



# U74LVC1G06

CMOS IC

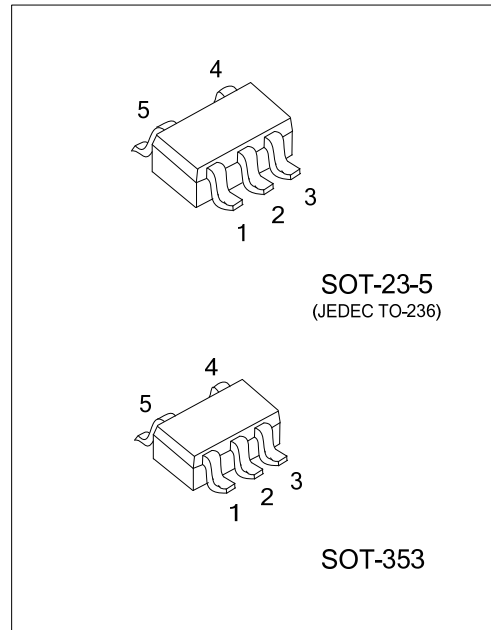
## SINGLE INVERTER WITH OPEN-DRAIN OUTPUT

### DESCRIPTION

The **U74LVC1G06** is a single inverter and its output is an open drain. This device provides the Function  $Y = \overline{A}$  in positive logic.

### FEATURES

- \* Operate From 1.65V to 5.5V
- \* Input and Open-Drain Output Accept Voltages to 5.5V
- \* I<sub>OFF</sub> Supports Partial-Power-Down Mode
- \* Low Power Dissipation
- \* Max t<sub>PD</sub> of 4 ns at 3.3V

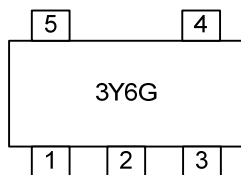


### ORDERING INFORMATION

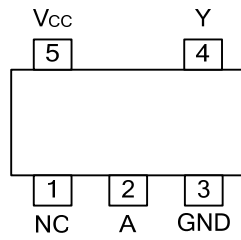
Ordering Number	Package	Packing
U74LVC1G06G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G06G-AL5-R	SOT-353	Tape Reel

<p>U74LVC1G06G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353 (3) G: Halogen Free and Lead Free</p>
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### MARKING



■ PIN CONFIGURATION

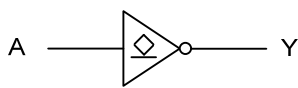


■ FUNCTION TABLE

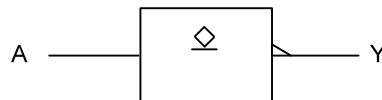
INPUT(A)	OUTPUT(Y)
H	L
L	Z

Note: H: High Voltage Level  
 L: Low Voltage Level  
 Z: High-Impedance OFF-State

■ LOGIC DIAGRAM (Positive Logic)



Logic Symbol



IEC Logic Symbol

### ■ 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 ~ +6.5	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		$T_{STG}$	-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-23-5	$\theta_{JA}$	280	°C/W
	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	$V_{OUT}$		0		$V_{CC}$	V
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
Operating Temperature	$T_A$		-40		85	°C
Input Transition Rise or Fall Rate	$t_R / t_F$	$V_{CC}=1.8V\pm 0.15V, 2.5V\pm 0.2V$			20	ns/V
		$V_{CC}=3.3V\pm 0.3V$			10	ns/V
		$V_{CC}=5V\pm 0.5V$			5	ns/V

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =1.65V ~ 1.95V	0.65*V <sub>CC</sub>			V
		V <sub>CC</sub> =2.3V ~ 2.7V	1.7			V
		V <sub>CC</sub> =3V ~ 3.6V	2			V
		V <sub>CC</sub> =4.5V ~ 5.5V	0.7*V <sub>CC</sub>			V
Low-Level Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> =1.65V ~ 1.95V			0.35*V <sub>CC</sub>	V
		V <sub>CC</sub> =2.3V ~ 2.7V			0.7	V
		V <sub>CC</sub> =3V ~ 3.6V			0.8	V
		V <sub>CC</sub> =4.5V ~ 5.5V			0.3*V <sub>CC</sub>	V
Low-Level Output Voltage	V <sub>OL</sub>	I <sub>OL</sub> =100μA    V <sub>CC</sub> =1.65 ~ 5.5V			0.1	V
		I <sub>OL</sub> =4mA    V <sub>CC</sub> =1.65V			0.45	V
		I <sub>OL</sub> =8mA    V <sub>CC</sub> =2.3V			0.3	V
		I <sub>OL</sub> =16mA    V <sub>CC</sub> =3.0V			0.4	V
		I <sub>OL</sub> =24mA    V <sub>CC</sub> =3.0V			0.55	V
		I <sub>OL</sub> =32mA    V <sub>CC</sub> =4.5V			0.55	V
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>IN</sub> =5.5V or GND, V <sub>CC</sub> =0 ~ 5.5V			±5	μA
Power OFF Leakage Current	I <sub>OFF</sub>	V <sub>IN</sub> or V <sub>OUT</sub> =5.5V, V <sub>CC</sub> =0V			10	μA
3-state Output OFF-state Current	I <sub>OZ</sub>	V <sub>IN</sub> =V <sub>IH</sub> or V <sub>IL</sub> , V <sub>OUT</sub> =V <sub>CC</sub> or GND, V <sub>CC</sub> =5.5V			±10	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 V <sub>CC</sub> =1.65 ~ 5.5V			10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI <sub>Q</sub>	V <sub>CC</sub> =3 ~ 5.5V, One input at V <sub>CC</sub> -0.6V, Other inputs at V <sub>CC</sub> or GND			500	μA
Input Capacitance	C <sub>I</sub>	V <sub>CC</sub> =3.3V, V <sub>IN</sub> =V <sub>CC</sub> or GND		4		pF
Output Capacitance	C <sub>O</sub>	V <sub>CC</sub> =3.3V, V <sub>OUT</sub> =V <sub>CC</sub> or GND		5		pF

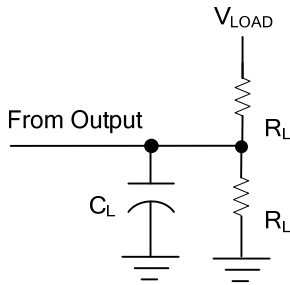
■ SWITCHING CHARACTERISTICS (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation delay from input (A) to output(Y)	t <sub>PZL</sub> / t <sub>PLZ</sub>	V <sub>CC</sub> =1.8±0.15V, R <sub>L</sub> =1KΩ	C <sub>L</sub> =30pF	2.2		6.5	ns
		V <sub>CC</sub> =2.5±0.2V, R <sub>L</sub> =500Ω		1.1		6	ns
		V <sub>CC</sub> =3.3±0.3V	C <sub>L</sub> =50pF R <sub>L</sub> =500Ω	1.2		6	ns
		V <sub>CC</sub> =5±0.5V		1		5.5	ns

■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C)

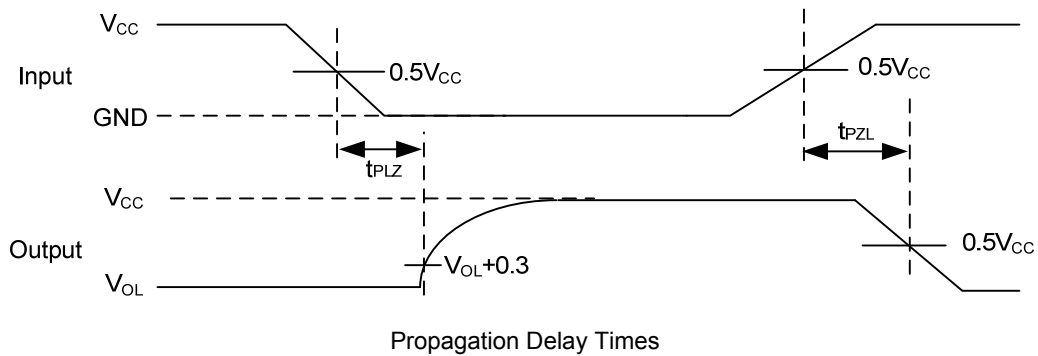
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Power Dissipation Capacitance	C <sub>PD</sub>	V <sub>CC</sub> =1.8V	f=10MHz		3		pF
		V <sub>CC</sub> =2.5V			3		pF
		V <sub>CC</sub> =3.3V			4		pF
		V <sub>CC</sub> =5.0V			6		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V <sub>CC</sub>	Inputs		V <sub>M</sub>	V <sub>LOAD</sub>	V <sub>Δ</sub>	C <sub>L</sub>	R <sub>L</sub>
	V <sub>IN</sub>	t <sub>R</sub> , t <sub>F</sub>					
1.8V±0.15V	V <sub>CC</sub>	≤2ns	V <sub>CC</sub> /2	2 x V <sub>CC</sub>	0.15V	30pF	1KΩ
2.5V±0.2V	V <sub>CC</sub>	≤2ns	V <sub>CC</sub> /2	2 x V <sub>CC</sub>	0.15V	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	0.3V	50pF	500Ω
5V±0.5V	V <sub>CC</sub>	≤2.5ns	V <sub>CC</sub> /2	2 x V <sub>CC</sub>	0.3V	50pF	500Ω



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