



# U74HCT08

CMOS IC

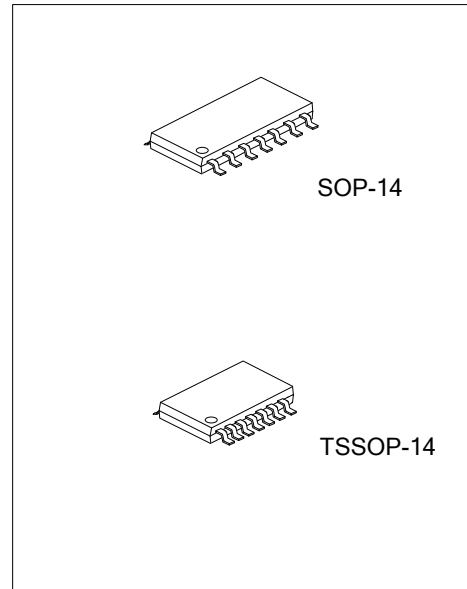
## QUAD 2-INPUT AND GATES

### DESCRIPTION

The **U74HCT08** contains four independent 2-input AND gates, perform the Boolean function  $Y = A \cdot B$  or  $Y = \overline{A + B}$  in positive logic.

### FEATURES

- \* Operation Voltage Range: 4.5~5.5V
- \* Low Power Dissipation:  $I_{CC}=20\mu A(\text{Max})$
- \* High Speed:  $t_{PD}=13\text{ns}(\text{TYP})$
- \* Low Input Current:  $1\mu A \text{ Max}$
- \* Input are TTL-Voltage Compatible

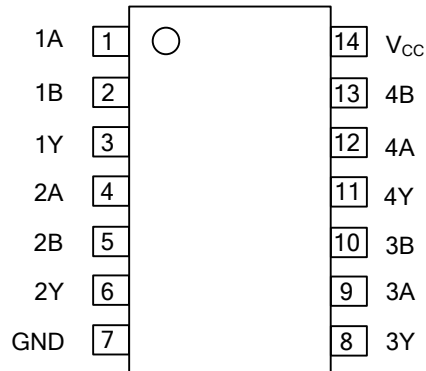


### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT08L-S14-R	U74HCT08G-S14-R	SOP-14	Tape Reel
U74HCT08L-P14-R	U74HCT08G-P14-R	TSSOP-14	Tape Reel

<p>U74HCT08L-S14-R</p>	<p>(1)Packing Type (2)Package Type (3)Lead Free</p> <p>(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free, L:Lead Free</p>
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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 Ambient	$\theta_{JA}$	127	°C/W

## ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		4.5	5.0	5.5	V
Input Voltage	$V_{IN}$		0		$V_{CC}$	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
Input Transition Rise or Fall Times	$t_R, t_F$				500	ns
Ambient Operating Temperature	$T_{OPR}$		-40		85	°C

## ■ ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	$V_{IH}$	$V_{CC}=4.5\text{V}\sim 5.5\text{V}$	2			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=4.5\text{V}\sim 5.5\text{V}$			0.8	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=4.5\text{V}, I_{OH}=-20\mu\text{A}$	4.4	4.499		V
		$V_{CC}=4.5\text{V}, I_{OH}=-4\text{mA}$	3.98	4.3		
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$		0.001	0.1	V
		$V_{CC}=4.5\text{V}, I_{OL}=4\text{mA}$		0.17	0.26	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND		±0.1	±100	nA
Quiescent Supply Current	$I_Q$	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			2	μA
Additional Quiescent Supply Current	$\Delta I_Q$	$V_{CC}=5.5\text{V}$ , One input at 0.5V or 2.4V, other inputs at 0 or $V_{CC}$		1.4	2.4	mA
Input Capacitance	$C_{IN}$	$V_{CC}=4.5\text{V}\sim 5.5\text{V}$		3	10	pF

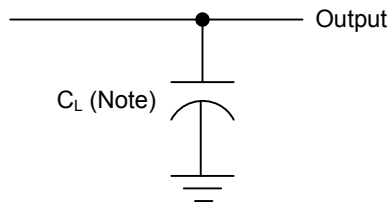
## ■ SWITCHING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , Input: $t_R=t_F=6\text{ns}$ , unless otherwise specified )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (nA) and (nB) to output(nY)	$t_{PHL} / t_{PLH}$	$C_L = 50\text{pF}$	$V_{CC}=4.5\text{V}$		15	24	ns
			$V_{CC}=5.5\text{V}$		13	22	
Output Transition Time	$t_{THL} / t_{TLH}$	$C_L = 50\text{pF}$	$V_{CC}=4.5\text{V}$		9	15	ns
			$V_{CC}=5.5\text{V}$		8	14	

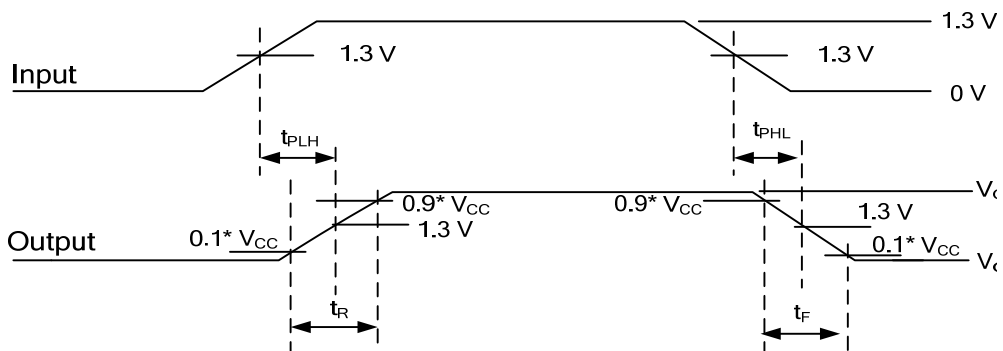
## ■ OPERATING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	$C_{PD}$	No Load		20		pF

■ TEST CIRCUIT AND WAVEFORMS



Note : C<sub>L</sub> includes probe and jig capacitance.



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