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台舟电子

LM337XX Series

1.5A, ADJUSTABLE OUTPUT, NEGATIVE VOLTAGE REGULATOR

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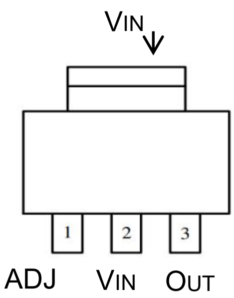
Features

- Output Adjustable between -1.2V and -37V
- output current up to 1.5A
- Internal Thermal Overload Protection
- internal thermal overload protection and short-circuit limiting

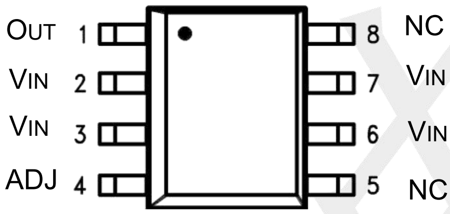
Applications

- HVAC Systems
- SMPS Post Regulation
- Test and Measurement Equipment
- Industrial Power Supplies

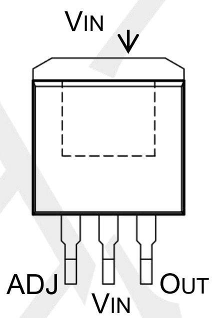
PIN CONFIGURATION



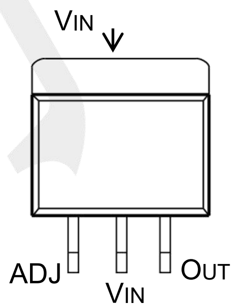
SOT-223-3
(TOP VIEW)



SOP8
(TOP VIEW)



TO-263-3
(TOP VIEW)



TO-252-3
(TOP VIEW)

Pin Number				Pin Name	Pin Function
LM337Y3	LM337W3	LM337K3	LM337S8		
SOT-223-3	TO-263-3	TO-252-3	SOP8		
1	1	1	4	ADJ	Adjust pin
2	2	2	2,3,6,7	VIN	Input of Supply Voltage
3	3	3	1	VOUT	Output of the Regulator
--	--	--	5,8	NC	No connection

Absolute Maximum Ratings

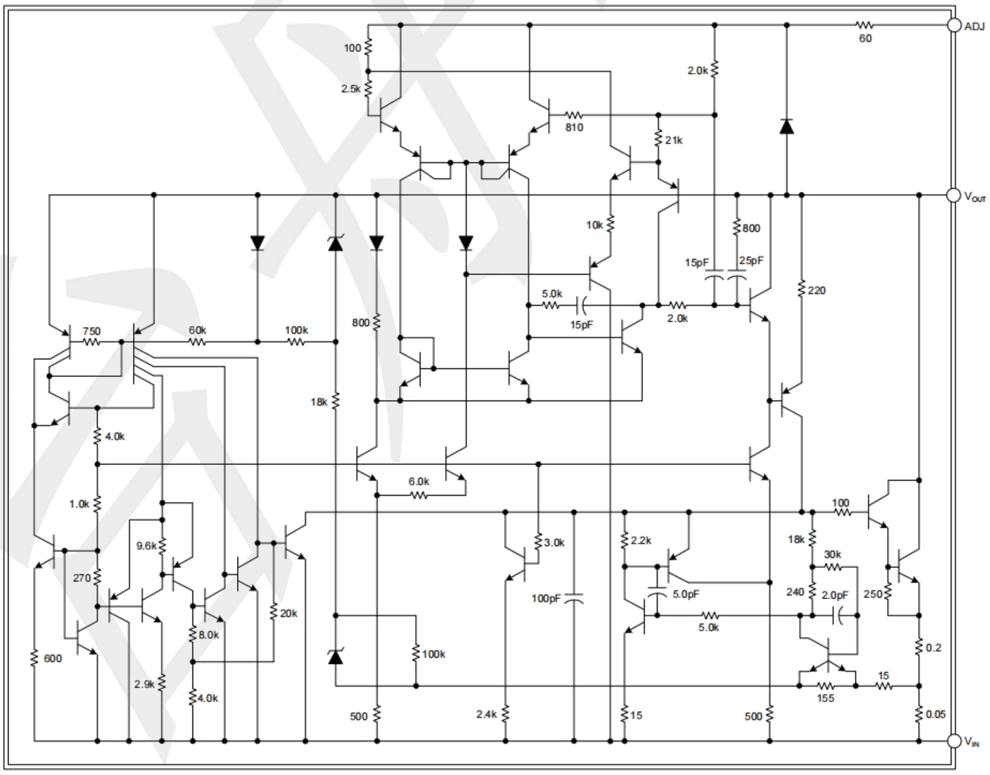
over operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	RATINGS	UNIT
$V_I - V_O$	Input-Output Voltage Differential	40	V
P_D	Power Dissipation	Internally Limited	W
T_J	Operating Junction Temperature Range	-40 ~ +125	℃
T_{stg}	Storage temperature range	-65～150	℃

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223-3	θ_{JA}	58.3	℃/W
	SOP8		111.3	℃/W
	TO-263-3		25.3	℃/W
	TO-252-3		28	℃/W
Junction to Case	SOT-223-3	θ_{JC}	36.3	℃/W
	SOP8		56.1	℃/W
	TO-263-3		30.3	℃/W
	TO-252-3		19	℃/W

BLOCK DIAGRAM



Electrical Characteristics

(TA=25℃, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions		MIN	TYP	MAX	UNIT
Line Regulation (Note 1)	ΔV_{OUT}	T_A = +25°C, 3.0V ≤ $\|V_I - V_O\|$ ≤ 40V		--	0.01	0.04	%/V
Load Regulation (Note 1)	ΔV_{OUT}	TA= +25°C, 10mA ≤ IO ≤ Imax	$\|V_O\|$ ≤ 5.0V	--	15	50	mV
			$\|V_O\|$ ≥5.0V	--	0.3	1.0	$\%V_O$
Adjustment Pin Current	I_{ADJ}			--	65	100	μA
Adjustment Pin Current Change	ΔI_{ADJ}	2.5V ≤ |VI-VO|≤ 40V, 10mA≤ IL ≤ IMAX, PD ≤PMAX, TA = +25°C		--	2.0	5.0	μA
Reference Voltage	V_{REF}	T_A = +25°C, 3.0V ≤ $\|V_I - V_O\|$ ≤ 40V		-1.213	-1.250	-1.287	V
		10mA ≤ I_O ≤ I_{MAX}, P_D ≤ P_{MAX}, T_J = T_{LOW} to T_{HIGH}		-1.20	-1.25	-1.30	V
Line Regulation (Note 1)	ΔV_{OUT}	3.0V ≤ $\|V_I - V_O\|$ ≤ 40V		--	0.02	0.07	%/V
Load Regulation (Note 1)	ΔV_{OUT}	10mA ≤ I_O ≤ I_{MAX}	$\|V_O\|$ ≤ 5.0V	--	20	70	mV
			$\|V_O\|$ ≥5.0V	--	0.3	1.5	$\%V_O$
Temperature Stability	T_S	T_{LOW} ≤ T_J ≤ T_{HIGH}		--	0.6	--	$\%V_O$
Minimum Load Current to Maintain Regulation	I_{LMIN}	$\|V_I - V_O\|$ ≤ 10V		--	1.5	6.0	mA
		$\|V_I - V_O\|$ ≤ 40V		--	2.5	10	mA
Maximum Output Current	I_{MAX}	$\|V_I - V_O\|$ ≤ 15V, P_D ≤ P_{MAX}		--	1.5	2.2	A
		$\|V_I - V_O\|$ ≤40V, P_D ≤ P_{MAX}, T_J =+25°C		--	0.15	0.4	A
RMS Noise	N	% of V_O, T_A = +25°C, 10Hz ≤ f ≤ 10kHz		--	0.003	--	$\%V_O$
Ripple Rejection	RR	V_O = -10V, f = 120Hz (Note 2)	Without C_{ADJ}	--	60	--	dB
			C_{ADJ}=10μF	66	77	--	dB
Long-Term Stability	S	T_J = T_{HIGH} (Note 4), T_A = +25°C for Endpoint Measurements			0.3	1.0	%/1.0k Hrs.
Thermal Regulation		T_A = +25°C (Note 3), 10ms Pulse			0.003	0.4	%VO/W

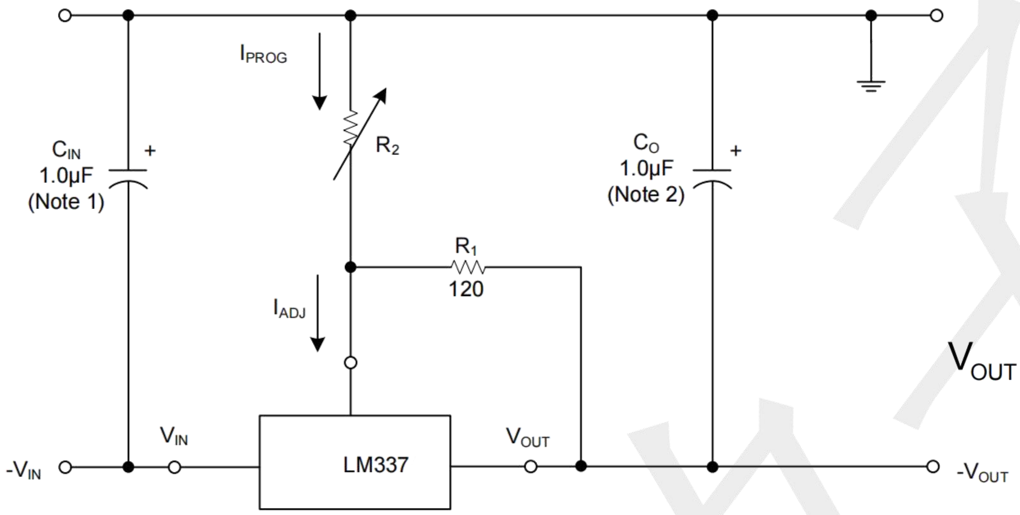
Notes: 1. Load and line regulation are specified at constant junction temperature. Change in V_O because of heating effects is covered under the Thermal Regulation specification. Pulse testing with a low duty cycle is used.

2. C_{ADJ}, when used, is connected between the adjustment pin and ground.

3. Power dissipation within an IC voltage regulator produces a temperature gradient on the die, affecting individual IC components on the die. These effects can be minimized by proper integrated circuit design and layout techniques. Thermal Regulation is the effect of these temperature gradients on the output voltage and is expressed in percentage of output change per watt of power change in a specified time.

4. Since Long Term Stability cannot be measured on each device before shipment, this specification is an engineering estimate of average stability from lot to lot.

Typical Application Circuit



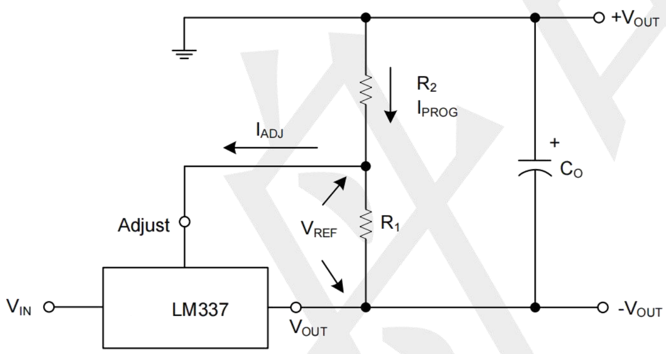
$$V_{OUT}=-1.25V\times(1+\frac{R2}{R1})$$

Notes: 1. C_{in} is required if regulator is located more than 4 inches from power supply filter.

A 1.0μF aluminum electrolytic is recommended.

2. C_O is necessary for stability. A 1.0μF aluminum electrolytic is recommended.

Figure 1. Standard Application



V_{REF}= -1.25V Typical

Figure 2. Basic Circuit Configuration

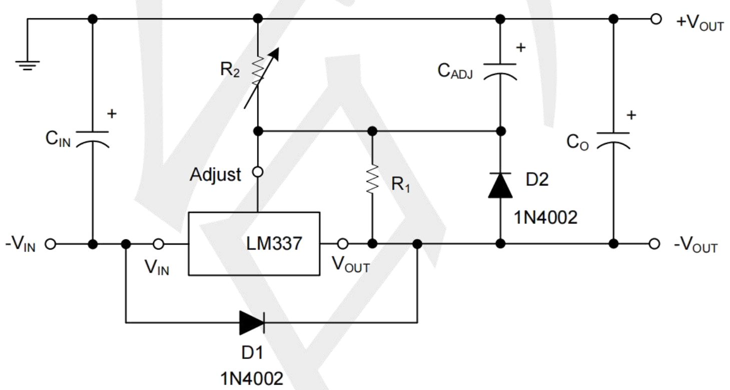
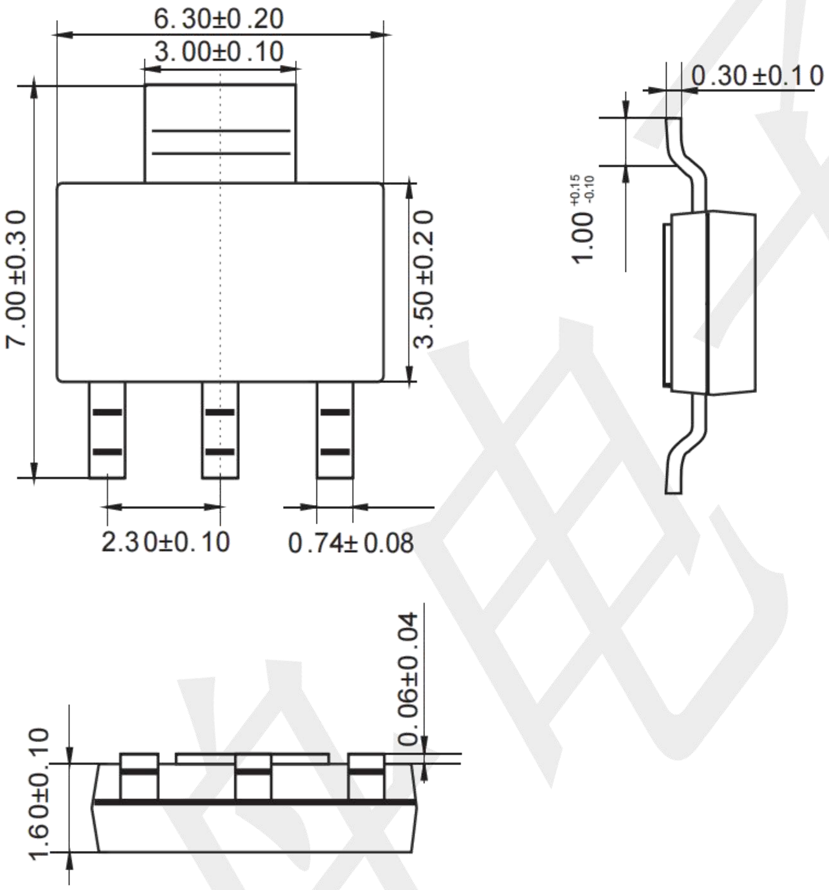


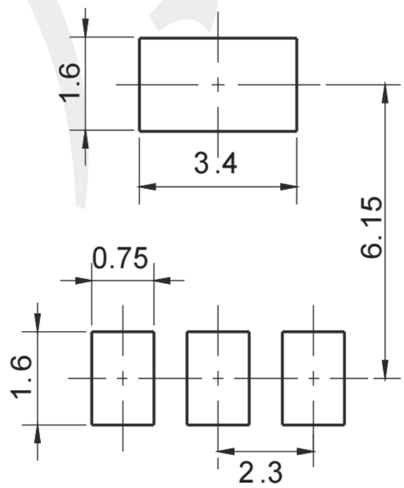
Figure 3. Voltage Regulator with Protection Diodes

Package Outline Dimensions (unit: mm)

SOT-223-3

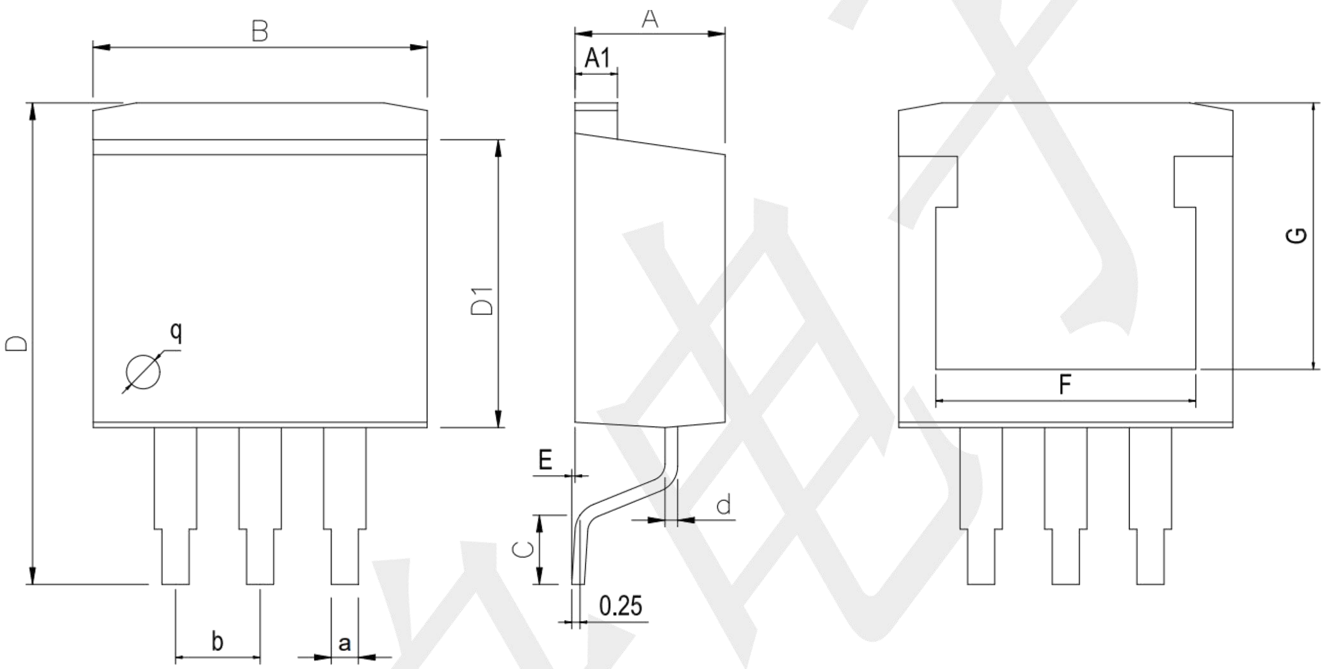


Mounting Pad Layout (unit: mm)



Package Outline Dimensions (unit: mm)

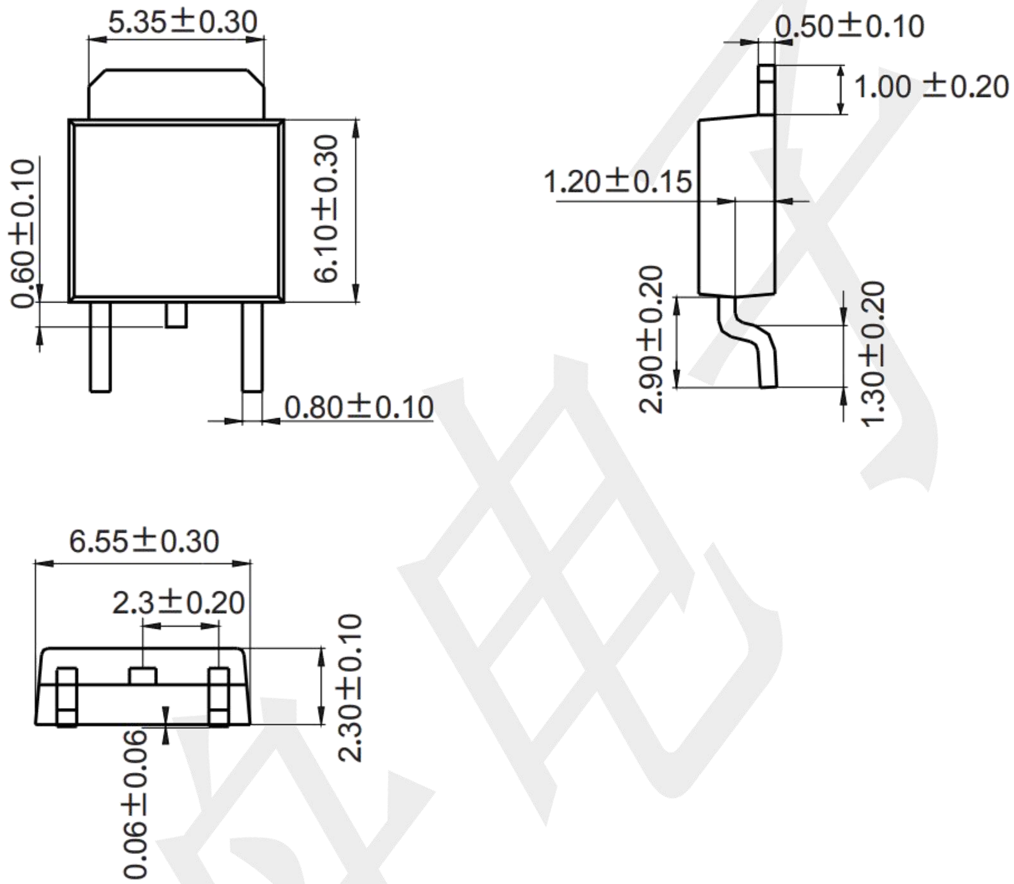
T0-263-3



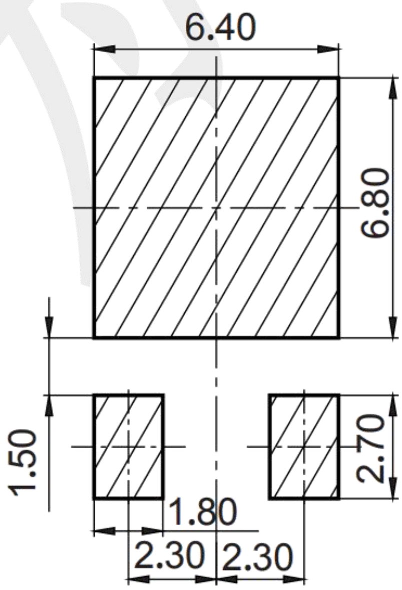
Dimensions In Millimeters(TO-263-3)											
Symbol:	A	A1	B	C	D	D1	E	F	G	a	b
Min:	4.45	1.22	10	1.89	13.7	8.38	0	8.332	7.70	0.71	2.54BSC
Max:	4.62	1.32	10.4	2.19	14.6	8.89	0.305	8.552	8.10	0.97	

Package Outline Dimensions (unit: mm)

T0-252-3

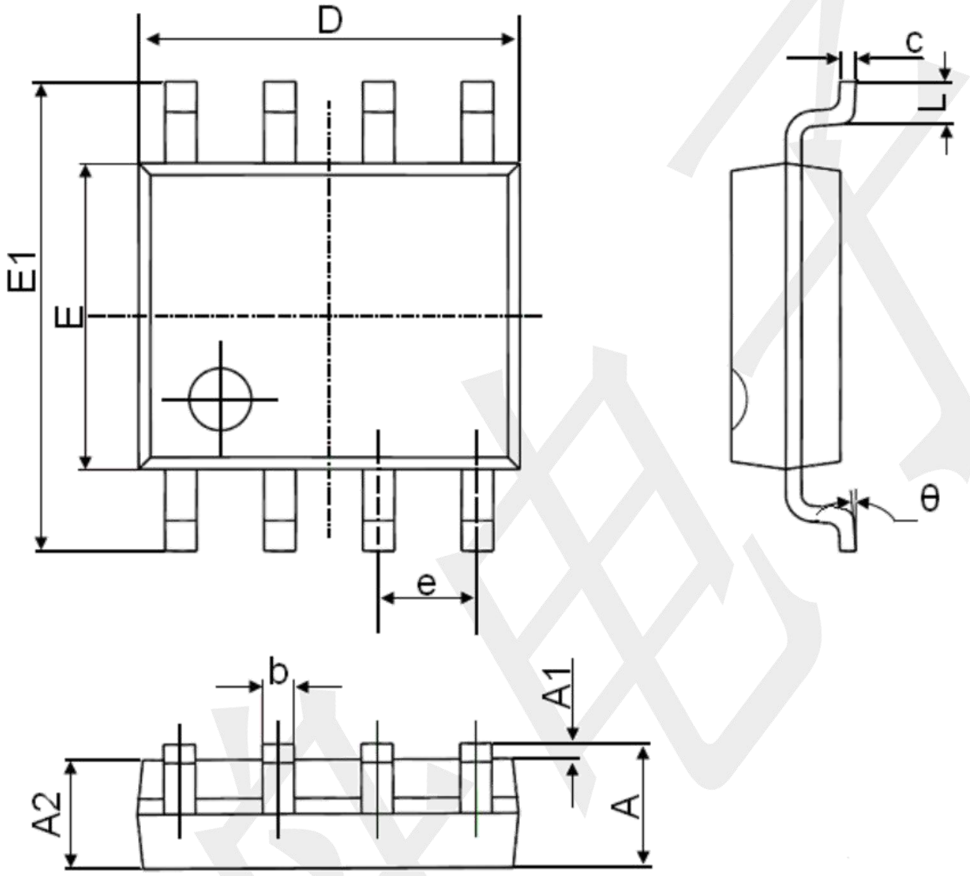


Mounting Pad Layout (unit: mm)



Package Outline Dimensions (unit: mm)

SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°