



U74LVC2G02

CMOS IC

DUAL 2-INPUT POSITIVE-NOR GATE

DESCRIPTION

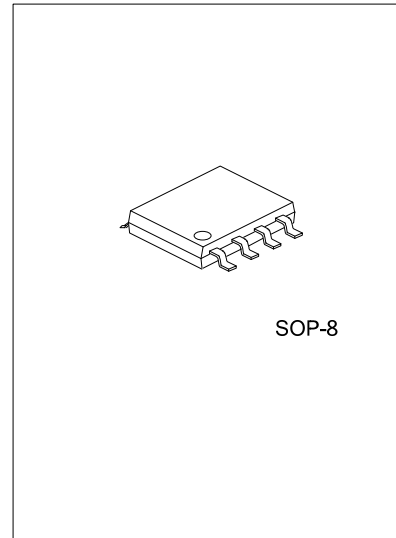
The UTC **U74LVC2G02** is a dual 2-input positive-NOR gate which provides the function $Y = \overline{A+B}$ or $Y = \overline{A} + \overline{B}$.

This device has power-down protective circuit, preventing device destruction when it is powered down.

FEATURES

- * Operation Voltage Range: 1.65~5.5V
- * Low Power Dissipation: $I_{CC} = 10\mu A$ (Max)
- * High Speed: $t_{pd} = 4.9ns$ ($V_{CC} = 3.3V$)
- * Specified from -40 to +85°C

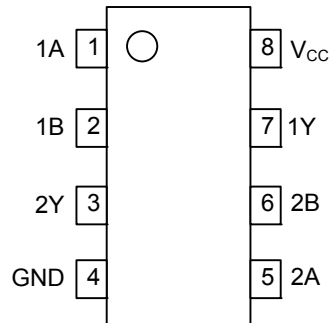
ORDERING INFORMATION



Ordering Number		Package	Packing
Lead Free Plating	Halogen Free		
U74LVC2G02L-S08-R	U74LVC2G02G-S08-R	SOP-8	Tape Reel
U74LVC2G02L-S08-T	U74LVC2G02G-S08-T	SOP-8	Tube

<p>U74LVC2G02G-S08-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) S08: SOP-8 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
--	---

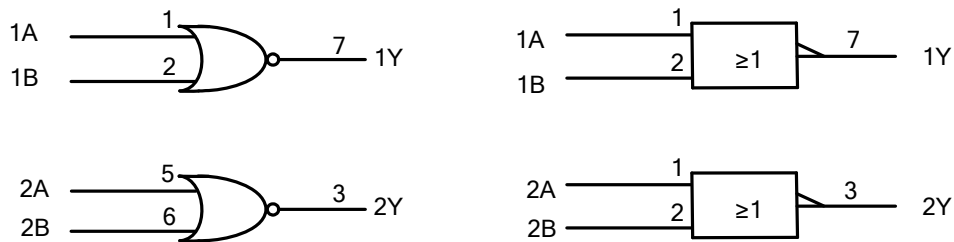
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified) (Note 1)

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
Input Clamp Current	I_{IK}	-50	mA
Output Clamp Current	I_{OK}	-50	mA
Output Current	I_{OUT}	± 50	mA
V_{CC} or GND Current	I_{CC}	± 100	mA
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		1.65	3.3	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	t_R, t_F	$V_{CC}=1.8V\pm 0.15V, 2.5V\pm 0.2V$			20	ns/V
		$V_{CC}=3.3V\pm 0.3V$			10	
		$V_{CC}=5V\pm 0.5V$			5	
Operating Temperature	T_A		-40	25	85	$^\circ\text{C}$

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=1.65V$ to $1.95V$	$0.65 \cdot V_{CC}$			V
		$V_{CC}=2.3V$ to $2.7V$	1.7			
		$V_{CC}=3V$ to $3.6V$	2			
		$V_{CC}=4.5V$ to $5.5V$	$0.7 \cdot V_{CC}$			
Low-Level Input Voltage	V_{IL}	$V_{CC}=1.65V$ to $1.95V$			$0.35 \cdot V_{CC}$	V
		$V_{CC}=2.3V$ to $2.7V$			0.7	
		$V_{CC}=3V$ to $3.6V$			0.8	
		$V_{CC}=4.5V$ to $5.5V$			$0.3 \cdot V_{CC}$	
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65$ to $5.5V, I_{OH}=-100\mu A$	$V_{CC}-0.1$			V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.9			
		$V_{CC}=3V, I_{OH}=-16mA$	2.4			
		$V_{CC}=3V, I_{OH}=-24mA$	2.3			
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65$ to $5.5V, I_{OL}=100\mu A$			0.1	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OL}=8mA$			0.3	
		$V_{CC}=3V, I_{OL}=16mA$			0.4	
		$V_{CC}=3V, I_{OL}=24mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0$ to $5.5V, V_{IN}=5.5V$ or GND			± 5	μA
		$V_{CC}=0V, V_{IN}$ or $V_O=5.5V$			± 10	μA

■ STATIC CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Supply Current		$V_{CC}=1.65$ to $5.5V$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	$V_{CC}=3$ to $5.5V$, One input at $V_{CC}-0.6V$, Other inputs at V_{CC} or GND			500	μA
Input Capacitance	C_{IN}	$V_{CC}=3.3V$, $V_{IN}=V_{CC}$ or GND		5		pF

■ DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Input (A or B) to Output(Y)	t_{PHL} / t_{PLH}	$V_{CC} = 1.8V \pm 0.15V$, $C_L = 30$ pF, $R_L = 1K\Omega$	3.2		8.9	ns
		$V_{CC} = 2.5V \pm 0.2V$, $C_L = 30$ pF, $R_L = 500\Omega$	1		5.4	
		$V_{CC} = 3.3V \pm 0.3V$, $C_L = 50$ pF, $R_L = 500\Omega$	1		4.9	
		$V_{CC} = 5V \pm 0.5V$, $C_L = 50$ pF, $R_L = 500\Omega$	1		4.4	

Note: See Fig. 1 and Fig. 2 for test circuit and waveforms.

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Cpd Power Dissipation Capacitance	C_{PD}	$V_{CC}=3.3V$, $f=10MHz$		19		pF

■ TEST CIRCUIT AND WAVEFORMS(Cont.)

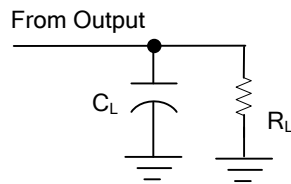


Fig.1 TEST CIRCUIT

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
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	50pF	500Ω

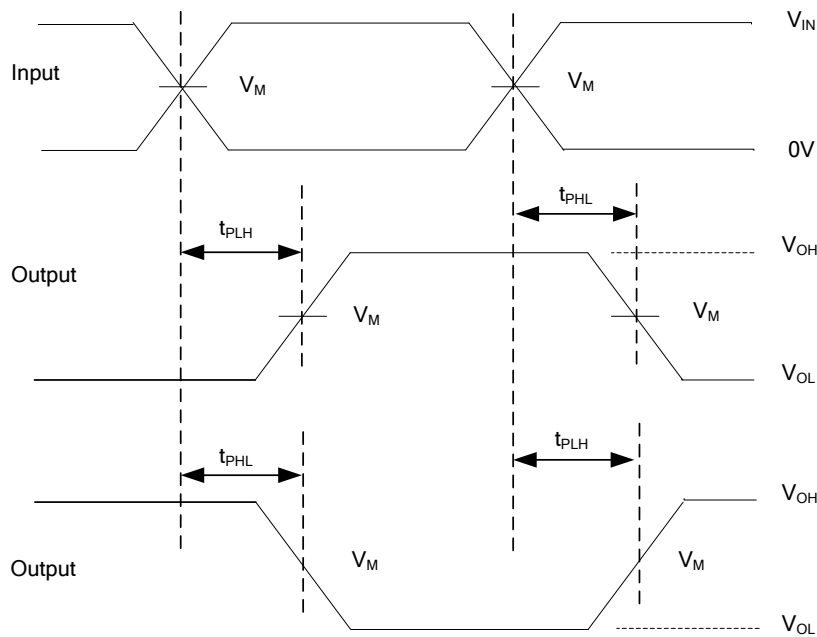


Fig.2 PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_o = 50Ω.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.