



## U74LVC1G06B

Preliminary

CMOS IC

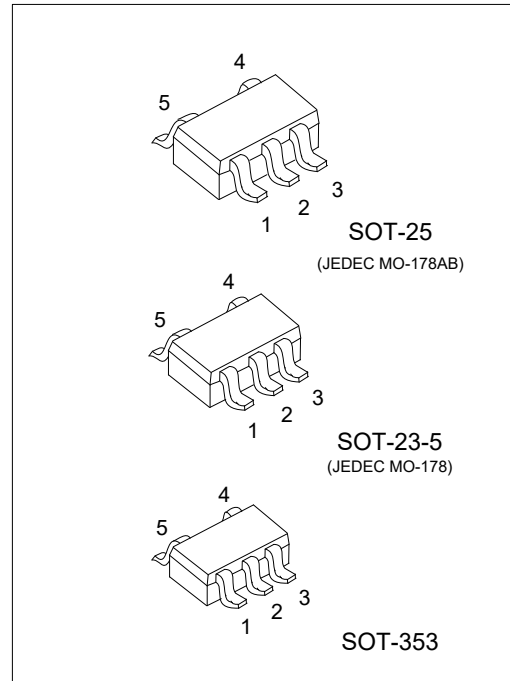
### SINGLE INVERTER WITH OPEN-DRAIN OUTPUT

#### DESCRIPTION

The **U74LVC1G06B** 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

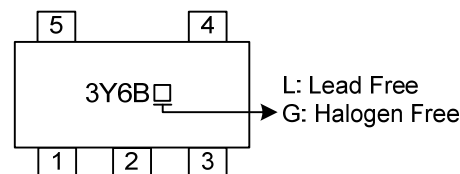


#### ORDERING INFORMATION

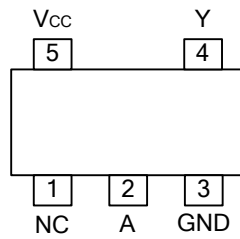
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G06BL-AE5-R	U74LVC1G06BG-AE5-R	SOT-23-5	Tape Reel
U74LVC1G06BL-AF5-R	U74LVC1G06BG-AF5-R	SOT-25	Tape Reel
U74LVC1G06BL-AL5-R	U74LVC1G06BG-AL5-R	SOT-353	Tape Reel

<p>U74LVC1G06BG-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(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</p>
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#### MARKING



■ PIN CONFIGURATION

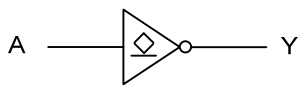


■ FUNCTION TABLE

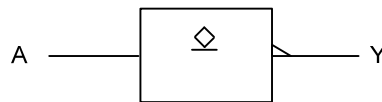
INPUT(A)	OUTPUT(Y)
H	L
L	Z

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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	-0.5 ~ +6.5	V
Input Voltage	V <sub>IN</sub>	-0.5 ~ +6.5	V
Output Voltage	V <sub>OUT</sub>	-0.5 ~ +6.5	V
V <sub>CC</sub> or GND Current	I <sub>CC</sub>	±100	mA
Continuous Output Current (V <sub>OUT</sub> =0 to V <sub>CC</sub> )	I <sub>OUT</sub>	±50	mA
Input Clamp Current (V <sub>IN</sub> <0)	I <sub>IK</sub>	-50	mA
Output Clamp Current (V <sub>OUT</sub> <0)	I <sub>OK</sub>	-50	mA
Storage Temperature	T <sub>STG</sub>	-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	280	°C/W
	SOT-25	230	°C/W
	SOT-353	350	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V <sub>CC</sub>	Operating	1.65		5.5	V
		Data retention only	1.5			V
Input Voltage	V <sub>IN</sub>		0		5.5	V
Output Voltage	V <sub>OUT</sub>		0		5.5	V
Low-Level Output Current	I <sub>OL</sub>	V <sub>CC</sub> =1.65V			4	mA
		V <sub>CC</sub> =2.3V			8	mA
		V <sub>CC</sub> =3V			16	mA
		V <sub>CC</sub> =3V			24	mA
		V <sub>CC</sub> =4.5V			32	mA
Input Transition Rise or Fall Rate	Δt/Δv	V <sub>CC</sub> =1.8V±0.15V, 2.5V±0.2V			20	ns/V
		V <sub>CC</sub> =3.3V±0.3V			10	ns/V
		V <sub>CC</sub> =5V±0.5V			5	ns/V
Operating Temperature	T <sub>A</sub>		-40		+125	°C

### ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V <sub>IH</sub>	V <sub>CC</sub> =1.65V~1.95V	0.65× V <sub>CC</sub>			0.65× V <sub>CC</sub>			V
		V <sub>CC</sub> =2.3V~2.7V	1.7			1.7			V
		V <sub>CC</sub> =3V~3.6V	2			2			V
		V <sub>CC</sub> =4.5V~5.5V	0.7× V <sub>CC</sub>			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>			0.35× V <sub>CC</sub>	V
		V <sub>CC</sub> =2.3V~2.7V			0.7			0.7	V
		V <sub>CC</sub> =3V~3.6V			0.8			0.8	V
		V <sub>CC</sub> =4.5V~5.5V			0.3× V <sub>CC</sub>			0.3× V <sub>CC</sub>	V
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =1.65~5.5V, I <sub>OL</sub> =100μA			0.1			0.1	V
		V <sub>CC</sub> =1.65V, I <sub>OL</sub> =4mA			0.45			0.7	V
		V <sub>CC</sub> =2.3V, I <sub>OL</sub> =8mA			0.3			0.45	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =16mA			0.4			0.6	V
		V <sub>CC</sub> =3.0V, I <sub>OL</sub> =24mA			0.55			0.8	V
		V <sub>CC</sub> =4.5V, I <sub>OL</sub> =32mA			0.55			0.8	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			±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			±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			±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			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			500	μA

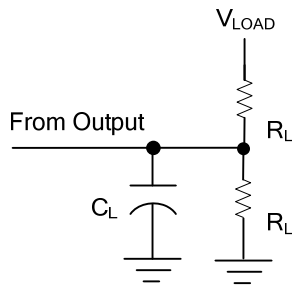
### SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40°C~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
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	1.0		6.5	1.0		8.5	ns
		V <sub>CC</sub> =2.5±0.2V, R <sub>L</sub> =500Ω		0.5		6	0.5		7.0	ns
		V <sub>CC</sub> =3.3±0.3V	C <sub>L</sub> =50pF R <sub>L</sub> =500Ω	0.5		6	0.5		7.0	ns
		V <sub>CC</sub> =5±0.5V		0.5		5.5	0.5		6.5	ns

### OPERATING CHARACTERISTICS (f=10MHz, T<sub>A</sub>=25°C, unless otherwise specified)

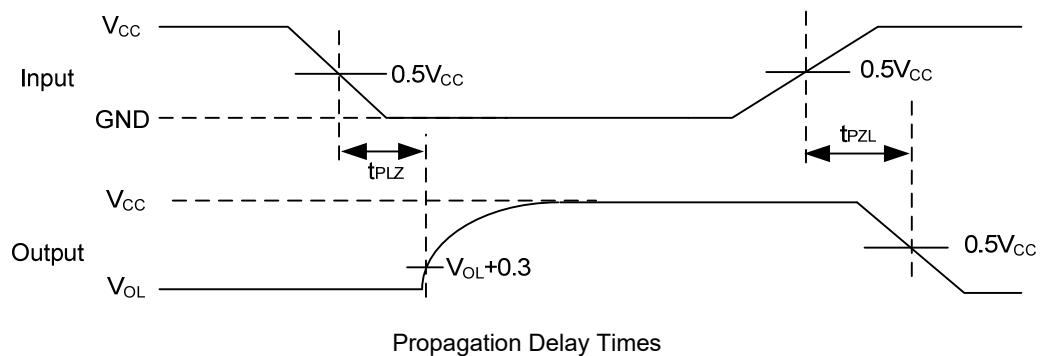
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C <sub>I</sub>	V <sub>CC</sub> =3.3V, V <sub>IN</sub> =V <sub>CC</sub> or GND		4		pF
Output Capacitance	C <sub>O</sub>	V <sub>CC</sub> =3.3V, V <sub>OUT</sub> =V <sub>CC</sub> or GND		5		pF
Power Dissipation Capacitance	C <sub>PD</sub>	V <sub>CC</sub> =1.8V		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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