

**U74LVC1G11A**

Preliminary

CMOS IC

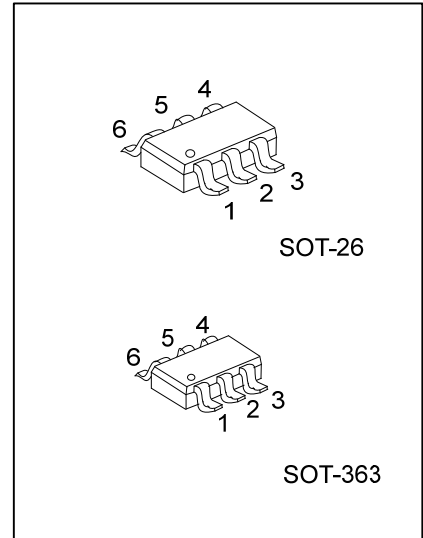
**SINGLE 3-INPUT
POSITIVE-AND GATE****DESCRIPTION**

The **U74LVC1G11A** performs the Boolean function $Y = A \bullet B \bullet C$ or $Y = \overline{A + B + C}$ in positive logic.

The device is fully specified for partial-power-down applications using I_{OFF} . The I_{OFF} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

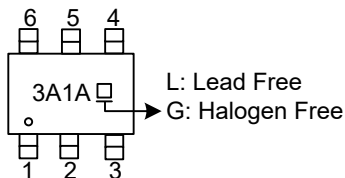
FEATURES

- * Supports 5V V_{CC} Operation
- * Inputs Accept Voltages to 5.5V
- * Max. t_{PD} of 4.1ns at 3.3V
- * Low power consumption, $I_{CC}=10\mu A$ (Max.)
- * I_{OFF} supports Partial-Power-Down Mode
- * $\pm 24mA$ output drive at 3.3V

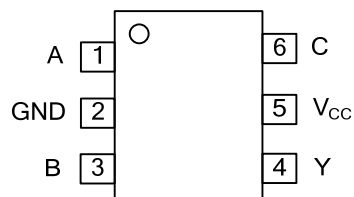
**ORDERING INFORMATION**

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G11AL-AG6-R	U74LVC1G11AG-AG6-R	SOT-26	Tape Reel
U74LVC1G11AL-AL6-R	U74LVC1G11AG-AL6-R	SOT-363	Tape Reel

U74LVC1G11AG-AG6-R	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) AG6: SOT-26, AL6: SOT-363 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

■ PIN CONFIGURATION

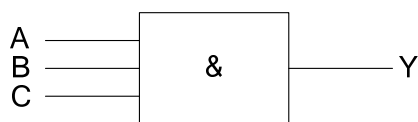
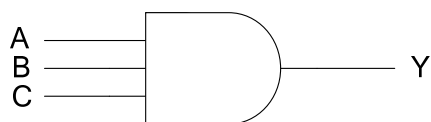


■ FUNCTION TABLE

INPUTS			OUTPUT Y
A	B	C	
H	H	H	H
L	X	X	L
X	L	X	L
X	X	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
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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-26	θ_{JA}	230	°C/W
	SOT-363		350	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
High-level input voltage	V_{IH}	$V_{CC}=1.65V$ to $1.95V$	0.65 $\times V_{CC}$			V
		$V_{CC}=2.3V$ to $2.7V$	1.7			V
		$V_{CC}=3V$ to $3.6V$	2			V
		$V_{CC}=4.5V$ to $5.5V$	$0.7 \times V_{CC}$			V
Low-level input voltage	V_{IL}	$V_{CC}=1.65V$ to $1.95V$			0.35 $\times V_{CC}$	V
		$V_{CC}=2.3V$ to $2.7V$			0.7	V
		$V_{CC}=3V$ to $3.6V$			0.8	V
		$V_{CC}=4.5V$ to $5.5V$			$0.3 \times V_{CC}$	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8V \pm 0.15V$, $2.5V \pm 0.2V$			20	ns/V
		$V_{CC}=3.3V \pm 0.3V$			10	ns/V
		$V_{CC}=5V \pm 0.5V$			10	ns/V
Operating Temperature	T_A		-40		+125	°C

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9			V
		V _{CC} =3.0V, I _{OH} =-16mA	2.4			V
			2.3			V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA			0.1	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45	V
		V _{CC} =2.3V, I _{OL} =8mA			0.30	V
		V _{CC} =3.0V, I _{OL} =16mA			0.40	V
					0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{IN} =5.5V or GND, V _{CC} =0 ~ 5.5V			±5	μA
					±10	μA
Power OFF Leakage Current	I _{off}	V _{IN} or V _{OUT} =5.5V, V _{CC} =0V				μA
Quiescent Supply Current	I _{CC}	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 _{CC}	V _{CC} =3 V~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND			500	μA
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		3.5		pF

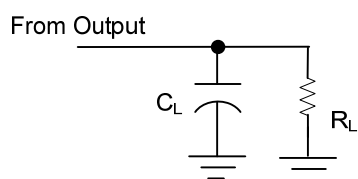
■ **SWITCHING CHARACTERISTICS** ((T_A=25°C, unless otherwise specified))

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input(A,B or C) to output(Y)	t _{PLH} /t _{PHL}	V _{CC} =1.8V±0.15V, C _L =15pF	1		15.2	ns
			1		17.2	
		V _{CC} =2.5V±0.2V, C _L =15pF	1		7.6	ns
			1		9.2	
		V _{CC} =3.3V±0.3V, C _L =15pF	1		6.1	ns
			1		7.9	
		V _{CC} =5V±0.5V, C _L =15pF	1		5.1	ns
			1		6.7	

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

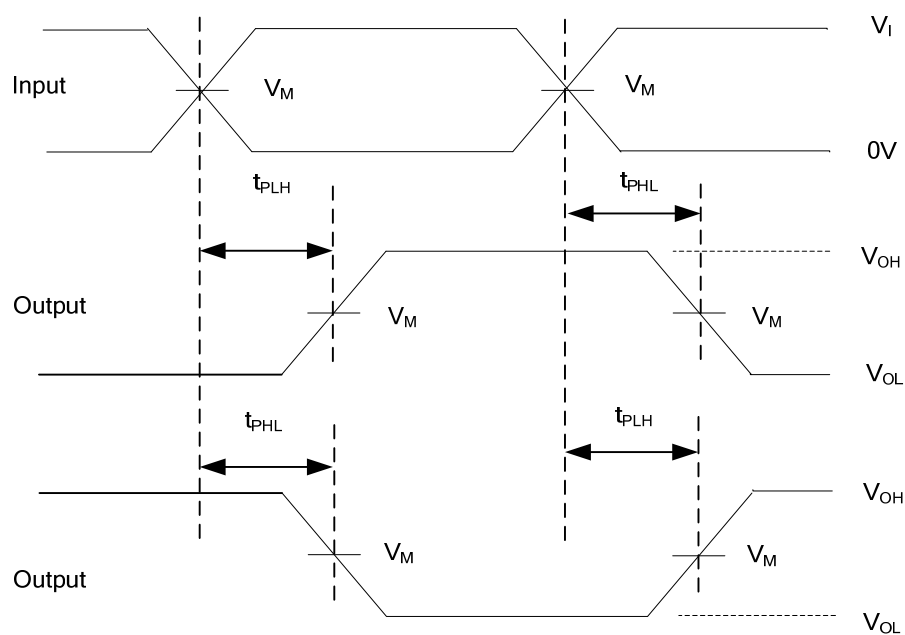
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	f=10MHZ	V _{CC} =1.8V	18		pF
			V _{CC} =2.5V	19		pF
			V _{CC} =3.3V	20		pF
			V _{CC} =5.0V	23		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	INPUTS		V_M	C_L	R_L
	V_I	t_r / t_f			
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
				30pF	1K Ω
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	15pF	1M Ω
				30pF	500 Ω
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF	1M Ω
				50pF	500 Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	15pF	1M Ω
				50pF	500 Ω



PROPAGATION DELAY TIMES

Figure 1. Test Circuit and Voltage Waveforms

Notes: 1. C_L includes probe and jig capacitance.

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

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