Features

- 2µA Ground Current at no Load
- ±2% Output Accuracy
- 500mA Output Current
- 10nA Disable Current (by option)
- Wide Operating Input Voltage Range: 1.2V to 5.5V
- Dropout Voltage: 0.32V at 500mA/ V_{OUT} 3.3V
- Support Fixed Output Voltage 1.2V, 1.5V, 1.6V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
  Over Temperature Protection
- SOT23-5, SOT89-3 Packages

Applications

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment
- Car Navigation Systems

General Descri tion

The HT78XX series are a group of low-dropout (LDO) voltage regulators offering the benefits of wide input voltage range from 1.2V to 5.5V, low dropout voltage, low power consumption, and miniaturized packaging. Quiescent current of only 2µA makes these devices ideal for powering the battery-powered, always-on systems that require very little idle-state power dissipation to a longer service life. There is an option of

shutdown mode by selecting the parts with the EN pin and pulling it low. The shutdown current in this mode goes down to only 10nA (typical).
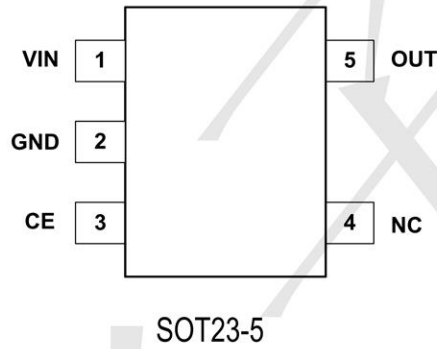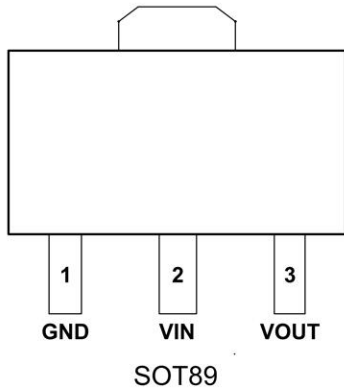
The HT78XX series of linear regulators are stable with the ceramic output capacitor over its wide input range from 1.2V to 5.5V and the entire range of output load current (0mA to 500mA).

Ordering Information

HT7833

Output voltage: 12=1.2V
15=1.5V
18=1.8V
30=3.0V
33=3.3V
XX=X.XV

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PIN CONFIGURATION
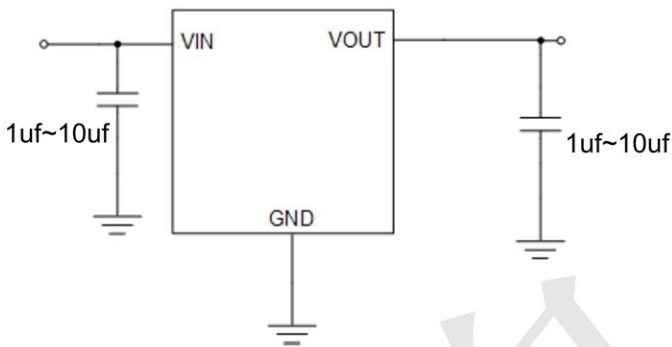

SOT89

SOT23-5

Typical Application Circuit

Figure 1: Application circuit of Fixed VOUT LDO
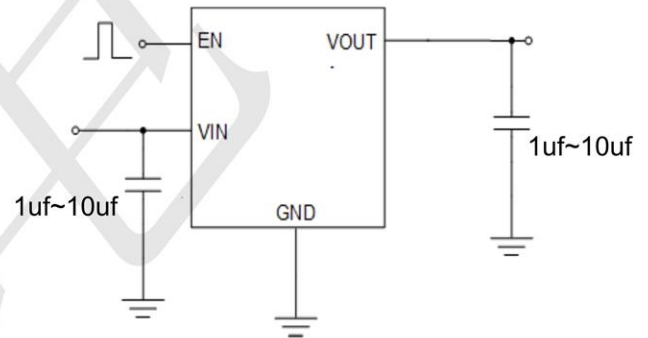
Figure 2: Application circuit of Fixed VOUT LDO with enable function

ABSOLUTE MAXIMUM RATINGS

Parameter		Value	Unit
Supply Voltage		-0.3~+6.5	V
Power Dissipation	SOT-23-5	400	mW
	SOT-89	600	mW
Thermal Resistance,Junction-to-Ambient	SOT-23-5	380	°C/W
	SOT-89	180	°C/W
Operating Junction Temperature		-40 ~ +125	°C
Storage Temperature Range		-65 ~ +150	°C
Lead Temperature (Soldering, 10 sec)		300	°C

Electrical Characteristics (T$_A$=25 C unless otherwise noted)

(V$_{IN}$ =5V, V$_{EN}$ = 5V T$_A$=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Supply Voltage	V$_{IN}$			1.2	--	5.5	V
DC Output Voltage Accuracy		I$_{LOAD}$ =0.1mA		-2		2	%
Dropout Voltage (I$_{LOAD}$ =600mA) (Note 3)	V$_{DROP\_3V}$	V$_{OUT}$ ≥ 3V			0.32		V
	V$_{DROP\_2.8V}$	V$_{OUT}$ = 2.8V			0.36		
	V$_{DROP\_2.5V}$	V$_{OUT}$ = 2.5V			0.36		
	V$_{DROP\_1.8V}$	V$_{OUT}$ = 1.8V			0.57		
	V$_{DROP\_1.5V}$	V$_{OUT}$ = 1.5V			0.71		
	V	V = 1.2V			0.8		
Ground Current	I$_Q$	I$_{LOAD}$ = 0mA			2		μA
Shutdown Ground Current	I$_{SD}$	V$_{EN}$ = 0V,			0.01	0.5	μA
V$_{OUT}$ Shutdown Leakage Current	I$_{LEAK}$	V$_{OUT}$ = 0V			0.01	0.5	
Enable Threshold Voltage	V$_{IH}$	EN Rising				2	V
	V$_{IL}$	EN Falling		0.6			
EN Input Current	I$_{EN}$	V$_{EN}$ = 5V			10	100	nA
Line Regulation	ΔLINE	I$_{LOAD}$ =30mA, 1.5V ≤ V$_{IN}$ ≤ 5.5V or (V$_{OUT}$ + 0.2V) ≤ V$_{IN}$ ≤ 5.5V			0.2		%
Load Regulation	ΔLOAD	10mA ≤ I$_{LOAD}$ ≤ 0.3A			0.2		%
Output Current Limit	I$_{LIM}$	V$_{OUT}$ =0		500	800		mA
Power Supply Rejection Ratio (I$_{LOAD}$ =5mA)	PSRR	V$_{OUT}$ =1.2V, V$_{IN}$ = 2V	f = 100Hz	--	80	--	dB
			f = 1kHz	--	75	--	
Output Voltage Noise (BW = 10Hz to 100kHz, C$_{OUT}$ =1μF,)		V$_{IN}$ = 3.5V I$_{LOAD}$ =0.1A	V$_{OUT}$ =0.9V	--	40	--	μV$_{RMS}$
			V$_{OUT}$ =2.8V	--	50	--	
Thermal Shutdown Temperature	T$_{SD}$	I$_{LOAD}$ =10mA		--	155	--	°C
Thermal Shutdown Hysteresis	ΔT$_{SD}$			--	15	--	°C
Discharge Resistance		EN = 0V , V$_{OUT}$ = 0.1V		--	100	--	Ω

Note 1. Stresses beyond those listed "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions may affect device reliability.

Note 2. θ_{JA} is measured at T_A = 25°C on a TECH PUBLICboard.

Note 3. $V_{DROP} = V_{IN} - V_{OUT}$ when the V_{OUT} is 98% of its target value.

Typical Characteristics
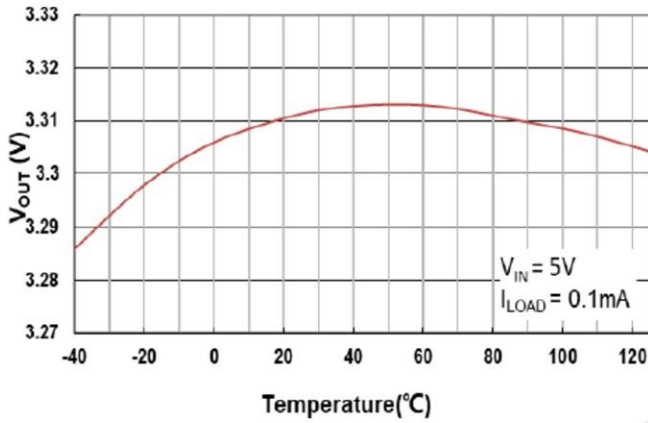
Fig. 5 Output Voltage vs. Temperature
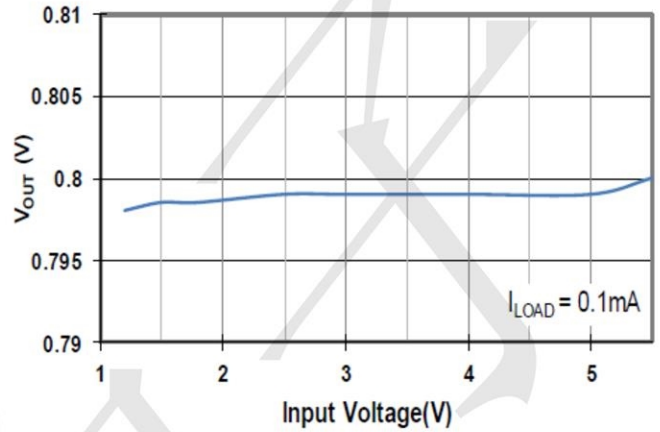
Fig. 6 Output Voltage vs. Input Voltage
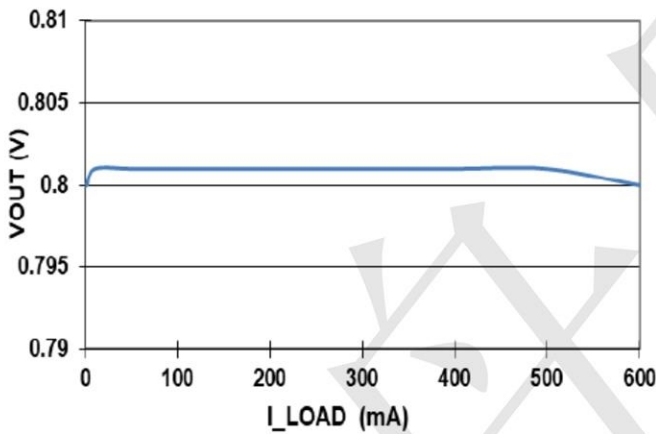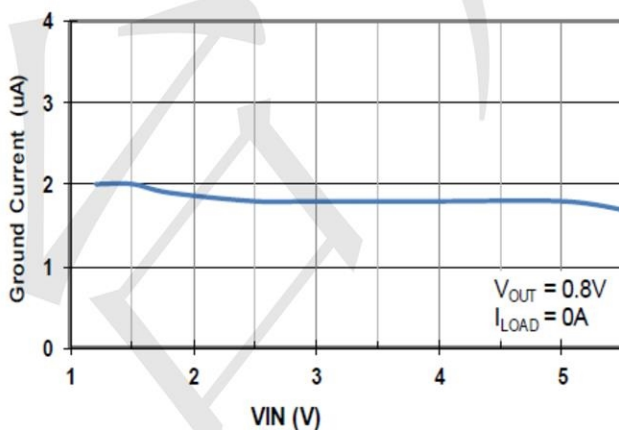

Fig. 7 Output Voltage vs. Load Current
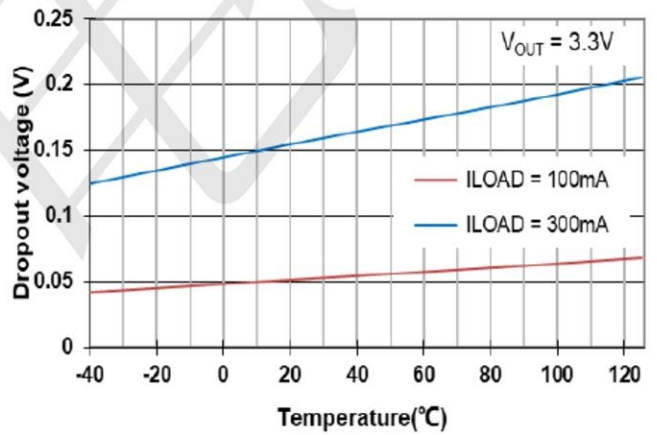
Fig. 8 Dropout Voltage vs. Temperature

Fig. 9 Ground Current vs. Input Voltage

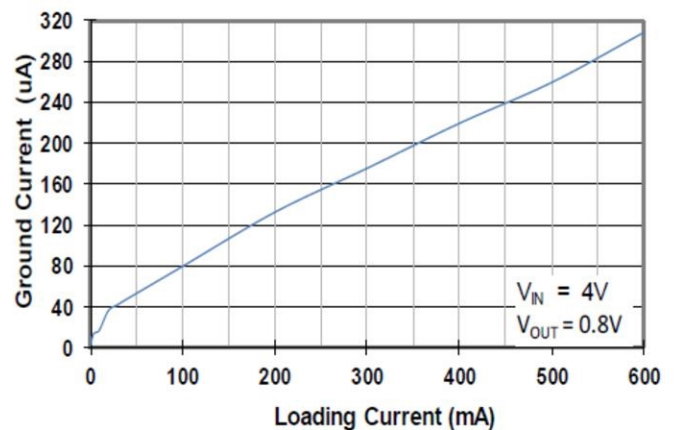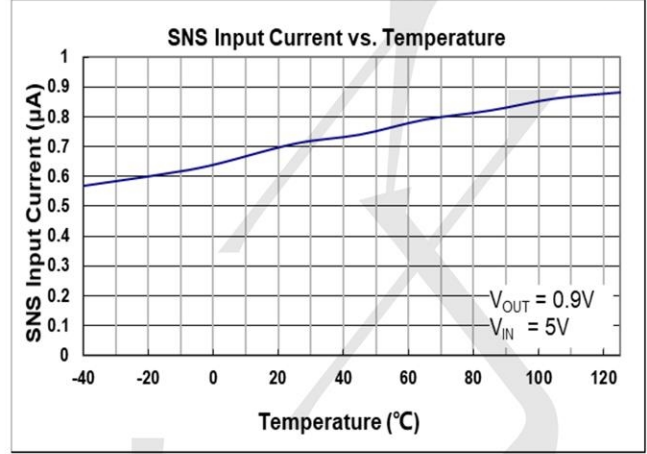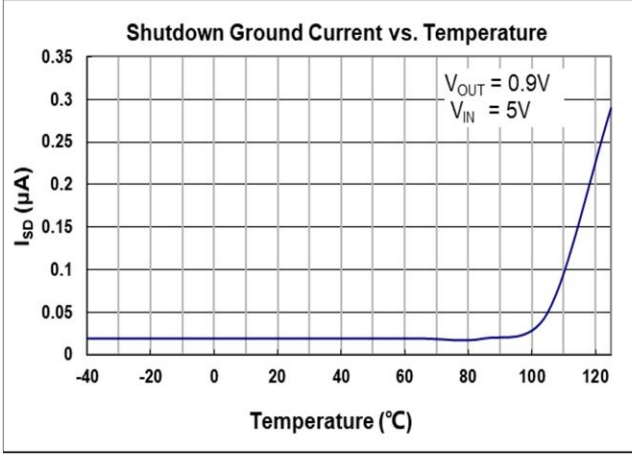Fig. 10 Ground Current vs. Loading Current

Shutdown Ground Current vs. Temperature

SNS Input Current vs. Temperature

Current Limit vs. Input voltage
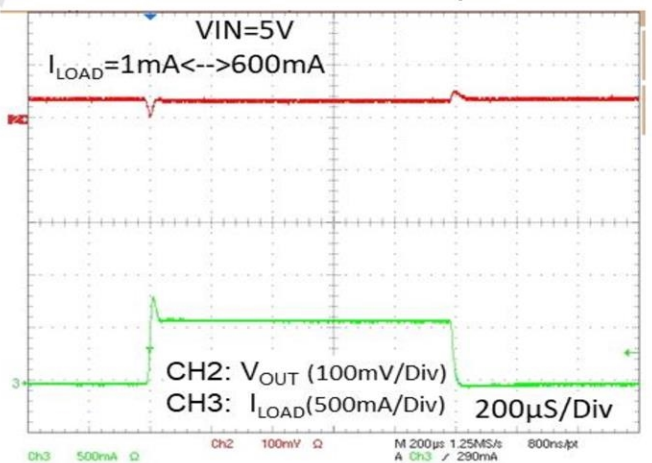
Current Limit Response
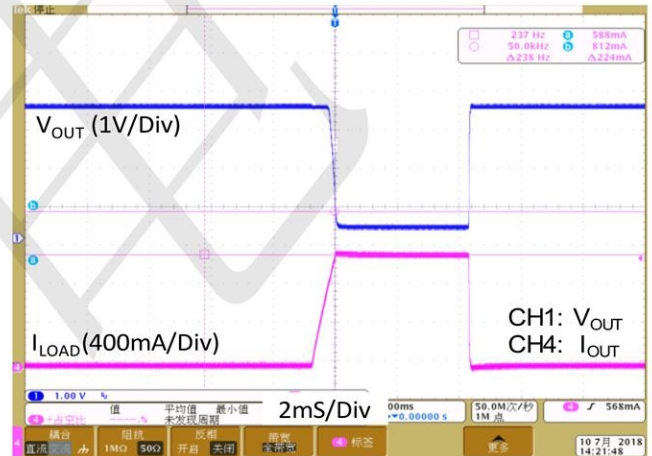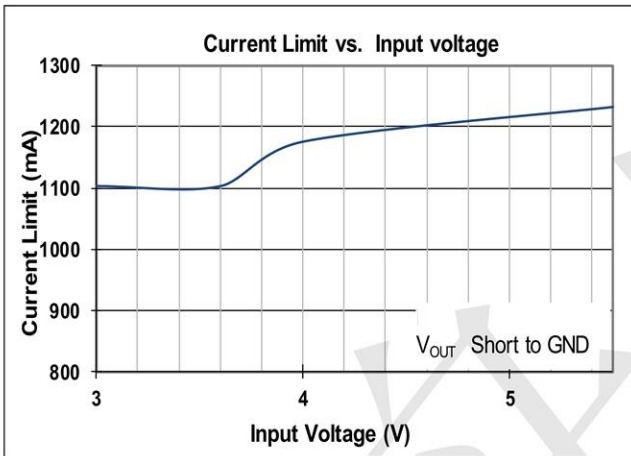
Load Transient Response I
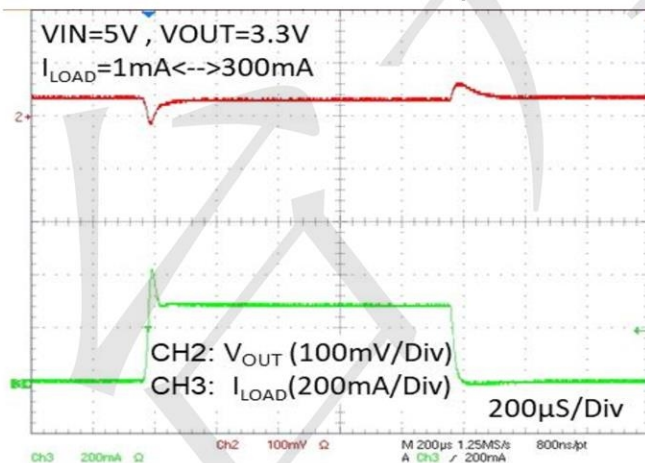
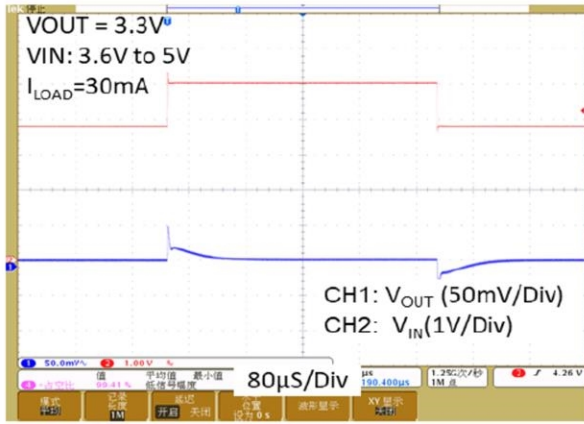## Load Transient Response II
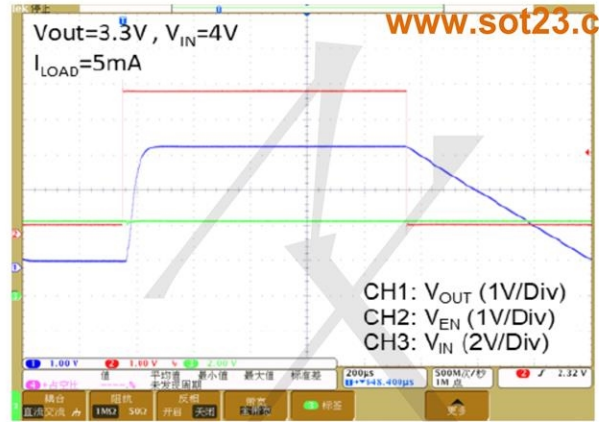
Fig. 17 Line Transient Response
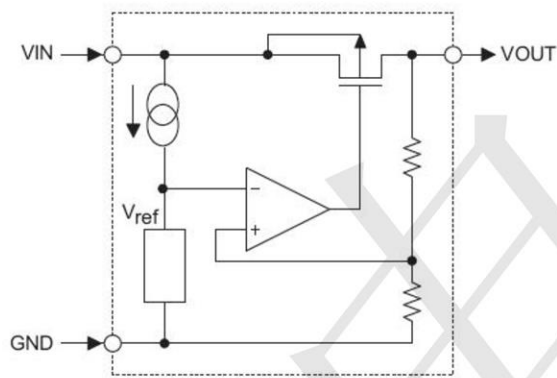

Fig. 18 V_{OUT} Turn On/Off by EN

BLOCK DIAGRAM

Figure 2.HT75XX Block Diagram

Package informantion

SOT23-5
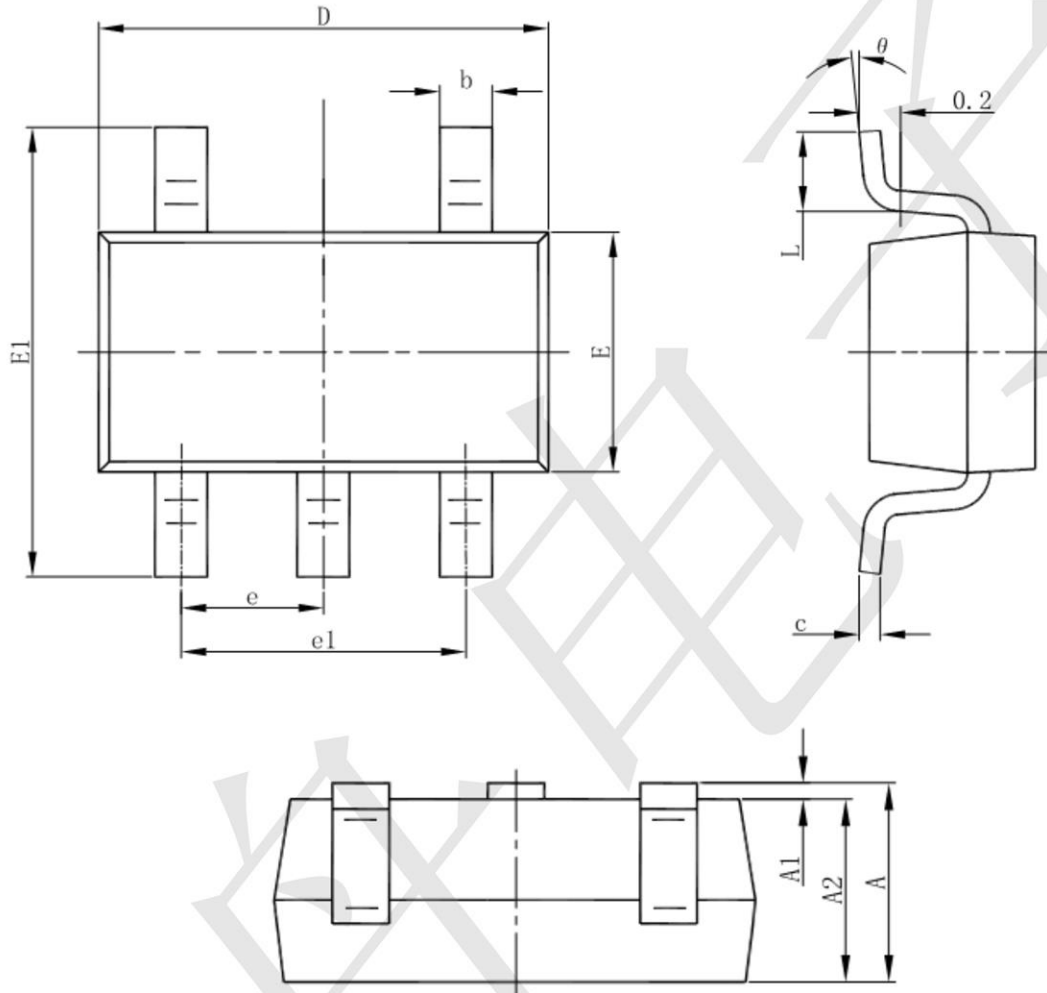
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package informantion

SOT89-3
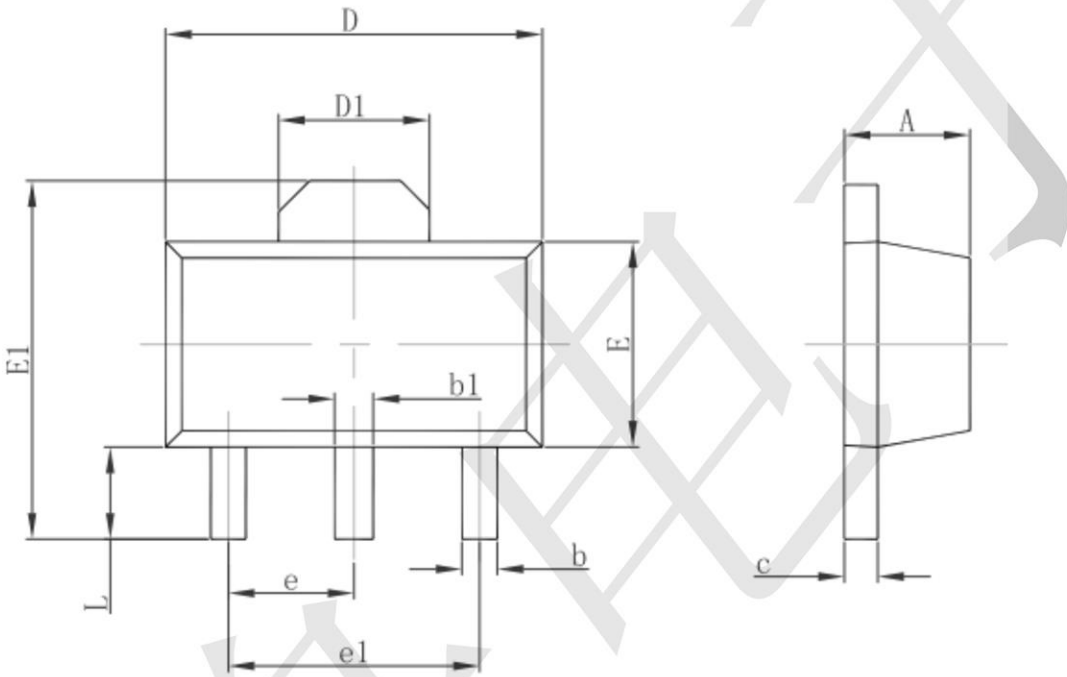
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

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