



## U74AHCT3G14

CMOS IC

### SCHMITT-TRIGGER INVERTER

#### DESCRIPTION

The **U74AHCT3G14G** is a triple Schmitt-trigger inverter providing the function  $Y = \overline{A}$ .

The gates of this device have different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals because of the Schmitt-trigger action. The device is capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

#### FEATURES

- \* Low Power Dissipation
- \* TTL voltage compatible
- \* Symmetrical output impedance
- \* Balanced propagation delays
- \* High noise immunity

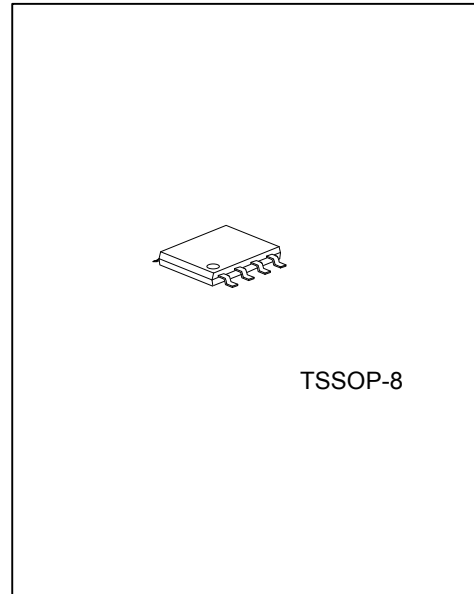
#### APPLICATIONS

- \* Wave and pulse shapers
- \* Astable multivibrators
- \* Monostable multivibrators

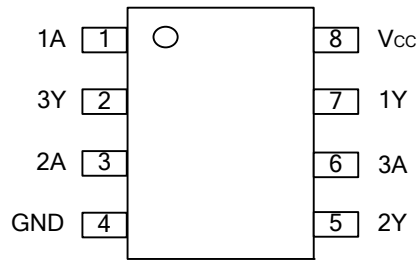
#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT3G14L-P08-R	U74AHCT3G14G-P08-R	TSSOP-8	Tape Reel
U74AHCT3G14L-P08-T	U74AHCT3G14G-P08-T	TSSOP-8	Tube

<p>U74AHCT3G14L-P08-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel, T: Tube (2) P08: TSSOP-8 (3) G:Halogen Free, L: Lead Free</p>
---	--



■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (each gate)



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 ~ 7.0	V
Input Voltage	$V_{IN}$	-0.5 ~ 7.0	V
Output Voltage	$V_{OUT}$	-0.5 ~ $V_{CC} + 0.5$	V
$V_{CC}$ or GND Current	$I_{CC}$	±75	mA
Output Current	$I_{OUT}$	±25	mA
Input Clamp Current	$I_{IK}$	-20	mA
Output Clamp Current	$I_{OK}$	±20	mA
Operating Temperature	$T_{OPR}$	-40 ~ + 85	°C
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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		4.5	5.0	5.5	V
Input Voltage	$V_{IN}$		0		5.5	V
Output Voltage	$V_{OUT}$	High or low state	0		$V_{CC}$	V

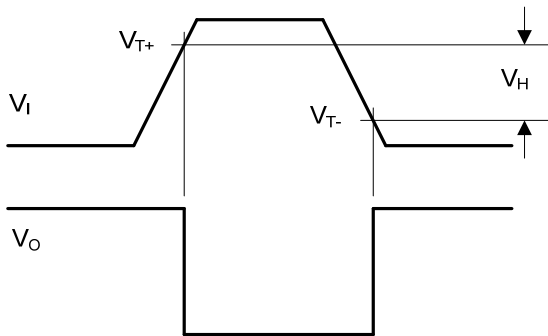
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-going threshold	$V_{T+}$	$V_{CC}=4.5\text{ V}$			2.0	V
		$V_{CC}=5.5\text{ V}$			2.0	
Negative-going threshold	$V_{T-}$	$V_{CC}=4.5\text{ V}$	0.5			V
		$V_{CC}=5.5\text{ V}$	0.6			
Hysteresis ( $V_{T+} - V_{T-}$ )	$\Delta V_T$	$V_{CC}=4.5\text{ V}$	0.4		1.4	V
		$V_{CC}=5.5\text{ V}$	0.4		1.6	
High-Level Output Voltage	$V_{OH}$	$I_{OH}=-50\mu\text{A}, V_{CC}=4.5\text{ V}$	4.4	4.5		V
		$I_{OH}=-8\text{mA}, V_{CC}=4.5\text{ V}$	3.94			
Low-Level Output Voltage	$V_{OL}$	$I_{OL}=50\mu\text{A}, V_{CC}=4.5\text{ V}$		0	0.1	V
		$I_{OL}=8\text{mA}, V_{CC}=4.5\text{ V}$			0.36	
Input Leakage Current	$I_{I(LEAK)}$	$V_{IN}=V_{IH}$ or $V_{IL}$			0.1	$\mu\text{A}$
Quiescent Supply Current	$I_{CC}$	$V_{IN}=V_{CC}$ or GND, $I_{OUT}=0, V_{CC}=5.5\text{ V}$			1.0	$\mu\text{A}$
Additional quiescent supply current per input pin	$\Delta I_{CC}$	$V_{IN}=3.4\text{ V}, V_{CC}=5.5\text{ V}, I_{OUT}=0$ , other inputs at $V_{CC}$ or GND			1.35	mA
Input Capacitance	$C_{IN}$	$V_{IN}=V_{CC}$ or GND, $V_{CC}=5\text{ V}$		1.5	10	pF

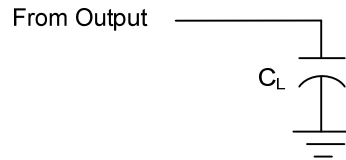
■ SWITCHING CHARACTERISTICS ( $T_A=25^\circ\text{C}, t_R = t_F \leq 3.0\text{ ns}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA) to output(nY)	$t_{PHL} / t_{PLH}$	$V_{CC}=5.0\text{V}, C_L = 15\text{pF}$		4.1		ns
		$V_{CC}=5.0\text{V}, C_L = 50\text{pF}$		5.9		
		$V_{CC}=4.5$ to $5.5\text{V}, C_L = 15\text{pF}$			7.0	
		$V_{CC}=4.5$ to $5.5\text{V}, C_L = 50\text{pF}$			8.5	

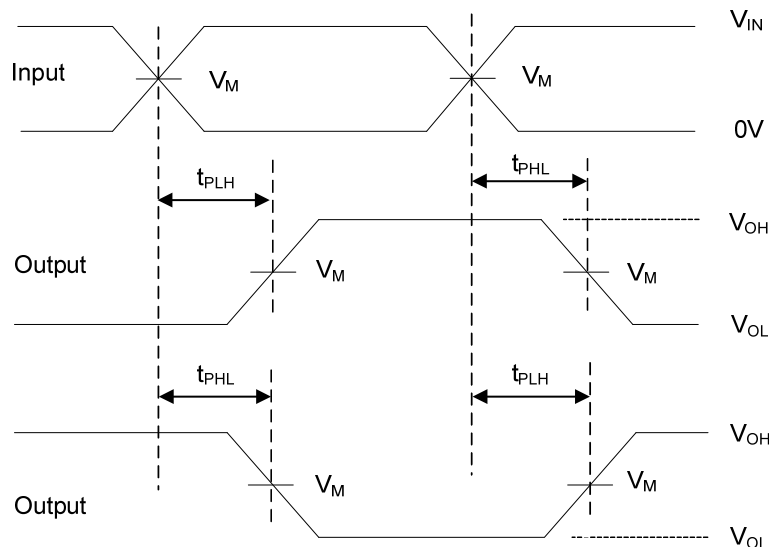
■ TEST CIRCUIT AND WAVEFORMS



Definitions of  $V_{T+}$ ,  $V_{T-}$  and  $V_H$



Propagation delay times test circuit



Propagation delay times Inverting and noninverting outputs

Note:  $C_L$  includes probe and jig capacitance.  
 $P_{RR} \leq 1\text{MHz}$ ,  $Z_O = 50\Omega$ ,  $t_R \leq 3\text{ns}$ ,  $t_F \leq 3\text{ns}$ .

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.