

## Features

- Wide supply voltage range from 0.8V to 3.6V
- Inputs accept voltages up to 3.6V
- $I_{OFF}$  supports partial-power-down mode
- Low static power consumption;  $I_{CC}=0.5\mu A$  (Max.)
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

## General Description

The 74AUP1G06GW-TP is a single inverting buffer with open-drain outputs and it provides the function  $Y = \overline{A}$  in positive logic. The output of this device is open-drain, and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

## Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

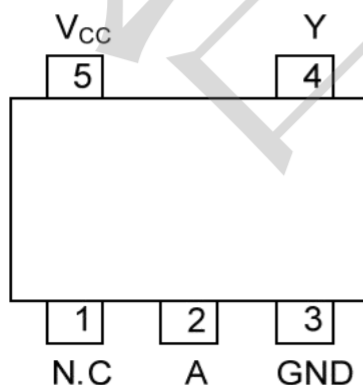
## Logic Diagram



## Ordering Information

| ORDER NUMBER   | PACKAGE DESCRIPTION | PACKAGE OPTION      |
|----------------|---------------------|---------------------|
| 74AUP1G06GW-TP | SOT353              | Tape and Reel, 3000 |

## Pin Configuratio (TOP VIEW)



SOT353

## Function Table (each gate)

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

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

Z: high impedance state.

## Absolute Maximum Ratings

| PARAMETER                 | SYMBOL           | CONDITIONS                          | RATINGS                       | UNIT |
|---------------------------|------------------|-------------------------------------|-------------------------------|------|
| Supply Voltage            | V <sub>CC</sub>  |                                     | -0.5 ~ +4.6                   | V    |
| Input Voltage             | V <sub>IN</sub>  |                                     | -0.5 ~ +4.6                   | V    |
| Output Voltage            | V <sub>OUT</sub> | Output in the high or low state     | -0.5 ~ +V <sub>CC</sub> +0.5V | V    |
|                           |                  | Output in the power-off state       | -0.5 ~ +4.6                   | V    |
| VCC or GND Current        | I <sub>CC</sub>  |                                     | ±50                           | mA   |
| Continuous Output Current | I <sub>OUT</sub> | V <sub>OUT</sub> =0~V <sub>CC</sub> | ±20                           | mA   |
| Input Clamp Current       | I <sub>IK</sub>  | V <sub>IN</sub> <0                  | -50                           | mA   |
| Output Clamp Current      | I <sub>OK</sub>  | V <sub>OUT</sub> <0                 | -50                           | mA   |
| Storage Temperature Range | T <sub>STG</sub> |                                     | -65 ~ +150                    | °C   |
| Junction to Ambient       | θ <sub>JA</sub>  | SOT353                              | 280                           | °C/W |

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           | TEST CONDITIONS              | MIN | TYP | MAX             | UNIT |
|------------------------------------|------------------|------------------------------|-----|-----|-----------------|------|
| Supply Voltage                     | V <sub>CC</sub>  | Operating                    | 0.8 | --  | 3.6             | V    |
| Input Voltage                      | V <sub>IN</sub>  |                              | 0   | --  | 3.6             | V    |
| Output Voltage                     | V <sub>OUT</sub> | High or low state            | 0   | --  | V <sub>CC</sub> | V    |
| Input Transition Rise or Fall Rate | Δt/Δv            | V <sub>CC</sub> =0.8V ~ 3.6V | --  | --  | 200             | ns/V |
| Operating Temperature              | T <sub>A</sub>   |                              | -40 | --  | +125            | °C   |

## Electrical Characteristics (T<sub>A</sub>=25°C ,unless otherwise specified)

| PARAMETER                                         | SYMBOL               | TEST CONDITIONS                                                                          | MIN                    | TYP | MAX                  | UNIT |
|---------------------------------------------------|----------------------|------------------------------------------------------------------------------------------|------------------------|-----|----------------------|------|
| High-level Input Voltage                          | V <sub>IH</sub>      | V <sub>CC</sub> =0.8V                                                                    | 0.7×V <sub>CC</sub>    | --  | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V ~ 1.95V                                                            | 0.65×V <sub>CC</sub>   | --  | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V ~ 2.7V                                                             | 1.6                    | --  | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =3V ~ 3.6V                                                               | 2                      | --  | --                   | V    |
| Low-level Input Voltage                           | V <sub>IL</sub>      | V <sub>CC</sub> =0.8V                                                                    | --                     | --  | 0.3×V <sub>CC</sub>  | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V ~ 1.95V                                                            | --                     | --  | 0.35×V <sub>CC</sub> | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V ~ 2.7V                                                             | --                     | --  | 0.7                  | V    |
|                                                   |                      | V <sub>CC</sub> =3V ~ 3.6V                                                               | --                     | --  | 0.9                  | V    |
| Low-Level Output Voltage                          | V <sub>OL</sub>      | V <sub>CC</sub> =0.8 ~ 3.6V, I <sub>OL</sub> =20μA                                       | --                     | --  | 0.1                  | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V, I <sub>OL</sub> =1.1mA                                            | --                     | --  | 0.3×V <sub>CC</sub>  | V    |
|                                                   |                      | V <sub>CC</sub> =1.4V, I <sub>OL</sub> =1.7mA                                            | --                     | --  | 0.31                 | V    |
|                                                   |                      | V <sub>CC</sub> =1.65V, I <sub>OL</sub> =1.9mA                                           | --                     | --  | 0.31                 | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V                                                                    | I <sub>OL</sub> =2.3mA | --  | 0.31                 | V    |
|                                                   |                      |                                                                                          |                        |     |                      |      |
|                                                   |                      | V <sub>CC</sub> =3V                                                                      | I <sub>OL</sub> =2.7mA | --  | 0.31                 | V    |
|                                                   |                      |                                                                                          |                        |     |                      |      |
| Input Leakage Current                             | I <sub>I(LEAK)</sub> | V <sub>CC</sub> =0 ~ 3.6V, V <sub>IN</sub> =GND ~ 3.6V                                   | --                     | --  | ±0.1                 | μA   |
| Power OFF Leakage Current                         | I <sub>off</sub>     | V <sub>CC</sub> =0 V, V <sub>IN</sub> or V <sub>OUT</sub> =0 ~ 3.6V                      | --                     | --  | ±0.2                 | μA   |
| Additional Power OFF Leakage Current              | ΔI <sub>off</sub>    | V <sub>CC</sub> =0 V~0.2V, V <sub>IN</sub> or V <sub>OUT</sub> =0 ~ 3.6V                 | --                     | --  | ±0.2                 | μA   |
| Quiescent Supply Current                          | I <sub>CC</sub>      | V <sub>CC</sub> =0.8 ~3.6V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 | --                     | --  | 0.5                  | μA   |
| Additional Quiescent Supply Current Per Input Pin | ΔI <sub>CC</sub>     | V <sub>CC</sub> =3.3 V, V <sub>IN</sub> =V <sub>CC</sub> -0.6V, I <sub>OUT</sub> =0      | --                     | --  | 40                   | μA   |
| Input Capacitance                                 | C <sub>I</sub>       | V <sub>CC</sub> =0V-3.6V, V <sub>IN</sub> =V <sub>CC</sub> or GND                        | --                     | 1.5 | --                   | pF   |
| Output Capacitance                                | C <sub>OUT</sub>     | V <sub>CC</sub> =0V, V <sub>OUT</sub> =GND                                               | --                     | 1.7 | --                   | pF   |

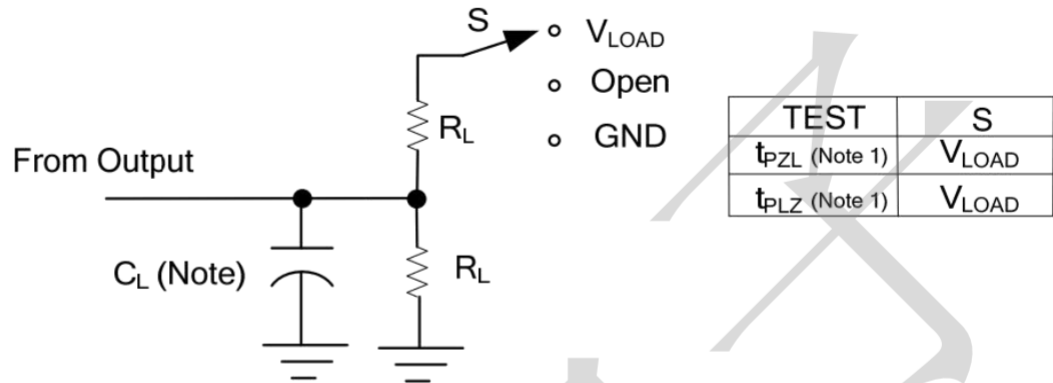
## OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

| PARAMETER                           | SYMBOL          | TEST CONDITIONS            | MIN | TYP | MAX | UNIT |
|-------------------------------------|-----------------|----------------------------|-----|-----|-----|------|
| Power<br>Dissipation<br>Capacitance | C <sub>PD</sub> | V <sub>CC</sub> =0.8V      | --  | 1.0 | --  | pF   |
|                                     |                 | V <sub>CC</sub> =1.2±0.1V  | --  | 1.0 | --  | pF   |
|                                     |                 | V <sub>CC</sub> =1.5±0.1V  | --  | 1.0 | --  | pF   |
|                                     |                 | V <sub>CC</sub> =1.8±0.15V | --  | 1.0 | --  | pF   |
|                                     |                 | V <sub>CC</sub> =2.5±0.2V  | --  | 1.0 | --  | pF   |
|                                     |                 | V <sub>CC</sub> =3.3±0.3V  | --  | 1.0 | --  | pF   |

### SWITCHING CHARACTERISTICS (TA = 25°C, unless otherwise specified)

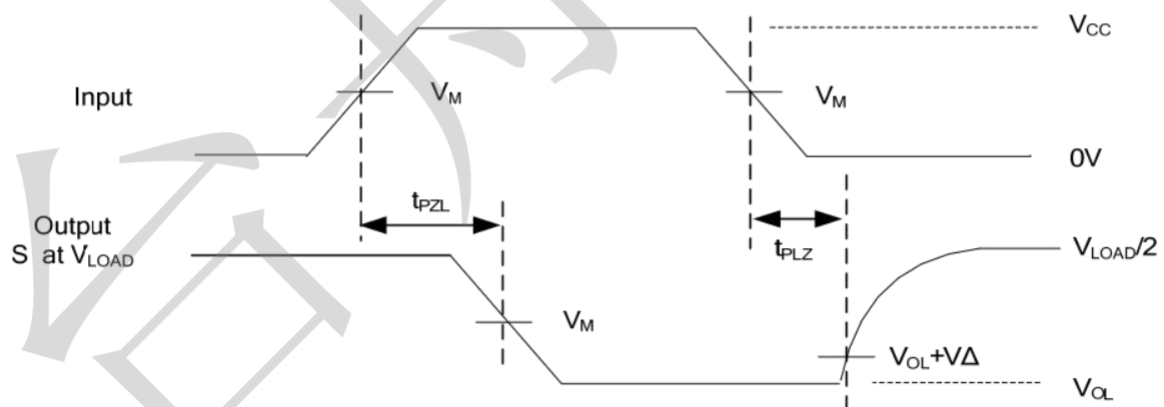
| PARAMETER                                            | SYMBOL   | TEST CONDITIONS    |                            | MIN | TYP  | MAX | UNIT |
|------------------------------------------------------|----------|--------------------|----------------------------|-----|------|-----|------|
| Propagation delay<br>from inputs (A) to<br>output(Y) | $t_{PD}$ | CL=5pF,<br>RL=1MΩ  | V <sub>CC</sub> =0.8V      | --  | 12.8 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.2±0.1V  | 2.3 | 12.0 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.5±0.1V  | 1.8 | 3.5  | --  | Ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.8±0.15V | 1.5 | 3.1  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =2.5±0.2V  | 1.2 | 2.2  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =3.3±0.3V  | 1.1 | 2.2  | --  | ns   |
|                                                      |          | CL=10pF,<br>RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 15.8 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.2±0.1V  | 2.7 | 12   | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.5±0.1V  | 2.2 | 4.3  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.8±0.15V | 1.9 | 3.9  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =2.5±0.2V  | 1.9 | 2.9  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =3.3±0.3V  | 1.6 | 3.0  | --  | ns   |
|                                                      |          | CL=15pF,<br>RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 18.8 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.2±0.1V  | 3.2 | 12.0 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.5±0.1V  | 2.6 | 5.0  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.8±0.15V | 2.3 | 4.8  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =2.5±0.2V  | 2.1 | 3.5  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =3.3±0.3V  | 2.0 | 3.8  | --  | ns   |
|                                                      |          | CL=30pF,<br>RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 27.8 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.2±0.1V  | 4.4 | 12.0 | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.5±0.1V  | 3.6 | 7.6  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =1.8±0.15V | 3.2 | 7.4  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =2.5±0.2V  | 2.9 | 5.4  | --  | ns   |
|                                                      |          |                    | V <sub>CC</sub> =3.3±0.3V  | 2.9 | 6.5  | --  | ns   |

## TEST CIRCUIT AND WAVEFORMS



Note:1. Since this device has open drain outputs, the  $t_{PLZ}$  and  $t_{PZL}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

| $V_{CC}$        | $V_{IN}$ | $t_R / t_F$ | $V_M$      | $V_{LOAD}$        | $C_L$        | $R_L$       | $V_{\Delta}$ |
|-----------------|----------|-------------|------------|-------------------|--------------|-------------|--------------|
| 0.8             | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.1V         |
| $1.2 \pm 0.1V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.1V         |
| $1.5 \pm 0.1V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.1V         |
| $1.8 \pm 0.15V$ | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.15V        |
| $2.5 \pm 0.2V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.15V        |
| $3.3 \pm 0.3V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5,10,15,30pF | 5k $\Omega$ | 0.3V         |



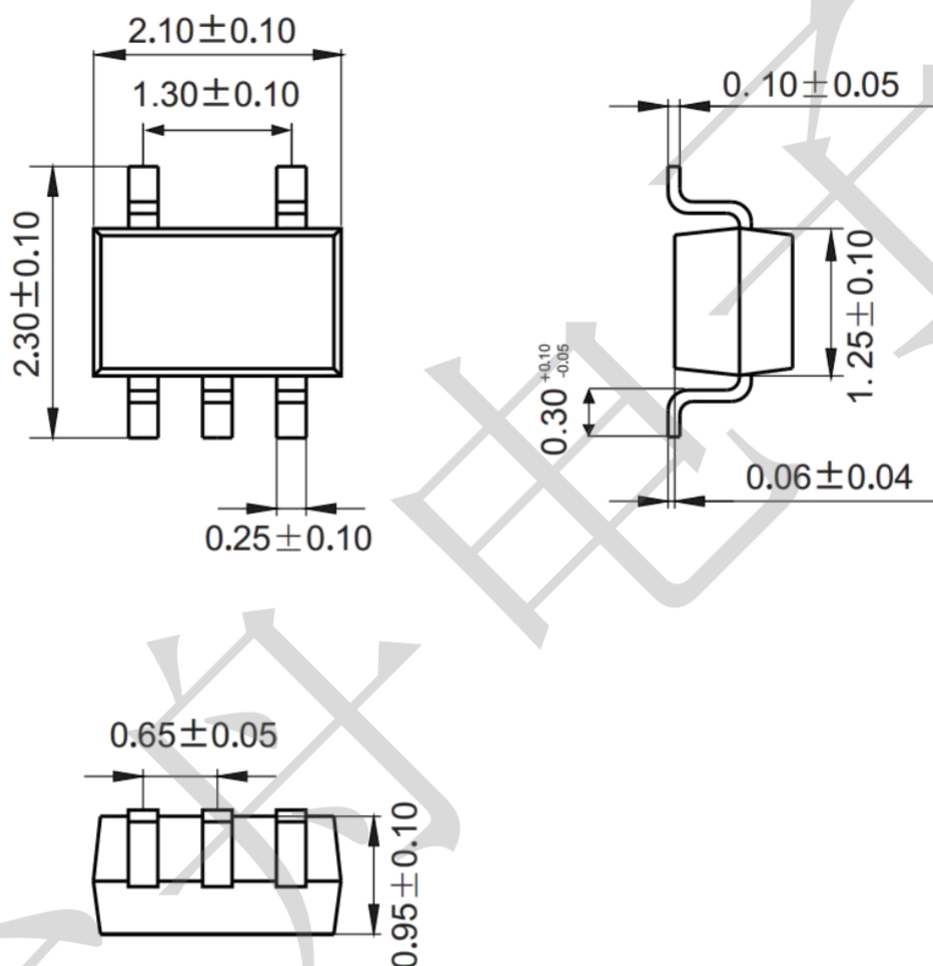
PROPAGATION DELAY FROM INPUT(A) TO OUTPUT(Y) AND OUTPUT TRANSITION TIME

### Notes:

- CL includes probe and jig capacitance.
- All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10\text{MHz}$ ,  $Z_O = 50\Omega$ .

## Package information (Unit: mm)

### SOT353



## Mounting Pad Layout (unit: mm)

