



## U74HC32

CMOS IC

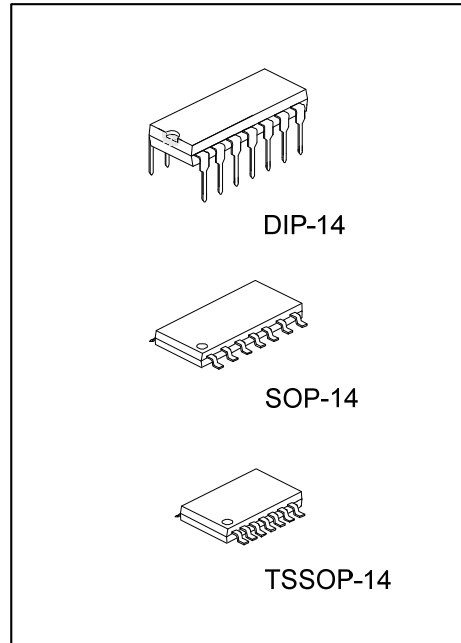
### QUADRUPLE 2-INPUT POSITIVE-OR GATES

#### 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<sub>CC</sub>
- \* ±20mA Output Drive at 5V
- \* Low Input Current of 1µA Max



#### ORDERING INFORMATION

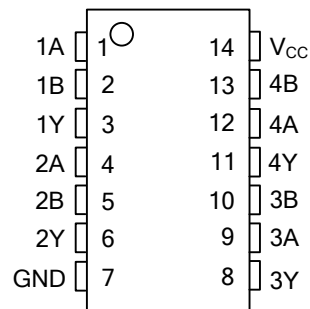
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC32L-D14-T	U74HC32G-D14-T	DIP-14	Tube
U74HC32L-S14-R	U74HC32G-S14-R	SOP-14	Tape Reel
U74HC32L-P14-R	U74HC32G-P14-R	TSSOP-14	Tape Reel

<p>U74HC32G-D14-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) D14: DIP-14, P14: TSSOP-14, S14: SOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING

DIP-14	SOP-14 / TSSOP-14
<p>14 13 12 11 10 9 8 Date Code UTC □□□□ L: Lead Free U74HC32□ G: Halogen Free □□ Lot Code 1 2 3 4 5 6 7</p>	<p>14 13 12 11 10 9 8 Date Code UTC □□□□ L: Lead Free U74HC32□ G: Halogen Free □□ Lot Code 1 2 3 4 5 6 7</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

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## ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	$V_{CC}$	1.0~7.0	V
Input Clamp Current (Note 1)	$I_{IK} (V_{IN} < 0 \text{ or } V_{IN} > V_{CC})$	$\pm 20$	mA
Output Clamp Current (Note 1)	$I_{OK} (V_{OUT} < 0 \text{ or } V_{OUT} > V_{CC})$	$\pm 20$	mA
Continuous Output Current	$I_O (V_{OUT} = 0 \sim V_{CC})$	$\pm 25$	mA
Continuous Current Through	$V_{CC}$ or GND	$\pm 50$	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		V
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	V
Input Current	$I_{IN}$	$V_{CC} = 6\text{V}, V_{IN} = V_{CC} \text{ or } 0$		$\pm 0.1$	$\pm 100$	nA
Quiescent Supply Current	$I_{CC}$	$V_{CC} = 6\text{V}, V_{IN} = V_{CC} \text{ or } 0, I_{OUT} = 0$			20	$\mu\text{A}$
<b>Operating Characteristics</b>						
Power Dissipation Capacitance Per Gate	$C_{PD}$	No load		20		pF

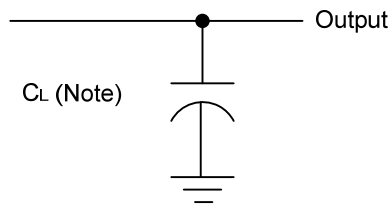
Note: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.

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

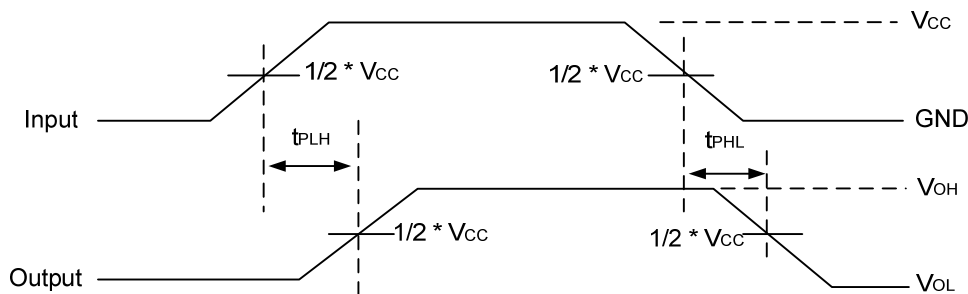
PARAMETER	SYMBOL	FROM(INPUT)	TO(OUTPUT)	$V_{CC}$	MIN	TYP	MAX	UNIT
Propagation Delay from A or B to Y	$t_{PD}$	A or B	Y	2V			43	ns
				4.5V			18	
				6V			15	
Output Rise and Fall Time	$t_r$		Y	2V			33	ns
				4.5V			19	
				6V			17	

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■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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