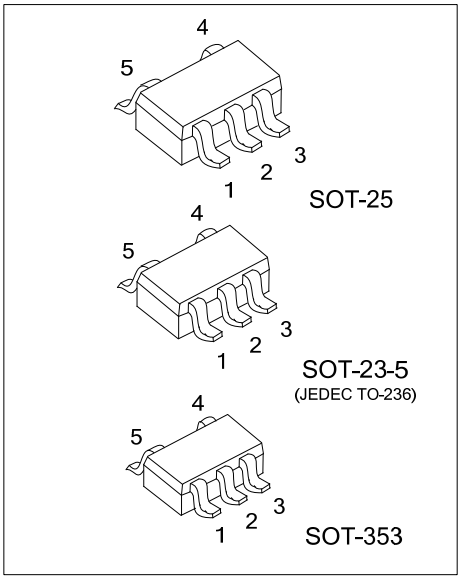
U74LVC1G32

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

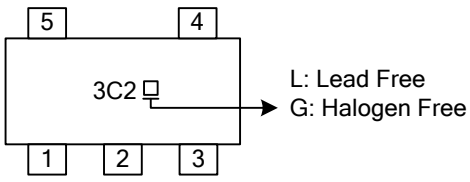
* Operation Voltage Range: 1.65V ~ 5.5V
* Low Power Current: I_{CC}=10μA (Max.)
* ±24mA Output Drive (V_{CC}=3.0V)
* Power Down Protection

■ ORDERING INFORMATION

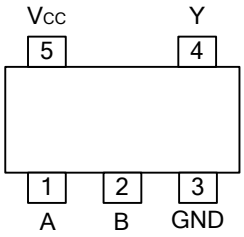
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G32L-AE5-R	U74LVC1G32G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G32L-AF5-R	U74LVC1G32G-AF5-R	SOT-25	Tape Reel
U74LVC1G32L-AL5-R	U74LVC1G32G-AL5-R	SOT-353	Tape Reel

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

■ MARKING



■ PIN CONFIGURATION

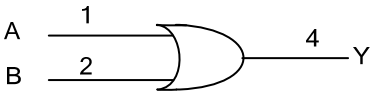


■ FUNCTION TABLE

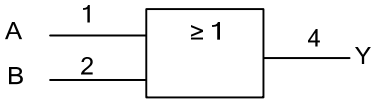
INPUT(A)	INPUT(B)	OUTPUT(Y)
H	X	H
X	H	H
L	L	L

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

■ LOGIC DIAGRAM (Positive Logic)



Logic symbol



IEC logic symbol

■ 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 ~ 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	θ_{JA}	280	°C/W
	SOT-25		230	°C/W
	SOT-353		350	°C/W
Junctions to Case	SOT-23-5	θ_{JC}	100	°C/W
	SOT-25		90	°C/W
	SOT-353		110	°C/W

■ 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±0.15V V_{CC}=2.5V±0.2V			20	ns/V
		V_{CC}=3.3V±0.3V			10	ns/V
		V_{CC}=5V±0.5V			5	ns/V
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
		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}=1.65 ~ 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
		V_{CC}=3.0V, 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

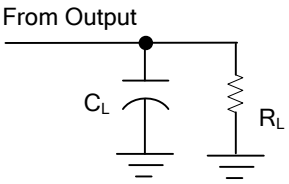
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

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
		C_L=30pF, R_L=500Ω	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	ns
			V_{CC}=5±0.5V	1		6			8	ns

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

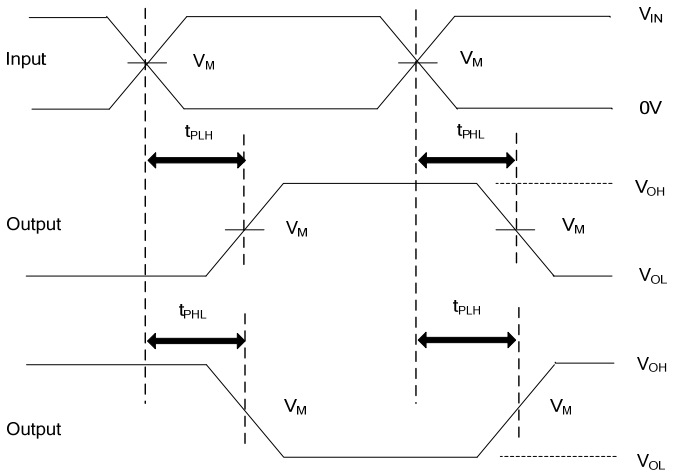
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC}=3.3V, V_{IN}=V_{CC} or GND		4		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		20		pF
		V_{CC}=2.5V		20		pF
		V_{CC}=3.3V		21		pF
		V_{CC}=5V		22		pF

■ 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} ≤10MHz, Z_O = 50Ω.