TP74AHC1G14 Series

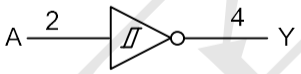
2-INPUT NAND GATE

DESCRIPTION

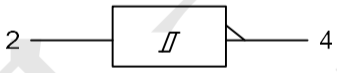
The TP74AHC1G14 contains one inverter with Schmitt-trigger, which provides the Function Y= $\overline{A}$.

They provide an inverting buffer function with Schmitt trigger action. These devices are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

LOGIC DIAGRAM



Logic symbol



IEC logic symbol

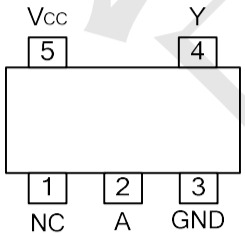
FEATURES

* Operation Voltage Range: 2V ~ 5.5V
* Low power consumption, I_{CC} = 1μA (Max.) at 5.5V
* ±8mA output driver at 5V

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74AHC1G14S5	SOT23-5	Tape and Reel,3000
TP74AHC1G14C5	SOT353	Tape and Reel,3000

PIN CONFIGURATION



FUNCTION TABLE

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

Note: H: high voltage level;
L: low voltage level

ABSOLUTE MAXIMUM RATING (T_A=25°, 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
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}		2		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		T_A=25°C			T_A=-40°C~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Threshold	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 Threshold	V_{T-}	V_{CC}=3.0V		0.90		1.90	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 Voltage (V_{T+}-V_{T-})	V_H	V_{CC}=3.0V		0.3		1.2	0.3		1.2	V
		V_{CC}=4.5V		0.4		1.4	0.4		1.4	V
		V_{CC}=5.5V		0.5		1.6	0.4		1.6	V
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V	I_{OH}=-50μA	1.9	2		1.9			V
		V_{CC}=3.0V		2.9	3		2.9			V
		V_{CC}=4.5V		4.4	4.5		4.4			V
		V_{CC}=3.0V, I_{OH}=-4mA		2.58			2.4			V
		V_{CC}=4.5V, I_{OH}=-8mA		3.94			3.7			V
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V	I_{OL}=50μA			0.1			0.1	V
		V_{CC}=3.0V				0.1			0.1	V
		V_{CC}=4.5V				0.1			0.1	V
		V_{CC}=3.0V, I_{OL}=4mA				0.36			0.6	V
		V_{CC}=4.5V, I_{OL}=8mA				0.36			0.6	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0~5.5V, 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}=0A				1			40	μA

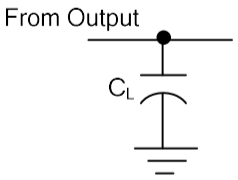
DYNAMIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		T_A=25°C			T_A=-40°C~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay Time Input (A) to Output (Y)	t_{PLH}	V_{CC}=3.3V±0.3V	C_L=15pF		10.8	16.3	1		21	ns
		V_{CC}=5V±0.5V			10.8	16.3	1		14	ns
	t_{PHL}	V_{CC}=3.3V±0.3V			7	10.6	1		21	ns
		V_{CC}=5V±0.5V			7	10.6	1		14	ns
	t_{PLH}	V_{CC}=3.3V±0.3V	C_L=50pF		10.8	16.3	1		21	ns
		V_{CC}=5V±0.5V			10.8	16.3	1		14	ns
	t_{PHL}	V_{CC}=3.3V±0.3V			7	10.6	1		21	ns
		V_{CC}=5V±0.5V			7	10.6	1		14	ns

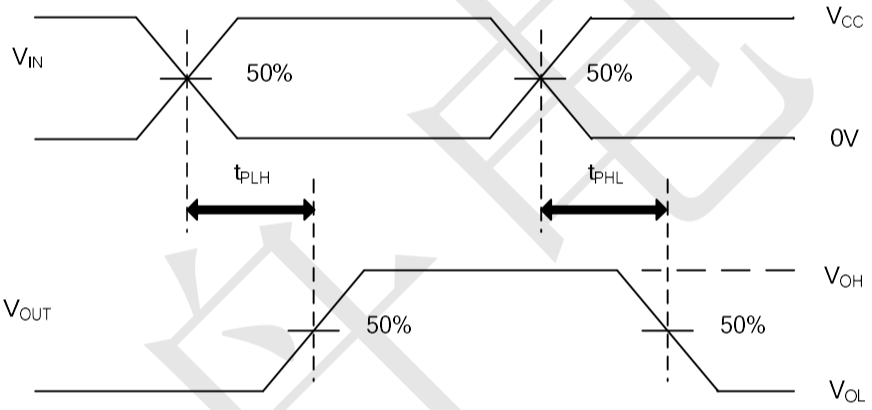
OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_I	V_{CC}=5.0V, V_{IN}=V_{CC} or GND		2	10	pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=5V, f=1MHz, No load		9		pF

TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT



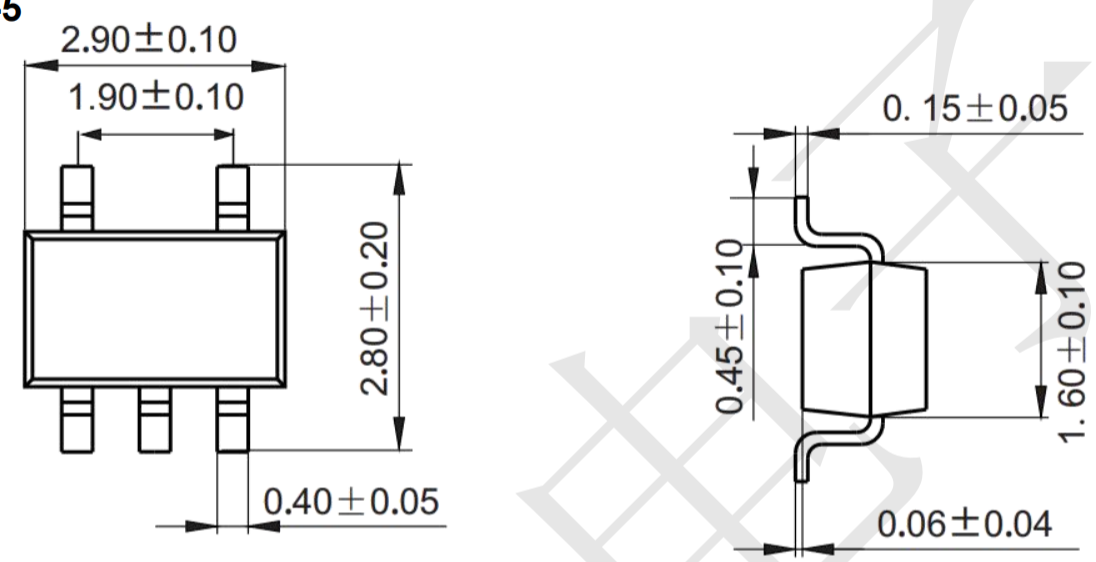
PROPAGATION DELAY TIMES

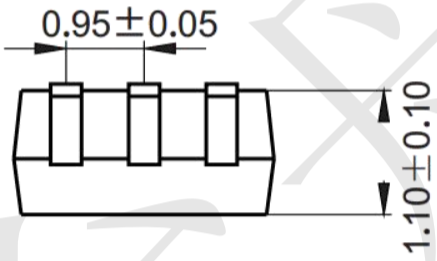
Notes: 1. C_L includes probe and jig capacitance.

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

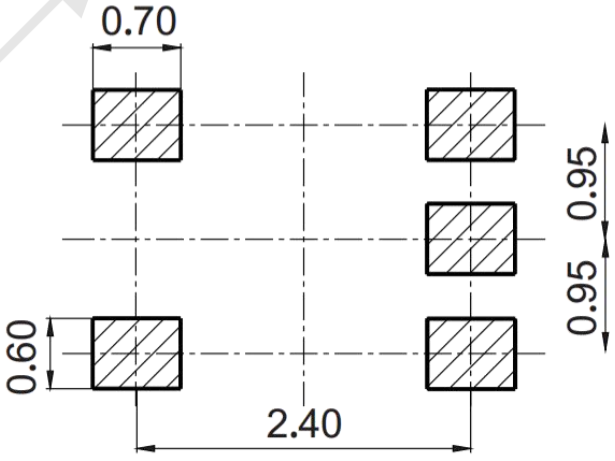
Package information (Unit: mm)

SOT23-5



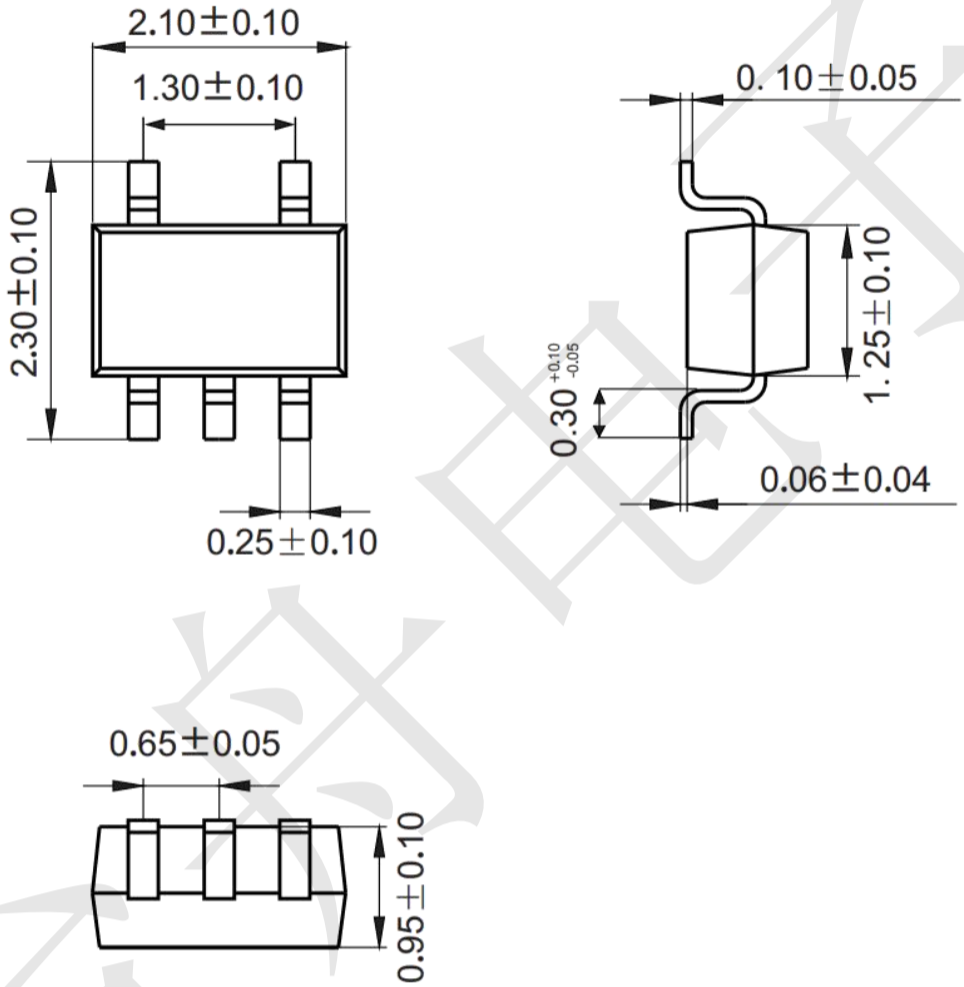


Mounting Pad Layout (Unit: mm)



Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)