



U74AHCT1G86

CMOS IC

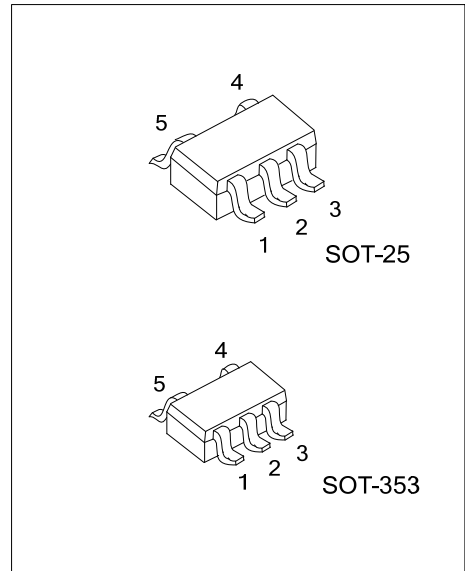
2-INPUT EXCLUSIVE-OR GATE

DESCRIPTION

The **U74AHCT1G86** is a 2-input EXCLUSIVE-OR gate, it provides the Function $Y=A \oplus B$.

FEATURES

- * Low Power Current: $I_{CC}=1.0\mu A(\text{Max})$
- * High Speed: $t_{PD}=5\text{ns}(\text{Typ})$
- * High Noise Immunity

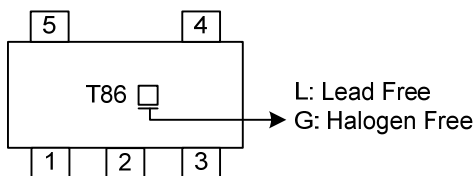


ORDERING INFORMATION

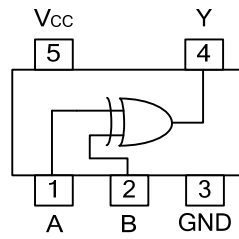
| Ordering Number | | Package | Packing |
|--------------------|--------------------|---------|-----------|
| Lead Free | Halogen Free | | |
| U74AHCT1G86L-AF5-R | U74AHCT1G86G-AF5-R | SOT-25 | Tape Reel |
| U74AHCT1G86L-AL5-R | U74AHCT1G86G-AL5-R | SOT-353 | Tape Reel |

| | |
|--|---|
| <p>U74AHCT1G86G-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p> | <p>(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--|---|

MARKING



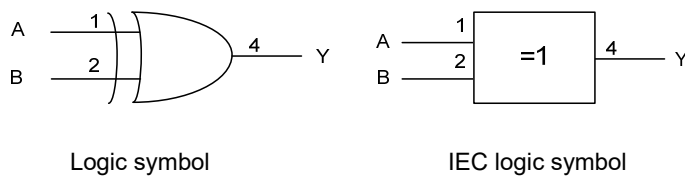
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

| INPUT | | OUTPUT |
|-------|---|--------|
| A | B | Y |
| L | L | L |
| L | H | H |
| H | L | H |
| H | H | L |

■ 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 CONDITIONS (Unless otherwise specified)

| 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 (Unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------------|---------------|--|------|-----|------|------|
| High-Level Input Voltage | V_{IH} | $V_{CC}=4.5V\sim 5.5V$ | 2.0 | | | V |
| Low-Level Input Voltage | V_{IL} | $V_{CC}=4.5V\sim 5.5V$ | | | 0.8 | V |
| 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} | $V_{CC}=4.5V, I_{OL}=50\mu A$ | | | 0.1 | V |
| | | $V_{CC}=4.5V, I_{OL}=8mA$ | | | 0.36 | |
| Input Leakage Current | $I_{I(LEAK)}$ | $V_{CC}=5.5V, V_{IN}=V_{CC}$ 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 | ΔI_Q | $V_{CC}=5.5V, V_{IN}=3.4V; I_{OUT}=0;$ other input at V_{CC} or GND | | | 1.35 | mA |
| Input Capacitance | C_{IN} | $V_{IN}=V_{CC}$ or GND | | 4 | 10 | pF |

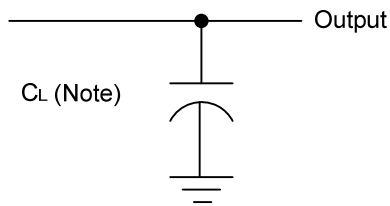
■ DYNAMIC CHARACTERISTICS ($t_r, t_f \leq 3ns$; PRR ≤ 1MHz, unless otherwise specified)

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

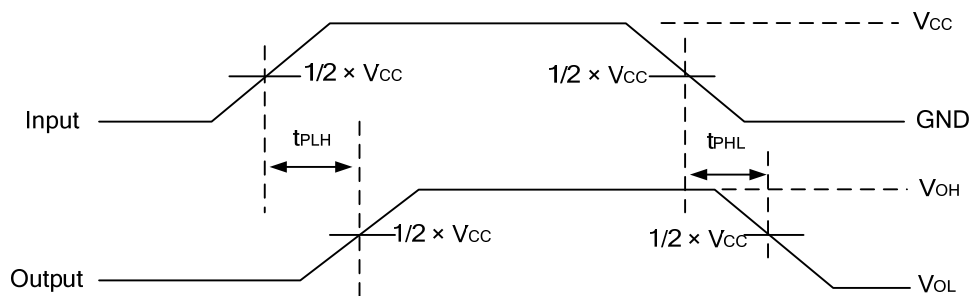
■ OPERATING CHARACTERISTICS (Unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------|----------|-------------------------------|-----|-----|-----|------|
| Power Dissipation Capacitance | C_{PD} | $V_{CC}=5V, f=1MHz, No\ load$ | | 18 | | pF |

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.



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