



U74AHC86

CMOS IC

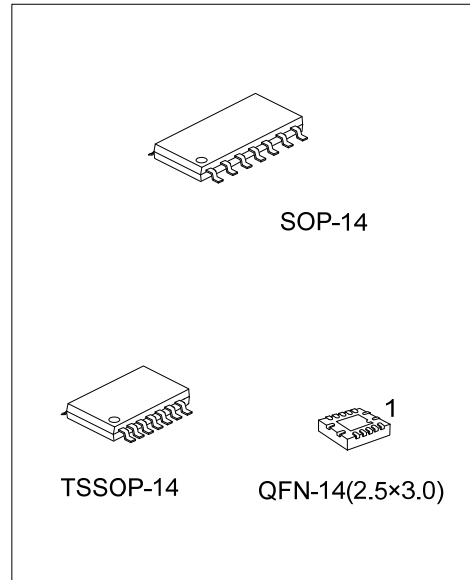
QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES

DESCRIPTION

The **U74AHC86** device is quadruple 2-input EXCLUSIVE-OR gate which perform the function $Y=A \oplus B$ or $Y = \overline{A}B + A\overline{B}$.

FEATURES

- * Operate from 2V to 5.5V
- * Max tpd of 8.8ns at 5.0V
- * Low Quiescent Current: $I_{CC}=2\mu A(\text{Max})$ at $T_A=25^\circ C$



ORDERING INFORMATION

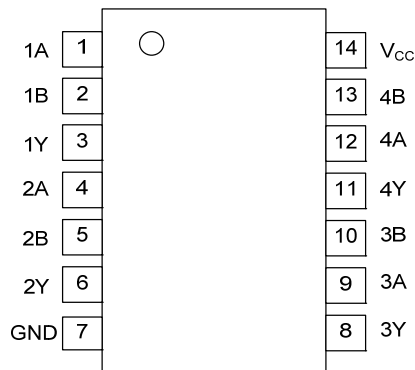
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC86L-S14-R	U74AHC86G-S14-R	SOP-14	Tape Reel
U74AHC86L-P14-R	U74AHC86G-P14-R	TSSOP-14	Tape Reel
U74AHC86L-Q14-2530-R	U74AHC86G-Q14-2530-R	QFN-14(2.5x3.0)	Tape Reel

<p>U74AHC86G-S14-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 Q14-2530: QFN-14(2.5x3.0) (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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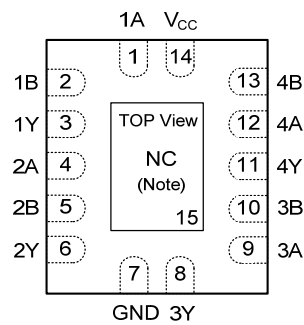
MARKING

SOP-14 / TSSOP-14	QFN-14(2.5x3.0)
<p>14 13 12 11 10 9 8 UTC □ □ □ □ → Date Code U74AHC86 □ → L: Lead Free □ → G: Halogen Free □ □ → Lot Code 1 2 3 4 5 6 7</p>	<p>AHC86 □ → L: Lead Free □ → G: Halogen Free</p>

PIN CONFIGURATION



DIP-14 / SOP-14 / TSSOP-14



QFN-14(2.5x3.0)

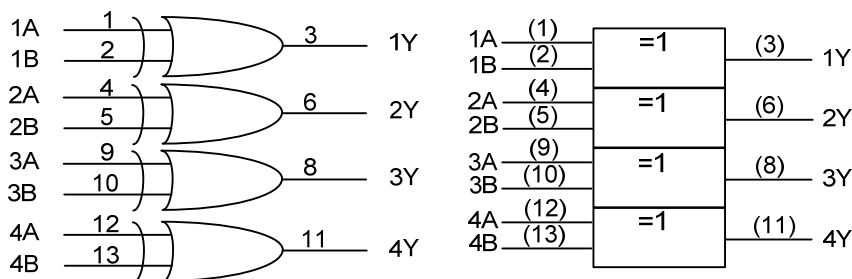
Note: No connect.

FUNCTION TABLE

INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	L
H	L	H
L	H	H
L	L	L

Note: H: High voltage level; L: Low voltage level

LOGIC SYMBOL



Logic symbol

IEC logic symbol

■ ABSOLUTE MAXIMUM RATINGS (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +7	V
Input Voltage	V_{IN}	-0.5 ~ +7	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC} + 0.5$	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

Notes: 1. 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.
 2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta V$	$V_{CC}=3.3\pm 0.3V$			100	ns/V
		$V_{CC}=5.0\pm 0.5V$			20	
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14	86	°C/W
	TSSOP-14	113	°C/W
	QFN-14(2.5×3.0)	104	°C/W

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2.0V$	1.5			V
		$V_{CC}=3.0V$	2.1			
		$V_{CC}=5.5V$	3.85			
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=3.0V$			0.9	
		$V_{CC}=5.5V$			1.65	
High-Level Output Voltage	V_{OH}	$V_{CC}=2V, I_{OH}=-50\mu A$	1.9	2		V
		$V_{CC}=3V, I_{OH}=-50\mu A$	2.9	3		
		$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		
		$V_{CC}=3V, I_{OH}=-4mA$	2.58			
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			
Low-Level Output Voltage	V_{OL}	$V_{CC}=2V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3V, I_{OL}=50\mu A$			0.1	
		$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1	
		$V_{CC}=3V, I_{OL}=4mA$			0.36	
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36	
Input Leakage Current	$I_{(LEAK)}$	$V_{IN}=5.5V$ or GND, $V_{CC}=0V$ to 5.5V			0.1	μA
Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ or GND, $I_{OUT}=0, V_{CC}=5.5V$			2	μA
Input Capacitance	C_{IN}	$V_{IN}=V_{CC}$ or GND		4	10	pF

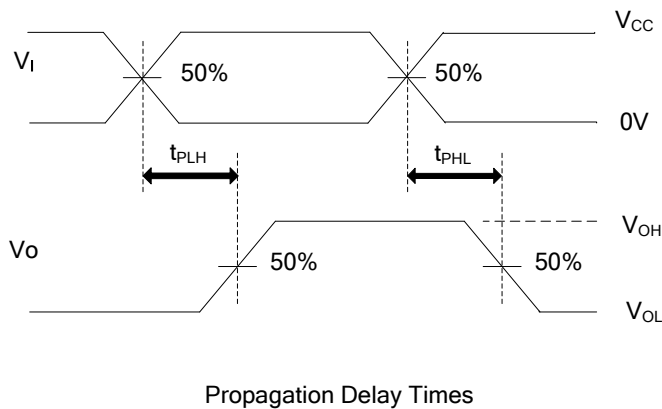
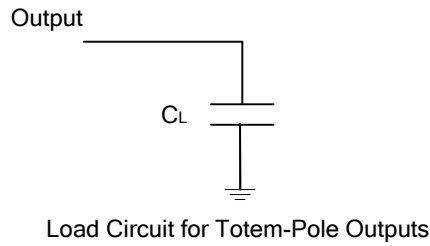
■ SWITCHING CHARACTERISTICS (see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	
Propagation Delay From Input (A or B) to Output(Y)	t_{PLH}	$V_{CC} = 3.3V \pm 0.3V$	$C_L = 15 \text{ pF}$		7	11	Ns
			$C_L = 50 \text{ pF}$		9.5	14.5	
	t_{PHL}	$V_{CC} = 5.0V \pm 0.5V$	$C_L = 15 \text{ pF}$		4.8	6.8	Ns
			$C_L = 50 \text{ pF}$		6.3	8.8	

■ OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, $f=1\text{MHz}$		18		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.
 PRR \leq 1MHz, $Z_o = 50\Omega$, $t_R \leq 3ns$, $t_F \leq 3ns$.

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