

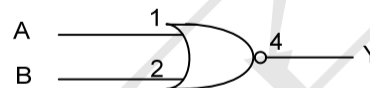
DESCRIPTION

The MC74VHC1G02 is a single 2-input NOR gate which provides the Function $Y = \overline{A+B}$.

FEATURES

- * Operation Voltage Range: 2.0~5.5V
- * Low Power Dissipation
- * High noise immunity
- * Balanced propagation delays
- * Specified from -40 to +125°C

LOGIC DIAGRAM



Logic symbol

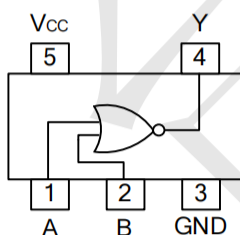


IEC logic symbol

Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
MC74VHC1G02DTT1G-TP	SOT23-5	Tape and Reel,3000
MC74VHC1G02DFT1G-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	L
H	L	L
H	H	L

ABSOLUTE MAXIMUM RATINGS (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
Continuous Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	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 CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0	5.0	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	$\Delta t/\Delta v$	$V_{CC}=3.3V\pm0.3V$			100	ns/V
		$V_{CC}=5V\pm0.5V$			20	ns/V
Operating Temperature	T_A		-40		+125	°C

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, 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
		$V_{CC}=5.5V$	3.85			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=3.0V$			0.9	V
		$V_{CC}=5.5V$			1.65	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0V, I_{OH}=-50\mu A$	1.9	2.0		V
		$V_{CC}=3.0V, I_{OH}=-50\mu A$	2.9	3.0		V
		$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		V
		$V_{CC}=3.0V, I_{OH}=-4mA$	2.58			V
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OL}=4mA$			0.36	V
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0V\sim5.5V, V_{IN}=V_{CC}$ 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}	$V_{CC}=5V, V_{IN}=V_{CC}$ or GND		4	10	pF

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

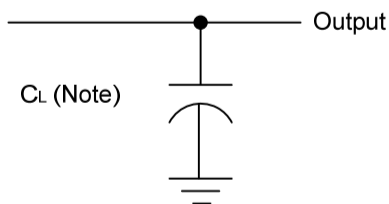
SWITCHING CHARACTERISTICS (Input signal: $T_A=25^{\circ}\text{C}$, $\text{PRR}\leq 1\text{MHz}$, $Z_O=50\Omega$, $t_R\leq 3\text{ns}$, $t_F\leq 3\text{ns}$.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Times	t_{PLH}	$V_{CC} = 3.3\text{V}\pm 0.3\text{V}$, $C_L=15\text{pF}$		5.6	7.9	ns
		$V_{CC} = 5\text{V}\pm 0.5\text{V}$, $C_L=15\text{pF}$		3.6	5.5	ns
		$V_{CC} = 3.3\text{V}\pm 0.3\text{V}$, $C_L=50\text{pF}$		8.1	11.4	ns
		$V_{CC} = 5\text{V}\pm 0.5\text{V}$, $C_L=50\text{pF}$		5.1	7.5	ns
	t_{PHL}	$V_{CC} = 3.3\text{V}\pm 0.3\text{V}$, $C_L=15\text{pF}$		5.6	7.9	ns
		$V_{CC} = 5\text{V}\pm 0.5\text{V}$, $C_L=15\text{pF}$		3.6	5.5	ns
		$V_{CC} = 3.3\text{V}\pm 0.3\text{V}$, $C_L=50\text{pF}$		8.1	11.4	ns
		$V_{CC} = 5\text{V}\pm 0.5\text{V}$, $C_L=50\text{pF}$		5.1	7.5	ns

OPERATING CHARACTERISTIC

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, $f=1\text{MHz}$, $V_{CC}=5\text{V}$, $T_A=25^{\circ}\text{C}$		15		pF

TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

Fig.1 Load circuitry for switching times.

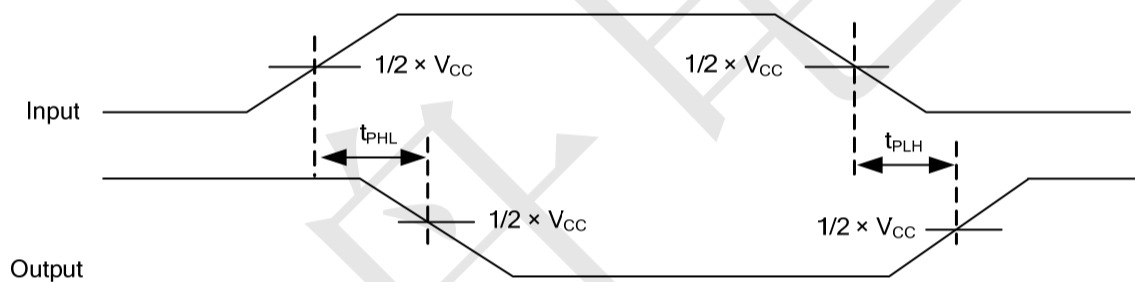
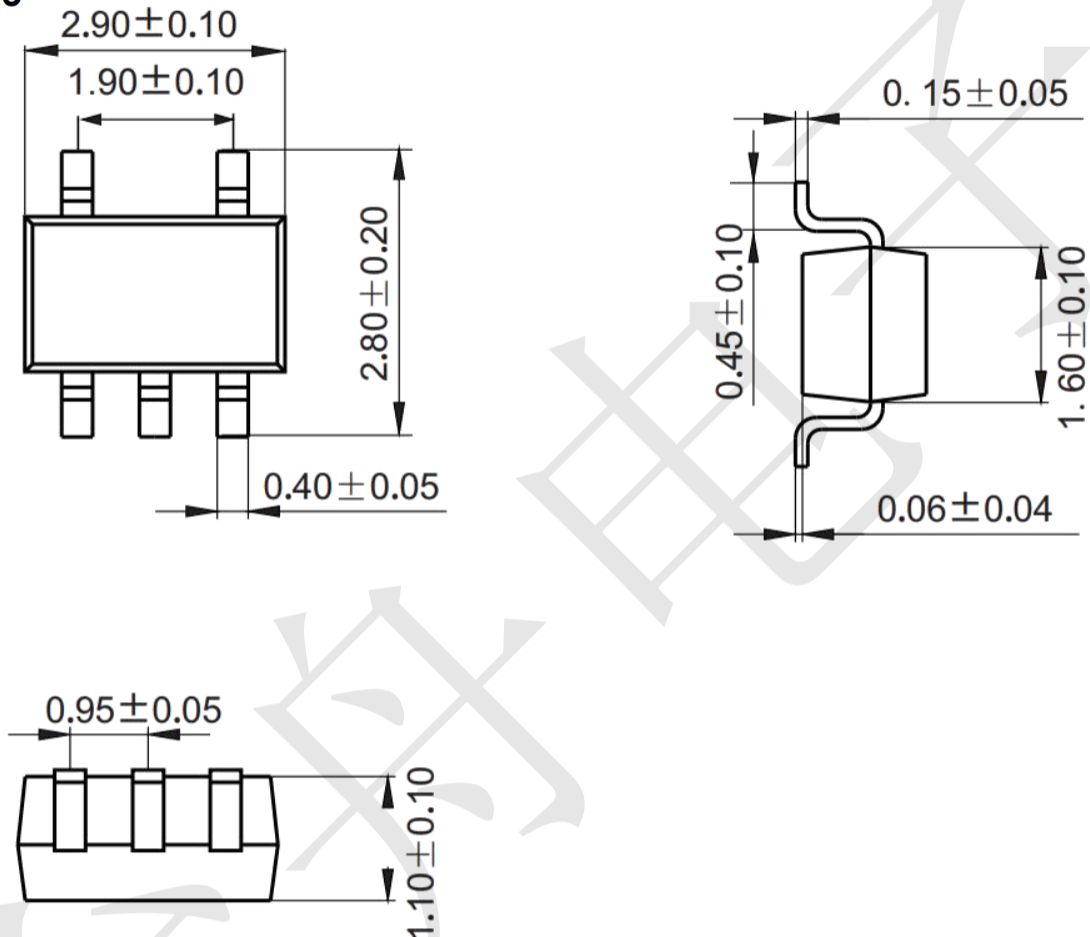


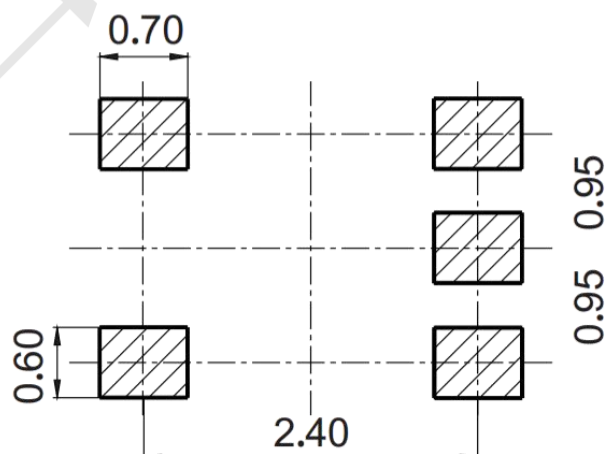
Fig.2 Propagation delay from input(A and B) to output(Y)

Package information (Unit: mm)

SOT23-5

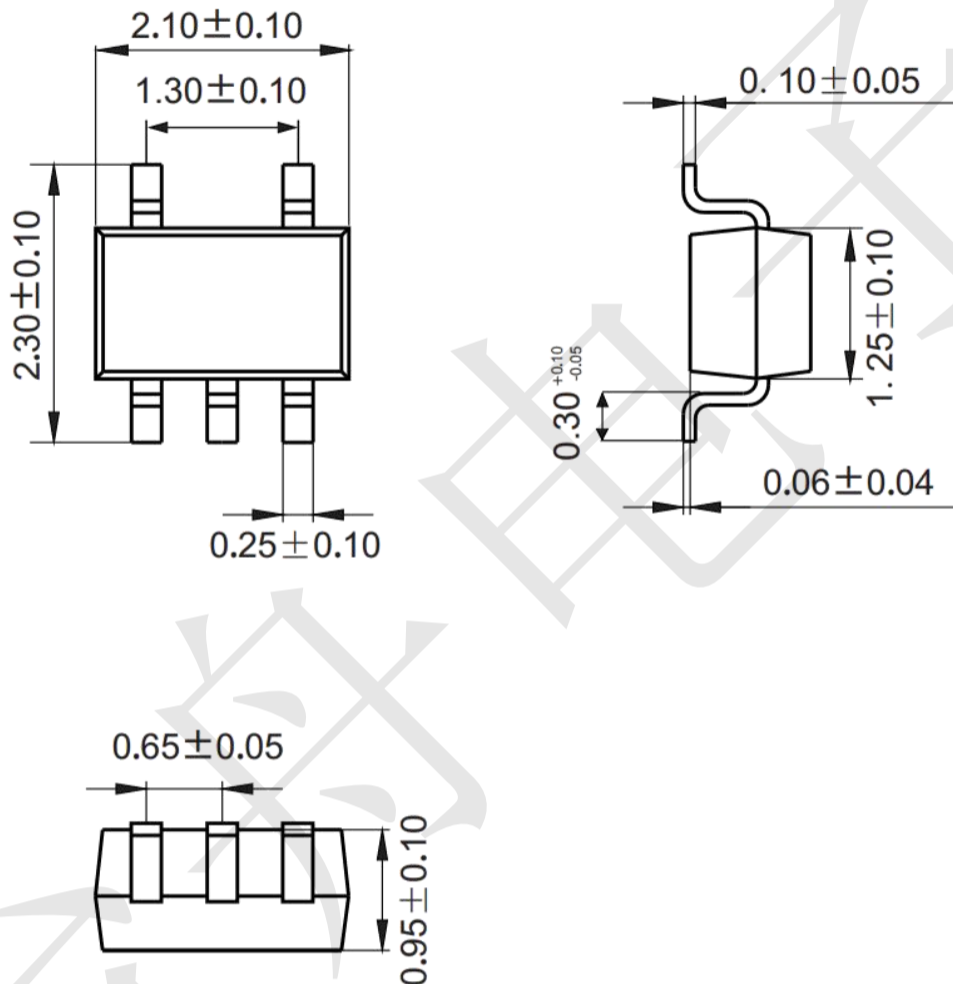


Mounting Pad Layout (Unit: mm)



Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)

