

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 $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$
- 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

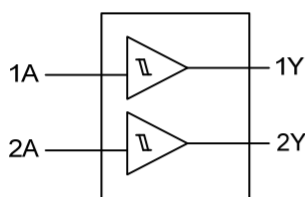
General Description

The 74LVC2G17 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.

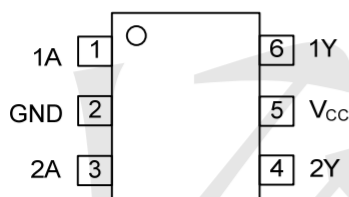
Ordering Information

| ORDER NUMBER | PACKAGE DESCRIPTION | PACKAGE OPTION |
|--------------|---------------------|--------------------|
| 74LVC2G17GV | SOT23-6 | Tape and Reel,3000 |
| 74LVC2G17GW | SOT363 | Tape and Reel,3000 |

Logic Diagram



Pin Configuration



Marking

74LVC2G17GV Marking:V17

74LVC2G17GW Marking:VV

Function Table

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

H=High Level

L=Low 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+} | $V_{CC} = 1.65$ V | 0.70 | | 1.40 | V |
| | | $V_{CC} = 2.3$ V | 1.00 | | 1.70 | V |
| | | $V_{CC} = 3.0$ V | 1.30 | | 2.20 | V |
| | | $V_{CC} = 4.5$ V | 1.90 | | 3.10 | V |
| | | $V_{CC} = 5.5$ V | 2.20 | | 3.70 | V |
| Low-Level Input Voltage | V_{T-} | $V_{CC} = 1.65$ V | 0.30 | | 0.70 | V |
| | | $V_{CC} = 2.3$ V | 0.40 | | 1.00 | V |
| | | $V_{CC} = 3.0$ V | 0.60 | | 1.30 | V |
| | | $V_{CC} = 4.5$ V | 1.10 | | 2.00 | V |
| | | $V_{CC} = 5.5$ V | 1.40 | | 2.50 | V |
| Hysteresis Voltage | ΔV_T | $V_{CC} = 1.65$ V | 0.30 | | 0.80 | V |
| | | $V_{CC} = 2.3$ V | 0.40 | | 0.90 | V |
| | | $V_{CC} = 3.0$ V | 0.40 | | 1.10 | V |
| | | $V_{CC} = 4.5$ V | 0.60 | | 1.30 | V |
| | | $V_{CC} = 5.5$ 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 5.5V , $V_{CC}=0\sim 5.5\text{V}$ | | | ± 5 | μA |
| Power OFF Leakage Current | I_{OFF} | V_{IN} or $V_{OUT}=5.5\text{V}$, $V_{CC}=0$ | | | ± 10 | μA |
| Quiescent Supply Current | I_{CC} | $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$ $V_{CC}=1.65\sim 5.5\text{V}$ | | | 10 | μA |
| Additional Quiescent Supply Current | ΔI_{CC} | One input at $V_{CC}-0.6\text{V}$ Other inputs at V_{CC} or GND, $I_{OUT}=0$, $V_{CC}=3\sim 5.5\text{V}$ | | | 500 | μA |
| 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)

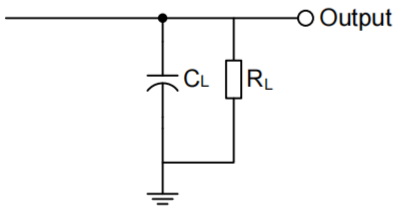
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|----------------------------|------------------------|--|-----|-----|-----|------|
| Propagation delay nA to nY | t_{PLH} t_{PHL} | $V_{CC}=1.8\text{V}\pm 0.15\text{V}$, $C_L=30\text{pF}$, $R_L=1\text{K}\Omega$ | 3.9 | | 9.3 | ns |
| | | $V_{CC}=2.5\text{V}\pm 0.2\text{V}$, $C_L=30\text{pF}$, $R_L=500\Omega$ | 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

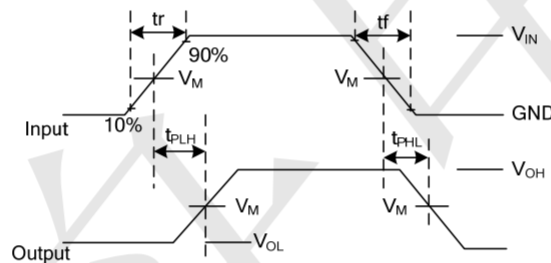


| V_{CC} | V_{IN} | t_R, t_F | V_M | C_L | R_L |
|-------------|----------|---------------------|------------|-------|--------------|
| 1.65V~1.95V | V_{CC} | $\leq 2\text{ns}$ | $V_{CC}/2$ | 30pF | 1k Ω |
| 2.3V~2.7V | V_{CC} | $\leq 2\text{ns}$ | $V_{CC}/2$ | 30pF | 500 Ω |
| 3.0V~3.6V | 3V | $\leq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

Definitions for test circuit:

R_L = Load resistance.

C_L = Load capacitance including jig and probe capacitance.



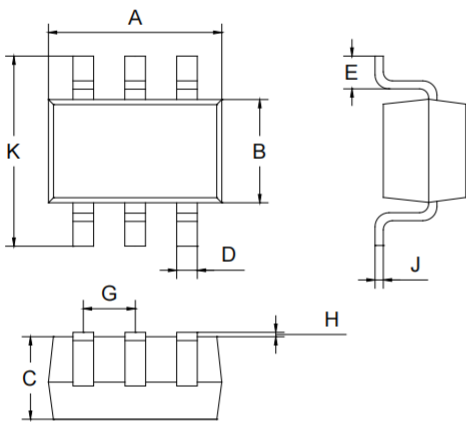
Notes: 1. V_{OL} and V_{OH} are typical output drop that occur with the output load.

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



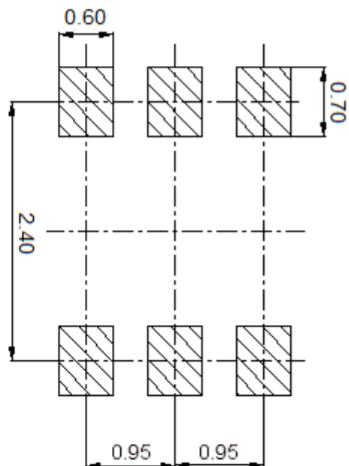
Package Outline Dimensions (Unit: mm)

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 |

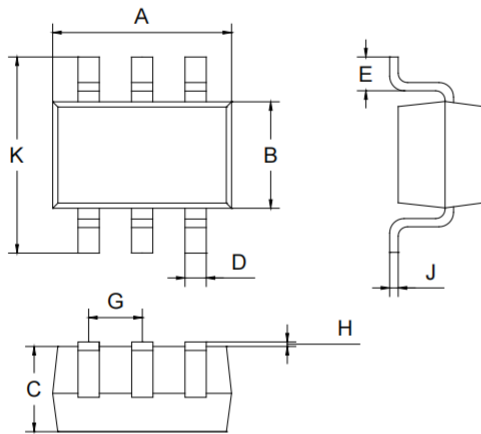
Mounting Pad Layout (Unit: mm)





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)

