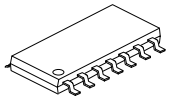
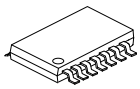
U74AHC08

CMOS IC

QUADRUPLE 2-INPUT POSITIVE-AND GATES



SOP-14



TSSOP-14

■ DESCRIPTION

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

■ FEATURES

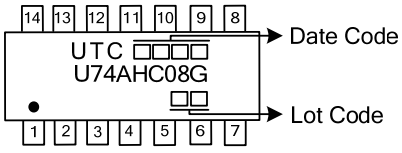
* Operation voltage range: 2~5.5V
* Max t_{PD} of 7.9 ns at 5 V
* Low power consumption, I_{CC}=2μA(Max)
* ±8mA output drive at 5 V

■ ORDERING INFORMATION

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

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

■ MARKING



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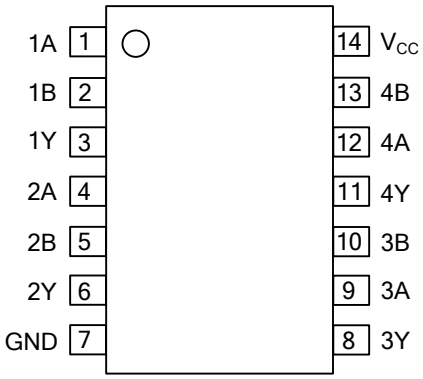
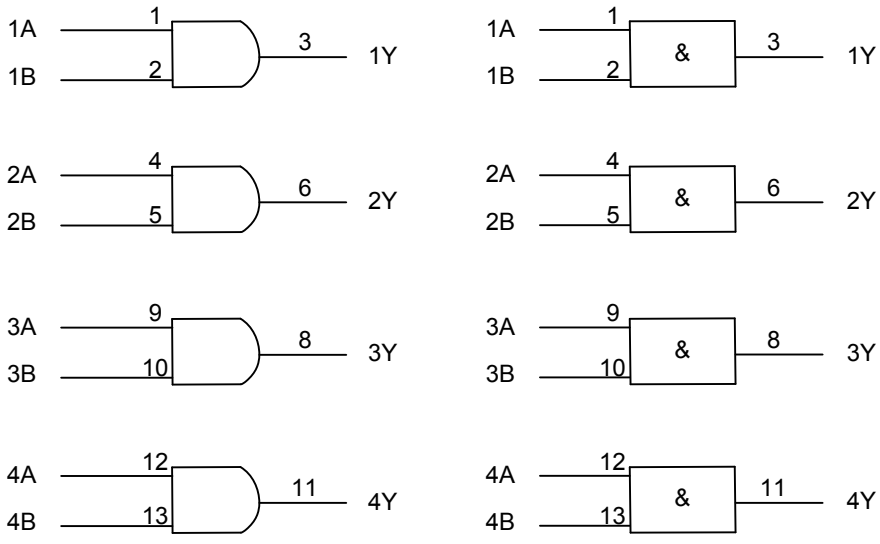
■ PIN CONFIGURATION



■ 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±0.3V			100	ns/V
		V_{CC}=5.0±0.5V			20	
Ambient Operating Temperature	T_{OPR}		-40		85	°C

■ STATIC CHARACTERISTICS (T_A=25°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}=-50μA	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}=50μA			0.1	V
		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}=0~5.5V, 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

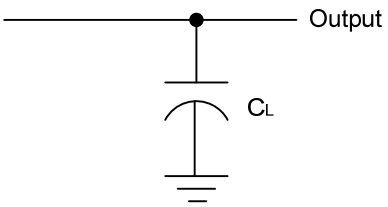
■ DYNAMIC CHARACTERISTICS (Input: t_R, t_F≤3ns; PRR≤1MHz)

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±0.3V, C_L=15pF		6.2	8.8	ns
	t_{PHL}			6.2	8.8	
	t_{PLH}	V_{CC}=3.3±0.3V, C_L=50pF		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±0.5V, C_L=15pF		4.3	5.9	ns
	t_{PHL}			4.3	5.9	
	t_{PLH}	V_{CC}=5.0±0.5V, C_L=50pF		5.8	7.9	
	t_{PHL}			5.8	7.9	

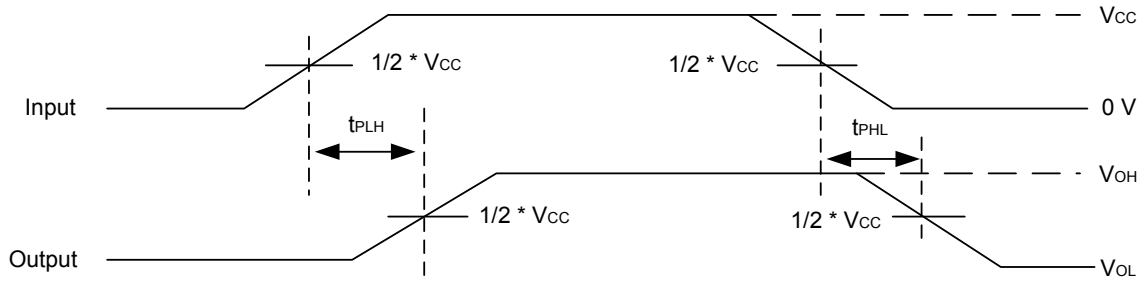
■ OPERATING CHARACTERISTICS (V_{CC}=5V; T_A=25°C)

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

■ TEST CIRCUIT AND WAVEFORMS



C_L includes probe and jig capacitance.



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