



U74AHCT86

CMOS IC

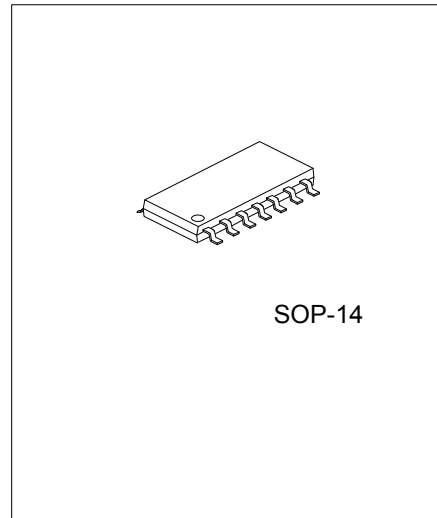
QUADRUPLE 2-INPUT EXCLUSIVE-OR GATE

DESCRIPTION

The **U74AHCT86** devices are quadruple 2-input exclusive-OR gate which perform the function $Y=A \oplus B$ or $Y = \bar{A}B + A\bar{B}$.

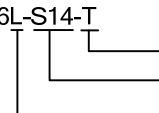
FEATURES

- * Operate from 4.5V to 5.5V
- * Max t_{PD} of 8.8ns at 5.0V
- * Low Quiescent Current: $I_{CC}=2\mu A(\text{Max})$ at $T_A=25^\circ C$
- * Inputs are TTL voltage compatible

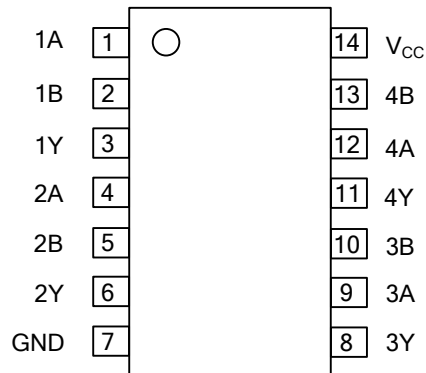


ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT86 L-S14-R	U74AHCT86 G-S14-R	SOP-14	Tape Reel
U74AHCT86 L-S14-T	U74AHCT86 G-S14-T	SOP-14	Tube

<p>U74AHCT86L-S14-T</p>  <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel, T: Tube (2) S14: SOP-14 (3) G: Halogen Free, L: Lead Free</p>
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■ PIN CONFIGURATION

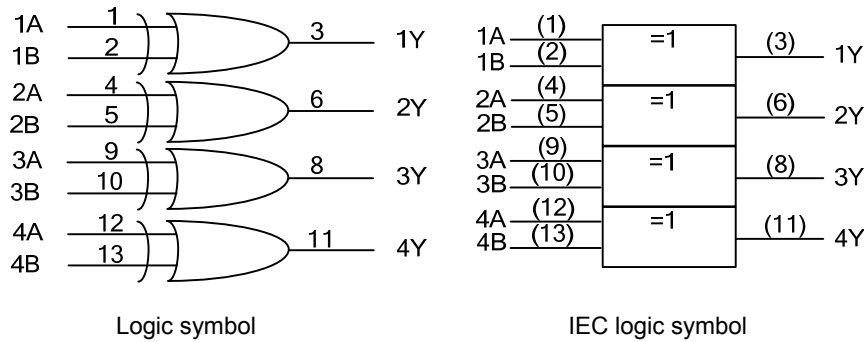


■ FUNCTION TABLE

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



■ 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 ($V_{OUT}=0 \sim V_{CC}$)	I_{OUT}	±25	mA
Input Clamp Current ($V_{IN}<0$)	I_{IK}	-20	mA
Output Clamp Current ($V_{OUT}<0$ or $V_{OUT}>V_{CC}$)	I_{OK}	±20	mA
Storage Temperature	T_{STG}	-65 ~ + 150	°C

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

2. 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}		4.5	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	$\Delta t/\Delta v$	$V_{CC}=5.0\pm 0.5V$			20	ns/V
Operating Temperature	T_A		-40	+25	+85	°C

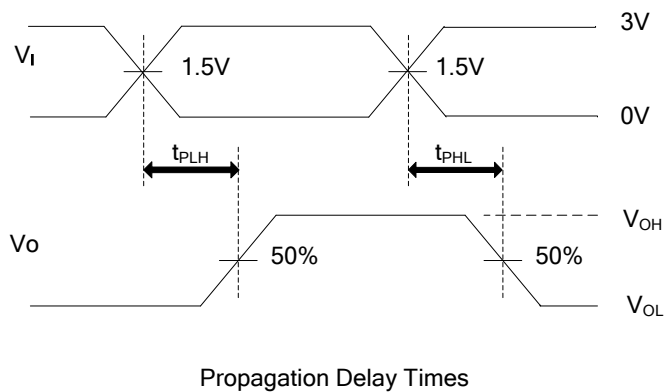
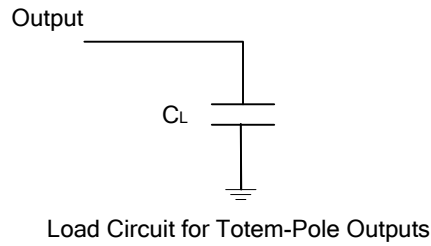
■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC} = 4.5V \sim 5.5V$	2.0			V
Low-Level Input Voltage	V_{IL}	$V_{CC} = 4.5V \sim 5.5V$			0.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		V
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			
Low-Level Output Voltage	V_{OL}	$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN}=5.5V$ 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
Additional quiescent Supply Current	ΔI_{CC}	$V_{CC}=5.5V$, One input at 3.4V, other input at V_{CC} or GND, $I_{OUT}=0$			1.35	mA
Input Capacitance	C_{IN}	$V_{CC}=5.0V, V_{IN}=V_{CC}$ or GND		4	10	pF

■ SWITCHING CHARACTERISTICS ($T_A=25^\circ C$, 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} / t_{PHL}	$V_{CC} = 5.0V \pm 0.5V$	$C_L = 15 pF$		5	6.9	ns
			$C_L = 50 pF$		5.5	8.8	
Power Dissipation Capacitance	C_{PD}	No load, $f=1MHz$		18		pF	

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.
 $P_{RR} \leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$.

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