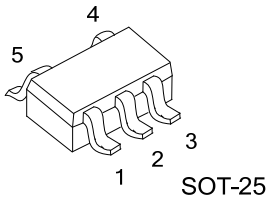
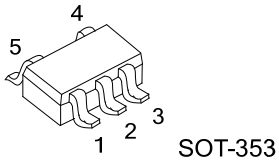
U74AHCT1G14

CMOS IC

SINGLE SCHMITT-TRIGGER INVERTER



SOT-25



SOT-353

■ 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

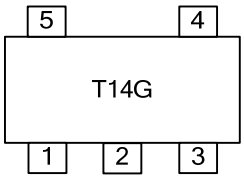
* Operation voltage range: 4.5V ~5.5V
* Low Power Current: I_{CC}=1μA (Max.)
* ±8mA Output Drive at 5V
* Inputs are TTL-Voltage Compatible

■ ORDERING INFORMATION

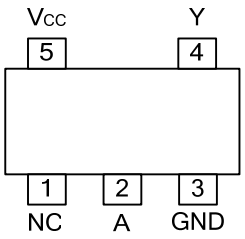
Ordering Number	Package	Packing
U74AHCT1G14G-AF5-R	SOT-25	Tape Reel
U74AHCT1G14G-AL5-R	SOT-353	Tape Reel

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

■ MARKING



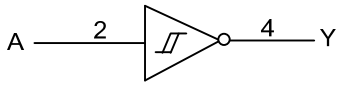
■ PIN CONFIGURATION



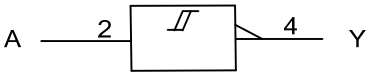
■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (T_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
V_{CC} or GND Current	I_{CC}	±50	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 ~ + 125	°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 COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=5.0+0.5V			20	ns/V
Operating Temperature	T_A		-40		125	°C

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

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

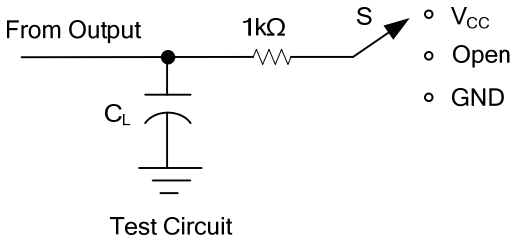
■ SWITCHING CHARACTERISTICS (T_A=25°C, see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA) and (nB) to output(nY)	t_{PHL} /t_{PLH}	V_{CC}=5.5V, C_L = 15pF		4	7	ns
		V_{CC}=5.5V, C_L = 50pF		5.5	8	

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

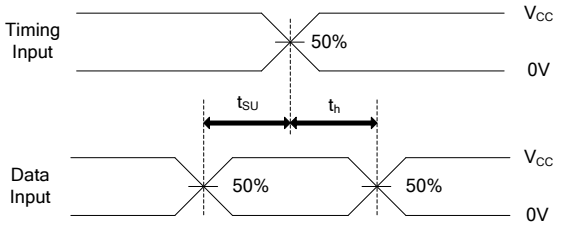
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=5V, f=1MHz, No load.		12		pF

■ TEST CIRCUIT AND WAVEFORMS

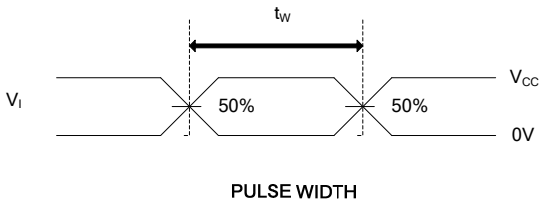


Test Circuit

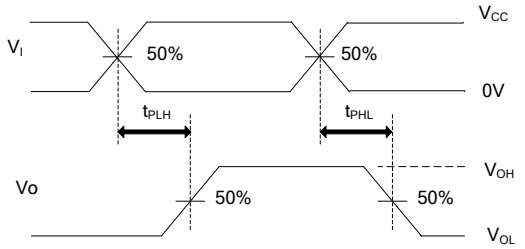
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{CC}



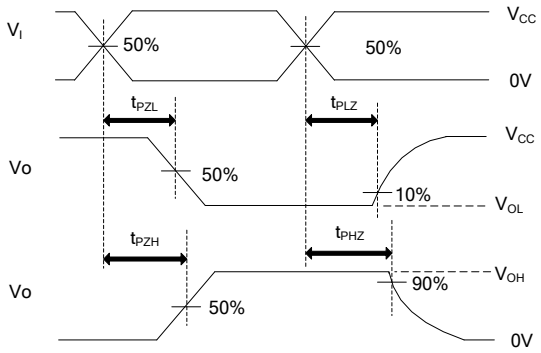
SETUP TIME AND HOLD TIME



PULSE WIDTH



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.
P_{RR} ≤1MHz, Z_O = 50Ω, t_R ≤3ns, t_F ≤3ns.