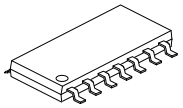
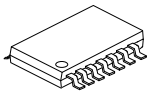
U74HC86

CMOS IC

QUAD 2-INPUT EXCLUSIVE-OR GATES



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74HC86** contains four independent 2-input exclusive-or gates, it provides the Boolean function $Y=A \oplus B$ or $Y=\overline{A}B+A\overline{B}$ in positive logic.

■ FEATURES

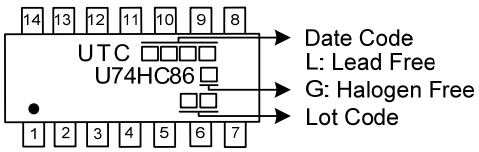
* Operation Voltage range: 2~6V

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC86L-S14-R	U74HC86G-S14-R	SOP-14	Tape Reel
U74HC86L-P14-R	U74HC86G-P14-R	TSSOP-14	Tape Reel

U74HC86G-S14-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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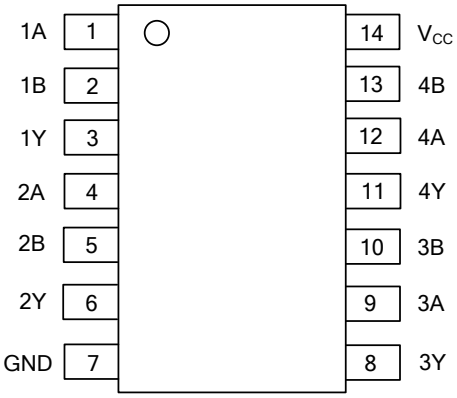
■ PIN CONFIGURATION

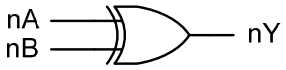


■ FUNCTION TABLE

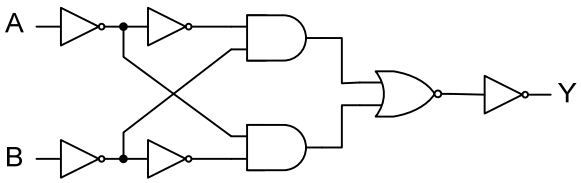
INPUTS(A)	INPUTS(B)	OUTPUT(Y)
L	L	L
L	H	H
H	L	H
H	H	L

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC SYMBOL



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
V_{CC} or GND Current	I_{CC}	±50	mA
Output Current	I_{OUT}	±25	mA
Input Clamp Current	I_{IK}	±20	mA
Output Clamp Current	I_{OK}	±20	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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2	5	6	V
High-level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			V
		V_{CC}=4.5V	3.15			
		V_{CC}=6.0V	4.2			
Low-level Input Voltage	V_{IL}	V_{CC}=2.0V	0		0.5	V
		V_{CC}=4.5V	0		1.35	
		V_{CC}=6.0V	0		1.8	
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Input Rise or Fall Times	t_R, t_F	V_{CC}=2.0V			1	μs
		V_{CC}=4.5V			0.5	
		V_{CC}=6.0V			0.4	
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14	θ_{JA}	86	°C/W
	TSSOP-14		113	

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	V_{CC}=2.0V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	1.9	1.998		V
		V_{CC}=4.5V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	4.4	4.499		
		V_{CC}=6.0V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	5.9	5.999		
		V_{CC}=4.5V, I_{OH}=-4mA, V_{IN}=V_{IH} or V_{IL}	3.98	4.3		
		V_{CC}=6.0V, I_{OH}=-5.2mA, V_{IN}=V_{IH} or V_{IL}	5.48	5.8		
Output Voltage Low-Level	V_{OL}	V_{CC}=2.0V, I_{OL}=20μA, V_{IN}=V_{IH} or V_{IL}		2	100	mV
		V_{CC}=4.5V, I_{OL}=20μA, V_{IN}=V_{IH} or V_{IL}		1	100	
		V_{CC}=6.0V, I_{OL}=20μA, V_{IN}=V_{IH} or V_{IL}		1	100	
		V_{CC}=4.5V, I_{OL}=4mA, V_{IN}=V_{IH} or V_{IL}		170	260	
		V_{CC}=6.0V, I_{OL}=5.2mA, V_{IN}=V_{IH} or V_{IL}		150	260	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=6.0V, V_{IN}=V_{CC} or 0		±0.1	±100	nA
Quiescent Supply Current	I_Q	V_{CC}=6.0V, V_{IN}=V_{CC} or 0, I_{OUT}=0			2	μA
Input Capacitance	C_{IN}	V_{CC}=2.0V~6.0V		3	10	pF

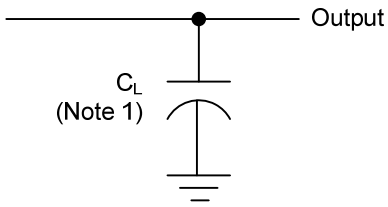
■ SWITCHING CHARACTERISTICS (see test circuit and waveforms)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay from Input (A or B) to Output(Y)	t_{PLH}/t_{PHL}	V_{CC}=2.0V, C_L=50pF		40	100	ns
		V_{CC}=4.5V, C_L=50pF		12	20	
		V_{CC}=6.0V, C_L=50pF		10	17	
To Output(Y)	t_t	V_{CC}=2.0V, C_L=50pF		28	75	ns
		V_{CC}=4.5V, C_L=50pF		8	15	
		V_{CC}=6.0V, C_L=50pF		6	13	

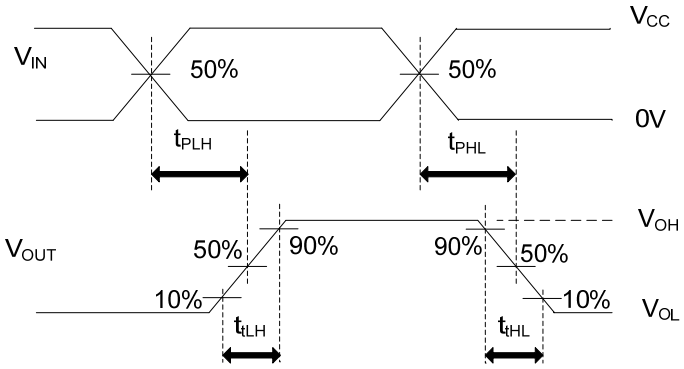
■ OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load		35		pF

■ TEST CIRCUIT AND WAVEFORMS



Test Circuit



Propagation Dely Times

Note: 1. C_L includes probe and jig capacitance.
2. PRR ≤1MHz, Zo = 50Ω, t_R =6ns, t_F =≤6ns.

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