



U74AHC14

CMOS IC

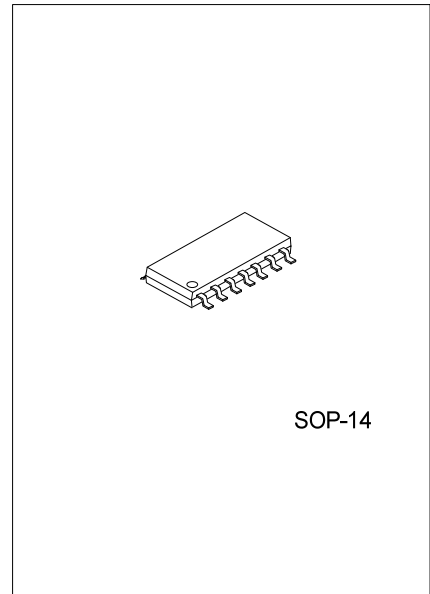
HEX SCHMITT-TRIGGER INVERTERS

■ DESCRIPTION

The **U74AHC14** is hex Schmitt-trigger inverters and each inverter provides the function $Y = \overline{A}$.

■ FEATURES

- * Operation Voltage Range: 2V~5.5V
- * Max t_{pd} of 8.6ns at 5 V($CL=15pF$)
- * High Noise Immunity
- * Low Power Dissipation

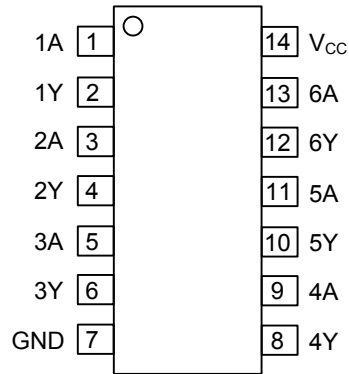


■ ORDERING INFORMATION

Order Number	Package	Packing
U74AHC14G-S14-R	SOP-14	Tape Reel

<p>U74AHC14G-D14-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) R: Tape Reel (2) S14: SOP-14 (3) G: Halogen Free</p>
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■ PIN CONFIGURATION

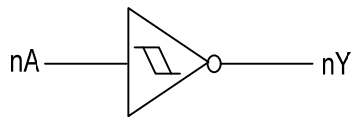


■ FUNCTION TABLE (each gate)

INPUT A	OUTPUT Y
L	H
H	L

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC SYMBOL



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ +7	V
Input Voltage	V_{IN}	-0.5 ~ +7	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC} + 0.5$	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Sink Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±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
Thermal Resistance Junction-Ambient	θ_{JA}	86	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
High-Level Input Current	I_{OH}	$V_{CC}=2V$			-50	µA
		$V_{CC}=3.3V \pm 0.3V$			-4	mA
		$V_{CC}=5V \pm 0.5V$			-8	mA
Low-Level Input Current	I_{OL}	$V_{CC}=2V$			50	µA
		$V_{CC}=3.3V \pm 0.3V$			4	mA
		$V_{CC}=5V \pm 0.5V$			8	mA
Operating Temperature	T_A		-40		+85	°C

■ STATIC CHARACTERISTICS ($T_A=25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-going Input Threshold Voltage	V_{T+}	$V_{CC}=3.0V$	1.2		2.2	V
		$V_{CC}=4.5V$	1.75		3.15	
		$V_{CC}=5.5V$	2.15		3.85	
Negative-going Input Threshold Voltage	V_{T-}	$V_{CC}=3.0V$	0.9		1.9	V
		$V_{CC}=4.5V$	1.35		2.75	
		$V_{CC}=5.5V$	1.65		3.35	
Hysteresis($V_{T+}-V_{T-}$)	ΔV_T	$V_{CC}=3.0V$	0.3		1.2	V
		$V_{CC}=4.5V$	0.4		1.4	
		$V_{CC}=5.5V$	0.5		1.6	
High-Level Output Voltage	V_{OH}	$I_{OH}=-50\mu\text{A}$	$V_{CC}=2.0V$	1.9		V
			$V_{CC}=3.0V$	2.9		
			$V_{CC}=4.5V$	4.4		
		$I_{OH}=-4\text{ mA}$	$V_{CC}=3.0V$	2.58		
		$I_{OH}=-8\text{ mA}$	$V_{CC}=4.5V$	3.94		
Low-Level Output Voltage	V_{OL}	$I_{OL}=50\mu\text{A}$	$V_{CC}=2.0V$		0.1	V
			$V_{CC}=3.0V$		0.1	
			$V_{CC}=4.5V$		0.1	
		$I_{OL}=4\text{ mA}$	$V_{CC}=3.0V$		0.36	
		$I_{OL}=8\text{ mA}$	$V_{CC}=4.5V$		0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0V\text{ to }5.5V, V_{IN}=5.5V\text{ or GND}$			±0.1	µA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V, V_{IN}=V_{CC}\text{ or GND}, I_{OUT}=0$			2	µA
Input Capacitance	C_I	$V_{IN}=V_{CC}\text{ or GND}$		2	10	pF

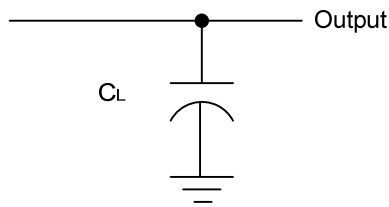
■ SWITCHING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay, From Input(A) To Output(Y)	t _{PLH} /t _{PHL}	V _{CC} =3.3±0.3 V	C _L =15 pF		8.3	12.8	ns
			C _L =50 pF		10.8	16.3	
	t _{PLH} /t _{PHL}	V _{CC} =5.0±0.5 V	C _L =15 pF		5.5	8.6	
			C _L =50 pF		7	10.6	

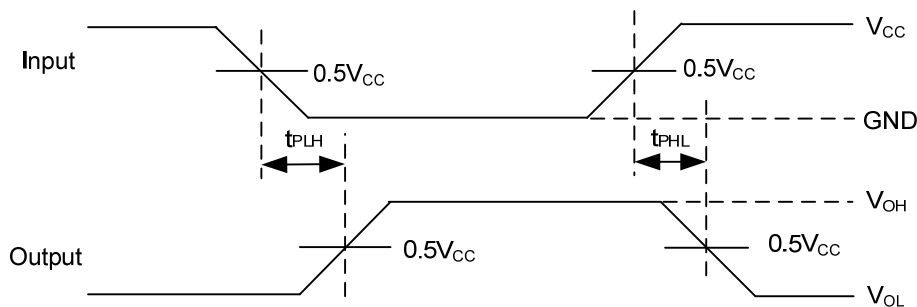
■ OPERATING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	No Load, f=1MHz		9		pF

■ TEST CIRCUIT AND WAVEFORMS



Test circuit for measuring propagation delay



Waveforms showing the Input(A) to Output(Y) propagation delays

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz, $Z_o = 50\Omega$, $t_r \leq 3$ ns, $t_f \leq 3$ ns.

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