



U74HC32

CMOS IC

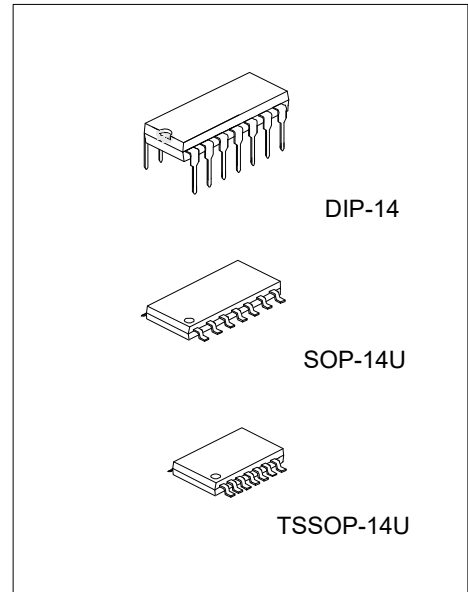
QUADRUPLE 2-INPUT POSITIVE-OR GATES

DESCRIPTION

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

FEATURES

- * Wide Operating Voltage Range of 2V ~ 6V
- * Low Power Consumption, 2μA Max I_{cc}
- * ±5.2mA Output Drive at 6V



ORDERING INFORMATION

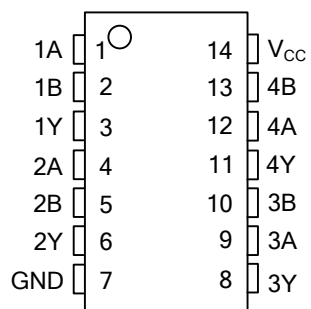
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC32L-D14-T	U74HC32G-D14-T	DIP-14	Tube
U74HC32L-UEA-R	U74HC32G-UEA-R	SOP-14U	Tape Reel
U74HC32L-UEB-R	U74HC32G-UEB-R	TSSOP-14U	Tape Reel

U74HC32G-D14-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) D14: DIP-14, UEA: SOP-14U, UEB: TSSOP-14U (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

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

■ 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	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage Range	V_{CC}		-0.5 ~ 7	V
Input Clamp Current (Note 2)	I_{IK}	$V_{IN} < 0$ or $V_{IN} > V_{CC}$	± 20	mA
Output Clamp Current (Note 2)	I_{OK}	$V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	± 20	mA
Continuous Output Current	I_O	$V_{OUT} = 0$ to V_{CC}	± 25	mA
Continuous Current Through		V_{CC} or GND	± 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 ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		6	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input transition Rise/Fall Time	dt/dv	$V_{CC}=2.0\text{V}$			1000	ns
		$V_{CC}=4.5\text{V}$			500	ns
		$V_{CC}=6.0\text{V}$			400	ns
Operating Temperature	T_A		-40		+125	°C

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

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Ambient to Junction	DIP-14	75	°C/W
	SOP-14U	95	°C/W
	TSSOP-14U	120	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}\text{C}$			$T_A=-40^{\circ}\text{C}\sim+125^{\circ}\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	$V_{CC}=2\text{V}$	1.5			1.5			V
		$V_{CC}=4.5\text{V}$	3.15			3.15			V
		$V_{CC}=6\text{V}$	4.2			4.2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2\text{V}$			0.5			0.5	V
		$V_{CC}=4.5\text{V}$			1.35			1.35	V
		$V_{CC}=6\text{V}$			1.8			1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OH}=-20\mu\text{A}$	1.9			1.9			V
		$V_{CC}=4.5\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OH}=-20\mu\text{A}$	4.4			4.4			V
		$V_{CC}=6\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OH}=-20\mu\text{A}$	5.9			5.9			V
		$V_{CC}=4.5\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OH}=-4\text{mA}$	3.98			3.7			V
		$V_{CC}=6\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OH}=-5.2\text{mA}$	5.48			5.2			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=4.5\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=6\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=4.5\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OL}=4\text{mA}$			0.26			0.4	V
		$V_{CC}=6\text{V}$, $V_{IN}=V_{IH}$ or V_{IL} , $I_{OL}=5.2\text{mA}$			0.26			0.4	V
Input Current	I_{IN}	$V_{CC}=6\text{V}$, $V_{IN}=V_{CC}$ or 0			± 0.1			± 1	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=6\text{V}$, $V_{IN}=V_{CC}$ or 0, $I_{OUT}=0$			2			40	μA

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

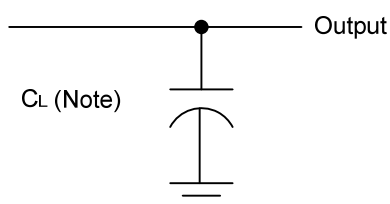
■ **SWITCHING CHARACTERISTICS OVER RECOMMENDED OPERATING FREE-AIR TEMPERATURE RANGE** ($C_L=50\text{ pF}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}\text{C}$			$T_A=-40^{\circ}\text{C}\sim+125^{\circ}\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A or B) to Output (Y)	t_{PLH}/t_{PHL}	$V_{CC}=2\text{V}$			100			150	ns
		$V_{CC}=4.5\text{V}$			20			30	ns
		$V_{CC}=6\text{V}$			17			25	ns
Output Rise and Fall Time	t_{TLH}/t_{THL}	$V_{CC}=2\text{V}$			75			110	ns
		$V_{CC}=4.5\text{V}$			19			22	ns
		$V_{CC}=6\text{V}$			17			19	ns

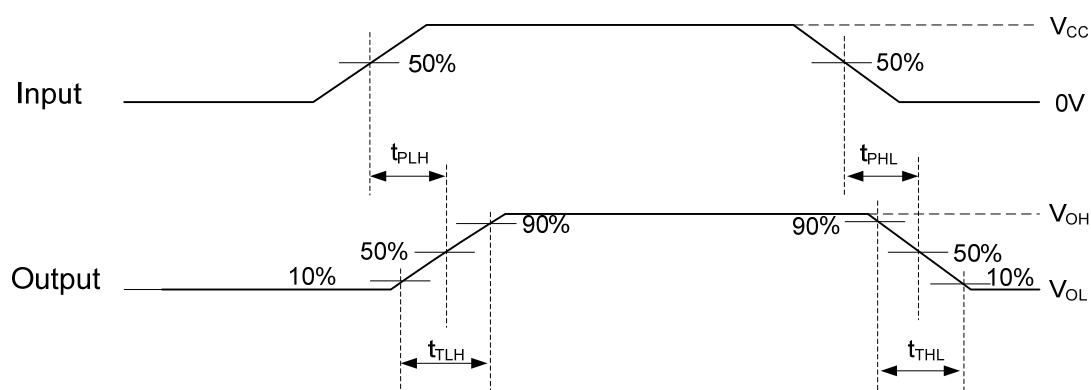
■ **OPERATING CHARACTERISTICS** ($f=10\text{MHz}$, $T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC}=2\text{V} \sim 6\text{V}$			10	pF
Power Dissipation Capacitance Per Gate	C_{PD}	No load		20		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.



Voltage Waveforms Propagation Delays and Transition Times

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.