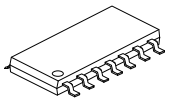
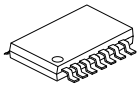
U74AHC132

CMOS IC

QUADRUPLE POSITIVE-NAND GATES WITH SCHMITT-TRIGGER INPUTS



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74AHC132** is a device is a quadruple positive NAND gate designed for 2V to 5.5V V_{CC} operation. This device performs the Boolean function $Y=\overline{A \times B}$ or $Y=\overline{A}+\overline{B}$ in positive logic.

■ FEATURES

* Operate from 2V to 5.5V
* Operation form very slow input transitions
* Temperature-Compensated threshold levels
* Balanced propagation delays

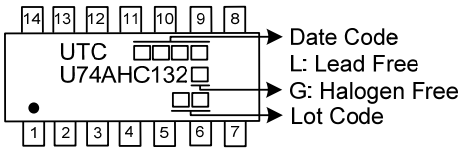
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC132L-S14-R	U74AHC132G-S14-R	SOP-14	Tape Reel
U74AHC132L-P14-R	U74AHC132G-P14-R	TSSOP-14	Tape Reel

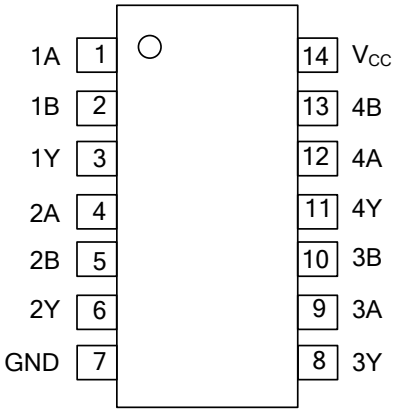
U74AHC132G-S14-R
(1)Packing Type
(2)Package Type
(3)Green Package

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

■ MARKING



■ PIN CONFIGURATION

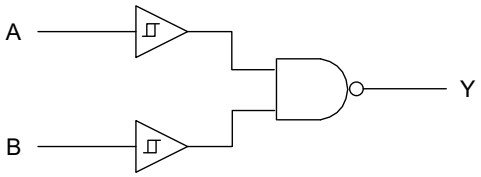


■ FUNCTION TABLE

INPUT(A)	INPUT(B)	OUTPUT(Y)
H	H	L
L	X	H
X	L	H

H = High voltage level；L = Low voltage level；X = Don't care

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ 7	V
Input Voltage	V_{IN}	V_{OUT}<0 or V_{OUT}>V_{CC}	-0.5 ~ 7	V
Output Voltage	V_{OUT}		-0.5 ~ V_{CC}+0.5	V
Continuous Current through V_{CC} or GND	I_{CC}		±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0	-20	mA
Output Clamp Current	I_{OK}	V_{OUT} < 0 or V_{OUT} > V_{CC}	±20	mA
Continuous Output Current	I_{OUT}	V_{OUT} < 0 or V_{CC}	±25	mA
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.

■ RECOMMENDED OPERATING COMDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Operating Temperature	T_A		-40		+125	°C

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		T_A=25°C			T_A=-40~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V_{T+}	V_{CC} =3.0V		1.2		2.2	1.2		2.2	V
		V_{CC} =4.5V		1.75		315	1.75		3.15	V
		V_{CC} =5.5V		2.15		3.85	2.15		3.85	V
Negative-Going Input Threshold Voltage	V_{T-}	V_{CC} =3.0V		0.9		1.9	0.9		1.9	V
		V_{CC} =4.5V		1.35		2.75	1.35		2.75	V
		V_{CC} =5.5V		1.65		3.35	1.65		3.35	V
Hysteresis (V_{T+}-V_{T-})	ΔV_T	V_{CC} =3.0V		0.3		1.2	0.25		1.2	V
		V_{CC} =4.5V		0.4		1.4	0.35		1.4	V
		V_{CC} =5.5V		0.5		1.6	045		1.6	V
High-Level Output Voltage	V_{OH}	V_{CC}=2V	I_{OH}=-50μA	1.9	2.0		1.9			V
		V_{CC}=3V		2.9	3.0		2.9			V
		V_{CC}=4.5V		4.4	4.5		4.4			V
		V_{CC}=3V, I_{OH}=-4mA		2.58			2.4			V
		V_{CC}=4.5V, I_{OH}=-8mA		3.94			3.7			V
Low-Level Output Voltage	V_{OL}	V_{CC}=2V	I_{OL}=50μA			0.1			0.1	V
		V_{CC}=3V				0.1			0.1	V
		V_{CC}=4.5V				0.1			0.1	V
		V_{CC}=3V, I_{OL}=4mA				0.36			0.55	V
		V_{CC}=4.5V, I_{OL}=8mA				0.36			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0~5.5V, V_{IN}=5.5V or GND				±0.1			±2	μA
Quiescent Supply Current	I_Q	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0A				2			40	μA

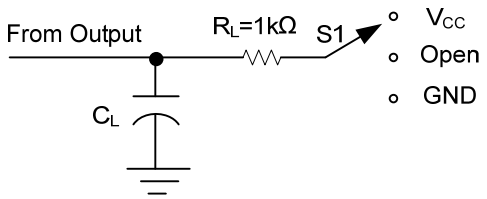
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		T_A=25°C			T_A=-40~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A or B) to Output (Y)	t_{PLH} / t_{PHL}	V_{CC}=3.3V±0.3V	C_L=15pF		5.6	11.9	1		15	ns
			C_L=50pF		8.8	15.4	1		19.5	ns
		V_{CC}=5V±0.5V	C_L=15pF		3.9	7.7	1		10	ns
			C_L=50pF		5.2	9.7	1		12.5	ns

■ OPERATING CHARACTERISTICS (Unless otherwise specified)

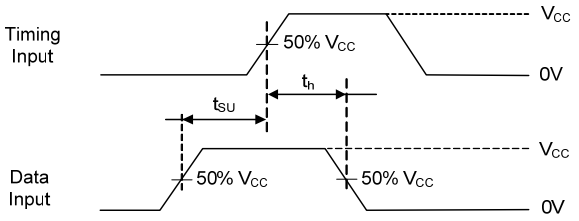
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC}=5.0V, V_{IN}=V_{CC} or GND		1.9	10	pF
Power Dissipation Capacitance Per Flip-Flop	C_{PD}	V_{CC}=5V, f=1MHz, No load.		11		pF

■ TEST CIRCUIT AND WAVEFORMS

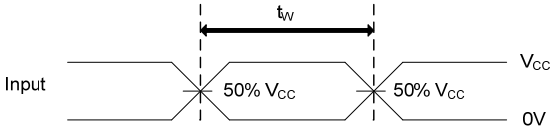


TEST	S1
t_{PLZ}/t_{PZL}	V_{CC}
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
Open Drain	V_{CC}

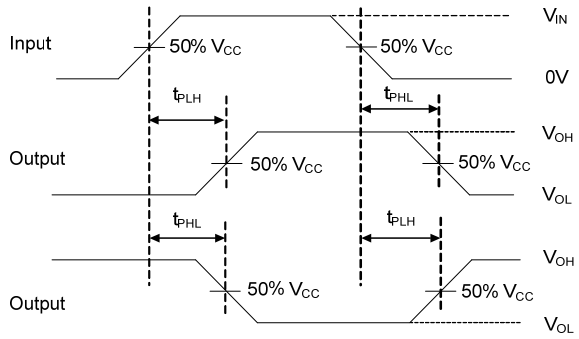
TEST CIRCUIT



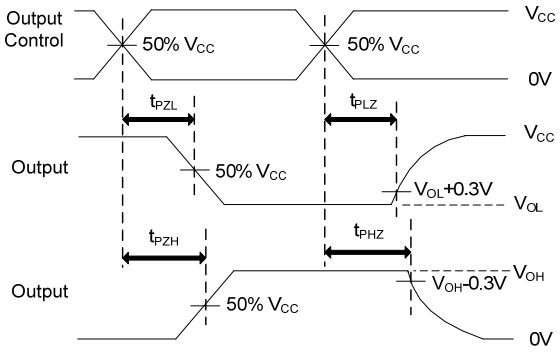
SETUP TIME AND HOLD TIME



PULSE WIDTH



PROPAGATION DELAY TIMES



ENABLE AND DISABLE 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,