

**U74LVC1G06B**

Preliminary

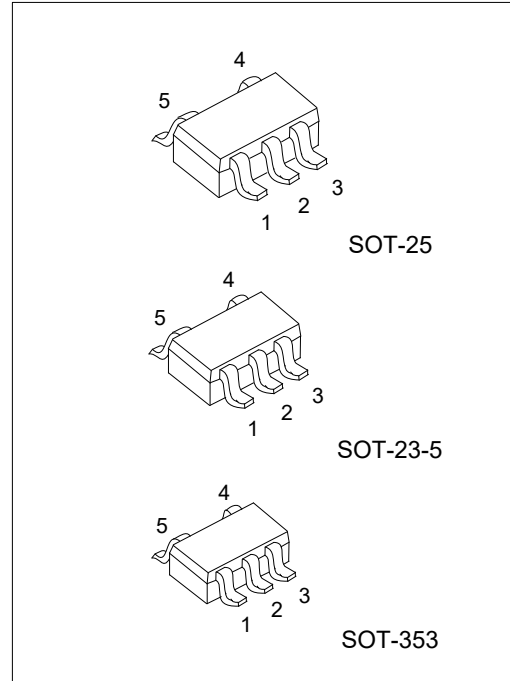
CMOS IC

**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.

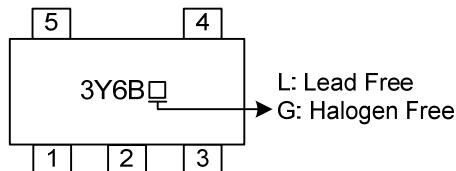
FEATURES

- * Operate From 1.65V to 5.5V
- * Input and Open-Drain Output Accept Voltages to 5.5V
- * I_{OFF} Supports Partial-Power-Down Mode
- * Low Power Dissipation
- * Max t_{PD} of 4 ns at 3.3V

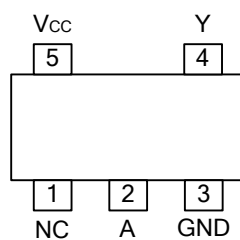
**ORDERING INFORMATION**

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

U74LVC1G06BG-AE5-R	(1)Packing Type (2)Package Type (3)Green Package	(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
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MARKING

■ PIN CONFIGURATION



■ FUNCTION TABLE

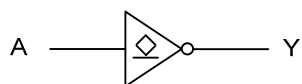
INPUT(A)	OUTPUT(Y)
H	L
L	Z

Note: H: High Voltage Level

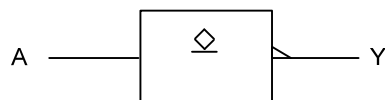
L: Low Voltage Level

Z: High-Impedance OFF-State

■ LOGIC DIAGRAM (Positive Logic)



Logic Symbol



IEC Logic Symbol

■ **ABSOLUTE MAXIMUM RATING** ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +6.5	V
Input Voltage	V_{IN}	-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	-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	$^{\circ}\text{C}$

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	$^{\circ}\text{C/W}$
	SOT-25	230	$^{\circ}\text{C/W}$
	SOT-353	350	$^{\circ}\text{C/W}$

■ **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		5.5	V
Low-Level Output Current	I_{OL}	$V_{CC}=1.65\text{V}$			4	mA
		$V_{CC}=2.3\text{V}$			8	mA
		$V_{CC}=3\text{V}$			16	mA
		$V_{CC}=3\text{V}$			24	mA
		$V_{CC}=4.5\text{V}$			32	mA
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8\text{V}\pm 0.15\text{V}, 2.5\text{V}\pm 0.2\text{V}$			20	ns/V
		$V_{CC}=3.3\text{V}\pm 0.3\text{V}$			10	ns/V
		$V_{CC}=5\text{V}\pm 0.5\text{V}$			5	ns/V
Operating Temperature	T_A		-40		+125	$^{\circ}\text{C}$

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V _{IH}	V _{CC} =1.65V~1.95V	0.65× V _{CC}			0.65× V _{CC}			V
		V _{CC} =2.3V~2.7V	1.7			1.7			V
		V _{CC} =3V~3.6V	2			2			V
		V _{CC} =4.5V~5.5V	0.7× V _{CC}			0.7× V _{CC}			V
Low-Level Input Voltage	V _{IL}	V _{CC} =1.65V~1.95V			0.35× V _{CC}			0.35× V _{CC}	V
		V _{CC} =2.3V~2.7V			0.7			0.7	V
		V _{CC} =3V~3.6V			0.8			0.8	V
		V _{CC} =4.5V~5.5V			0.3× V _{CC}			0.3× V _{CC}	V
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 _{IN} =5.5V or GND, V _{CC} =0 ~ 5.5V			±5			±5	μA
Power OFF Leakage Current	I _{OFF}	V _{IN} or V _{OUT} =5.5V, V _{CC} =0V			10			±10	μA
3-state Output OFF-state Current	I _{OZ}	V _{IN} =V _{IH} or V _{IL} , V _{OUT} =V _{CC} or GND V _{CC} =5.5V			±10			±10	μA
Quiescent Supply Current	I _Q	V _{IN} =V _{CC} or GND, I _{OUT} =0 V _{CC} =1.65 ~ 5.5V			10			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			500	μA

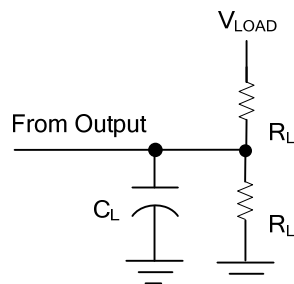
■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A) to output(Y)	t _{PZL} / t _{PLZ}	V _{CC} =1.8±0.15V, R _L =1KΩ	1.0		6.5	1.0		8.5	ns
		V _{CC} =2.5±0.2V, R _L =500Ω	0.5		6	0.5		7.0	ns
		V _{CC} =3.3±0.3V	0.5		6	0.5		7.0	ns
		V _{CC} =5±0.5V	0.5		5.5	0.5		6.5	ns

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

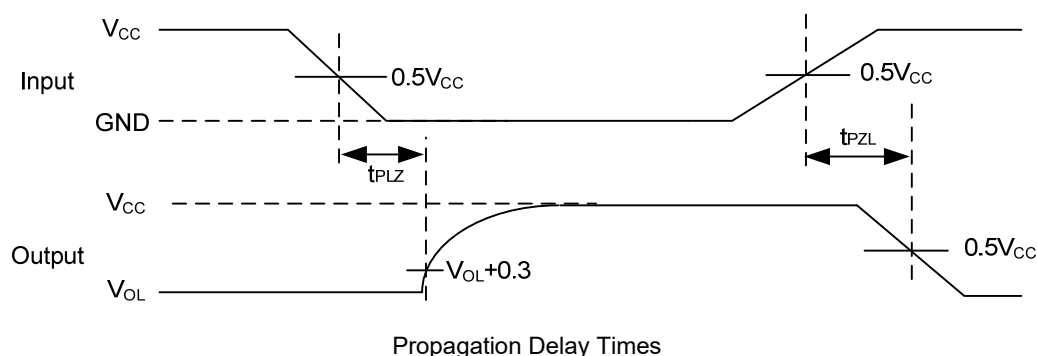
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND		4		pF
Output Capacitance	C _O	V _{CC} =3.3V, V _{OUT} =V _{CC} or GND		5		pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V		3		pF
		V _{CC} =2.5V		3		pF
		V _{CC} =3.3V		4		pF
		V _{CC} =5.0V		6		pF

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

V_{CC}	Inputs		V_M	V_{LOAD}	V_{Δ}	C_L	R_L
	V_{IN}	t_R, t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	$0.15V$	$30pF$	$1K\Omega$
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	$0.15V$	$30pF$	500Ω
$3.3V \pm 0.3V$	$3V$	$\leq 2.5ns$	$1.5V$	$6V$	$0.3V$	$50pF$	500Ω
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	$0.3V$	$50pF$	500Ω



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