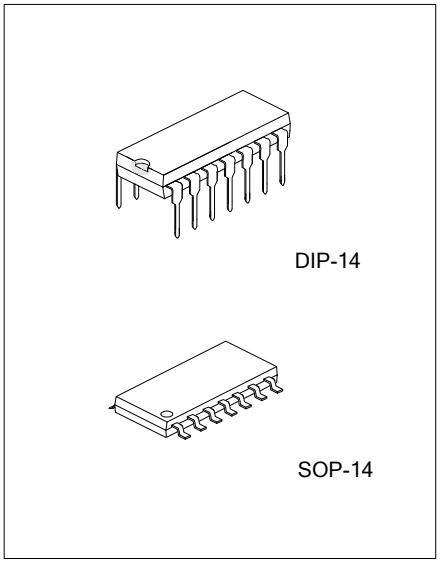
U74AHCT86

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 $Y = \overline{A}B + A\overline{B}$.

■ FEATURES

* Operate from 4.5V to 5.5V
* Max t_{PD} of 8.8ns at 5.0V
* Low Quiescent Current: I_{CC}=2μA(Max) at T_A=25°C
* Inputs are TTL voltage compatiable

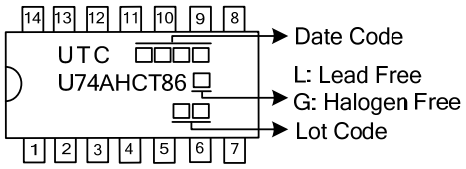
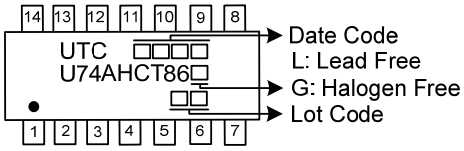
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT86L-D14-R	U74AHCT86G-D14-R	DIP-14	Tube
U74AHCT86L-S14-R	U74AHCT86G-S14-R	SOP-14	Tape Reel

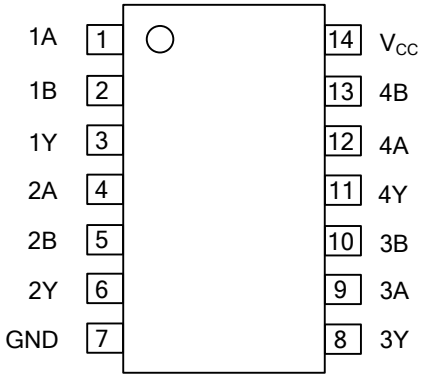
U74AHCT86G-D14-R

(1)Packing Type	(1) T: Tube, R: Tape Reel
(2)Package Type	(2) D14: DIP-14, S14: SOP-14
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

DIP-14	SOP-14
	

■ PIN CONFIGURATION

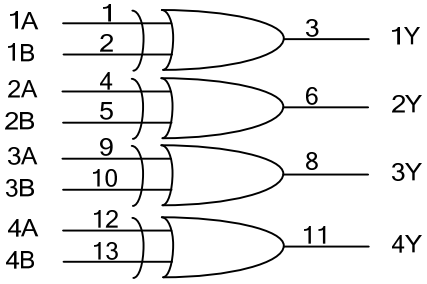


■ FUNCTION TABLE

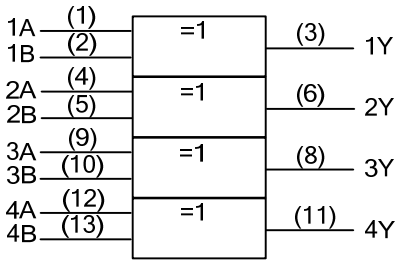
INPUT(nA)	INPUT(nB)	OUTPUT(nY)
H	H	L
H	L	H
L	H	H
L	L	L

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

■ LOGIC SYMBOL



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 (V_{OUT}=0 ~ 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 (Unless otherwise specified)

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±0.5V			20	ns/V
Operating Temperature	T_A		-40		+125	°C

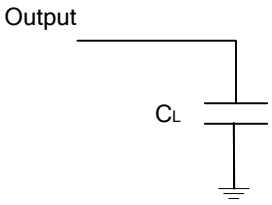
■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC} =4.5V ~ 5.5V	2.0			V
Low-Level Input Voltage	V_{IL}	V_{CC} =4.5V ~ 5.5V			0.8	V
High-Level Output Voltage	V_{OH}	V_{CC}=4.5V, I_{OH}=-50μA	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}=50μA			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

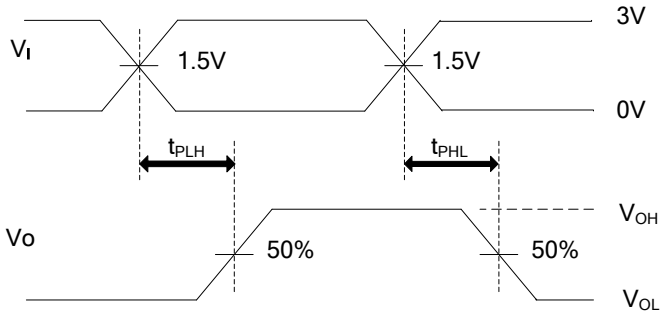
■ SWITCHING CHARACTERISTICS (see TEST CIRCUIT AND WAVEFORMS)

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±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



Load Circuit for Totem-Pole Outputs



Propagation Delay Times

Note: C_L includes probe and jig capacitance.
P_{RR} ≤1MHz, Zo = 50Ω, t_R ≤3ns, t_F ≤3ns.