

Features

- Inputs and open-drain output accept voltage up to 5.5V
- Low power current: $I_{CC}=10\mu A(\text{Max})$
- $\pm 24\text{mA}$ output drive ($V_{CC}=3.3\text{V}$)
- Power down protection
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)
- SOT23-5 Package Available
- SOT353 Package Available
- SOT553 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.

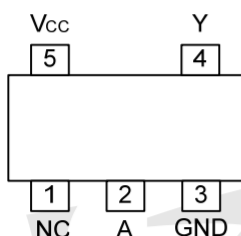
Ordering Information

| ORDER NUMBER | PACKAGE DESCRIPTION | PACKAGE OPTION |
|-----------------|---------------------|--------------------|
| SN74LVC1G07DBVR | SOT23-5 | Tape and Reel,3000 |
| SN74LVC1G07DCKR | SOT353 | Tape and Reel,3000 |
| SN74LVC1G07DRLR | SOT553 | Tape and Reel,4000 |

Logic Diagram



Pin Configuration



SOT23-5
SOT353
SOT553

Marking

SN74LVC1G07DBVR Marking:C07F
SN74LVC1G07DCKR Marking:CV5
SN74LVC1G07DRLR Marking:CV7

Function Table

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



Absolute Maximum Ratings

| PARAMETER | SYMBOL | TEST CONDITIONS | RATINGS | UNIT |
|------------------------------------|-----------|-----------------|------------|------|
| Supply Voltage | V_{CC} | | -0.5 ~ 6.5 | V |
| Input Voltage | V_{IN} | | -0.5 ~ 6.5 | V |
| Output Voltage | V_{OUT} | Active | -0.5 ~ 6.5 | V |
| | | Power-Down | -0.5 ~ 6.5 | V |
| Continuous V_{CC} or GND Current | I_{CC} | | ±100 | mA |
| Continuous Output Current | I_{OUT} | | ±50 | mA |
| Input Clamp Current | I_{IK} | $V_{IN} < 0$ | -50 | mA |
| Output Clamp Current | I_{OK} | $V_{OUT} < 0$ | -50 | mA |
| Storage Temperature Range | T_{STG} | | -65 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommended Operating Conditions

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------------------|-----------|---------------------|------|-----|------|------|
| Supply Voltage | V_{CC} | Operating | 1.65 | | 5.5 | V |
| | | Data retention only | 1.5 | | | V |
| Input Voltage | V_{IN} | | 0 | | 5.5 | V |
| Output Voltage | V_{OUT} | | 0 | | 5.5 | V |
| Operating Temperature | T_A | | -40 | | +125 | °C |



Electrical Characteristics

| PARAMETER | SYMBOL | TEST CONDITIONS | T _A =25°C | | | T _A =-40~+125°C | | | UNIT |
|-------------------------------------|----------------------|--|--------------------------|------|--------------------------|----------------------------|-----|--------------------------|------|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| High-Level Input Voltage | V _{IH} | V _{CC} =1.65V~1.95V | 0.65× V _{CC} | | | 0.65× V _{CC} | | | V |
| | | V _{CC} =2.3V~2.7V | 1.7 | | | 1.7 | | | V |
| | | V _{CC} =3.0V~3.6V | 2 | | | 2 | | | V |
| | | V _{CC} =4.5V~5.5V | 0.7× V _{CC} | | | 0.7× V _{CC} | | | V |
| Low-Level Input Voltage | V _{IL} | V _{CC} =1.65V~1.95V | | | 0.35× V _{CC} | | | 0.35× V _{CC} | V |
| | | V _{CC} =2.3V~2.7V | | | 0.7 | | | 0.7 | V |
| | | V _{CC} =3.0V~3.6V | | | 0.8 | | | 0.8 | V |
| | | V _{CC} =4.5V~5.5V | | | 0.3× V _{CC} | | | 0.3× V _{CC} | V |
| Low-Level Output Voltage | V _{OL} | V _{CC} =1.65V ~ 5.5V, I _{OL} =100μA | | | 0.1 | | | 0.1 | V |
| | | V _{CC} =1.65V, I _{OL} =4mA | | | 0.45 | | | 0.7 | V |
| | | V _{CC} =2.3V, I _{OL} =8mA | | | 0.3 | | | 0.45 | V |
| | | V _{CC} =3.0V, I _{OL} =16mA | | | 0.4 | | | 0.6 | V |
| | | V _{CC} =3.0V, I _{OL} =24mA | | | 0.55 | | | 0.8 | V |
| | | V _{CC} =4.5V, I _{OL} =32mA | | | 0.55 | | | 0.8 | V |
| Input Leakage Current | I _{I(LEAK)} | V _{CC} =0V~5.5V, V _{IN} =V _{CC} or GND | | | ±5 | | | ±5 | μA |
| Power OFF Leakage Current | I _{OFF} | V _{CC} =0V, V _{IN} or V _{OUT} =5.5V | | | ±10 | | | ±10 | μA |
| OFF-state output current | I _{OZ} | V _{CC} =5.5V, V _{IN} =V _{IH} or V _{IL} , V _{OUT} =V _{CC} or GND | | ±0.1 | ±10 | | | ±10 | μA |
| Quiescent Supply Current | I _Q | V _{CC} =1.65V~5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0 | | | 10 | | | 10 | μA |
| Additional Quiescent Supply Current | ΔI _Q | V _{CC} =3V~5.5V, One input at V _{CC} -0.6V, other inputs at V _{CC} or GND | | | 500 | | | 500 | μA |

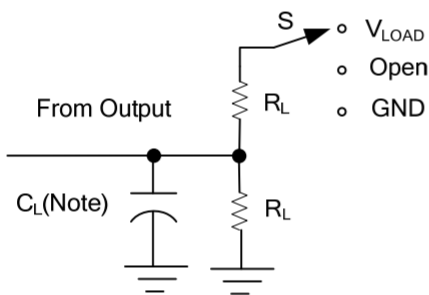
Dynamic Characteristics (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

| PARAMETER | SYMBOL | TEST CONDITIONS | T _A =25°C | | | T _A =-40~+125°C | | | UNIT |
|---|------------------------------------|---|----------------------|-----|------|----------------------------|-----|-----|------|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Propagation delay from input (A) to output(Y) | t _{PLZ} /t _{PZL} | V _{CC} =1.8V±0.15V, C _L =30pF, R _L =1KΩ | 1 | | 13.6 | 1 | | 14 | ns |
| | | V _{CC} =2.5V±0.2V, C _L =30pF, R _L =500Ω | 0.5 | | 9.8 | 0.5 | | 10 | ns |
| | | V _{CC} =3.3V±0.3V, C _L = 50 pF, R _L =500Ω | 1 | | 7.5 | 1 | | 8 | ns |
| | | V _{CC} = 5V±0.5V, C _L = 50 pF, R _L =500Ω | 0.5 | | 6.6 | 0.5 | | 7 | ns |

Operating Characteristics

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------|-----------|--------------------------------------|-----|-----|-----|------|
| Input Capacitance | C_{IN} | $V_{CC}=3.3V, V_{IN}=V_{CC}$ or GND | | 4 | | pF |
| Output Capacitance | C_{OUT} | $V_{CC}=3.3V, V_{OUT}=V_{CC}$ or GND | | 5 | | pF |
| Power Dissipation Capacitance | C_{PD} | $V_{CC}=1.8V$ | 3 | 3 | | pF |
| | | $V_{CC}=2.5V$ | 3 | 3 | | pF |
| | | $V_{CC}=3.3V$ | 3 | 4 | | pF |
| | | $V_{CC}=5V$ | 3 | 6 | | pF |

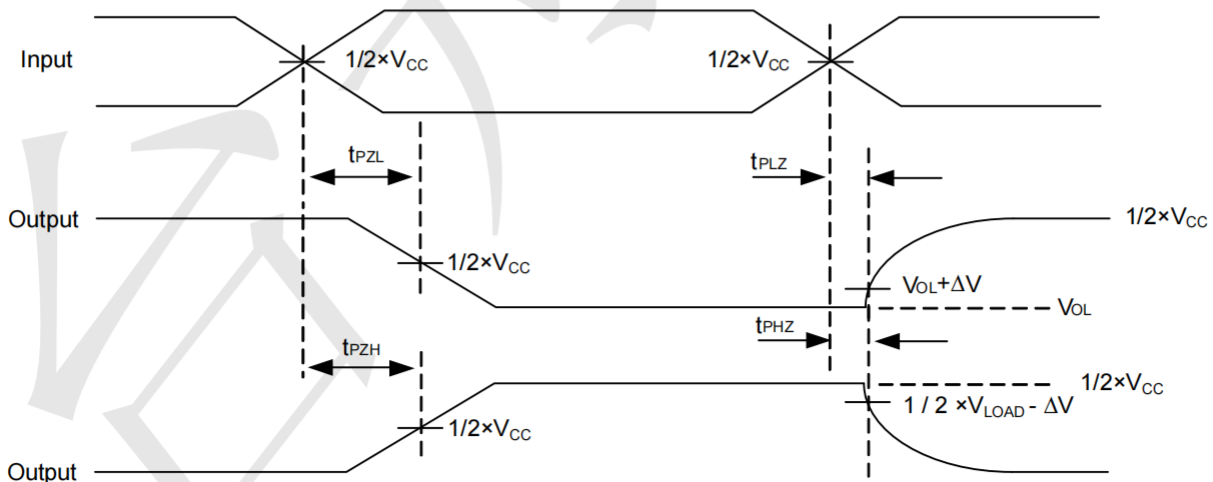
Test Circuit And Waveforms



| TEST | S |
|-------------------|------------|
| t_{PLH}/t_{PHL} | Open |
| t_{PHZ}/t_{PZH} | GND |
| t_{PLZ}/t_{PZL} | V_{LOAD} |

Note: C_L includes probe and jig capacitance.

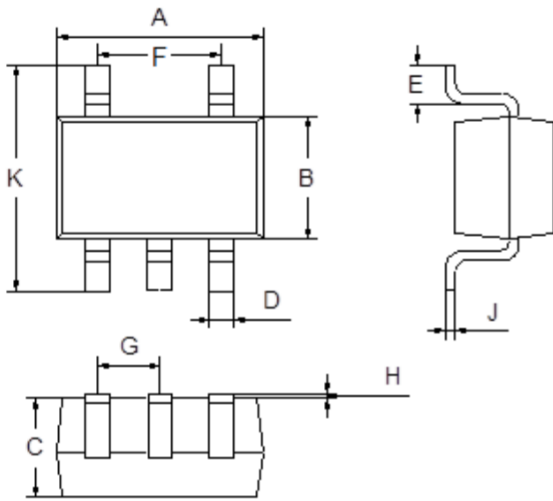
| V_{CC} | V_{IN} | t_R / t_F | V_M | V_{LOAD} | C_L | R_L | V_{Δ} |
|------------------|----------|--------------|------------|-------------------|-------|--------------|--------------|
| $1.8V \pm 0.15V$ | V_{CC} | $\leq 2ns$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 30pF | 1K Ω | 0.15V |
| $2.5V \pm 0.2V$ | V_{CC} | $\leq 2ns$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 30pF | 500 Ω | 0.15V |
| $3.3V \pm 0.3V$ | 3 V | $\leq 2.5ns$ | 1.5V | 6V | 50pF | 500 Ω | 0.3V |
| $5V \pm 0.5V$ | V_{CC} | $\leq 2.5ns$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 50pF | 500 Ω | 0.3V |





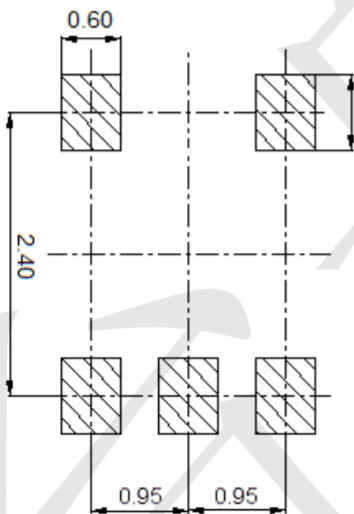
Package Outline Dimensions (Unit: mm)

SOT23-5



| Dimension | Min. | Max. |
|-----------|------|------|
| A | 2.80 | 3.00 |
| B | 1.50 | 1.70 |
| C | 1.00 | 1.20 |
| D | 0.35 | 0.45 |
| E | 0.35 | 0.55 |
| F | 1.80 | 2.00 |
| G | 0.90 | 1.00 |
| H | 0.02 | 0.10 |
| J | 0.10 | 0.20 |
| K | 2.60 | 3.00 |

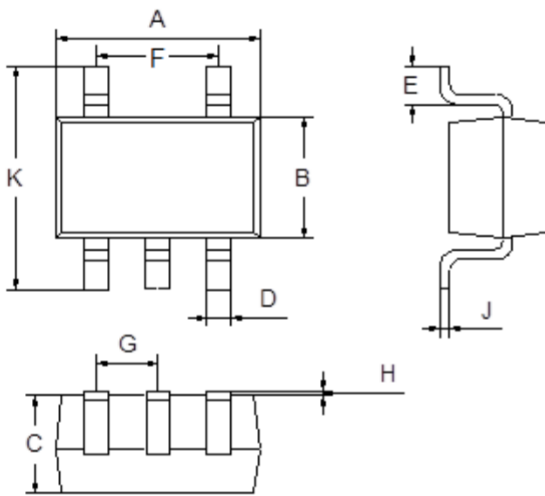
Mounting Pad Layout (Unit: mm)





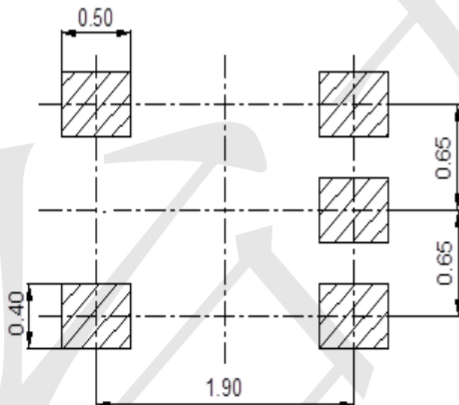
Package Outline Dimensions (Unit: mm)

SOT353



| Dimension | Min. | Max. |
|-----------|------|------|
| A | 2.00 | 2.20 |
| B | 1.15 | 1.35 |
| C | 0.85 | 1.05 |
| D | 0.15 | 0.35 |
| E | 0.25 | 0.40 |
| F | 1.20 | 1.40 |
| G | 0.60 | 0.70 |
| H | 0.02 | 0.10 |
| J | 0.05 | 0.15 |
| K | 2.20 | 2.40 |

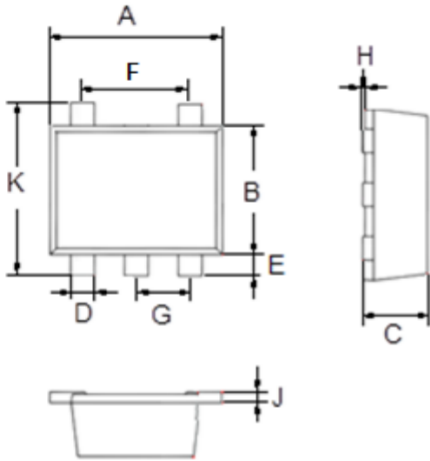
Mounting Pad Layout (Unit: mm)





Package Outline Dimensions (Unit: mm)

SOT553



| Dimension | Min. | Max. |
|-----------|-------|-------|
| A | 1.500 | 1.700 |
| B | 1.100 | 1.300 |
| C | 0.525 | 0.600 |
| D | 0.170 | 0.270 |
| E | 0.100 | 0.300 |
| F | 0.400 | 0.600 |
| G | 0.450 | 0.550 |
| H | 0.000 | 0.050 |
| J | 0.090 | 0.160 |
| K | 1.500 | 1.700 |

Mounting Pad Layout (Unit: mm)

