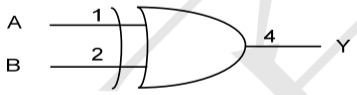
TP74AHC1G86 Series

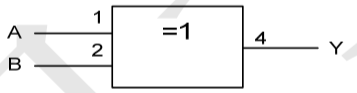
2-INPUT NAND GATE

DESCRIPTION

The TP74AHC1G86 is a 2-input EXCLUSIVE-OR gate, it provides the Function Y=A⊕B.

LOGIC DIAGRAM





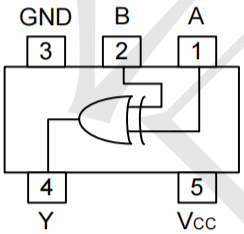
FEATURES

* Operation voltage range: 2 ~ 5.5V
* Low power current: I_{CC}=10Ma (Max)
* High speed: t_{PD}=4.3ns(Typ)

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74AHC1G86S5	SOT23-5	Tape and Reel,3000
TP74AHC1G86C5	SOT353	Tape and Reel,3000

PIN CONFIGURATION



FUNCTION TABLE

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

ABSOLUTE MAXIMUM RATINGS (Unless otherwise specified) (Note 2)

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
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes: 1. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT23-5	θ_{JA}	280	°C/W
	SOT-353		350	°C/W

RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

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}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=3.3+0.3V			100	ns/V
		V_{CC}=5.0+0.5V			20	
Operating Temperature	T_A		-40		+125	°C

STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			V
		V_{CC}=3.0V	2.1			
		V_{CC}=5.5V	3.85			
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V			0.5	V
		V_{CC}=3.0V			0.9	
		V_{CC}=5.5V			1.65	
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V, I_{OH}=-50μA	1.9	2.0		V
		V_{CC}=3.0V, I_{OH}=-50μA	2.9	3.0		
		V_{CC}=4.5V, I_{OH}=-50μA	4.4	4.5		
		V_{CC}=3.0V, I_{OH}=-4mA	2.58			
		V_{CC}=4.5V, I_{OH}=-8mA	3.94			
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V, I_{OL}=50μA			0.1	V
		V_{CC}=3.0V, I_{OL}=50μA			0.1	
		V_{CC}=4.5V, I_{OL}=50μA			0.1	
		V_{CC}=3.0V, I_{OL}=4mA			0.36	
		V_{CC}=4.5V, I_{OL}=8mA			0.36	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 5.5V, V_{IN}=V_{CC} 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
Input Capacitance	C_{IN}	V_{CC}=5.0V, V_{IN}=V_{CC} or GND		4	10	pF

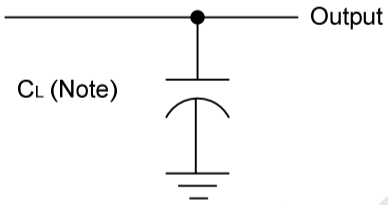
DYNAMIC CHARACTERISTICS (Input: t_R, t_F≤3ns; PRR≤1MHz, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A and B) to output(Y)	t_{PLH}	V_{CC} =3.3V±0.3V, C_L=15pF		7	11	ns
	t_{PHL}			7	11	
	t_{PLH}	V_{CC} =3.3V±0.3V, C_L=50pF		9.5	14.5	
	t_{PHL}			9.5	14.5	
Propagation delay from input (A and B) to output(Y)	t_{PLH}	V_{CC} =5V±0.5V, C_L=15pF		4.8	6.8	ns
	t_{PHL}			4.8	6.8	
	t_{PLH}	V_{CC} =5V±0.5V, C_L=50pF		6.3	8.8	
	t_{PHL}			6.3	8.8	

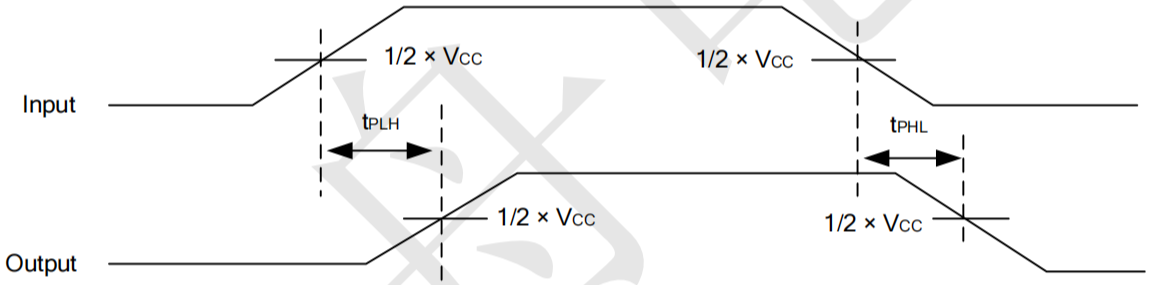
OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, f=1MHz, V_{CC}=5V		18		pF

TEST CIRCUIT AND WAVEFORMS

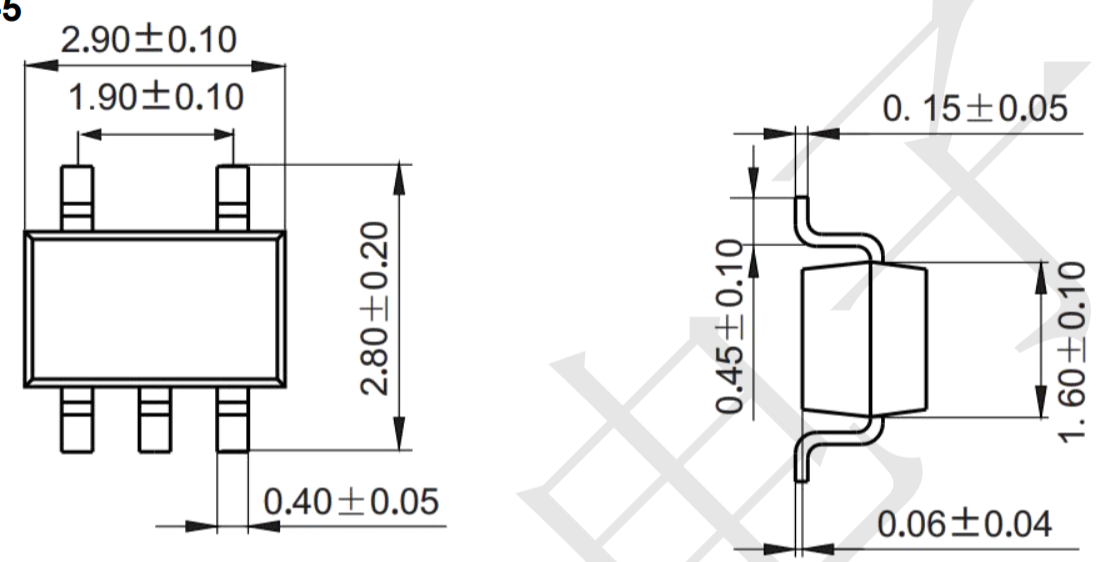


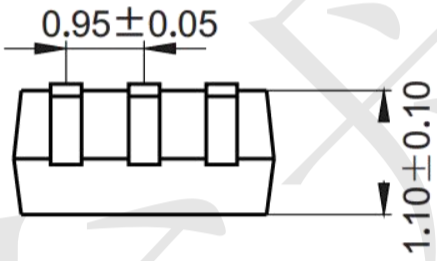
Note: C_L includes probe and jig capacitance.



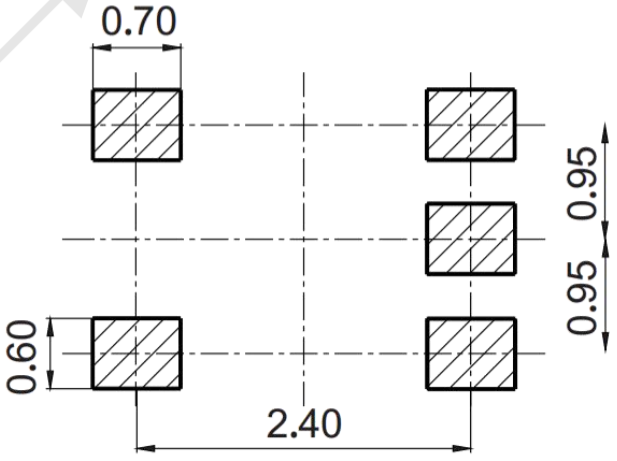
Package information (Unit: mm)

SOT23-5



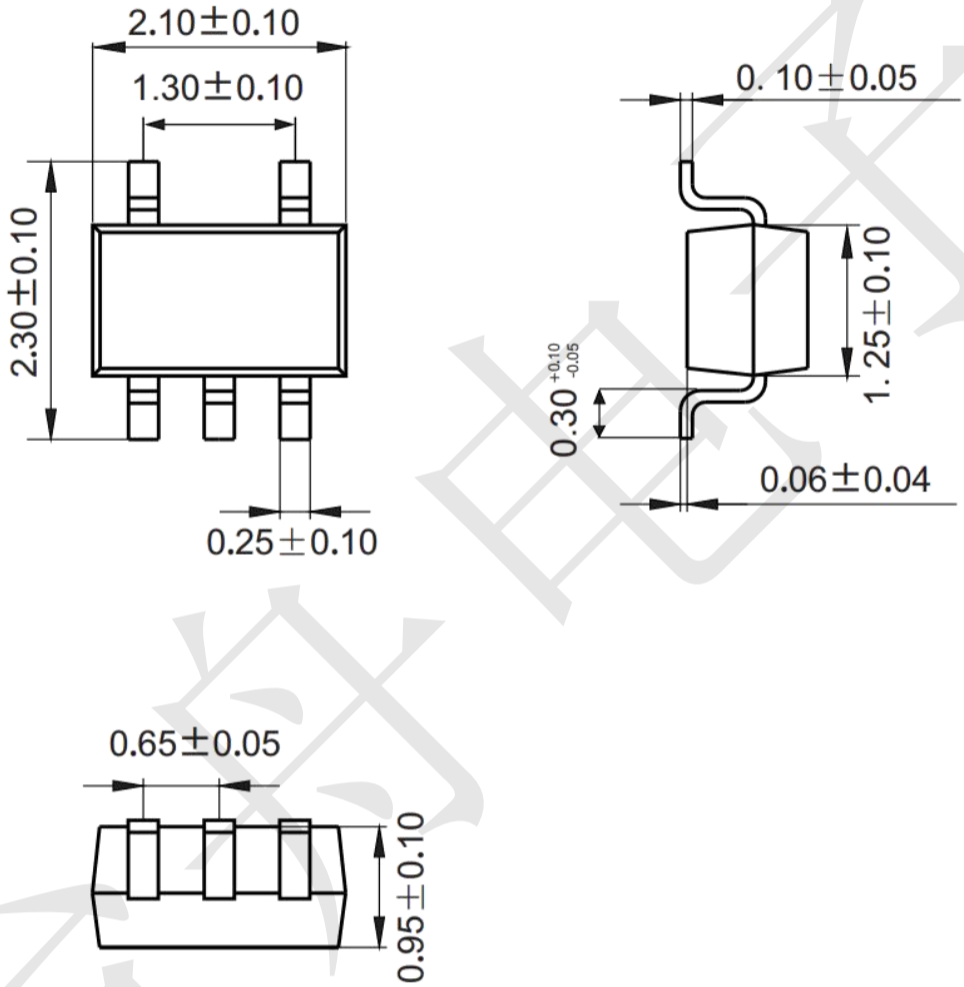


Mounting Pad Layout (Unit: mm)



Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)

