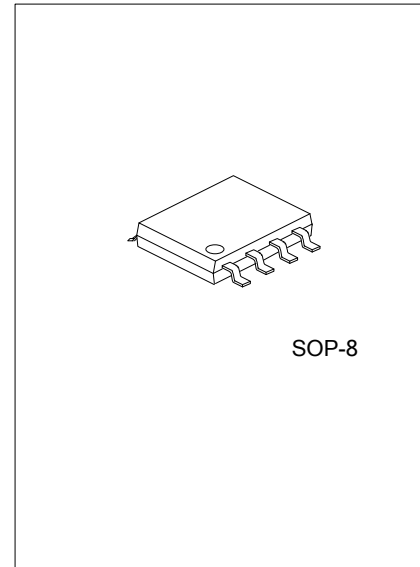




U74LVC2G132

CMOS IC

DUAL 2-INPUT NAND GATE WITH SCHMITT-TRIGGER INPUTS



DESCRIPTION

The **U74LVC2G132** is a dual 2-input NAND gate with Schmitt-trigger inputs circuit and it contains two inverters that perform the function $Y = \overline{A \bullet B}$ or $Y = \overline{A} + \overline{B}$

The device have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

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

FEATURES

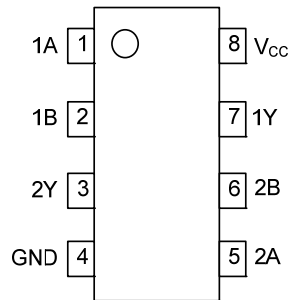
- * Operate from 1.65V to 5.5V
- * Inputs accept voltages to 5.5V
- * I_{off} supports partial-power-down mode
- * Low power dissipation: $I_{CC} = 10\mu A$ (Max)
- * Max t_{PD} of 5.3 ns at 3.3V
- * $\pm 24mA$ output drive ($V_{CC} = 3.3V$)

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free Plating	Halogen Free		
U74LVC2G132L-S08-R	U74LVC2G132G-S08-R	SOP-8	Tape Reel
U74LVC2G132L-S08-T	U74LVC2G132G-S08-T	SOP-8	Tube

<p>U74LVC2G132G-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

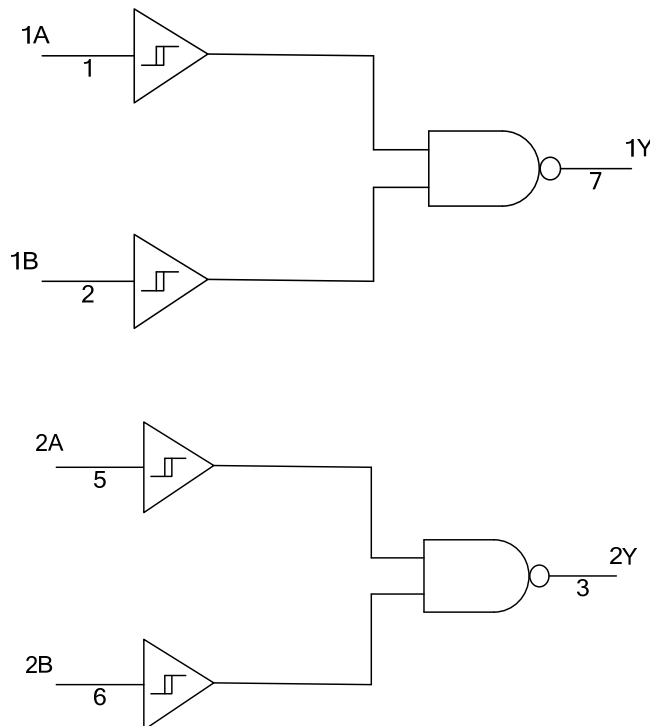


■ FUNCTION TABLE (EACH GATE)

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

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

■ LOGIC DIAGRAM (positive logic)



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	Output in the high or low state	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	V
	Output in the high-impedance or power-off state		-0.5 ~ +6.5	V
V_{CC} or GND Current		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 ($V_{OUT}<0$)		I_{OK}	-50	mA
Storage Temperature Range		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		5.5	V
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
High-level Output Current	I_{OH}	$V_{CC}=1.65V$			-4	mA
		$V_{CC}=2.3V$			-8	mA
		$V_{CC}=3V$			-16	mA
		$V_{CC}=3V$			-24	mA
		$V_{CC}=4.5V$			-32	mA
Low-level Output Current	I_{OL}	$V_{CC}=1.65V$			4	mA
		$V_{CC}=2.3V$			8	mA
		$V_{CC}=3V$			16	mA
		$V_{CC}=3V$			24	mA
		$V_{CC}=4.5V$			32	mA
Operating Temperature	T_A		-40		85	°C
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8V\pm 0.15V, 2.5V\pm 0.2V$			20	ns/V
		$V_{CC}=3.3V\pm 0.3V, V_{CC}=5V\pm 0.5V$			10	ns/V

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	V_{T+}	$V_{CC}=1.65V$	0.79		1.16	V
		$V_{CC}=2.3V$	1.11		1.56	
		$V_{CC}=3.0V$	1.5		1.87	
		$V_{CC}=4.5V$	2.16		2.74	
		$V_{CC}=5.5V$	2.61		3.33	
Negative-Going Input Threshold Voltage	V_{T-}	$V_{CC}=1.65V$	0.39		0.62	V
		$V_{CC}=2.3V$	0.58		0.87	
		$V_{CC}=3.0V$	0.84		1.14	
		$V_{CC}=4.5V$	1.41		1.79	
		$V_{CC}=5.5V$	1.87		2.29	
Hysteresis Voltage ($V_{T+}-V_{T-}$)	ΔV_T	$V_{CC}=1.65V$	0.37		0.62	V
		$V_{CC}=2.3V$	0.48		0.77	
		$V_{CC}=3.0V$	0.56		0.87	
		$V_{CC}=4.5V$	0.71		1.04	
		$V_{CC}=5.5V$	0.71		1.11	

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	$V_{CC}=1.65V \sim 5.5V, I_{OH}=-100\mu A$	$V_{CC}-0.1$			V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.9			
		$V_{CC}=3.0V, I_{OH}=-16mA$	2.4			
		$V_{CC}=3.0V, I_{OH}=-24mA$	2.3			
		$V_{CC}=4.5V, I_{OH}=-32mA$	3.8			
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65V \sim 5.5V, I_{OH}=100\mu A$			0.1	V
		$V_{CC}=1.65V, I_{OH}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OH}=8mA$			0.3	
		$V_{CC}=3.0V, I_{OH}=16mA$			0.4	
		$V_{CC}=3.0V, I_{OH}=24mA$			0.55	
		$V_{CC}=4.5V, I_{OH}=32mA$			0.55	
Input Leakage Current (A or B port)	$I_{I(LEAK)}$	$V_{CC}=1.65V \sim 5.5V, V_{IN}=V_{CC}$ or GND			± 1	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_{OUT}=5.5V$			± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=1.65V \sim 5.5V, V_{IN}=5.5V$ or GND, $I_{OUT}=0$			10	μA
Additional Quiescent Supply Current	ΔI_Q	$V_{CC}=3V \sim 5.5V$, 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		3.5		pF

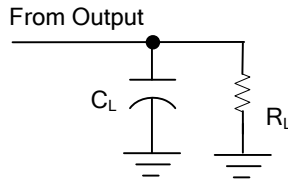
■ SWITCHING CHARACTERISTICS ($T_A=25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	$V_{CC}=1.8V \pm 0.15V, C_L=15pF$	4		16	ns
		$V_{CC}=1.8V \pm 0.15V, C_L=30pF$	4		16	ns
		$V_{CC}=2.5V \pm 0.2V, C_L=15pF$	2.5		7	ns
		$V_{CC}=2.5V \pm 0.2V, C_L=30pF$	3		7.5	ns
		$V_{CC}=3.3V \pm 0.3V, C_L=15pF$	2		5.3	ns
		$V_{CC}=3.3V \pm 0.3V, C_L=50pF$	2		6	ns
		$V_{CC}=5V \pm 0.5V, C_L=15pF$	1.5		4.4	ns
		$V_{CC}=5V \pm 0.5V, C_L=50pF$	2		5	ns

■ OPERATING CHARACTERISTICS ($T_A=25^\circ C$)

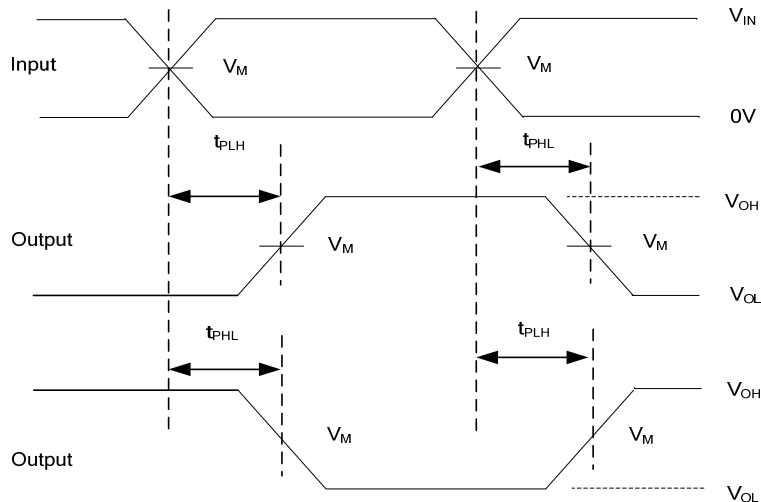
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC}=3.3V, f=10MHz$		18		pF

■ 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	$V_{CC}/2$	15pF/30pF	1MΩ/1KΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	15pF/30pF	1MΩ/500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF/50pF	1MΩ/500Ω
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	15pF/50pF	1MΩ/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, $Z_o = 50\Omega$.

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.