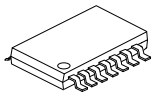
U74HC08E

CMOS IC

QUAD 2-INPUT AND GATES



TSSOP-14U

■ DESCRIPTION

The **U74HC08E** contains four independent 2-input AND gates, perform the Boolean function Y = A • B or $Y=\overline{\overline{A}+\overline{B}}$ in positive logic.

■ FEATURES

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

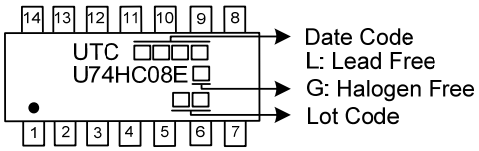
■ ORDERING INFORMATION

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

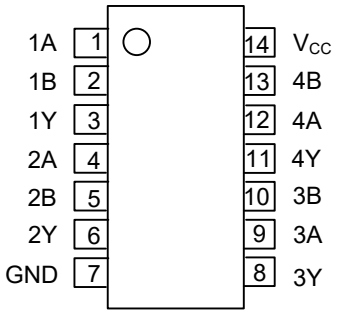
U74HC08EG-UEB-R
- (1) Packing Type
- (2) Package Type
- (3) Green Package

(1) R: Tape Reel
(2) UEB: TSSOP-14U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ 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	θ_{JA}	100	°C/W
	SOP-14U		125	°C/W
	TSSOP-14U		150	°C/W

■ STATIC CHARACTERISTICS (T_A=25°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}=20μA	1.9	1.998		V
		V_{CC}=4.5V, I_{OH}=20μA	4.4	4.499		V
		V_{CC}=6V, I_{OH}=20μA	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}=20μA		0.002	0.1	V
		V_{CC}=4.5V, I_{OL}=20μA		0.001	0.1	V
		V_{CC}=6V, I_{OL}=20μA		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	$I_{I(LEAK)}$	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~6V			10	pF

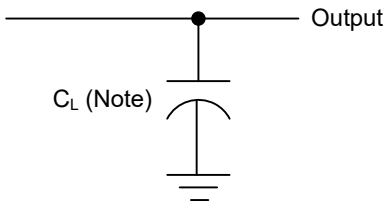
■ DYNAMIC CHARACTERISTICS (T_A=25°C, Input: t_R=t_F=6ns, unless otherwise specified)

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=50pF			120	ns
		V_{CC}=4.5V, C_L=50pF			25	ns
		V_{CC}=6V, C_L=50pF			20	ns
Output Transition Time	t_T	V_{CC}=2V			80	ns
		V_{CC}=4.5V			20	ns
		V_{CC}=6V			15	ns

■ OPERATING CHARACTERISTICS (T_A=25°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.