TECH PUBLIC
台舟电子

MC74VHC1G07DT1G

BUFFER/DRIVER WITH OPEN-DRAIN OUTPUT

www.sot23.com.tw

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

Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROM
  - TV, DVD, DVR, Set-Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

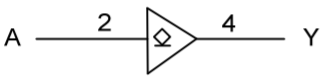
General Descrition

The 74LVC1G07 is a single Buffer/Driver with open-drain output. This device has power-down protective circuit, preventing device destruction when it is powered down.

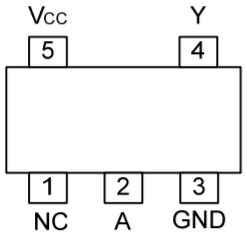
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
MC74VHC1G07DTT1G	TSOT23-5	Tape and Reel,3000

Logic Diagram



Pin Configuration



TSOT23-5

Marking:V7x

x is internal code

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 1000	V
$I_{Latchup}$	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
	Input Rise and Fall Time	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	

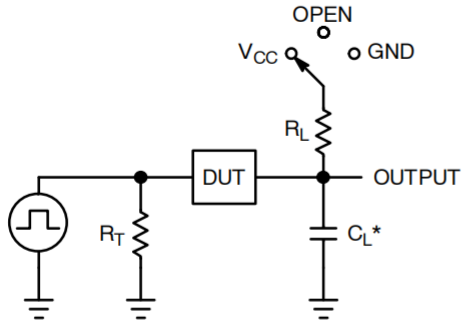
Electrical Characteristics

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 3.0 4.5 3.0 4.5	 – – – – –	 0.0 0.0 0.0 – –	 0.1 0.1 0.1 0.36 0.36	 – – – – –	 0.1 0.1 0.1 0.44 0.44	 – – – – –	 0.1 0.1 0.1 0.52 0.52	V
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
		C_L = 50 pF		–	7.5	10.6	–	12.0	–	14.5	
		C_L = 15 pF	4.5 to 5.5	–	3.8	5.5	–	6.5	–	8.0	
		C_L = 50 pF		–	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
		C_L = 50 pF		–	7.5	10.6	–	15.0	–	14.5	
		C_L = 15 pF	4.5 to 5.5	–	4.8	6.8	–	8.0	–	9.0	
		C_L = 50 pF		–	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

		Typical @ 25°C, V_{CC} = 5.0 V	
C_{PD}	Power Dissipation Capacitance (Note 5)	8.0	pF

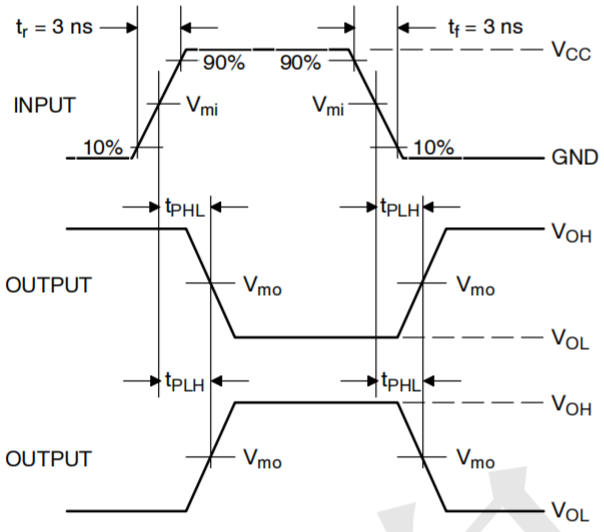


C_L includes probe and jig capacitance
R_T is Z_{OUT} of pulse generator (typically 50 Ω)
f = 1 MHz

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



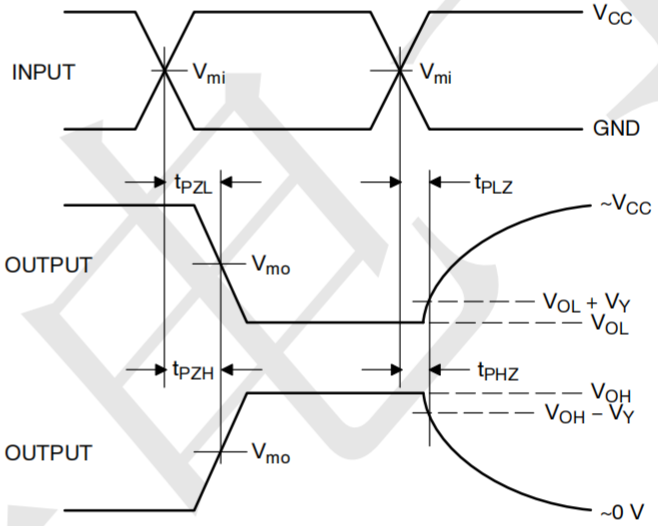


Figure 4. Switching Waveforms

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)

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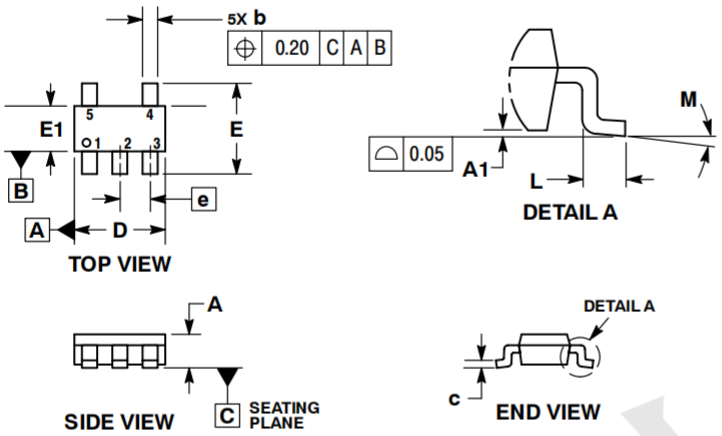

DIM	MILLIMETERS MIN	MAX
A	0.90	1.10
A1	0.01	0.10
b	0.25	0.50
c	0.10	0.26
D	2.85	3.15
E	2.50	3.00
E1	1.35	1.65
e	0.95 BSC	
L	0.20	0.60
M	0 °	10 °

Mounting Pad Layout (Unit: mm)