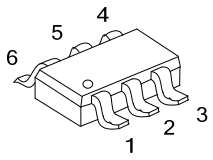
U74LVC1G97

CMOS IC

CONFIGURABLE MULTIPLE-FUNCTION GATE



SOT-363

■ DESCRIPTION

The **U74LVC1G97** is a configurable multiple-function gate with Schmitt input.All inputs can be connected to V_{CC} or GND.

The output state is determined by eight patterns of 3-bit input. The user can choose the logic functions MUX, AND, OR, NAND, NOR, inverter, and noninverter.

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

■ FEATURES

* Wide supply voltage range from 1.65V to 5.5V
* Inputs accept voltages up to 5.5V
* I_{OFF} supports partial-power-down mode
* Low static power consumption; I_{CC}=10μA (Max.)
* ±24mA output drive (V_{CC}=3.3V)

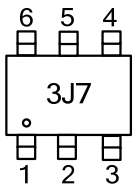
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G97L-AL6-R	U74LVC1G97G-AL6-R	SOT-363	Tape Reel

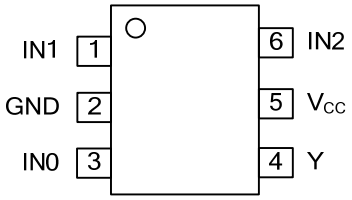
U74LVC1G97G-AL6-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) AL6: SOT-363
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

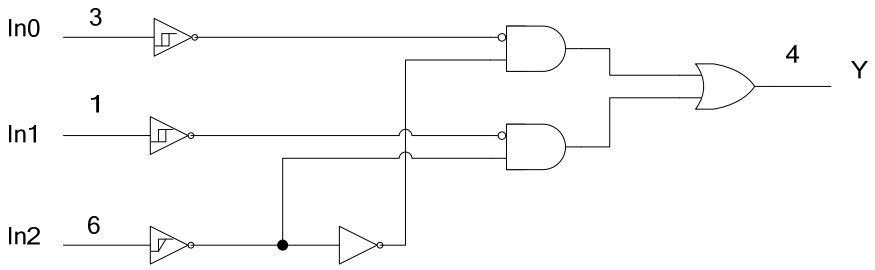


■ FUNCTION TABLE (each gate)

INPUT(IN2)	INPUT(IN1)	INPUT(IN0)	OUTPUT(Y)
L	L	L	L
L	L	H	L
L	H	L	H
L	H	H	H
H	L	L	L
H	L	H	H
H	H	L	L
H	H	H	H

Note: H: High voltage level; L: Low voltage level.

■ LOGIC DIAGRAM (positive logic)



Logic symbol

■ 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 Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ V_{CC}+0.5	V
Continuous V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0V ~ V_{CC}	±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0V	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}>V_{CC} or V_{OUT}<0V	-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
Operating Temperature	T_A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V_{T+}	V_{CC}=1.65V	0.79		1.16	0.76		1.20	V
		V_{CC}=2.3V	1.11		1.56	1.08		1.60	V
		V_{CC}=3V	1.5		1.87	1.47		2.0	V
		V_{CC}=4.5V	2.16		2.74	2.13		2.8	V
		V_{CC}=5.5V	2.61		3.33	2.58		3.39	V
Negative-Going Input Threshold Voltage	V_{T-}	V_{CC}=1.65V	0.35		0.62	0.35		0.88	V
		V_{CC}=2.3V	0.58		0.87	0.58		1.03	V
		V_{CC}=3V	0.84		1.19	0.84		1.45	V
		V_{CC}=4.5V	1.41		1.9	1.41		1.93	V
		V_{CC}=5.5V	1.87		2.29	1.87		2.32	V
Hysteresis Voltage (V_{T+}-V_{T-})	$\triangle V_T$	V_{CC}=1.65V	0.3		0.62	0.23		0.62	V
		V_{CC}=2.3V	0.4		0.8	0.34		0.8	V
		V_{CC}=3V	0.53		0.87	0.44		1.00	V
		V_{CC}=4.5V	0.71		1.04	0.65		1.20	V
		V_{CC}=5.5V	0.71		1.11	0.65		1.40	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			1.9			V
		V_{CC}=3.0V, I_{OH}=-24mA	2.3			2.0			V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
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			0.6	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			±10	μA
Quiescent Supply Current	I_{CC}	V_{CC}=1.65 ~ 5.5V, V_{IN}=5.5V or GND, I_{OUT}=0A			10			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=3 ~ 5.5V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND			500			500	μA

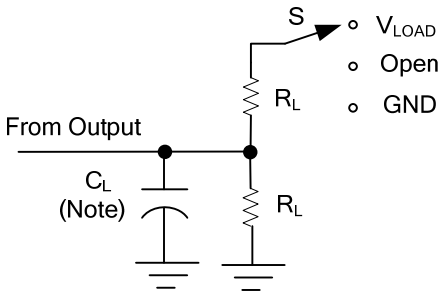
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A) to output(Y)	t_{PD}	V_{CC}=1.8±0.15V,C_L=30pF, R_L=1kΩ	3.2		14.4	1.0		18	ns
		V_{CC}=2.5±0.2V,C_L=30pF, R_L=500Ω	2.0		8.3	0.5		10.4	ns
		V_{CC}=3.3±0.3V,C_L=50pF, R_L=500Ω	1.5		6.3	0.5		7.9	ns
		V_{CC}=5±0.5V,C_L=50pF, R_L=500Ω	1.1		5.1	0.5		6.4	ns

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=V_{CC} or GND		3.5		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		22		pF
		V_{CC}=2.5V		23		pF
		V_{CC}=3.3V		23		pF
		V_{CC}=5V		26		pF

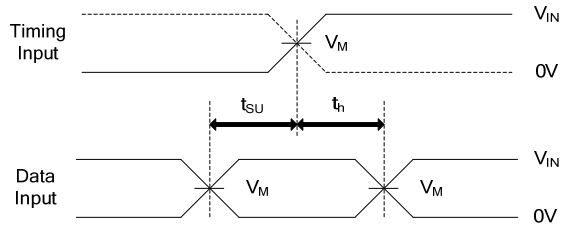
■ TEST CIRCUIT AND WAVEFORMS



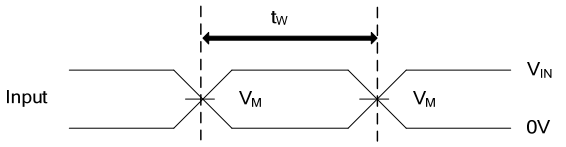
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Note: C_L includes probe and jig capacitance.

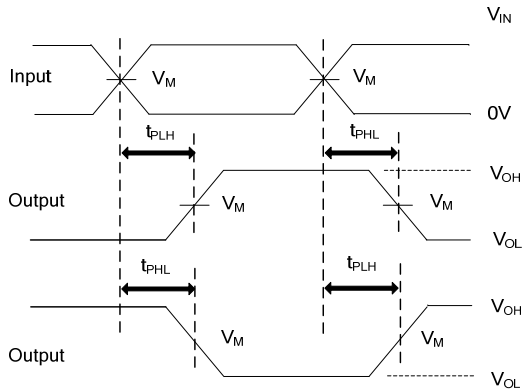
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_{IN}	t_R, t_F					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	30pF	1KΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	30pF	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2 x V_{CC}	50pF	500Ω	0.3V



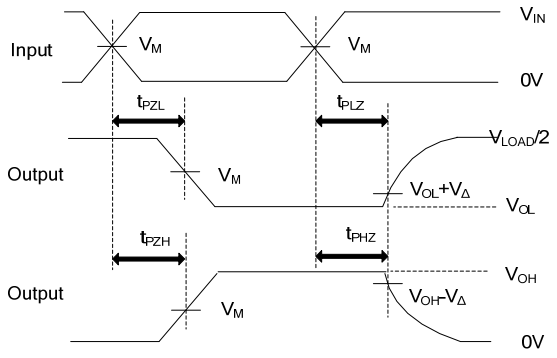
SETUP TIME AND HOLD TIME



PULSE DURATION



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O = 50Ω.