



U74HC32

CMOS IC

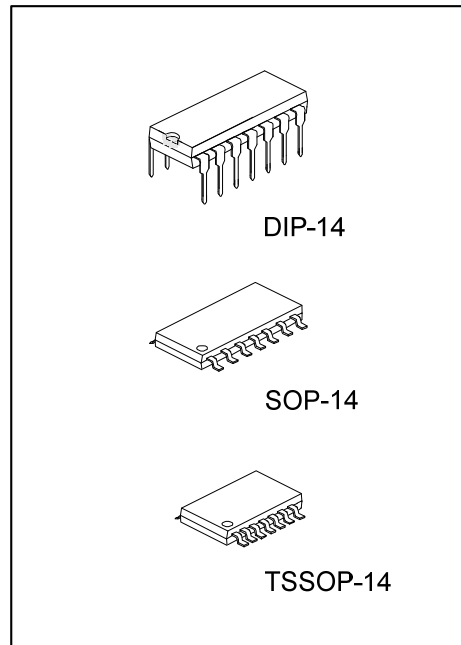
QUADRUPLE 2-INPUT POSITIVE-OR GATES

DESCRIPTION

The UTC **U74HC32** devices contain four independent 2-input OR gates. They perform the Boolean function $Y = \overline{A \cdot B}$ or $Y = A + B$ in positive logic.

FEATURES

- * Wide Operating Voltage Range of 1.0V ~ 7.0V
- * Low Power Consumption, 20µA Max I_{CC}
- * ±20mA Output Drive at 5V
- * Low Input Current of 1µA Max

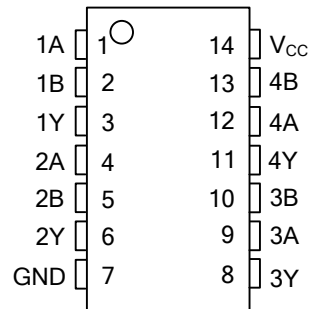


ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|-------------------|----------------|----------|-----------|
| Lead Free Plating | Halogen Free | | |
| U74HC32L-D14-T | U74HC32G-D14-T | DIP-14 | Tube |
| U74HC32L-S14-T | U74HC32G-S14-T | SOP-14 | Tube |
| U74HC32L-S14-R | U74HC32G-S14-R | SOP-14 | Tape Reel |
| U74HC32L-P14-T | U74HC32G-P14-T | TSSOP-14 | Tube |
| U74HC32L-P14-R | U74HC32G-P14-R | TSSOP-14 | Tape Reel |

| | |
|---|--|
| <p>U74HC32L-D14-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p> | <p>(1) R: Tape Reel, T: Tube (2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14 (3) L: Lead Free Plating, G: Halogen Free</p> |
|---|--|

■ PIN CONFIGURATION



■ LOGIC DIAGRAM (Positive Logic)



■ FUNCTION TABLE (Each Inverter)

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

■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-------------------------------|---|------------|------|
| Supply Voltage Range | V_{CC} | 1.0~7.0 | V |
| Input Clamp Current (Note 1) | $I_{IK} (V_{IN} < 0 \text{ or } V_{IN} > V_{CC})$ | ± 20 | mA |
| Output Clamp Current (Note 1) | $I_{OK} (V_{OUT} < 0 \text{ or } V_{OUT} > V_{CC})$ | ± 20 | mA |
| Continuous Output Current | $I_O (V_{OUT} = 0 \sim V_{CC})$ | ± 25 | mA |
| Continuous Current Through | V_{CC} or GND | ± 50 | mA |
| Storage Temperature | T_{STG} | -65 ~ +150 | °C |

Note : 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. 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.

■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|----------|---------|-------|
| Ambient to Junction | SOP-14 | 86 | °C /W |
| | DIP-14 | 80 | °C /W |
| | TSSOP-14 | 113 | °C /W |

■ RECOMMENDED OPERATING CONDITIONS ($T_A = 25^\circ\text{C}$)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---------------------------------|-----------|--------------------------|-----|-----|----------|------|
| Supply Voltage | V_{CC} | | 2 | 4.5 | 6 | V |
| High-Level Input Voltage | V_{IH} | $V_{CC} = 2 \text{ V}$ | 1.4 | | | V |
| | | $V_{CC} = 4.5 \text{ V}$ | 3 | | | V |
| | | $V_{CC} = 6 \text{ V}$ | 4.2 | | | V |
| Low- Level Input Voltage | V_{IL} | $V_{CC} = 2 \text{ V}$ | | | 0.7 | V |
| | | $V_{CC} = 4.5 \text{ V}$ | | | 1.5 | V |
| | | $V_{CC} = 6 \text{ V}$ | | | 2 | V |
| Input Voltage | V_{IN} | | 0 | | V_{CC} | V |
| Output Voltage | V_{OUT} | | 0 | | V_{CC} | V |
| Input transition Rise/Fall Time | dt/dv | $V_{CC} = 4.5 \text{ V}$ | | | 500 | ns |
| Ambient Operating Temperature | T_{OPR} | | -40 | | 85 | °C |

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, unless otherwise noted)

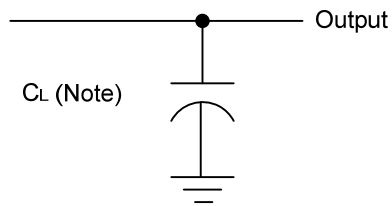
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|----------|---|------|-----------|-----------|---------------|
| High-Level Output Voltage | V_{OH} | $V_{CC} = 4.5\text{V}, V_{IN} = V_{IH} \text{ or } V_{IL}, I_{OH} = -20\mu\text{A}$ | 4.4 | 4.5 | | V |
| | | $V_{CC} = 4.5\text{V}, V_{IN} = V_{IH} \text{ or } V_{IL}, I_{OH} = -4\text{mA}$ | 3.98 | 4.3 | | |
| Low-level Input Voltage | V_{OL} | $V_{CC} = 4.5\text{V}, V_{IN} = V_{IH} \text{ or } V_{IL}, I_{OL} = 20\mu\text{A}$ | | 0.001 | 0.1 | V |
| | | $V_{CC} = 4.5\text{V}, V_{IN} = V_{IH} \text{ or } V_{IL}, I_{OL} = 4\text{mA}$ | | 0.18 | 0.26 | |
| Input Current | I_{IN} | $V_{CC} = 6\text{V}, V_{IN} = V_{CC} \text{ or } 0$ | | ± 0.1 | ± 100 | nA |
| Quiescent Supply Current | I_{CC} | $V_{CC} = 6\text{V}, V_{IN} = V_{CC} \text{ or } 0, I_{OUT} = 0$ | | | 20 | μA |
| Operating Characteristics | | | | | | |
| Power Dissipation Capacitance Per Gate | C_{PD} | No load | | 20 | | pF |

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

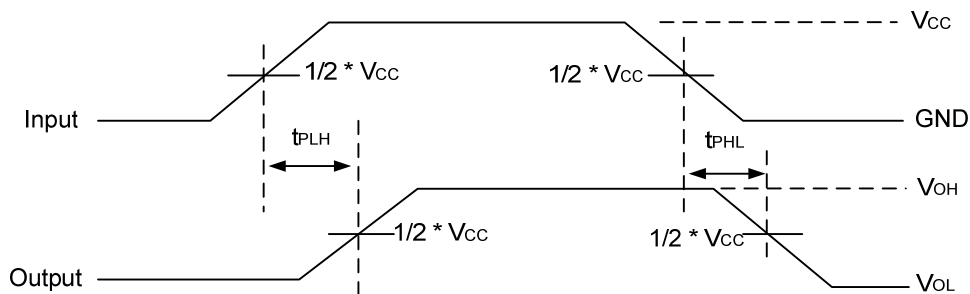
- SWITCHING CHARACTERISTICS OVER RECOMMENDED OPERATING FREE-AIR TEMPERATURE RANGE ($T_a = 25^\circ\text{C}$, $C_L = 50\text{ pF}$, unless otherwise specified)

| PARAMETER | SYMBOL | FROM(INPUT) | TO(OUTPUT) | V_{CC} | MIN | TYP | MAX | UNIT |
|------------------------------------|----------|-------------|------------|----------|-----|-----|-----|------|
| Propagation Delay from A or B to Y | t_{PD} | A or B | Y | 2V | | | 43 | ns |
| | | | | 4.5V | | | 18 | |
| | | | | 6V | | | 15 | |
| Output Rise and Fall Time | t_r | | Y | 2V | | | 33 | ns |
| | | | | 4.5V | | | 19 | |
| | | | | 6V | | | 17 | |

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.



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