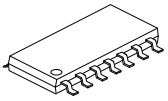
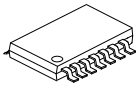
U74AC32

CMOS IC

QUADRUPLE 2-INPUT POSITIVE-OR GATE



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74AC32** is a quad 2-input positive-OR gate. The device performs the Boolean function Y=A+B or $Y = \overline{\overline{A} \bullet \overline{B}}$ in positive logic.

■ FEATURES

* Operation Voltage Range: 2~6V
* Inputs Accept Voltages to 6V
* Max t_{pd} of 7.5 ns at 5V

■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74AC32G-S14-R	SOP-14	Tape Reel
U74AC32G-P14-R	TSSOP-14	Tape Reel

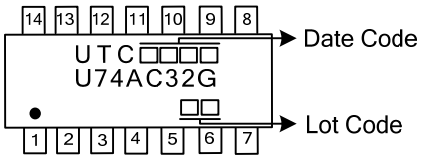
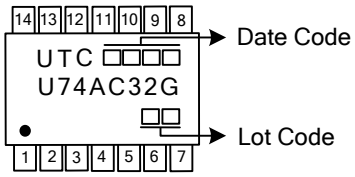
U74AC32G-S14-R
- (1)Packing Type
- (2)Packing Type
- (3)Green Package

(1) R: Tape Reel

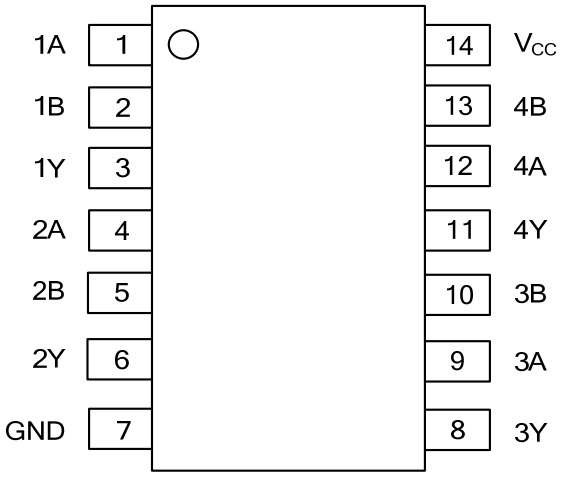
(2) S14: SOP-14, P14: TSSOP-14

(3) G: Halogen Free and Lead Free

■ MARKING

SOP-14	TSSOP-14
	

■ PIN CONFIGURATION



■ FUNCTION TABLE(EACH GATE)

INPUTS		OUTPUT
A	B	Y
H	X	H
X	H	H
L	L	L

L: low voltage level; H: high voltage level; X: don't care

■ LOGIC DIAGRAM,EACH GATE (POSITIVE LOGIC)

■ ABSOLUTE MAXIMUM RATING (unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7.0	V
Input Voltage	V_{IN}	-0.5~Vcc+0.5	V
Output Voltage	V_{OUT}	-0.5~V_{CC}+0.5	V
Input Clamp Current (V_I<0 or V_I>V_{CC})	I_{IK}	±20	mA
Output Clamp Current (V_O<0 or V_O>V_{CC})	I_{OK}	±20	mA
Output Current(V_O=0 to V_{CC})	I_{OUT}	±50	mA
Continuous current through V_{CC} or GND	I_{CC}	±200	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.

■ THERMAL DATA

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

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	2		6	V
Input Voltage	V_{IN}	0		Vcc	V
Output Voltage	V_{OUT}	0		Vcc	V
Operating free-air temperature	T_A	-40		85	°C
Input Transition Rise or Fall Rate	Δt/Δv			8	ns/V

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
HIGH-level input voltage	V_{IH}	V_{CC}=3V	2.1			V
		V_{CC}=4.5V	3.15			
		V_{CC}=5.5V	3.85			
LOW-lever output voltage	V_{IL}	V_{CC}=3V			0.9	V
		V_{CC}=4.5V			1.35	
		V_{CC}=5.5V			1.65	
High-Level Output Voltage	V_{OH}	V_{CC}=3V, I_{OH}=-50μA	2.9			V
		V_{CC}=4.5V, I_{OH}=-50μA	4.4			
		V_{CC}=5.5V, I_{OH}=-50μA	5.4			
		V_{CC}=3V, I_{OH}=-12mA	2.56			
		V_{CC}=4.5V, I_{OH}=-24mA	3.86			
		V_{CC}=5.5V, I_{OH}=-24mA	4.86			
Low-Level Output Voltage	V_{OL}	V_{CC}=3V, I_{OH}=50μA		0.002	0.1	V
		V_{CC}=4.5V, I_{OH}=50μA		0.001	0.1	
		V_{CC}=5.5V, I_{OH}=50μA		0.001	0.1	
		V_{CC}=3V, I_{OH}=12mA			0.36	
		V_{CC}=4.5V, I_{OH}=24mA			0.36	
		V_{CC}=5.5V, I_{OH}=24mA			0.36	
Input Leakage Current	I_I	V_I=V_{CC} or GND, V_{CC}=5.5V			±0.1	μA
Quiescent Supply Current	I_{CC}	V_I=GND or V_{CC}, I_O=0, V_{CC}=5.5V			2	μA
Input Capacitance	C_I	V_I=V_{CC} or GND, V_{CC}=5V		2.6		pF

■ DYNAMIC CHARACTERISTICS

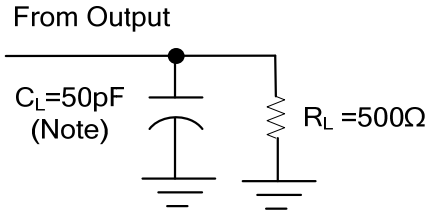
(C_L=50pF, R_L=500Ω, T_A=25°C, unless otherwise specified) (see Figure 1)

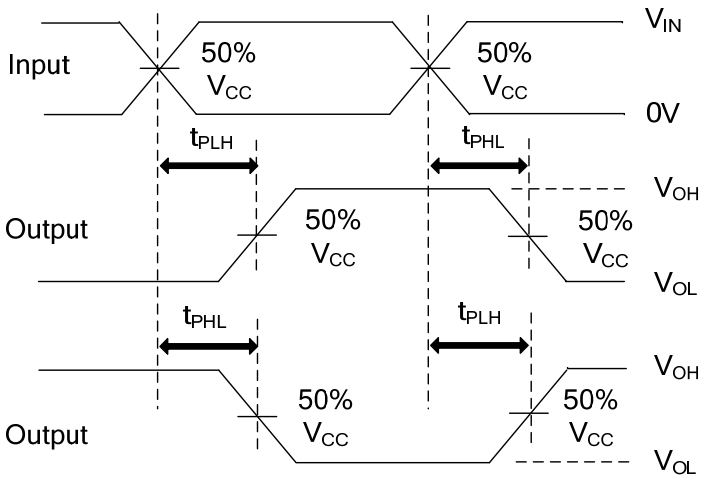
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}	V_{CC}=3.3V±0.3V	1.5	7	9	ns
		V_{CC}=5V±0.5V	1.5	5.5	7.5	ns
	t_{PHL}	V_{CC}=3.3V±0.3V	1.5	7	8.5	ns
		V_{CC}=5V±0.5V	1.5	5	7	ns

■ OPERATING CHARACTERISTICS (V_{CC}=5V,T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	C_L=50pF, f =1MHz		40		pF

■ TEST CIRCUIT AND WAVEFORMS





PROPAGATION DELAY TIMES

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR≤1MHZ, Z_O=50Ω, tr≤2.5ns,tf≤2.5ns.
3. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms