

Product Summary

The GPL6225 series are a group of positive voltage regulators manufactured by CMOS technologies with high ripple rejection, ultra-low noise, low power consumption and low dropout voltage, which can prolong battery life in portable electronics. The GPL6225 series work with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications. The GPL6225 series consume less than 0.1 μ A in shutdown mode and have fast turn-on time less than 50 μ S. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

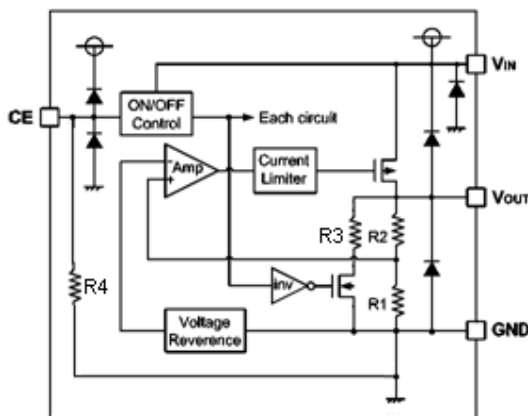
Features

- Low Quiescent Current: 50 μ A
- Low Output Noise: 40 μ VRMS(10Hz~100kHz)
- Operating Voltage Range: 1.8V~6.0V
- Low Dropout Voltage: 50mV@100mA
- Output Voltage: 1.05~ 5.0V
- High Accuracy: \pm 2%(Typ.)
- TTL-Logic-Controlled Shutdown Input
- Excellent Line and Load Transient Response
- Built-in Current Limiter, Short-Circuit Protection

Applications

- Cellular and Smart Phones
- Radio control systems
- Laptop, Palmtops and PDAs
- Digital Still and Video Cameras
- MP3, MP4 Player
- Battery-Powered Equipment

Block Diagram

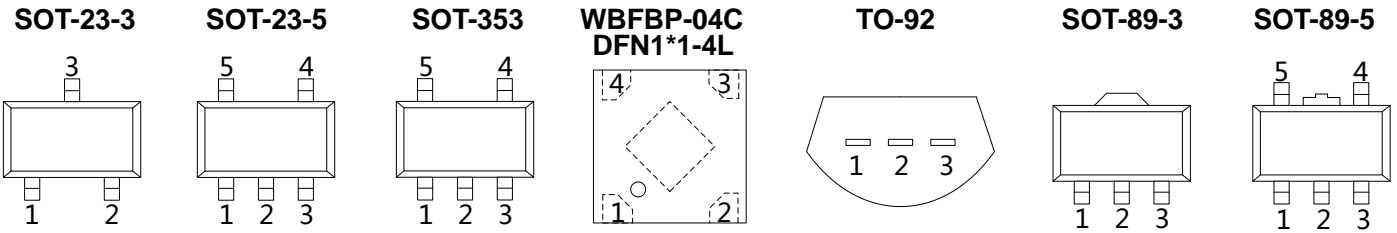


Order Information

GPL6225V①②

Designator	Description
①	Output Voltage e.g. 1.8V=18
②	Package: SOT-23-3L=K3 SOT-23-5L=K5 WBFBP-04C(DFN1*1-4)=H4 SOT-89-3L=KE SOT-89-5L=KT TO-92=Z

Pin Configuration



Pin Number			Pin Name	Function
SOT-23-3	TO-92	SOT-89-3		
1	1	1	V_{SS}	Ground
2	3	3	V_{OUT}	Output
3	2	2	V_{IN}	Power input

Pin Number		Pin Name	Function
SOT-23-5L	SOT-353		
1	1	V_{IN}	Power Input Pin
2	2	V_{SS}	Ground
3	3	CE	Chip Enable Pin
4	4	NC	No Connection
5	5	V_{OUT}	Output Pin

WBFBP-04C/DFN1*1-4L

Pin Number	Pin Name	Function
1	V_{OUT}	Output Pin
2	V_{SS}	Ground
3	CE	Chip Enable Pin
4	V_{IN}	Power Input Pin

SOT-89-5L

Pin Number	Pin Name	Function
1	V_{OUT}	Output Pin
2	V_{SS}	Ground
3	NC	No Connection
4	CE	Chip Enable Pin
5	V_{IN}	Power Input Pin

Absolute Maximum Ratings ⁽¹⁾ ($T_a=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Ratings	Units
Input Voltage ⁽²⁾	V_{IN}	$V_{SS}-0.3\sim V_{SS}+7$	V
Output Voltage ⁽²⁾	V_{OUT}	$V_{SS}-0.3\sim V_{IN}+0.3$	V
Output Current	I_{OUT}	500	mA
Power Dissipation	SOT-23-3/5L	P_D	0.38
	SOT-89/TO-92	P_D	0.60
	DFN1*1-4	P_D	0.40
Thermal Resistance	SOT-23-3/5L	θ_{JA}	258
	SOT-89/TO-92	θ_{JA}	167
	DFN1*1-4	θ_{JA}	250
Operating Free Air Temperature Range	T_A	-40~85	$^{\circ}\text{C}$
Operating Junction Temperature Range ⁽³⁾	T_j	-40~125	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40~125	$^{\circ}\text{C}$
Lead Temperature(Soldering, 10 sec)	T_{solder}	260	$^{\circ}\text{C}$
ESD rating ⁽⁴⁾	Human Body Model -(HBM)	4	kV
	Machine Model- (MM)	200	V

(1) Stresses beyond those listed under *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 under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) All voltages are with respect to network ground terminal.

(3) This IC includes overtemperature protection that is intended to protect the device during momentary overload. Junction temperature will exceed 125°C when overtemperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

(4) ESD testing is performed according to the respective JEDEC standard.

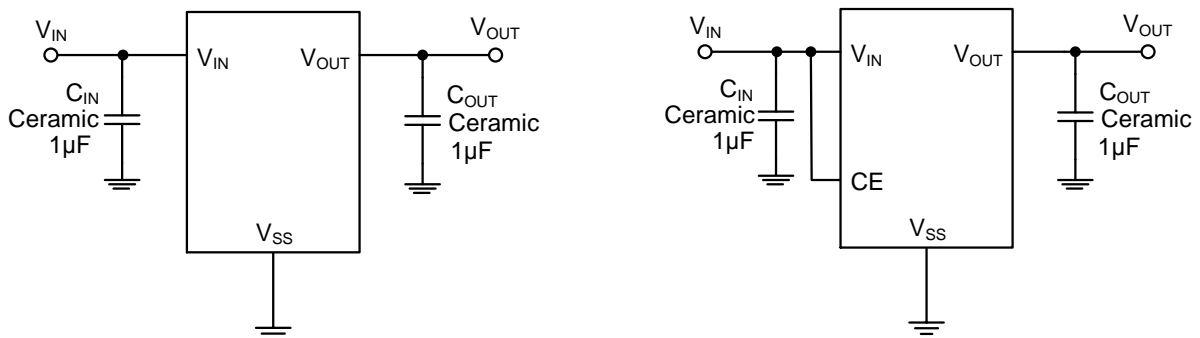
The human body model is a 100 pF capacitor discharged through a 1.5k Ω resistor into each pin. The machine model is a 200pF capacitor discharged directly into each pin.

Electrical Characteristics ($V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}^{2)}$	$I_{OUT}=1mA$	$V_{OUT} \cdot 0.98$	V_{OUT}	$V_{OUT} \cdot 1.02$	V
Supply Current	I_{SS}	$I_{OUT}=0$		50	100	μA
Standby Current	I_{STBY}	$CE = V_{SS}$		0.1	1	μA
Output Current	I_{OUT}	—	500			mA
Dropout Voltage ³⁾	V_{dif}	$I_{OUT} = 100mA$ $V_{OUT} \geq 3.3V$		50		mV
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$, $1mA \leq I_{OUT} \leq 100mA$		1		mV
Line Regulation		$I_{OUT} = 10mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6V$		0.01	0.2	%/V
Output Voltage Temperature Characteristics		$I_{OUT} = 10mA$ $-40 \leq T \leq +85$		50		ppm
Short Current	I_{Short}	$V_{OUT} = V_{SS}$		50		mA
Input Voltage	V_{IN}	—	1.8		6.0	V
Power Supply Rejection Rate	100Hz	PSRR	$I_{OUT}=50mA$	75		dB
	1kHz			80		
	10kHz			80		
CE "High" Voltage	$V_{CE"H"}$		1.5		V_{IN}	V
CE "Low" Voltage	$V_{CE"L"}$				0.3	V
C_{OUT} Auto-Discharge Resistance	$R_{DISCHRG}$	$V_{IN}=5V, V_{OUT}=3.0V$, $V_{CE}=V_{SS}$		60		Ω

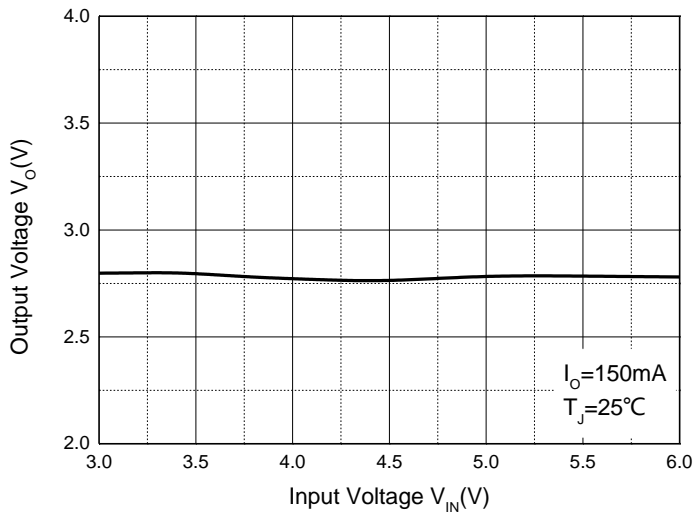
- 1) V_{OUT} : Specified Output Voltage.
- 2) $V_{OUT(E)}$: Effective Output Voltage (i.e. The output voltage when $V_{IN} = (V_{OUT} + 1.0V)$ and maintain a certain I_{OUT} Value).
- 3) V_{dif} : The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

Typical Application

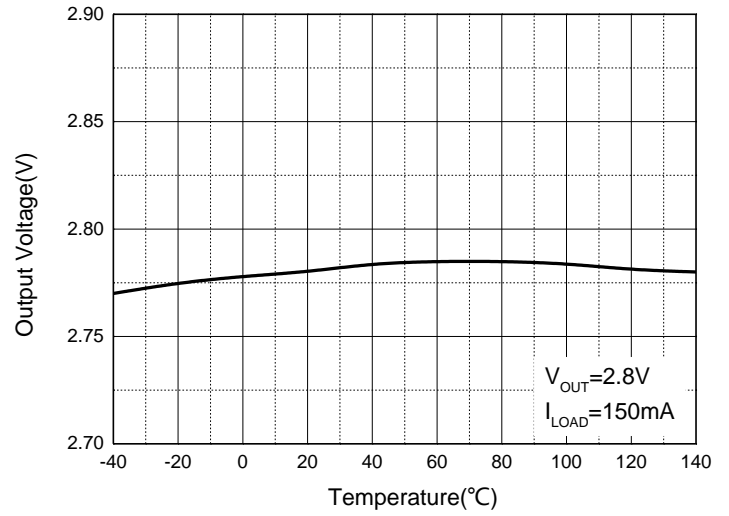


Typical Performance Characteristics

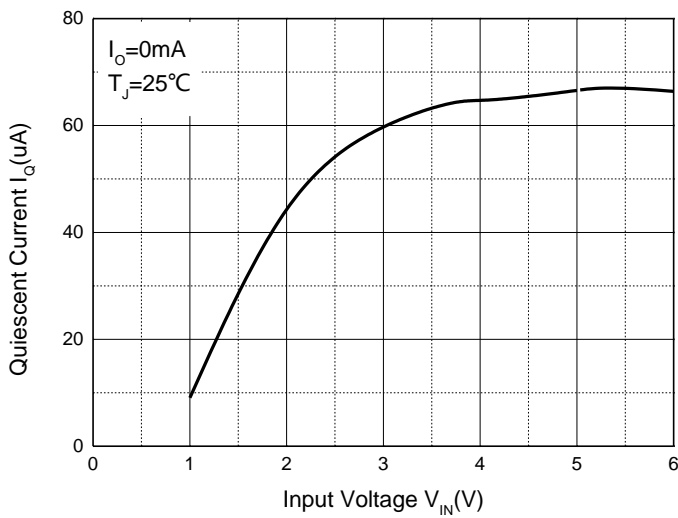
Output Characteristics



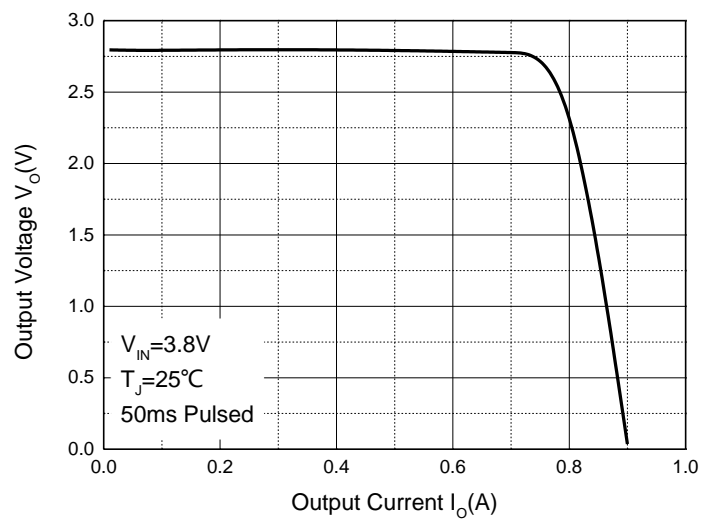
Output Voltage vs. Temperature



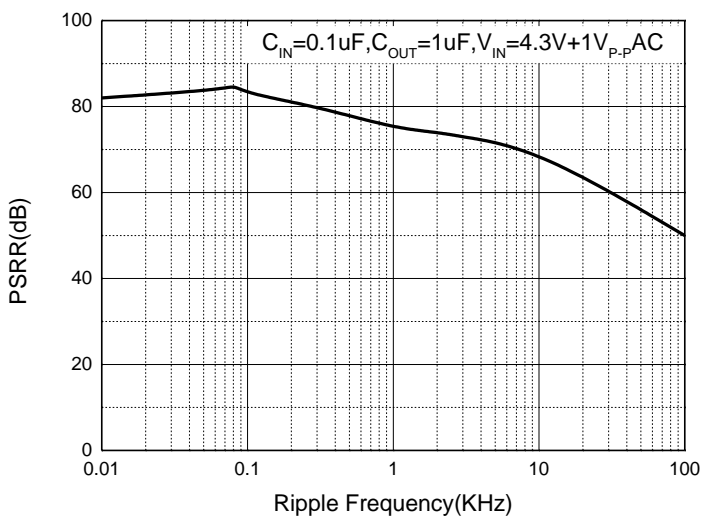
Quiescent Current



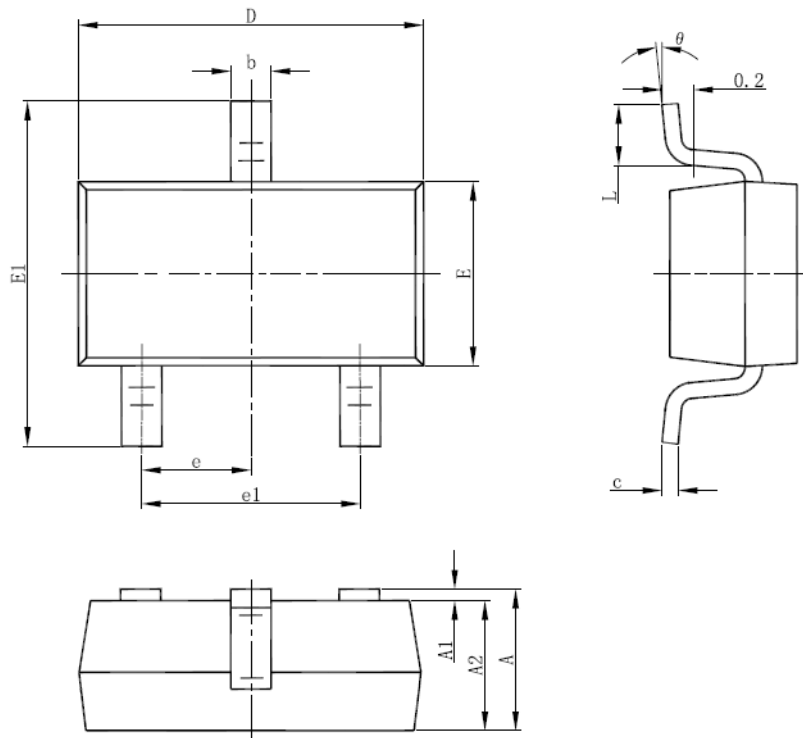
Current Cut-off Grid Voltage



PSRR vs. Frequency

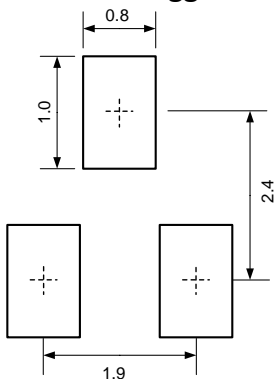


SOT-23-3L Package Outline Dimensions



Symbol	Dimensions in millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

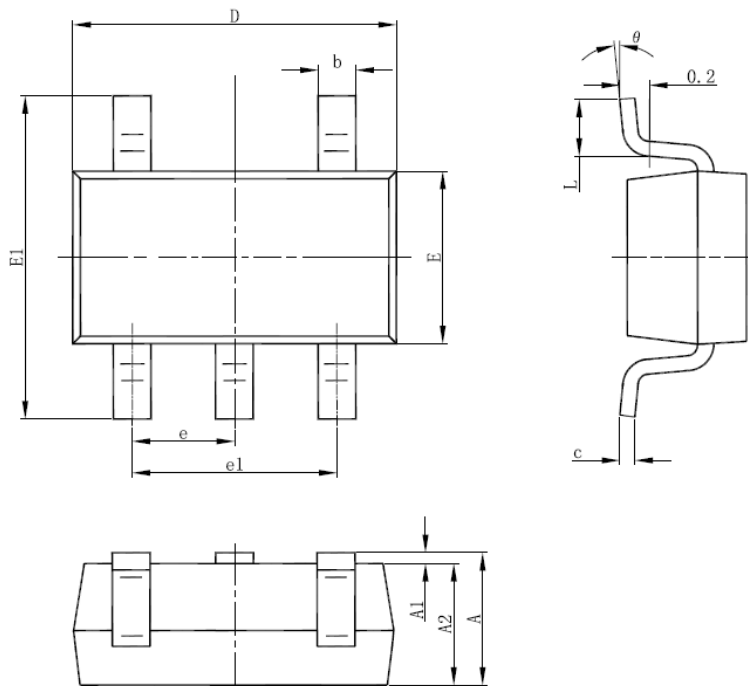
SOT-23-3L Suggested Pad Layout (Unit: mm)



Notes:

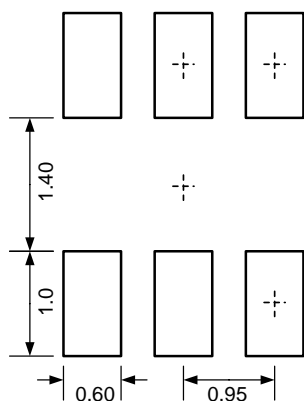
1. General tolerance: $\pm 0.05\text{mm}$.
2. The pad layout is for reference purposes only.

SOT-23-5L Package Outline Dimensions



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

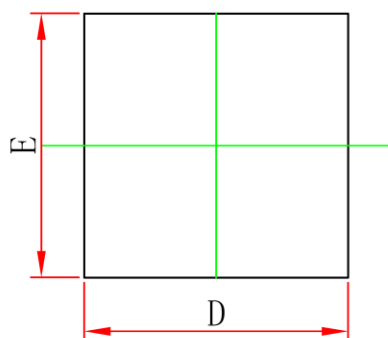
SOT-23-5L Suggested Pad Layout (Unit: mm)



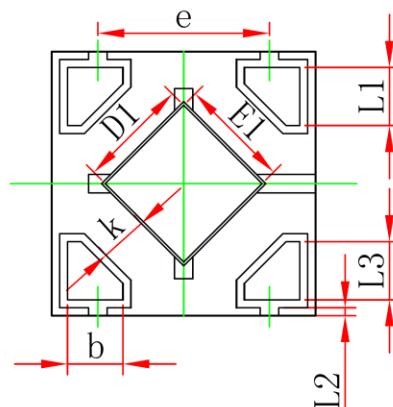
Notes:

1. General tolerance: $\pm 0.05\text{mm}$.
2. The pad layout is for reference purposes only.

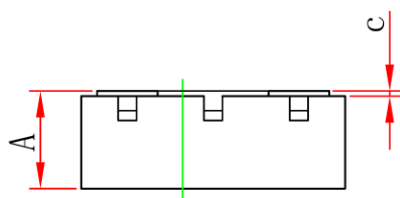
WFBFP-04C Package Outline Dimensions



TOP VIEW
[顶视图]



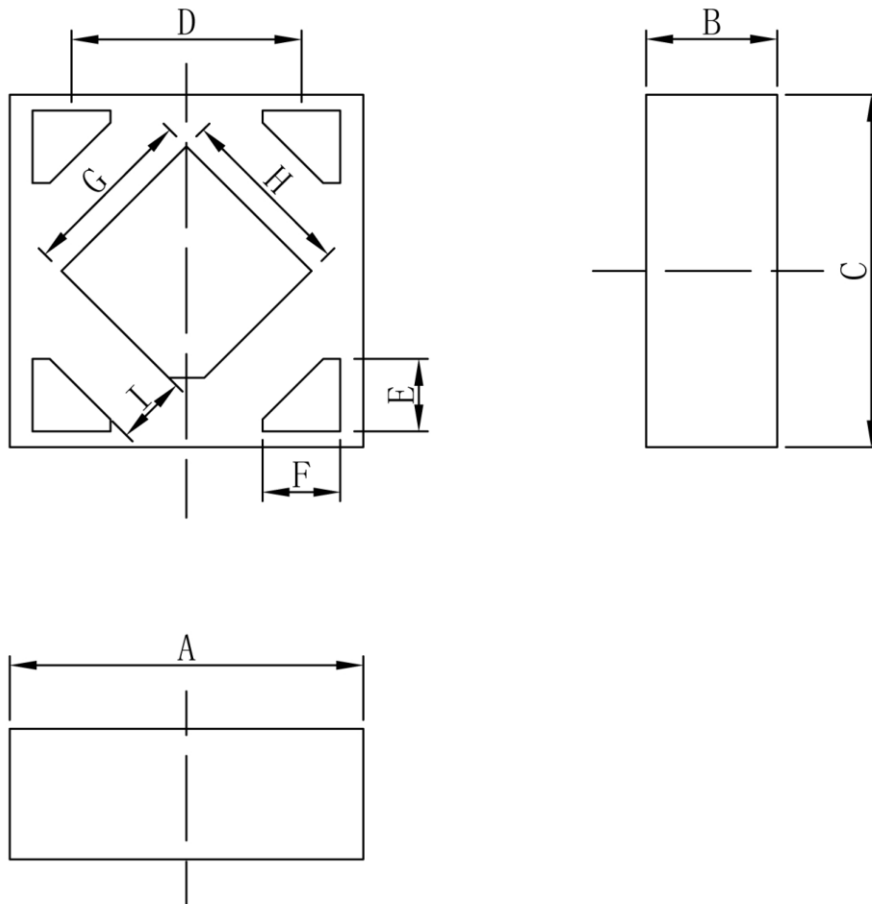
BOTTOM VIEW
[背视图]



SIDE VIEW
[侧视图]

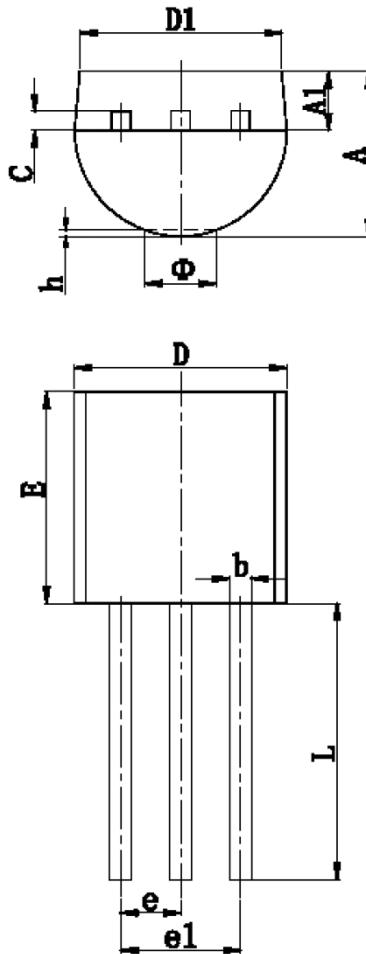
Symbol	Dimensions in millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.335	0.495	0.013	0.016
D	0.950	1.050	0.037	0.041
E	0.950	1.050	0.037	0.041
D1	0.037	0.047	0.015	0.019
E1	0.037	0.047	0.015	0.019
k	0.17MIN		0.007MIN	
b	0.160	0.260	0.006	0.010
c	0.010	0.090	0.000	0.004
e	0.600	0.700	0.024	0.028
L1	0.185	0.255	0.007	0.010
L2	0.030REF		0.001REF	
L3	0.185	0.255	0.007	0.010

DFN1*1-4L Package Outline Dimensions



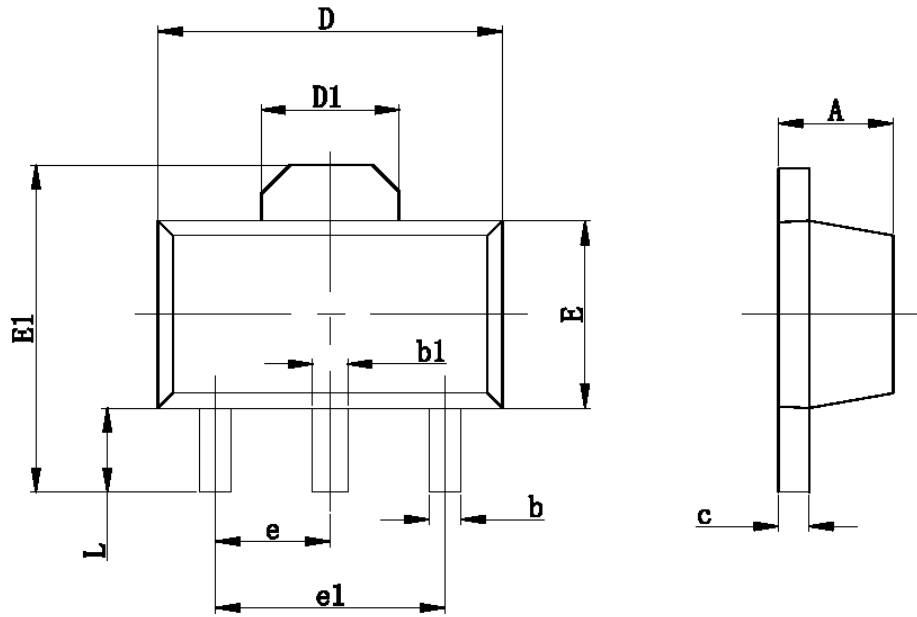
Symbol	Dimensions in millimeters	
	Min.	Max.
A	0.950	1.050
B	0.320	0.420
C	0.950	1.050
D	0.600	0.700
E	0.175	0.275
F	0.170	0.270
G	0.440	0.540
H	0.440	0.540
I	0.140	0.240

TO-92 Package Outline Dimensions



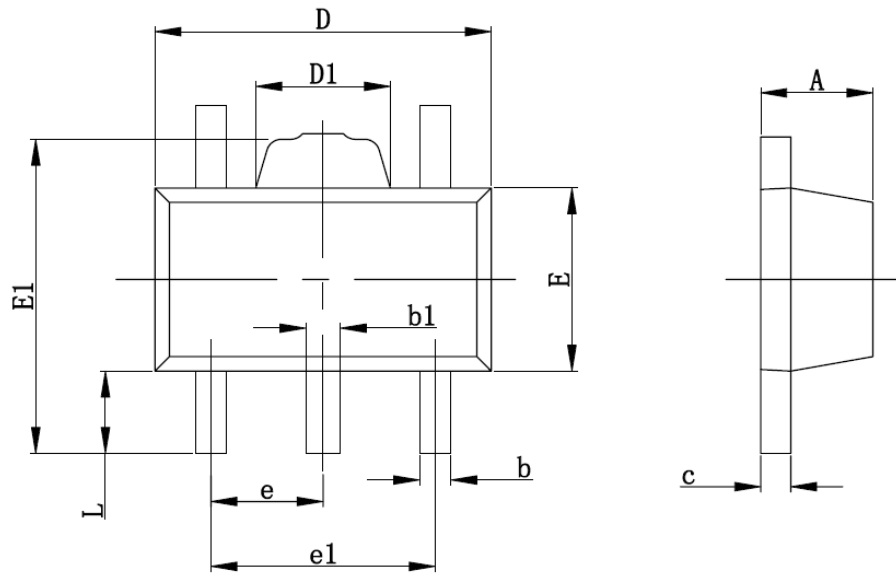
Symbol	Dimensions in millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270TYP		0.050TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
ϕ		1.600		0.063
h	0.000	0.380	0.000	0.015

SOT-89-3L Package Outline Dimensions



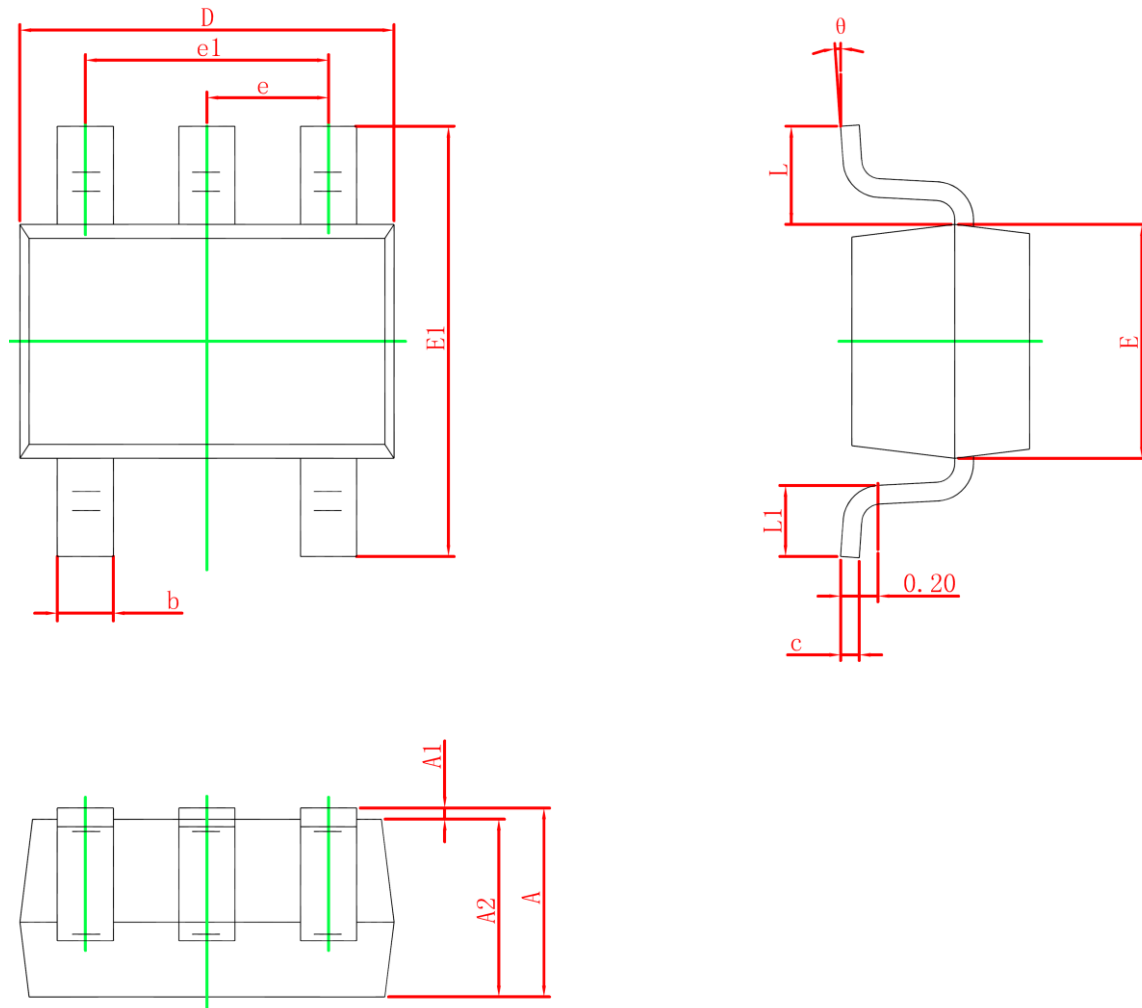
Symbol	Dimensions in millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF		0.061REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047

SOT-89-5L Package 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	0.197
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-353 Package Outline Dimensions



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.110	0.175
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP	
e1	1.200	1.400
L	0.525 REF	
L1	0.260	0.460
θ	0°	8°