

### Features

- Operation Voltage Range: 2V ~ 5.5V
- Low power consumption,  $I_{CC} = 1\mu A$  (Max.) at 5.5V
- $\pm 8mA$  output driver at 5V
- 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

### General Description

The 74AHC1G14 contains one inverter with Schmitt-trigger, which provides the Function  $Y = \overline{A}$ .

They provide an inverting buffer function with Schmitt trigger action. These devices are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

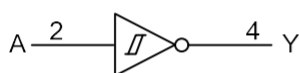
### Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROM
  - TV, DVD, DVR, Set-Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

### Ordering Information

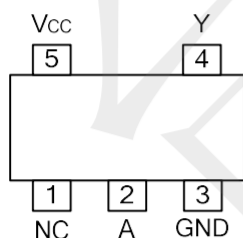
| ORDER NUMBER   | PACKAGE DESCRIPTION | PACKAGE OPTION     |
|----------------|---------------------|--------------------|
| 74AHC1G14W5-TP | SOT23-5             | Tape and Reel,3000 |
| 74AHC1G14SE-TP | SOT353              | Tape and Reel,3000 |

### Logic Diagram



Logic symbol

### Pin Configuration



SOT23-5/ SOT353

### Function Table

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

Note: H: high voltage level; L: low voltage level

### Absolute Maximum Ratings

| PARAMETER               | SYMBOL    | RATINGS             | UNIT |
|-------------------------|-----------|---------------------|------|
| Supply Voltage          | $V_{CC}$  | -0.5 ~ 7            | V    |
| Input Voltage           | $V_{IN}$  | -0.5 ~ 7            | V    |
| Output Voltage          | $V_{OUT}$ | -0.5 ~ $V_{CC}+0.5$ | V    |
| $V_{CC}$ or GND Current | $I_{CC}$  | ±50                 | mA   |
| Output Current          | $I_{OUT}$ | ±25                 | mA   |
| Input Clamp Current     | $I_{IK}$  | -20                 | mA   |
| Output Clamp Current    | $I_{OK}$  | ±20                 | mA   |
| Storage Temperature     | $T_{STG}$ | -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        | $V_{CC}$  |                   | 2   |     | 5.5      | V    |
| Input Voltage         | $V_{IN}$  |                   | 0   |     | 5.5      | V    |
| Output Voltage        | $V_{OUT}$ | High or low state | 0   |     | $V_{CC}$ | V    |
| Operating Temperature | $T_A$     |                   | -40 |     | +125     | °C   |

### Electrical Characteristics

| PARAMETER                                                 | SYMBOL               | TEST CONDITIONS                                                                         | T <sub>A</sub> =25°C |     |      | T <sub>A</sub> =-40°C~+125°C |     |      | UNIT |
|-----------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------|----------------------|-----|------|------------------------------|-----|------|------|
|                                                           |                      |                                                                                         | MIN                  | TYP | MAX  | MIN                          | TYP | MAX  |      |
| Positive-Going Threshold                                  | V <sub>T+</sub>      | V <sub>CC</sub> =3.0V                                                                   | 1.2                  |     | 2.2  | 1.2                          |     | 2.2  | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V                                                                   | 1.75                 |     | 3.15 | 1.75                         |     | 3.15 | V    |
|                                                           |                      | V <sub>CC</sub> =5.5V                                                                   | 2.15                 |     | 3.85 | 2.15                         |     | 3.85 | V    |
| Negative-Going Threshold                                  | V <sub>T-</sub>      | V <sub>CC</sub> =3.0V                                                                   | 0.90                 |     | 1.90 | 0.9                          |     | 1.9  | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V                                                                   | 1.35                 |     | 2.75 | 1.35                         |     | 2.75 | V    |
|                                                           |                      | V <sub>CC</sub> =5.5V                                                                   | 1.65                 |     | 3.35 | 1.65                         |     | 3.35 | V    |
| Hysteresis Voltage<br>(V <sub>T+</sub> -V <sub>T-</sub> ) | ΔV <sub>T</sub>      | V <sub>CC</sub> =3.0V                                                                   | 0.3                  |     | 1.2  | 0.3                          |     | 1.2  | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V                                                                   | 0.4                  |     | 1.4  | 0.4                          |     | 1.4  | V    |
|                                                           |                      | V <sub>CC</sub> =5.5V                                                                   | 0.5                  |     | 1.6  | 0.4                          |     | 1.6  | V    |
| High-Level Output Voltage                                 | V <sub>OH</sub>      | V <sub>CC</sub> =2.0V                                                                   | 1.9                  | 2   |      | 1.9                          |     |      | V    |
|                                                           |                      | V <sub>CC</sub> =3.0V                                                                   | 2.9                  | 3   |      | 2.9                          |     |      | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V                                                                   | 4.4                  | 4.5 |      | 4.4                          |     |      | V    |
|                                                           |                      | V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-4mA                                            | 2.58                 |     |      | 2.4                          |     |      | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-8mA                                            | 3.94                 |     |      | 3.7                          |     |      | V    |
| Low-Level Output Voltage                                  | V <sub>OL</sub>      | V <sub>CC</sub> =2.0V                                                                   |                      |     | 0.1  |                              |     | 0.1  | V    |
|                                                           |                      | V <sub>CC</sub> =3.0V                                                                   |                      |     | 0.1  |                              |     | 0.1  | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V                                                                   |                      |     | 0.1  |                              |     | 0.1  | V    |
|                                                           |                      | V <sub>CC</sub> =3.0V, I <sub>OL</sub> =4mA                                             |                      |     | 0.36 |                              |     | 0.6  | V    |
|                                                           |                      | V <sub>CC</sub> =4.5V, I <sub>OL</sub> =8mA                                             |                      |     | 0.36 |                              |     | 0.6  | V    |
| Input Leakage Current                                     | I <sub>I(LEAK)</sub> | V <sub>CC</sub> =0~5.5V,<br>V <sub>IN</sub> =5.5V or GND                                |                      |     | ±0.1 |                              |     | ±2   | μA   |
| Quiescent Supply Current                                  | I <sub>Q</sub>       | V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND,<br>I <sub>OUT</sub> =0A |                      |     | 1    |                              |     | 40   | μA   |

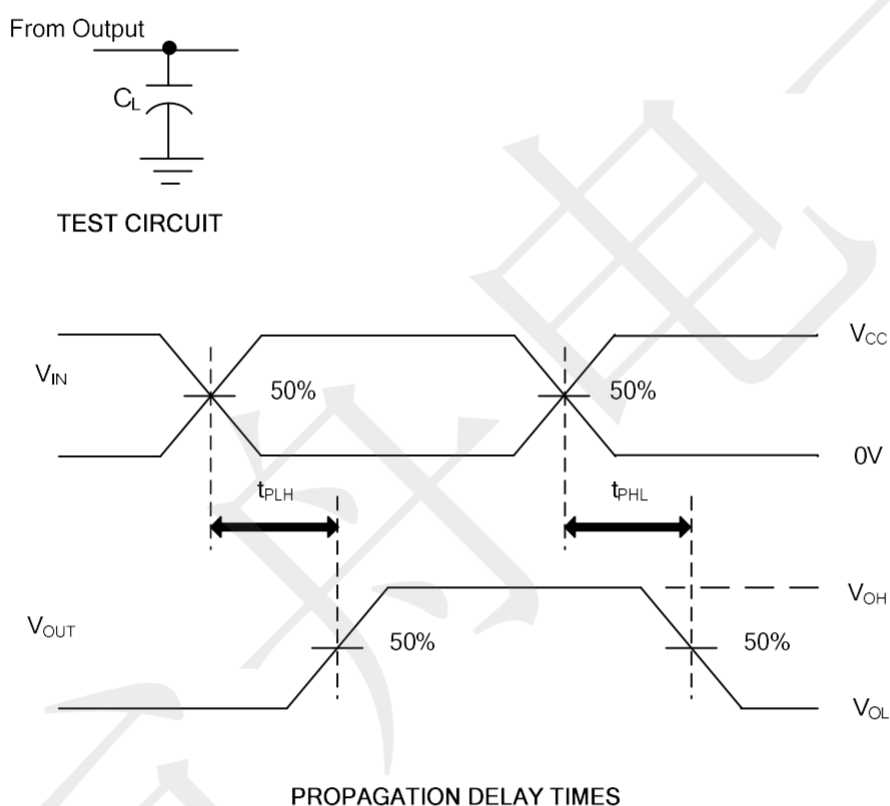
### Dynamic Characteristics (Input: t<sub>R</sub>, t<sub>F</sub>≤3ns; P<sub>RR</sub>≤1MHz)

| PARAMETER                                         | SYMBOL           | TEST CONDITIONS            | T <sub>A</sub> =25°C |      |      | T <sub>A</sub> =-40°C~+125°C |     |     | UNIT |
|---------------------------------------------------|------------------|----------------------------|----------------------|------|------|------------------------------|-----|-----|------|
|                                                   |                  |                            | MIN                  | TYP  | MAX  | MIN                          | TYP | MAX |      |
| Propagation Delay Time<br>Input (A) to Output (Y) | t <sub>PLH</sub> | V <sub>CC</sub> =3.3V±0.3V |                      | 10.8 | 16.3 | 1                            |     | 21  | ns   |
|                                                   |                  | V <sub>CC</sub> =5V±0.5V   |                      | 10.8 | 16.3 | 1                            |     | 14  | ns   |
|                                                   | t <sub>PHL</sub> | V <sub>CC</sub> =3.3V±0.3V |                      | 7    | 10.6 | 1                            |     | 21  | ns   |
|                                                   |                  | V <sub>CC</sub> =5V±0.5V   |                      | 7    | 10.6 | 1                            |     | 14  | ns   |
|                                                   | t <sub>PLH</sub> | V <sub>CC</sub> =3.3V±0.3V |                      | 10.8 | 16.3 | 1                            |     | 21  | ns   |
|                                                   |                  | V <sub>CC</sub> =5V±0.5V   |                      | 10.8 | 16.3 | 1                            |     | 14  | ns   |
|                                                   | t <sub>PHL</sub> | V <sub>CC</sub> =3.3V±0.3V |                      | 7    | 10.6 | 1                            |     | 21  | ns   |
|                                                   |                  | V <sub>CC</sub> =5V±0.5V   |                      | 7    | 10.6 | 1                            |     | 14  | ns   |

### Operating Characteristics

| PARAMETER                     | SYMBOL   | TEST CONDITIONS                        | MIN | TYP | MAX | UNIT |
|-------------------------------|----------|----------------------------------------|-----|-----|-----|------|
| Input Capacitance             | $C_i$    | $V_{CC}=5.0V$ , $V_{IN}=V_{CC}$ or GND |     | 2   | 10  | pF   |
| Power Dissipation Capacitance | $C_{PD}$ | $V_{CC}=5V$ , $f=1MHz$ , No load       |     | 9   |     | pF   |

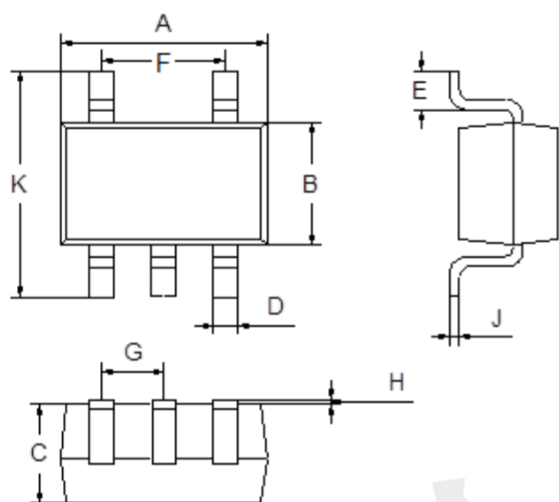
### Test Circuit And Waveforms



- Notes: 1.  $C_L$  includes probe and jig capacitance.  
2.  $P_{RR} \leq 1MHz$ ,  $Z_O = 50\Omega$ ,  $t_R \leq 3ns$ ,  $t_F \leq 3ns$ .

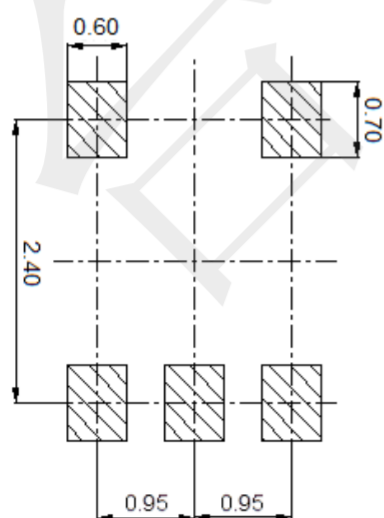
**Package Outline Dimensions** (Unit: mm)

**SOT23-5**



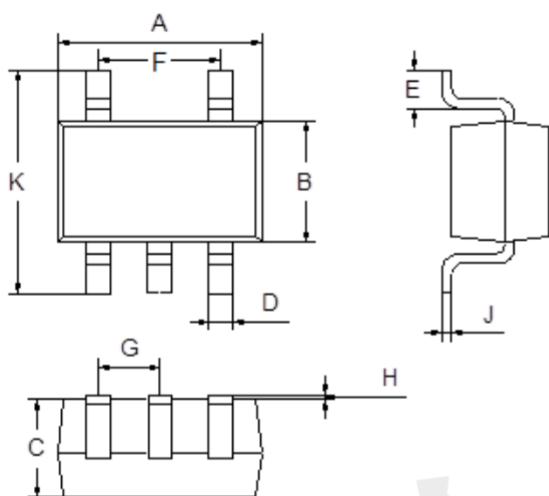
| Dimension | Min. | Max. |
|-----------|------|------|
| A         | 2.80 | 3.00 |
| B         | 1.50 | 1.70 |
| C         | 1.00 | 1.20 |
| D         | 0.35 | 0.45 |
| E         | 0.35 | 0.55 |
| F         | 1.80 | 2.00 |
| G         | 0.90 | 1.00 |
| H         | 0.02 | 0.10 |
| J         | 0.10 |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

