



U74AHC08

CMOS IC

QUADRUPLE 2-INPUT POSITIVE-AND GATES

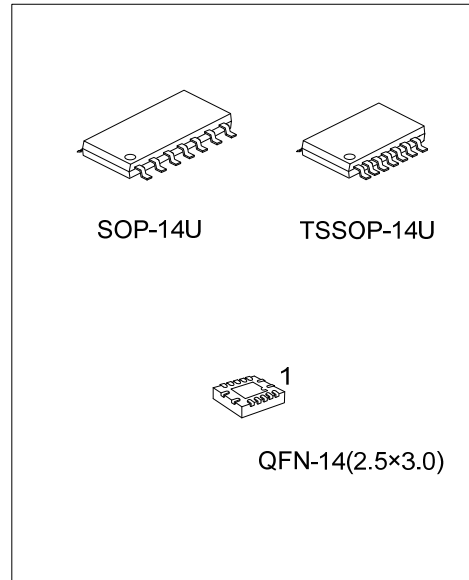
DESCRIPTION

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



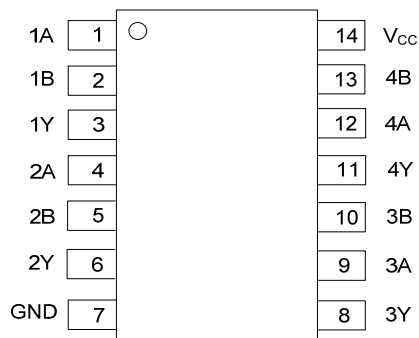
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC08L-UEA-R	U74AHC08G-UEA-R	SOP-14U	Tape Reel
U74AHC08L-UEB-R	U74AHC08G-UEB-R	TSSOP-14U	Tape Reel
U74AHC08L-QAF-R	U74AHC08G-QAF-R	QFN-14(2.5x3.0)	Tape Reel

<p>U74AHC08G-UEA-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) UEA: SOP-14U, UEB: TSSOP-14U QAF: QFN-14(2.5x3.0) (3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	---

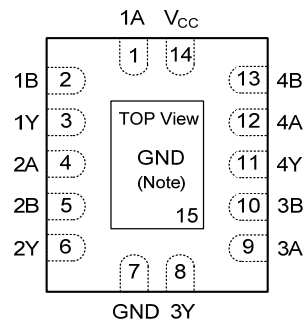
MARKING

SOP-14U / TSSOP-14U	QFN-14(2.5x3.0)
<p>UTC □□□□ → Date Code L: Lead Free U74AHC08 □ → G: Halogen Free □□□□ → Lot Code</p>	<p>AHC08 □ → L: Lead Free □ → G: Halogen Free</p>

■ PIN CONFIGURATION



SOP-14U / TSSOP-14U



QFN-14(2.5x3.0)

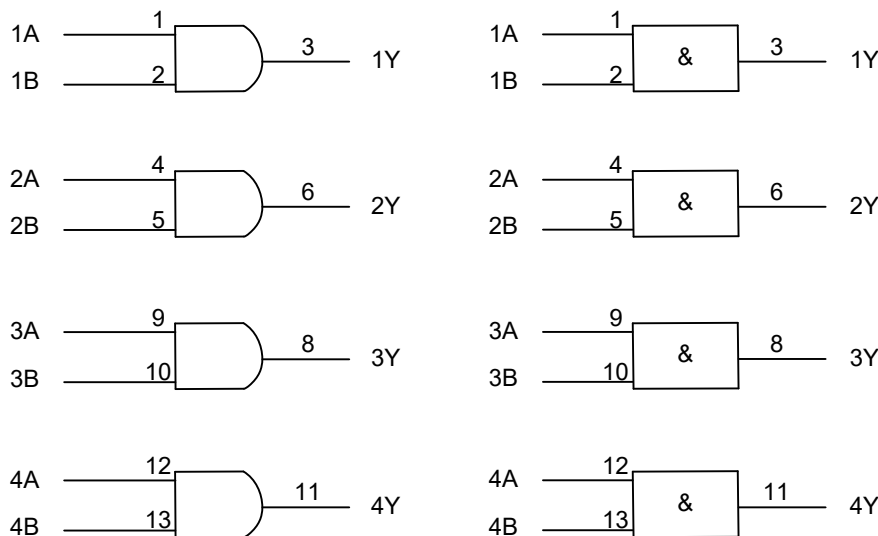
Note: Connect exposed pad to GND

■ 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°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	°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°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±0.3V			100	ns/V
		V _{CC} =5.0±0.5V			20	
Ambient Operating Temperature	T _A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14U	125	°C/W
	TSSOP-14U	150	°C/W
	QFN-14(2.5×3.0)	130	°C/W

■ STATIC CHARACTERISTICS (unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V _{IH}	V _{CC} =2.0V	1.5			1.5			V
		V _{CC} =3.0V	2.1			2.1			V
		V _{CC} =5.5V	3.85			3.85			V
Low-Level Input Voltage	V _{IL}	V _{CC} =2.0V			0.5			0.5	V
		V _{CC} =3.0V			0.9			0.9	V
		V _{CC} =5.5V			1.65			1.65	V
High-Level Output Voltage	V _{OH}	V _{CC} =2.0V	I _{OH} =-50μA	1.9	2.0		1.9		V
		V _{CC} =3.0V		2.9	3.0		2.9		V
		V _{CC} =4.5V		4.4	4.5		4.4		V
		V _{CC} =3.0V, I _{OH} =-4mA	2.58			2.4		V	
		V _{CC} =4.5V, I _{OH} =-8mA	3.94			3.7		V	
Low-Level Output Voltage	V _{OL}	V _{CC} =2.0V	I _{OL} =50μA			0.1		0.1	V
		V _{CC} =3.0V				0.1		0.1	V
		V _{CC} =4.5V				0.1		0.1	V
		V _{CC} =3.0V, I _{OL} =4mA			0.36		0.55	V	
		V _{CC} =4.5V, I _{OL} =8mA			0.36		0.55	V	
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0~5.5V, V _{IN} =5.5 or GND			±0.1			±2	μA
Quiescent Supply Current	I _Q	V _{CC} =5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0			2			40	μA

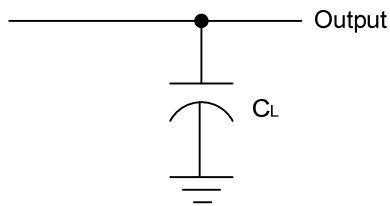
■ DYNAMIC CHARACTERISTICS (Input: $t_R, t_F \leq 3\text{ns}$; $\text{PRR} \leq 1\text{MHz}$)

PARAMETER	SYMBOL	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	
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

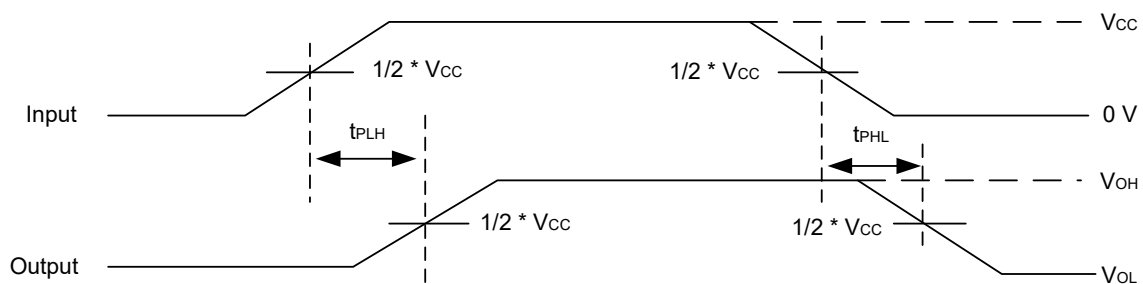
■ OPERATING CHARACTERISTICS ($V_{CC}=5\text{V}, T_A=25^\circ\text{C}$, unless otherwise specified)

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

■ TEST CIRCUIT AND WAVEFORMS



CL includes probe and jig capacitance.



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.