

**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

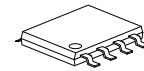
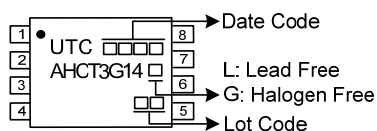
APPLICATIONS

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

ORDERING INFORMATION

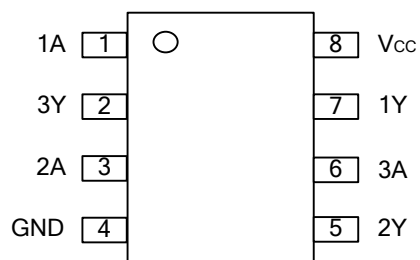
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT3G14L-P08-R	U74AHCT3G14G-P08-R	TSSOP-8	Tape Reel

U74AHCT3G14G-P08-R	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) P08: TSSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

TSSOP-8

■ 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
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 (Unless otherwise specified)

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
Operating Temperature	T_A		-40		+125	°C

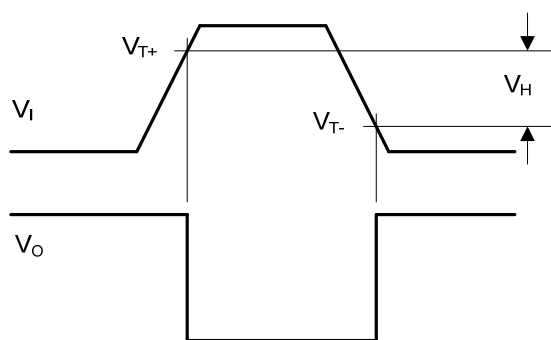
■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

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 ($V_{T+} - V_{T-}$)	ΔV_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	μA
Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$, $V_{CC}=5.5\text{ V}$			1.0	μA
Additional quiescent supply current per input pin	ΔI_{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

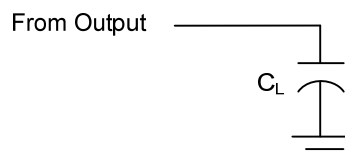
■ SWITCHING CHARACTERISTICS ($t_R = t_F \leq 3.0\text{ ns}$, unless otherwise specified)

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 5.5V , $C_L = 15\text{pF}$			7.0	
		$V_{CC}=4.5$ to 5.5V , $C_L = 50\text{pF}$			8.5	

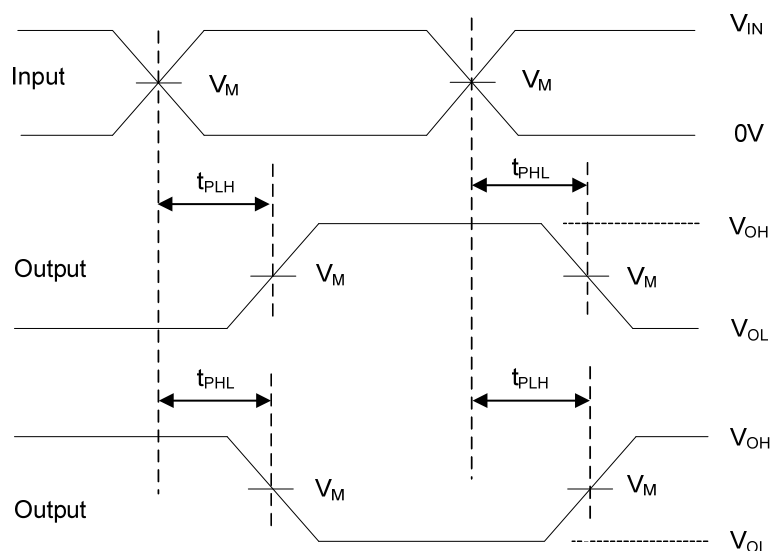
■ TEST CIRCUIT AND WAVEFORMS



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.
 $P_{RR} \leq 1\text{MHz}$, $Z_O = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$.

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