



# U74AHC1G32

CMOS IC

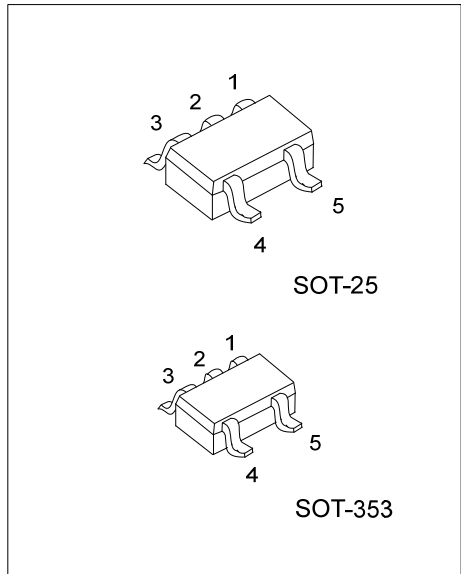
## SINGLE 2-INPUT POSITIVE-OR GATE

### DESCRIPTION

The UTC **U74AHC1G32** is a single 2-input positive-or gate, which provides the function  $Y=A+B$  in positive logic.

### FEATURES

- \* Operate from 2V to 5.5V
- \* Max  $t_{PD}$  of 6.5ns at 5 V
- \* Low Power Current:  $I_{CC}=10\mu A(\text{Max}) @ T_A=25^\circ C$

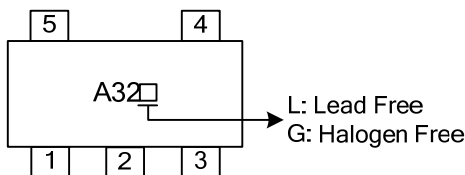


### ORDERING INFORMATION

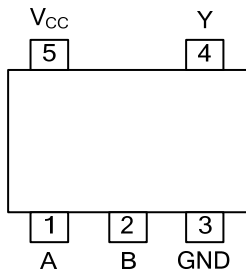
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G32L-AF5-R	U74AHC1G32G-AF5-R	SOT-25	Tape Reel
U74AHC1G32L-AL5-R	U74AHC1G32G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G32L-AL5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free, L: Lead Free</p>
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### MARKING



## ■ PIN CONFIGURATION

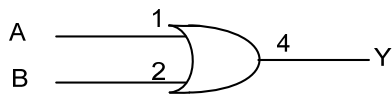


## ■ FUNCTION TABLE

INPUT(A)	INPUT(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
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.

## ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2		5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$	High or low state	0		$V_{CC}$	V
High-Level Input Voltage	$V_{IH}$	$V_{CC}=2.0V$	1.5			V
		$V_{CC}=3.0V$	2.1			
		$V_{CC}=5.5V$	3.85			
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=3.0V$			0.9	
		$V_{CC}=5.5V$			1.65	
High-Level Output Current	$I_{OH}$	$V_{CC}=2.0V$			-50	μA
		$V_{CC}=3.3V \pm 0.3V$			-4	mA
		$V_{CC}=5.0V \pm 0.5V$			-8	
Low-Level Output Current	$I_{OL}$	$V_{CC}=2.0V$			50	μA
		$V_{CC}=3.3V \pm 0.3V$			4	mA
		$V_{CC}=5.0V \pm 0.5V$			8	
Input Transition Rise or Fall Rate	$t_R, t_F$	$V_{CC}=3.3V \pm 0.3V$			100	ns/V
		$V_{CC}=5.0V \pm 0.5V$			20	

## ■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	$V_{OH}$	$V_{CC}=2.0V, I_{OH}=-50\mu A$	1.9	2.0		V
		$V_{CC}=3.0V, I_{OH}=-50\mu A$	2.9	3.0		
		$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		
		$V_{CC}=3.0V, I_{OH}=-4mA$	2.58			
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=2.0V, I_{OH}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OH}=50\mu A$			0.1	
		$V_{CC}=4.5V, I_{OH}=50\mu A$			0.1	
		$V_{CC}=3.0V, I_{OH}=4mA$			0.36	
		$V_{CC}=4.5V, I_{OH}=8mA$			0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0 \sim 5.5V, V_{IN}=5.5V$ or GND			±0.1	μA
Quiescent Supply Current	$I_Q$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0A$			1	μA
Input Capacitance	$C_I$	$V_{CC}=5.0V, V_{IN}=V_{CC}$ or GND		2	10	pF

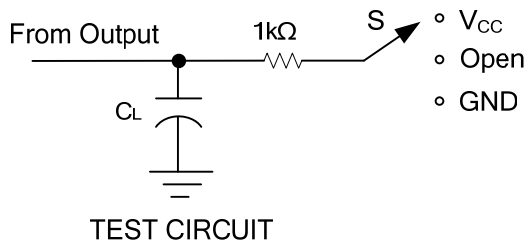
■ DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time Input(A or B) to Output(Y)	$t_{PLH}$	$V_{CC}=3.3V\pm 0.3V, C_L=15pF$		5.5	7.9	ns
	$t_{PHL}$			5.5	7.9	
	$t_{PLH}$	$V_{CC}=3.3V\pm 0.3V, C_L=50pF$		8	11.4	
	$t_{PHL}$			8	11.4	
Propagation Delay Time Input(A or B) to Output(Y)	$t_{PLH}$	$V_{CC}=5V\pm 0.5V, C_L=15pF$		3.8	5.5	ns
	$t_{PHL}$			3.8	5.5	
	$t_{PLH}$	$V_{CC}=5V\pm 0.5V, C_L=50pF$		5.3	7.5	
	$t_{PHL}$			5.3	7.5	

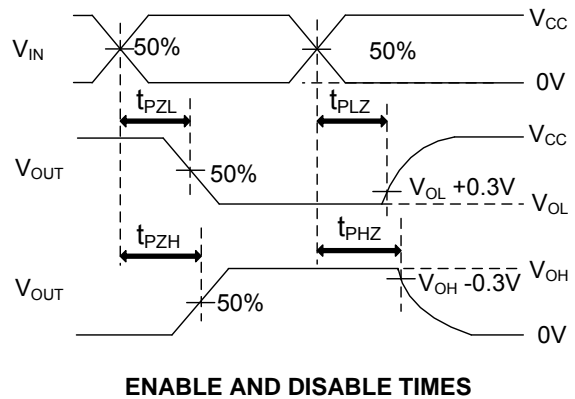
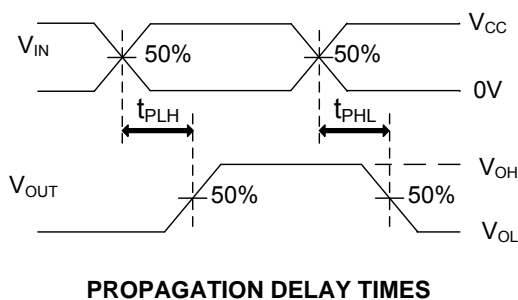
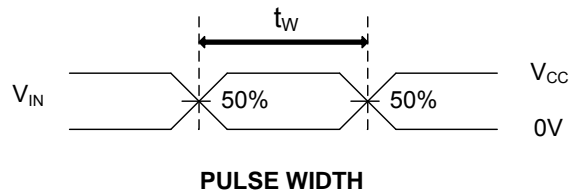
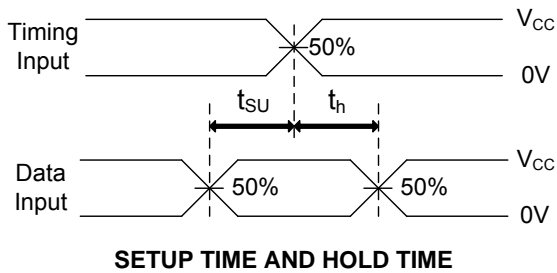
■ OPERATING CHARACTERISTICS ( $T_a=25^\circ C$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No load, $V_{CC}=5V, f=1MHz$		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>



Note: C<sub>L</sub> includes probe and jig capacitance.  
 P<sub>RR</sub> ≅ 1MHz, Z<sub>O</sub> = 50Ω, t<sub>r</sub> ≅ 3ns, t<sub>f</sub> ≅ 3ns

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