

Features

- Designed for 2.0 V to 5.5 V V_{CC} Operation
- 3.5 ns t_{PD} at 5 V (typ)
- Inputs/Outputs Over-Voltage Tolerant up to 5.5 V
- I_{OFF} Supports Partial Power Down Protection
- Source/Sink 8 mA at 3.0 V
- TSOT23-5 Package Available

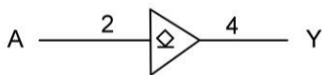
General Description

The SN74LVC1G07 is a single Buffer/Driver with open-drain output. This device has power-down protective circuit, preventing device destruction when it is powered down.

Ordering Information

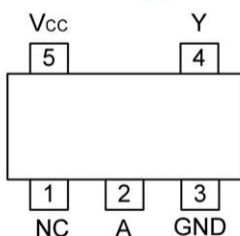
ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74AHC1G07DBVR-TP	TSOT23-5	Tape and Reel,3000

Logic Diagram



Marking: V7x
x is internal code

Pin Configuration



TSOT23-5

Function Table

INPUT(A)	OUTPUT(Y)
H	Z
L	L



Absolute Maximum Ratings

Symbol	Characteristics	Value	Unit
V_{CC}	DC Supply Voltage	-0.5 to +7.0	V
V_{IN}	DC Input Voltage	-0.5 to +7.0	V
V_{OUT}	DC Output Voltage (NLV)	-0.5 to $V_{CC} + 0.5$	V
	DC Output Voltage Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode ($V_{CC} = 0$ V)	-0.5 to $V_{CC} + 0.5$ -0.5 to +6.5 -0.5 to +6.5	V
I_{IK}	DC Input Diode Current $V_{IN} < GND$	-20	mA
I_{OK}	DC Output Diode Current (NLV) $V_{OUT} > V_{CC}, V_{OUT} < GND$	20	mA
	DC Output Diode Current $V_{OUT} < GND$	-20	mA
I_{OUT}	DC Output Source/Sink Current	25	mA
I_{CC} or I_{GND}	DC Supply Current per Supply Pin or Ground Pin	50	mA
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs	260	°C
T_J	Junction Temperature Under Bias	+150	°C
θ_{JA}	Thermal Resistance (Note 2)	320	°C/W
P_D	Power Dissipation in Still Air	390	mW
MSL	Moisture Sensitivity	Level 1	-
F_R	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	-
V_{ESD}	ESD Withstand Voltage (Note 3) Human Body Model Charged Device Model	2000	V
		1000	
$I_{Latchup}$	Latchup Performance (Note 4)	± 100	mA



Recommended Operating Conditions

Symbol	Characteristics	Min	Max	Unit	
V _{CC}	Positive DC Supply Voltage	2.0	5.5	V	
V _{IN}	DC Input Voltage	0	5.5	V	
V _{OUT}	DC Output Voltage (NLV)	0	V _{CC}	V	
	DC Output Voltage	Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V)	0 0 0	V _{CC} 5.5 5.5	V
T _A	Operating Temperature Range	-55	+125	°C	
t _r , t _f	Input Rise and Fall Time	V _{CC} = 3.0 V to 3.6 V V _{CC} = 4.5 V to 5.5 V	0 0	100 20	ns/V
		V _{CC} = 2.0 V V _{CC} = 2.3 V to 2.7 V V _{CC} = 3.0 V to 3.6 V V _{CC} = 4.5 V to 5.5 V	0 0 0 0	20 20 10 5	

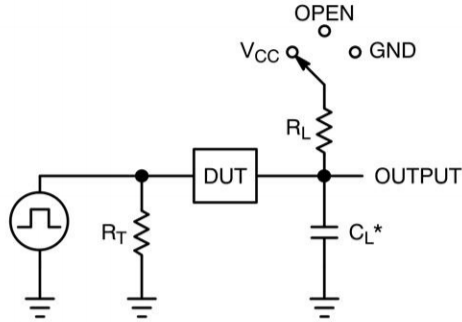
Electrical Characteristics

Symbol	Parameter	Test Conditions	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		-55°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V _{IH}	High-Level Input Voltage		2.0	1.5	-	-	1.5	-	1.5	-	V
			3.0	2.1	-	-	2.1	-	2.1	-	
			4.5	3.15	-	-	3.15	-	3.15	-	
			5.5	3.85	-	-	3.85	-	3.85	-	
V _{IL}	Low-Level Input Voltage		2.0	-	-	0.5	-	0.5	-	0.5	V
			3.0	-	-	0.9	-	0.9	-	0.9	
			4.5	-	-	1.35	-	1.35	-	1.35	
			5.5	-	-	1.65	-	1.65	-	1.65	
V _{OL}	Low-Level Output Voltage	V _{IN} = V _{IH} or V _{IL} I _{OL} = 50 μA I _{OL} = 50 μA I _{OL} = 50 μA I _{OL} = 4 mA I _{OL} = 8 mA	2.0	-	0.0	0.1	-	0.1	-	0.1	V
			3.0	-	0.0	0.1	-	0.1	-	0.1	
			4.5	-	0.0	0.1	-	0.1	-	0.1	
			3.0	-	-	0.36	-	0.44	-	0.52	
			4.5	-	-	0.36	-	0.44	-	0.52	
I _{IN}	Input Leakage Current	V _{IN} = 5.5 V or GND	2.0 to 5.5	-	-	0.1	-	1.0	-	± 1.0	μA
I _{OZ}	3-State Output Leakage Current	V _{OUT} = 0 V to 5.5 V	5.5	-	-	0.25	-	± 2.5	-	± 2.5	μA
I _{OFF}	Power Off Leakage Current (NLV)	V _{IN} = 5.5 V	0.0	-	-	1.0	-	10	-	10	μA
	Power Off Leakage Current	V _{IN} = 5.5 V or V _{OUT} = 5.5 V	0.0	-	-	1.0	-	10	-	10	μA
I _{CC}	Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5	-	-	1.0	-	20	-	40	μA



AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		-55°C ≤ T _A ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
t _{PZL}	Propagation Delay, A to Y (Figures 3 and 4)	C _L = 15 pF	3.0 to 3.6	-	5.0	7.1	-	8.5	-	10.0	ns
				-	7.5	10.6	-	12.0	-	14.5	
		C _L = 50 pF	4.5 to 5.5	-	3.8	5.5	-	6.5	-	8.0	
				-	5.3	7.5	-	8.5	-	10.0	
t _{PLZ}	Propagation Delay, A to Y (Figures 3 and 4)	C _L = 15 pF	3.0 to 3.6	-	6.5	9.7	-	11.5	-	12.5	ns
				-	7.5	10.6	-	15.0	-	14.5	
		C _L = 50 pF	4.5 to 5.5	-	4.8	6.8	-	8.0	-	9.0	
				-	5.3	7.5	-	10.0	-	12.0	
C _{IN}	Input Capacitance			-	4.0	10	-	10	-	10	pF
C _{OUT}	Output Capacitance	Output in High Impedance State		-	6.0	-	-	-	-	-	pF
C _{PD}	Power Dissipation Capacitance (Note 5)	Typical @ 25°C, V _{CC} = 5.0 V								pF	
		8.0									



C_L includes probe and jig capacitance
 R_T is Z_{OUT} of pulse generator (typically 50 Ω)
 $f = 1$ MHz

Figure 3. Test Circuit

Test	Switch Position	C_L , pF	R_L , Ω
t_{PLH} / t_{PHL}	Open	See AC Characteristics Table	X
t_{PLZ} / t_{PZL}	V_{CC}		1 k
t_{PHZ} / t_{PZH}	GND		1 k

X = Don't Care

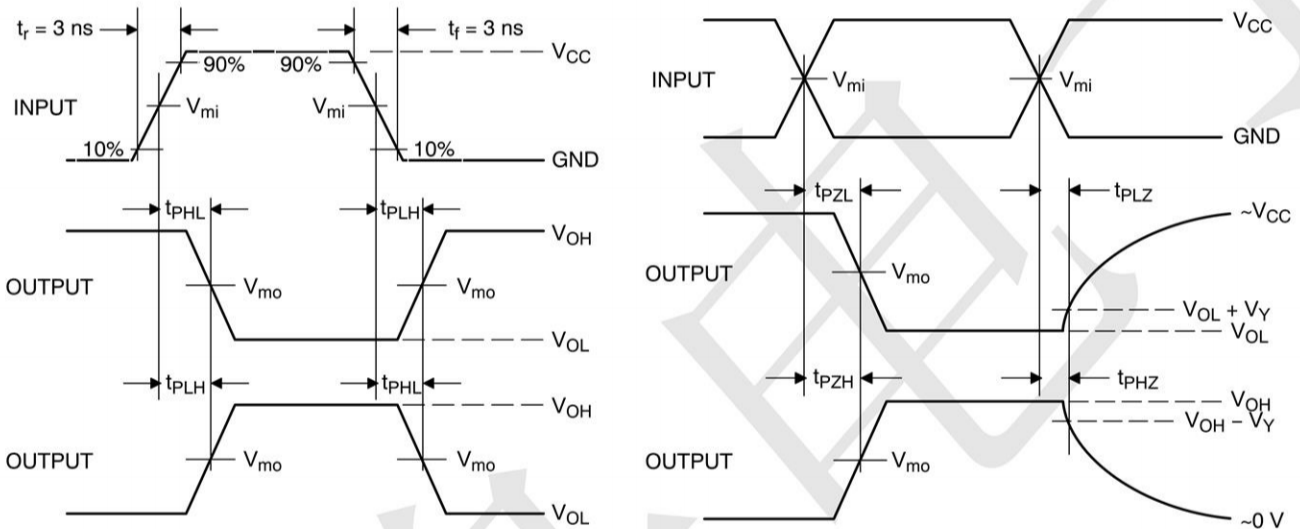


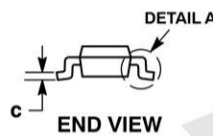
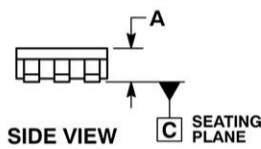
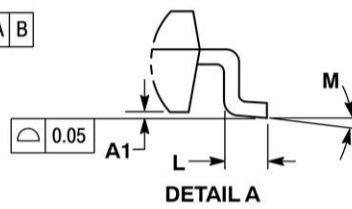
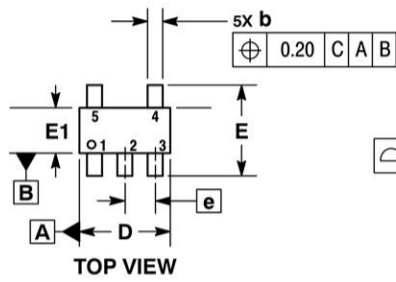
Figure 4. Switching Waveforms

V_{CC} , V	V_{mi} , V	V_{mo} , V		V_Y , V
		t_{PLH} , t_{PHL}	t_{PZL} , t_{PLZ} , t_{PZH} , t_{PHZ}	
3.0 to 3.6	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	0.3
4.5 to 5.5	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	0.3



Package Outline Dimensions (Unit: mm)

TSOT23-5



MILLIMETERS		
DIM	MIN	MAX
A	0.90	1.10
A1	0.01	0.10
b	0.25	0.50
c	0.10	0.26
D	2.85	3.15
E	2.50	3.00
E1	1.35	1.65
e	0.95 BSC	
L	0.20	0.60
M	0° 10°	

Mounting Pad Layout (Unit: mm)

