

### Features

- Operate From 1.65V to 5.5V
- 5 V tolerant input/output for interfacing with 5 V logic
- $\pm 24\text{mA}$  output drive ( $V_{CC} = 3.3\text{V}$ )
- CMOS low-power consumption and high noise immunity
- OFF Supports Partial-Power-Down Mode Operation
- Latch-up performance exceeds 100mA
- Specified from  $-40^\circ\text{C}$  to  $+125^\circ\text{C}$
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)
- SOT23-6 Package Available
- SOT363 Package Available

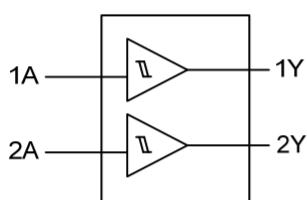
### General Description

The 74LVC2G07 is a high-performance, low-power, low-voltage, Si-gate CMOS device which provides two independent buffers with Schmitt trigger action. It is capable of transforming slowly changed input signals into sharply defined, jitter-free output signals.

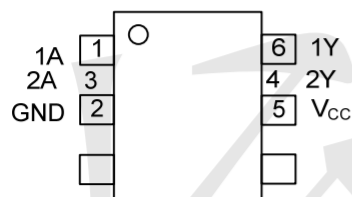
### Ordering Information

| ORDER NUMBER | PACKAGE DESCRIPTION | PACKAGE OPTION     |
|--------------|---------------------|--------------------|
| 74LVC2G07GV  | SOT23-6             | Tape and Reel,3000 |
| 74LVC2G07GW  | SOT363              | Tape and Reel,3000 |

### Logic Diagram



### Pin Configuration



### Marking

SN74LVC2G04DBVR Marking:V07

SN74LVC2G04DCKR Marking:V7

### Function Table

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

H=High Level

## Absolute Maximum Ratings

| PARAMETER                            | SYMBOL          | RATINGS             | UNIT |
|--------------------------------------|-----------------|---------------------|------|
| Supply Voltage                       | $V_{CC}$        | -0.5 ~ 6.5          | V    |
| Input Voltage (Note 2)               | $V_{IN}$        | -0.5 ~ 6.5          | V    |
| Output Voltage (Note 2,3)            | High-Impedance  | -0.5 ~ 6.5          | V    |
|                                      | Power-Off State |                     |      |
|                                      | High State      | -0.5 ~ $V_{CC}+0.5$ | V    |
|                                      | Low State       |                     |      |
| Input Clamp Current ( $V_{IN}<0$ )   | $I_{IK}$        | -50                 | mA   |
| Output Clamp Current ( $V_{OUT}<0$ ) | $I_{OK}$        | -50                 | mA   |
| Output Current                       | $I_{OUT}$       | ±50                 | mA   |
| $V_{CC}$ or GND Current              | $I_{CC}$        | ±100                | mA   |
| Junction Temperature                 | $T_J$           | +150                | °C   |
| Storage Temperature                  | $T_{STG}$       | -65 ~ +150          | °C   |

- Notes: 1. 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.
2. The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
3. The value of  $V_{CC}$  is provided in the recommended operating conditions table.

## Recommended Operating Conditions

| PARAMETER                | SYMBOL       | TEST CONDITIONS          | MIN  | TYP | MAX      | UNIT |
|--------------------------|--------------|--------------------------|------|-----|----------|------|
| Supply Voltage           | $V_{CC}$     | Operating                | 1.65 |     | 5.5      | V    |
| Input Voltage            | $V_{IN}$     |                          | 0    |     | 5.5      | V    |
| Output Voltage           | $V_{OUT}$    | High or low state        | 0    |     | $V_{CC}$ | V    |
| High-Level Input Voltage | $V_{T+}$     | $V_{CC} = 1.65\text{ V}$ | 0.70 |     | 1.40     | V    |
|                          |              | $V_{CC} = 2.3\text{ V}$  | 1.00 |     | 1.70     | V    |
|                          |              | $V_{CC} = 3.0\text{ V}$  | 1.30 |     | 2.20     | V    |
|                          |              | $V_{CC} = 4.5\text{ V}$  | 1.90 |     | 3.10     | V    |
|                          |              | $V_{CC} = 5.5\text{ V}$  | 2.20 |     | 3.70     | V    |
| Low-Level Input Voltage  | $V_{T-}$     | $V_{CC} = 1.65\text{ V}$ | 0.30 |     | 0.70     | V    |
|                          |              | $V_{CC} = 2.3\text{ V}$  | 0.40 |     | 1.00     | V    |
|                          |              | $V_{CC} = 3.0\text{ V}$  | 0.60 |     | 1.30     | V    |
|                          |              | $V_{CC} = 4.5\text{ V}$  | 1.10 |     | 2.00     | V    |
|                          |              | $V_{CC} = 5.5\text{ V}$  | 1.40 |     | 2.50     | V    |
| Hysteresis Voltage       | $\Delta V_T$ | $V_{CC} = 1.65\text{ V}$ | 0.30 |     | 0.80     | V    |
|                          |              | $V_{CC} = 2.3\text{ V}$  | 0.40 |     | 0.90     | V    |
|                          |              | $V_{CC} = 3.0\text{ V}$  | 0.40 |     | 1.10     | V    |
|                          |              | $V_{CC} = 4.5\text{ V}$  | 0.60 |     | 1.30     | V    |
|                          |              | $V_{CC} = 5.5\text{ V}$  | 0.70 |     | 1.40     | V    |
| Operating Temperature    | $T_A$        |                          | -40  |     | +125     | °C   |

Note: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                           | SYMBOL          | TEST CONDITIONS                                                                                                   | MIN          | TYP | MAX      | UNIT          |
|-------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------|--------------|-----|----------|---------------|
| High-Level Output Voltage           | $V_{OH}$        | $V_{CC}=1.65\text{V}\sim 5.5\text{V}$ , $I_{OH}=-100\mu\text{A}$                                                  | $V_{CC}-0.1$ |     |          | V             |
|                                     |                 | $V_{CC}=1.65\text{V}$ , $I_{OH}=-4\text{mA}$                                                                      | 1.20         |     |          | V             |
|                                     |                 | $V_{CC}=2.3\text{V}$ , $I_{OH}=-8\text{mA}$                                                                       | 1.90         |     |          | V             |
|                                     |                 | $V_{CC}=3.0\text{V}$ , $I_{OH}=-16\text{mA}$                                                                      | 2.40         |     |          | V             |
|                                     |                 | $V_{CC}=3.0\text{V}$ , $I_{OH}=-24\text{mA}$                                                                      | 2.30         |     |          | V             |
|                                     |                 | $V_{CC}=4.5\text{V}$ , $I_{OH}=-32\text{mA}$                                                                      | 3.80         |     |          | V             |
| Low-Level Output Voltage            | $V_{OL}$        | $V_{CC}=1.65\sim 5.5\text{V}$ , $I_{OL}=100\mu\text{A}$                                                           |              |     | 0.10     | V             |
|                                     |                 | $V_{CC}=1.65\text{V}$ , $I_{OL}=4\text{mA}$                                                                       |              |     | 0.45     | V             |
|                                     |                 | $V_{CC}=2.3\text{V}$ , $I_{OL}=8\text{mA}$                                                                        |              |     | 0.30     | V             |
|                                     |                 | $V_{CC}=3.0\text{V}$ , $I_{OL}=16\text{mA}$                                                                       |              |     | 0.40     | V             |
|                                     |                 | $V_{CC}=3.0\text{V}$ , $I_{OL}=24\text{mA}$                                                                       |              |     | 0.55     | V             |
|                                     |                 | $V_{CC}=4.5\text{V}$ , $I_{OL}=32\text{mA}$                                                                       |              |     | 0.55     | V             |
| Input Leakage Current               | $I_{I(LEAK)}$   | $V_{IN}=0$ to $5.5\text{V}$ , $V_{CC}=0\sim 5.5\text{V}$                                                          |              |     | $\pm 5$  | $\mu\text{A}$ |
| Power OFF Leakage Current           | $I_{OFF}$       | $V_{IN}$ or $V_{OUT}=5.5\text{V}$ , $V_{CC}=0$                                                                    |              |     | $\pm 10$ | $\mu\text{A}$ |
| Quiescent Supply Current            | $I_{CC}$        | $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$<br>$V_{CC}=1.65\sim 5.5\text{V}$                                              |              |     | 10       | $\mu\text{A}$ |
| Additional Quiescent Supply Current | $\Delta I_{CC}$ | One input at $V_{CC}-0.6\text{V}$<br>Other inputs at $V_{CC}$ or GND,<br>$I_{OUT}=0$ , $V_{CC}=3\sim 5.5\text{V}$ |              |     | 500      | $\mu\text{A}$ |
| Input Capacitance                   | $C_I$           | $V_{IN}=V_{CC}$ or GND, $V_{CC}=3.3\text{V}$                                                                      |              | 4   |          | pF            |

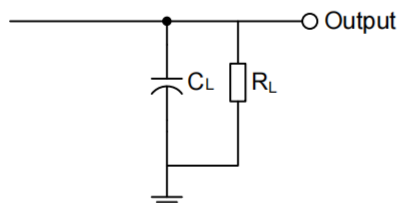
**Switching Characteristics** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                  | SYMBOL                 | TEST CONDITIONS                                                                  | MIN | TYP | MAX | UNIT |
|----------------------------|------------------------|----------------------------------------------------------------------------------|-----|-----|-----|------|
| Propagation delay nA to nY | $t_{PLH}$<br>$t_{PHL}$ | $V_{CC}=1.8\text{V}\pm 0.15\text{V}$ , $C_L=30\text{pF}$ , $R_L=1\text{K}\Omega$ | 3.9 |     | 9.3 | ns   |
|                            |                        | $V_{CC}=2.5\text{V}\pm 0.2\text{V}$ , $C_L=30\text{pF}$ , $R_L=500\Omega$        | 1.9 |     | 5.7 | ns   |
|                            |                        | $V_{CC}=3.3\text{V}\pm 0.3\text{V}$ , $C_L=50\text{pF}$ , $R_L=500\Omega$        | 2.2 |     | 5.4 | ns   |
|                            |                        | $V_{CC}=5\text{V}\pm 0.5\text{V}$ , $C_L=50\text{pF}$ , $R_L=500\Omega$          | 1.5 |     | 4.3 | ns   |

**Operating Characteristics** (Unless otherwise specified)

| PARAMETER                     | SYMBOL   | TEST CONDITIONS                       | MIN | TYP | MAX | UNIT |
|-------------------------------|----------|---------------------------------------|-----|-----|-----|------|
| Power Dissipation Capacitance | $C_{PD}$ | $V_{CC}=5\text{V}$ , $f=10\text{MHz}$ |     | 21  |     | pF   |

## TEST CIRCUIT AND WAVEFORMS

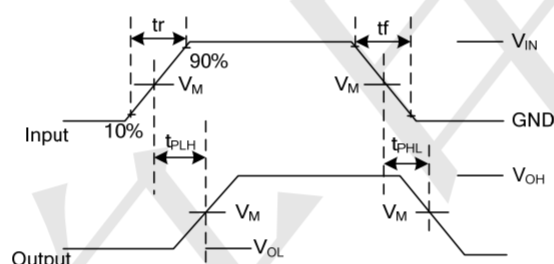


| $V_{CC}$    | $V_{IN}$ | $t_R, t_F$          | $V_M$      | $C_L$ | $R_L$        |
|-------------|----------|---------------------|------------|-------|--------------|
| 1.65V~1.95V | $V_{CC}$ | $\leq 2\text{ns}$   | $V_{CC}/2$ | 30pF  | 1k $\Omega$  |
| 2.3V~2.7V   | $V_{CC}$ | $\leq 2\text{ns}$   | $V_{CC}/2$ | 30pF  | 500 $\Omega$ |
| 3.0V~3.6V   | 3V       | $\leq 2.5\text{ns}$ | 1.5V       | 50pF  | 500 $\Omega$ |
| 4.5V~5.5V   | $V_{CC}$ | $\leq 2.5\text{ns}$ | $V_{CC}/2$ | 50pF  | 500 $\Omega$ |

Definitions for test circuit:

$R_L$  = Load resistance.

$C_L$  = Load capacitance including jig and probe capacitance.

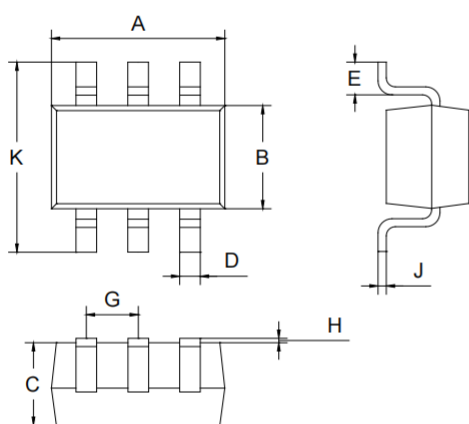


Notes: 1.  $V_{OL}$  and  $V_{OH}$  are typical output drop that occur with the output load.

2.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

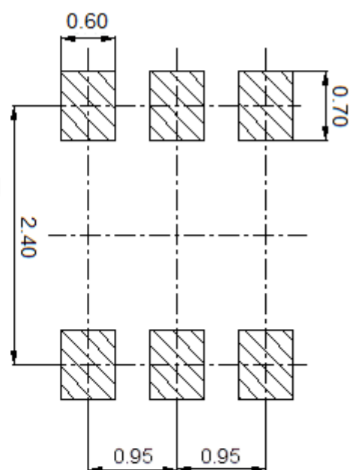
**Package Outline Dimensions** (Unit: mm)

**SOT23-6**



| 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 |
| 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)





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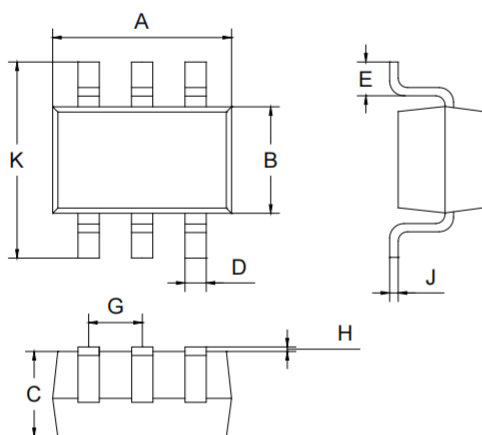
74LVC2G07

Dual Schmitt-Trigger Buffer

[www.sot23.com.tw](http://www.sot23.com.tw)

Package Outline Dimensions (Unit: mm)

SOT363



| 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 |
| 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)

