



U74AHC14

CMOS IC

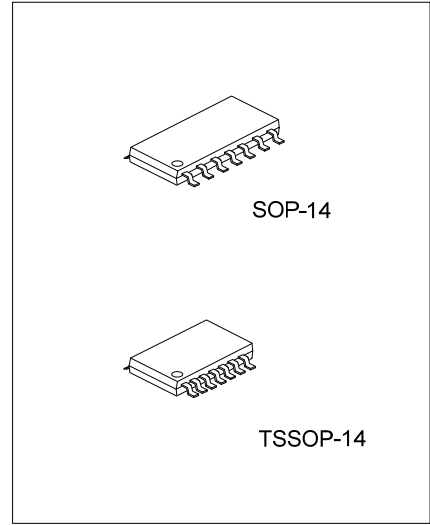
HEX SCHMITT-TRIGGER INVERTERS

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($C_L=15pF$)
- * High Noise Immunity
- * Low Power Dissipation

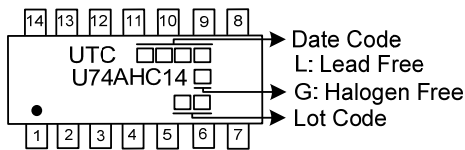


ORDERING INFORMATION

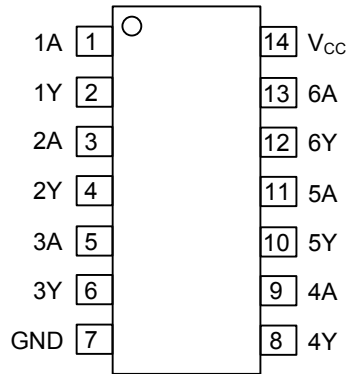
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC14L-S14-R	U74AHC14G-S14-R	SOP-14	Tape Reel
U74AHC14L-P14-R	U74AHC14G-P14-R	TSSOP-14	Tape Reel

<p>U74AHC14G-S14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S14: SOP-14, P14: TSSOP-14</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ PIN CONFIGURATION

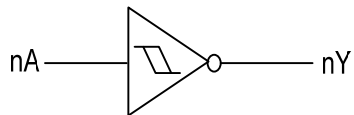


■ FUNCTION TABLE (each gate)

INPUT A	OUTPUT Y
L	H
H	L

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

■ LOGIC SYMBOL



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, 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.

■ RECOMMENDED OPERATING CONDITIONS (T_A=25°C, unless otherwise specified)

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±0.3V			-4	mA
		V _{CC} =5V±0.5V			-8	mA
Low-Level Input Current	I _{OL}	V _{CC} =2V			50	μA
		V _{CC} =3.3V±0.3V			4	mA
		V _{CC} =5V±0.5V			8	mA
Operating Temperature	T _A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Ambient	SOP-14	θ _{JA}	86
	TSSOP-14		113

■ STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-going Input Threshold Voltage	V _{T+}	V _{CC} =3.0V	1.2		2.2	1.2		2.2	V
		V _{CC} =4.5V	1.75		3.15	1.75		3.15	V
		V _{CC} =5.5V	2.15		3.85	2.15		3.85	V
Negative-going Input Threshold Voltage	V _{T-}	V _{CC} =3.0V	0.9		1.9	0.9		1.9	V
		V _{CC} =4.5V	1.35		2.75	1.35		2.75	V
		V _{CC} =5.5V	1.65		3.35	1.65		3.35	V
Hysteresis(V _{T+} -V _{T-})	ΔV _T	V _{CC} =3.0V	0.3		1.2	0.25		1.2	V
		V _{CC} =4.5V	0.4		1.4	0.35		1.4	V
		V _{CC} =5.5V	0.5		1.6	0.45		1.6	V
High-Level Output Voltage	V _{OH}	I _{OH} =-50μA	V _{CC} =2.0V	1.9		1.9			V
			V _{CC} =3.0V	2.9		2.9			V
			V _{CC} =4.5V	4.4		4.4			V
		I _{OH} =-4 mA	V _{CC} =3.0V	2.58		2.40			V
		I _{OH} =-8mA	V _{CC} =4.5V	3.94		3.70			V
Low-Level Output Voltage	V _{OL}	I _{OL} =50μA	V _{CC} =2.0V			0.1		0.1	V
			V _{CC} =3.0V			0.1		0.1	V
			V _{CC} =4.5V			0.1		0.1	V
		I _{OL} =4 mA	V _{CC} =3.0V			0.36		0.55	V
		I _{OL} =8mA	V _{CC} =4.5V			0.36		0.55	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0V to 5.5V, V _{IN} =5.5V or GND			±0.1			2	μA
Quiescent Supply Current	I _Q	V _{CC} =5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0			2			40	μA

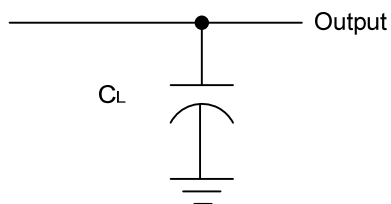
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
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			16	ns
			C _L =50 pF		10.8	16.3			20.5	ns
	t _{PLH} /t _{PHL}	V _{CC} =5.0±0.5 V	C _L =15 pF		5.5	8.6			11	ns
			C _L =50 pF		7	10.6			13.5	ns

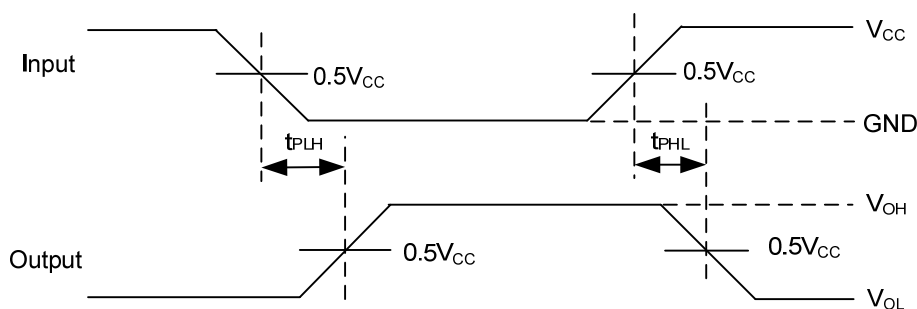
■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{IN} =V _{CC} or GND		2	10	pF
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 $\leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_r \leq 3\text{ns}$, $t_f \leq 3\text{ns}$.

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