



# U74AHC32

**CMOS IC**

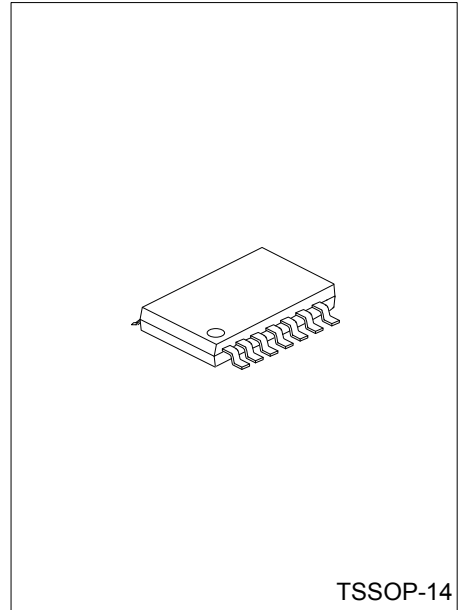
## QUADRUPLE 2-INPUT POSITIVE-OR GATES

### ■ DESCRIPTION

The UTC **U74AHC32** are quadruple 2-input positive-or gates which provides the function  $Y=A+B$  in positive logic.

### ■ FEATURES

- \* Operate from 2V to 5.5V
- \* Max tpd of 7.5ns at 5 V
- \* Low power dissipation:  $I_{CC}=2\mu A(\text{Max})$  at  $T_a=25^\circ C$
- \* Halogen Free

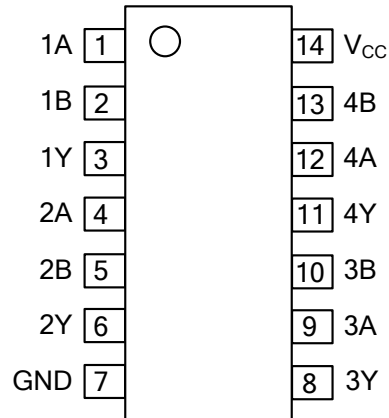


### ■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74AHC32G-P14-R	TSSOP-14	Tape Reel

<p>U74AHC02G-P14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Halogen Free</p>	<p>(1) R: Tape Reel</p> <p>(2) P14: TSSOP-14</p> <p>(3) G: Halogen Free</p>
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■ PIN CONFIGURATION

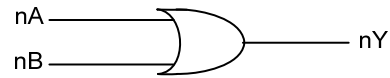


■ FUNCTION TABLE

INPUTS(A)	INPUTS(B)	OUTPUT(Y)
H	X	H
X	H	H
L	L	L

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

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
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
Continuous Output Current	$I_{OUT}$	±25	mA
Input Clamp Current	$I_{IK}$	-20	mA
Output Clamp Current	$I_{OK}$	±20	mA
Operating Temperature	$T_{OPR}$	-40 ~ + 85	°C
Storage Temperature	$T_{STG}$	-65 ~ + 150	°C

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.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	113	°C/W

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2		5.5	V
High-level Input Voltage	$V_{IH}$	$V_{CC}=2V$	1.5			V
		$V_{CC}=3V$	2.1			V
		$V_{CC}=5.5V$	3.85			V
Low-level Input Voltage	$V_{IL}$	$V_{CC}=2V$			0.5	V
		$V_{CC}=3V$			0.9	V
		$V_{CC}=5.5V$			1.65	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$	High or low state	0		$V_{CC}$	V
High-level Output Current	$I_{OH}$	$V_{CC}=2V$			-50	μA
		$V_{CC}=3.3V \pm 0.3V$			-4	mA
		$V_{CC}=5V \pm 0.5V$			-8	mA
Low-level Output Current	$I_{OL}$	$V_{CC}=2V$			50	μA
		$V_{CC}=3.3V \pm 0.3V$			4	mA
		$V_{CC}=5V \pm 0.5V$			8	mA
Input Rise or Fall Times	$\frac{\Delta t}{\Delta V}$	$V_{CC}=3.3V \pm 0.3V$			100	ns/V
		$V_{CC}=5V \pm 0.5V$			20	ns/V

■ ELECTRICAL CHARACTERISTICS (Ta=25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-Level Output Voltage	V <sub>OH</sub>	I <sub>OH</sub> =-50μA	V <sub>CC</sub> =2.0V	1.9	2.0		V
			V <sub>CC</sub> =3.0V	2.9	3.0		V
			V <sub>CC</sub> =4.5V	4.4	4.5		V
		I <sub>OH</sub> =-4mA	V <sub>CC</sub> =3.0V	2.58			V
		I <sub>OH</sub> =-8mA	V <sub>CC</sub> =4.5V	3.94			V
Low-Level Output Voltage	V <sub>OL</sub>	I <sub>OL</sub> =50μA	V <sub>CC</sub> =2.0V			0.1	V
			V <sub>CC</sub> =3.0V			0.1	V
			V <sub>CC</sub> =4.5V			0.1	V
		I <sub>OL</sub> =4mA	V <sub>CC</sub> =3.0V			0.36	V
		I <sub>OL</sub> =8mA	V <sub>CC</sub> =4.5V			0.36	V
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>IN</sub> =5.5V or GND	V <sub>CC</sub> =0 to 5.5V			±0.1	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND I <sub>OUT</sub> =0	V <sub>CC</sub> =5.5V			2	μA
Input Capacitance	C <sub>IN</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND	V <sub>CC</sub> =5.0V		2	10	pF

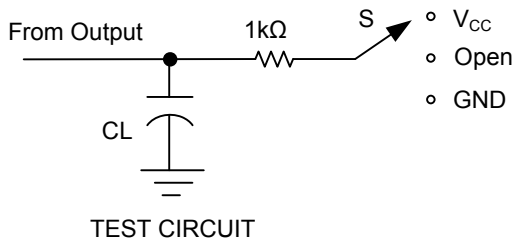
■ SWITCHING CHARACTERISTICS (see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t <sub>PLH</sub> t <sub>PHL</sub>	V <sub>CC</sub> =3.3V±0.3V	C <sub>L</sub> =15 pF		5.5	7.9	ns
			C <sub>L</sub> =50 pF		8	11.4	ns
		V <sub>CC</sub> =5.0V±0.5V	C <sub>L</sub> =15 pF		3.8	5.5	ns
			C <sub>L</sub> =50 pF		5.3	7.5	ns

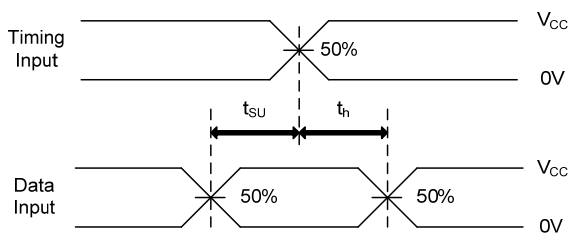
■ OPERATING CHARACTERISTICS (T<sub>a</sub>=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C <sub>pd</sub>	No load, f=1MHz, V <sub>CC</sub> =5V		14		pF

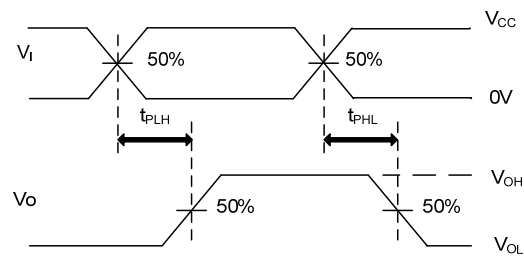
## ■ TEST CIRCUIT AND WAVEFORMS



TEST	S
t <sub>PLH</sub> /t <sub>PHL</sub>	Open
t <sub>PHZ</sub> /t <sub>PZH</sub>	GND
t <sub>PLZ</sub> /t <sub>PZL</sub>	V <sub>CC</sub>



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES

Note: CL includes probe and jig capacitance.  
 PRR ≤ 1MHz, Z<sub>O</sub> = 50Ω, t<sub>r</sub> ≤ 3ns, t<sub>f</sub> ≤ 3ns.

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