



# U74AHC1G32

**CMOS IC**

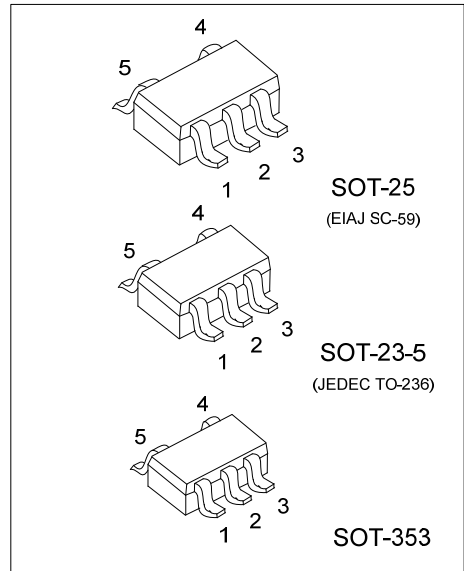
## SINGLE 2-INPUT POSITIVE-OR GATE

■ **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 5.5ns at 5 V

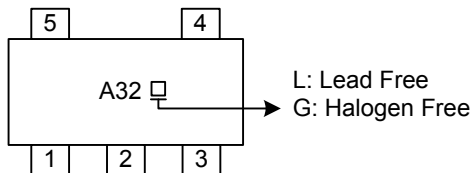


■ **ORDERING INFORMATION**

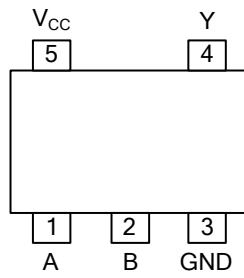
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G32L-AE5-R	U74AHC1G32G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G32L-AF5-R	U74AHC1G32G-AF5-R	SOT-25	Tape Reel
U74AHC1G32L-AL5-R	U74AHC1G32G-AL5-R	SOT-353	Tape Reel

<p>U74AHC1G32G-AE5-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ **MARKING**



## ■ PIN CONFIGURATION

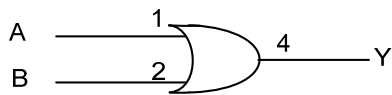


## ■ FUNCTION TABLE

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 (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sub>CC</sub>	-0.5 ~ 7	V
Input Voltage		V <sub>IN</sub>	-0.5 ~ 7	V
Output Voltage		V <sub>OUT</sub>	-0.5 ~ V <sub>CC</sub> +0.5	V
V <sub>CC</sub> or GND Current		I <sub>CC</sub>	±50	mA
Output Current		I <sub>OUT</sub>	±25	mA
Input Clamp Current		I <sub>IK</sub>	-20	mA
Output Clamp Current		I <sub>OK</sub>	±20	mA
Power Dissipation	SOT-23-5	P <sub>D</sub>	300	mW
	SOT-25		360	mW
	SOT-353		250	mW
Storage Temperature		T <sub>STG</sub>	-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 <sub>CC</sub>		2		5.5	V
Input Voltage	V <sub>IN</sub>		0		5.5	V
Output Voltage	V <sub>OUT</sub>	High or low state	0		V <sub>CC</sub>	V
Input Transition Rise or Fall Rate	Δt/Δv	V <sub>CC</sub> =3.3V±0.3V			100	ns/V
		V <sub>CC</sub> =5.0V±0.5V			20	
Operating Temperature	T <sub>A</sub>		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =2.0V	1.5			V
		V <sub>CC</sub> =3.0V	2.1			V
		V <sub>CC</sub> =5.5V	3.85			V
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> =2.0V			0.5	V
		V <sub>CC</sub> =3.0V			0.9	V
		V <sub>CC</sub> =5.5V			1.65	V
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =2.0V, I <sub>OH</sub> =-50μA	1.9	2.0		V
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-50μA	2.9	3.0		V
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-50μA	4.4	4.5		V
		V <sub>CC</sub> =3.0V, I <sub>OH</sub> =-4mA	2.58			V
		V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-8mA	3.94			V
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =2.0V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =50μA			0.1	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =4mA			0.36	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =8mA			0.36	V
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0~5.5V, V <sub>IN</sub> =5.5V or GND			±0.1	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0A			1	μA
Input Capacitance	C <sub>I</sub>	V <sub>CC</sub> =5.0V, V <sub>IN</sub> =V <sub>CC</sub> or GND		2	10	pF

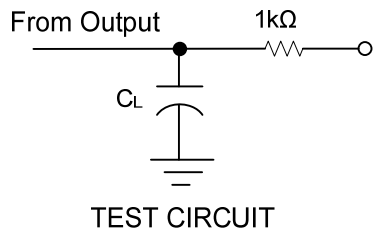
■ DYNAMIC CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , Input:  $t_R, t_F \leq 3\text{ns}$ ;  $P_{RR} \leq 1\text{MHz}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time Input(A or B) to Output(Y)	$t_{PLH}$	$V_{CC}=3.3V \pm 0.3V, C_L=15\text{pF}$		5.5	7.9	ns
	$t_{PHL}$			5.5	7.9	
	$t_{PLH}$	$V_{CC}=3.3V \pm 0.3V, C_L=50\text{pF}$		8	12	
	$t_{PHL}$			8	12	
Propagation Delay Time Input(A or B) to Output(Y)	$t_{PLH}$	$V_{CC}=5V \pm 0.5V, C_L=15\text{pF}$		3.8	5.5	ns
	$t_{PHL}$			3.8	5.5	
	$t_{PLH}$	$V_{CC}=5V \pm 0.5V, C_L=50\text{pF}$		5.3	7.5	
	$t_{PHL}$			5.3	7.5	

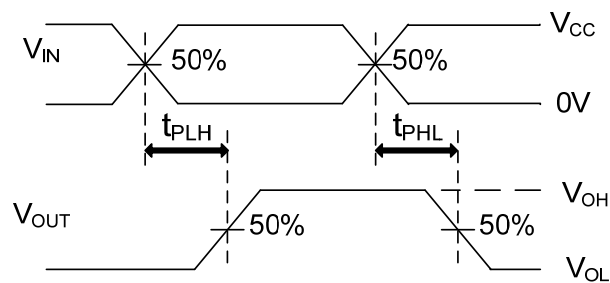
■ OPERATING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No load, $V_{CC}=5V, f=1\text{MHz}$		14		pF

■ TEST CIRCUIT AND WAVEFORMS



### SETUP TIME AND HOLD TIME



### PROPAGATION DELAY TIMES

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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