



灵星芯微 芯片经营

SN74LVC2GU04 Dual Unbuffered Inverter

Product Specification

Specification Revision History:

| Version | Date | Description |
|------------|---------|---------------------|
| 2017-05-A1 | 2017-05 | New |
| 2023-04-B1 | 2023-04 | Update the template |
| | | |
| | | |



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1、 General Description

The SN74LVC2GU04 provides two unbuffered inverters. Each inverter is a single stage with unbuffered output. The inputs can be driven from either 3.3V or 5V devices. This feature allows the use of this device in a mixed 3.3V and 5V environment.

Features:

- Wide supply voltage range from 1.65V to 5.5V
- 5V tolerant inputs for interfacing with 5V logic
- $\pm 24\text{mA}$ output drive ($V_{CC}=3.0\text{V}$)
- CMOS low power consumption
- Specified from -40°C to $+125^{\circ}\text{C}$
- Packaging information: SOT-23-6/SOT-363

Ordering Information:

Reel packing specifications:

| Part number | Packaging form | Marking code | Reel quantity | Boxed reel quantity | Notes |
|----------------|----------------|--------------|------------------|---------------------|--|
| SN74LVC2GU04DB | SOT-23-6 | BJXX | 3000 PCS/reel | 30000 PCS/box | Dimensions of plastic enclosure: 2.9mm \times 1.6mm Pin spacing: 0.95mm |
| SN74LVC2GU04DC | SOT-363 | BJXX | 3000 PCS/reel | 30000 PCS/box | Dimensions of plastic enclosure: 2.1mm \times 1.3mm Pin spacing: 0.65mm |

Note 1: "XX" refers to variable content, meaning year and package batch serial number.

Note 2: If the physical information is inconsistent with the ordering information, please refer to the actual product.



2、Block Diagram And Pin Description

2.1、Block Diagram

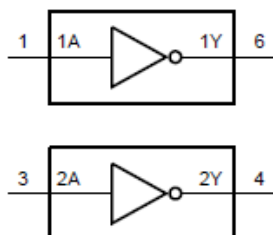


Figure 1. Logic symbol

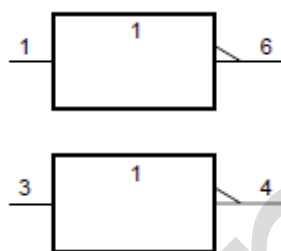


Figure 2. IEC logic symbol

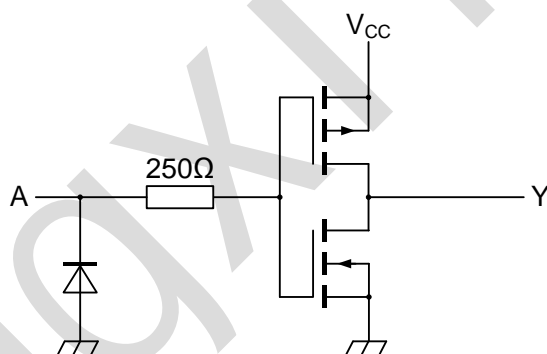
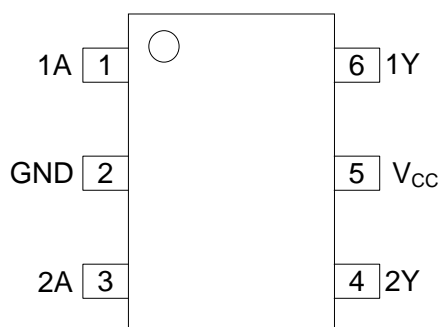


Figure 3. Logic diagram (one gate)

2.2、Pin Configurations





2.3、Pin Description

| Pin No. | Pin Name | Description |
|---------|-----------------|----------------|
| 1 | 1A | data input |
| 2 | GND | ground (0V) |
| 3 | 2A | data input |
| 4 | 2Y | data output |
| 5 | V _{CC} | supply voltage |
| 6 | 1Y | data output |

2.4、Function Table

| Input | Output |
|-------|--------|
| nA | nY |
| L | H |
| H | L |

Note: H=HIGH voltage level; L=LOW voltage level.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND(ground=0V), unless otherwise specified.)

| Parameter | Symbol | Conditions | Min. | Max. | Unit |
|-------------------------|------------------|---------------------------------------|------|----------------------|------|
| supply voltage | V _{CC} | - | -0.5 | +6.5 | V |
| input clamping current | I _{IK} | V _I < 0V | -50 | - | mA |
| input voltage | V _I | - | -0.5 | +6.5 | V |
| output clamping current | I _{OK} | V _O < 0V | -50 | - | mA |
| output voltage | V _O | Active mode | -0.5 | V _{CC} +0.5 | V |
| output current | I _O | V _O =0V to V _{CC} | - | ±50 | mA |
| supply current | I _{CC} | - | - | 100 | mA |
| ground current | I _{GND} | - | -100 | - | mA |
| total power dissipation | P _{tot} | - | - | 250 | mW |
| storage temperature | T _{stg} | - | -65 | +150 | °C |
| soldering temperature | T _L | 10s | 260 | | °C |

Note: When V_{CC}=0V (Power-down mode), the output voltage can be 5.5V in normal operation.

3.2、Recommended Operating Conditions

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|------------------|-------------|------|------|-----------------|------|
| supply voltage | V _{CC} | - | 1.65 | - | 5.5 | V |
| input voltage | V _I | - | 0 | - | 5.5 | V |
| output voltage | V _O | Active mode | 0 | - | V _{CC} | V |
| ambient temperature | T _{amb} | - | -40 | - | +125 | °C |



3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

($T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------------|----------|--|---|----------------|----------------------|---------------|---|
| HIGH-level input voltage | V_{IH} | $V_{CC}=1.65\text{V}$ to 5.5V | $0.75 \times V_{CC}$ | - | - | V | |
| LOW-level input voltage | V_{IL} | $V_{CC}=1.65\text{V}$ to 5.5V | - | - | $0.25 \times V_{CC}$ | V | |
| HIGH-level output voltage | V_{OH} | $V_I = V_{IH}$ or V_{IL} | $I_O = -100\mu\text{A}; V_{CC}=1.65\text{V}$ to 5.5V | $V_{CC} - 0.1$ | - | - | V |
| | | | $I_O = -4\text{mA}; V_{CC}=1.65\text{V}$ | 1.2 | - | - | V |
| | | | $I_O = -8\text{mA}; V_{CC}=2.3\text{V}$ | 1.9 | - | - | V |
| | | | $I_O = -12\text{mA}; V_{CC}=2.7\text{V}$ | 2.2 | - | - | V |
| | | | $I_O = -24\text{mA}; V_{CC}=3.0\text{V}$ | 2.3 | - | - | V |
| | | | $I_O = -32\text{mA}; V_{CC}=4.5\text{V}$ | 3.8 | - | - | V |
| LOW-level output voltage | V_{OL} | $V_I = V_{IH}$ or V_{IL} | $I_O = 100\mu\text{A}; V_{CC}=1.65\text{V}$ to 5.5V | - | - | 0.10 | V |
| | | | $I_O = 4\text{mA}; V_{CC}=1.65\text{V}$ | - | - | 0.45 | V |
| | | | $I_O = 8\text{mA}; V_{CC}=2.3\text{V}$ | - | - | 0.30 | V |
| | | | $I_O = 12\text{mA}; V_{CC}=2.7\text{V}$ | - | - | 0.40 | V |
| | | | $I_O = 24\text{mA}; V_{CC}=3.0\text{V}$ | - | - | 0.55 | V |
| | | | $I_O = 32\text{mA}; V_{CC}=4.5\text{V}$ | - | - | 0.55 | V |
| input leakage current | I_I | $V_I = 5.5\text{V}$ or GND; $V_{CC} = 0\text{V}$ to 5.5V | - | - | ± 1 | μA | |
| supply current | I_{CC} | $V_I = 5.5\text{V}$ or GND; $I_O = 0\text{A};$ $V_{CC} = 1.65\text{V}$ to 5.5V | - | - | 4 | μA | |
| input capacitance | C_I | $V_{CC} = 3.3\text{V}; V_I = \text{GND}$ to V_{CC} | - | 5 | - | pF | |

Note: All typical values are measured at $V_{CC} = 3.3\text{V}$ and $T_{amb} = 25^{\circ}\text{C}$.



3.3.2、DC Characteristics 2

($T_{amb}=-40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------------|----------|---|---|----------------|----------------------|---------------|---|
| HIGH-level input voltage | V_{IH} | $V_{CC}=1.65\text{V}$ to 5.5V | $0.75 \times V_{CC}$ | - | - | V | |
| LOW-level input voltage | V_{IL} | $V_{CC}=1.65\text{V}$ to 5.5V | - | - | $0.25 \times V_{CC}$ | V | |
| HIGH-level output voltage | V_{OH} | $V_I = V_{IH}$ or V_{IL} | $I_O=-100\mu\text{A}; V_{CC}=1.65\text{V}$ to 5.5V | $V_{CC} - 0.1$ | - | - | V |
| | | | $I_O=-4\text{mA}; V_{CC}=1.65\text{V}$ | 0.95 | - | - | V |
| | | | $I_O=-8\text{mA}; V_{CC}=2.3\text{V}$ | 1.7 | - | - | V |
| | | | $I_O=-12\text{mA}; V_{CC}=2.7\text{V}$ | 1.9 | - | - | V |
| | | | $I_O=-24\text{mA}; V_{CC}=3.0\text{V}$ | 2.0 | - | - | V |
| | | | $I_O=-32\text{mA}; V_{CC}=4.5\text{V}$ | 3.4 | - | - | V |
| LOW-level output voltage | V_{OL} | $V_I = V_{IH}$ or V_{IL} | $I_O=100\mu\text{A}; V_{CC}=1.65\text{V}$ to 5.5V | - | - | 0.10 | V |
| | | | $I_O=4\text{mA}; V_{CC}=1.65\text{V}$ | - | - | 0.70 | V |
| | | | $I_O=8\text{mA}; V_{CC}=2.3\text{V}$ | - | - | 0.45 | V |
| | | | $I_O=12\text{mA}; V_{CC}=2.7\text{V}$ | - | - | 0.60 | V |
| | | | $I_O=24\text{mA}; V_{CC}=3.0\text{V}$ | - | - | 0.80 | V |
| | | | $I_O=32\text{mA}; V_{CC}=4.5\text{V}$ | - | - | 0.80 | V |
| input leakage current | I_I | $V_I=5.5\text{V}$ or GND; $V_{CC}=0\text{V}$ to 5.5V | - | - | ± 1 | μA | |
| supply current | I_{CC} | $V_I=5.5\text{V}$ or GND; $I_O=0\text{A}; V_{CC}=1.65\text{V}$ to 5.5V | - | - | 4 | μA | |

3.3.3、AC Characteristics 1

($T_{amb}=-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

| Parameter | Symbol | Conditions | Min. | Typ. ^[1] | Max. | Unit | |
|----------------------------|--------------------|--------------|---|---------------------|------|------|----|
| nA to nY propagation delay | t_{PLH}, t_{PHL} | see Figure 5 | $V_{CC}=1.65\text{V}$ to 1.95V | - | 4.6 | 6.9 | ns |
| | | | $V_{CC}=2.3\text{V}$ to 2.7V | - | 3.6 | 5.4 | ns |
| | | | $V_{CC}=2.7\text{V}$ | - | 5.2 | 7.8 | ns |
| | | | $V_{CC}=3.0\text{V}$ to 3.6V | - | 4.6 | 6.9 | ns |
| | | | $V_{CC}=4.5\text{V}$ to 5.5V | - | 3.4 | 5.1 | ns |

Note:

[1] Typical values are measured at $T_{amb}=25^{\circ}\text{C}$ and $V_{CC}=1.8\text{V}, 2.5\text{V}, 2.7\text{V}, 3.3\text{V}$ and 5.0V respectively.

3.3.4、AC Characteristics 2

($T_{amb}=-40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|----------------------------|----------|--------------|---|------|------|------|----|
| nA to nY propagation delay | t_{pd} | see Figure 5 | $V_{CC}=1.65\text{V}$ to 1.95V | - | - | 8.7 | ns |
| | | | $V_{CC}=2.3\text{V}$ to 2.7V | - | - | 6.8 | ns |
| | | | $V_{CC}=2.7\text{V}$ | - | - | 9.7 | ns |
| | | | $V_{CC}=3.0\text{V}$ to 3.6V | - | - | 8.4 | ns |
| | | | $V_{CC}=4.5\text{V}$ to 5.5V | - | - | 6.5 | ns |



4、Testing Circuit

4.1、AC Testing Circuit

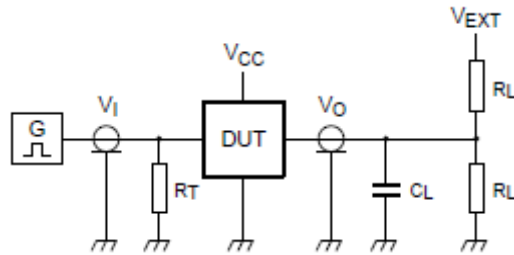


Figure 4. Test circuit for measuring switching times

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

R_T =Termination resistance; should be equal to the output impedance Z_o of the pulse generator.

V_{EXT} =External voltage for measuring switching times.

4.2、AC Testing Waveforms

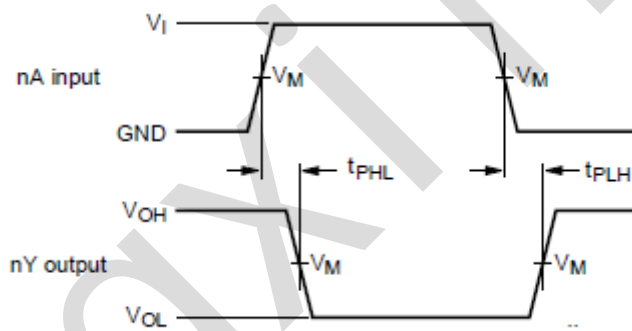


Figure 5. The input (nA) to output (nY) propagation delay times



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4.3、Measurement Points

| Supply voltage | Input | Output |
|----------------|---------------------|---------------------|
| V_{CC} | V_M | V_M |
| 1.65V to 1.95V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.3V to 2.7V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |
| 2.7V | 1.5V | 1.5V |
| 3.0V to 3.6V | 1.5V | 1.5V |
| 4.5V to 5.5V | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ |

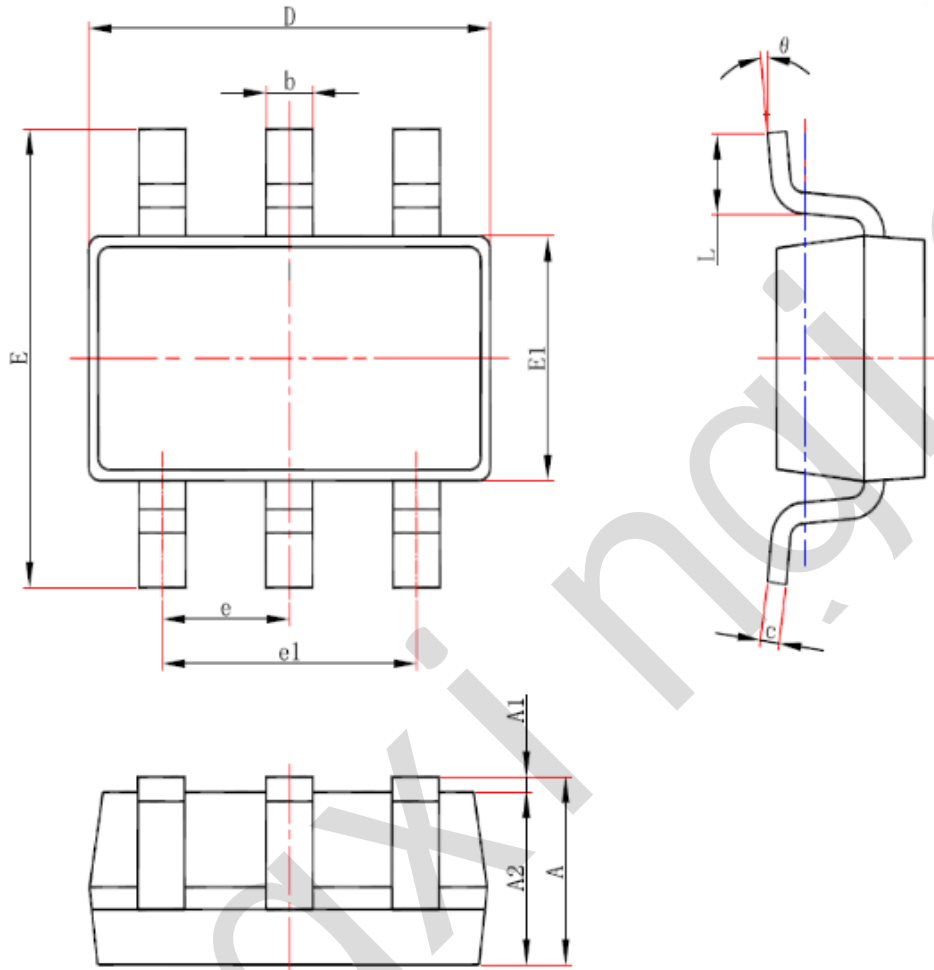
4.4、Test Data

| Supply voltage | Input | | Load | | V_{EXT} |
|----------------|----------|-------------|-------|--------------|--------------------|
| | V_I | $t_r = t_f$ | C_L | R_L | t_{PLH}, t_{PHL} |
| 1.65V to 1.95V | V_{CC} | $\leq 3ns$ | 30pF | 1k Ω | open |
| 2.3V to 2.7V | V_{CC} | $\leq 3ns$ | 30pF | 500 Ω | open |
| 2.7V | 2.7V | $\leq 3ns$ | 50pF | 500 Ω | open |
| 3.0V to 3.6V | 2.7V | $\leq 3ns$ | 50pF | 500 Ω | open |
| 4.5V to 5.5V | V_{CC} | $\leq 3ns$ | 50pF | 500 Ω | open |



5、Package Information

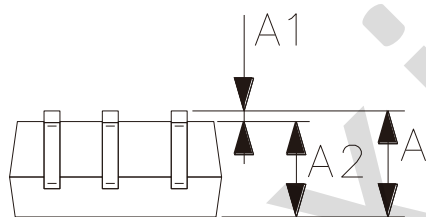
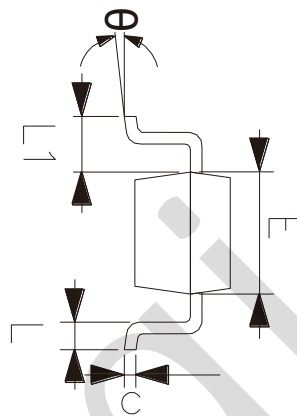
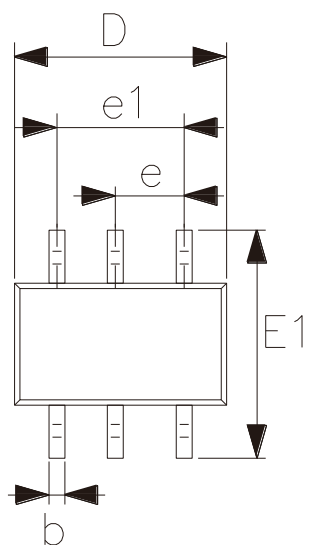
5.1、SOT-23-6



| Symbol | Dimensions (mm) | |
|--------|-----------------|------|
| | Min. | Max. |
| A | - | 1.25 |
| A1 | 0.00 | 0.12 |
| A2 | 1.00 | 1.20 |
| b | 0.30 | 0.50 |
| c | 0.10 | 0.20 |
| D | 2.82 | 3.02 |
| E | 2.60 | 3.00 |
| E1 | 1.50 | 1.70 |
| e | 0.95 | |
| e1 | 1.80 | 2.00 |
| L | 0.30 | 0.60 |
| θ | 0° | 8° |



5.2、SOT-363



| Symbol | Dimensions (mm) | |
|----------|-----------------|-------|
| | Min. | Max. |
| A | 0.90 | 1.10 |
| A1 | 0.00 | 0.10 |
| A2 | 0.90 | 1.00 |
| b | 0.15 | 0.35 |
| c | 0.11 | 0.175 |
| D | 2.00 | 2.20 |
| E1 | 2.15 | 2.45 |
| E | 1.15 | 1.35 |
| e | 0.65 | |
| e1 | 1.20 | 1.40 |
| L | 0.26 | 0.46 |
| L1 | 0.525 | |
| θ | 0° | 8° |



6、Statements

6.1、The name and content of Hazardous substances or Elements in the product

| Part name | Hazardous substances or Elements | | | | | | | | | |
|-------------------------|--|-------------------------------|-------------------------------|-------------------------------|--------------------------|--------------------------------|-------------------|-----------------------|---------------------------|----------------------|
| | Lead and lead compounds | Mercury and mercury compounds | Cadmium and cadmium compounds | Hexavalent chromium compounds | Polybrominated biphenyls | Polybrominated biphenyl ethers | Dibutyl phthalate | Butylbenzyl phthalate | Di-2-ethylhexyl phthalate | Diisobutyl phthalate |
| Lead frame | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Plastic resin | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Chip | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The lead | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Plastic sheet installed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| explanation | <p>○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard.</p> <p>×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.</p> | | | | | | | | | |

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[74HC14DMT/TR](#) [74HC04DN](#) [HT74HC04ARZ](#) [HT40106ARZ](#) [74HC14-HXY](#) [IW4069UBN](#) [RS1GT04XC5](#)