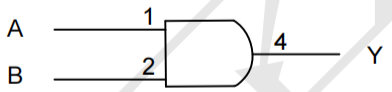
TP74AHC1G08 Series

2-INPUT NAND GATE

DESCRIPTION

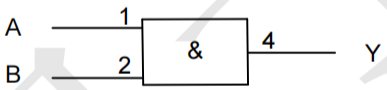
The **TP74AHC1G08** is a high-speed si-gate CMOS device which provides the 2-input AND function.

LOGIC DIAGRAM



FEATURES

* Operation Voltage Range: 2 ~ 5.5V
* Low Power Current: I CC=40μA (Max.)
* High speed: t_{PD}=4.8ns (Typ.) @ VCC=5V

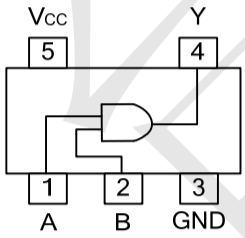


IEC logic symbol

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74AHC1G08S5	SOT23-5	Tape and Reel,3000
TP74AHC1G08C5	SOT353	Tape and Reel,3000

PIN CONFIGURATION



FUNCTION TABLE

INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

ABSOLUTE MAXIMUM RATINGS (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
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
Power Dissipation	P_D	250	mW
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

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 Times	t_R, t_F	V_{CC}=3.3V±0.3V			100	ns/V
		V_{CC}=5.0V±0.5V			20	
Operating Temperature	T_{OPR}		-40		125	°C

STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			1.5			V
		V_{CC}=3.0V	2.1			2.1			V
		V_{CC}=5.5V	3.85			3.85			V
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V			0.5			0.5	V
		V_{CC}=3.0V			0.9			0.9	V
		V_{CC}=5.5V			1.65			1.65	V
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V, I_{OH}=-50μA	1.9	2.0		1.9			V
		V_{CC}=3.0V, I_{OH}=-50μA	2.9	3.0		2.9			V
		V_{CC}=4.5V, I_{OH}=-50μA	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, I_{OL}=50μA			0.1			0.1	V
		V_{CC}=4.5V, I_{OL}=50μA			0.1			0.1	V
		V_{CC}=3.0V, I_{OL}=4mA			0.36			0.55	V
		V_{CC}=4.5V, I_{OL}=8mA			0.36			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0~5.5V, V_{IN}=V_{CC} or GND			±0.1			±2	μA
Quiescent Supply Current	I_Q	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0			1			40	μA

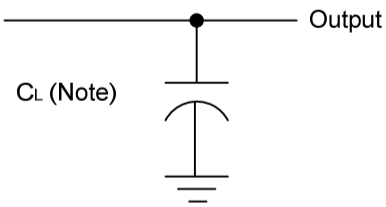
DYNAMIC CHARACTERISTICS (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay time Input (A or B) to output(Y)	t_{PLH}	V_{CC}=3.3V±0.3V, C_L=15pF		6.7	9.8	1		12	ns
	t_{PHL}			6.7	9.8	1		12	ns
	t_{PLH}	V_{CC}=3.3V±0.3V, C_L=50pF		9.2	13.3	1		16	ns
	t_{PHL}			9.2	13.3	1		16	ns
Propagation delay time Input (A or B) to output(Y)	t_{PLH}	V_{CC}=5V±0.5V, C_L=15pF		4.8	6.9	1		8	ns
	t_{PHL}			4.8	6.9	1		8	ns
	t_{PLH}	V_{CC}=5V±0.5V, C_L=50pF		6.3	8.9	1		10.5	ns
	t_{PHL}			6.3	8.9	1		10.5	ns

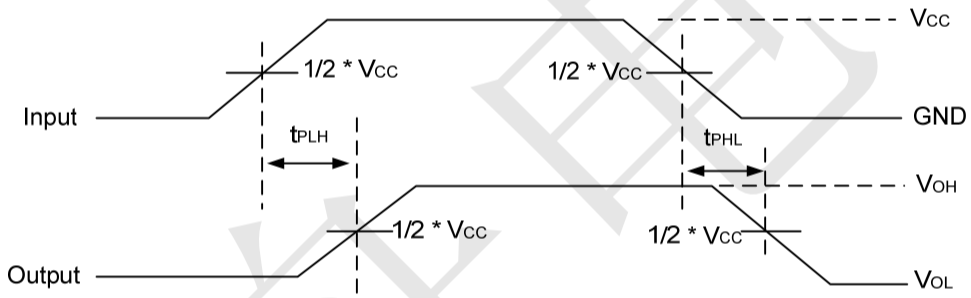
OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC}=5V, V_{IN}=V_{CC} or GND		4	10	pF
Power Dissipation Capacitance	C_{PD}	No load, V_{CC}=5V, f=1MHz		18		pF

TEST CIRCUIT AND WAVEFORMS

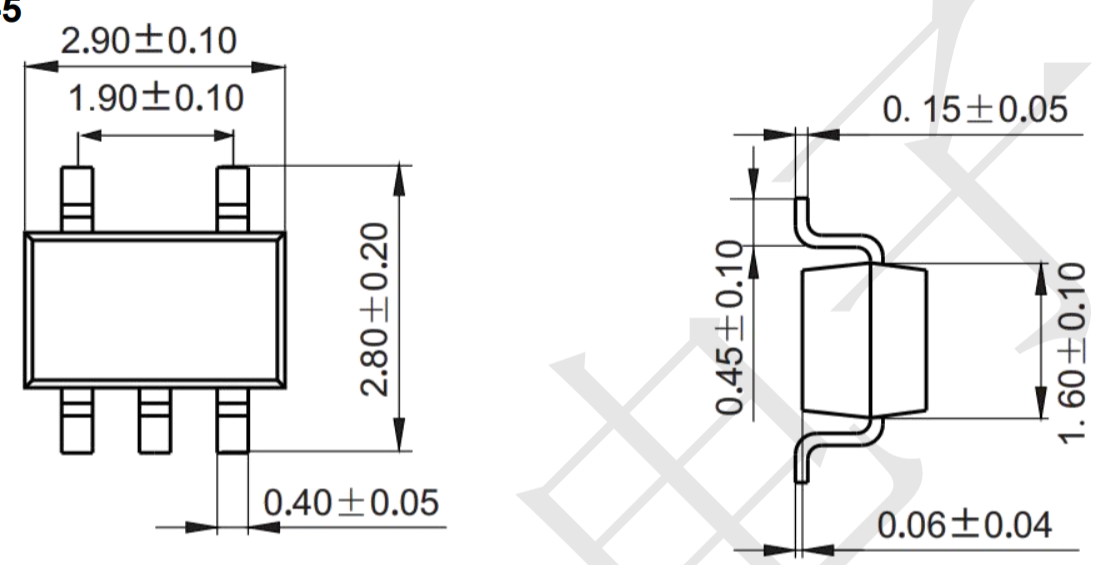


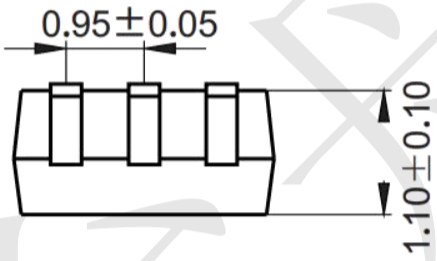
Note: CL includes probe and jig capacitance.



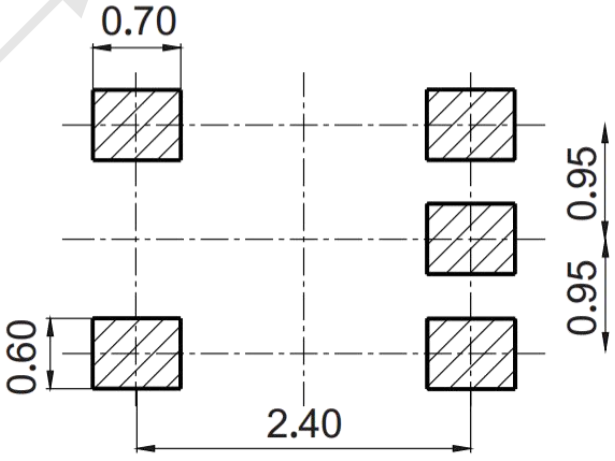
Package information (Unit: mm)

SOT23-5



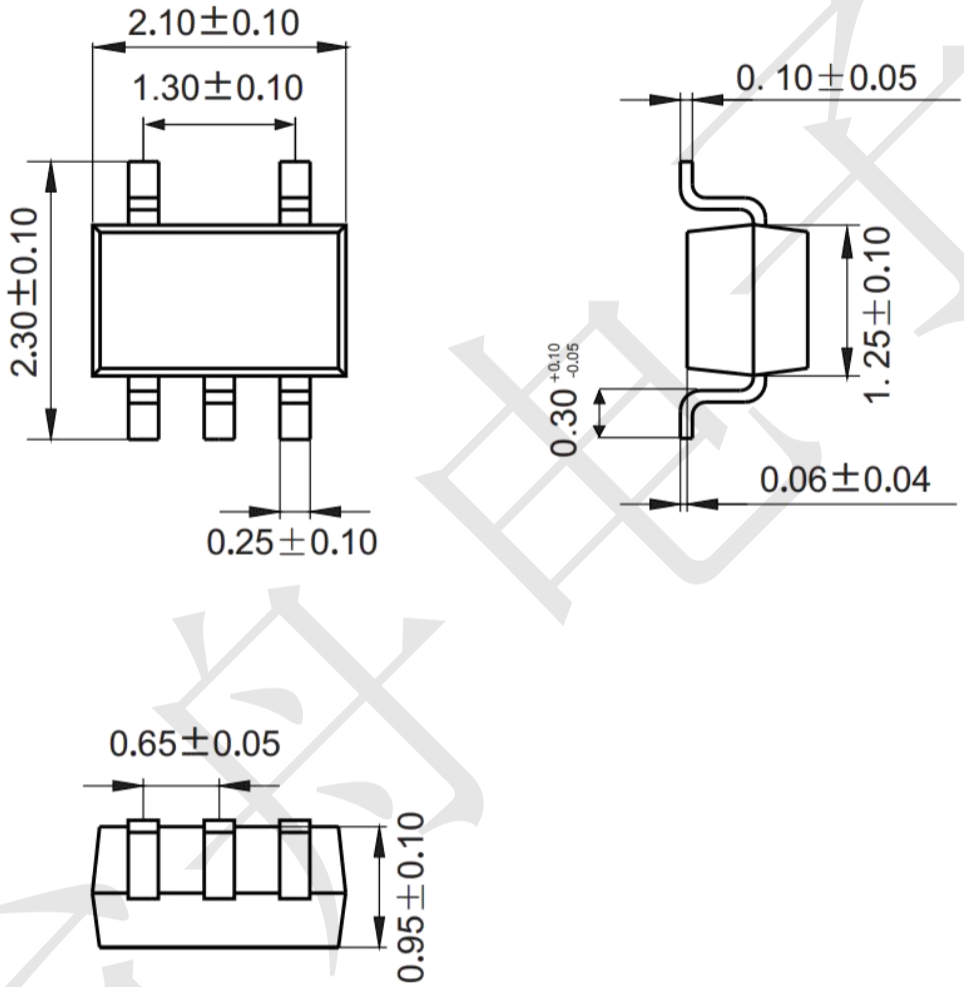
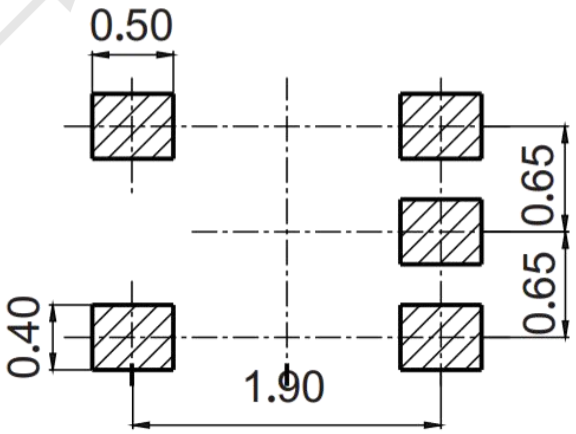


Mounting Pad Layout (Unit: mm)



Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)