



U74LVC2G132B

CMOS IC

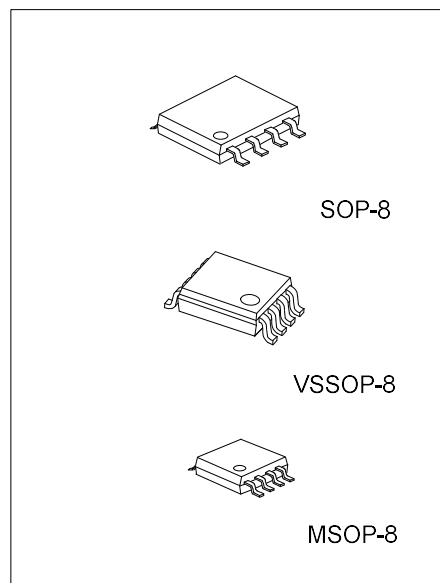
DUAL 2-INPUT NAND GATE WITH SCHMITT-TRIGGER INPUTS

■ DESCRIPTION

The **U74LVC2G132B** 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 7.3 ns at 3.3V
- * $\pm 24mA$ output drive ($V_{CC} = 3.3V$)
- * Green Product

■ ORDERING INFORMATION

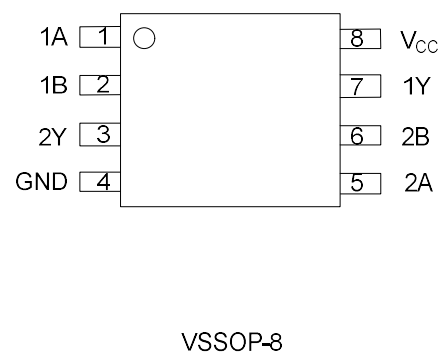
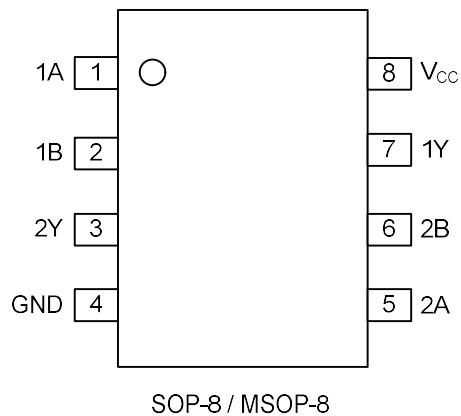
Ordering Number	Package	Packing
U74LVC2G132BG-S08-R	SOP-8	Tape Reel
U74LVC2G132BG-SM1-R	MSOP-8	Tape Reel
U74LVC2G132BG-V08-R	VSSOP-8	Tape Reel

U74LVC2G132BG-S08-R	(1) Packing Type	(1) R: Tape Reel
	(2) Package Type	(2) S08: SOP-8, SM1: MSOP-8, V08: VSSOP-8
	(3) Green Package	(3) G: Halogen Free and Lead Free

MARKING

SOP-8 / MSOP-8	VSSOP-8

PIN CONFIGURATION

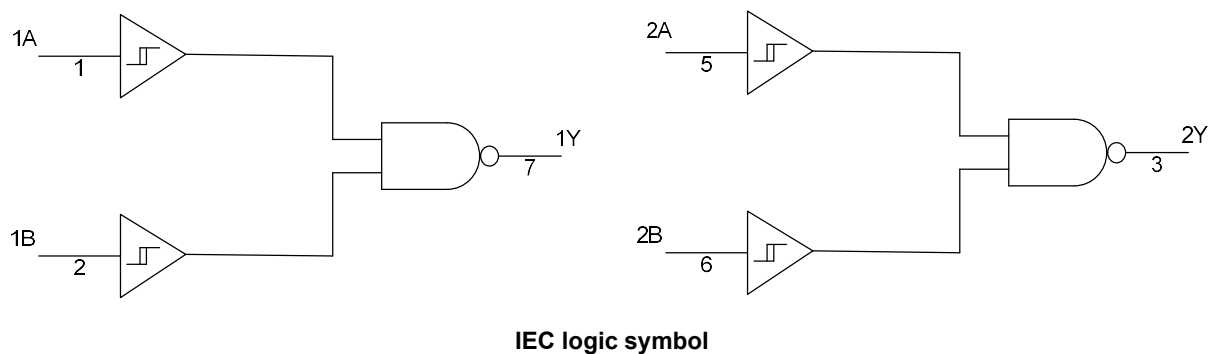


FUNCTION TABLE (EACH GATE)

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)



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V _{CC}		-0.5 ~ +6.5	V
Input Voltage	V _{IN}		-0.5 ~ +6.5	V
Output Voltage	V _{OUT}	Output in the high or low state	-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	I _{OUT}	V _{OUT} =0 to V _{CC}	±50	mA
Input Clamp Current	I _{IK}	V _{IN} < 0	-50	mA
Output Clamp Current	I _{OK}	V _{OUT} < 0	-50	mA
Storage Temperature Range	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. It's guarantee by design, this parameter is not production tested.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	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		+125	°C

Note: It's guarantee by design, this parameter is not production tested.

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

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V _{T+}	V _{CC} =1.65V	0.79		1.16	0.79		1.26	V
		V _{CC} =2.3V	1.11		1.56	1.11		1.76	V
		V _{CC} =3.0V	1.5		1.87	1.5		1.97	V
		V _{CC} =4.5V	2.16		2.74	2.16		2.94	V
		V _{CC} =5.5V	2.61		3.33	2.61		3.53	V
Negative-Going Input Threshold Voltage	V _{T-}	V _{CC} =1.65V	0.39		0.62	0.39		0.82	V
		V _{CC} =2.3V	0.58		0.87	0.58		1.07	V
		V _{CC} =3.0V	0.84		1.14	0.84		1.34	V
		V _{CC} =4.5V	1.41		1.79	1.41		1.99	V
		V _{CC} =5.5V	1.87		2.29	1.87		2.49	V
Hysteresis Voltage (V _{T+} -V _{T-})	ΔV _T	V _{CC} =1.65V	0.37		0.62	0.37		0.82	V
		V _{CC} =2.3V	0.48		0.77	0.48		0.97	V
		V _{CC} =3.0V	0.56		0.87	0.56		1.07	V
		V _{CC} =4.5V	0.71		1.04	0.71		1.24	V
		V _{CC} =5.5V	0.71		1.11	0.71		1.21	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65V ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1			V _{CC} -0.1			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2			0.95			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9			1.7			V
		V _{CC} =3.0V, I _{OH} =-16mA	2.4			2.1			V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3			2.0			V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8			3.4			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65V ~ 5.5V, I _{OL} =100μA			0.1			0.1	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45			0.45	V
		V _{CC} =2.3V, I _{OL} =8mA			0.3			0.3	V
		V _{CC} =3.0V, I _{OL} =16mA			0.4			0.4	V
		V _{CC} =3.0V, I _{OL} =24mA			0.55			0.65	V
		V _{CC} =4.5V, I _{OL} =32mA			0.55			0.65	V
Input Leakage Current (A or B port)	I _{I(LEAK)}	V _{CC} =1.65V ~ 5.5V, V _{IN} =V _{CC} or GND			±1			±1	μA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V			±10			±10	μA
Quiescent Supply Current	I _Q	V _{CC} =1.65V ~ 5.5V, V _{IN} =5.5V or GND, I _{OUT} =0			10			10	μA
Additional Quiescent Supply Current	ΔI _Q	V _{CC} =3V ~ 5.5V, One input at V _{CC} -0.6V, other inputs at V _{CC} or GND			500			500	μA

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

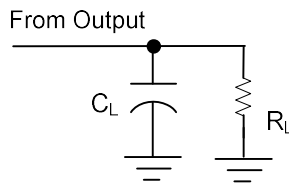
PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A or B) to Output (Y)	t _{PLH} /t _{PHL}	V _{CC} =1.8V±0.15V C _L =15pF	4		16	1		18	ns
		V _{CC} =1.8V±0.15V C _L =30pF	4		16	1		18	ns
		V _{CC} =2.5V±0.2V C _L =15pF	2.5		10	1		12	ns
		V _{CC} =2.5V±0.2V C _L =30pF	3		10.5	1		12.5	ns
		V _{CC} =3.3V±0.3V C _L =15pF	2		7.3	1		9.3	ns
		V _{CC} =3.3V±0.3V C _L =50pF	2		8	1		10	ns
		V _{CC} =5V±0.5V C _L =15pF	1.5		5.4	1		7.4	ns
		V _{CC} =5V±0.5V C _L =50pF	2		6	1		8	ns

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

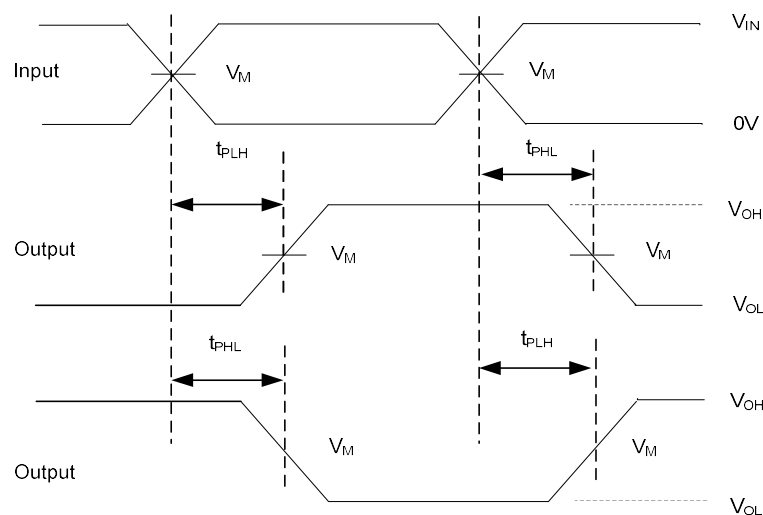
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		3.5		pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =3.3V, f=10MHz		18		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	Inputs		V_M	C_L	R_L
	V_{IN}	t_R, t_F			
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF / 30pF	1M Ω / 1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF / 30pF	1M Ω / 500 Ω
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF / 50pF	1M Ω / 500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	15pF / 50pF	1M Ω / 500 Ω



PROPAGATION DELAY TIMES

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 10MHz$, $Z_o = 50\Omega$.

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