



GP
ELECTRONICS

Ultra Low Current Consumption 300mA CMOS Voltage Regulators

GPL6232 Series

Product Summary

The GPL6232 series are a group of positive voltage regulators manufactured by CMOS technologies with ultra-low power consumption and low dropout voltage, which provide large output currents even when the difference of the input-output voltage is small. The GPL6232 series can deliver 300mA output current and allow an input voltage as high as 8V. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

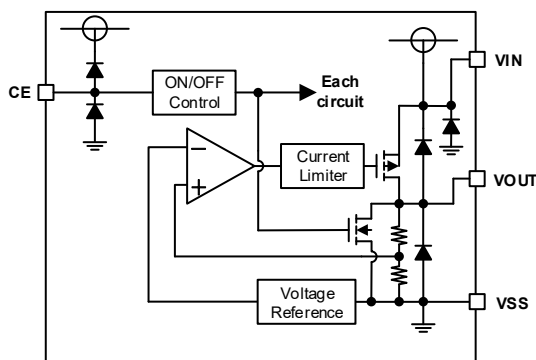
Features

- Low Quiescent Current: 0.8 μ A
- Operating Voltage Range: 1.8V~8V
- Output Current: 300mA
- Low Dropout Voltage:
110mV@100mA(VOUT=3.3V)
- Output Voltage: 1.2~5.0V
- High Accuracy: $\pm 2\%/\pm 1\%$ (Typ.)
- High Power Supply Rejection Ratio: 50dB@1kHz
- Low Output Noise: 27Xvout μ V_{RMS}(10Hz~100kHz)
- Excellent Line and Load Transient Response
- Built-in Current Limiter, Short-Circuit Protection

Applications

- Portable consumer equipments
- Radio control systems
- Laptop, Palmtops and PDAs
- Wireless Communication Equipments
- Portable Audio Video Equipments
- Ultra-low Power Microcontroller

Block Diagram

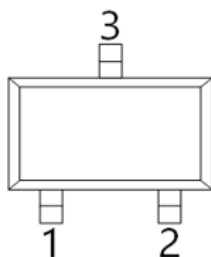
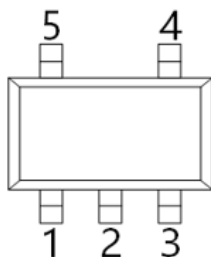
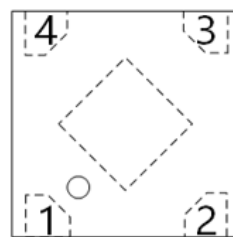
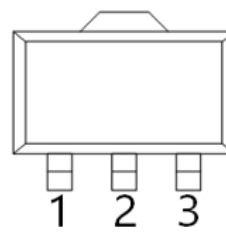


Order Information

GPL6232V①②

Designator	Description
①	Output Voltage e.g. 1.8V=18
②	Package: SOT-23-3L=K3 SOT-23-5L=K5 DFN1X1-4L=H1 SOT-89-3L=KE

Pin Configuration

SOT-23-3L

SOT-23-5L

DFN1X1-4L

SOT-89-3L


SOT-23-3L & SOT-89-3L

Pin Number		Pin Name	Function
SOT-23-3L	SOT-89-3L		
1	1	V _{SS}	Ground
2	3	V _{OUT}	Output
3	2	V _{IN}	Power input

SOT-23-5L

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

DFN1X1-4L

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

Absolute Maximum Ratings¹⁾ (T_A=25°C, unless otherwise noted)

Parameter		Symbol	Ratings	Units
Input Voltage ²⁾		V _{IN}	-0.3~9	V
Output Voltage ²⁾		V _{OUT}	-0.3~V _{IN} +0.3	V
Output Current		I _{OUT}	300	mA
Power Dissipation	SOT-23	P _D	0.4	W
	DFN1X1-4L		0.4	W
	SOT-89		0.6	W
Operating Junction Temperature Range		T _j	-40~125	°C
Storage Temperature		T _{stg}	-40~125	°C
Lead Temperature(Soldering, 10 sec)		T _{solder}	260	°C

- 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.

Recommended Operating Conditions

Parameter	Min.	Nom.	Max.	Units
Supply voltage at V _{IN}	1.8		8	V
Operating junction temperature range, T _j	-40		125	°C
Operating free air temperature range, T _A	-40		85	°C

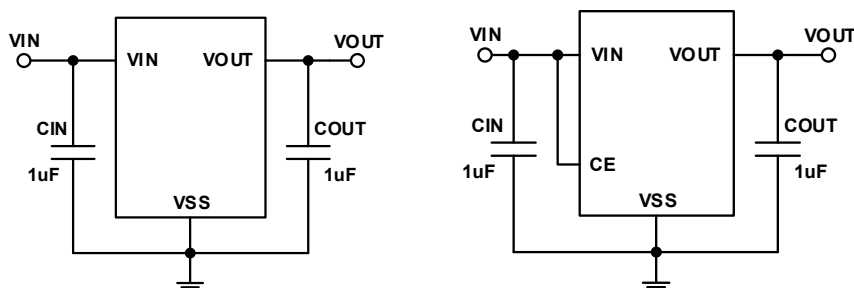
Electrical Characteristics ($V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ. ³⁾	Max.	Units
Input Voltage	V_{IN}		1.8	—	8	V
Output Voltage Range	V_{OUT}		1.2	—	5	V
DC Output Accuracy		$I_{OUT}=1mA$	-2	—	2	%
			-1	—	1	%
Dropout Voltage	$V_{dif}^{4)}$	$I_{OUT}=100mA, V_{OUT}=3.3V$	—	110	—	mV
Supply Current	I_{SS}	$I_{OUT}=0$	$1.2V \leq V_{OUT} \leq 3.3V$	—	0.8	μA
			$3.3V < V_{OUT} \leq 5.0V$	—	1.0	μA
Standby Current	I_{STBY}	$CE=V_{SS}$	—	—	0.1	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	$I_{OUT}=10mA$ $V_{OUT}+1V \leq V_{IN} \leq 8V$	—	0.05	0.3	%/V
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$, $1mA \leq I_{OUT} \leq 100mA$	—	10	—	mV
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$	$I_{OUT}=10mA$, - $40^\circ C < T_A < 125^\circ C$	—	100	—	ppm
Output Current Limit	I_{LIM}	$V_{OUT}=0.5 \times V_{OUT(Normal)}$, $V_{IN}=5V$	550	700	850	mA
Short Current	I_{SHORT}	$V_{OUT}=V_{SS}$	—	20	—	mA
Power Supply Rejection Ratio	PSRR	$I_{OUT}=50mA$	100Hz	—	70	dB
			1kHz	—	50	
			10kHz	—	40	
			100kHz	—	35	
Output Noise Voltage	V_{ON}	$BW=10Hz$ to $100kHz$	—	$27 \times V_{OUT}$	—	μV_{RMS}
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	$R_{DISCHRG}$	$V_{IN}=5V, V_{OUT}=3.0V$, $V_{CE}=V_{SS}$	—	200	—	Ω

3) Typical numbers are at $25^\circ C$ and represent the most likely norm.

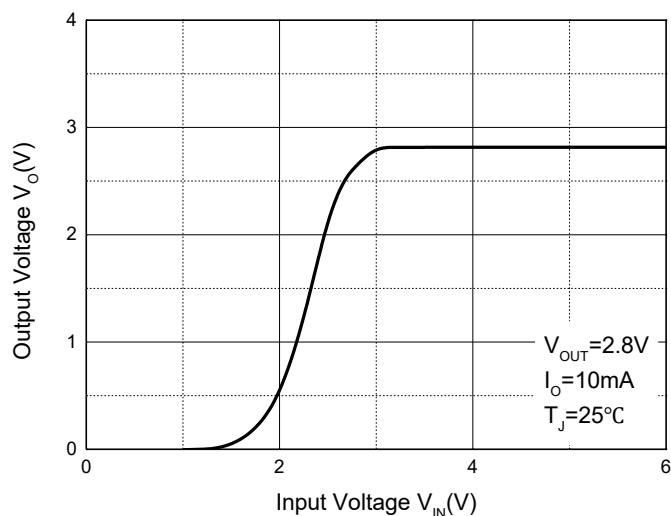
4) V_{dif} : The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

Typical Application

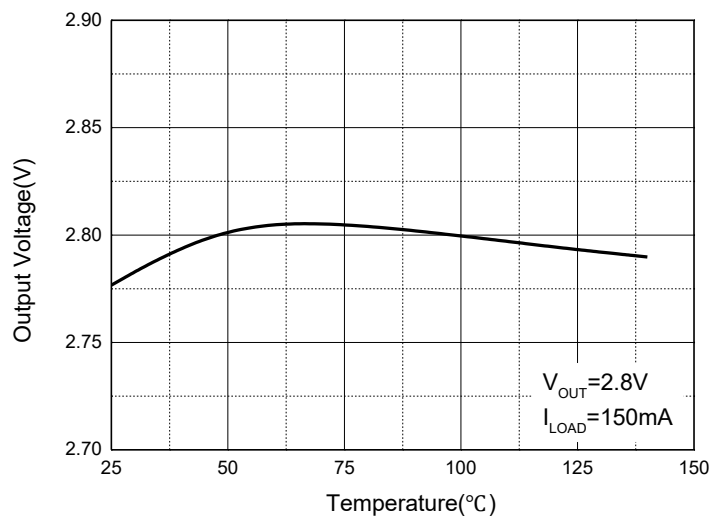


Typical Performance Characteristics

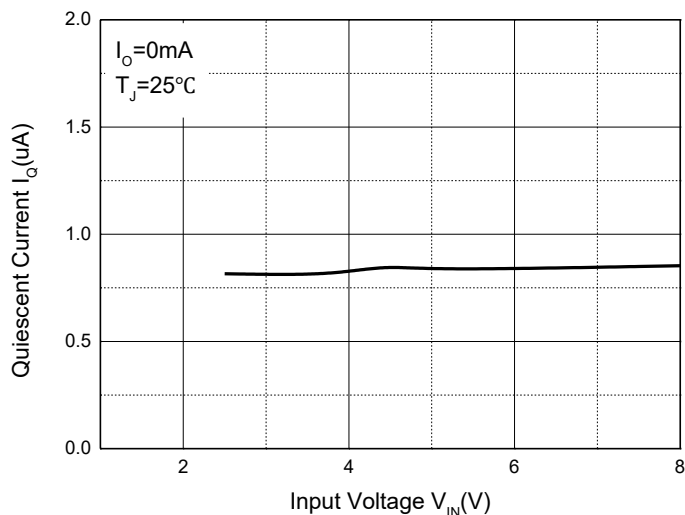
Output Characteristics



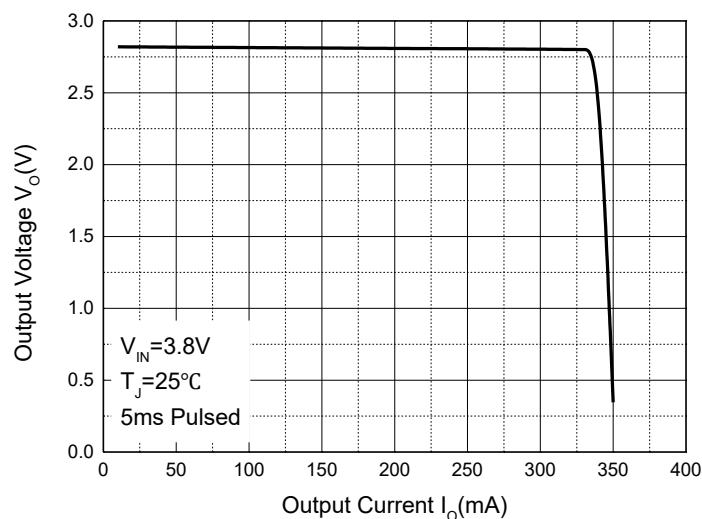
Output Voltage vs. Temperature



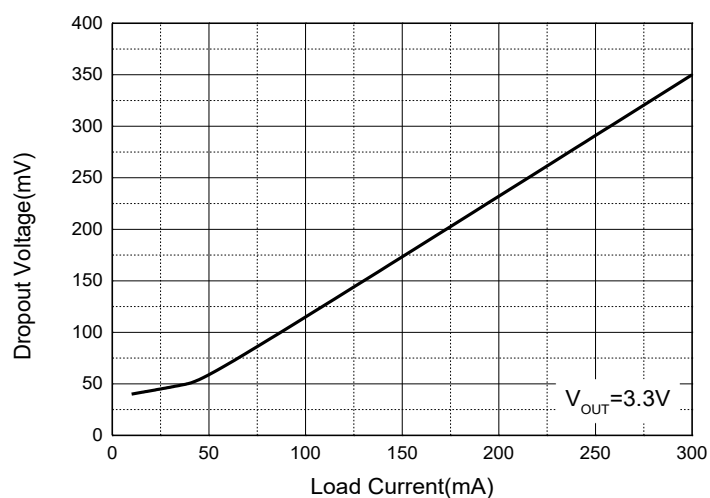
Quiescent Current



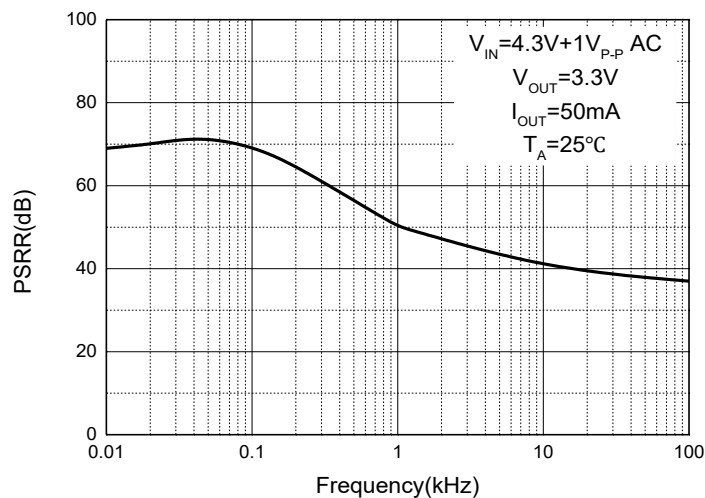
Current Cut-off Grid Voltage

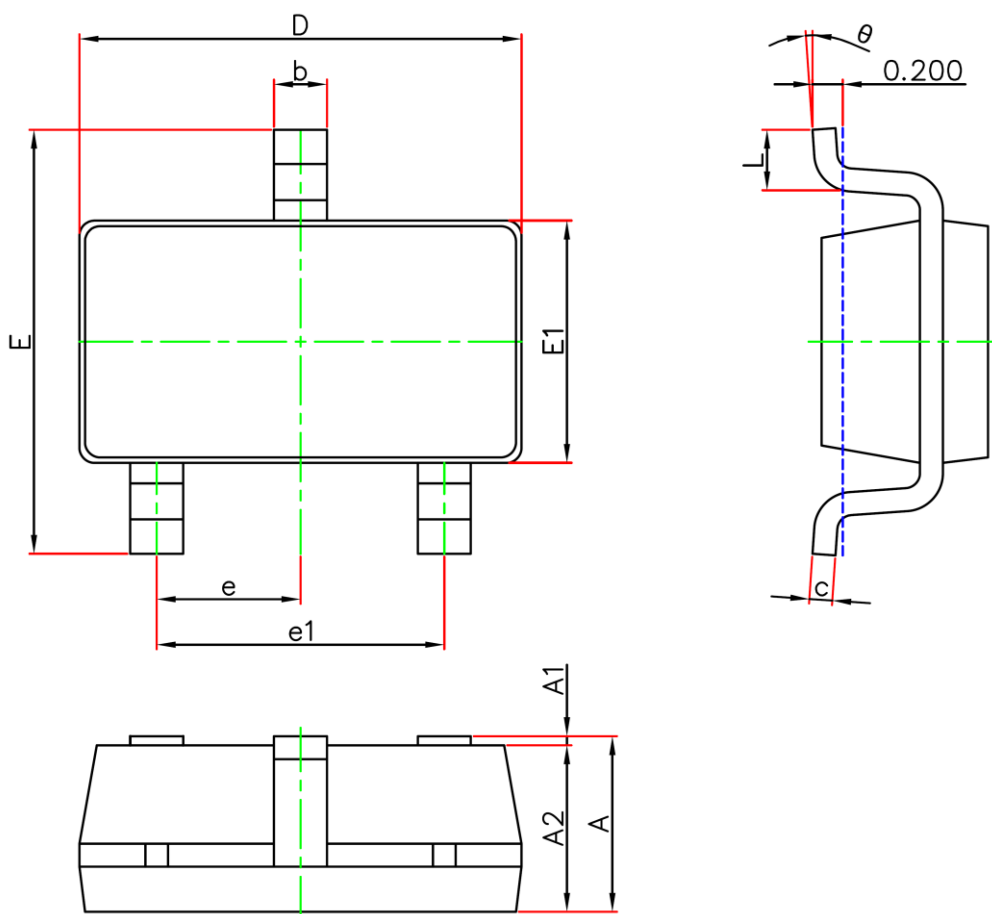


Dropout Voltage vs. Load Current

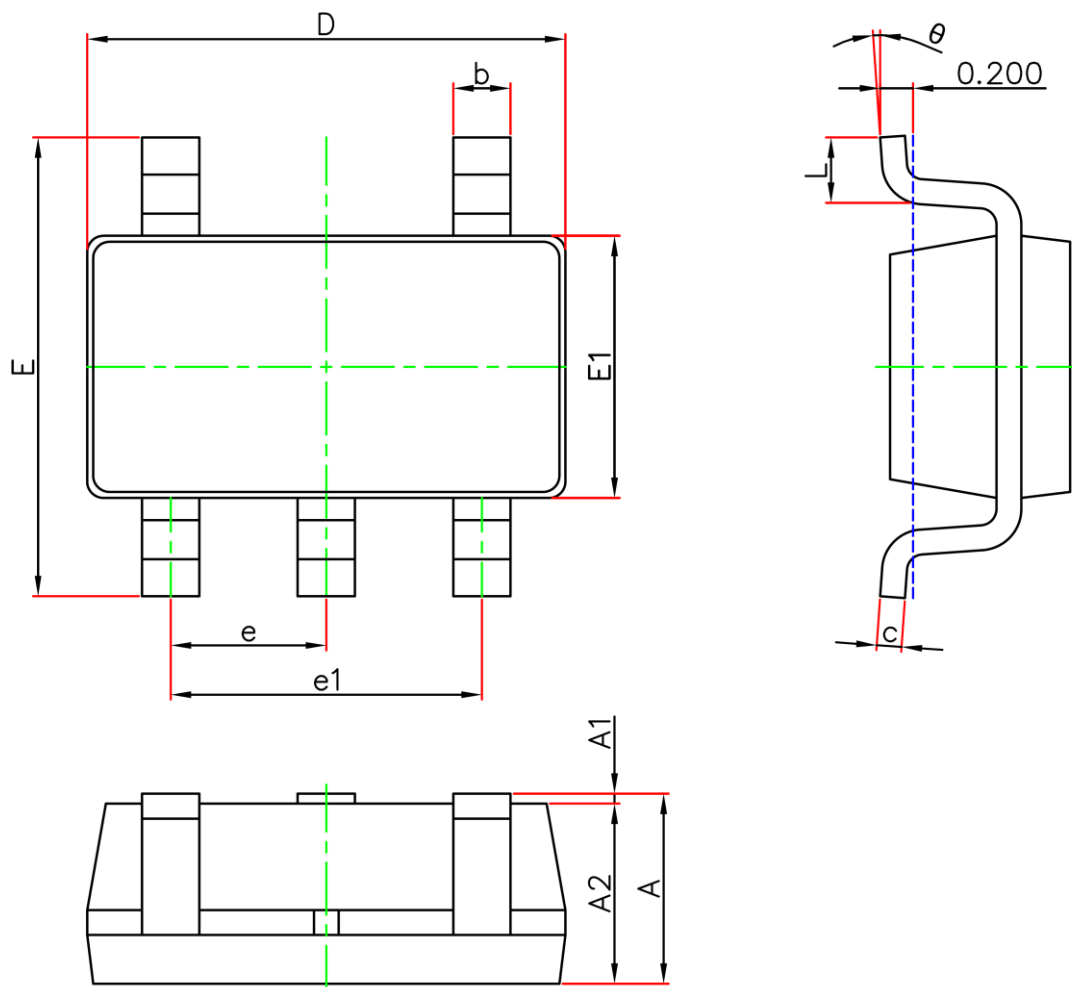


PSRR vs. Frequency

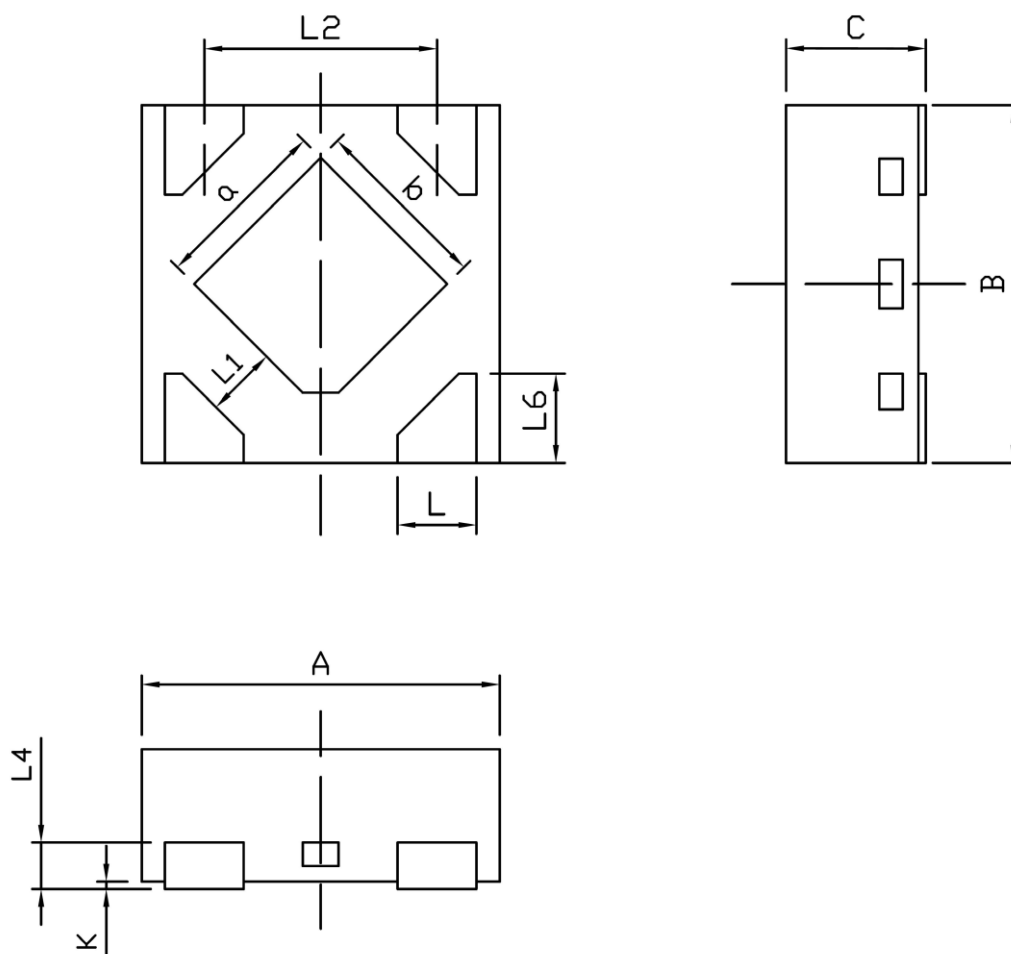


SOT-23-3L Package Outline Dimensions


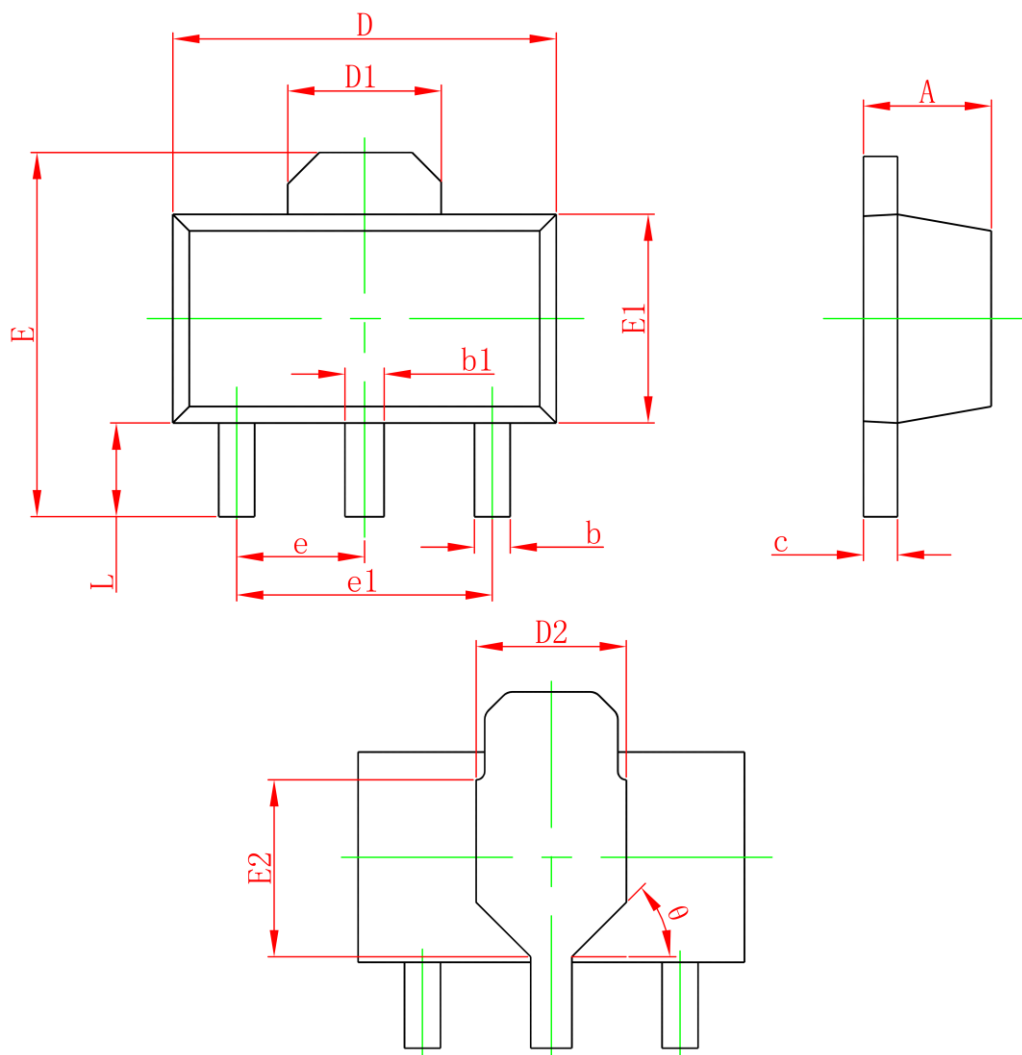
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.450	0.035	0.057
A1	0	0.150	0	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.600	3.000	0.102	0.118
E1	1.500	1.700	0.059	0.067
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-5L Package Outline Dimensions


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0	0.150	0.000	0.006
A2	1.050	1.250	0.041	0.049
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	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

DFN1X1-4L Package Outline Dimensions


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.950	1.050	0.037	0.041
B	0.950	1.050	0.037	0.041
C	0.340	0.400	0.013	0.016
L	0.150	0.270	0.006	0.011
L1	0.150MIN		0.006MIN	
L2	0.650BSC		0.026BSC	
L4	0.127REF		0.005REF	
L6	0.200	0.300	0.008	0.012
K	0.000	0.050	0.000	0.002
a	0.380	0.580	0.015	0.023
b	0.380	0.580	0.015	0.023

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	0.020
b1	0.380	0.580	0.015	0.023
c	0.350	0.500	0.014	0.020
D	4.400	4.600	0.173	0.181
D1	1.650REF		0.065REF	
D2	1.650	1.850	0.065	0.073
E	3.900	4.400	0.154	0.173
E1	2.300	2.600	0.091	0.102
E2	1.900REF		0.075REF	
e	1.500TYP		0.059TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047
θ	45°		45°	

Attention:

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customers are solely responsible for providing adequate safe measures when design their systems.
- GreenPower Electronics products belong to consumer electronics or other civilian electronic products.