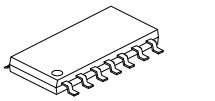
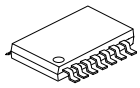
U74AHC08

CMOS IC

QUADRUPLE 2-INPUT POSITIVE-AND GATES



SOP-14U



TSSOP-14U

QFN-14(2.5×3.0)

■ DESCRIPTION

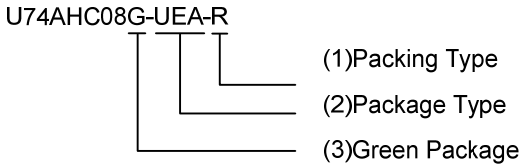
The **U74AHC08** is QUADRUPLE 2-INPUT POSITIVE-AND GATES. Which provides the Function Y=A×B.

■ 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

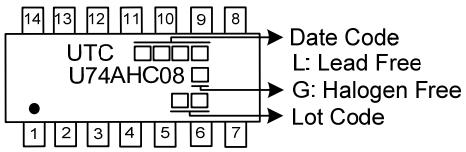
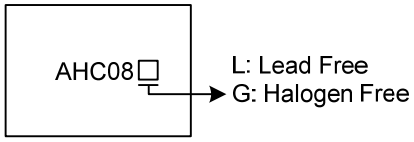
■ ORDERING INFORMATION

Ordering Number		Package	Packing
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(2.5×3.0)	Tape Reel

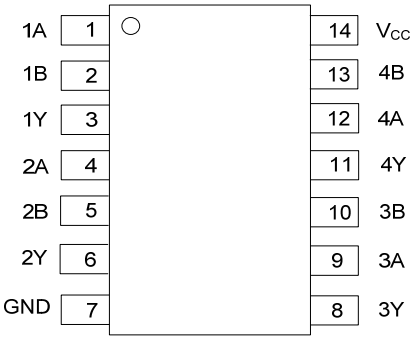


(1) R: Tape Reel
(2) UEA: SOP-14U, UEB: TSSOP-14U
QAF: QFN-14(2.5×3.0)
(3) G: Halogen Free and Lead Free, L: Lead Free

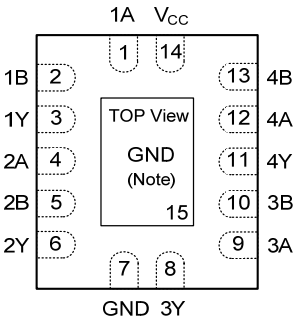
■ MARKING

SOP-14U / TSSOP-14U	QFN-14(2.5×3.0)
	

■ PIN CONFIGURATION



SOP-14U / TSSOP-14U



QFN-14(2.5×3.0)

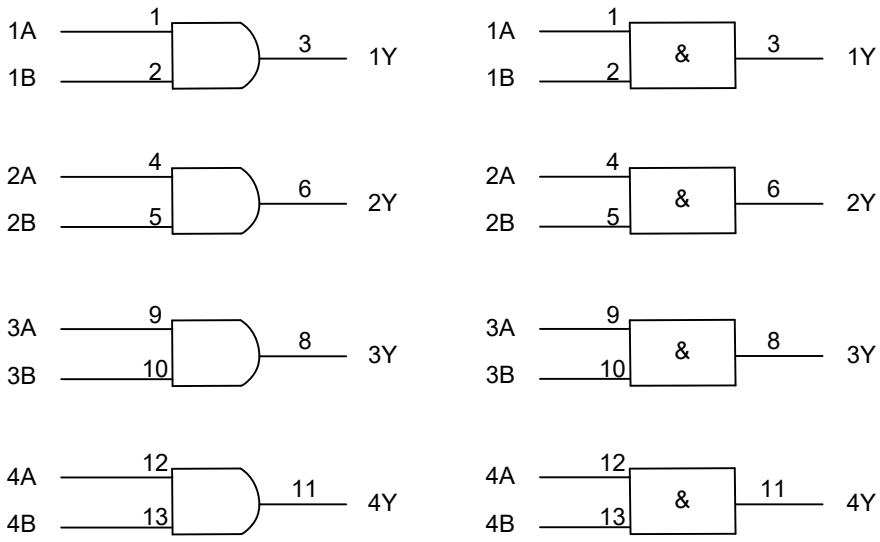
Note: Connect exposed pad to GND

■ 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	θ_{JA}	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

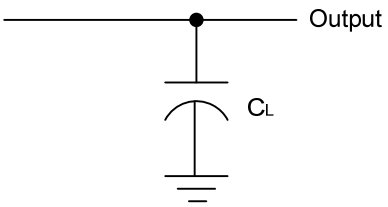
■ DYNAMIC CHARACTERISTICS (Input: t_R, t_F ≤ 3ns; PRR ≤ 1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay from Input (A and B) to Output(Y)	t_{PLH}	V_{CC}=3.3±0.3V, C_L=15pF		7	10			13	ns
	t_{PHL}			7	10			13	ns
	t_{PLH}	V_{CC}=3.3±0.3V, C_L=50pF		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±0.5V, C_L=15pF		5	7			10	ns
	t_{PHL}			5	7			10	ns
	t_{PLH}	V_{CC}=5.0±0.5V, C_L=50pF		6.5	9			12	ns
	t_{PHL}			6.5	9			12	ns

■ OPERATING CHARACTERISTICS (V_{CC}=5V, T_A=25°C, unless otherwise specified)

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

■ TEST CIRCUIT AND WAVEFORMS



C_L includes probe and jig capacitance.