



U74HC86

CMOS IC

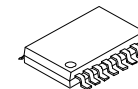
QUAD 2-INPUT EXCLUSIVE-OR GATES

■ DESCRIPTION

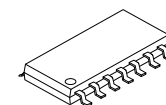
The **U74HC86** contains four independent 2-input exclusive-or gates, it provides the Boolean function $Y=A\oplus B$ or $Y=\overline{A}B+A\overline{B}$ in positive logic.

■ FEATURES

* Operation Voltage range: 2~6V



TSSOP-14

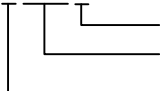


SOP-14

■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74HC86G-S14-R	SOP-14	Tape Reel
U74HC86G-P14-R	TSSOP-14	Tape Reel

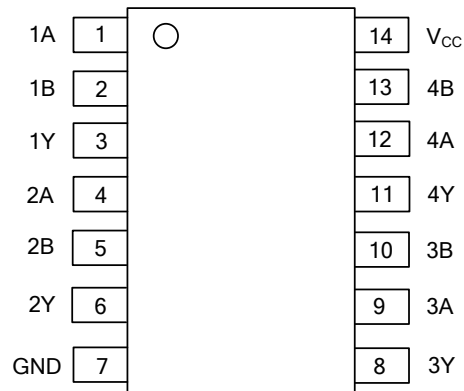
U74HC86G-P14-T



(1)Packing Type
(2)Package Type
(3)Halogen Free

(1) R: Tape Reel
(2) P14: TSSOP-14, S14: SOP-14
(3) G: Halogen Free

PIN CONFIGURATION



FUNCTION TABLE

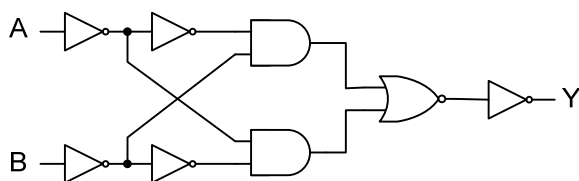
INPUTS(A)	INPUTS(B)	OUTPUT(Y)
L	L	L
L	H	H
H	L	H
H	H	L

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

LOGIC SYMBOL



LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING

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
Ambient Operating Temperature	T_{OPR}	-40 ~ + 85	°C
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	SOP-14	113	°C /W
	TSSOP-14		

■ 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	

■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$)

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

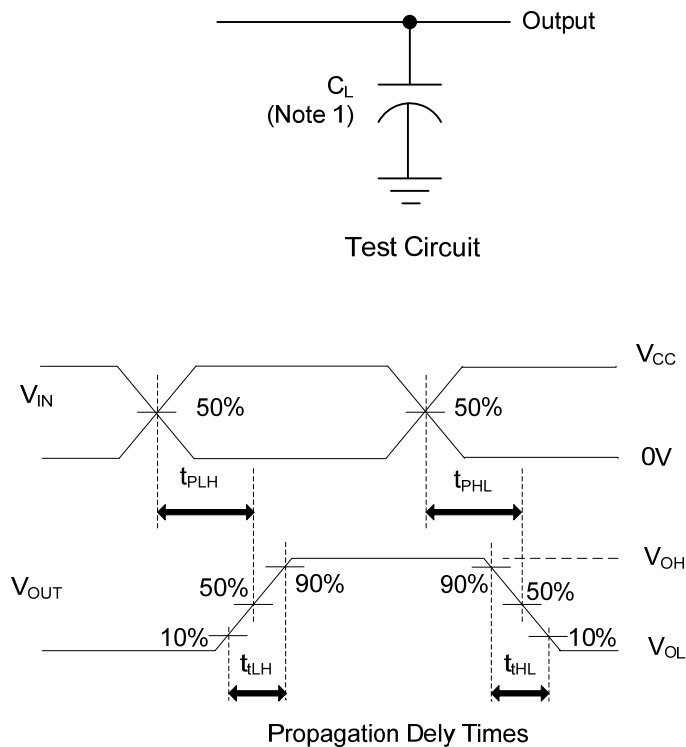
■ SWITCHING CHARACTERISTICS (see test circuit and waveforms)

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 ($T_a=25^{\circ}C$)

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

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



Note: 1. C_L includes probe and jig capacitance.
 2. $PRR \leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_R = 6\text{ns}$, $t_F = 6\text{ns}$.

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