



## U74AHC08

CMOS IC

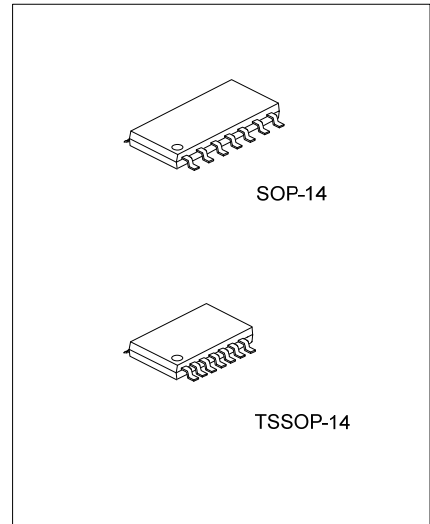
### QUADRUPLE 2-INPUT POSITIVE-AND GATES

#### DESCRIPTION

The **U74AHC08** is QUADRUPLE 2-INPUT POSITIVE-AND GATES. Which provides the Function  $Y=A \times B$ .

#### FEATURES

- \* Operation voltage range: 2~5.5V
- \* Max  $t_{PD}$  of 7.9 ns at 5 V
- \* Low power consumption,  $I_{CC}=2\mu A(\text{Max})$
- \*  $\pm 8\text{mA}$  output drive at 5 V

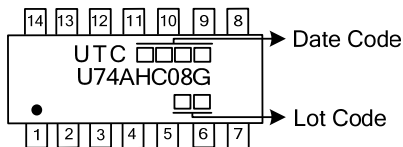


#### ORDERING INFORMATION

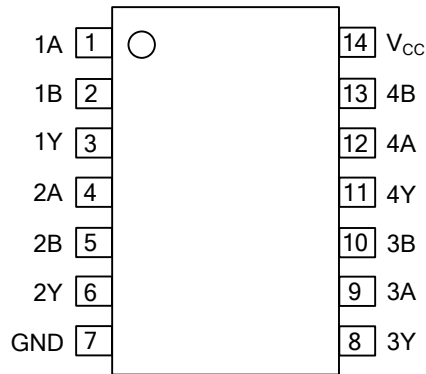
Ordering Number	Package	Packing
U74AHC08G-S14-R	SOP-14	Tape Reel
U74AHC08G-P14-R	TSSOP-14	Tape Reel

<p>U74AHC08G-S14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S14: SOP-14, P14: TSSOP-14</p> <p>(3) G: Halogen Free and Lead Free</p>
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#### MARKING



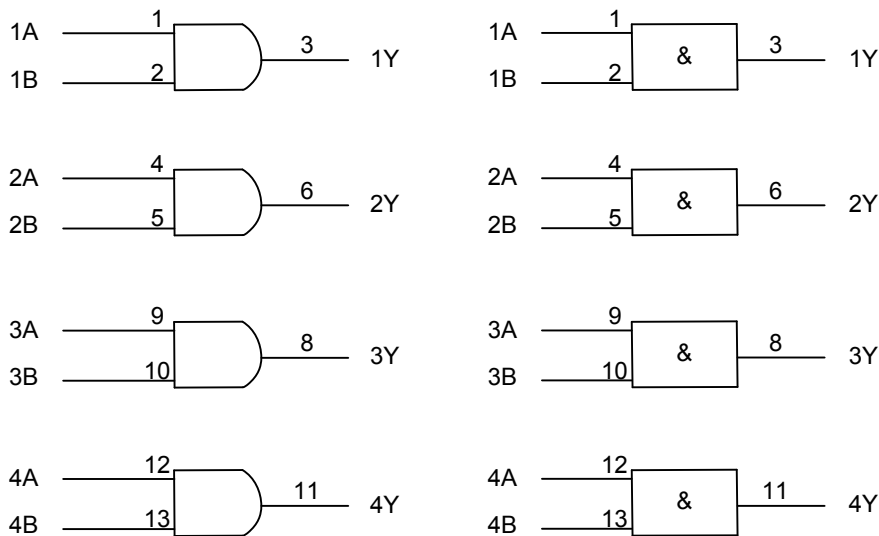
■ PIN CONFIGURATION



■ FUNCTION TABLE (Each Gate)

INPUT (A)	INPUT (B)	OUTPUT (Y)
L	L	L
L	H	L
H	L	L
H	H	H

■ LOGIC DIAGRAM (Positive Logic)



## ■ 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
Input Clamp Current	$I_{IK}$	-20	mA
Output Clamp Current	$I_{OK}$	±20	mA
Output Current	$I_{OUT}$	±25	mA
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2		5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
Input Transition Rise or Fall Rate	$t_R, t_F$	$V_{CC}=3.3\pm0.3V$			100	ns/V
		$V_{CC}=5.0\pm0.5V$			20	
Ambient Operating Temperature	$T_{OPR}$		-40		85	°C

## ■ STATIC CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

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

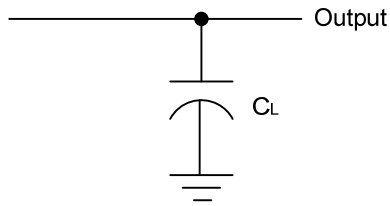
■ DYNAMIC CHARACTERISTICS (Input:  $t_R, t_F \leq 3\text{ns}$ ;  $\text{PRR} \leq 1\text{MHz}$ )

PARAMETER	SYMBOL	$V_{CC}(V)$	MIN	TYP	MAX	UNIT
Propagation Delay from Input (A and B) to Output(Y)	$t_{PLH}$	$V_{CC}=3.3 \pm 0.3V, C_L=15\text{pF}$		6.2	8.8	ns
	$t_{PHL}$			6.2	8.8	
	$t_{PLH}$	$V_{CC}=3.3 \pm 0.3V, C_L=50\text{pF}$		8.7	12.3	
	$t_{PHL}$			8.7	12.3	
Propagation Delay from Input (A and B) to Output(Y)	$t_{PLH}$	$V_{CC}=5.0 \pm 0.5V, C_L=15\text{pF}$		4.3	5.9	ns
	$t_{PHL}$			4.3	5.9	
	$t_{PLH}$	$V_{CC}=5.0 \pm 0.5V, C_L=50\text{pF}$		5.8	7.9	
	$t_{PHL}$			5.8	7.9	

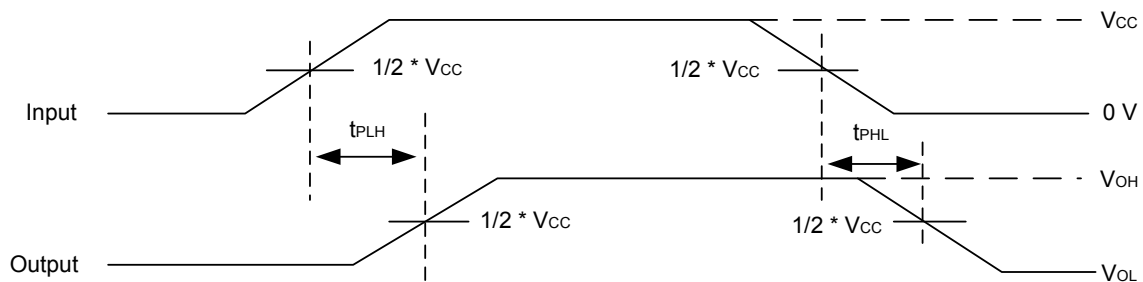
■ OPERATING CHARACTERISTICS ( $V_{CC}=5V$ ;  $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No load, $f=1\text{MHz}$		18		pF

## ■ TEST CIRCUIT AND WAVEFORMS



CL includes probe and jig capacitance.



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