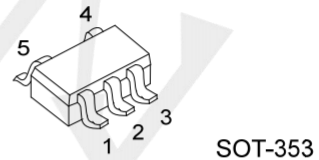


### DESCRIPTION

The **NC7S32P5X-TP** is a single 2-input positive-or gate, which provides the function  $Y=A+B$  in positive logic.

### FEATURES

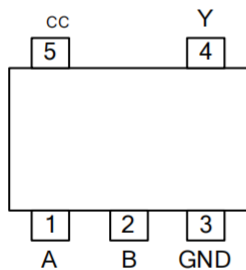
- \* Operate from 2V to 5.5V
- \* Max  $t_{PD}$  of 5.5ns at 5 V



### ORDERING INFORMATION

| Ordering Number |              | Package | Packing   |
|-----------------|--------------|---------|-----------|
| Lead Free       | Halogen Free |         |           |
| NC7S32P5X-TP    | NC7S32P5X-TP | SOT-353 | Tape Reel |

### PIN CONFIGURATION

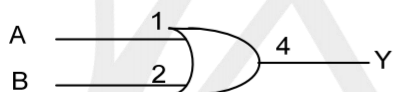


### FUNCTION TABLE

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

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

### LOGIC DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

| PARAMETER                      |         | SYMBOL           | RATINGS                     | UNIT |
|--------------------------------|---------|------------------|-----------------------------|------|
| Supply Voltage                 |         | V <sub>CC</sub>  | -0.5 ~ 7                    | V    |
| Input Voltage                  |         | V <sub>IN</sub>  | -0.5 ~ 7                    | V    |
| Output Voltage                 |         | V <sub>OUT</sub> | -0.5 ~ V <sub>CC</sub> +0.5 | V    |
| V <sub>CC</sub> or GND Current |         | I <sub>CC</sub>  | ±50                         | mA   |
| Output Current                 |         | I <sub>OUT</sub> | ±25                         | mA   |
| Input Clamp Current            |         | I <sub>IK</sub>  | -20                         | mA   |
| Output Clamp Current           |         | I <sub>OK</sub>  | ±20                         | mA   |
| Power Dissipation              | SOT-353 | P <sub>D</sub>   | 250                         | mW   |
| Storage Temperature            |         | T <sub>STG</sub> | -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           | TEST CONDITIONS            | MIN | TYP | MAX             | UNIT |
|------------------------------------|------------------|----------------------------|-----|-----|-----------------|------|
| Supply Voltage                     | V <sub>CC</sub>  |                            | 2   |     | 5.5             | V    |
| Input Voltage                      | V <sub>IN</sub>  |                            | 0   |     | 5.5             | 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> =3.3V±0.3V |     |     | 100             | ns/V |
|                                    |                  | V <sub>CC</sub> =5.0V±0.5V |     |     | 20              |      |
| 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> =2.0V                                                                | 1.5  |     |      | V    |
|                           |                      | V <sub>CC</sub> =3.0V                                                                | 2.1  |     |      | V    |
|                           |                      | V <sub>CC</sub> =5.5V                                                                | 3.85 |     |      | V    |
| Low-Level Input Voltage   | V <sub>IL</sub>      | V <sub>CC</sub> =2.0V                                                                |      |     | 0.5  | V    |
|                           |                      | V <sub>CC</sub> =3.0V                                                                |      |     | 0.9  | V    |
|                           |                      | V <sub>CC</sub> =5.5V                                                                |      |     | 1.65 | V    |
| High-Level Output Voltage | V <sub>OH</sub>      | V <sub>CC</sub> =2.0V, I <sub>OH</sub> =-50μA                                        | 1.9  | 2.0 |      | V    |
|                           |                      | V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-50μA                                        | 2.9  | 3.0 |      | V    |
|                           |                      | V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-50μA                                        | 4.4  | 4.5 |      | V    |
|                           |                      | V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-4mA                                         | 2.58 |     |      | V    |
|                           |                      | V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-8mA                                         | 3.94 |     |      | V    |
| Low-Level Output Voltage  | V <sub>OL</sub>      | V <sub>CC</sub> =2.0V, I <sub>OL</sub> =50μA                                         |      |     | 0.1  | V    |
|                           |                      | V <sub>CC</sub> =3.0V, I <sub>OL</sub> =50μA                                         |      |     | 0.1  | V    |
|                           |                      | V <sub>CC</sub> =4.5V, I <sub>OL</sub> =50μA                                         |      |     | 0.1  | V    |
|                           |                      | V <sub>CC</sub> =3.0V, I <sub>OL</sub> =4mA                                          |      |     | 0.36 | V    |
|                           |                      | V <sub>CC</sub> =4.5V, I <sub>OL</sub> =8mA                                          |      |     | 0.36 | V    |
| Input Leakage Current     | I <sub>I(LEAK)</sub> | V <sub>CC</sub> =0~5.5V, V <sub>IN</sub> =5.5V or GND                                |      |     | ±0.1 | μA   |
| Quiescent Supply Current  | I <sub>Q</sub>       | V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0A |      |     | 1    | μA   |
| Input Capacitance         | C <sub>I</sub>       | V <sub>CC</sub> =5.0V, V <sub>IN</sub> =V <sub>CC</sub> or GND                       |      | 2   | 10   | pF   |

# NC7S32P5X-TP

## SINGLE 2-INPUT POSITIVE-OR GATE

[WWW.TECHPUBLIC.COM](http://WWW.TECHPUBLIC.COM)

■ **DYNAMIC CHARACTERISTICS** ( $T_A=25^\circ\text{C}$ , Input:  $t_R, t_F \leq 3\text{ns}$ ;  $P_{RR} \leq 1\text{MHz}$ )

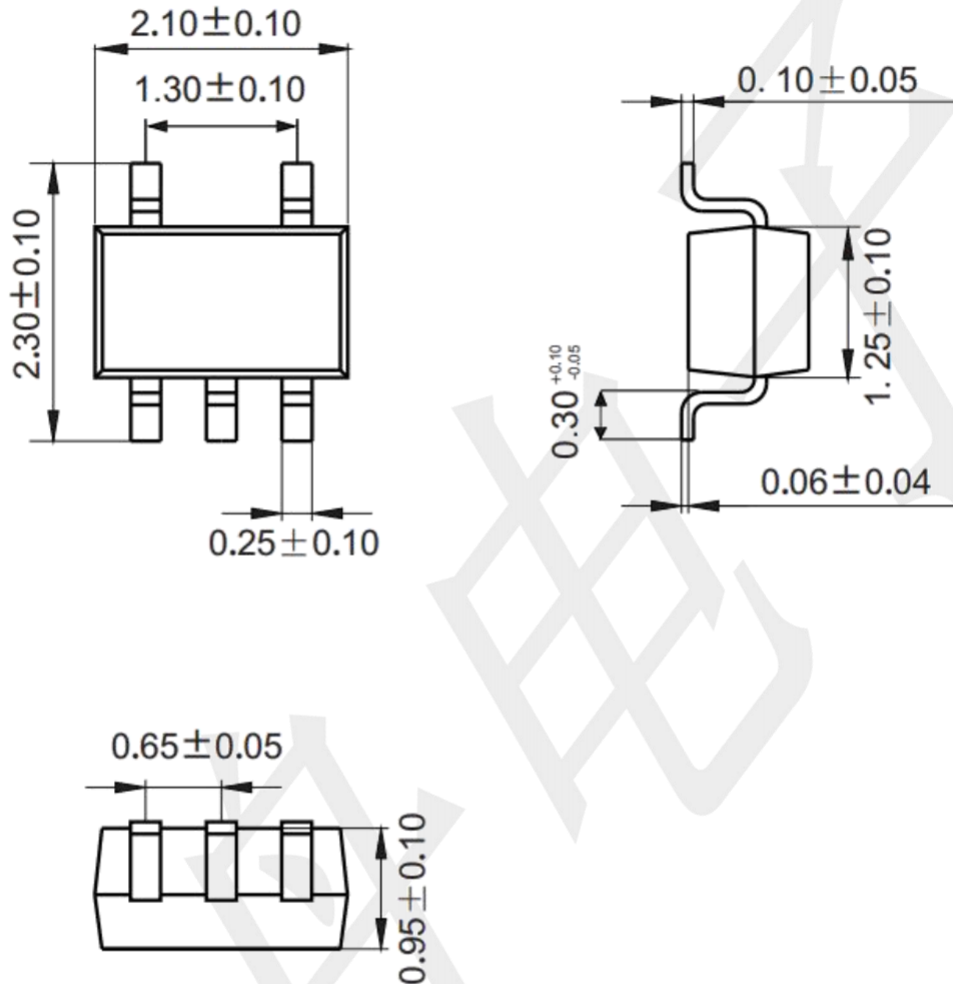
| PARAMETER                                         | SYMBOL    | TEST CONDITIONS                         | MIN | TYP | MAX | UNIT |
|---------------------------------------------------|-----------|-----------------------------------------|-----|-----|-----|------|
| Propagation Delay Time Input(A or B) to Output(Y) | $t_{PLH}$ | $V_{CC}=3.3V \pm 0.3V, C_L=15\text{pF}$ |     | 5.5 | 7.9 | ns   |
|                                                   | $t_{PHL}$ |                                         |     | 5.5 | 7.9 |      |
|                                                   | $t_{PLH}$ | $V_{CC}=3.3V \pm 0.3V, C_L=50\text{pF}$ |     | 8   | 12  |      |
|                                                   | $t_{PHL}$ |                                         |     | 8   | 12  |      |
| Propagation Delay Time Input(A or B) to Output(Y) | $t_{PLH}$ | $V_{CC}=5V \pm 0.5V, C_L=15\text{pF}$   |     | 3.8 | 5.5 | ns   |
|                                                   | $t_{PHL}$ |                                         |     | 3.8 | 5.5 |      |
|                                                   | $t_{PLH}$ | $V_{CC}=5V \pm 0.5V, C_L=50\text{pF}$   |     | 5.3 | 7.5 |      |
|                                                   | $t_{PHL}$ |                                         |     | 5.3 | 7.5 |      |

■ **OPERATING CHARACTERISTICS** ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                     | SYMBOL   | TEST CONDITIONS                     | MIN | TYP | MAX | UNIT |
|-------------------------------|----------|-------------------------------------|-----|-----|-----|------|
| Power Dissipation Capacitance | $C_{PD}$ | No load, $V_{CC}=5V, f=1\text{MHz}$ |     | 14  |     | pF   |

**Package information (Unit: mm)**

SOT353



**Mounting Pad Layout (Unit: mm)**

