



U74LVC1G32

CMOS IC

SINGLE 2-INPUT POSITIVE-OR GATE

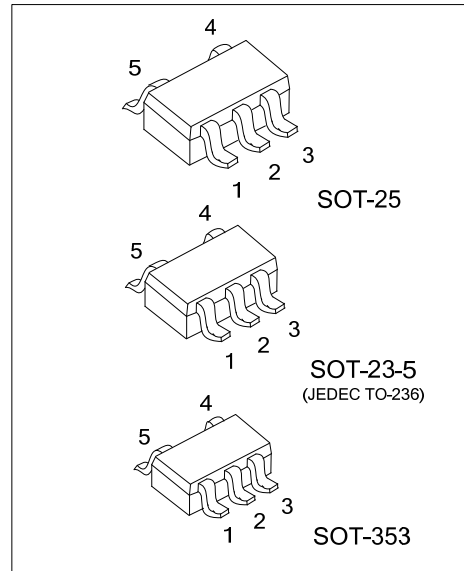
DESCRIPTION

The **U74LVC1G32** is a single 2-input OR gate which provides the Function $Y=A+B$ in positive logic circuit.

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

FEATURES

- * Operation Voltage Range: 1.6V ~ 5.5V
- * Low Power Current: $I_{CC}=10\mu A$ (Max.)
- * $\pm 24mA$ Output Drive ($V_{CC}=3.0V$)
- * Power Down Protection

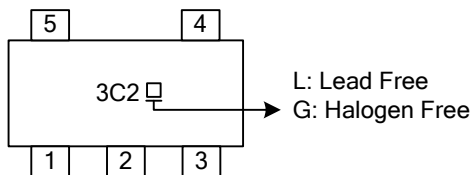


ORDERING INFORMATION

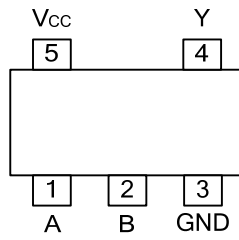
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G32L-AE5-R	U74LVC1G32G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G32L-AF5-R	U74LVC1G32G-AF5-R	SOT-25	Tape Reel
U74LVC1G32L-AL5-R	U74LVC1G32G-AL5-R	SOT-353	Tape Reel

<p>U74LVC1G32G-AF5-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

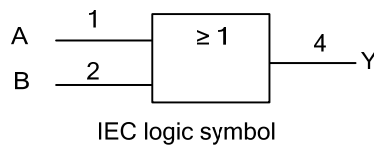
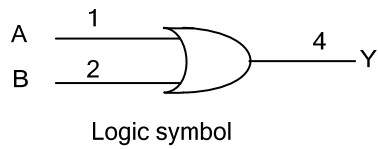


■ FUNCTION TABLE

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

Note: H: HIGH voltage level; L: LOW voltage level; X: Don't care.

■ LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	TEST 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}	$V_{OUT}=0 \sim V_{CC}$	±50	mA
Input Clamp Current	I_{IK}	$V_{IN}<0$	-50	mA
Output Clamp Current	I_{OK}	$V_{OUT}<0$	-50	mA
Operating Temperature	T_{OPR}		-40 ~ + 125	°C
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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junctions to Ambient	SOT-23-5	280	°C/W
	SOT-25	230	
	SOT-353	350	

■ 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
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8V\pm 0.15V$			20	ns/V
		$V_{CC}=2.5V\pm 0.2V$			10	ns/V
		$V_{CC}=3.3V\pm 0.3V$			5	ns/V
		$V_{CC}=5V\pm 0.5V$				
Operating Temperature	T_A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65× V _{CC}			0.65× V _{CC}			V	
		V _{CC} =2.3V ~ 2.7V	1.7			1.7			V	
		V _{CC} =3V ~ 3.6V	2			2			V	
		V _{CC} =4.5V ~ 5.5V	0.7×V _{CC}			0.7×V _{CC}			V	
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V			0.35× V _{CC}			0.35× V _{CC}	V	
		V _{CC} =2.3V ~ 2.7V			0.7			0.7	V	
		V _{CC} =3V ~ 3.6V			0.8			0.8	V	
		V _{CC} =4.5V ~ 5.5V			0.3×V _{CC}			0.3×V _{CC}	V	
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 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
			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} =1.65 ~ 5.5V, I _{OL} =100μA			0.1			0.1	V	
		V _{CC} =1.65V, I _{OL} =4mA			0.45			0.7	V	
		V _{CC} =2.3V, I _{OL} =8mA			0.3			0.45	V	
		V _{CC} =3.0V	I _{OL} =16mA			0.4			0.5	V
			I _{OL} =24mA			0.55			0.8	V
V _{CC} =4.5V, I _{OL} =32mA			0.55			0.8	V			
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0 ~ 5.5V, V _{IN} =5.5V or GND			±5			±5	μA	
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V			±10			±25	μA	
Quiescent Supply Current	I _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =5.5V or GND, I _{OUT} =0			10			10	μA	
Additional Quiescent Supply Current Per Input Pin	ΔI _Q	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND			500			500	μA	

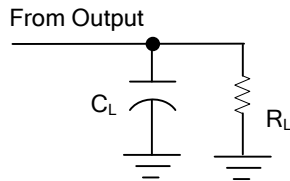
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

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) to Output (Y)	t _{PLH} / t _{PHL}	C _L =15pF, R _L =1MΩ	V _{CC} =1.8±0.15V	1.9		9			12	ns
			V _{CC} =2.5±0.2V	0.8		6.5			9	ns
			V _{CC} =3.3±0.3V	0.9		5.5			8	ns
			V _{CC} =5±0.5V	0.8		5			7	ns
		C _L =30pF, R _L =1KΩ	V _{CC} =1.8±0.15V	2.8		9.5			12.5	ns
			V _{CC} =2.5±0.2V	1.2		7.5			10	ns
			C _L =50pF, R _L =500Ω	V _{CC} =3.3±0.3V	1.1		6.5			9
V _{CC} =5±0.5V	1			6			8	ns		

■ OPERATING CHARACTERISTICS (f=10MHz, T_A=25°C, unless otherwise specified)

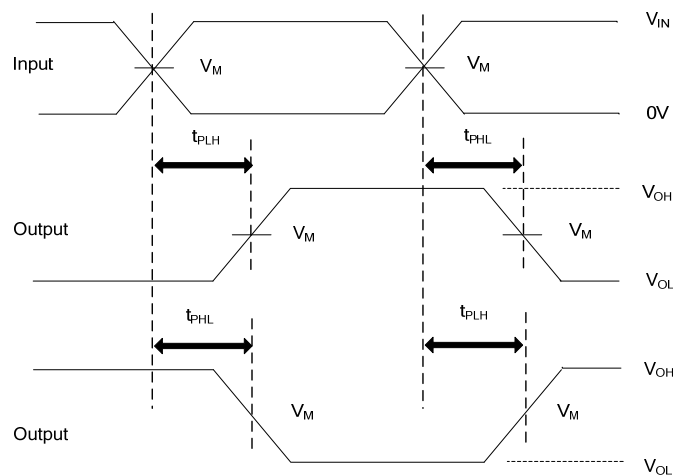
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V		20		pF
		V _{CC} =2.5V		20		pF
		V _{CC} =3.3V		21		pF
		V _{CC} =5V		22		pF

■ 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	1MΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	15pF	1MΩ
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



PROPAGATION DELAY TIMES

Notes: 1. C_L includes probe and jig capacitance.

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

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