



## U74AHCT1G14

CMOS IC

### SINGLE SCHMITT-TRIGGER INVERTER

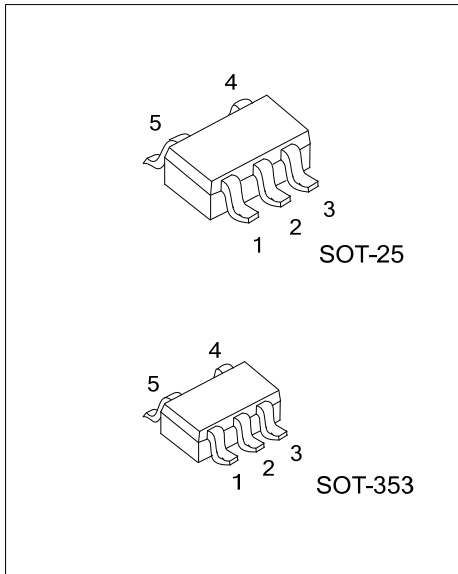
#### DESCRIPTION

The **U74AHCT1G14** is a single schmitt-trigger inverter providing the function  $Y = \overline{A}$ .

The gates of device have different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals because of the schmitt-trigger action in the input.

#### FEATURES

- \* Operation voltage range: 4.5V ~5.5V
- \* Low Power Current:  $I_{CC}=1\mu A$  (Max.)
- \*  $\pm 8mA$  Output Drive at 5V
- \* Inputs are TTL-Voltage Compatible

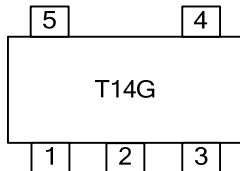


#### ORDERING INFORMATION

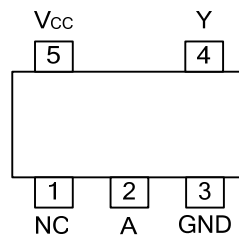
Ordering Number	Package	Packing
U74AHCT1G14G-AF5-R	SOT-25	Tape Reel
U74AHCT1G14G-AL5-R	SOT-353	Tape Reel

<p>U74AHCT1G14G-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free and Lead Free</p>
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#### MARKING



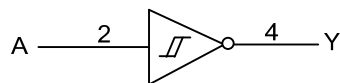
■ PIN CONFIGURATION



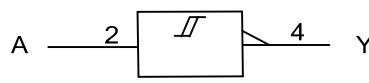
■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	-0.5 ~ 7	V
Input Voltage	V <sub>IN</sub>	-0.5 ~ 7	V
Output Voltage	V <sub>OUT</sub>	-0.5 ~ V <sub>CC</sub> +0.5	V
V <sub>CC</sub> or GND Current	I <sub>CC</sub>	±50	mA
Output Current	I <sub>OUT</sub>	±25	mA
Input Clamp Current	I <sub>IK</sub>	-20	mA
Output Clamp Current	I <sub>OK</sub>	±20	mA
Operating Temperature	T <sub>OPR</sub>	-40 ~ + 125	°C
Storage Temperature	T <sub>STG</sub>	-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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V <sub>CC</sub>		4.5		5.5	V
Input Voltage	V <sub>IN</sub>		0		5.5	V
Output Voltage	V <sub>OUT</sub>		0		V <sub>CC</sub>	V
Input Transition Rise or Fall Rate	Δt/ΔV	V <sub>CC</sub> =5.0+0.5V			20	ns/V
Operating Temperature	T <sub>A</sub>		-40		125	°C

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-going threshold	V <sub>T+</sub>	V <sub>CC</sub> =4.5V	0.9		2	V
		V <sub>CC</sub> =5.5V	1.1		2	
Negative-going threshold	V <sub>T-</sub>	V <sub>CC</sub> =4.5V	0.5		1.6	V
		V <sub>CC</sub> =5.5V	0.6		1.5	
Negative-going threshold	ΔV <sub>T</sub>	V <sub>CC</sub> =4.5V	0.4		1.4	V
		V <sub>CC</sub> =5.5V	0.5		1.6	
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> =4.5V	I <sub>OH</sub> =-50μA	4.4	4.5	V
			I <sub>OH</sub> =-8mA	3.94		
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> =4.5V	I <sub>OL</sub> =50μA		0.1	V
			I <sub>OL</sub> =8mA		0.36	
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> =0 ~ 5.5V, V <sub>IN</sub> =5.5V or GND			±0.1	μA
Quiescent Supply Current	I <sub>Q</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0			1	μA
Additional Quiescent Supply Current	Δ I <sub>Q</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =3.4V; other input at V <sub>CC</sub> or GND; I <sub>OUT</sub> =0			1.35	mA
Input Capacitance	C <sub>IN</sub>	V <sub>CC</sub> =5V, V <sub>IN</sub> =V <sub>CC</sub> or GND		2	10	pF

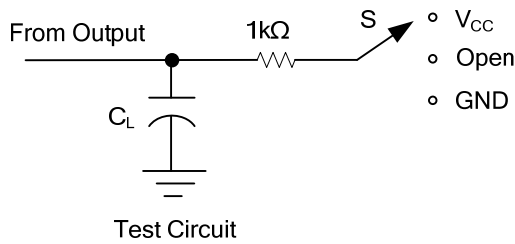
■ SWITCHING CHARACTERISTICS (T<sub>A</sub>=25°C, see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA) and (nB) to output(nY)	t <sub>PHL</sub> /t <sub>PLH</sub>	V <sub>CC</sub> =5.5V, C <sub>L</sub> = 15pF		4	7	ns
		V <sub>CC</sub> =5.5V, C <sub>L</sub> = 50pF		5.5	8	

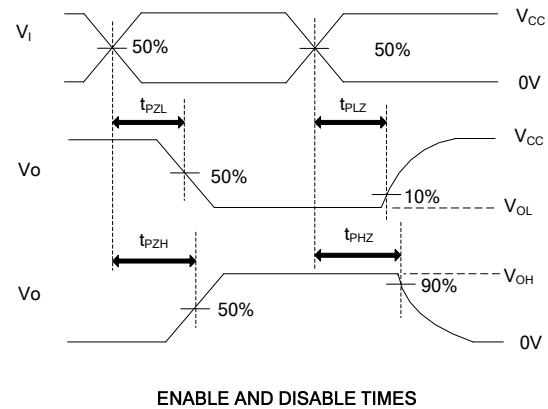
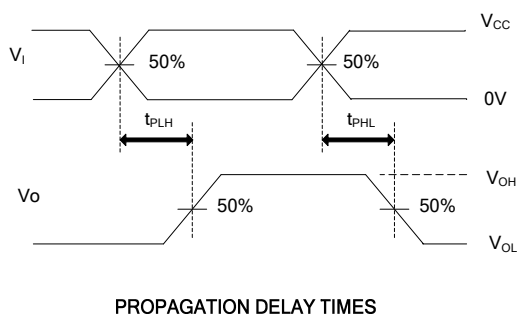
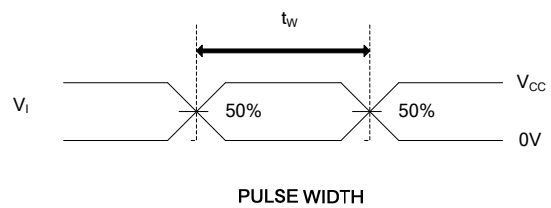
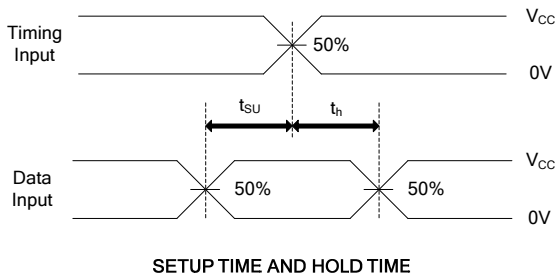
■ OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C <sub>PD</sub>	V <sub>CC</sub> =5V, f=1MHz, No load.		12		pF

## TEST CIRCUIT AND WAVEFORMS



TEST	S
t <sub>PLH</sub> /t <sub>PHL</sub>	Open
t <sub>PHZ</sub> /t <sub>PZH</sub>	GND
t <sub>PLZ</sub> /t <sub>PZL</sub>	V <sub>CC</sub>



Note: C<sub>L</sub> includes probe and jig capacitance.  
 P<sub>RR</sub> ≤ 1MHz, Z<sub>O</sub> = 50Ω, t<sub>r</sub> ≤ 3ns, t<sub>f</sub> ≤ 3ns.

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