



Quad 2-input NAND Schmitt Trigger

## CJ74HC/HCT132 Logic

### 1 Introduction

The CJ74HC/HCT132 is a quad 2-input NAND gate with Schmitt-trigger inputs.

### 2 Available Packages

| PART NUMBER | PACKAGE |
|-------------|---------|
| CJ74HC132   | SOP14   |
|             | TSSOP14 |
| CJ74HCT132  | SOP14   |
|             | TSSOP14 |

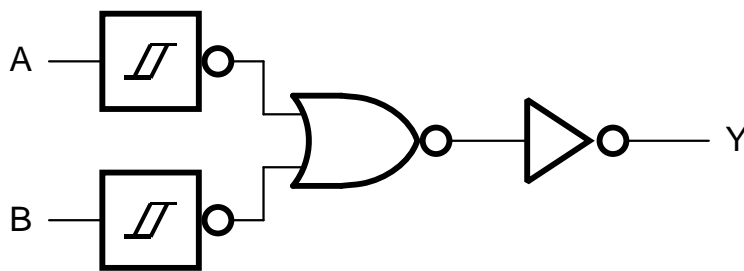
**Note:** For all available packages, please refer to the part Orderable Information.

### 3 Features

- Input levels:
  - For CJ74HC132: CMOS level
  - For CJ74HCT132: TTL level
- Low-power dissipation
- Specified from -40°C to +125°C

### 4 Applications

- Alarm / tamper detect circuit
- S-R latch



Logic diagram

**5 Orderable Information**

| DEVICE        | PACKAGE | OP TEMP   | ECO PLAN     | MSL              | PACKING OPTION                     | SORT   |
|---------------|---------|-----------|--------------|------------------|------------------------------------|--------|
| CJ74HC132ADN  | SOP14   | -40~125°C | RoHS & Green | Level 3<br>168HR | Tape and Reel<br>4000 Units / Reel | Active |
| CJ74HCT132ADN | SOP14   | -40~125°C | RoHS & Green | Level 3<br>168HR | Tape and Reel<br>4000 Units / Reel | Active |
| CJ74HC132BDN  | TSSOP14 | -40~125°C | RoHS & Green | Level 3<br>168HR | Tape and Reel<br>5000 Units / Reel | Active |
| CJ74HCT132BDN | TSSOP14 | -40~125°C | RoHS & Green | Level 3<br>168HR | Tape and Reel<br>5000 Units / Reel | Active |

**Note:**

**ECO PLAN:** For the RoHS and Green certification standards of this product, please refer to the official report provided by JSCJ.

**MSL:** Moisture Sensitivity Level. Determined according to JEDEC industry standard classification.

**SORT:** Specifically defined as follows:

Active: Recommended for new products;

Customized: Products manufactured to meet the specific needs of customers;

Preview: The device has been released and has not been fully mass produced. The sample may or may not be available;

NoRD: It is not recommended to use the device for new design. The device is only produced for the needs of existing customers;

Obsolete: The device has been discontinued.

## 6 Pin Configuration and Marking Information

### 6.1 Pin Configuration

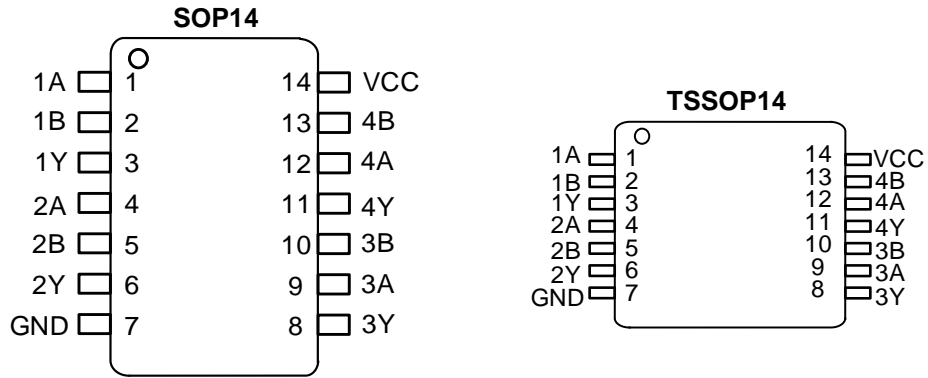


Figure 6-1 Pin configuration

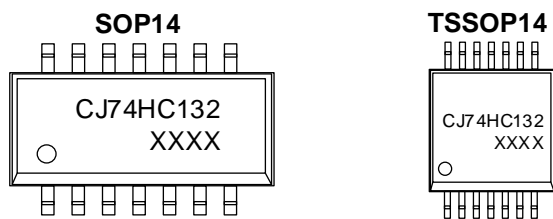
### 6.2 Pin Function

| PIN |      | I/O <sup>(1)</sup> | DESCRIPTION    |
|-----|------|--------------------|----------------|
| No. | NAME |                    |                |
| 1   | 1A   | I                  | Data input     |
| 2   | 1B   | I                  | Data input     |
| 3   | 1Y   | O                  | Data output    |
| 4   | 2A   | I                  | Data input     |
| 5   | 2B   | I                  | Data input     |
| 6   | 2Y   | O                  | Data output    |
| 7   | GND  | G                  | Ground (0V)    |
| 8   | 3Y   | O                  | Data output    |
| 9   | 3A   | I                  | Data input     |
| 10  | 3B   | I                  | Data input     |
| 11  | 4Y   | O                  | Data output    |
| 12  | 4A   | I                  | Data input     |
| 13  | 4B   | I                  | Data input     |
| 14  | VCC  | P                  | Supply voltage |

(1) I-Input, O-Output, P-Power, G-Ground

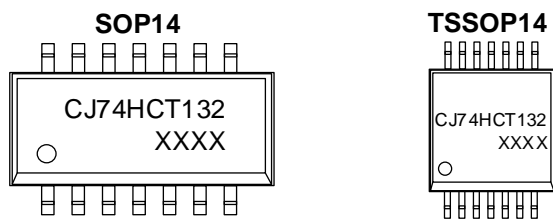
6.3 Marking Information

6.3.1 CJ74HC132



XXXX: Code, indicates weekly record information.

6.3.2 CJ74HCT132



XXXX: Code, indicates weekly record information.

## 7 Specifications

### 7.1 Absolute Maximum Ratings

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

| SYMBOL           | PARAMETER               | CONDITIONS   |           | MIN. | MAX. | UNIT |
|------------------|-------------------------|--|-----------|------|------|------|
| V <sub>CC</sub>  | Supply voltage          | -  |           | -0.5 | +7   | V    |
| I <sub>IK</sub>  | Input clamping current  | V <sub>I</sub> < -0.5V or V <sub>I</sub> > V <sub>CC</sub> +0.5V |           | -    | ±20  | mA   |
| I <sub>OK</sub>  | Output clamping current | V <sub>O</sub> < -0.5V or V <sub>O</sub> > V <sub>CC</sub> +0.5V |           | -    | ±20  | mA   |
| I <sub>O</sub>   | Output current          | -0.5V < V <sub>O</sub> < V <sub>CC</sub> +0.5V                   |           | -    | ±25  | mA   |
| I <sub>CC</sub>  | Supply current          | -  |           | -    | 50   | mA   |
| I <sub>GND</sub> | Ground current          | -  |           | -50  | -    | mA   |
| P <sub>tot</sub> | Total power dissipation | -  |           | -    | 500  | mW   |
| T <sub>stg</sub> | Storage temperature     | -  |           | -65  | +150 | °C   |
| T <sub>L</sub>   | Soldering temperature   | 10s  | SOP/TSSOP | -    | 260  | °C   |

**Note:** Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to GND. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

### 7.2 Recommended Operating Conditions

| SYMBOL            | PARAMETER           | CONDITIONS | MIN. | TYP. | MAX.            | UNIT |
|-------------------|---------------------|------------|------|------|-----------------|------|
| <b>CJ74HC132</b>  |                     |            |      |      |                 |      |
| V <sub>CC</sub>   | Supply voltage      | -          | 2.0  | 5.0  | 6.0             | V    |
| V <sub>I</sub>    | Input voltage       | -          | 0    | -    | V <sub>CC</sub> | V    |
| V <sub>O</sub>    | Output voltage      | -          | 0    | -    | V <sub>CC</sub> | V    |
| T <sub>amb</sub>  | Ambient temperature | -          | -40  | -    | +125            | °C   |
| <b>CJ74HCT132</b> |                     |            |      |      |                 |      |
| V <sub>CC</sub>   | Supply voltage      | -          | 4.5  | 5.0  | 5.5             | V    |
| V <sub>I</sub>    | Input voltage       | -          | 0    | -    | V <sub>CC</sub> | V    |
| V <sub>O</sub>    | Output voltage      | -          | 0    | -    | V <sub>CC</sub> | V    |
| T <sub>amb</sub>  | Ambient temperature | -          | -40  | -    | +125            | °C   |

**7.3 Electrical Characteristics**
**7.3.1 DC Characteristics 1**
 $T_{amb}=25^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                 | CONDITIONS  | MIN.                                     | TYP. | MAX.    | UNIT          |   |
|-------------------|---------------------------|---|--|------|---------|---------------|---|
| <b>CJ74HC132</b>  |                           |   |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I=V_{T+}$ or $V_{T-}$  | $I_O=-20\mu\text{A}; V_{CC}=2.0\text{V}$ | 1.9  | 2.0     | -             | V |
|                   |                           |   | $I_O=-20\mu\text{A}; V_{CC}=4.5\text{V}$ | 4.4  | 4.5     | -             | V |
|                   |                           |   | $I_O=-20\mu\text{A}; V_{CC}=6.0\text{V}$ | 5.9  | 6.0     | -             | V |
|                   |                           |   | $I_O=-4.0\text{mA}; V_{CC}=4.5\text{V}$  | 3.98 | 4.32    | -             | V |
|                   |                           |   | $I_O=-5.2\text{mA}; V_{CC}=6.0\text{V}$  | 5.48 | 5.81    | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I=V_{T+}$ or $V_{T-}$  | $I_O=20\mu\text{A}; V_{CC}=2.0\text{V}$  | -    | 0       | 0.1           | V |
|                   |                           |   | $I_O=20\mu\text{A}; V_{CC}=4.5\text{V}$  | -    | 0       | 0.1           | V |
|                   |                           |   | $I_O=20\mu\text{A}; V_{CC}=6.0\text{V}$  | -    | 0       | 0.1           | V |
|                   |                           |   | $I_O=4.0\text{mA}; V_{CC}=4.5\text{V}$   | -    | 0.15    | 0.26          | V |
|                   |                           |   | $I_O=5.2\text{mA}; V_{CC}=6.0\text{V}$   | -    | 0.16    | 0.26          | V |
| $I_I$             | Input leakage current     | $V_I=V_{CC}$ or GND; $V_{CC}=6.0\text{V}$   | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I=V_{CC}$ or GND; $I_O=0\text{A}; V_{CC}=6.0\text{V}$  | -  | -    | 2.0     | $\mu\text{A}$ |   |
| $C_I$             | Input capacitance         | -   | -  | 3.5  | -       | pF            |   |
| <b>CJ74HCT132</b> |                           |   |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I=V_{T+}$ or $V_{T-}$  | $I_O=-20\mu\text{A}; V_{CC}=4.5\text{V}$ | 4.4  | 4.5     | -             | V |
|                   |                           |   | $I_O=-4.0\text{mA}; V_{CC}=4.5\text{V}$  | 3.98 | 4.32    | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I=V_{T+}$ or $V_{T-}$  | $I_O=20\mu\text{A}; V_{CC}=4.5\text{V}$  | -    | 0       | 0.1           | V |
|                   |                           |   | $I_O=4.0\text{mA}; V_{CC}=4.5\text{V}$   | -    | 0.15    | 0.26          | V |
| $I_I$             | Input leakage current     | $V_I=V_{CC}$ or GND; $V_{CC}=5.5\text{V}$   | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I=V_{CC}$ or GND; $I_O=0\text{A}; V_{CC}=5.5\text{V}$  | -  | -    | 2.0     | $\mu\text{A}$ |   |
| $\Delta I_{CC}$   | Additional supply current | Per input pin; $V_I=V_{CC}-2.1\text{V}; I_O=0\text{A}$ ; Other inputs at $V_{CC}$ or GND; $V_{CC}=4.5\text{V}$ to $5.5\text{V}$ | -  | -    | 108     | $\mu\text{A}$ |   |
| $C_I$             | Input capacitance         | -   | -  | 3.5  | -       | pF            |   |

**7.3.2 DC Characteristics 2**
 $T_{amb} = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                 | CONDITIONS   | MIN.   | TYP. | MAX.    | UNIT          |   |
|-------------------|---------------------------|--|--|------|---------|---------------|---|
| <b>CJ74HC132</b>  |                           |  |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = -20\mu\text{A}; V_{CC} = 2.0\text{V}$ | 1.9  | -       | -             | V |
|                   |                           |  | $I_O = -20\mu\text{A}; V_{CC} = 4.5\text{V}$ | 4.4  | -       | -             | V |
|                   |                           |  | $I_O = -20\mu\text{A}; V_{CC} = 6.0\text{V}$ | 5.9  | -       | -             | V |
|                   |                           |  | $I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$  | 3.84 | -       | -             | V |
|                   |                           |  | $I_O = -5.2\text{mA}; V_{CC} = 6.0\text{V}$  | 5.34 | -       | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = 20\mu\text{A}; V_{CC} = 2.0\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 20\mu\text{A}; V_{CC} = 4.5\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 20\mu\text{A}; V_{CC} = 6.0\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$   | -    | -       | 0.33          | V |
|                   |                           |  | $I_O = 5.2\text{mA}; V_{CC} = 6.0\text{V}$   | -    | -       | 0.33          | V |
| $I_I$             | Input leakage current     | $V_I = V_{CC}$ or GND; $V_{CC} = 6.0\text{V}$  | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 6.0\text{V}$   | -  | -    | 20      | $\mu\text{A}$ |   |
| <b>CJ74HCT132</b> |                           |  |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = -20\mu\text{A}; V_{CC} = 4.5\text{V}$ | 4.4  | -       | -             | V |
|                   |                           |  | $I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$  | 3.84 | -       | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = 20\mu\text{A}; V_{CC} = 4.5\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$   | -    | -       | 0.33          | V |
| $I_I$             | Input leakage current     | $V_I = V_{CC}$ or GND; $V_{CC} = 5.5\text{V}$  | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 5.5\text{V}$   | -  | -    | 20      | $\mu\text{A}$ |   |
| $\Delta I_{CC}$   | Additional supply current | Per input pin; $V_I = V_{CC} - 2.1\text{V}; I_O = 0\text{A};$ Other inputs at $V_{CC}$ or GND; $V_{CC} = 4.5\text{V}$ to $5.5\text{V}$ | -  | -    | 135     | $\mu\text{A}$ |   |

**7.3.3 DC Characteristics 3**

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

| SYMBOL            | PARAMETER                 | CONDITIONS   | MIN.   | TYP. | MAX.    | UNIT          |   |
|-------------------|---------------------------|--|--|------|---------|---------------|---|
| <b>CJ74HC132</b>  |                           |  |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = -20\mu\text{A}; V_{CC} = 2.0\text{V}$ | 1.9  | -       | -             | V |
|                   |                           |  | $I_O = -20\mu\text{A}; V_{CC} = 4.5\text{V}$ | 4.4  | -       | -             | V |
|                   |                           |  | $I_O = -20\mu\text{A}; V_{CC} = 6.0\text{V}$ | 5.9  | -       | -             | V |
|                   |                           |  | $I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$  | 3.7  | -       | -             | V |
|                   |                           |  | $I_O = -5.2\text{mA}; V_{CC} = 6.0\text{V}$  | 5.2  | -       | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = 20\mu\text{A}; V_{CC} = 2.0\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 20\mu\text{A}; V_{CC} = 4.5\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 20\mu\text{A}; V_{CC} = 6.0\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$   | -    | -       | 0.4           | V |
|                   |                           |  | $I_O = 5.2\text{mA}; V_{CC} = 6.0\text{V}$   | -    | -       | 0.4           | V |
| $I_I$             | Input leakage current     | $V_I = V_{CC}$ or GND; $V_{CC} = 6.0\text{V}$  | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 6.0\text{V}$   | -  | -    | 40      | $\mu\text{A}$ |   |
| <b>CJ74HCT132</b> |                           |  |  |      |         |               |   |
| $V_{OH}$          | HIGH-level output voltage | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = -20\mu\text{A}; V_{CC} = 4.5\text{V}$ | 4.4  | -       | -             | V |
|                   |                           |  | $I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$  | 3.7  | -       | -             | V |
| $V_{OL}$          | LOW-level output voltage  | $V_I = V_{T+}$ or $V_{T-}$   | $I_O = 20\mu\text{A}; V_{CC} = 4.5\text{V}$  | -    | -       | 0.1           | V |
|                   |                           |  | $I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$   | -    | -       | 0.4           | V |
| $I_I$             | Input leakage current     | $V_I = V_{CC}$ or GND; $V_{CC} = 5.5\text{V}$  | -  | -    | $\pm 1$ | $\mu\text{A}$ |   |
| $I_{CC}$          | Supply current            | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 5.5\text{V}$   | -  | -    | 40      | $\mu\text{A}$ |   |
| $\Delta I_{CC}$   | Additional supply current | Per input pin; $V_I = V_{CC} - 2.1\text{V}; I_O = 0\text{A};$ Other inputs at $V_{CC}$ or GND; $V_{CC} = 4.5\text{V}$ to $5.5\text{V}$ | -  | -    | 147     | $\mu\text{A}$ |   |

**7.3.4 AC Characteristics 1**

 T<sub>amb</sub>=25°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                      | CONDITIONS  | MIN.  | TYP. | MAX. | UNIT |    |
|-------------------|--------------------------------|---|---|------|------|------|----|
| <b>CJ74HC132</b>  |                                |   |   |      |      |      |    |
| t <sub>pd</sub>   | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup>   | V <sub>CC</sub> =2.0V                       | -    | 36   | 125  | ns |
|                   |                                |   | V <sub>CC</sub> =4.5V                       | -    | 13   | 25   | ns |
|                   |                                |   | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 11   | -    | ns |
|                   |                                |   | V <sub>CC</sub> =6.0V                       | -    | 10   | 21   | ns |
| t <sub>t</sub>    | Transition time                | See Figure 8-5 <sup>(2)</sup>   | V <sub>CC</sub> =2.0V                       | -    | 19   | 75   | ns |
|                   |                                |   | V <sub>CC</sub> =4.5V                       | -    | 7    | 15   | ns |
|                   |                                |   | V <sub>CC</sub> =6.0V                       | -    | 6    | 13   | ns |
| C <sub>PD</sub>   | Power dissipation capacitance  | Per package; V <sub>I</sub> = GND to V <sub>CC</sub> <sup>(3)</sup>       | -   | 24   | -    | pF   |    |
| <b>CJ74HCT132</b> |                                |   |   |      |      |      |    |
| t <sub>pd</sub>   | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup>   | V <sub>CC</sub> =4.5V                       | -    | 20   | 33   | ns |
|                   |                                |   | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 17   | -    | ns |
| t <sub>t</sub>    | Transition time                | See Figure 8-5 <sup>(2)</sup>   | V <sub>CC</sub> =4.5V                       | -    | 7    | 15   | ns |
| C <sub>PD</sub>   | Power dissipation capacitance  | Per package; V <sub>I</sub> = GND to V <sub>CC</sub> -1.5V <sup>(3)</sup> | -   | 20   | -    | pF   |    |

 (1) t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.

 (2) t<sub>t</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.

 (3) C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in uW).

$$P_D = (C_{PD} \times V_{CC}^2 \times f_i \times N) + \sum (C_L \times V_{CC}^2 \times f_o)$$
 where:

 f<sub>i</sub>=input frequency in MHz;

 f<sub>o</sub>=output frequency in MHz;

 C<sub>L</sub>=output load capacitance in pF;

 V<sub>CC</sub>=supply voltage in V;

N=number of inputs switching;

 $\sum (C_L \times V_{CC}^2 \times f_o)$ =sum of outputs.

**7.3.5 AC Characteristics 2**
 $T_{amb} = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                      | CONDITIONS                    | MIN.                 | TYP. | MAX. | UNIT |    |
|-------------------|--------------------------------|-------------------------------|----------------------|------|------|------|----|
| <b>CJ74HC132</b>  |                                |                               |                      |      |      |      |    |
| $t_{pd}$          | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup> | $V_{CC}=2.0\text{V}$ | -    | -    | 155  | ns |
|                   |                                |                               | $V_{CC}=4.5\text{V}$ | -    | -    | 31   | ns |
|                   |                                |                               | $V_{CC}=6.0\text{V}$ | -    | -    | 26   | ns |
| $t_t$             | Transition time                | See Figure 8-5 <sup>(2)</sup> | $V_{CC}=2.0\text{V}$ | -    | -    | 95   | ns |
|                   |                                |                               | $V_{CC}=4.5\text{V}$ | -    | -    | 19   | ns |
|                   |                                |                               | $V_{CC}=6.0\text{V}$ | -    | -    | 16   | ns |
| <b>CJ74HCT132</b> |                                |                               |                      |      |      |      |    |
| $t_{pd}$          | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup> | $V_{CC}=4.5\text{V}$ | -    | -    | 41   | ns |
| $t_t$             | Transition time                | See Figure 8-5 <sup>(2)</sup> | $V_{CC}=4.5\text{V}$ | -    | -    | 19   | ns |

(1)  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

(2)  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

**7.3.6 AC Characteristics 3**
 $T_{amb} = -40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                      | CONDITIONS                    | MIN.                 | TYP. | MAX. | UNIT |    |
|-------------------|--------------------------------|-------------------------------|----------------------|------|------|------|----|
| <b>CJ74HC132</b>  |                                |                               |                      |      |      |      |    |
| $t_{pd}$          | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup> | $V_{CC}=2.0\text{V}$ | -    | -    | 190  | ns |
|                   |                                |                               | $V_{CC}=4.5\text{V}$ | -    | -    | 38   | ns |
|                   |                                |                               | $V_{CC}=6.0\text{V}$ | -    | -    | 32   | ns |
| $t_t$             | Transition time                | See Figure 8-5 <sup>(2)</sup> | $V_{CC}=2.0\text{V}$ | -    | -    | 110  | ns |
|                   |                                |                               | $V_{CC}=4.5\text{V}$ | -    | -    | 22   | ns |
|                   |                                |                               | $V_{CC}=6.0\text{V}$ | -    | -    | 19   | ns |
| <b>CJ74HCT132</b> |                                |                               |                      |      |      |      |    |
| $t_{pd}$          | nA, nB to nY propagation delay | See Figure 8-5 <sup>(1)</sup> | $V_{CC}=4.5\text{V}$ | -    | -    | 50   | ns |
| $t_t$             | Transition time                | See Figure 8-5 <sup>(2)</sup> | $V_{CC}=4.5\text{V}$ | -    | -    | 22   | ns |

(1)  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .

(2)  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

**7.3.7 Transfer characteristics 1**

$T_{amb}=25^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                        | CONDITIONS           | MIN. | TYP. | MAX. | UNIT |
|-------------------|----------------------------------|----------------------|------|------|------|------|
| <b>CJ74HC132</b>  |                                  |                      |      |      |      |      |
| $V_{T+}$          | Positive-going threshold voltage | $V_{CC}=2.0\text{V}$ | 0.7  | 1.18 | 1.5  | V    |
|                   |                                  | $V_{CC}=4.5\text{V}$ | 1.7  | 2.38 | 3.15 | V    |
|                   |                                  | $V_{CC}=6.0\text{V}$ | 2.1  | 3.14 | 4.2  | V    |
| $V_{T-}$          | Negative-going threshold voltage | $V_{CC}=2.0\text{V}$ | 0.3  | 0.63 | 1.0  | V    |
|                   |                                  | $V_{CC}=4.5\text{V}$ | 0.9  | 1.67 | 2.2  | V    |
|                   |                                  | $V_{CC}=6.0\text{V}$ | 1.2  | 2.26 | 3.0  | V    |
| $V_H$             | Hysteresis voltage               | $V_{CC}=2.0\text{V}$ | 0.2  | 0.55 | 1.0  | V    |
|                   |                                  | $V_{CC}=4.5\text{V}$ | 0.4  | 0.71 | 1.4  | V    |
|                   |                                  | $V_{CC}=6.0\text{V}$ | 0.6  | 0.88 | 1.6  | V    |
| <b>CJ74HCT132</b> |                                  |                      |      |      |      |      |
| $V_{T+}$          | Positive-going threshold voltage | $V_{CC}=4.5\text{V}$ | 1.2  | 1.41 | 1.9  | V    |
|                   |                                  | $V_{CC}=5.5\text{V}$ | 1.4  | 1.59 | 2.1  | V    |
| $V_{T-}$          | Negative-going threshold voltage | $V_{CC}=4.5\text{V}$ | 0.5  | 0.85 | 1.2  | V    |
|                   |                                  | $V_{CC}=5.5\text{V}$ | 0.6  | 0.99 | 1.4  | V    |
| $V_H$             | Hysteresis voltage               | $V_{CC}=4.5\text{V}$ | 0.4  | 0.56 | -    | V    |
|                   |                                  | $V_{CC}=5.5\text{V}$ | 0.4  | 0.6  | -    | V    |

**7.3.8 Transfer characteristics 2**

T<sub>amb</sub>=-40°C to +85°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                        | CONDITIONS            | MIN. | TYP. | MAX. | UNIT |
|-------------------|----------------------------------|-----------------------|------|------|------|------|
| <b>CJ74HC132</b>  |                                  |                       |      |      |      |      |
| V <sub>T+</sub>   | Positive-going threshold voltage | V <sub>CC</sub> =2.0V | 0.7  | -    | 1.5  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 1.7  | -    | 3.15 | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 2.1  | -    | 4.2  | V    |
| V <sub>T-</sub>   | Negative-going threshold voltage | V <sub>CC</sub> =2.0V | 0.3  | -    | 1.0  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 0.9  | -    | 2.2  | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 1.2  | -    | 3.0  | V    |
| V <sub>H</sub>    | Hysteresis voltage               | V <sub>CC</sub> =2.0V | 0.2  | -    | 1.0  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 0.4  | -    | 1.4  | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 0.6  | -    | 1.6  | V    |
| <b>CJ74HCT132</b> |                                  |                       |      |      |      |      |
| V <sub>T+</sub>   | Positive-going threshold voltage | V <sub>CC</sub> =4.5V | 1.2  | -    | 1.9  | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 1.4  | -    | 2.1  | V    |
| V <sub>T-</sub>   | Negative-going threshold voltage | V <sub>CC</sub> =4.5V | 0.5  | -    | 1.2  | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 0.6  | -    | 1.4  | V    |
| V <sub>H</sub>    | Hysteresis voltage               | V <sub>CC</sub> =4.5V | 0.4  | -    | -    | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 0.4  | -    | -    | V    |

**7.3.9 Transfer characteristics 3**

T<sub>amb</sub>=-40°C to +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

| SYMBOL            | PARAMETER                        | CONDITIONS            | MIN. | TYP. | MAX. | UNIT |
|-------------------|----------------------------------|-----------------------|------|------|------|------|
| <b>CJ74HC132</b>  |                                  |                       |      |      |      |      |
| V <sub>T+</sub>   | Positive-going threshold voltage | V <sub>CC</sub> =2.0V | 0.7  | -    | 1.5  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 1.7  | -    | 3.15 | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 2.1  | -    | 4.2  | V    |
| V <sub>T-</sub>   | Negative-going threshold voltage | V <sub>CC</sub> =2.0V | 0.3  | -    | 1.0  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 0.9  | -    | 2.2  | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 1.2  | -    | 3.0  | V    |
| V <sub>H</sub>    | Hysteresis voltage               | V <sub>CC</sub> =2.0V | 0.2  | -    | 1.0  | V    |
|                   |                                  | V <sub>CC</sub> =4.5V | 0.4  | -    | 1.4  | V    |
|                   |                                  | V <sub>CC</sub> =6.0V | 0.6  | -    | 1.6  | V    |
| <b>CJ74HCT132</b> |                                  |                       |      |      |      |      |
| V <sub>T+</sub>   | Positive-going threshold voltage | V <sub>CC</sub> =4.5V | 1.2  | -    | 1.9  | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 1.4  | -    | 2.1  | V    |
| V <sub>T-</sub>   | Negative-going threshold voltage | V <sub>CC</sub> =4.5V | 0.5  | -    | 1.2  | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 0.6  | -    | 1.4  | V    |
| V <sub>H</sub>    | Hysteresis voltage               | V <sub>CC</sub> =4.5V | 0.4  | -    | -    | V    |
|                   |                                  | V <sub>CC</sub> =5.5V | 0.4  | -    | -    | V    |

## 8 Detailed Description

### 8.1 Overview

The CJ74HC/HCT132 is a quad 2-input NAND gate with Schmitt-trigger inputs.

### 8.2 Functional Block Diagram

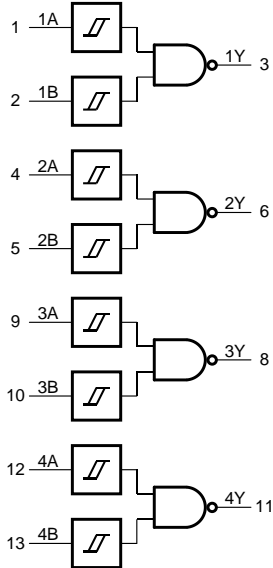


Figure 8-1 Logic symbol

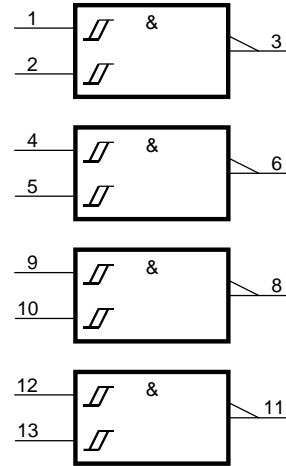


Figure 8-2 IEC logic symbol

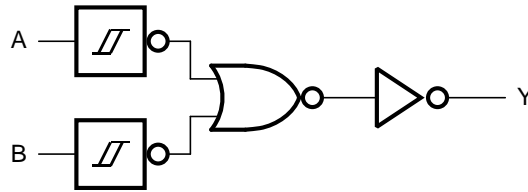


Figure 8-3 Logic diagram for one gate

### 8.3 Function Table<sup>(1)</sup>

| INPUT |    | OUTPUT |
|-------|----|--------|
| nA    | nB | nY     |
| L     | L  | H      |
| L     | H  | H      |
| H     | L  | H      |
| H     | H  | L      |

(1) H=HIGH voltage level; L=LOW voltage level; X=don't care.

8.4 Testing Circuit

8.4.1 AC Testing Circuit

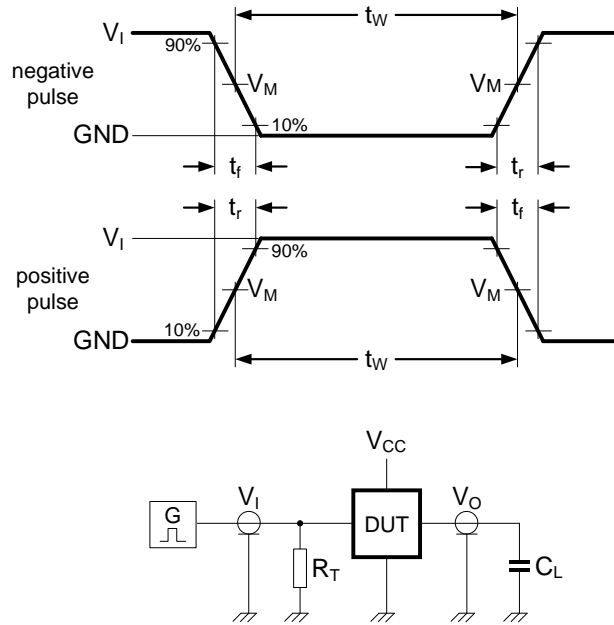


Figure 8-4 Test circuit for measuring switching times

Definitions for test circuit:

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

$R_T$ =termination resistance should be equal to the output impedance  $Z_o$  of the pulse generator.

8.4.2 AC Testing Waveforms

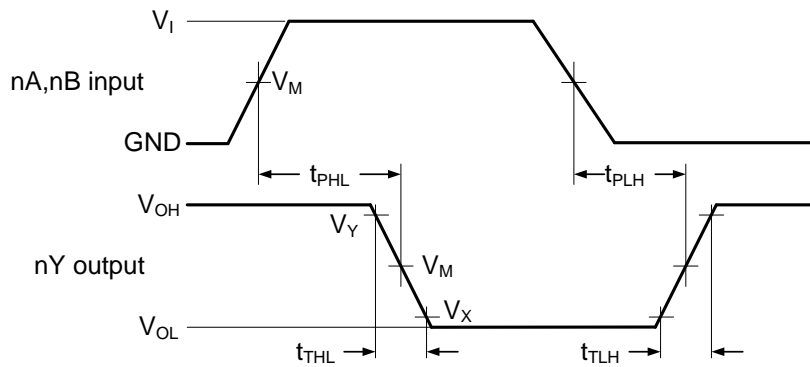


Figure 8-5 Input to output propagation delays

8.4.3 Transfer Characteristics Waveforms

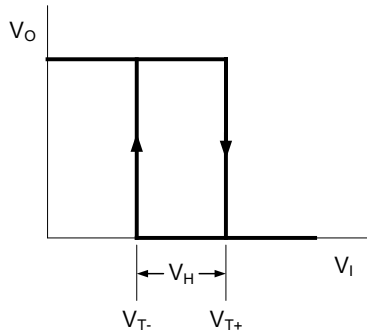


Figure 8-6 Transfer characteristics

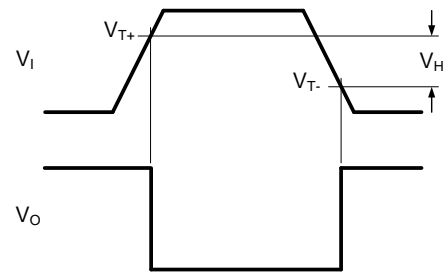


Figure 8-7 Transfer characteristics definitions

8.4.4 Measurement Points

| TYPE       | INPUT               | OUTPUT              |                     |                     |
|------------|---------------------|---------------------|---------------------|---------------------|
|            | $V_M$               | $V_M$               | $V_X$               | $V_Y$               |
| CJ74HC132  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |
| CJ74HCT132 | 1.3V                | 1.3V                | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |

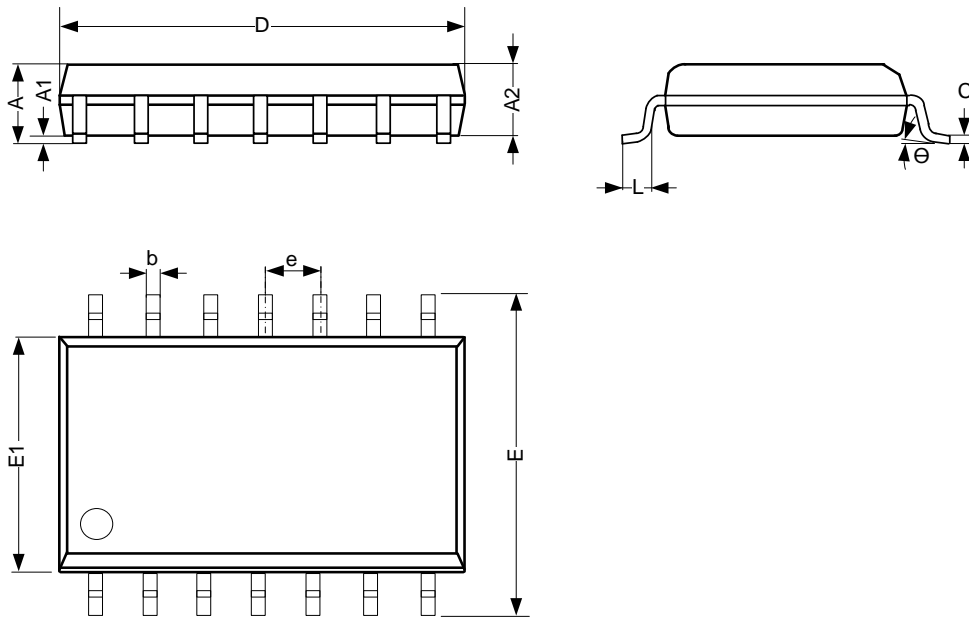
8.4.5 Test Data

| TYPE       | INPUT    |            | LOAD       | TEST               |
|------------|----------|------------|------------|--------------------|
|            | $V_I$    | $t_r, t_f$ | $C_L$      |                    |
| CJ74HC132  | $V_{CC}$ | 6.0ns      | 15pF, 50pF | $t_{PLH}, t_{PHL}$ |
| CJ74HCT132 | 3.0V     | 6.0ns      | 15pF, 50pF | $t_{PLH}, t_{PHL}$ |

9 Mechanical Information

9.1 SOP14 Mechanical Information

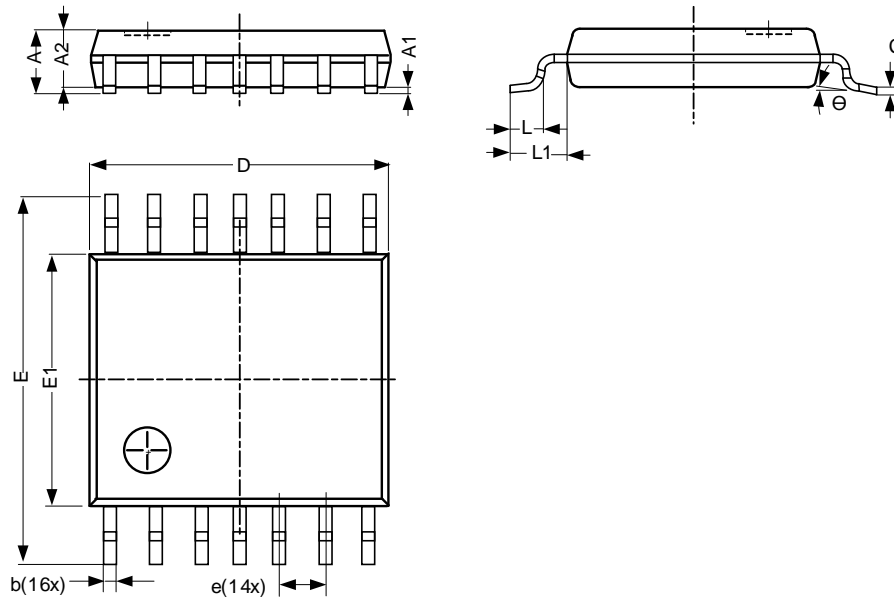
9.1.1 SOP14 Outline Dimensions



| SYMBOL   | Dimensions In Millimeters |      |      |
|----------|---------------------------|------|------|
|          | Min.                      | Typ. | Max. |
| A        | 1.50                      | -    | 1.75 |
| A1       | 0.05                      | -    | 0.25 |
| A2       | 1.30                      | -    | -    |
| b        | 0.33                      | -    | 0.50 |
| c        | 0.19                      | -    | 0.25 |
| D        | 8.43                      | -    | 8.76 |
| E        | 5.80                      | -    | 6.25 |
| E1       | 3.75                      | -    | 4.00 |
| e        | 1.27 BSC                  |      |      |
| L        | 0.40                      | -    | 0.89 |
| $\Theta$ | 0°                        | -    | 8°   |
| Unit: mm |                           |      |      |

9.2 TSSOP14 Mechanical Information

9.2.1 TSSOP14 Outline Dimensions



| SYMBOL   | Dimensions In Millimeters |      |      |
|----------|---------------------------|------|------|
|          | Min.                      | Typ. | Max. |
| A        | -                         | -    | 1.20 |
| A1       | 0.05                      | -    | 0.15 |
| A2       | 0.80                      | -    | 1.05 |
| b        | 0.19                      | -    | 0.30 |
| c        | 0.09                      | -    | 0.20 |
| D        | 4.90                      | -    | 5.10 |
| E        | 6.20                      | -    | 6.60 |
| E1       | 4.30                      | -    | 4.50 |
| e        | 0.65 BSC                  |      |      |
| L        | 0.45                      | -    | 0.75 |
| L1       | -                         | 1.00 | -    |
| Θ        | 0°                        | -    | 8°   |
| Unit: mm |                           |      |      |

## 10 Notes and Revision History

### 10.1 Associated Product Family and Others

To view other products of the same type or IC products of other types, click the official website of JSCJ -- <https://www.jscj-elec.com> for more details.

### 10.2 Notes

#### Electrostatic Discharge Caution



This IC may be damaged by ESD. Relevant personnel shall comply with correct installation and use specifications to avoid ESD damage to the IC. If appropriate measures are not taken to prevent ESD damage, the hazards caused by ESD include but are not limited to degradation of integrated circuit performance or complete damage of integrated circuit. For some precision integrated circuits, a very small parameter change may cause the whole device to be inconsistent with its published specifications.

# DISCLAIMER

## IMPORTANT NOTICE, PLEASE READ CAREFULLY

The information in this data sheet is intended to describe the operation and characteristics of our products. JSCJ has the right to make any modification, enhancement, improvement, correction or other changes to any content in this data sheet, including but not limited to specification parameters, circuit design and application information, without prior notice.

Any person who purchases or uses JSCJ products for design shall: 1. Select products suitable for circuit application and design; 2. Design, verify and test the rationality of circuit design; 3. Procedures to ensure that the design complies with relevant laws and regulations and the requirements of such laws and regulations. JSCJ makes no warranty or representation as to the accuracy or completeness of the information contained in this data sheet and assumes no responsibility for the application or use of any of the products described in this data sheet.

Without the written consent of JSCJ, this product shall not be used in occasions requiring high quality or high reliability, including but not limited to the following occasions: medical equipment, military facilities and aerospace. JSCJ shall not be responsible for casualties or property losses caused by abnormal use or application of this product.

Official Website: [www.jscj-elec.com](http://www.jscj-elec.com)

Copyright © JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD