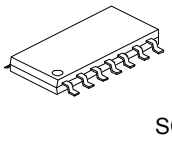
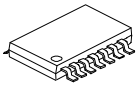
U74LVC00A

CMOS IC

QUAD 2-INPUT NAND GATE



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74LVC00A** is a quad 2-input NAND gate which performs the Function $Y=\overline{A \bullet B}$ or $Y=\overline{A}+\overline{B}$ in positive logic circuit.

This device has power-down protective circuit to prevent the device from destruction when it is powered down.

■ FEATURES

* Operate From 1.65V to 3.6V
* Inputs Accept Voltages to 5.5V
* High Noise Immunity
* Low Power Dissipation
* Max t_{PD} of 5 ns at 3.3V

■ ORDERING INFORMATION

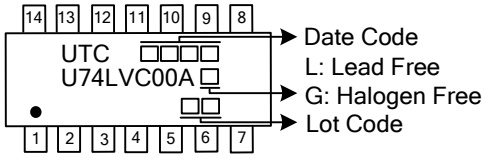
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC00AL-S14-R	U74LVC00AG-S14-R	SOP-14	Tape Reel
U74LVC00AL-P14-R	U74LVC00AG-P14-R	TSSOP-14	Tape Reel

U74LVC00AG-S14-R
(1)Packing Type
(2)Package Type
(3)Green Package

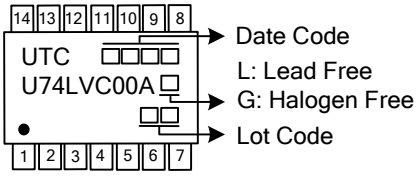
(1) R: Tape Reel
(2) S14: SOP-14, P14: TSSOP-14
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

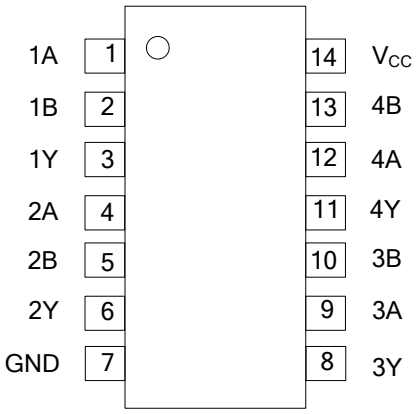
SOP-14



TSSOP-14



■ PIN CONFIGURATION

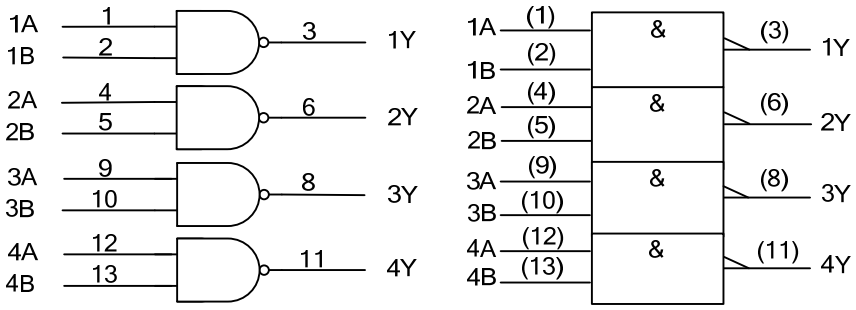


■ FUNCTION TABLE

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

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

■ LOGIC DIAGRAM (Positive Logic)



Logic Symbol IEC Logic Symbol

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 6.5	V
Input Voltage	V_{IN}	-0.5 ~ 6.5	V
Output Voltage	V_{OUT}	-0.5 ~ V_{CC}+0.5	V
V_{CC} or GND Current (Output In The Power-Off State)	I_{CC}	±100	mA
Continuous Output Current (V_{OUT}=0 to V_{CC})	I_{OUT}	±50	mA
Input Clamp Current (V_{IN}<0)	I_{IK}	-50	mA
Output Clamp Current (V_{OUT}<0 or V_{OUT}>V_{CC})	I_{OK}	-50	mA
Power Dissipation	P_D	500	mW
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 CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		3.6	V
High-Level Input Voltage	V_{IH}	V_{CC}=1.65V to 1.95V	0.65×V_{CC}			V
		V_{CC}=2.3V to 2.7V	1.7			
		V_{CC}=2.7V to 3.6V	2			
Low-Level Input Voltage	V_{IL}	V_{CC}=1.65V to 1.95V			0.35×V_{CC}	V
		V_{CC}=2.3V to 2.7V			0.7	
		V_{CC}=2.7V to 3.6V			0.8	
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Operating Ambient Temperature	T_A		-40		+125	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	I_{OH}=-100μA, V_{CC}=1.65V to 3.6V		V_{CC}-0.2			V
		I_{OH}=-4mA, V_{CC}=1.65V		1.2			V
		I_{OH}=-8mA, V_{CC}=2.3V		1.7			V
		I_{OH}=-12mA	V_{CC}=2.7V	2.2			V
			V_{CC}=3V	2.4			
		I_{OH}=-24mA	V_{CC}=3.0V	2.2			V
Low-Level Output Voltage	V_{OL}	I_{OL}=100μA, V_{CC}=1.65V to 3.6V				0.2	V
		I_{OL}=4mA, V_{CC}=1.65V				0.45	
		I_{OL}=8mA, V_{CC}=2.3V				0.7	
		I_{OL}=12mA, V_{CC}=2.7V				0.4	V
		I_{OL}=24mA, V_{CC}=3.0V				0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{IN}=5.5V or GND, V_{CC}=3.6V				±5	μA
Quiescent Supply Current	I_Q	V_{IN}=V_{CC} or GND, I_{OUT}=0, V_{CC}=3.6V				10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_Q	V_{CC}=2.7 ~ 3.6V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND, I_{OUT}=0				500	μA
Input Capacitance	C_{IN}	V_{IN}=V_{CC} or GND			5		pF

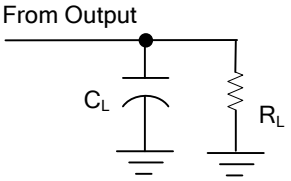
■ SWITCHING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation Delay From Input (nA or nB) To Output(nY)	t_{PD}	V_{CC}=2.7V, R_L=500Ω	C_L=50pF			5.1	ns
		V_{CC}=3.3±0.3V, R_L=500Ω		1		4.3	ns

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

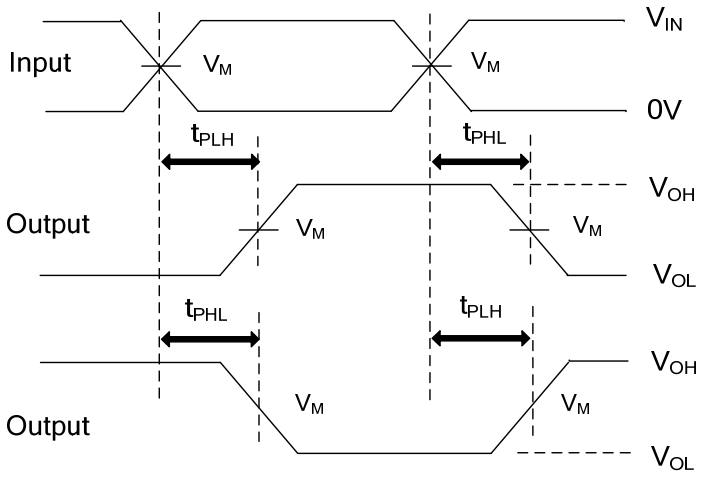
PARAMETER	SYMBOL	TEST CONDITIONS	TYP	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=3.3V±0.3V, C_L=50pF,f=10MHz	9.5	pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	INPUTS		V_M	C_L	R_L
	V_{IN}	t_R / t_F			
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	1KΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
3.3V±0.3V	2.7V	≤2.5ns	1.5V	50pF	500Ω



PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.
All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Zo = 50Ω.