

Features

- Operation Voltage Range: 2.0~5.5V
- Inputs Accept Voltages to 5.5V
- Low power dissipation
- Very low ON-resistance: 26Ω (typ.) at $V_{CC}=3.0V$
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

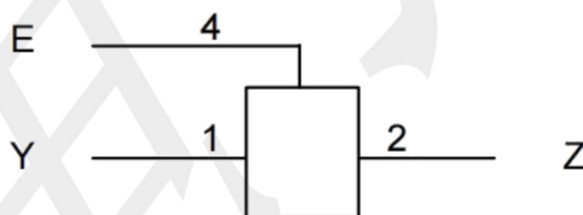
General Description

The 74AHC1G66 is an analog switch which transmits signals from pin(Y or Z) to pin (Z or Y) with an active HIGH enable input pin (E). When pin E is LOW, the switch is turned off.

Applications

- Wireless Devices
- Audio and Video Signal Routing
- Portable Computing
- Wearable Devices
- Signal Gating, Chopping, Modulation or Demodulation (Modem)
- Signal Multiplexing for Analog-to-Digital and Digital-to-Analog Conversion Systems

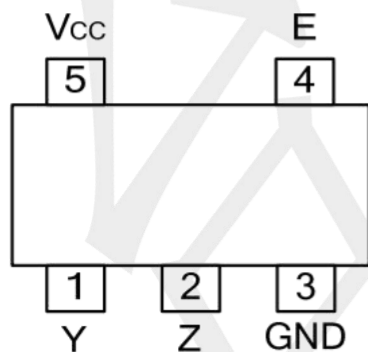
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
74AHC1G66GV-TP	SOT23-5	Tape and Reel,3000
74AHC1G66GW-TP	SOT353	Tape and Reel,3000

Pin Configuratio



SOT23-5/SOT353

Function Table(each gate)

CONTROL INPUT(C)	SWITCH
L	OFF
H	ON

Absolute Maximum Ratings(unless otherwise specified)(Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5~7	V
Enable Input Voltage	V _E	-0.5~7	V
Enable Input Clamp Current	I _{EK}	-20	mA
Switch Diode Current	I _{SK}	±20	mA
On-State Switch Current(-0.5V<V _{OS} <V _{CC} +0.5V)	I _S	±25	mA
V _{CC} or GND Current	I _{CC}	±75	mA
Power Dissipation	P _D	250	mW
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.

- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
- To avoid drawing V_{CC} current out of pin Z, when switch current flows into pin Y, the voltage drop across the bidirectional switch must not exceed 0.4V. If the switch current flows into pin Z, no V_{CC} current will flow out of pin Y. In this case there is no limit for the voltage drop across the switch, but the voltage at pins Y and Z may not exceed V_{CC} or GND.

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}		2	5.0	5.5	V
Enable Input Voltage	V _E		0		5.5	V
Switch Voltage	V _S		0		V _{CC}	V
Input Transition Rise or	Δt	V _{CC} =3.3+0.3V			100	ns/V
Fall Rate	ΔV	V _{CC} =5.0+0.5V			20	ns/V
Operating Temperature	T _A		-40	25	125	°C

74AHC1G66 Series

SINGLE BILATRAL ANALOG SWITCH

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STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	High-Level	VIH	VCC=2.0V	1.5			V
			VCC=3.0V	2.1			V
			VCC=5.5V	3.85			V
	Low-Level	VIL	VCC=2.0V			0.5	V
			VCC=3.0V			0.9	V
			VCC=5.5V			1.65	V
Enable Input Leakage Current		IE(LEAK)	VCC=5.5V, VE =VCC or GND			0.1	μA
StateSwitch Current	OFF	IS	VCC=5.5V, Vs =VCC -GND			0.1	μA
	ON		VCC=5.5V			0.1	μA
ON-Resistance(Peak) (Note)		RON(PEAK)	VCC=2.0V, VIS= VCC to GND, IS=1mA		148		Ω
			VCC=3.0V~3.6V, VI s= VCC to GND, IS=10mA		28	50	Ω
			VCC=4.5V~5.5V, VI s= VCC to GND, IS=10mA		15	30	Ω
ON-Resistance (Rail)		RON(RAIL)	VCC=2.0V, VIS = VCC, IS=1mA		28		Ω
			VCC=2.0V, VIS = GND, IS=1mA		30		Ω
			VCC=3.0V~3.6V, VIS = VCC, IS=10mA		18	50	Ω
			VCC=3.0V~3.6V, VIS = GND, IS=10mA		20	50	Ω
			VCC=4.5V~5.5V, VIS= VCC, IS=10mA		13	22	Ω
			VCC=4.5V~5.5V, VIS= GND, IS=10mA		15	22	Ω
Quiescent Supply Current		IQ	VCC=5.5V,VE =VCC or GND,VIS= GND or VCC, VOS=VCC or GND			1.0	μA
Enable Input Capacitance		CE	VE=VCC or GND		2	10	pF
MaximumSwitchCapacitance		CS	Independent I/O		4	10	pF

Note: With supply voltages at or near 2V, the analog switch on-state resistance becomes very nonlinear.
Only digital signals should be transmitted at these low supply voltages

DYNAMIC CHARACTERISTICS

Input: $t_R, t_F \leq 3\text{ns}$; $\text{PRR} \leq 1\text{MHz}$, All typical values are measured at $V_{CC}=2\text{V}$; $V_{CC}=3.3\text{V}$ or $V_{CC}=5\text{V}$.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Y/Z TO Z/Y	tPHL /tPLH	$V_{CC} = 2.0\text{V}, C_L = 50\text{pF}$		2.2	5	ns
Turn-On Time From E TO Z/Y	tPZH /tPZL	$V_{CC} = 2.0\text{V}, C_L = 15\text{pF}$		7	25	ns
		$V_{CC} = 2.0\text{V}, C_L = 50\text{pF}$		11	35	ns
Turn-Off Time From E TO Z/Y	tPHZ /tPLZ	$V_{CC} = 2.0\text{V}, C_L = 15\text{pF}$		9	25	ns
		$V_{CC} = 2.0\text{V}, C_L = 50\text{pF}$		13	35	ns
Propagation Delay From Y/Z TO Z/Y	tPHL /tPLH	$V_{CC} = 3.0\text{V} \sim 3.6\text{V}, C_L = 50\text{pF}$		1	2	ns
Turn-On Time From E TO Z/Y	tPZH /tPZL	$V_{CC} = 3.0\text{V} \sim 3.6\text{V}, C_L = 15\text{pF}$		4	11	ns
		$V_{CC} = 3.0\text{V} \sim 3.6\text{V}, C_L = 50\text{pF}$		5.8	15	ns
Turn-Off Time From E TO Z/Y	tPHZ /tPLZ	$V_{CC} = 3.0\text{V} \sim 3.6\text{V}, C_L = 15\text{pF}$		6	11	ns
		$V_{CC} = 3.0\text{V} \sim 3.6\text{V}, C_L = 50\text{pF}$		8.4	15	ns
Propagation Delay From Y/Z TO Z/Y	tPHL /tPLH	$V_{CC} = 4.5\text{V} \sim 5.5\text{V}, C_L = 50\text{pF}$		0.6	1	ns
Turn-On From E TO Z/Y	tPZH /tPZL	$V_{CC} = 4.5\text{V} \sim 5.5\text{V}, C_L = 15\text{pF}$		3	8	ns
		$V_{CC} = 4.5\text{V} \sim 5.5\text{V}, C_L = 50\text{pF}$		4.4	11	ns
Turn-Off Time From E TO Z/Y	tPHZ /tPLZ	$V_{CC} = 4.5\text{V} \sim 5.5\text{V}, C_L = 15\text{pF}$		5	8	ns
		$V_{CC} = 4.5\text{V} \sim 5.5\text{V}, C_L = 50\text{pF}$		6.1	11	ns

Recommended conditions and typical values. GND=0; $t_R=t_F=3ns$

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Sine-Wave Distortion at f=1kHz		V _{CC} =3.0V~3.6V, V _{IS(P-P)} =2.5V, R _L =10kΩ, C _L =50pF		0.02 5		%
		V _{CC} =4.5V~5.5V, V _{IS(P-P)} =4.0V, R _L =10kΩ, C _L =50pF		0.01 5		%
Sine-Wave Distortion at f=10kHz		V _{CC} =3.0V~3.6V, V _{IS(P-P)} =2.5V, R _L =10kΩ, C _L =50pF		0.02 5		%
		V _{CC} =4.5V~5.5V, V _{IS(P-P)} =4.0V, R _L =10kΩ, C _L =50pF		0.01 5		%
Switch OFF Signal Feed-Through (Note 1)		V _{CC} =3.0V~3.6V, R _L =600Ω, C _L =50pF, F=1MHz		-50		dB
		V _{CC} =4.5V~5.5V, R _L =600Ω, C _L =50pF, F=1MHz		-50		dB
Minimum Frequency Response (-3dB) (Note 2)	f _{MAX}	V _{CC} =3.0V~3.6V, R _L =50Ω, C _L =10pF		230		MHz
		V _{CC} =4.5V~5.5V, R _L =50Ω, C _L =10pF		280		MHz
OPERATING CHARACTERISTICS						
Power Dissipation Capacitance	C _{pd}	C _L =50pF, f=10MHz, V _{CC} =5		13		pF

Notes: 1. Adjust input voltage V_{IS} is 0dbm level (0dbm=1mW into 600Ω)

2. Adjust input voltage V_{IS} is 0dbm level at V_{OS} for 1MHz (0dbm=1mW into 50Ω)

TEST CIRCUIT AND WAVEFORMS

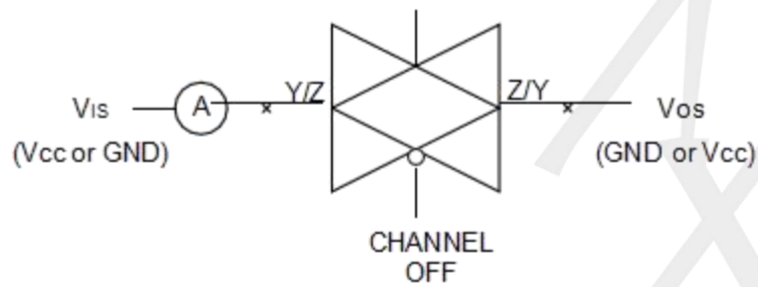


Fig-1 OFF-State Switch Leakage Current Test Circuit

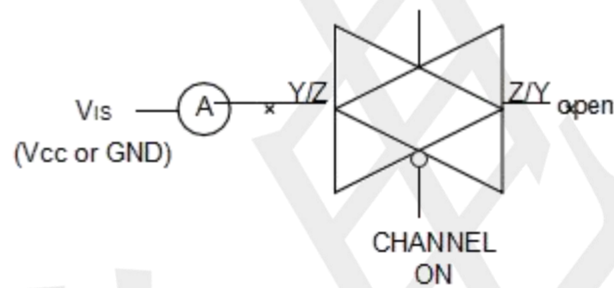


Fig-2 ON-State Leakage Current Test Circuit

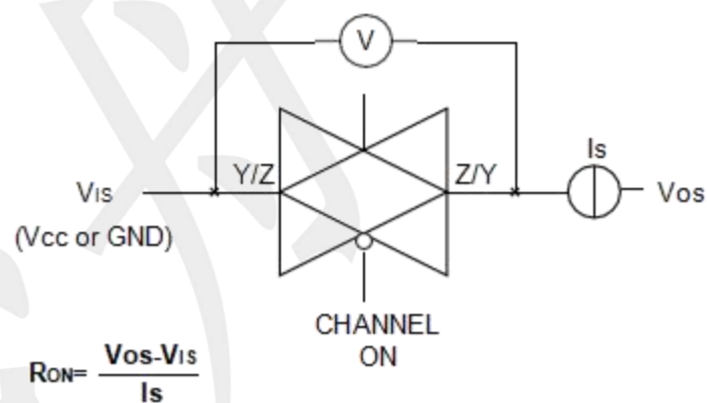


Fig-3 ON-State Resistance Test Circuit

TEST CIRCUIT AND WAVEFORMS(Cont.)

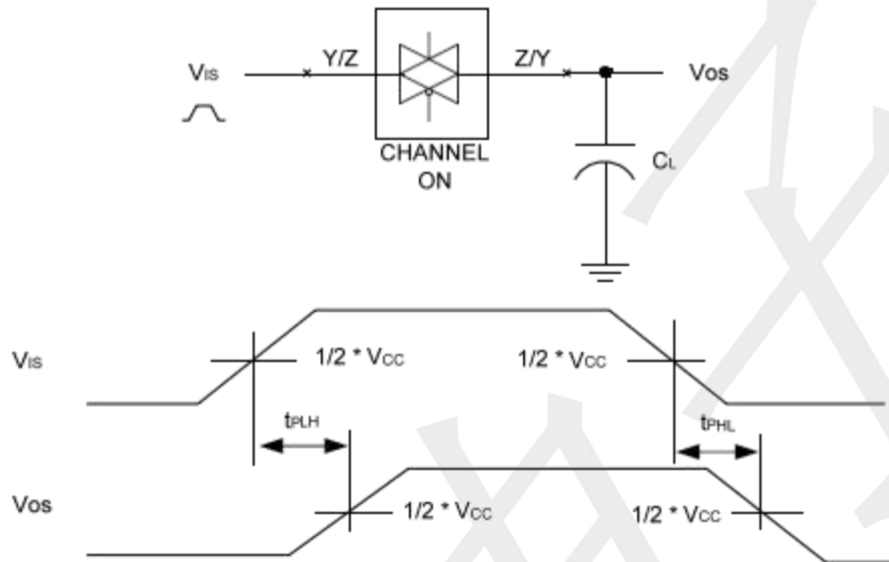


Fig-4 The input (Y/Z) to output (Z/Y) propagation delays.

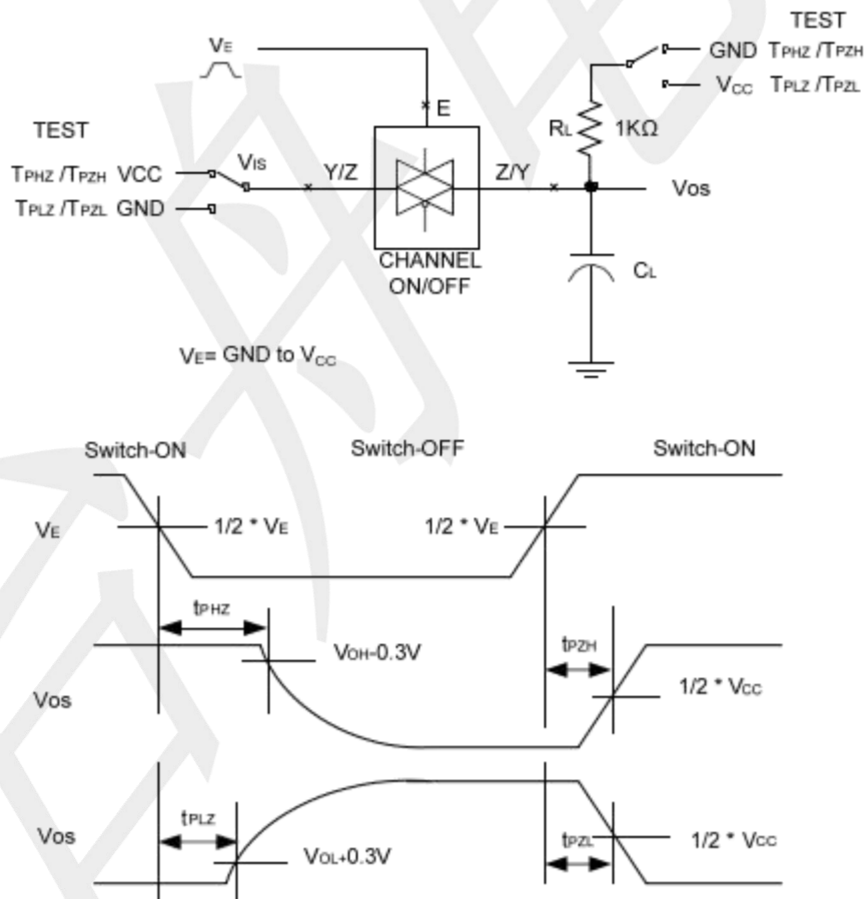


Fig-5 The switch-on and switch-off times.

TEST CIRCUIT AND WAVEFORMS(Cont.)

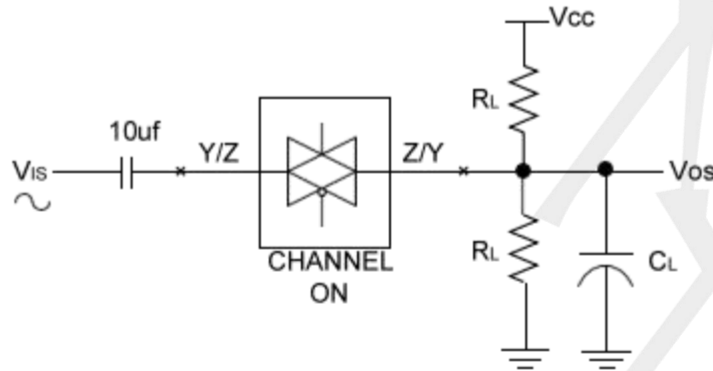


Fig-6 Sine-Wave Distortion

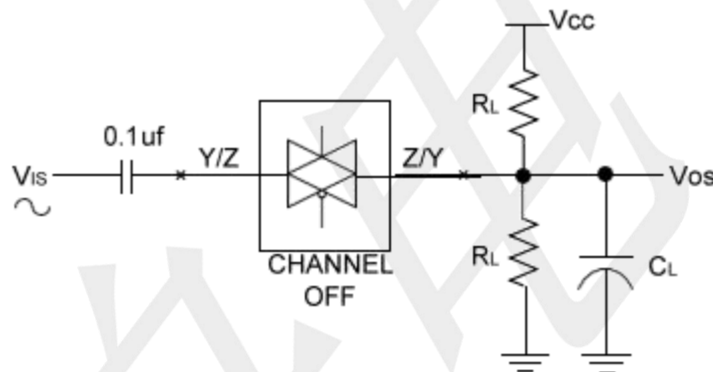


Fig-7 Feed-through Attenuation (Switch OFF)

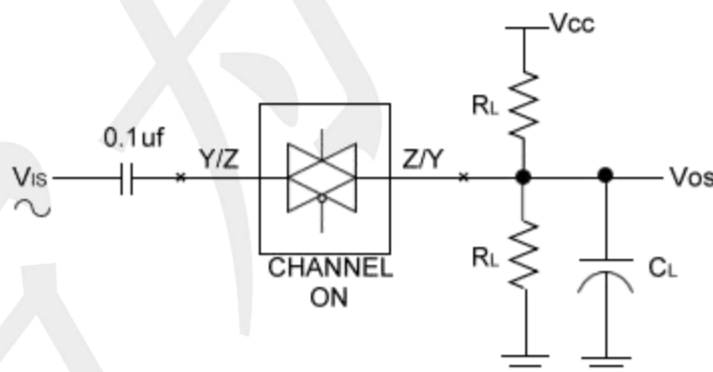
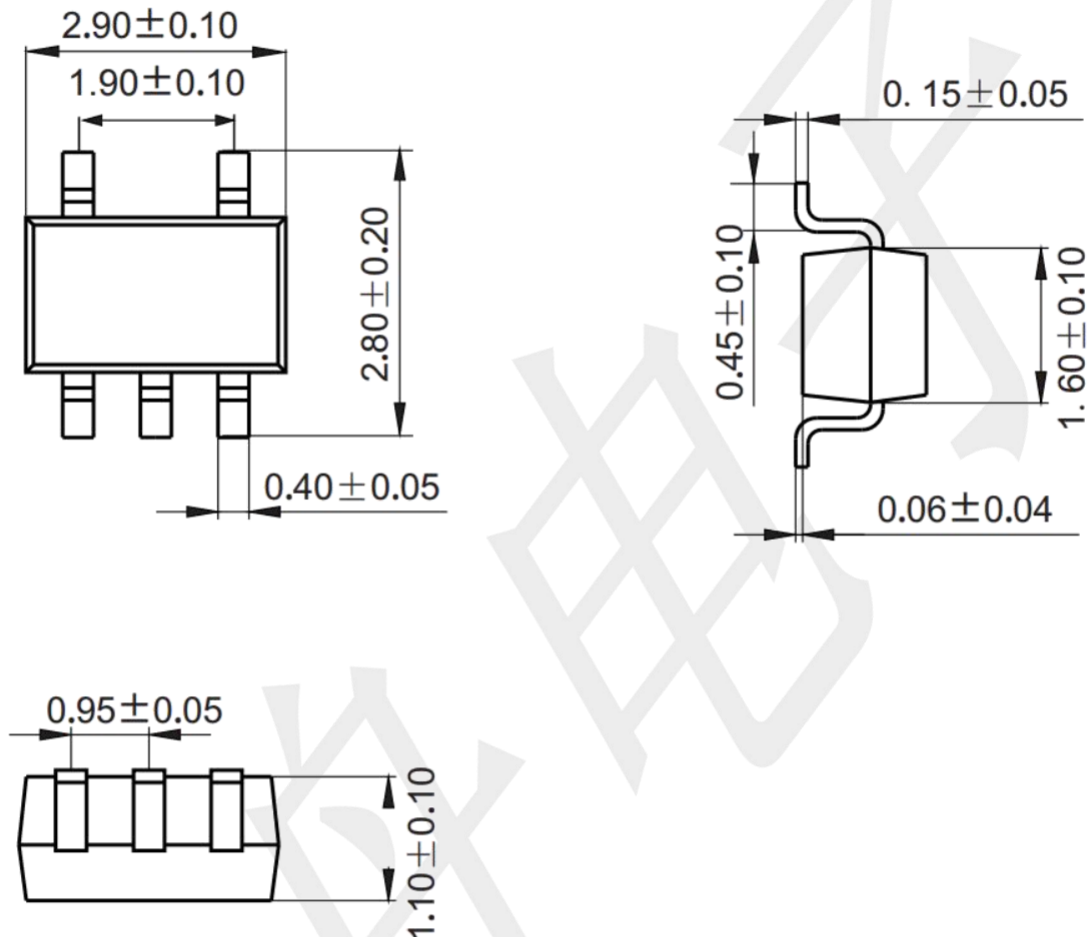


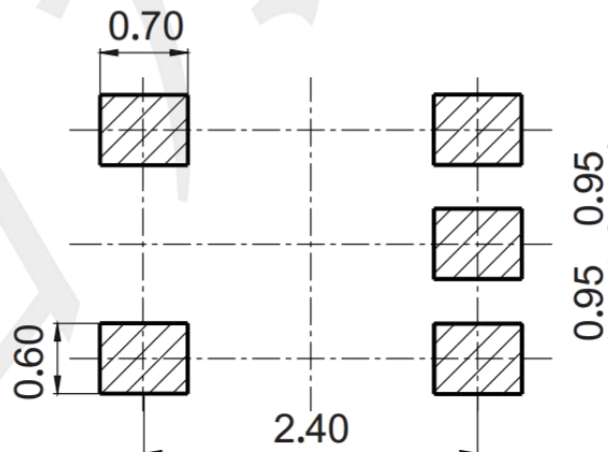
Fig-8 Minimum Frequency Response

Package informantion

SOT23-5 (Unit: mm)

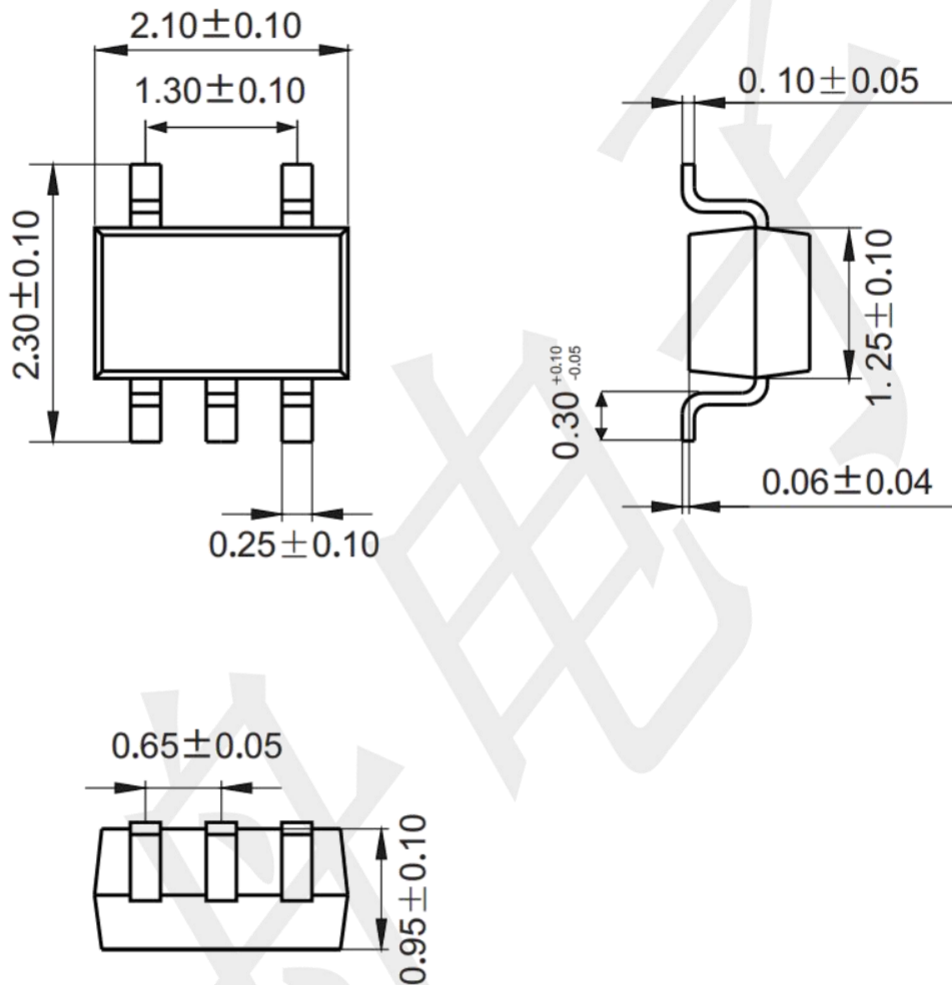


Mounting Pad Layout (Unit: mm)



Package informantion

SOT353 (Unit: mm)



Mounting Pad Layout (Unit: mm)

