300mA Low Dropout CMOS Voltage Regulators

13534212799
Q Q 2851339680

■ General Description

The LN1132 series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The LN1132 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error amplifier. Output voltage is selectable in 0.1V steps between 1.3V ~ 6.0V. SOT-23 and SOT-89 packages are available.

■ Applications

- Mobile phones
- Cordless phones
- Cameras, video recorders
- Portable games
- Portable AV equipment
- Reference voltage
- Battery powered equipment

■ Ordering Information

LN1132 **P** ③④⑤⑥
     ① ②

■ Features

- Output Voltage Range: 1.2V to 6.0V (selectable in 100mV steps)
- Highly Accurate: ± 2%
- Dropout Voltage : 160mV @ 100mA (3.0V type)
- Low Power Consumption : 5.0μA (TYP.)
- Maximum Output Current : 300mA (Vin≥Vout+1V)
- Internal protector: current limiter and short protector
- Maximum Operating voltage: 7V
- Small packages: SOT-89-3, SOT-23 and other required

■ Package

- SOT-89-3L
- SOT-23-3L,SOT-23-3B,SOT23-5
- SOT-89-5L

Designator	Symbol	Description	Designator	Symbol	Description
①	32	Indicates the product number	④	1/2	Output Voltage Accuracy 1：±1%；2：±2%
②	P	Type of regulator 3-pin	⑤	M	SOT-23-3L
				V	SOT23-3B
				P	SOT-89-3
				N	SOT23-5
				R	SOT-89-5L
③	12-60	Output Voltage e.g. 30:3.0V; 50:5.0V	⑥	R	Embossed Tape :Standard Feed
				L	Embossed Tape :Reverse Feed

■ Pin Configuration

SOT-23-3L/SOT-23-3B
(Top View)

SOT-89-5L
(Top View)

SOT-23-5
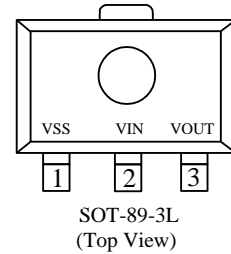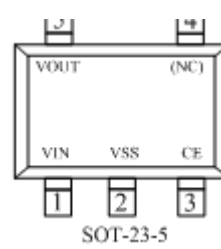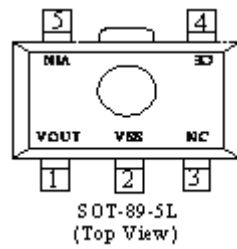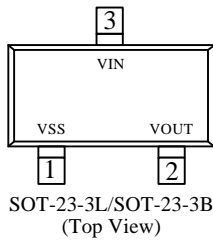
SOT-89-3L
(Top View)

	引脚号			引脚名	功能
SOT-23-3L/B	SOT-89-5L	SOT23-5	SOT-89-3L		
3	5	1	2	VIN	Supply Power
1	2	2	1	VSS	Ground
-	3	4	-	NC	No connect
-	4	3	-	CE	Chip enable
2	1	5	3	VOUT	Voltage Pin

■ Marking Rule

● **SOT-89-3L and SOT-23-3L/B**

① Represents the product name

Symbol	Product Name
H	LN1132◆◆◆◆◆

② Represents the range of output voltage

Output Voltage Range（V）	0.1～3.0	3.1～6.0	6.1～9.0
Symbol	R	S	T

③ Represents the Output Voltage

Symbol	Output Voltage（V）		Symbol	Output Voltage（V）	
0	-	3.1	-	F	1.6	4.6	-
1	-	3.2	-	H	1.7	4.7	-
2	-	3.3	-	K	1.8	4.8	-
3	-	3.4	-	L	1.9	4.9	-
4	-	3.5	-	M	2	5.0	-
5	-	3.6	-	N	2.1	5.1	-
6	-	3.7	-	P	2.2	5.2	-
7	-	3.8	-	R	2.3	5.3	-

Symbol	Output Voltage（V）			Symbol	Output Voltage（V）		
8	-	3.9	-	S	2.4	5.4	-
9	-	4	-	T	2.5	5.5	-
A	-	4.1	-	U	2.6	5.6	-
B	1.2	4.2	-	V	2.7	5.7	-
C	1.3	4.3	-	X	2.8	5.8	-
D	1.4	4.4	-	Y	2.9	5.9	-
E	1.5	4.5	-	Z	3	6.0	-

④ **Represents the assembly lot no.**

0~9, A~Z repeated (G, I, J, O, Q, W excepted)

■ Function Block Diagram
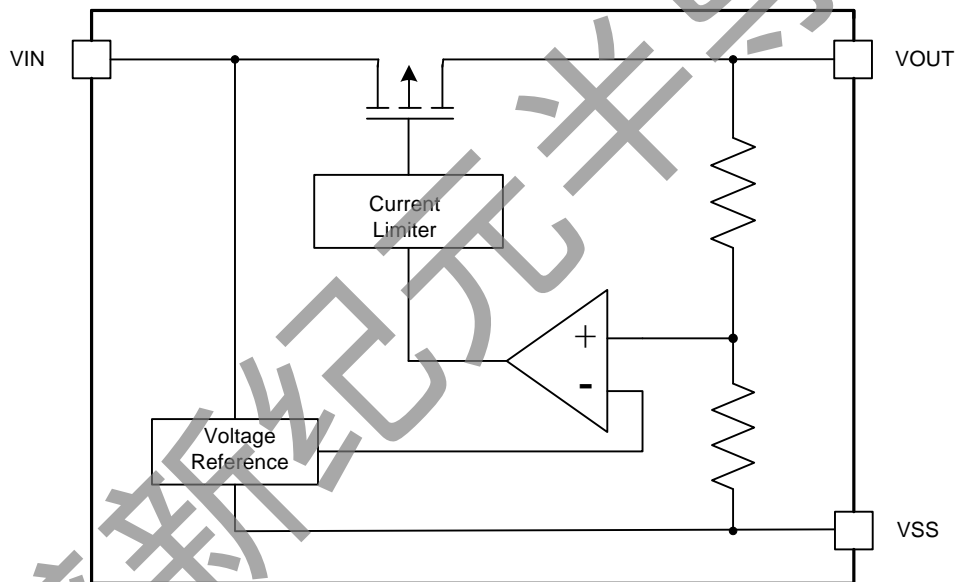
■ Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating		Unit
Input Voltage	V_{IN}	$V_{SS}-0.3 \sim V_{SS}+10$		V
Output Current	V_{OUT}	$V_{SS}-0.3 \sim V_{IN}+0.3$		
Power Dissipation	P_D	SOT-23-3	250	mW
		SOT-89-3	500	
Operating Ambient Temperature	Topr	$-40 \sim +85$		℃
Storage Temperature	Tstg	$-40 \sim +125$		

Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

■ Typical Application Circuit
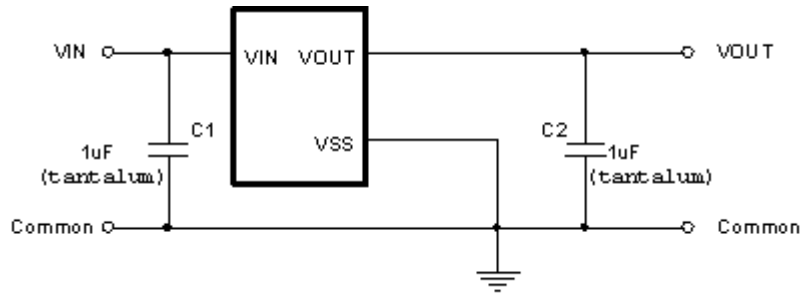
Caution：The above connection diagram and constant will not guarantee successful operation.
Perform thorough evaluation using the actual application to set the constant.

■ Electrical Characteristics

Item	Symbol	Condition		Min	Typ	Max	Unit	Circuit
Output Voltage	$V_{OUT(E)}$	$V_{IN}=V_{OUT(S)}+1.0$ V, $I_{OUT}=40$ mA		$V_{OUT(S)}$ ×0.98	$V_{OUT(S)}$	$V_{OUT(S)}$ ×1.02	V	1
Output Current	I_{OUT}	$V_{IN}≥V_{OUT(S)}+1.0$ V		300	—	—	mA	1
Dropout Voltage	V_{drop}	$I_{OUT}=100$ mA	2.2 V ≤$V_{OUT(S)}$≤2.5 V	—	0.20	0.28	V	1
			2.6 V ≤$V_{OUT(S)}$≤3.3 V	—	0.16	0.24		
			3.4 V ≤$V_{OUT(S)}$≤5.5 V	—	0.12	0.20		
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)}+0.5$ V ≤V_{IN}≤7V $I_{OUT}=80$ mA		—	0.05	0.3	%/V	
Input Voltage	ΔV_{OUT2}	$V_{IN}=V_{OUT(S)}+1.0$ V 1.0 mA ≤I_{OUT} ≤80 mA		—	20	40	mV	
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN}=V_{OUT(S)}+1.0$ V, $I_{OUT}=10$ mA -40°C ≤Ta ≤85°C		—	±100	—	ppm/℃	
Supply Current	I_{SS1}	$V_{IN}=V_{OUT(S)}+1.0$ V		—	5	6.5	µA	2
Input Voltage	V_{IN}	——		1.8	—	7	V	—
Ripple-Rejection	|RR|	$V_{IN}=V_{OUT(S)}+1.0$ V，f=1.0 kHz Vrip=0.5 Vrms, $I_{OUT}=80$ mA		—	50	—	dB	1
Short current	I_{short}	$V_{IN}=V_{OUT(S)}+1.5$ V,		—	60	—	mA	1
Current Limiter	I_{lim}	$V_{IN}=V_{OUT(S)}+1.5$ V,		—	380	—	mA	1

■ Test Circuits

Circuit① Circuit②
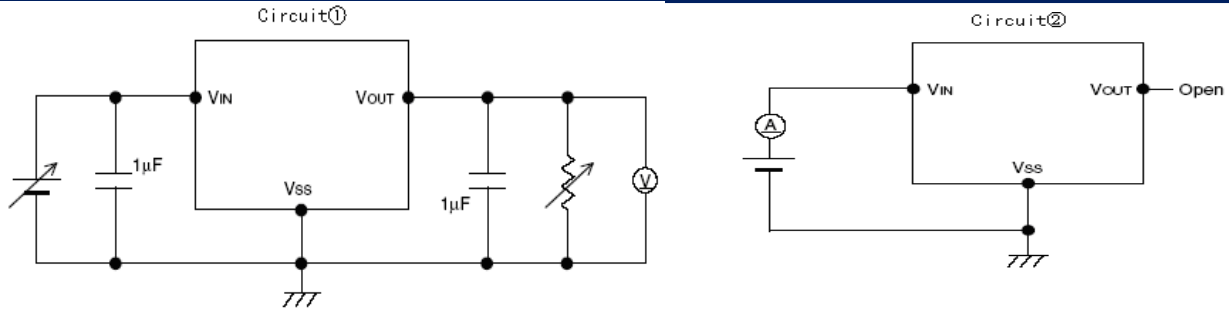
■ Typical Performance Characteristics （3.0V output）

Output Voltage vs Temperature

| 101.04C | 2.41451V |
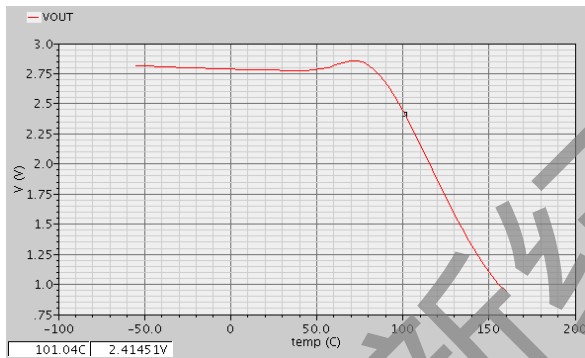
Output Voltage vs Input Voltage

| 1.874 | 1.8583V |
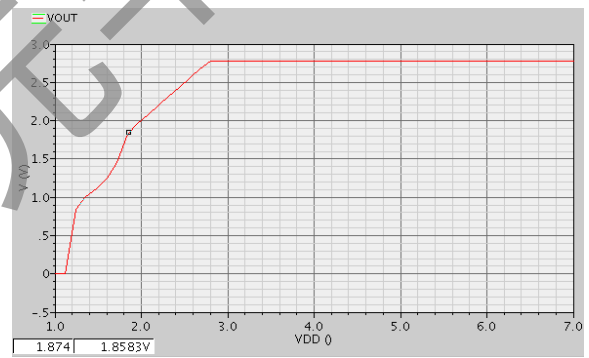
ISS vs Input Voltage

| 5.953 | -5.09uA |
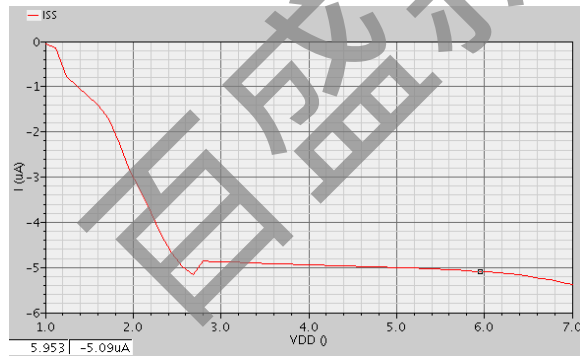
输入电流与负载电流

Output Current vs Output Voltage

| 10.0 | 4.8036mV |
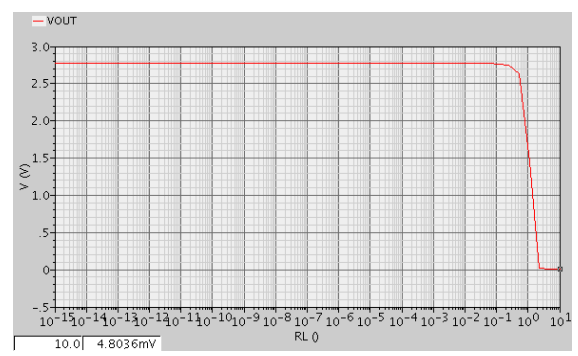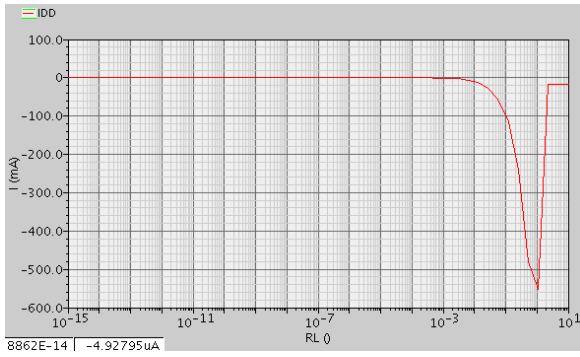
■ Package Information

● SOT-89-3L
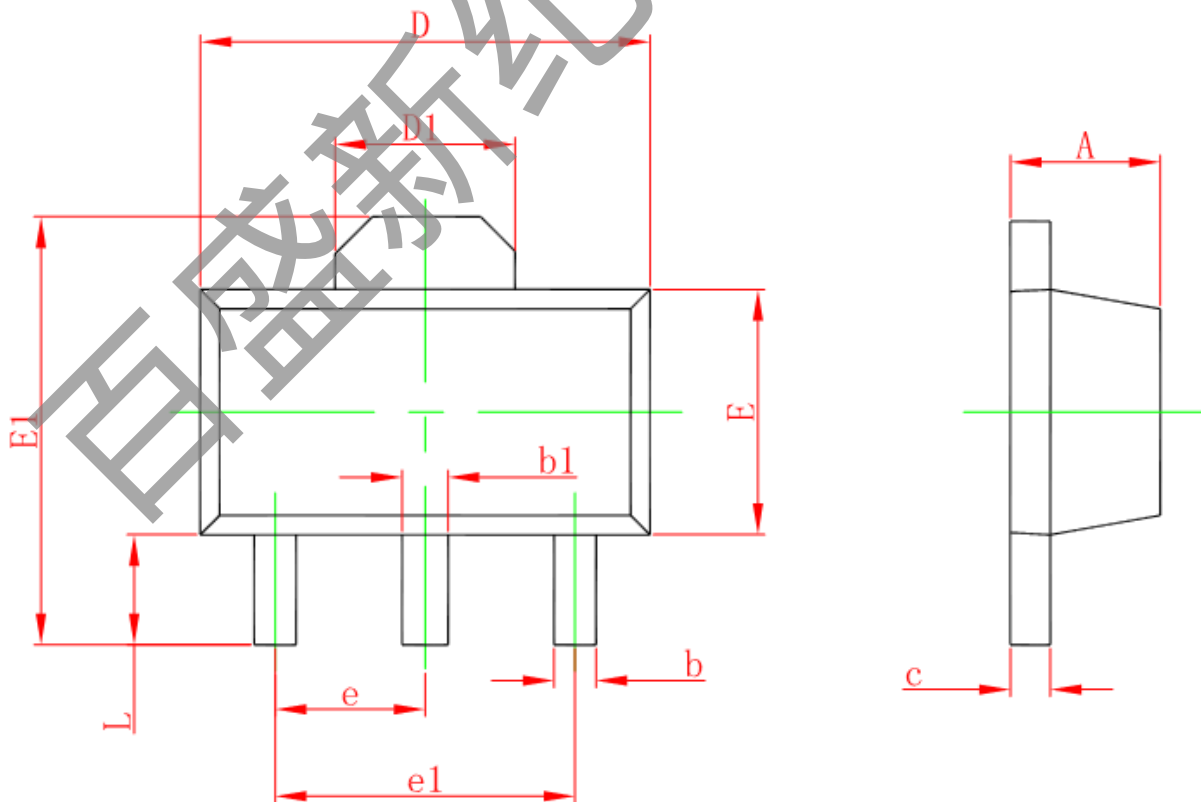
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

● **SOT-353/SC70-5**
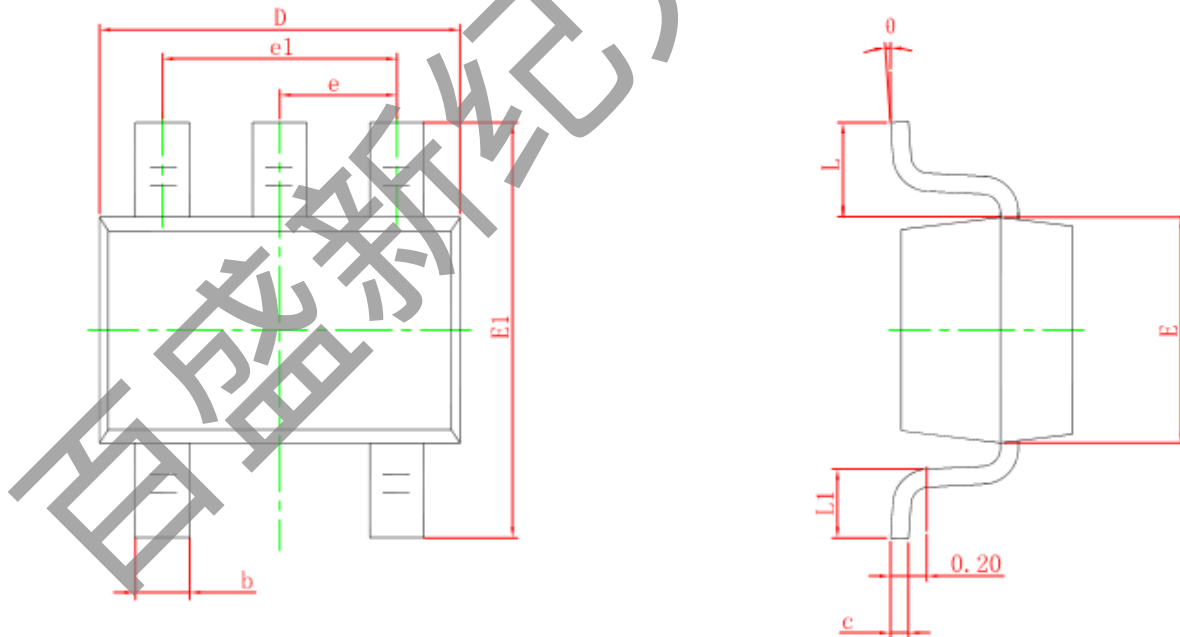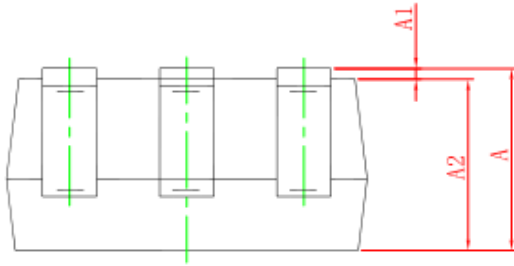
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

● **SOT-23-3L**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

● **SOT-23-3B**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°
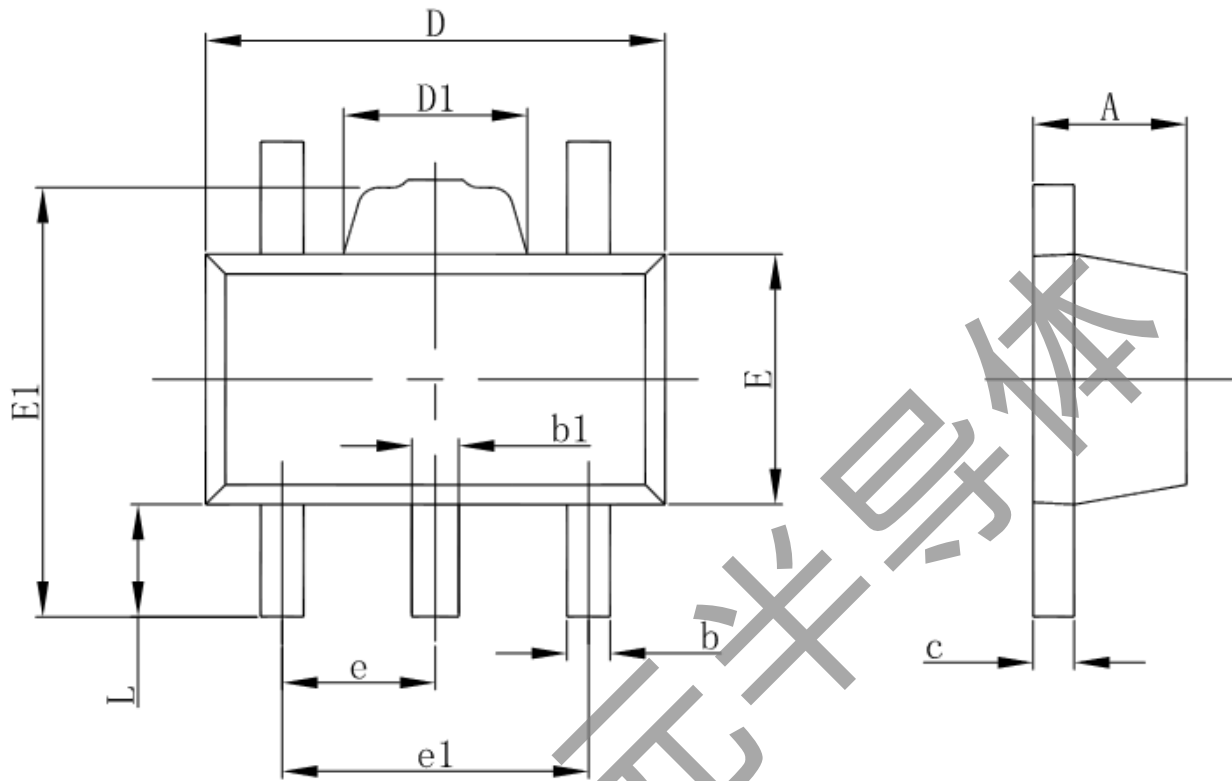
● SOT89-5L

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP.		0.060TYP.	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043

- **SOT-23-5L**

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°