



U74HC1G06

CMOS IC

SINGLE INVERTER WITH OPEN-DRAIN OUTPUTS

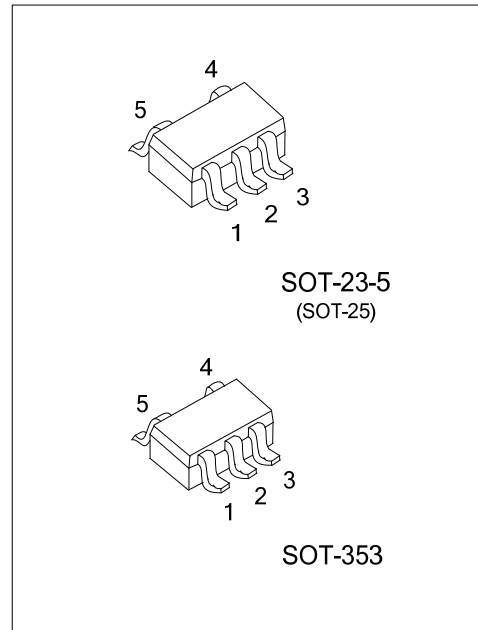
DESCRIPTION

The **U74HC1G06** is a single inverting buffer with open-drain outputs and it provides the function $Y = \overline{A}$ in positive logic.

For digital operation the outputs of this device must have a pull-up resistor to establish a logic HIGH-level.

FEATURES

- * Wide supply voltage range from 2V to 6V
- * High noise immunity
- * Low power dissipation; $I_{CC} = 1\mu A$ (Max.)
- * Typical $t_{PD} = 6ns$ at $V_{CC} = 6V$

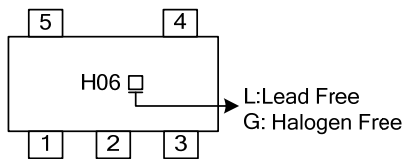


ORDERING INFORMATION

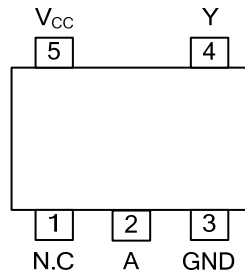
Ordering Number		Package	Packing
Lead Free Plating	Halogen Free		
U74HC1G06L-AE5-R	U74HC1G06G-AE5-R	SOT-23-5	Tape Reel
U74HC1G06L-AL5-R	U74HC1G06G-AL5-R	SOT-353	Tape Reel

<p>U74HC1G06L-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353 (3) L: Lead Free, G: Halogen Free</p>
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MARKING



■ PIN CONFIGURATION

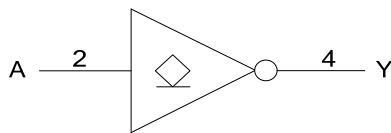


■ FUNCTION TABLE

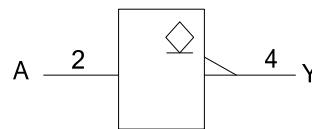
INPUT(A)	OUTPUT(Y)
H	L
L	Z

Note: H: HIGH voltage level; L: LOW voltage level; Z: high impedance state.

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7.0	V
Input Voltage	V_{IN}	-0.5 ~ $V_{CC} + 0.5$	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC} + 0.5$	V
V_{CC} or GND Current	I_{CC}	±50	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})	I_{OUT}	±25	mA
Input Clamp Current ($V_{IN}<0$)	I_{IK}	±20	mA
Output Clamp Current ($V_{OUT}<0$)	I_{OK}	±20	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}		2		6	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Low-level Output Current	I_{OL}	$V_{CC}=2.0V$			20	uA
		$V_{CC}=4.5V$			20	uA
		$V_{CC}=6.0V$			20	uA
		$V_{CC}=4.5V$			4.0	mA
		$V_{CC}=6.0V$			5.2	mA
Operating Temperature	T_A		-40		85	°C
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=2.0V$			500	ns/V
		$V_{CC}=4.5V$			112	
		$V_{CC}=6.0V$			67	

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	$V_{CC}=2.0V$	1.5			V
		$V_{CC}=4.5V$	3.15			V
		$V_{CC}=6.0V$	4.2			V
Low-level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=4.5V$			1.35	V
		$V_{CC}=6.0V$			1.8	V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V$	$I_{OL}=20\mu A$	0	0.1	V
		$V_{CC}=4.5V$		0	0.1	V
		$V_{CC}=6.0V$		0	0.1	V
		$V_{CC}=4.5V$	$I_{OL}=4.0mA$	0.17	0.26	V
		$V_{CC}=6.0V$	$I_{OL}=5.2mA$	0.18	0.26	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0\sim 6V$, $V_{IN}=V_{CC}$ or GND			±0.1	μA
Output Leakage Current	I_{OZ}	$V_{CC}=6.0V$, $V_{IN}=V_{IL}$ or V_{IH} , $V_{OUT}=V_{CC}$ or GND			±0.5	μA
Quiescent Supply Current	I_{CC}	$V_{CC}=6.0V$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			1.0	μA
Input Capacitance	C_I	$V_{CC}=5.0V$		5		pF
Output Capacitance	C_{OUT}	$V_{CC}=5.0V$		3		pF

■ SWITCHING CHARACTERISTICS (T_A=25°C)

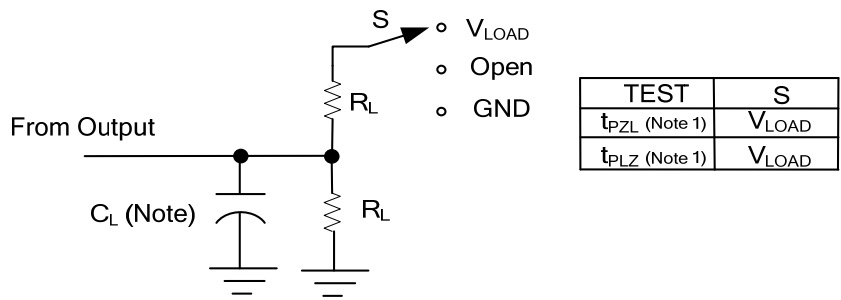
See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output transition time	t _{THL}	V _{CC} =2.0V		30	75	ns
		V _{CC} =4.5V		8	15	
		V _{CC} =6.0V		7	13	
Propagation delay from input (A) to output(Y)	t _{PLZ}	V _{CC} =2.0V, C _L =50pF, R _L =1kΩ		10	90	ns
		V _{CC} =4.5V		7	18	
		V _{CC} =6.0V		6	15	
Propagation delay from input (A) to output(Y)	t _{PZL}	V _{CC} =2.0V, C _L =50pF, R _L =1kΩ		17	90	ns
		V _{CC} =4.5V		7	18	
		V _{CC} =6.0V		5	15	

■ OPERATING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	V _{CC} =5.0V, C _L =50pF, f = 1MHz		4.0		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: 1. Since this device has open drain outputs, the t_{PLZ} and t_{PZL} is the same as t_{PLH} and t_{PHL} .

Fig. 1 LOAD CIRCUITRY FOR SWITCHING TIMES

V_{CC}	V_{IN}	t_R / t_F	V_M	V_{LOAD}	C_L	R_L	V_{Δ}
$V_{CC}=2.0V$	V_{CC}	6ns	$V_{CC}/2$	$2 \times V_{CC}$	50pF	1k Ω	0.3V
$V_{CC}=4.5V$	V_{CC}	6ns	$V_{CC}/2$	$2 \times V_{CC}$	50pF	1k Ω	0.3V
$V_{CC}=6.0V$	V_{CC}	6ns	$V_{CC}/2$	$2 \times V_{CC}$	50pF	1k Ω	0.3V

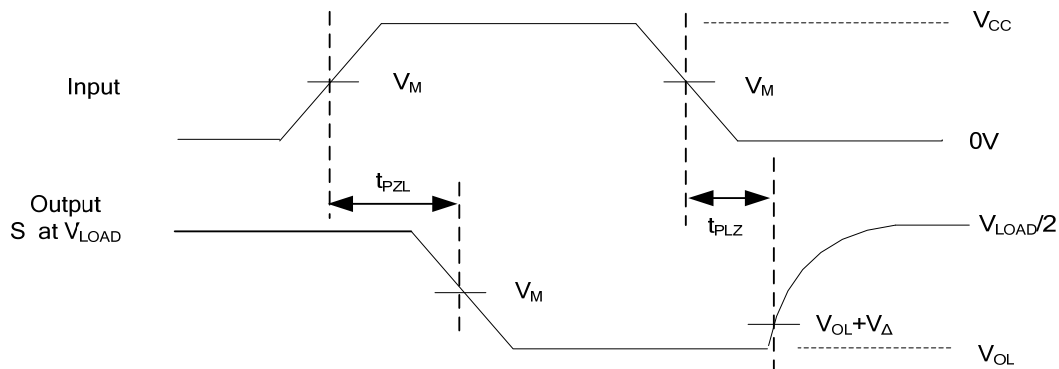


Fig. 2 PROPAGATION DELAY FROM INPUT(A) TO OUTPUT(Y) AND OUTPUT TRANSITION TIME

Note: 1. C_L includes probe and jig capacitance.

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

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