

Features

- Wide supply voltage range from 1.65V to 5.5V
- Supports 5V V_{CC} operation
- I_{OFF} supports partial-power-down mode back-drive protection
- Low power consumption, $ICC=10\mu A$ (Max)
- 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 TP74LVC1G386 device performs the Boolean function $Y=A \oplus B \oplus C$ in positive logic. The device is fully specified for partial-power-down applications using I_{OFF} . The I_{OFF} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

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

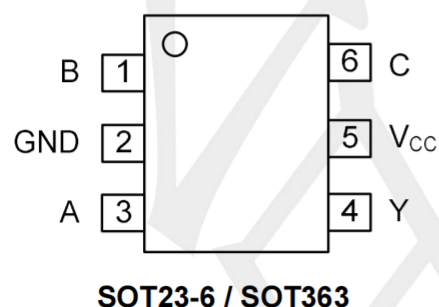
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74LVC1G386S6	SOT23-6	Tape and Reel,3000
TP74LVC1G386C6	SOT363	Tape and Reel,3000

Pin Configuratio



Function Table

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

Note: H: HIGH voltage level, L: LOW voltage level

ABSOLUTE MAXIMUM RATINGS

(unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ +6.5	V
Input Voltage		V_{IN}	-0.5 ~ +6.5	V
Output Voltage	Output in the high or low state	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	V
	Output in the power-off state		-0.5 ~ +6.5	V
V_{CC} or GND Current		I_{CC}	±100	mA
Continuous Output Current ($V_{OUT}=0$ to V_{CC})		I_{OUT}	±50	mA
Input Clamp Current ($V_{IN}<0$)		I_{IK}	-50	mA
Output Clamp Current ($V_{OUT}<0$)		I_{OK}	-50	mA
Storage Temperature Range		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

(Unless otherwise specified)

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}		0	--	V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=1.8V\pm0.15V, 2.5V\pm0.2V$	--	--	20	ns/V
		$V_{CC}=3.3V\pm0.3V$	--	--	10	ns/V
		$V_{CC}=5V\pm0.5V$	--	--	5	ns/V
Operating Temperature	T_A		-40	--	125	°C

ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-level Input Voltage	V _{IH}	V _{CC} =1.8±0.15V	0.65× V _{CC}	--	--	0.65× V _{CC}	--	--	V
		V _{CC} =2.5±0.2V	1.7	--	--	1.7	--	--	V
		V _{CC} =3.3±0.3V	2	--	--	2	--	--	V
		V _{CC} =5±0.5V	0.7× V _{CC}	--	--	0.7× V _{CC}	--	--	V
Low-level Input Voltage	V _{IL}	V _{CC} =1.8±0.15V	--	--	0.35× V _{CC}	--	--	0.35× V _{CC}	V
		V _{CC} =2.5±0.2V	--	--	0.7	--	--	0.7	V
		V _{CC} =3.3±0.3V	--	--	0.8	--	--	0.8	V
		V _{CC} =5±0.5V	--	--	0.3× V _{CC}	--	--	0.3× V _{CC}	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	--	--	0.95	--	--	V
		V _{CC} =2.3V, I _{OH} =-8mA	1.9	--	--	1.7	--	--	V
		V _{CC} =3.0V, I _{OH} =-16mA	2.4	--	--	2.2	--	--	V
		V _{CC} =3.0V, I _{OH} =-24mA	2.3	--	--	2.0	--	--	V
		V _{CC} =4.5V, I _{OH} =-32mA	3.8	--	--	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	--	--	0.45	--	--	0.7	V
		V _{CC} =2.3V, I _{OL} =8mA	--	--	0.3	--	--	0.45	V
		V _{CC} =3.0V, I _{OL} =16mA	--	--	0.4	--	--	0.6	V
		V _{CC} =3.0V, I _{OL} =24mA	--	--	0.55	--	--	0.8	V
		V _{CC} =4.5V, I _{OL} =32mA	--	--	0.55	--	--	0.8	V
Input Leakage Current (A, B, or C Input)	I _{I(LEAK)}	V _{CC} =0V ~ 5.5V V _{IN} =5.5V or GND	--	--	±5	--	--	±5	μA
Power Off Leakage Current	I _{OFF}	V _{CC} =0V, V _{IN} or V _{OUT} =5.5V	--	--	±10	--	--	±10	μA
Quiescent Supply Current	I _{CC}	V _{CC} =1.65 ~ 5.5V, V _{IN} =5.5V or GND, I _{OUT} =0	--	--	10	--	--	10	μA
Additional Quiescent Supply Current Per Input Pin	ΔI _{CC}	V _{CC} =3 ~ 5.5V, One input at V _{CC} -0.6V, other inputs at V _{CC} or GND	--	--	500	--	--	500	μA

SWITCHING CHARACTERISTICS

(Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A, B or C) to output (Y)	t _{PD}	V _{CC} =1.8V±0.15V	3	--	15	1	--	17	ns
		V _{CC} =2.5V±0.2V	1.3	--	9	1	--	11	ns
		V _{CC} =3.3V±0.3V	0.8	--	7	0.5	--	9	ns
		V _{CC} =5V±0.5V	0.5	--	5	0.5	--	6.5	ns
		V _{CC} =1.8V±0.15V	3.5	--	16	1	--	18	ns
		V _{CC} =2.5V±0.2V	1.8	--	10	1	--	12	ns
		V _{CC} =3.3V±0.3V	1.3	--	8	1	--	10	ns
		V _{CC} =5V±0.5V	1	--	6	1	--	7.5	ns

OPERATING CHARACTERISTICS

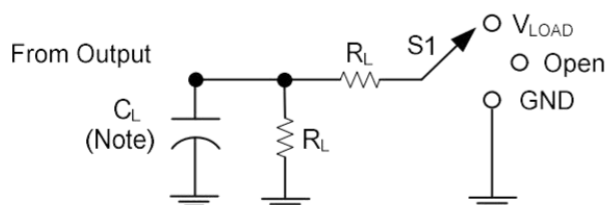
(T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =3.3V, V _{IN} =V _{CC} or GND	--	3.5	--	pF
Power Dissipation Capacitance	C _{PD}	V _{CC} =1.8V, f=10MHz	--	17.5	--	pF
		V _{CC} =2.5V, f=10MHz	--	18	--	pF
		V _{CC} =3.3V, f=10MHz	--	19	--	pF
		V _{CC} =5V, f=10MHz	--	22	--	pF

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT23-6	θ _{JA}	230	°C/W
	SOT-363		350	°C/W

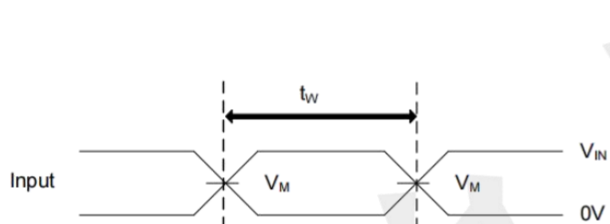
TEST CIRCUIT AND WAVEFORMS



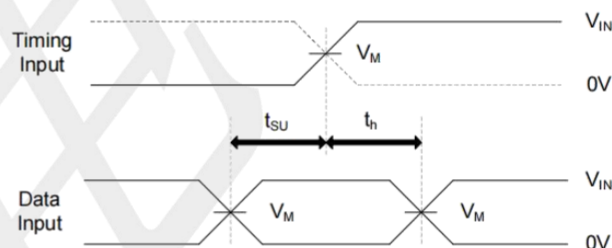
TEST	S1
t_{PLH}/t_{PHL}	V_{LOAD}
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	V_{LOAD}

Note: C_L includes probe and jig capacitance.

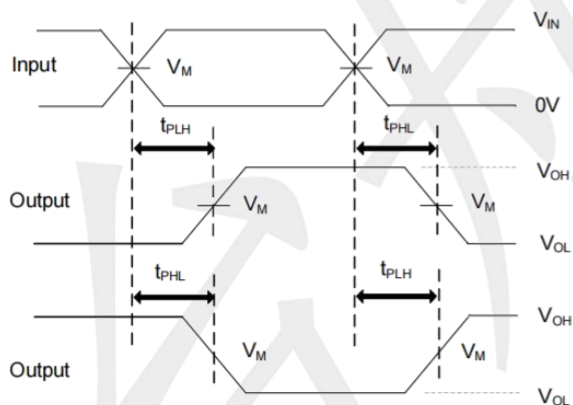
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R / t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	15pF	1M Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.3V



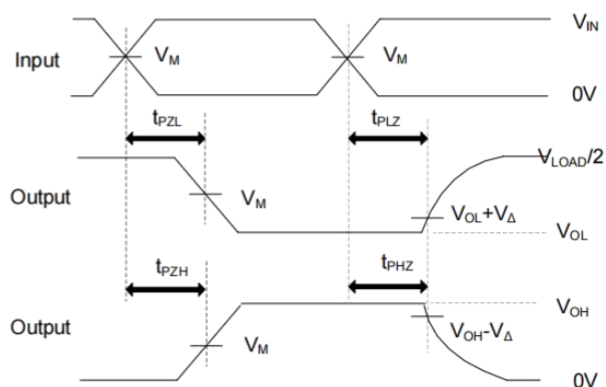
PULSE WIDTH



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES

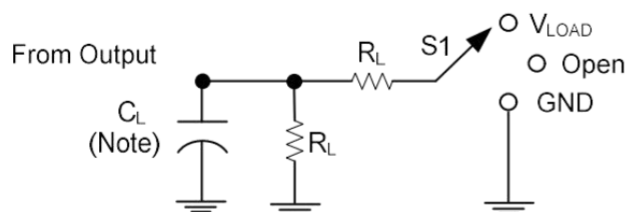


ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.

2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_O = 50\Omega$.

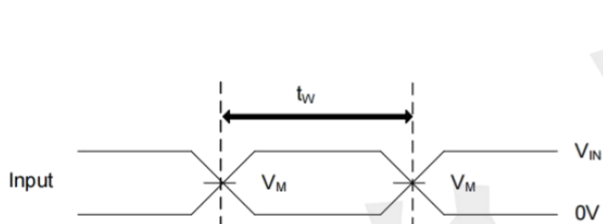
TEST CIRCUIT AND WAVEFORMS (Cont.)



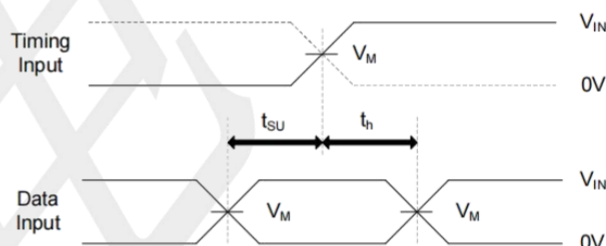
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Note: C_L includes probe and jig capacitance.

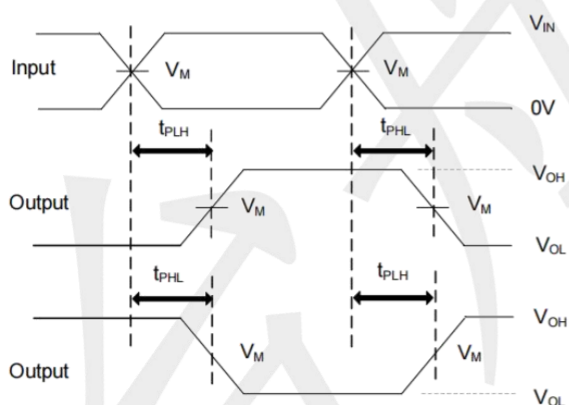
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R / t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1K Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V



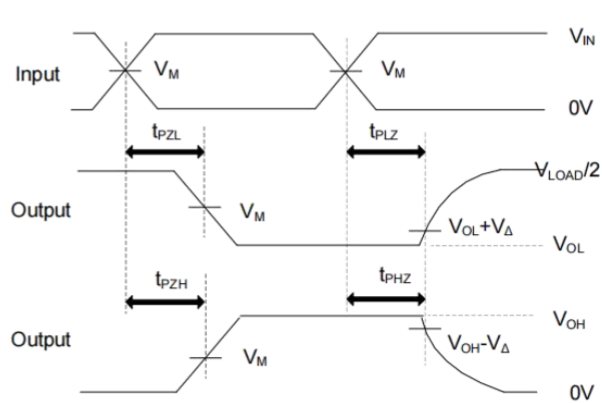
PULSE WIDTH



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



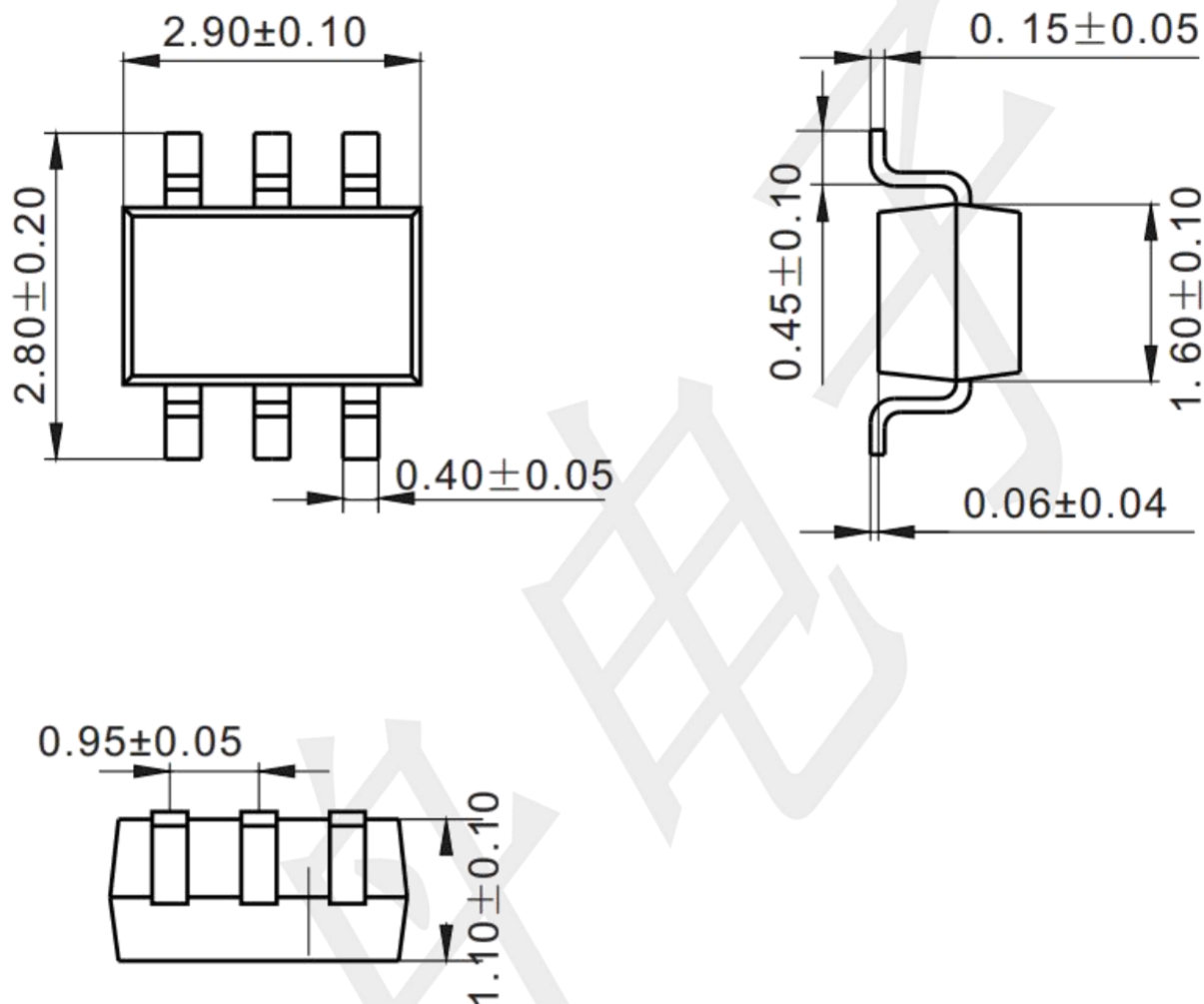
ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.

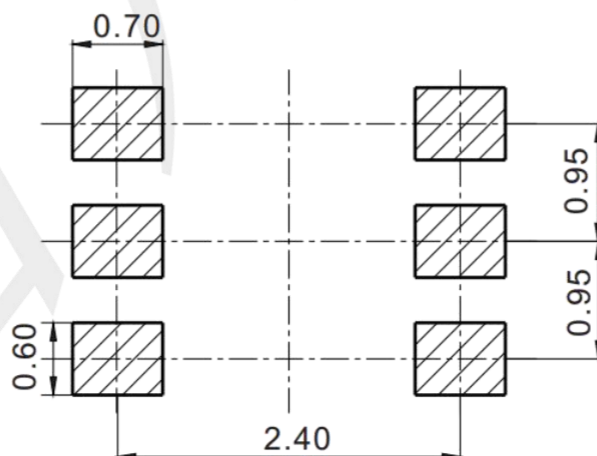
2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_O = 50\Omega$.

Package information

SOT23-6 (Unit: mm)

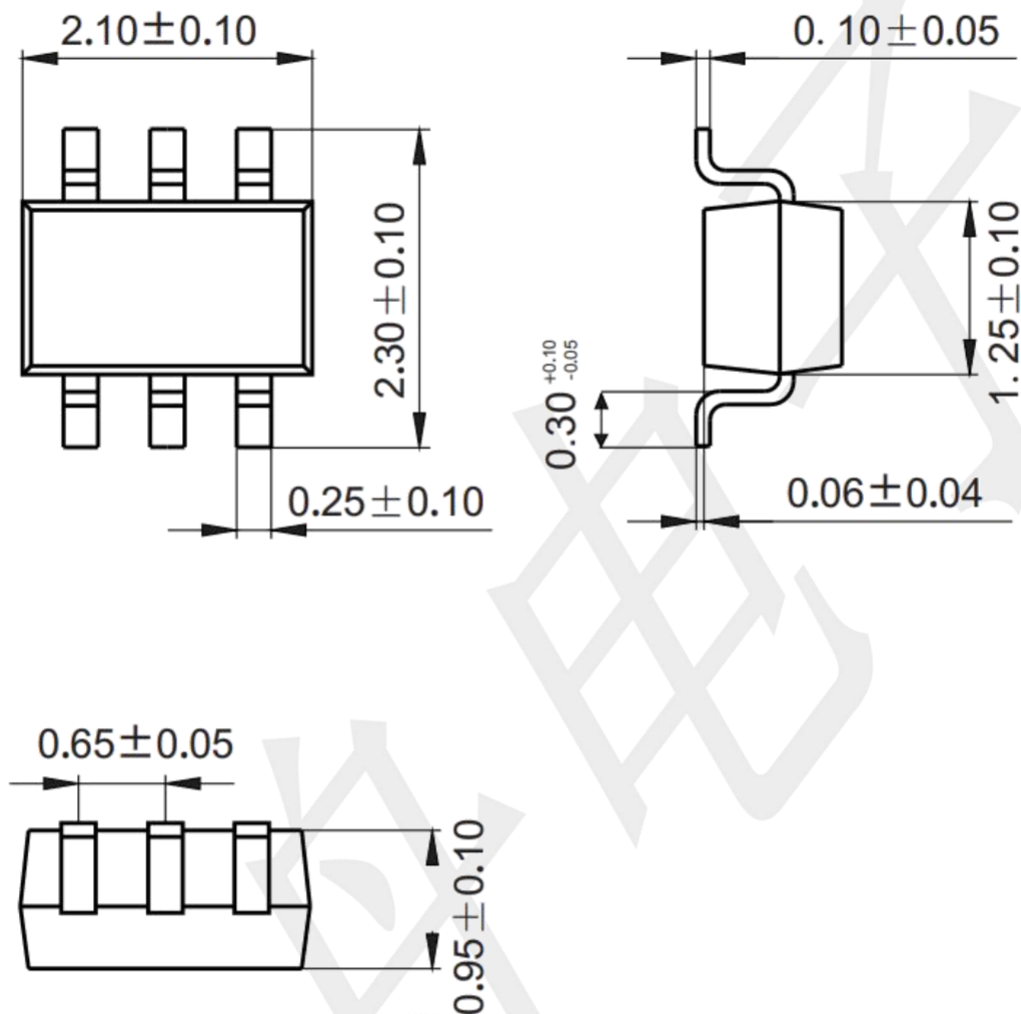


Mounting Pad Layout (unit: mm)



Package informantion

SOT363 (Unit: mm)



Mounting Pad Layout (unit: mm)

