



## U74ACT86

CMOS IC

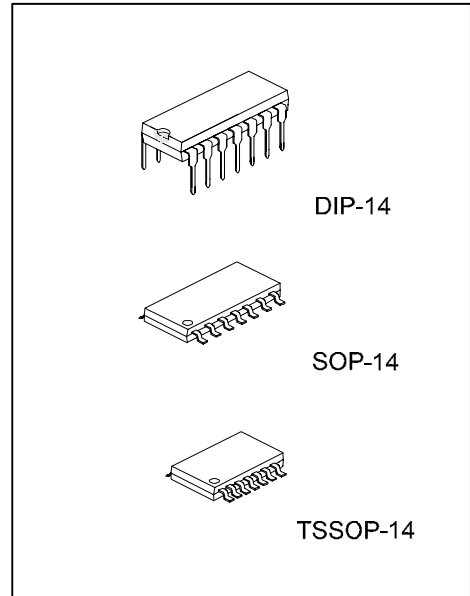
### QUAD EXCLUSIVE OR GATE

#### DESCRIPTION

The **U74ACT86** consists of four EXCLUSIVE OR GATE it provides the function  $Y=A \oplus B$ , the device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.

#### FEATURES

- \* Operation voltage range: 4.5~5.5V
- \* Low power dissipation:  $I_{CC}=2\mu A(\text{Max})$
- \* High noise immunity
- \* Compatible with TTL output



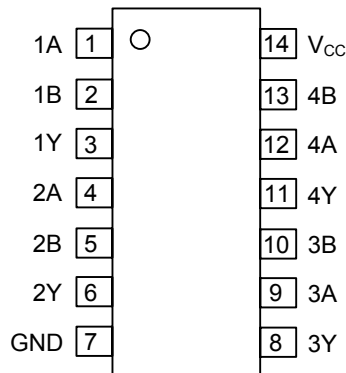
\*Pb-free plating product number:  
U74ACT86L

#### ORDERING INFORMATION

| Ordering Number |                   | Package  | Packing   |
|-----------------|-------------------|----------|-----------|
| Normal          | Lead Free Plating |          |           |
| U74ACT86-D14-T  | U74ACT86L-D14-T   | DIP-14   | Tube      |
| U74ACT86-S14-T  | U74ACT86L-S14-T   | SOP-14   | Tube      |
| U74ACT86-S14-R  | U74ACT86L-S14-R   | SOP-14   | Tape Reel |
| U74ACT86-P14-T  | U74ACT86L-P14-T   | TSSOP-14 | Tube      |

|   |   |
|---|---|
| <p>U74ACT86L-D14-T</p> <p>(1)Packing Type<br/>(2)Package Type<br/>(3)Lead Plating</p> | <p>(1) R: Tape Reel, T: Tube<br/>(2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14<br/>(3) L: Lead Free Plating, Blank: Pb/Sn</p> |
|---|---|

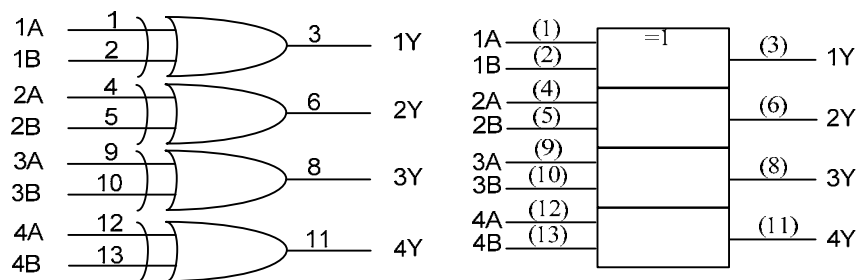
■ PIN CONFIGURATION



■ 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)

| PARAMETER                            | SYMBOL    | RATINGS            | UNIT |
|--------------------------------------|-----------|--------------------|------|
| Supply Voltage                       | $V_{CC}$  | -0.5~7             | V    |
| Input Voltage                        | $V_{IN}$  | -0.5~ $V_{CC}+0.5$ | V    |
| DC Output Voltage                    | $V_{OUT}$ | -0.5~ $V_{CC}+0.5$ | V    |
| Input Clamp Current ( $V_{IN}<0$ )   | $I_{IK}$  | ±20                | mA   |
| Output Clamp Current ( $V_{OUT}<0$ ) | $I_{OK}$  | ±20                | mA   |
| Output Current                       | $I_{OUT}$ | ±50                | mA   |
| $V_{CC}$ or GND Current              | $I_{CC}$  | ±200               | mA   |
| Storage Temperature                  | $T_{STG}$ | -65 ~ +150         |      |

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     | RATING       | UNIT |
|------------------------------------|------------|--------------|------|
| Supply Voltage                     | $V_{CC}$   | 4.5 ~ 5.5    | V    |
| Input Voltage                      | $V_{IN}$   | 0 ~ $V_{CC}$ | V    |
| Output Voltage                     | $V_{OUT}$  | 0 ~ $V_{CC}$ | V    |
| Input Transition Rise or Fall Rate | $t_R, t_F$ | 8            | ns/V |
| Operating Temperature              | $T_A$      | -55 ~ +125   |      |

### ■ STATIC CHARACTERISTICS

| PARAMETER                           | SYMBOL        | TEST CONDITIONS  | MIN  | TYP   | MAX  | UNIT |
|-------------------------------------|---------------|--|------|-------|------|------|
| High-Level Input Voltage            | $V_{IH}$      | $V_{CC}=4.5V\sim 5.5V, V_{OUT}=0.1V$ or $V_{CC}-0.1V$                    | 2.0  | 1.5   |      | V    |
| Low-Level Input Voltage             | $V_{IL}$      | $V_{CC}=4.5V\sim 5.5V, V_{OUT}=0.1V$ or $V_{CC}-0.1V$                    |      | 1.5   | 0.8  | V    |
| High-Level Output Voltage           | $V_{OH}$      | $V_{CC}=4.5V, I_{OH}=-50\mu A$   | 4.4  | 4.49  |      | V    |
|                                     |               | $V_{CC}=5.5V, I_{OH}=-50\mu A$   | 5.4  | 5.49  |      |      |
|                                     |               | $V_{CC}=4.5V, I_{OH}=-24mA$  | 3.86 |       |      |      |
|                                     |               | $V_{CC}=5.5V, I_{OH}=-24mA$  | 4.86 |       |      |      |
| Low-Level Output Voltage            | $V_{OL}$      | $V_{CC}=4.5V, I_{OL}=50\mu A$  |      | 0.001 | 0.1  | V    |
|                                     |               | $V_{CC}=5.5V, I_{OL}=50\mu A$  |      | 0.001 | 0.1  |      |
|                                     |               | $V_{CC}=4.5V, I_{OL}=24mA$   |      |       | 0.36 |      |
|                                     |               | $V_{CC}=5.5V, I_{OL}=24mA$   |      |       | 0.36 |      |
| Input Leakage Current               | $I_{I(LEAK)}$ | $V_{CC}=5.5V, V_{IN}=5.5V$ or GND  |      |       | ±0.1 | μA   |
| Quiescent Supply Current            | $I_Q$         | $V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$                         |      |       | 2    | μA   |
| Additional Quiescent Supply Current | $\Delta I_Q$  | $V_{CC}=5.5V, V_{IN}=3.4V$ ; other input at $V_{CC}$ or GND; $I_{OUT}=0$ |      | 0.6   |      | mA   |
| Input Capacitance                   | $C_{IN}$      | $V_{CC}=5.0V, V_{IN}=V_{CC}$ or GND                                      |      | 5     |      | pF   |

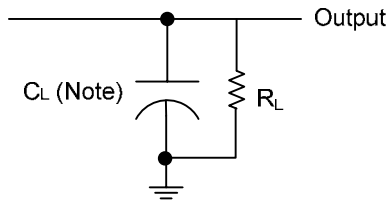
### ■ DYNAMIC CHARACTERISTIC (input $t_R = t_F = 3ns, T_A = 25^\circ C$ )

| PARAMETER              | SYMBOL            | TEST CONDITION  | MIN | TYP | MAX | UNIT |
|------------------------|-------------------|---|-----|-----|-----|------|
| Propagation Delay Time | $t_{PLH} t_{PHL}$ | $V_{CC} = 5.0V \pm 0.5V, C_L = 50pF, R_L = 500\Omega$ | 1.5 | 5.0 | 9.5 | ns   |

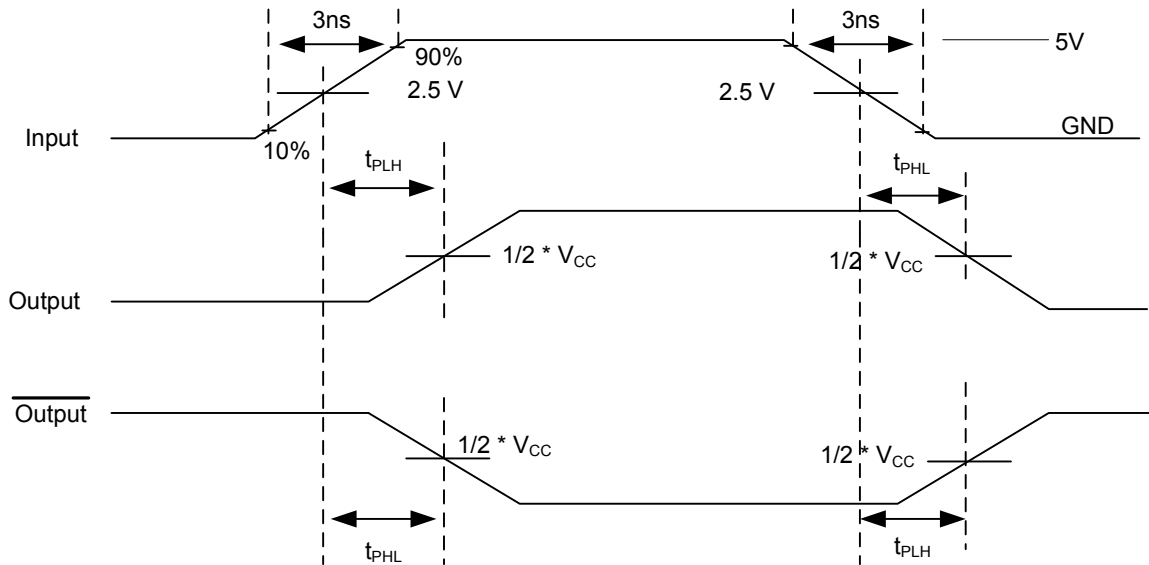
### ■ OPERATING CHARACTERISTIC

| PARAMETER                     | SYMBOL | TEST CONDITION  | MIN | TYP | MAX | UNIT |
|-------------------------------|--------|-----------------|-----|-----|-----|------|
| Power Dissipation Capacitance | Cpd    | $V_{CC} = 5.0V$ |     | 30  |     | pF   |

■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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