

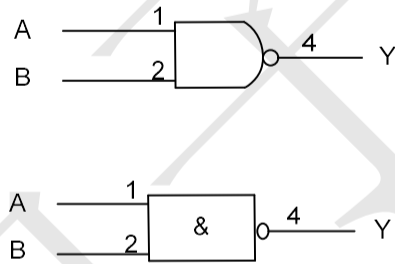
DESCRIPTION

The MC74VHC1G00 is a 2-input NAND gate which provides the Function $Y=A \times B$.

FEATURES

- * Operation Voltage Range: 2~5.5V
- * Low Power Dissipation: $I_{CC}=1.0\mu A$ (Max)
- * High Speed: $t_{PD}=4.3ns$ (Typ)

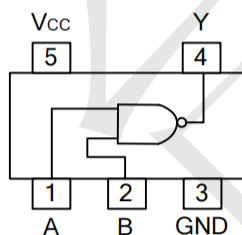
LOGIC DIAGRAM



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
MC74VHC1G00DTT1G-TP	SOT23-5	Tape and Reel,3000
MC74VHC1G00DFT1G-TP	SOT353	Tape and Reel,3000

PIN CONFIGURATION



SOT23-5/
SOT353

FUNCTION TABLE(each gate)

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

ABSOLUTE MAXIMUM RATING (Note 1)

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. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. 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
High-Level Output Current	I_{OH}	$V_{CC}=2V$			-50	μA
		$V_{CC}=3.3\pm 0.3V$			-4	mA
		$V_{CC}=5\pm 0.3V$			-8	mA
Low-Level Output Current	I_{OL}	$V_{CC}=2V$			50	μA
		$V_{CC}=3.3\pm 0.3V$			4	mA
		$V_{CC}=5\pm 0.5V$			8	mA
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	ns/V
Operating Temperature	T_A		-40		+125	°C

STATIC CHARACTERISTICS

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 _{CC} =5.5V	3.85			3.85			
Low-Level Input Voltage	V _{IL}	V _{CC} =2.0V			0.5			0.5	V
		V _{CC} =3.0V			0.9			0.9	
		V _{CC} =5.5V			1.65			1.65	
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 _{CC} =4.5V, I _{OH} =-50μA	4.4	4.5		4.4			
		V _{CC} =3.0V, I _{OH} =-4mA	2.58			2.4			
		V _{CC} =4.5V, I _{OH} =-8mA	3.94			3.7			
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 _{CC} =4.5V, I _{OL} =50μA			0.1			0.1	
		V _{CC} =3.0V, I _{OL} =4mA			0.36			0.55	
		V _{CC} =4.5V, I _{OL} =8mA			0.36			0.55	
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 _{CC}	V _{CC} =5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0			1			40	μA

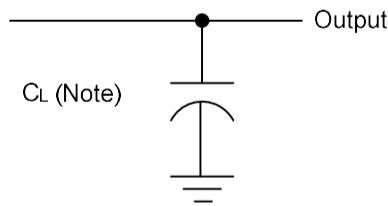
DYNAMIC CHARACTERISTICS (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

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} =3.3±0.3V, C _L =15pF		5.5	7.9	1		10.5	ns
	t _{PHL}			5.5	7.9	1		10.5	ns
	t _{PLH}	V _{CC} =3.3±0.3V, C _L =50pF		8	11.4	1		14.5	ns
	t _{PHL}			8	11.4	1		14.5	ns
Propagation Delay Time Input (A or B) to Output(Y)	t _{PLH}	V _{CC} =5±0.5V, C _L =15pF		3.7	5.5	1		7	ns
	t _{PHL}			3.7	5.5	1		7	ns
	t _{PLH}	V _{CC} =5±0.5V, C _L =50pF		5.2	7.5	1		9.5	ns
	t _{PHL}			5.2	7.5	1		9.5	ns

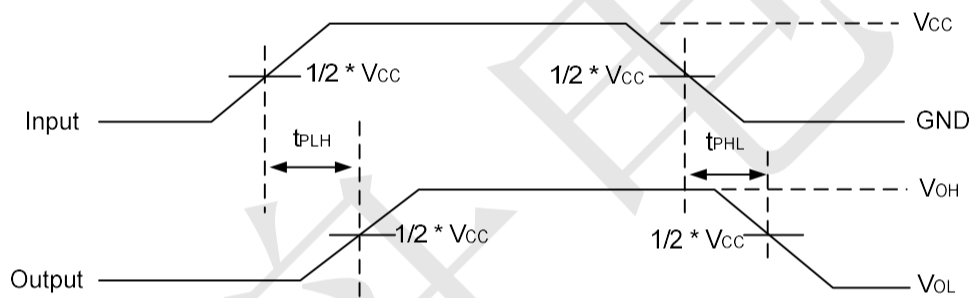
OPERATING CHARACTERISTICS

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, f=1MHz, V _{CC} =5V		9.5		pF

TEST CIRCUIT AND WAVEFORMS

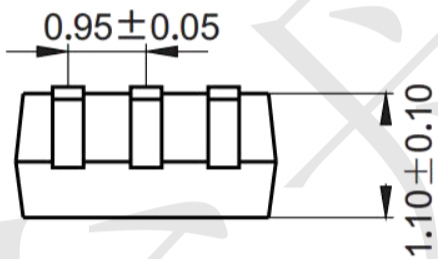
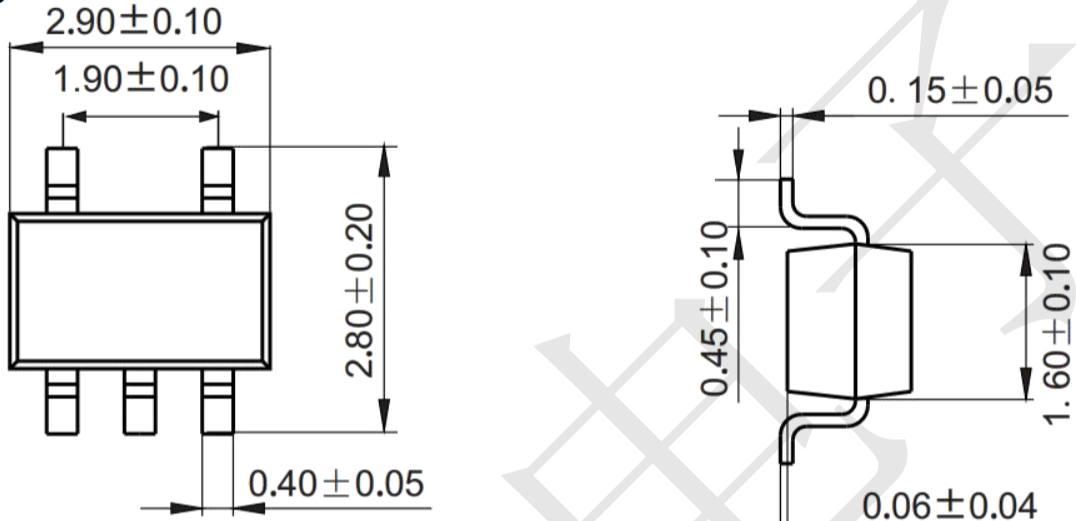


Note: C_L includes probe and jig capacitance.

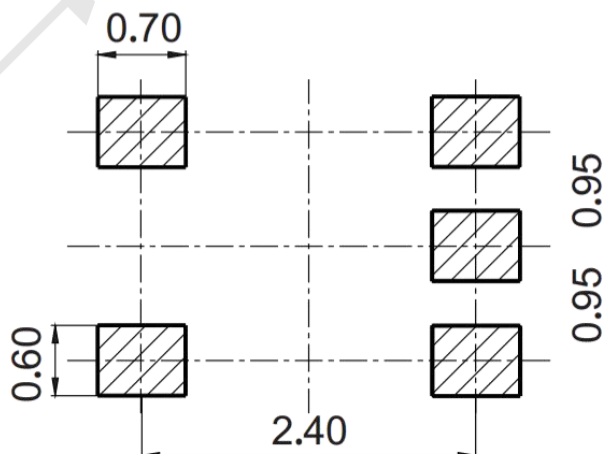


Package information (Unit: mm)

SOT23-5

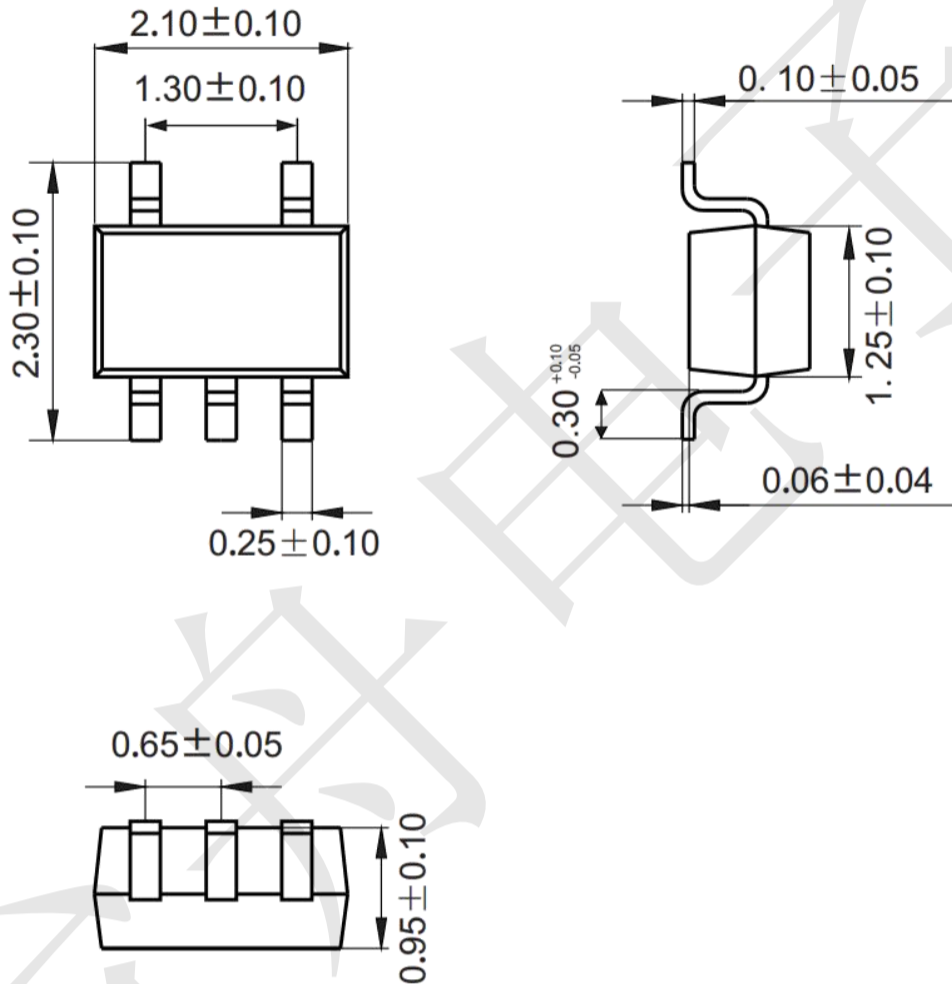


Mounting Pad Layout (Unit: mm)



Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)

