



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

- * Operate From 1.65V to 5.5V
- * Inputs Accept Voltages to 5.5V
- * I_{OFF} Supports Partial-Power-Down Mode
- * Low Power Dissipation
- * Max t_{PD} of 3.6 ns at 3.3V

ORDERING INFORMATION

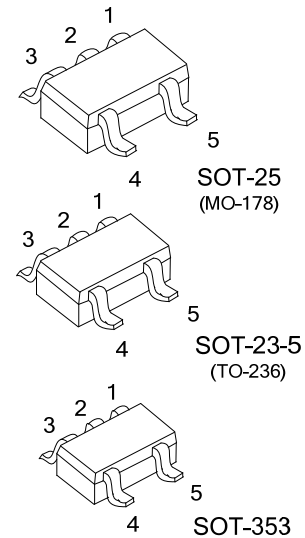
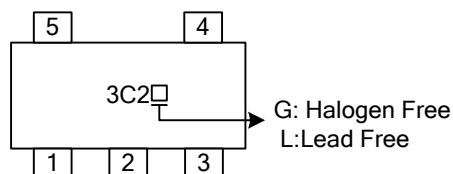
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G32L-AE5-R	U74LVC1G32G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G32L-AF5-R	U74LVC1G32G-AF5-R	SOT-25	Tape Reel
U74LVC1G32L-AL5-R	U74LVC1G32G-AL5-R	SOT-353	Tape Reel

U74LVC1G32L-AL5-R

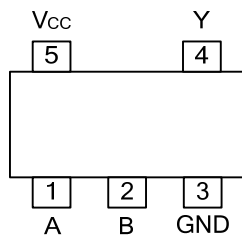
- (1) Packing Type
- (2) Package Type
- (3) Lead Free

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

MARKING



■ PIN CONFIGURATION

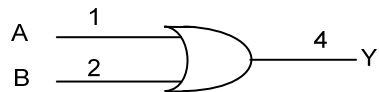


■ FUNCTION TABLE

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)



■ 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
Operating Temperature		T_{OPR}	-40 ~ + 85	°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	
	SOT-353		350	

■ 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
Input Transition Rise or Fall Rate	t_R/t_F	$V_{CC}=1.8V\pm0.15V, 2.5V\pm0.2V$			20	ns/V
		$V_{CC}=3.3V\pm0.3V$			10	ns/V
		$V_{CC}=5V\pm0.5V$			5	ns/V

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V ~ 1.95V	0.65*V _{CC}			V
		V _{CC} =2.3V ~ 2.7V	1.7			V
		V _{CC} =3V ~ 3.6V	2			V
		V _{CC} =4.5V ~ 5.5V	0.7*V _{CC}			V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V ~ 1.95V			0.35*V _{CC}	V
		V _{CC} =2.3V ~ 2.7V			0.7	V
		V _{CC} =3V ~ 3.6V			0.8	V
		V _{CC} =4.5V ~ 5.5V			0.3*V _{CC}	V
High-Level Output Voltage	V _{OH}	I _{OH} =-100μA V _{CC} =1.65 ~ 5.5V	V _{CC} -0.1			V
		I _{OH} =-4mA V _{CC} =1.65V	1.2			V
		I _{OH} =-8mA V _{CC} =2.3V	1.9			V
		I _{OH} =-16mA V _{CC} =3.0V	2.4			V
		I _{OH} =-24mA V _{CC} =3.0V	2.3			V
		I _{OH} =-32mA V _{CC} =4.5V	3.8			V
Low-Level Output Voltage	V _{OL}	I _{OL} =100μA V _{CC} =1.65 ~ 5.5V			0.1	V
		I _{OL} =4mA V _{CC} =1.65V			0.45	V
		I _{OL} =8mA V _{CC} =2.3V			0.3	V
		I _{OL} =16mA V _{CC} =3.0V			0.4	V
		I _{OL} =24mA V _{CC} =3.0V			0.55	V
		I _{OL} =32mA V _{CC} =4.5V			0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{IN} =5.5V or GND, V _{CC} =0 ~ 5.5V			± 5	μA
Power OFF Leakage Current	I _{OFF}	V _{IN} or V _{OUT} =5.5V, V _{CC} =0V			± 10	μA
Quiescent Supply Current	I _Q	V _{IN} =5.5V or GND, I _{OUT} =0 V _{CC} =1.65 ~ 5.5V			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	μA
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF

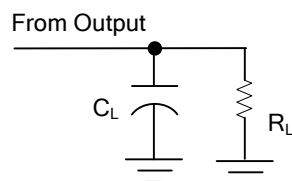
■ SWITCHING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output(Y)	t _{PLH} / t _{PHL}	V _{CC} =1.8±0.15V	1.9		7.2	ns
		V _{CC} =2.5±0.2V	0.8		4.4	ns
		V _{CC} =3.3±0.3V	0.9		3.6	ns
		V _{CC} =5±0.5V	0.8		3.4	ns
Propagation delay from input (A) to output(Y)	t _{PLH} / t _{PHL}	V _{CC} =1.8±0.15V, R _L =1KΩ	2.8		8	ns
		V _{CC} =2.5±0.2V, R _L =500Ω	1.2		5.5	ns
		V _{CC} =3.3±0.3V	1.1		4.5	ns
		V _{CC} =5±0.5V	1		4	ns

■ OPERATING CHARACTERISTICS (T_A=25°C)

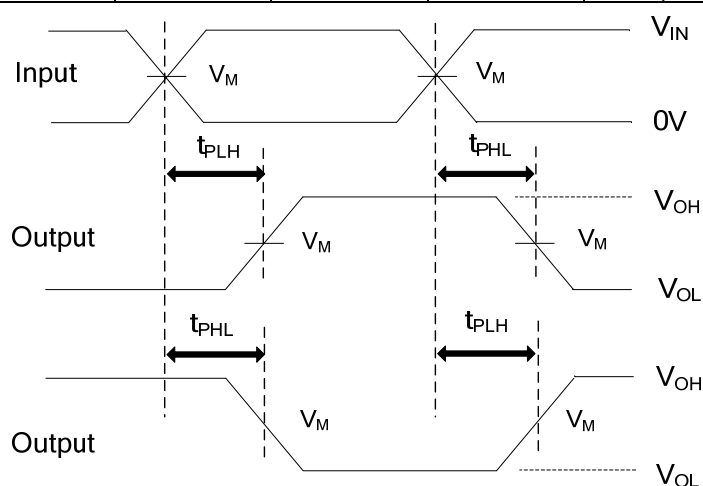
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V		20		pF
		V _{CC} =2.5V		20		pF
		V _{CC} =3.3V		21		pF
		V _{CC} =5V		22		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

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

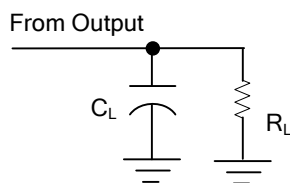


PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.

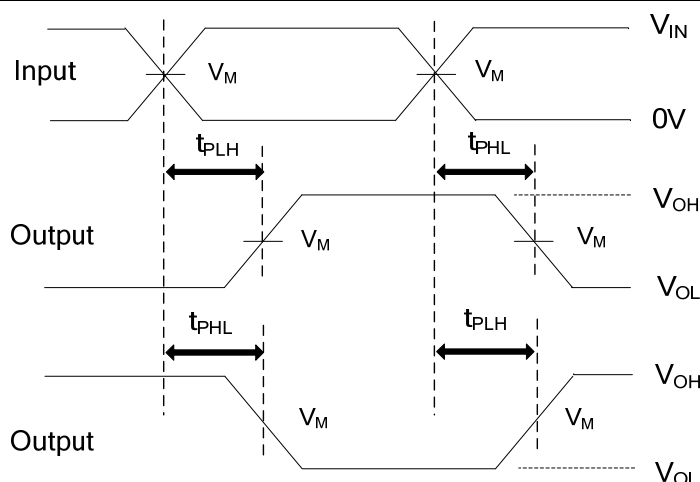
All input pulses are supplied by generators having the following characteristics: $P_{RR} \leq 10MHz$, $Z_O = 50\Omega$.

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



TEST CIRCUIT

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



PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.

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