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General Description

The HT75XXH series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 40V. They are available with several fixed output voltages ranging from 1.8V to 5.0V. CMOS technology ensures low voltage drop and low quiescent current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

Features

- Quiescent Current: 4.2uA@12V
- PSRR:60dB@100Hz
- Voltage drop:600mV@100mA
- ESD HBM:8KV
- High input voltage (up to 40V)
- Output voltage accuracy: tolerance $\pm 2\%$
- Output current:100mA(Typ.)
- TO92 and SOT89 package

Applications

- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

Selection Table

Part No.	Output Voltage	Package
HT7518H	1.8V	
HT7525H	2.5V	
HT7527H	2.7V	
HT7530H	3.0V	SOT89
HT7533H	3.3V	SOT23-3
HT7536H	3.6V	SOT23
HT7540H	4.0V	
HT7544H	4.4V	
HT7550H	5.0V	

Application Circuits
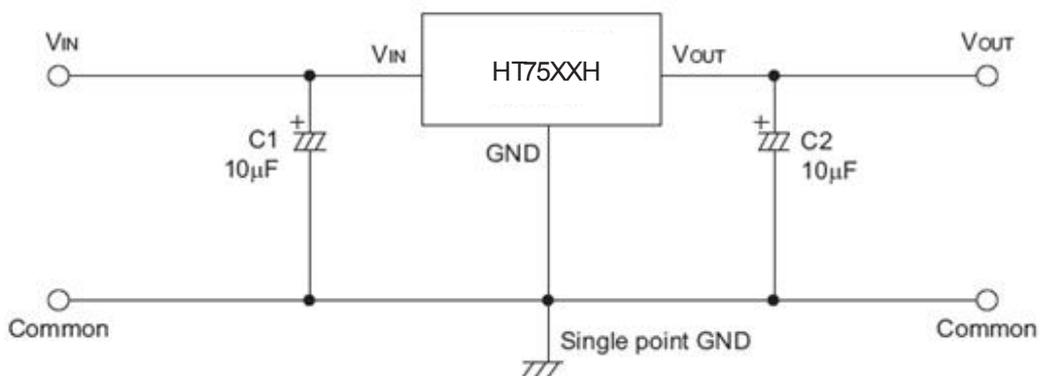
Block Diagram

Pin Assignment

SOT23   **SOT23-3**   **SOT89-3**
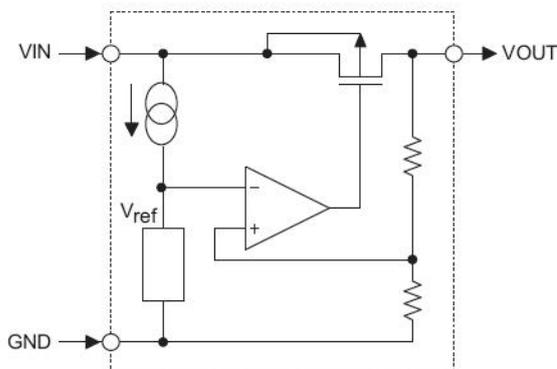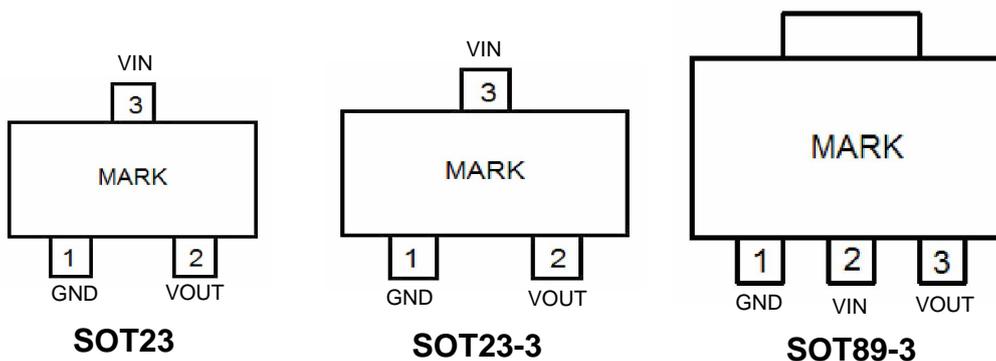
Absolute Maximum Ratings

Supply Voltage ....-0.3V to 40V   Storage Temperature ....-50℃ to 125℃

Operating Temperature ....-40℃ to 85℃

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum
Ratings" may cause substantial damage to the device. Functional operation of this device at other
conditions beyond those listed in the specification is not implied and prolonged exposure to extreme
conditions may affect device reliability.

Thermal Information

| Symbol	Parameter	Package	Max.	Unit
θ_{JA}	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	TO92	200	℃/W
		SOT89	200	℃/W
P_D	Power Dissipation	TO92	0.50	W
		SOT89	0.50	W

Note: P_D is measured at Ta= 25℃

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Electrical Characteristics

The following specifications apply for VIN = 12V, TA=25℃，C_{IN}=C_{OUT}=10μF, unless specified otherwise.

| SYMBOL	ITEMS	CONDITIONS		MIN	TYP	MAX	UNIT
V_{IN}	Input Range	I_{OUT} = 10mA		4.75		40	V
V_{OUT}	Output Range	I_{OUT} = 10mA		V_{OUT}x0.98	V_{OUT}	V_{OUT}x1.02	V
ΔV_{OUT}	Output Voltage	V_{IN} = 12V, I_{OUT} = 10mA		4.9	5	5.1	V
				3.234	3.3	3.366	
				2.94	3.0	3.06	
I_Q	Quiescent Current	V_{IN} = 7V, I_{OUT} = 0			4	6	μA
		V_{IN} = 24V, I_{OUT} = 0			4.6	6.7	
		V_{IN} = 40V, I_{OUT} = 0			5.4	8.2	
I_{OUT_PK}	Maximum Output Current	V_{IN} = 12V, R_L=1Ω			190		mA
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA			60	90	mV
		I_{OUT} = 100mA			600	900	
ΔV_{LINE}	Line Regulation	V_{IN} =7 ~ 24V, V_{OUT} = 5V, I_{OUT} = 1mA			0.02	0.03	%/V
		V_{IN} = 7 ~ 45V, V_{OUT} = 5V, I_{OUT} = 1mA			0.08	0.1	
ΔV_{LOAD}	Load Regulation	V_{IN} = 7V , I_{OUT} = 1 ~ 100mA			19	37	mV
I_{SHORT}	Short Current	V_{OUT} Short to GND with 1Ω (1ms pulse), V_{IN} = 40V			180		mA
PSRR	Power Supply Rejection Rate	V_{IN} = 10V, V_{PP} = 0.5V, I_{OUT} = 1mA	F = 100Hz		60		dB
			F = 1kHz		50		
			F = 10kHz		40		
e_{NO}	Output Noise Voltage	10Hz to 100kHz, C_{OUT} = 10 μF, I_{OUT}=10mA			±100		μV_{RMS}
T_{SD}	Thermal Shutdown Protection	V_{IN} = 12V, I_{OUT} = 1mA			165		℃
$\Delta V_O/\Delta T$	Temperature Coefficient				±0.5		mV/℃

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## Application Circuits

Basic Circuits
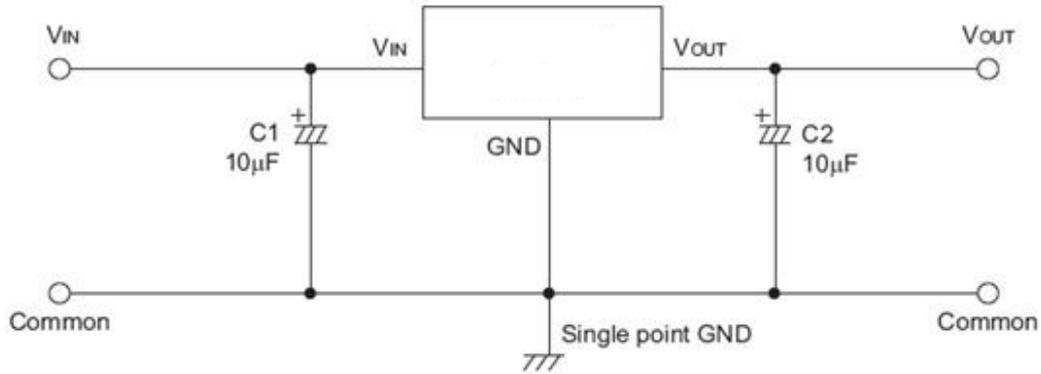
High Output Current Positive Voltage Regulator
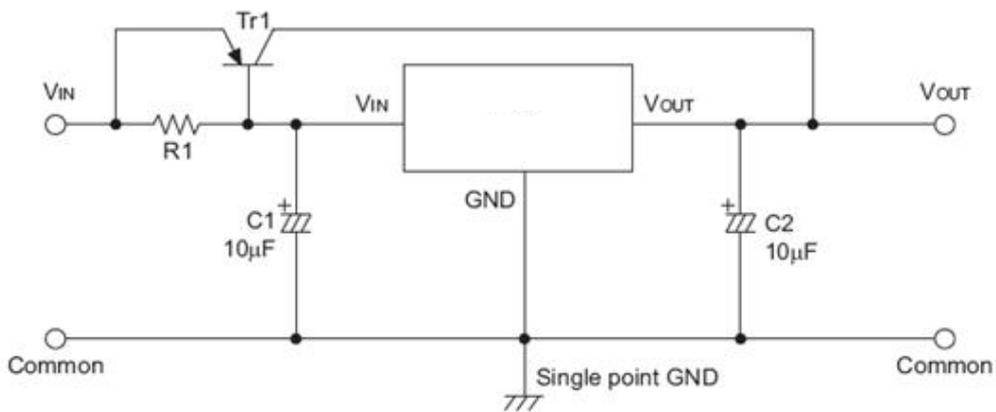

Short-Circuit Protection by Tr1

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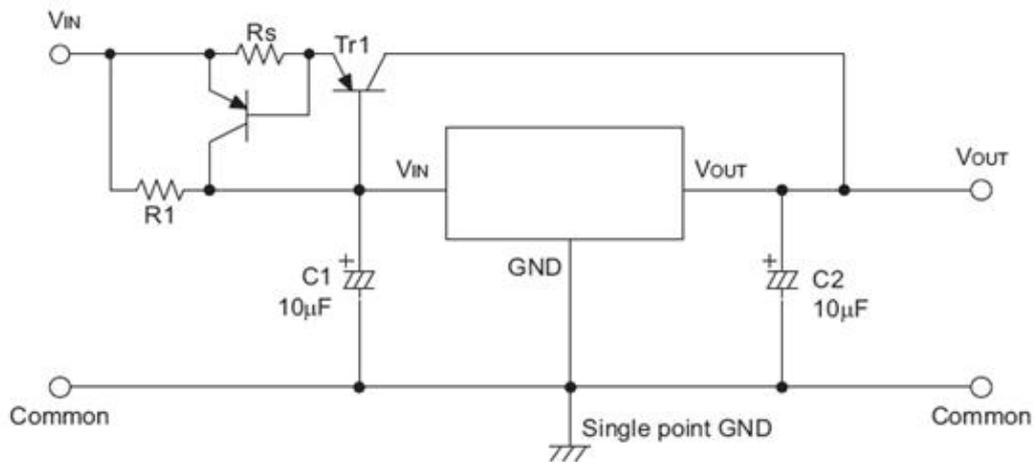
Circuit for Increasing Output Voltage

Circuit for Increasing Output Voltage

$$V_{OUT}=V_{XX}+V_{D1}$$
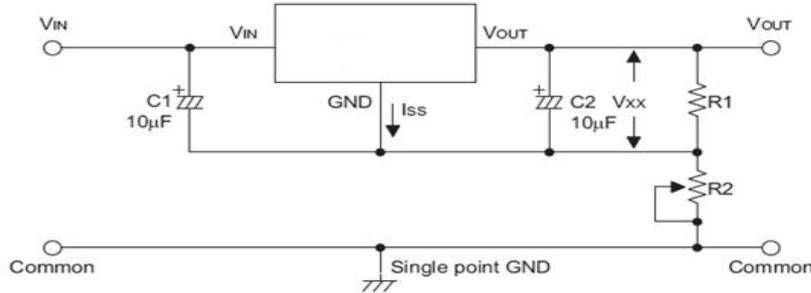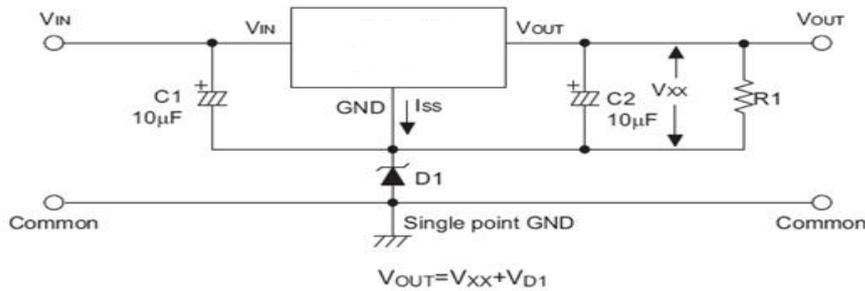
Constant Current Regulator
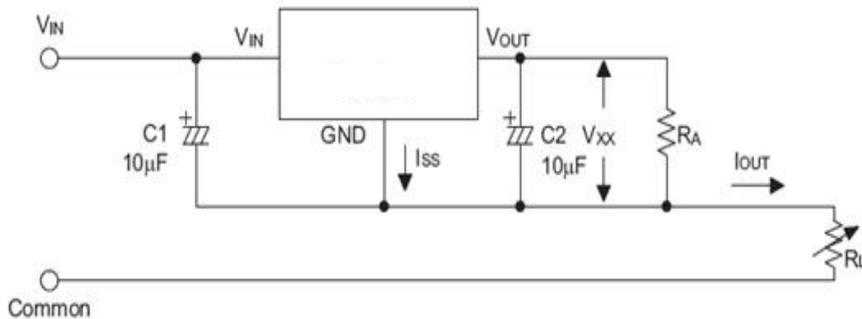
$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

Dual Supply

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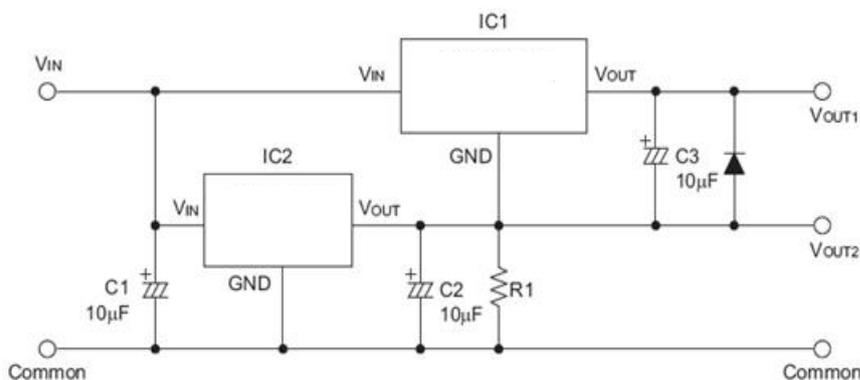
3-pin SOT23 Outline Dimensions
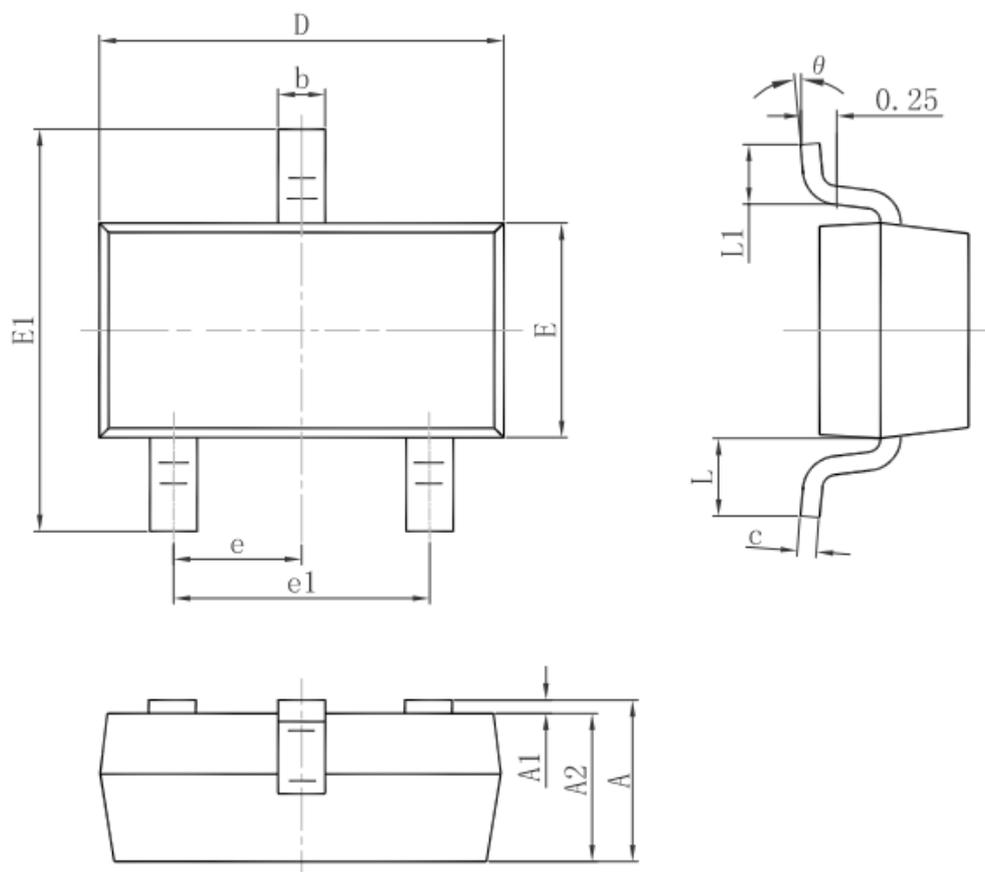
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		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°

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3-pin SOT23-3 Outline Dimensions
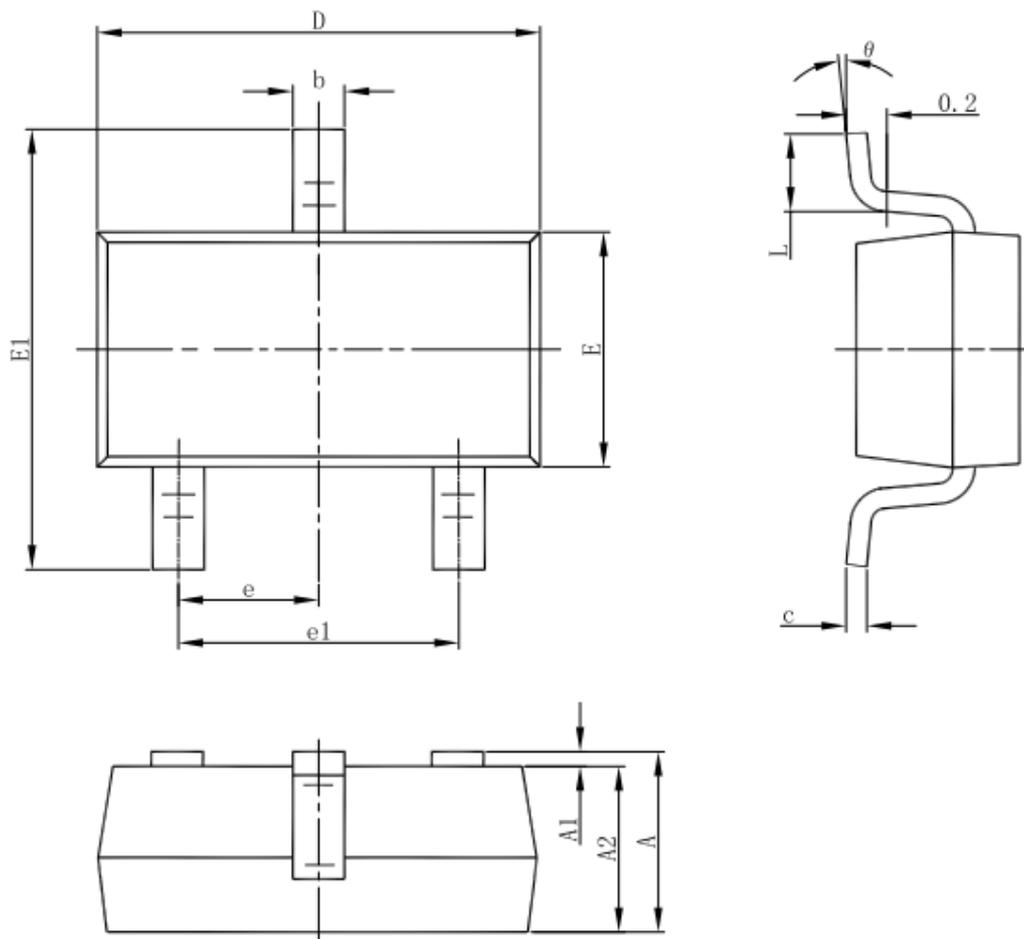
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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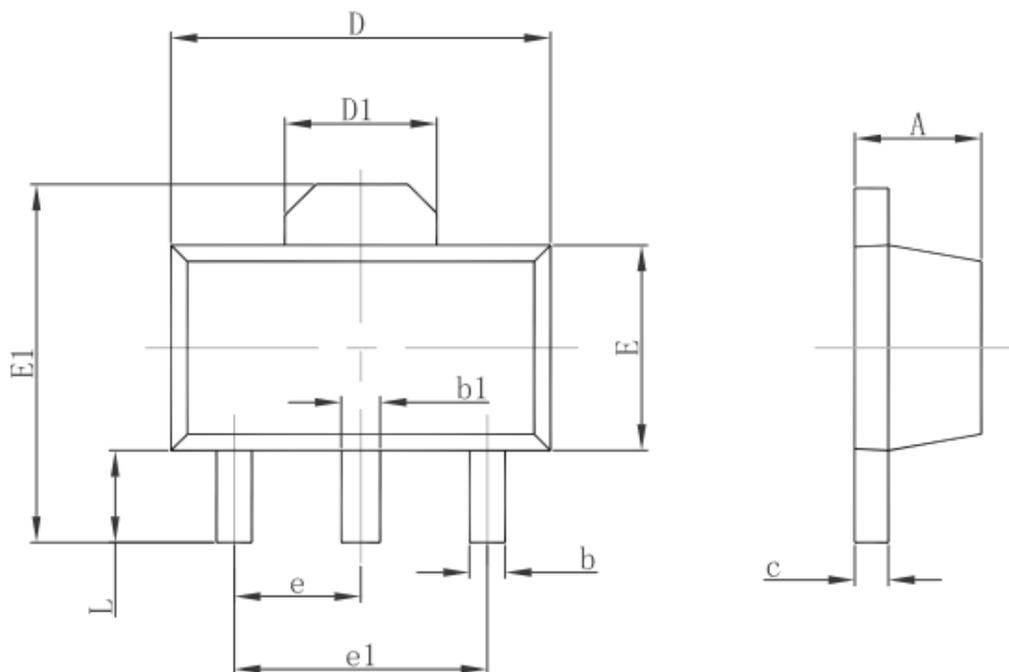
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.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