

Features

- Operation Voltage Range: 1.65V ~ 5.5V
- Power Down Protection
- $\pm 24\text{mA}$ Output Drive ($V_{CC}=3.0\text{V}$)
- Low Power Consumption, 10- μA Max ICC
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

General Description

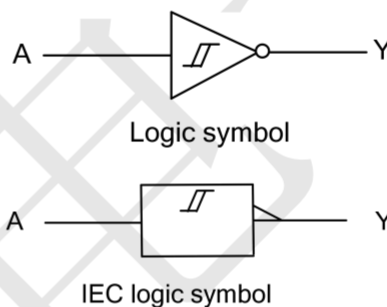
The MC74VHC1G14 is a single Schmitt-trigger inverter, it provides the function $Y=\overline{A}$.

The device have different input threshold levels for positive going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

Applications

- AV Receiver
- Audio Dock:Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant(PDA)
- Power:Telecom/Server AC/DC Supply:Single Controller:Analog and Digital

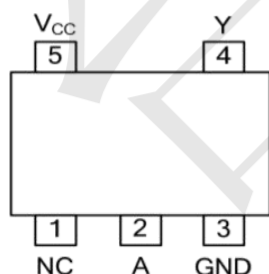
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
MC74VHC1G14DTT1G-TP	SOT23-5	Tape and Reel,3000
MC74VHC1G14DFT1G-TP	SOT353	Tape and Reel,3000

Pin Configuratio



SOT23-5
SOT353

Function Table

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

Note:H: HIGH voltage level;L: LOW voltage level.

MC74VHC1G14 Series

SINGLE SCHMITT-TRIGGER INVERTER

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Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V _{CC}		-0.5 ~ +6.5	V
Input Voltage	V _{IN}		-0.5 ~ +6.5	V
Output Voltage	V _{OUT}	Output in the Power-off state	-0.5 ~ +6.5	V
		Output in the High or Low state	-0.5 ~ V _{CC} +0.5	V
V _{CC} or GND Current	I _{CC}	Output in the Power-off state	±100	mA
Continuous Output Current	I _{OUT}	V _{OUT} =0~V _{CC}	±50	mA
Input Clamp Current	I _{IK}	V _{IN} <0	-50	mA
Output Clamp Current	I _{OK}	V _{OUT} <0	-50	mA
Storage Temperature Range	T _{STG}		-65 ~ +150	°C
Junction to Ambient	θ _{JA}	SOT-23-5	230	°C/W
		SOT353	280	°C/W

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	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}	Operating	1.65	--	5.5	V
		Data retention only	1.5	--	--	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

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Electrical Characteristics (unless otherwise specified)

PARAMETER	SYM BOL	TEST Conditions	TA =25°C			TA =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V _{T+}	V _{CC} =1.65V	0.79	--	1.16	0.76	--	1.16	V
		V _{CC} =2.3V	1.11	--	1.56	1.07	--	1.56	V
		V _{CC} =3V	1.5	--	1.87	1.47	--	1.87	V
		V _{CC} =4.5V	2.16	--	2.74	2.13	--	2.74	V
		V _{CC} =5.5V	2.61	--	3.33	2.58	--	3.33	V
Negative-Going Input Threshold Voltage	V _{T-}	V _{CC} =1.65V	0.39	--	0.62	0.39	--	0.65	V
		V _{CC} =2.3V	0.58	--	0.87	0.58	--	0.9	V
		V _{CC} =2.7V	0.84	--	1.14	0.84	--	1.17	V
		V _{CC} =4.5V	1.41	--	1.79	1.41	--	1.82	V
		V _{CC} =5.5V	1.87	--	2.29	1.87	--	2.31	V
Hysteresis Voltage (V _{T+} -V _{T-})	ΔV _T	V _{CC} =1.65V	0.37	--	0.62	0.3	--	0.62	V
		V _{CC} =2.3V	0.48	--	0.77	0.42	--	0.77	V
		V _{CC} =2.7V	0.56	--	0.87	0.5	--	0.87	V
		V _{CC} =4.5V	0.71	--	1.04	0.65	--	1.04	V
		V _{CC} =5.5V	0.71	--	1.11	0.65	--	1.11	V
High-Level Output Voltage	V _{OH}	V _{CC} =1.65 ~ 5.5V, I _{OH} =-100μA	V _{CC} -0.1	--	--	V _{CC} -0.1	--	--	V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2	1.54	--	0.95	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	2.15	--	1.7	--	--	V
		V _{CC} =2.7V, I _{OH} =-16mA	2.2	2.5	--	1.9	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	2.62	--	2.0	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	4.11	--	3.4	--	--	V
Low-Level Output Voltage	V _{OL}	V _{CC} =1.65 ~ 5.5V, I _{OL} =100μA	--	--	0.1	--	--	0.1	V
		V _{CC} =1.65V, I _{OL} =4mA	--	0.07	0.45	--	--	0.7	V
		V _{CC} =2.3V, I _{OL} =8mA	--	0.12	0.3	--	--	0.45	V
		V _{CC} =2.7V, I _{OL} =16mA	--	0.17	0.4	--	--	0.6	V
		V _{CC} =3.0V, I _{OL} =24mA	--	0.33	0.55	--	--	0.8	V
		V _{CC} =4.5V, I _{OL} =32mA	--	0.39	0.55	--	--	0.8	V
Input Leakage Current	I _{I(LEAK)}	V _{CC} =0 ~ 5.5V, V _{IN} =5.5V or GND	--	±0.1	±5	--	--	±5	uA
Power OFF Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	±0.1	±10	--	--	±10	uA
Quiescent Supply Current	I _Q	V _{CC} =1.65 ~ 5.5V, V _{IN} =V _{CC} or GND, I _{OUT} =0A	--	0.1	10	--	--	10	uA
Additional Quiescent Supply ent Per Input Pin	ΔI _Q	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND	--	5	500	--	--	500	uA

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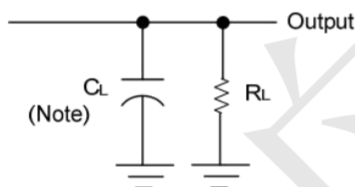
OPERATING CHARACTERISTICS (f=10MHz, TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Input Capacitance	C _I	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	5	--	pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =3.3V, V _{IN} =GND or V _{CC}	--	15.4	--	pF

SWITCHING CHARACTERISTICS (TA=25°C, unless otherwise specified)

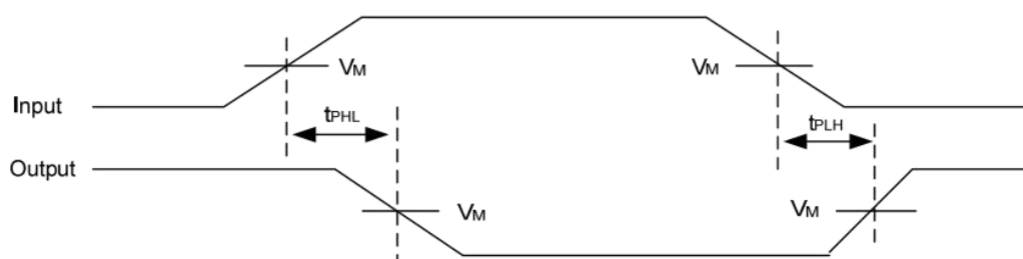
PARAMETER	SYMBOL	TEST Conditions	TA=25°C			TA=-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output(Y)	t _{PLH} / t _{PHL}	V _{CC} =1.65~1.95V, C _L =30 pF, R _L =1K	1	8	13	--	--	15	nS
		V _{CC} =2.3~2.7V, C _L =30 pF, R _L =500 Ω	0.7	5	9	--	--	11	nS
		V _{CC} =2.7V, C _L =50pF, R _L =500Ω	0.7	5	8	--	--	10	nS
		V _{CC} =3.0~3.6V, C _L =50pF, R _L =500Ω	0.7	4.5	7	--	--	9	nS
		V _{CC} =4.5~5.5V, C _L =50pF, R _L =500Ω	0.7	4	6	--	--	8	nS

TEST CIRCUIT AND WAVEFORMS



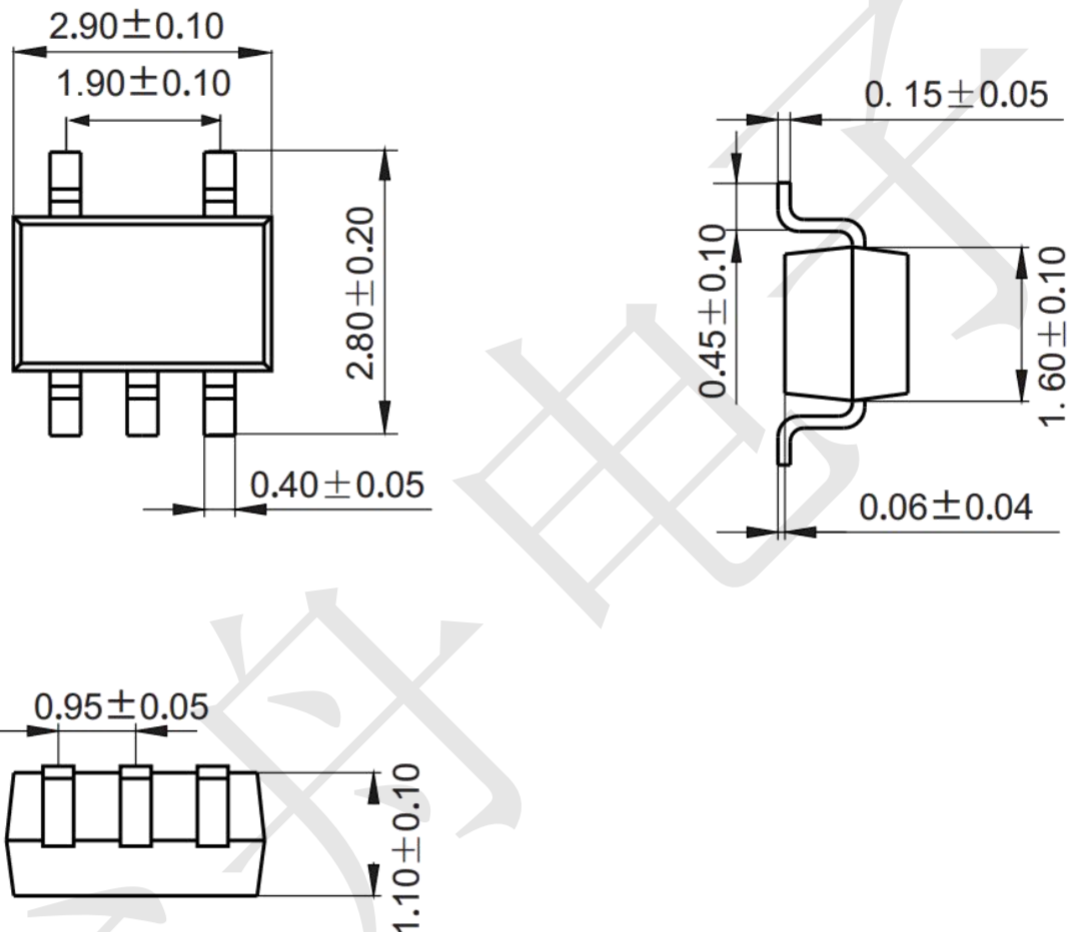
Note: C_L includes probe and jig capacitance.

V _{CC}	V _{IN}	t _R , t _F	V _M	C _L	R _L
1.65V~1.95V	V _{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	1kΩ
2.3V~2.7V	V _{CC}	≤2ns	$\frac{V_{CC}}{2}$	30pF	500Ω
2.7V	2.7V	≤2.5ns	1.5V	50pF	500Ω
3.0V~3.6V	2.7V	≤2.5ns	1.5V	50pF	500Ω
4.5V~5.5V	V _{CC}	≤2.5ns	$\frac{V_{CC}}{2}$	50pF	500Ω

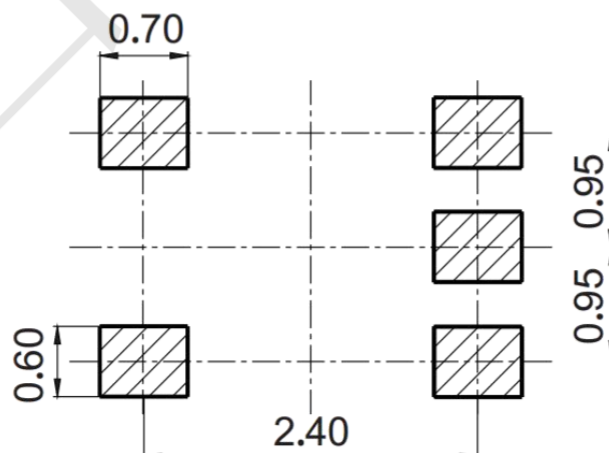


Package informantion

SOT23-5 (Unit: mm)

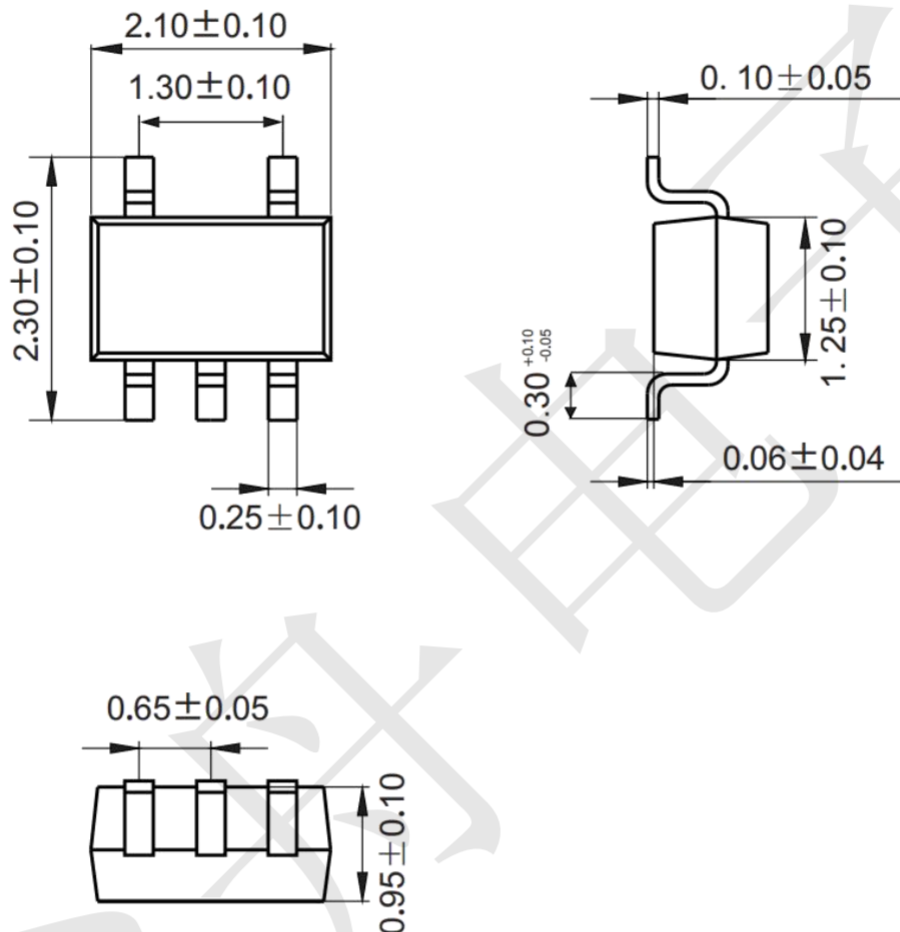


Mounting Pad Layout (unit: mm)



Package informantion

SOT353 (Unit: mm)



Mounting Pad Layout (unit: mm)

