



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

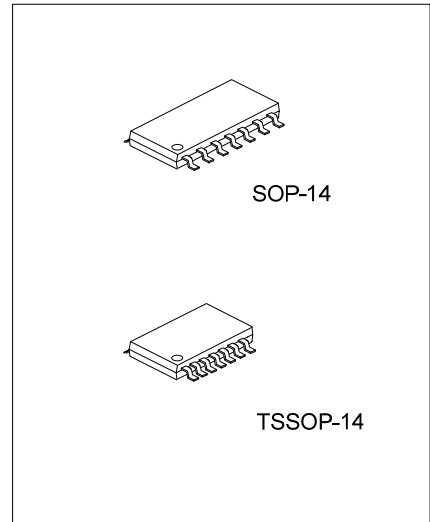
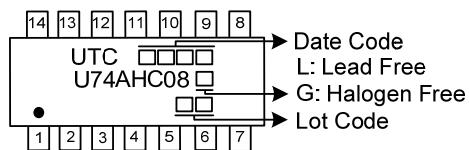
- * Operation voltage range: 2~5.5V
- * Max t_{PD} of 7.9 ns at 5 V
- * Low power consumption, $I_{CC}=2\mu A(\text{Max})$
- * $\pm 8\text{mA}$ output drive at 5 V

ORDERING INFORMATION

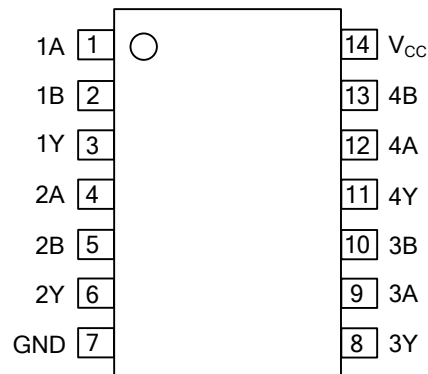
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC08L-S14-R	U74AHC08G-S14-R	SOP-14	Tape Reel
U74AHC08L-P14-R	U74AHC08G-P14-R	TSSOP-14	Tape Reel

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



PIN CONFIGURATION

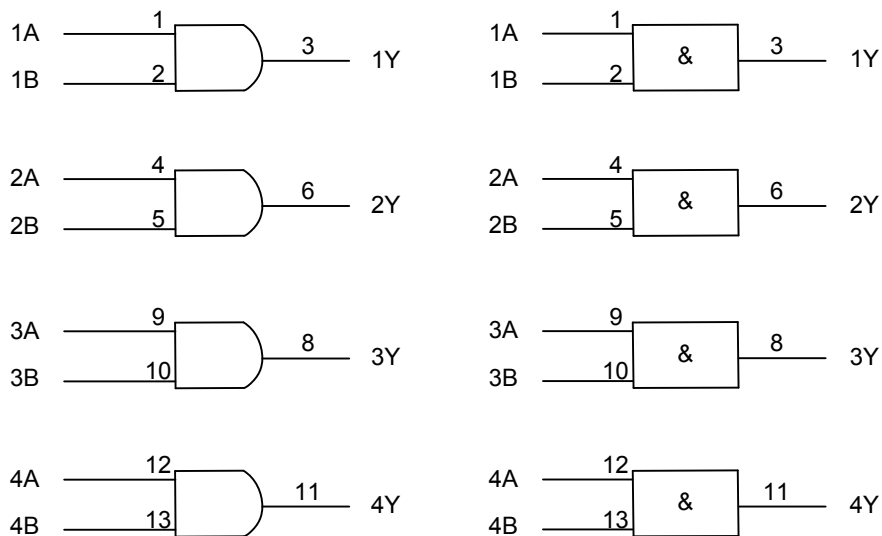


FUNCTION TABLE (Each Gate)

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

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

LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$, unless otherwise specified)

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	$^\circ\text{C}$

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

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	$V_{CC}=3.3\pm 0.3\text{V}$			100	ns/V
		$V_{CC}=5.0\pm 0.5\text{V}$			20	
Ambient Operating Temperature	T_A		-40		+125	$^\circ\text{C}$

■ STATIC CHARACTERISTICS (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	
High-Level Input Voltage	V_{IH}	$V_{CC}=2.0\text{V}$	1.5			1.5			V
		$V_{CC}=3.0\text{V}$	2.1			2.1			V
		$V_{CC}=5.5\text{V}$	3.85			3.85			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0\text{V}$			0.5			0.5	V
		$V_{CC}=3.0\text{V}$			0.9			0.9	V
		$V_{CC}=5.5\text{V}$			1.65			1.65	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0\text{V}$	1.9	2.0		1.9			V
		$V_{CC}=3.0\text{V}$	2.9	3.0		2.9			V
		$V_{CC}=4.5\text{V}$	4.4	4.5		4.4			V
		$V_{CC}=3.0\text{V}, I_{OH}=-4\text{mA}$	2.58			2.4			V
		$V_{CC}=4.5\text{V}, I_{OH}=-8\text{mA}$	3.94			3.7			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0\text{V}$			0.1			0.1	V
		$V_{CC}=3.0\text{V}$			0.1			0.1	V
		$V_{CC}=4.5\text{V}$			0.1			0.1	V
		$V_{CC}=3.0\text{V}, I_{OL}=4\text{mA}$			0.36			0.55	V
		$V_{CC}=4.5\text{V}, I_{OL}=8\text{mA}$			0.36			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0\sim 5.5\text{V}, V_{IN}=5.5\text{ or GND}$			± 0.1			± 2	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}\text{ or GND}, I_{OUT}=0$			2			40	μA

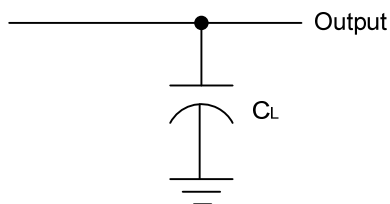
■ DYNAMIC CHARACTERISTICS (Input: $t_R, t_F \leq 3\text{ns}$; $\text{PRR} \leq 1\text{MHz}$)

PARAMETER	SYMBOL	$V_{CC}(\text{V})$	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C} \sim +125^\circ\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay from Input (A and B) to Output(Y)	t_{PLH}	$V_{CC} = 3.3 \pm 0.3\text{V}, C_L = 15\text{pF}$		7	10			13	ns
	t_{PHL}			7	10			13	ns
	t_{PLH}	$V_{CC} = 3.3 \pm 0.3\text{V}, C_L = 50\text{pF}$		9	13			16	ns
	t_{PHL}			9	13			16	ns
Propagation Delay from Input (A and B) to Output(Y)	t_{PLH}	$V_{CC} = 5.0 \pm 0.5\text{V}, C_L = 15\text{pF}$		5	7			10	ns
	t_{PHL}			5	7			10	ns
	t_{PLH}	$V_{CC} = 5.0 \pm 0.5\text{V}, C_L = 50\text{pF}$		6.5	9			12	ns
	t_{PHL}			6.5	9			12	ns

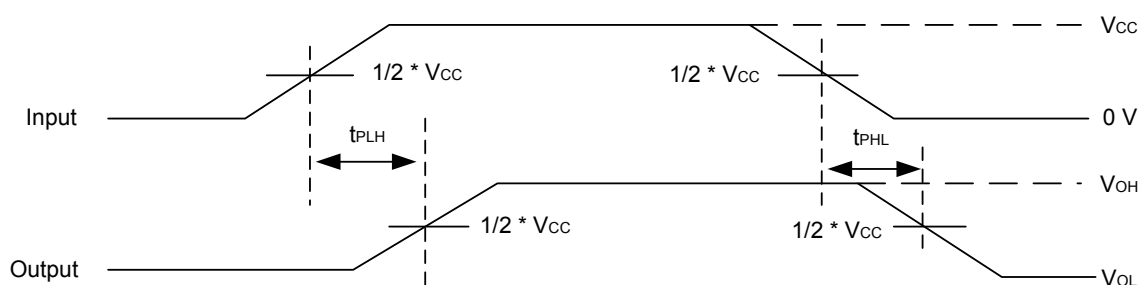
■ OPERATING CHARACTERISTICS ($V_{CC} = 5\text{V}$; $T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC} = 5.0\text{V}, V_{IN} = V_{CC} \text{ or } \text{GND}$		4	10	pF
Power Dissipation Capacitance	C_{PD}	No load, $f = 1\text{MHz}$		18		pF

■ TEST CIRCUIT AND WAVEFORMS



C_L includes probe and jig capacitance.



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