

Features

- Wide supply voltage range from 1.65V to 5.5V
- Supports 5V V_{CC} operation
- I_{OFF} supports partial-power-down mode
- Low power consumption, I_{CC}=10μA (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

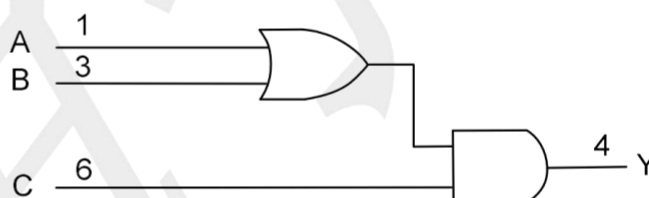
The TP74LVC1G3208 device is a single 3-input positive OR-AND gate. It performs the Boolean function $Y=(A+B) \cdot C$ in positive logic.

By tying one input to GND or V_{CC}, the device offers two more functions. When C is tied to V_{CC}, this device performs as a 2-input OR gate ($Y=A+B$). When A is tied to GND, the device works as a 2-input AND gate ($Y=B \cdot C$). This device also works as a 2-input AND gate when B is tied to GND ($Y=A \cdot C$).

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

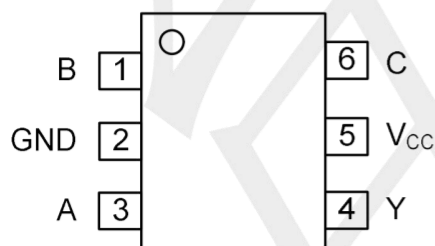
Logic Diagram



Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74LVC1G3208S6	SOT23-6	Tape and Reel,3000
TP74LVC1G3208C6	SOT363	Tape and Reel,3000

Pin Configuratio



SOT23-6 / SOT363

Function Table

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

Note: H: HIGH voltage level, L: LOW voltage level, X = Valid H or L

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	C _L =15pF	3.7	--	14	1	--	16	ns
		V _{CC} =2.5V±0.2V		2.5	--	8	1	--	9.5	ns
		V _{CC} =3.3V±0.3V		1.7	--	6	1	--	7.5	ns
		V _{CC} =5V±0.5V		1.3	--	4.5	1	--	6	ns
		V _{CC} =1.8V±0.15V	C _L =30pF or 50pF	2.5	--	17.5	1	--	19.5	ns
		V _{CC} =2.5V±0.2V		1.8	--	9	1	--	10.5	ns
		V _{CC} =3.3V±0.3V		1.8	--	7.5	1	--	9	ns
		V _{CC} =5V±0.5V		1.3	--	5.5	1	--	6.5	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	--	15	--	pF
		V _{CC} =2.5V, f=10MHz	--	15	--	pF
		V _{CC} =3.3V, f=10MHz	--	16	--	pF
		V _{CC} =5V, f=10MHz	--	17	--	pF

THERMAL DATA

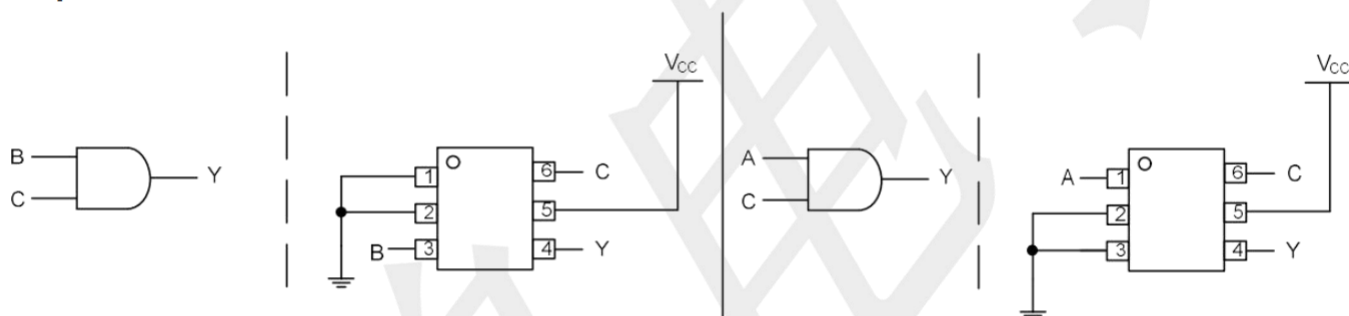
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT23-6	θ _{JA}	230	°C/W
	SOT-363		350	°C/W

FUNCTION SELECTION TABLE

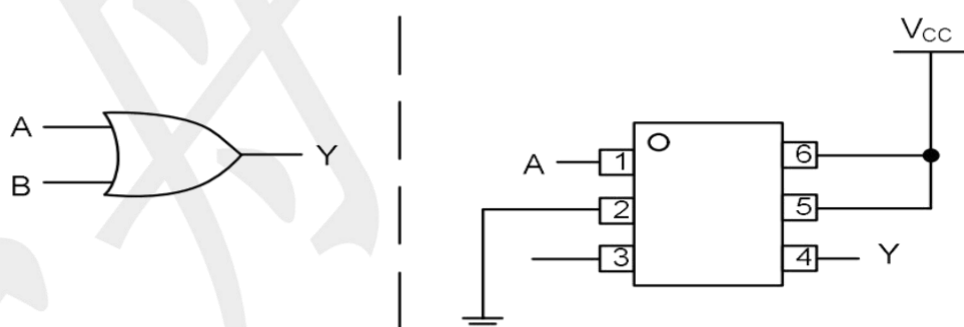
LOGIC FUNCTION
2-Input AND Gate
2-Input OR Gate
$Y = (A + B) \cdot C$

LOGIC FUNCTION

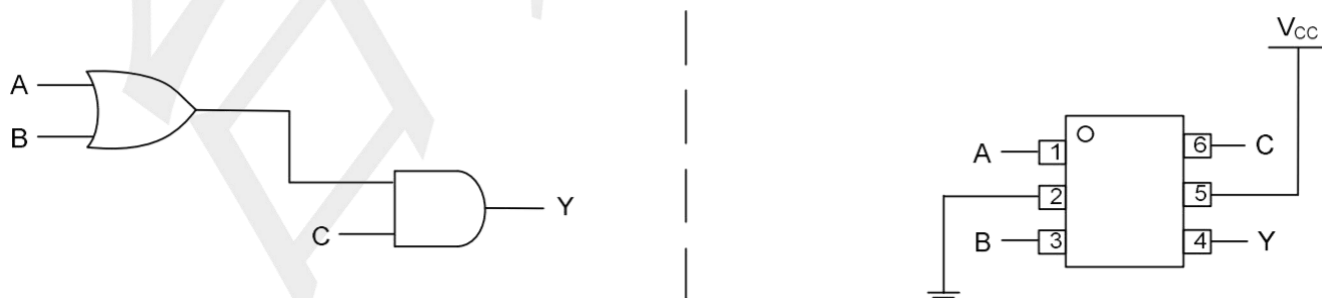
2-Input AND Gate



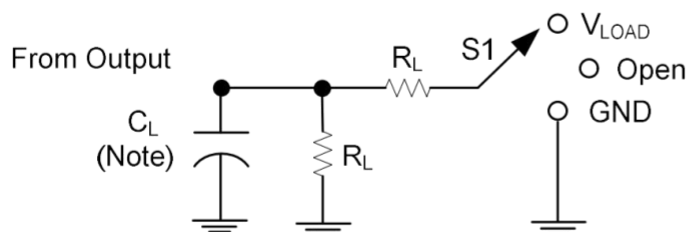
2-Input OR Gate



$Y = (A+B) \cdot C$



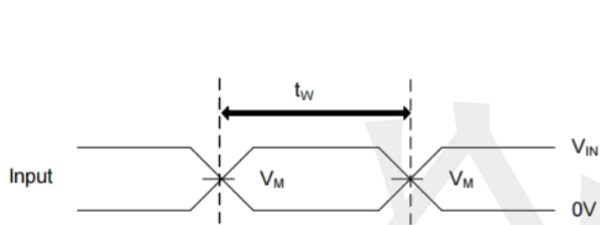
TEST CIRCUIT AND WAVEFORMS



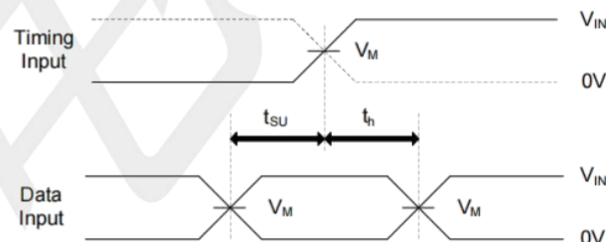
TEST	S1
t_{PLH}/t_{PHL}	V_{LOAD}
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	V_{LOAD}

Note: C_L includes probe and jig capacitance.

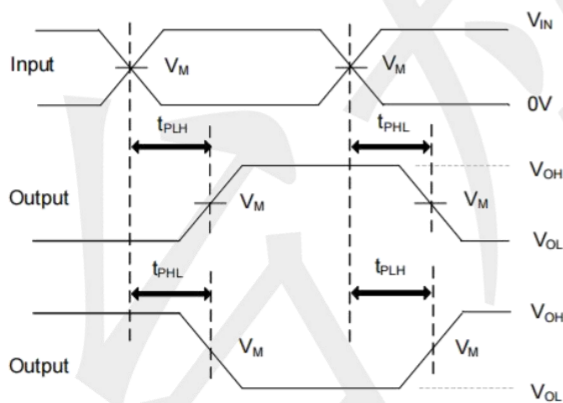
V_{CC}	Inputs		V_M	V_{LOAD}	C_L	R_L	V_{Δ}
	V_{IN}	t_R / t_F					
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	1M Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	15pF	1M Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq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



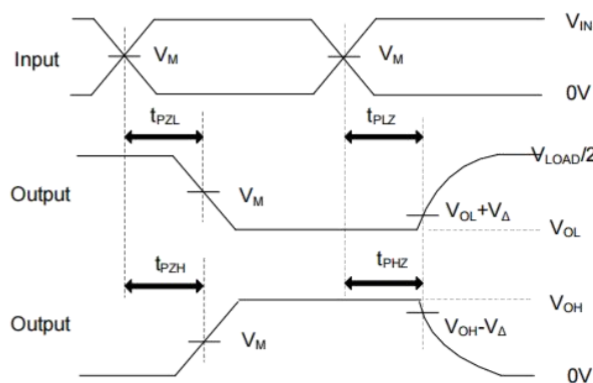
PULSE WIDTH



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



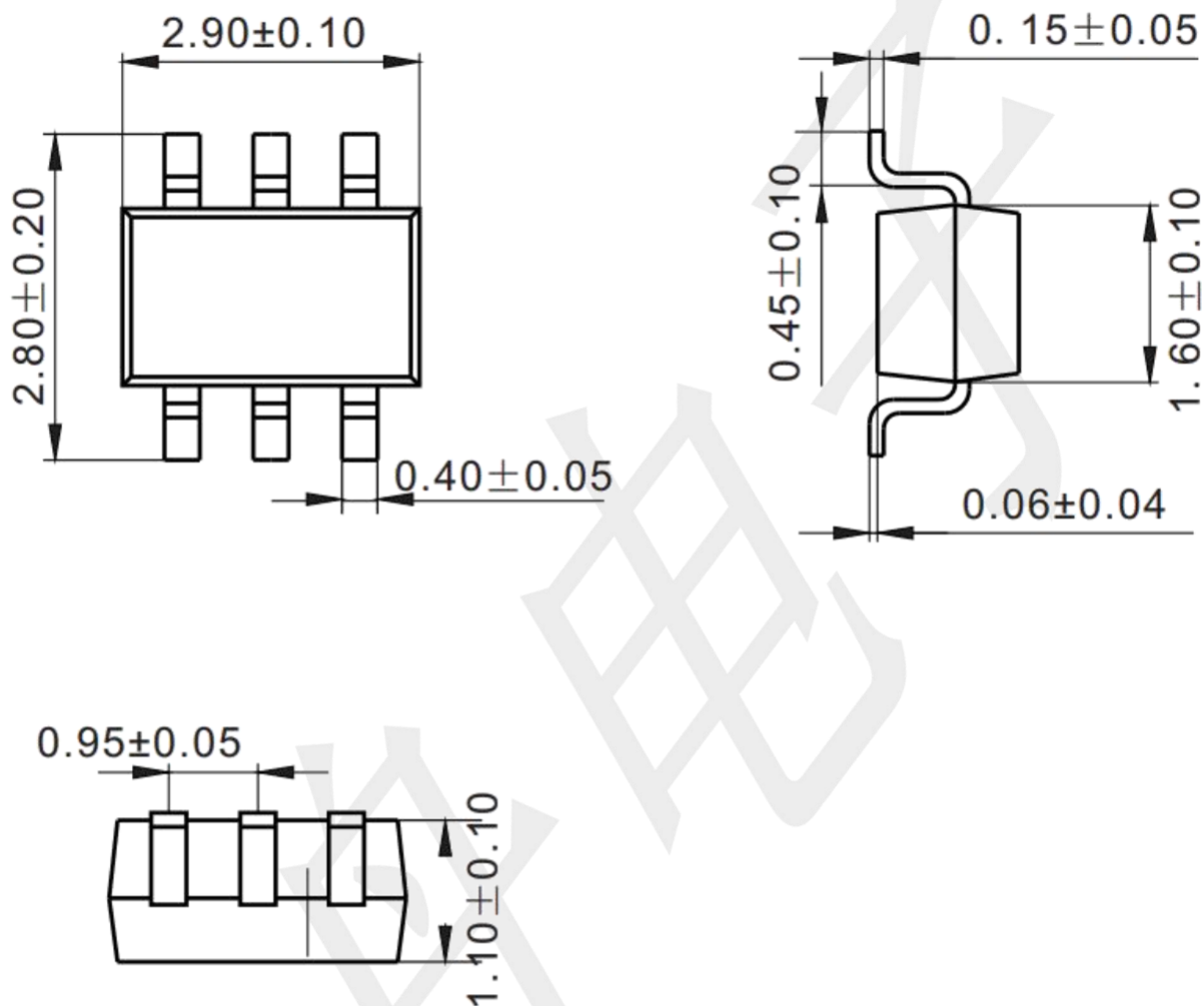
ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.

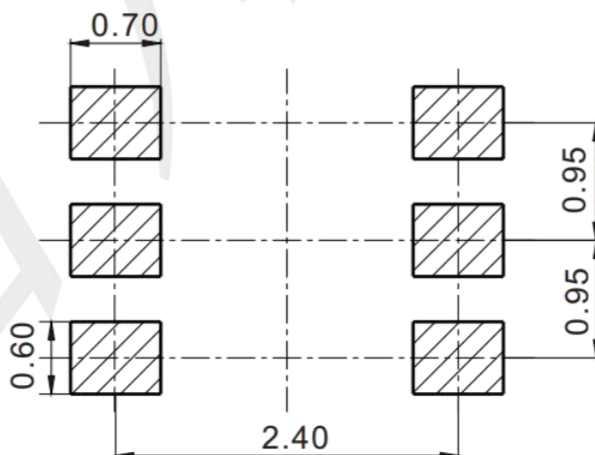
2. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_0 = 50\Omega$.

Package information

SOT23-6 (Unit: mm)

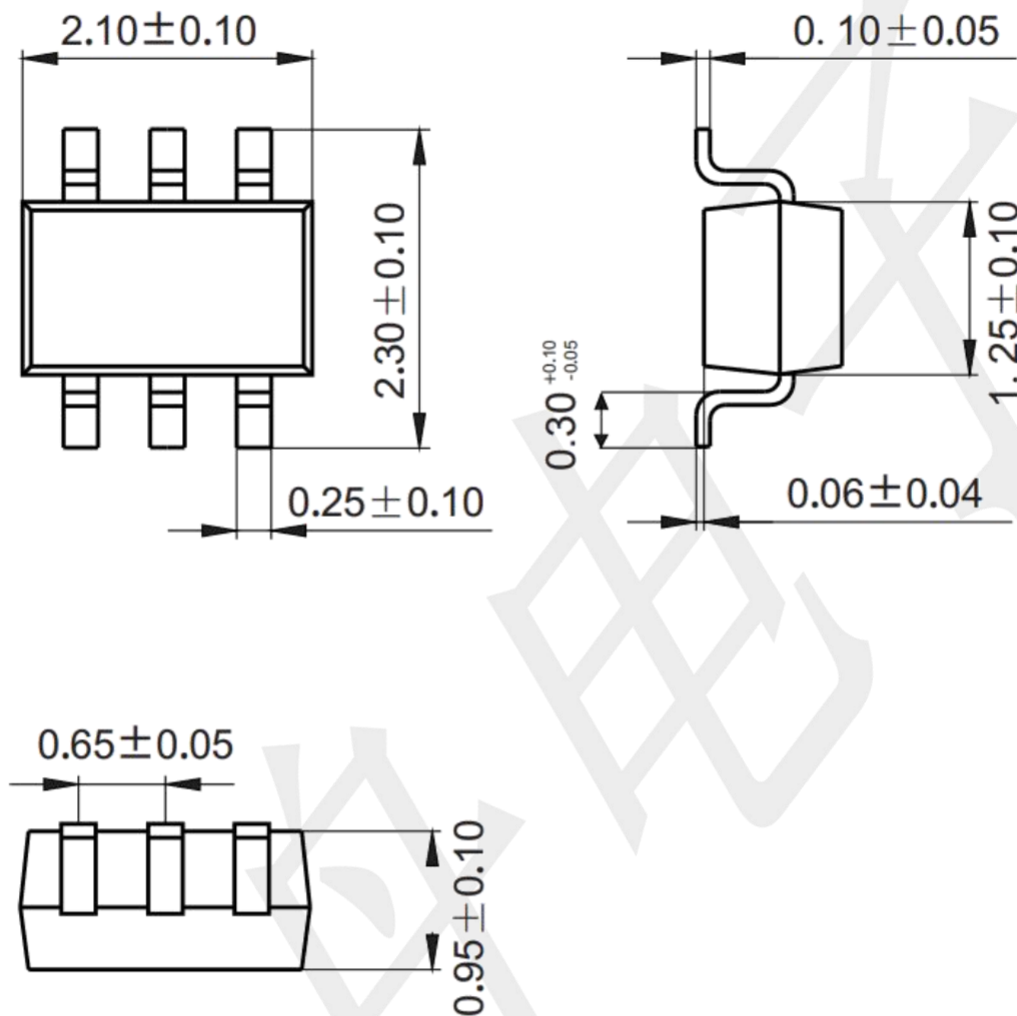


Mounting Pad Layout (unit: mm)



Package information

SOT363 (Unit: mm)



Mounting Pad Layout (unit: mm)

