



U74AHCT1G125

CMOS IC

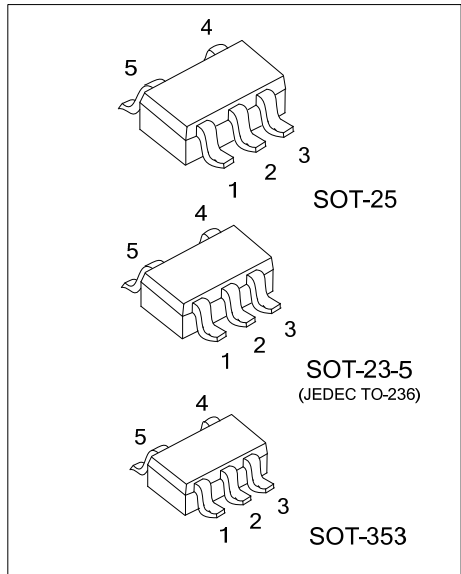
SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

DESCRIPTION

The UTC **U74AHCT1G125** is a single bus buffer gate with 3-state output controlled by enable input (\overline{OE}). When \overline{OE} is HIGH, the output is disabled.

FEATURES

- * Operation voltage range: 4.5V ~5.5V
- * Low Power Current: $I_{CC}=1\mu A$ (Max.)
- * $\pm 8mA$ Output Drive at 5V
- * Inputs are TTL-Voltage Compatible

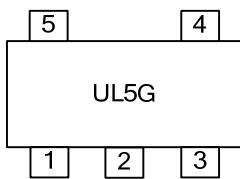


ORDERING INFORMATION

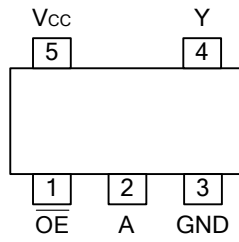
| Ordering Number | Package | Packing |
|---------------------|----------|-----------|
| U74AHCT1G125G-AE5-R | SOT-23-5 | Tape Reel |
| U74AHCT1G125G-AF5-R | SOT-25 | Tape Reel |
| U74AHCT1G125G-AL5-R | SOT-353 | Tape Reel |

| | |
|--|--|
| <p>U74AHCT1G125G-AE5-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p> | <p>(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free</p> |
|--|--|

MARKING



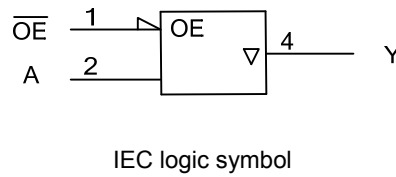
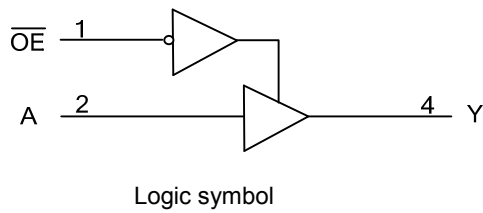
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

| INPUT | | OUTPUT |
|-----------------|---|--------|
| \overline{OE} | A | Y |
| L | L | L |
| L | H | H |
| H | X | Z |

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)(Note 2)

| 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 |
| Input Clamp Current | I_{IK} | -20 | mA |
| Output Clamp Current | I_{OK} | ±20 | mA |
| Output Current | I_{OUT} | ±25 | mA |
| V_{CC} or GND Current | I_{CC} | ±50 | mA |
| Storage Temperature | T_{STG} | -65 ~ +150 | °C |

Notes: 1. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING COMDITIONS

| PARAMETER | SYMBOL | 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 |
| Input Transition Rise or Fall Rate | $\Delta t/\Delta v$ | $V_{CC}=5.0+0.5V$ | | | 20 | ns/V |
| Operating Temperature | T_A | | -40 | | 125 | °C |

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

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT | | |
|-------------------------------------|---------------|---|------------------------|-------------------|------|-------|------|---|
| Input Voltage | High-Level | V_{IH} | $V_{CC}=4.5V\sim 5.5V$ | | 2 | V | | |
| | Low-Level | V_{IL} | $V_{CC}=4.5V\sim 5.5V$ | | | 0.8 | | |
| Output Voltage | High-Level | V_{OH} | $V_{CC}=4.5V$ | $I_{OH}=-50\mu A$ | 4.4 | 4.5 | V | |
| | | | | $I_{OH}=-8mA$ | 3.94 | | | |
| | Low-Level | V_{OL} | $V_{CC}=4.5V$ | $I_{OL}=50\mu A$ | | | 0.1 | V |
| | | | | $I_{OH}=8mA$ | | | 0.36 | |
| Input Leakage Current | $I_{I(LEAK)}$ | $V_{CC}=0V\sim 5.5V, V_{IN}=V_{CC}$ or GND | | | | ±0.1 | μA | |
| Output Current, OFF-state | I_{OZ} | $V_{CC}=5.5V, V_{OUT}=V_{CC}$ or GND | | | | ±0.25 | 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 | ΔI_Q | $V_{CC}=5.5V$, One input at 3.4V, Other input at V_{CC} or GND | | | | 1.35 | mA | |
| Input Capacitance | C_{IN} | $V_{CC}=5V, V_{IN}=V_{CC}$ or GND | | | 4 | 10 | pF | |
| Output Capacitance | C_{OUT} | $V_{CC}=5V, V_{OUT}=V_{CC}$ or GND | | | 10 | | pF | |

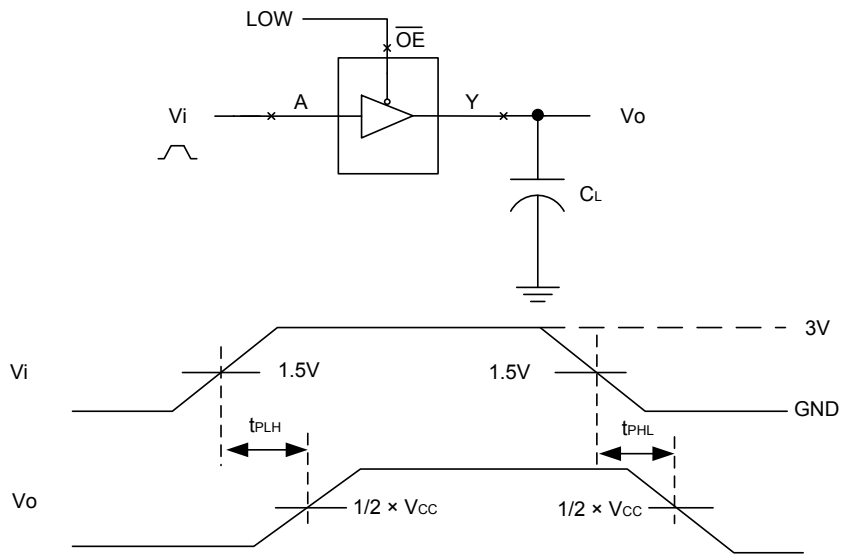
■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, Input: $t_R, t_F\leq 3ns$; $PRR\leq 1MHz$)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|------------------------------------|-----------|-------------------------------|-------------------------------|-----|-----|------|----|
| Propagation Delay From A to Y | t_{PLH} | $C_L=15pF, V_{CC}=5V\pm 0.5V$ | | 3.8 | 5.5 | ns | |
| | t_{PHL} | | | 3.8 | 5.5 | | |
| Turn-On Time \overline{OE} to Y | t_{PZH} | | | 3.6 | 5.1 | ns | |
| | t_{PZL} | | | 3.6 | 5.1 | | |
| Turn-Off Time \overline{OE} to Y | t_{PHZ} | | | 4.6 | 6.8 | ns | |
| | t_{PLZ} | | | 4.6 | 6.8 | | |
| Propagation Delay From A to Y | t_{PLH} | | $C_L=50pF, V_{CC}=5V\pm 0.5V$ | | 5.3 | 7.5 | ns |
| | t_{PHL} | | | | 5.3 | 7.5 | |
| Turn-On Time \overline{OE} to Y | t_{PZH} | | | | 5.1 | 7.1 | ns |
| | t_{PZL} | | | | 5.1 | 7.1 | |
| Turn-Off Time \overline{OE} to Y | t_{PHZ} | | | 6.1 | 8.8 | ns | |
| | t_{PLZ} | | | 6.1 | 8.8 | | |

■ OPERATING CHARACTERISTICS ($V_{CC}=5V$, $T_A=25^{\circ}C$, unless otherwise specified)

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

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

Fig-1 Propagation delay from A to Y

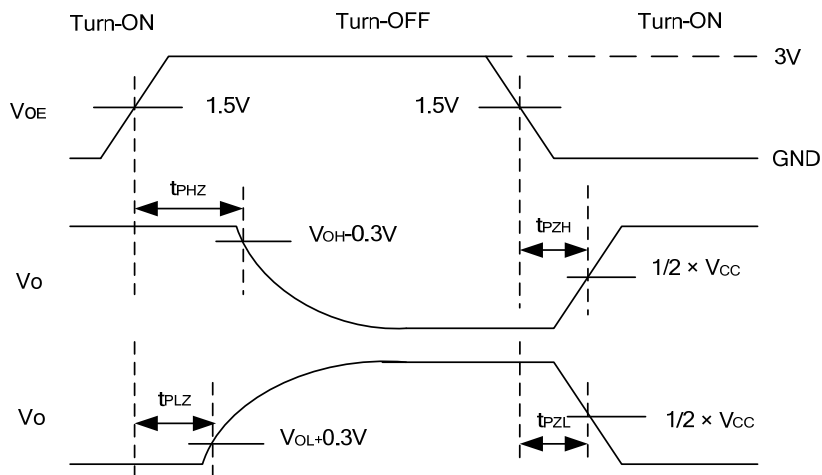
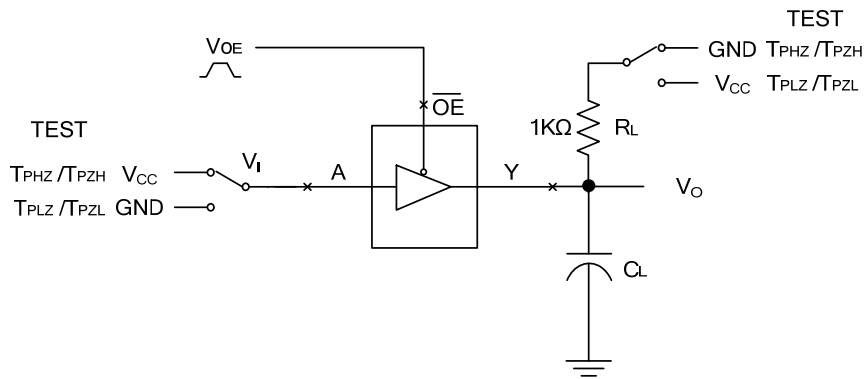


Fig-2 The turn-on and turn-off times.

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