



U74HC08E

CMOS IC

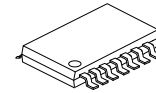
QUAD 2-INPUT AND GATES

DESCRIPTION

The **U74HC08E** 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: 2~6V
- * Low Quiescent Current: $I_{CC}=2\mu A$ (Max.)
- * High Speed: $t_{PD}=8ns$ (Typ.)
- * Low Input Current: 100nA (Max.)



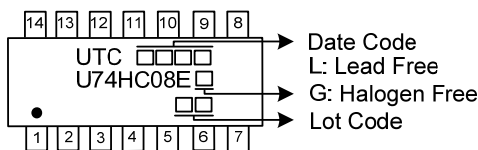
TSSOP-14U

ORDERING INFORMATION

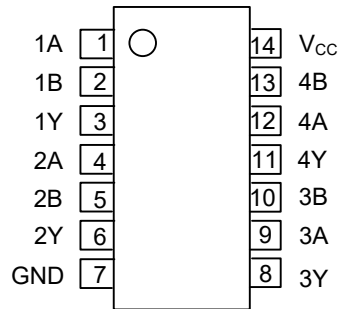
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC08EL-UEB-R	U74HC08EG-UEB-R	TSSOP-14U	Tape Reel

<p>U74HC08EG-UEB-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) UEB: TSSOP-14U (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ 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	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ 7	V
Input Clamp Current	I_{IK}	$V_I < 0$ or $V_I > V_{CC}$	± 20	mA
Output Clamp Current	I_{OK}	$V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	± 20	mA
Output Current	I_{OUT}	$V_O = 0$ to V_{CC}	± 25	mA
V_{CC} or GND Current	I_{CC}		± 50	mA
Electrostatic Discharge	$V_{(ESD)}$	Human-Body Model (HBM) Per JESD22-A114/115	2000	V
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		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				1000	ns
					500	ns
					400	ns
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	100	°C/W
	SOP-14U	125	°C/W
	TSSOP-14U	150	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2V$	1.5			V
		$V_{CC}=4.5V$	3.15			V
		$V_{CC}=6V$	4.2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2V$			0.5	V
		$V_{CC}=4.5V$			1.35	V
		$V_{CC}=6V$			1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2V, I_{OH}=20\mu A$	1.9	1.998		V
		$V_{CC}=4.5V, I_{OH}=20\mu A$	4.4	4.499		V
		$V_{CC}=6V, I_{OH}=20\mu A$	5.9	5.999		V
		$V_{CC}=4.5V, I_{OH}=4mA$	3.98			V
		$V_{CC}=6V, I_{OH}=5.2mA$	5.48			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2V, I_{OL}=20\mu A$		0.002	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=6V, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=4.5V, I_{OL}=4mA$			0.26	V
		$V_{CC}=6V, I_{OL}=5.2mA$			0.26	V
Input Leakage Current	$I_{(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND			± 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}	$V_{CC}=2V\sim 6V$			10	pF

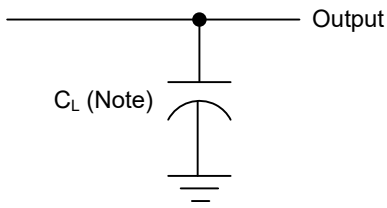
■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, Input: $t_R=t_F=6\text{ns}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}, t_{PHL}	$V_{CC}=2\text{V}, C_L=50\text{pF}$			120	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$			25	ns
		$V_{CC}=6\text{V}, C_L=50\text{pF}$			20	ns
Output Transition Time	t_T	$V_{CC}=2\text{V}$			80	ns
		$V_{CC}=4.5\text{V}$			20	ns
		$V_{CC}=6\text{V}$			15	ns

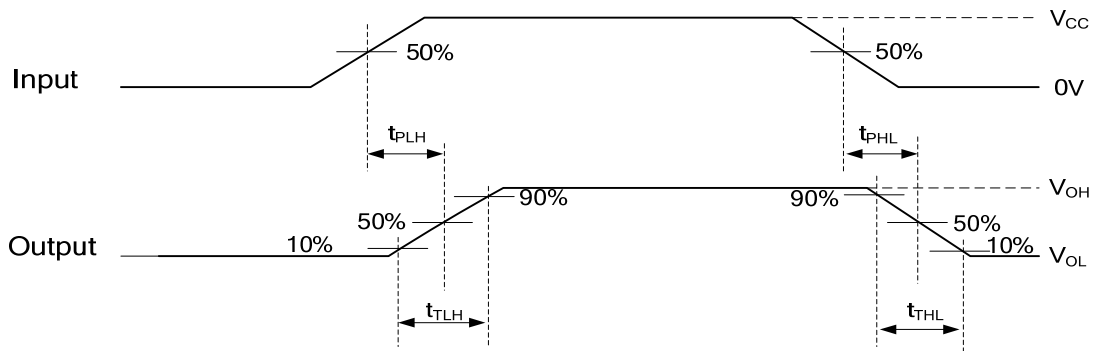
■ OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

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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