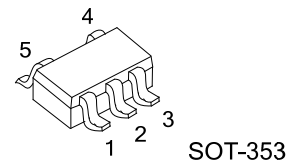
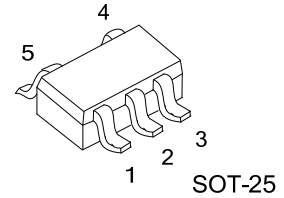


**U74AHCT1G32****CMOS IC****SINGLE 2-INPUT POSITIVE-OR GATE****DESCRIPTION**

The UTC **U74AHCT1G32** is a single 2-input positive-or gate, which provides the function  $Y=A+B$  in positive logic.

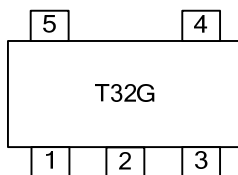
**FEATURES**

- \* Inputs are TTL voltage compatible
- \* Operate from 4.5V to 5.5V
- \* Max  $t_{PD}$  of 8ns @ 5 V
- \* Low power dissipation:  $I_{CC}=10\mu A(\text{Max})$  @  $T_A=25^\circ C$

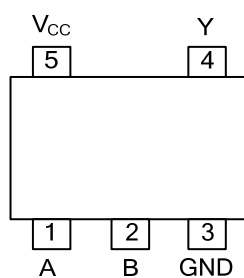
**ORDERING INFORMATION**

| Ordering Number    | Package | Packing   |
|--------------------|---------|-----------|
| U74AHCT1G32G-AF5-R | SOT-25  | Tape Reel |
| U74AHCT1G32G-AL5-R | SOT-353 | Tape Reel |

|                        |                                                                                        |
|------------------------|----------------------------------------------------------------------------------------|
| U74AHCT1G32G-AF5-R<br> | (1) R: Tape Reel<br>(2) AF5: SOT-25, AL5: SOT-353<br>(3) G: Halogen Free and Lead Free |
|------------------------|----------------------------------------------------------------------------------------|

**MARKING**

## ■ PIN CONFIGURATION

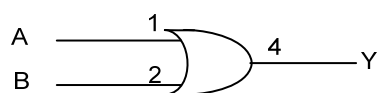


## ■ FUNCTION TABLE

| 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



Logic symbol

## ■ ABSOLUTE MAXIMUM RATING

| 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   |
| Operating Temperature   | $T_{OPR}$ | -40 ~ +85            | °C   |
| 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     | TEST CONDITIONS | MIN | TYP | MAX      | UNIT |
|------------------------------------|------------|-----------------|-----|-----|----------|------|
| Supply Voltage                     | $V_{CC}$   |                 | 4.5 |     | 5.5      | V    |
| Input Voltage                      | $V_{IN}$   |                 | 0   |     | 5.5      | V    |
| Output Voltage                     | $V_{OUT}$  |                 | 0   |     | $V_{CC}$ | V    |
| High-level Input Voltage           | $V_{IH}$   |                 | 2   |     |          | V    |
| Low-level Input Voltage            | $V_{IL}$   |                 |     |     | 0.8      | V    |
| High-level Output Current          | $I_{OH}$   |                 |     |     | -8       | mA   |
| Low-level Output Current           | $I_{OL}$   |                 |     |     | 8        | mA   |
| Input Transition Rise or Fall Rate | $t_R, t_F$ |                 |     |     | 20       | ns/V |

## ■ ELECTRICAL CHARACTERISTICS

| PARAMETER                           | SYMBOL        | TEST CONDITIONS                                                    | MIN  | TYP | MAX  | UNIT |
|-------------------------------------|---------------|--------------------------------------------------------------------|------|-----|------|------|
| High-Level Output Voltage           | $V_{OH}$      | $V_{CC}=4.5V, I_{OH}=-50\mu A$                                     | 4.4  | 4.5 |      | V    |
|                                     |               | $V_{CC}=4.5V, I_{OH}=-8mA$                                         | 3.94 |     |      |      |
| Low-Level Output Voltage            | $V_{OL}$      | $V_{CC}=4.5V, I_{OH}=50\mu A$                                      |      |     | 0.1  | V    |
|                                     |               | $V_{CC}=4.5V, I_{OH}=8mA$                                          |      |     | 0.36 |      |
| Input Leakage Current               | $I_{I(LEAK)}$ | $V_{CC}=0\sim 5.5V, V_{IN}=5.5V$ or GND                            |      |     | ±0.1 | μA   |
| Quiescent Supply Current            | $I_Q$         | $V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$                   |      |     | 1    | μA   |
| Additional Quiescent Supply Current | $\Delta I_Q$  | $V_{CC}=5.5V$ , One input at 3.4V, Other inputs at $V_{CC}$ or GND |      |     | 1.35 | mA   |
| Input Capacitance                   | $C_I$         | $V_{CC}=4.5V, V_{IN}=V_{CC}$ or GND                                |      | 2   | 10   | pF   |

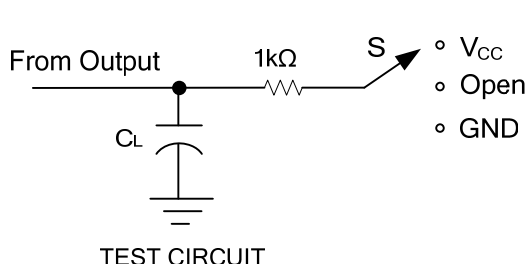
## ■ DYNAMIC CHARACTERISTICS

| PARAMETER                                         | SYMBOL    | TEST CONDITIONS               | MIN | TYP | MAX | UNIT |
|---------------------------------------------------|-----------|-------------------------------|-----|-----|-----|------|
| Propagation Delay Time Input(A or B) to Output(Y) | $t_{PLH}$ | $V_{CC}=5V\pm 0.5V, C_L=15pF$ |     | 5   | 6.9 | ns   |
|                                                   | $t_{PHL}$ |                               |     | 5   | 6.9 |      |
|                                                   | $t_{PLH}$ | $V_{CC}=5V\pm 0.5V, C_L=50pF$ |     | 5.5 | 7.9 |      |
|                                                   | $t_{PHL}$ |                               |     | 5.5 | 7.9 |      |

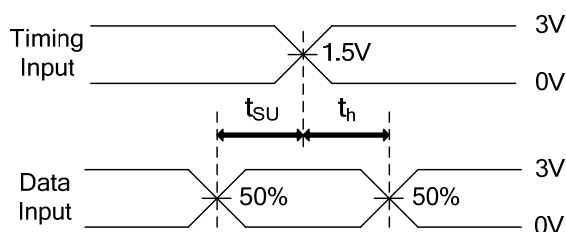
## ■ OPERATING CHARACTERISTICS ( $T_A=25^\circ C$ , unless otherwise specified)

| PARAMETER                     | SYMBOL   | TEST CONDITIONS               | MIN | TYP  | MAX | UNIT |
|-------------------------------|----------|-------------------------------|-----|------|-----|------|
| Power Dissipation Capacitance | $C_{PD}$ | $V_{CC}=5V, f=1MHz$ , No load |     | 11.5 |     | pF   |

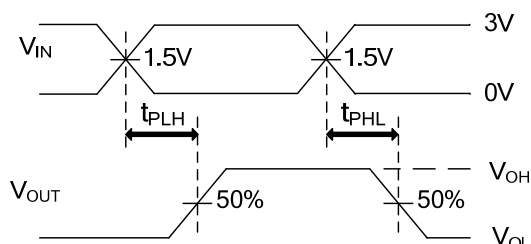
## ■ TEST CIRCUIT AND WAVEFORMS



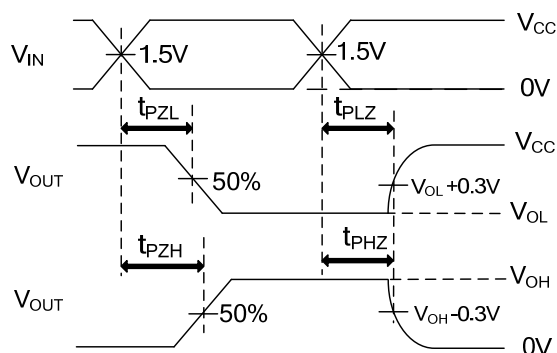
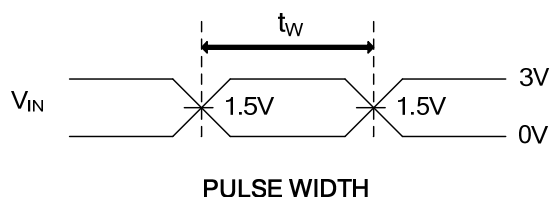
| TEST              | S        |
|-------------------|----------|
| $t_{PLH}/t_{PHL}$ | Open     |
| $t_{PHZ}/t_{PZH}$ | GND      |
| $t_{PLZ}/t_{PZL}$ | $V_{CC}$ |



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Note:  $C_L$  includes probe and jig capacitance.

$P_{RR} \leq 1\text{MHz}$ ,  $Z_O=50\Omega$ ,  $t_R \leq 3\text{ns}$ ,  $t_F \leq 3\text{ns}$

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