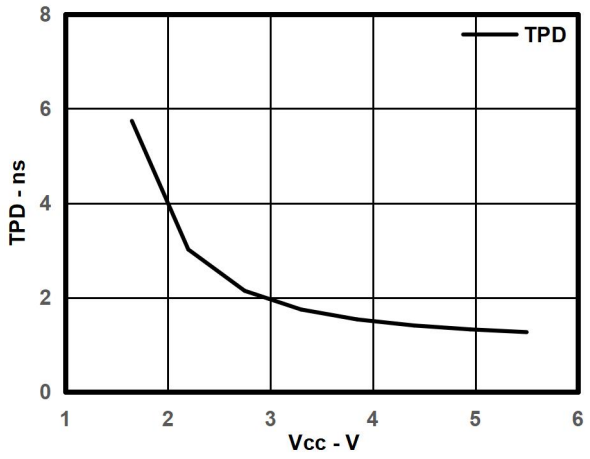


Fig.7-1. Typical Tpd vs Vcc

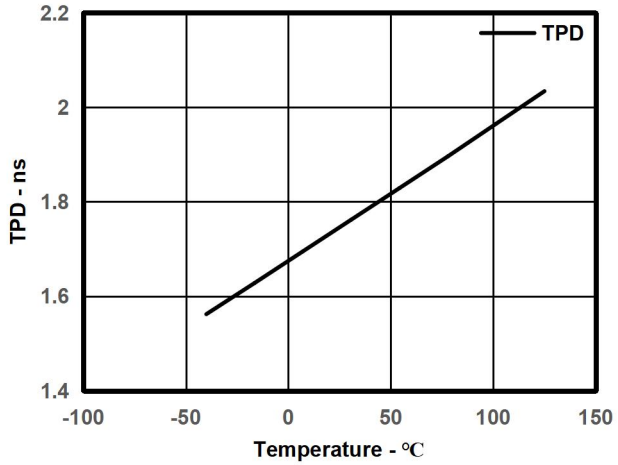
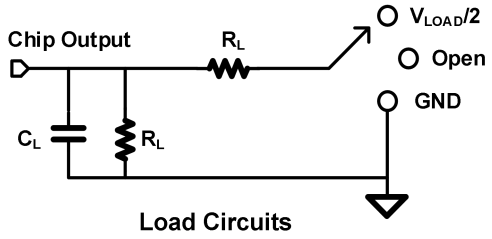


Fig.7-2. Typical Tpd vs Temp

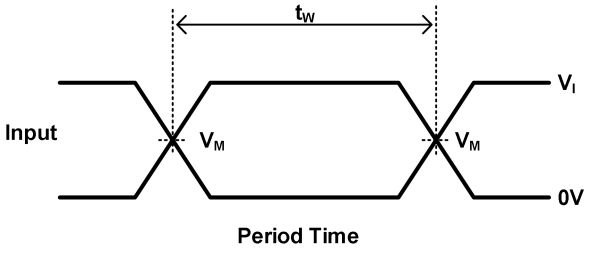
8 Parameter Measurement Information



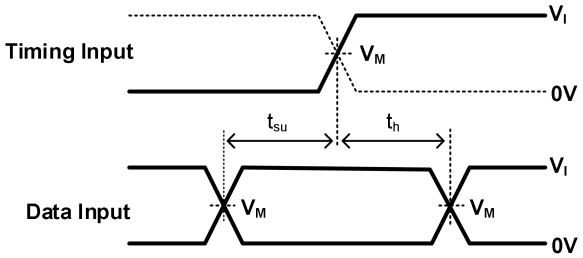
Load Circuits

TEST	S1
T_{PHL}/T_{PLH}	OPEN
T_{PLZ}/T_{PZL}	V_{LOAD}
T_{PHZ}/T_{PZH}	GND

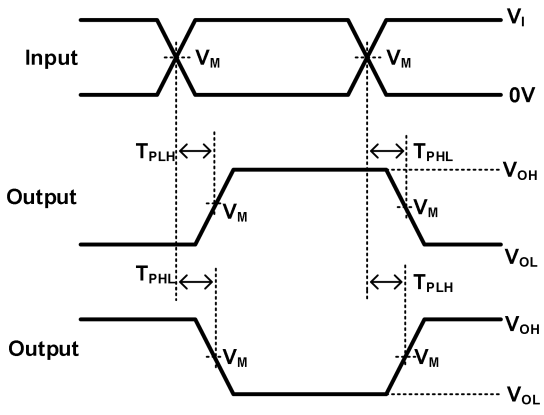
V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	T_r/T_f					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	1kΩ	0.15V
2.5V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	500Ω	0.15V
3.3V±0.15V	3V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.15V	V_{CC}	≤2.5ns	$V_{CC}/2$	$2\times V_{CC}$	50pF	500Ω	0.3V



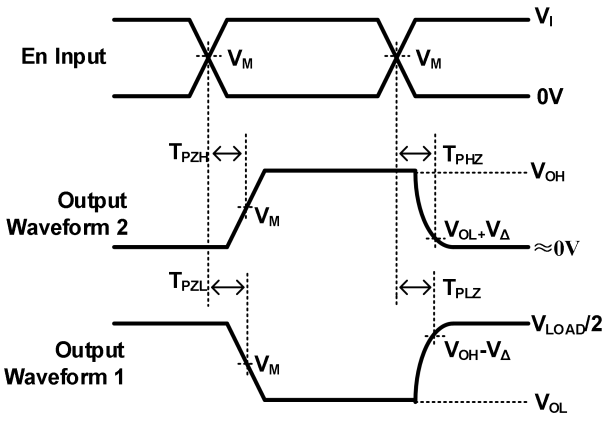
Period Time



Setup and Hold Times



Propagation Delay
for Output and Inverted Output



Enable and Disable Times
Low-And High-Level Enabling

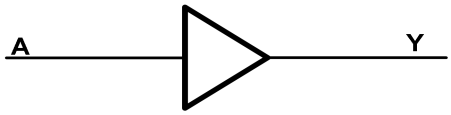
Notes: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR 10 MHz, Z =50.
D. The outputs are measured one at a time, with one transition per measurement.
E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
F. t_{PZL} and t_{PZH} are the same as t_{en}.
G. t_{PLH} and t_{PHL} are the same as t_{pd}.
H. All parameters and waveforms are not applicable to all device.

9 Detailed Description

9.1 Overview

This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current back flow through the device when it is powered down.

9.2 Functional Block Diagram



9.3 Feature Description

The 74LVC1G34 device contains one buffer gate device and performs the Boolean function Y = A. This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

9.4 Device Functional Modes

Table 9-1 Function Table

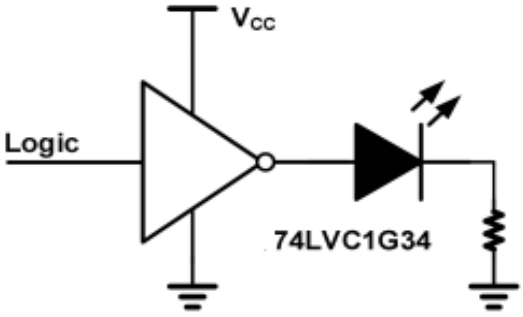
Input A	Output Y
H	H
L	L

10 Application Note

10.1 Application Information

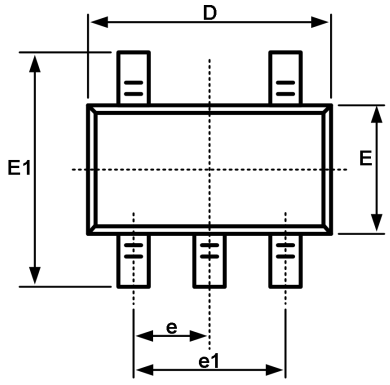
The 74LVC1G34 is a high drive CMOS device that can be used for implementing inversion logic with a high output drive, such as an LED application. It can produce 24 mA of drive current at 3.3 V making it Ideal for driving multiple outputs and good for high-speed applications up to 100 Mhz. The inputs are 5.5 V tolerant allowing it to translate down to V_{CC}.

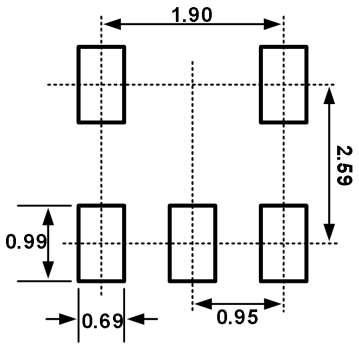
10.2 Typical Application



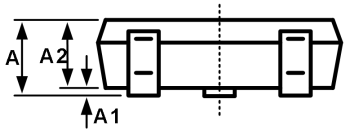
11 Package Outline Dimension

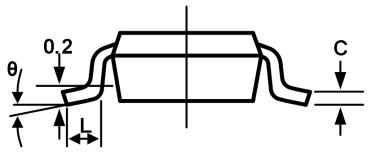
SOT23-5





Recommended Land Pattern (Unit: mm)

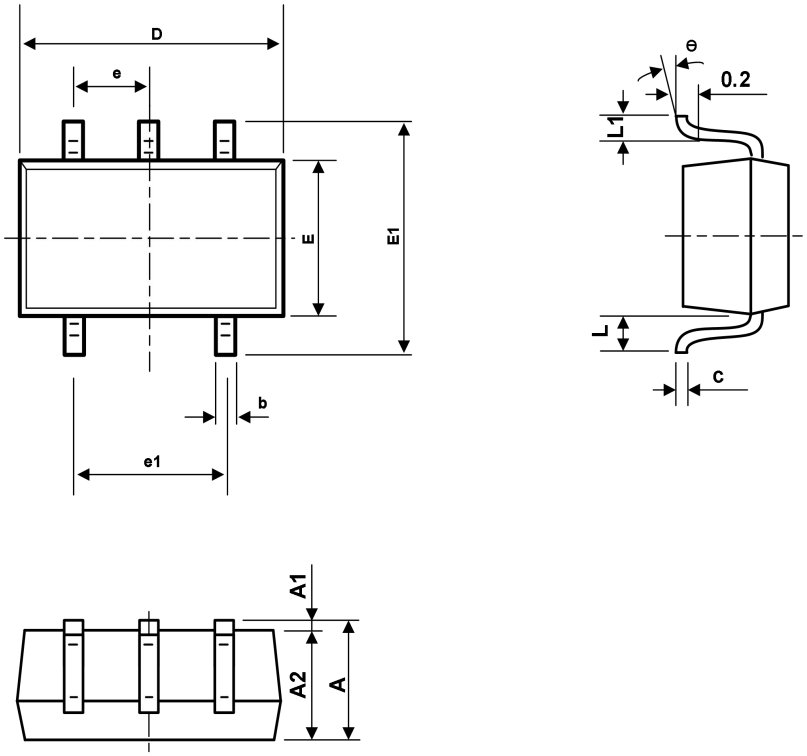




Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950BSC		0.037BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF		0.024REF	
θ	0°	8°	0°	8°

11 Package Outline Dimension(Continued)

SC70-5

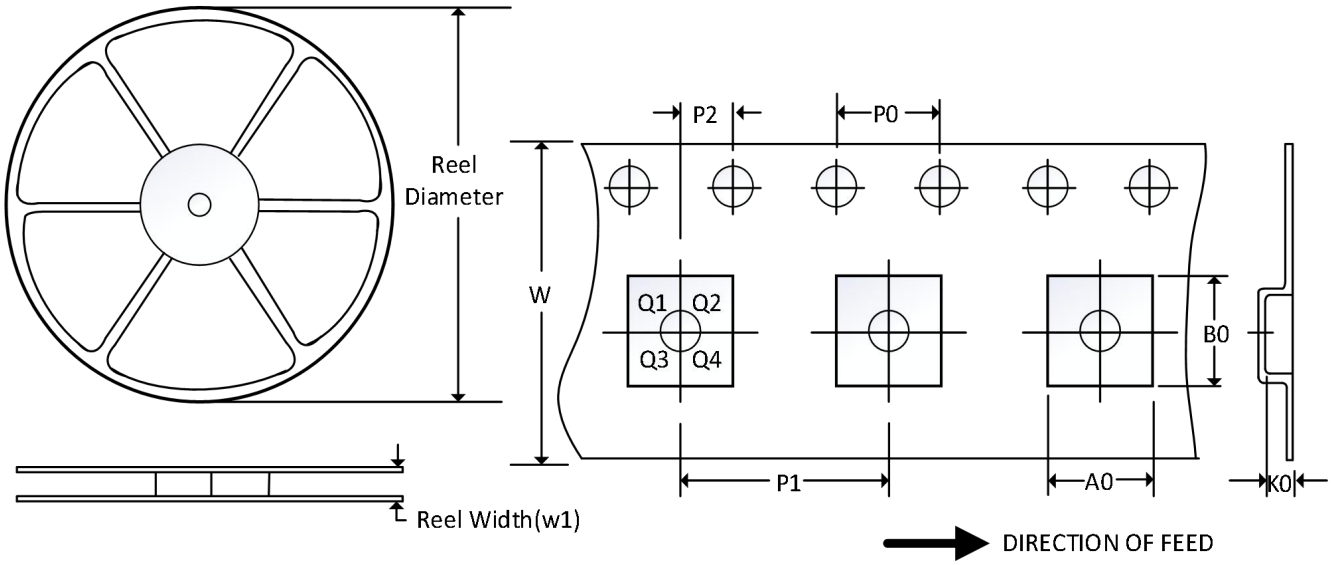


symbol	Dimension In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.110	0.175	0.004	0.007
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

12 TAPE AND REEL INFORMATION

REEL DIMENSIONS

REEL DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT23-5	7''	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3
SC70-5	7''	9.5	2.25	2.55	1.20	4.0	4.0	2.0	8.0	Q3

NOTE:
1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.