

U74HC08

CMOS IC

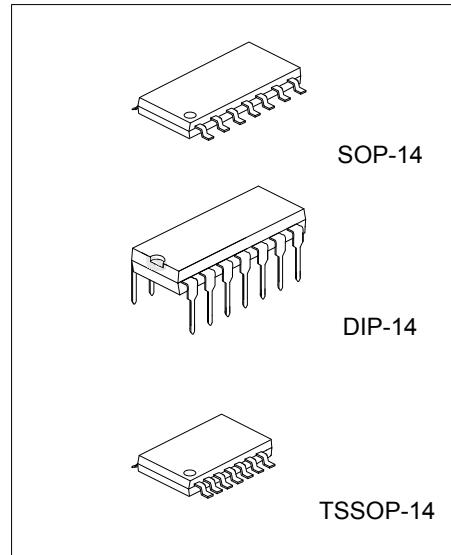
QUAD 2-INPUT AND GATES

■ DESCRIPTION

The **U74HC08** contains four independent 2-input AND gates, perform the Boolean function $Y = A \cdot B$ or $Y = \overline{A} + \overline{B}$ in positive logic.

■ FEATURES

- * Operation Voltage Range: 2~6V
- * Low Quiescent Current: $I_{CC}=2\mu A$ (Max)
- * High Speed: $t_{PD}=8ns$ (Typ)
- * Low Input Current: 100nA (Max)

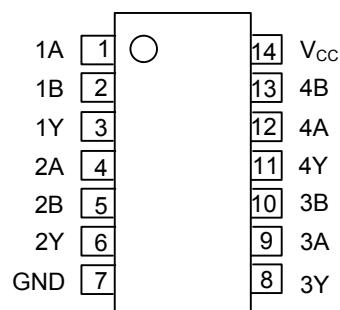


■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC08L-S14-R	U74HC08G-S14-R	SOP-14	Tape Reel
U74HC08L-S14-T	U74HC08G-S14-T	SOP-14	Tube
U74HC08L-D14-T	U74HC08G-D14-T	DIP-14	Tube
U74HC08L-P14-R	U74HC08G-P14-R	TSSOP-14	Tape Reel
U74HC08L-P14-T	U74HC08G-P14-T	TSSOP-14	Tube

 U74HC08L-P14-T	(1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel, T: Tube (2) P14: TSSOP-14, S14: SOP-14, D14: DIP-14 (3) G: Halogen Free, L: Lead Free
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■ PIN CONFIGURATION



■ FUNCTION TABLE (Each Gate)

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

■ LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5~7	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	SOP-14	86	°C/W
	DIP-14	80	
	TSSOP-14	113	

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}		2		6	V
Input Voltage	V _{IN}		0		V _{CC}	V
Output Voltage	V _{OUT}		0		V _{CC}	V
Input Transition Rise or Fall Rate	t _R , t _F	V _{CC} =2V			1000	ns
		V _{CC} =4.5V			500	
		V _{CC} =6V			400	
Ambient Operating Temperature	T _{OPR}		-40		85	°C

■ STATIC CHARACTERISTICS (T_A = 25°C)

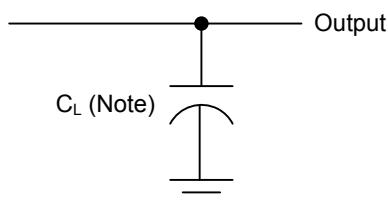
PARAMETER	SYMBOL		MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	V _{CC} = 2 V	1.5			V
		V _{CC} = 4.5V	3.15			
		V _{CC} = 6 V	4.2			
Low-Level Input Voltage	V _{IL}	V _{CC} = 2 V			0.5	V
		V _{CC} = 4.5 V			1.35	
		V _{CC} = 6 V			1.8	
High-Level Output Voltage	V _{OH}	V _{CC} = 2V, I _{OH} = 20μA	1.9	1.998		V
		V _{CC} = 4.5V, I _{OH} = 20μA	4.4	4.999		
		V _{CC} = 6V, I _{OH} = 20μA	5.9	5.999		
		V _{CC} = 4.5V, I _{OH} = 4mA	3.98	4.3		
		V _{CC} = 6V, I _{OH} = 5.2mA	5.48	5.8		
Low-Level Output Voltage	V _{OL}	V _{CC} = 2V, I _{OL} = 20μA	0.002	0.1		V
		V _{CC} = 4.5V, I _{OL} = 20μA	0.001	0.1		
		V _{CC} = 6V, I _{OL} = 20μA	0.001	0.1		
		V _{CC} = 4.5V, I _{OL} = 4mA	0.17	0.26		
		V _{CC} = 6V, I _{OL} = 5.2mA	0.15	0.26		
Input Leakage Current	I _{IK(LEAK)}	V _{CC} = 6V , V _{IN} = V _{CC} or GND		±0.1	±100	nA
Quiescent Supply Current	I _Q	V _{CC} = 6V, V _{IN} = V _{CC} or GND, I _{OUT} = 0			2	μA
Input Capacitance	C _{IN}	V _{CC} =2V~6V		3	10	pF

■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ C$, Input: $t_R=t_F=6\text{ns}$, unless otherwise specified)

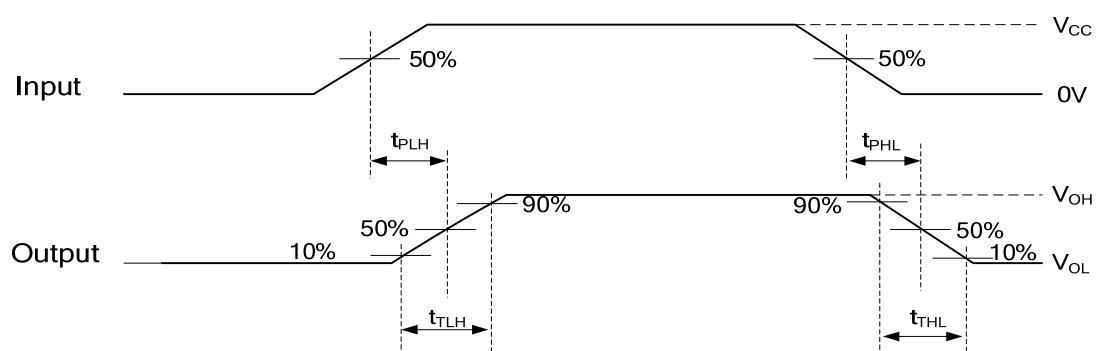
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}, t_{PHL}	$V_{CC}=2V, C_L=50\text{pF}$		50	100	ns
		$V_{CC}=4.5V, C_L=50\text{pF}$		10	20	
		$V_{CC}=6V, C_L=50\text{pF}$		8	17	
Output Transition Time	t_T	$V_{CC}=2V$		38	75	ns
		$V_{CC}=4.5V$		8	15	
		$V_{CC}=6V$		6	13	

■ OPERATING CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	20	pF

■ TEST CIRCUIT AND WAVEFORMS

Note: C_L includes probe and jig capacitance.



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