



**GP**  
**ELECTRONICS**

**Ultra Low Current Consumption 200mA CMOS Voltage Regulators**

## GPL6103 Series

### Product Summary

The GPL6103 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 GPL6103 series can deliver 200mA output current and allow an input voltage as high as 6.5V. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

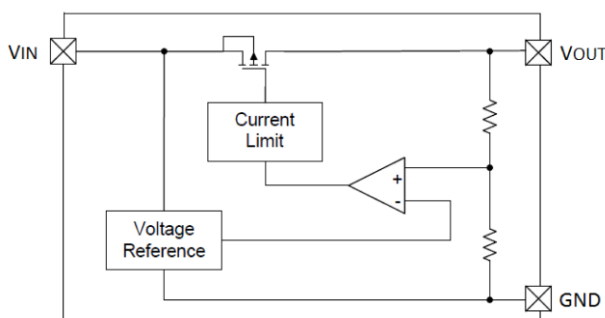
### Features

- Low Quiescent Current: 1.0 $\mu$ A
- Operating Voltage Range: 1.2V~6V
- Output Current: 200mA
- Low Dropout Voltage:  
200mV@100mA(VOUT=3.3V)
- Output Voltage: 1.2~3.6V
- High Accuracy:  $\pm 2\%/\pm 1\%$ (Typ.)
- Low Output Noise: 27Xvout  $\mu$ V<sub>RMS</sub>(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



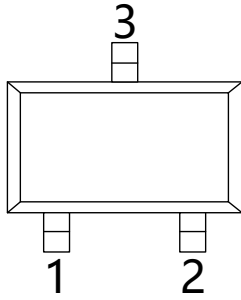
### Order Information

GPL6103V①②

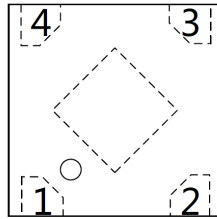
Designator	Description
①	Output Voltage e.g. 1.8V=18
②	Package: SOT-23-3L=K3 DFN1*1-4=H1 SOT-89-3L=KE

## Pin Configuration

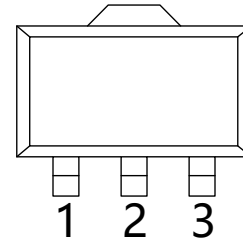
SOT-23&SOT-23-3L



DFN1\*1-4L



SOT-89-3



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

Pin Number		Pin Name	Function
SOT-23/-3L	SOT-89-3L		
1	1	V <sub>SS</sub>	Ground
2	3	V <sub>OUT</sub>	Output
3	2	V <sub>IN</sub>	Power input

DFN1\*1-4L

Pin Number	Pin Number	Function
1	V <sub>OUT</sub>	Output Pin
2	V <sub>SS</sub>	Ground
3	NC	No Connection
4	V <sub>IN</sub>	Power Input Pin

## Absolute Maximum Ratings<sup>1)</sup> (T<sub>a</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Ratings	Units
Input Voltage <sup>2)</sup>	V <sub>IN</sub>	-0.3~7	V
Output Voltage <sup>2)</sup>	V <sub>OUT</sub>	-0.3~V <sub>IN</sub> +0.3	V
Output Current	I <sub>OUT</sub>	500 <sup>3)</sup>	mA
Power Dissipation	SOT-23	150	mW
	SOT-23-3L	300	
	SOT-89	500	
ESD rating	Human Body Model	4000	V
	Machine Model	400	V
Operating Junction Temperature Range	T <sub>j</sub>	-25~85	°C
Storage Temperature	T <sub>stg</sub>	-40~125	°C
Lead Temperature(Soldering, 10 sec)	T <sub>solder</sub>	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.
- 3)  $I_{OUT} \leq P_D / (V_{IN} - V_{OUT})$

## Recommended Operating Conditions

Parameter	Min.	Nom.	Max.	Units
Supply voltage at V <sub>IN</sub>	-0.3		7	V
Operating junction temperature range, T <sub>j</sub>	-40		125	°C
Operating free air temperature range, T <sub>A</sub>	-40		85	°C

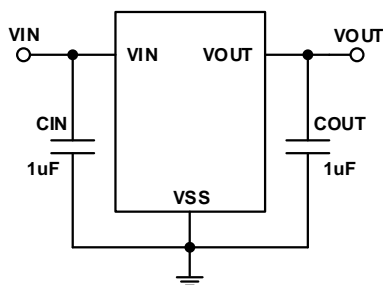
**Electrical Characteristics ( $V_{IN} = V_{OUT} + 1V$ ,  $C_{IN} = C_{OUT} = 1\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise specified)**

Parameter	Symbol	Conditions	Min.	Typ. <sup>4)</sup>	Max.	Units
Input Voltage	$V_{IN}$		-0.3	—	7	V
Output Voltage Range	$V_{OUT}$		1.2	—	3.6	V
DC Output Accuracy		$I_{OUT} = 1mA$	-2	—	2	%
			-1	—	1	%
Dropout Voltage	$V_{dif}^{5)}$	$I_{OUT} = 30mA$	—	60	—	mV
		$I_{OUT} = 100mA$	—	200	—	
Supply Current	$I_{SS}$	$I_{OUT} = 0$	—	1	—	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	$I_{OUT} = 30mA$ $4.3V \leq V_{IN} \leq 7V$	—	0.05	—	%/V
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = 4.3V, 1mA \leq I_{OUT} \leq 100mA$	—	20	—	mV
		$V_{IN} = 4.3V, 1mA \leq I_{OUT} \leq 200mA$	—	40	—	
Output Current Limit	$I_{LIM}$	$V_{IN} = 4.3V$	—	300	—	mA
Short Current	$I_{SHORT}$	$V_{IN} = 4.3V$	—	50	—	mA

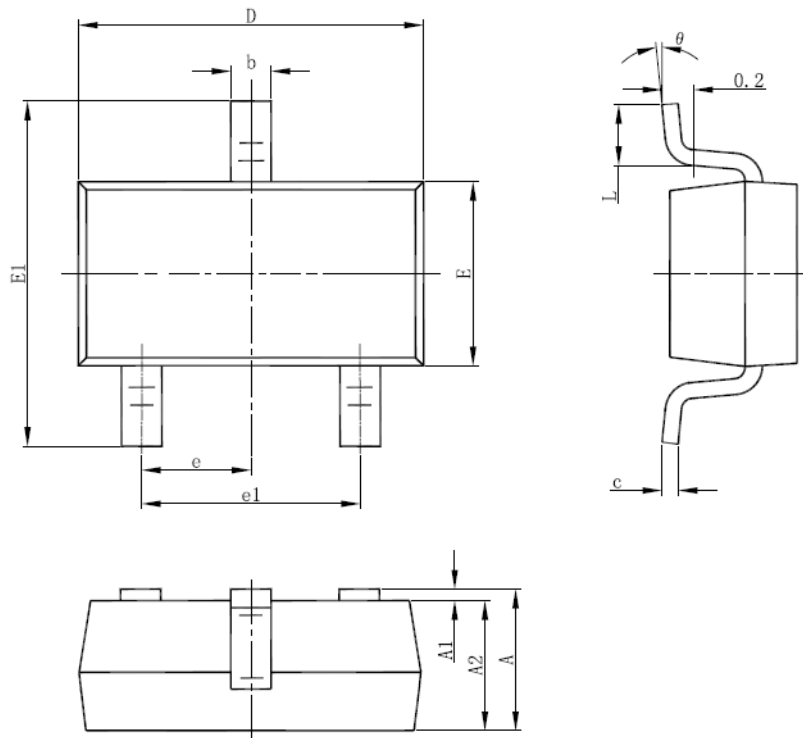
4) Typical numbers are at 25°C and represent the most likely norm.

5)  $V_{dif}$ : 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

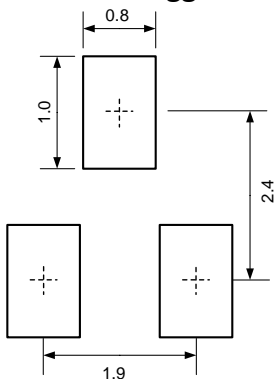


## SOT-23-3L Package Outline Dimensions



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
$\theta$	0°	8°

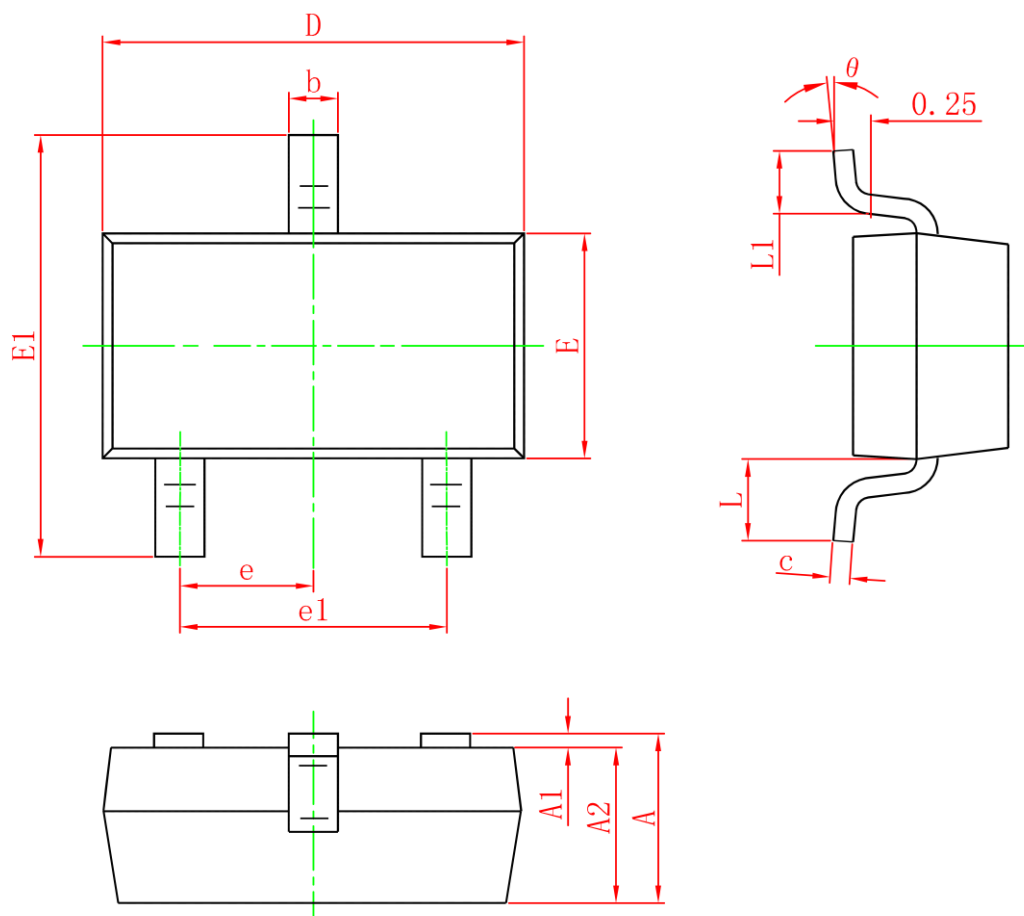
### SOT-23-3L Suggested Pad Layout (Unit: mm)



#### Notes:

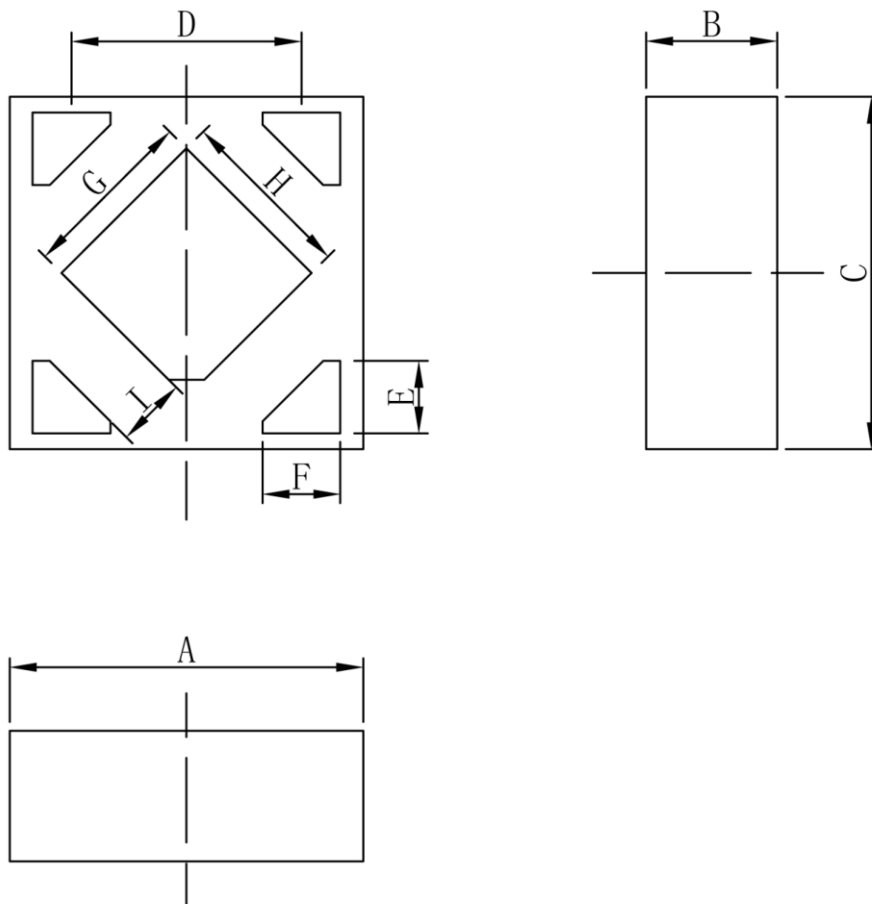
1. General tolerance:  $\pm 0.05\text{mm}$ .
2. The pad layout is for reference purposes only.

## SOT-23 Package Outline Dimensions



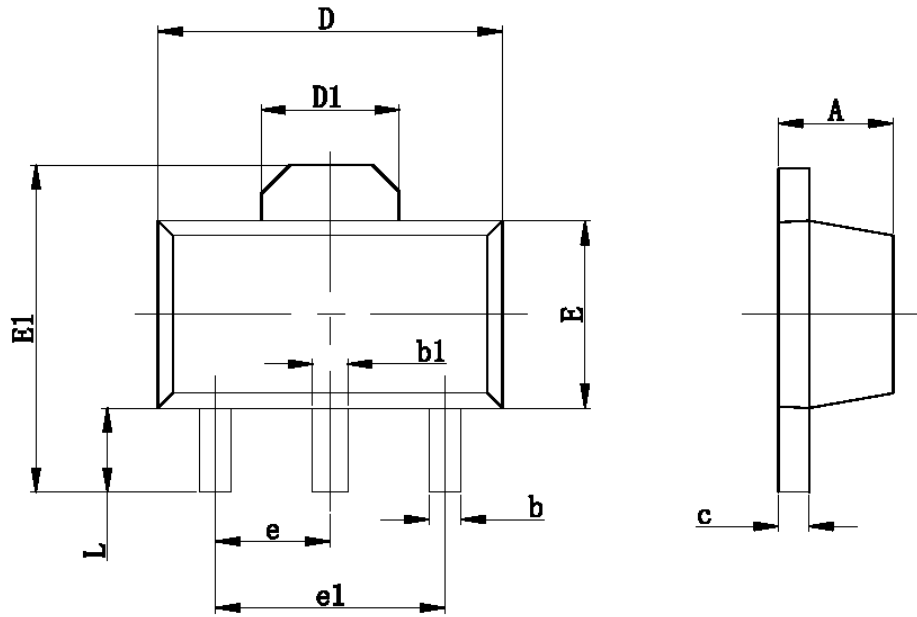
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0	0.100	0	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.150	1.500	0.045	0.059
E1	2.250	2.650	0.089	0.104
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°

## 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

## 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