# 250mA，Low Power Consumption LDO BL9103 Series

## ■ General Description

The BL9103 series are a group of positive voltage output, three–pin regulator, that provide a high current even when the input/output Voltage differerntial is small. Low power consumption and high accuracy is achieved through CMOS technology. They allow input voltages as high as 18V.

## ■ Features

- Ultra low quienscent current: 3.0uA(typ)
- High input voltage (up to 18v)
- Low dropout voltage :80mV@Iout=40mA （Vout=3.3v）
- Output voltage accuracy： ±2％
- Maximum output current：250mA （within max.power dissipation,Vout=3.3V）
- Low temperature coefficient
- Package：SOT23-3、TO-92、SOT89-3

## ■ Typical Application

- Cameras, video recorders
- Voltage regulator for microprocessor
- Voltage regulator for LAN cards
- Wireless communication equipment
- Audio/Video equipment

## ■ Selection Guide

**BL9103-*XX X X X***

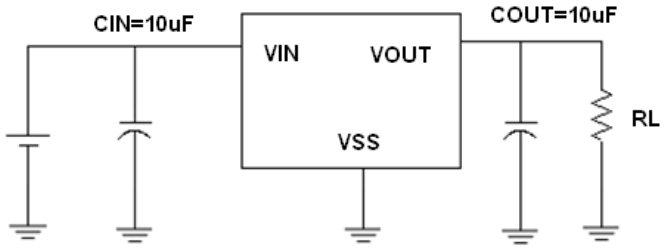
Packages：
RM：SOT-23-3
SM：SOT-89-3
T：TO-92

Output accucy：
Default，±2％
1： ±1％
（customized）

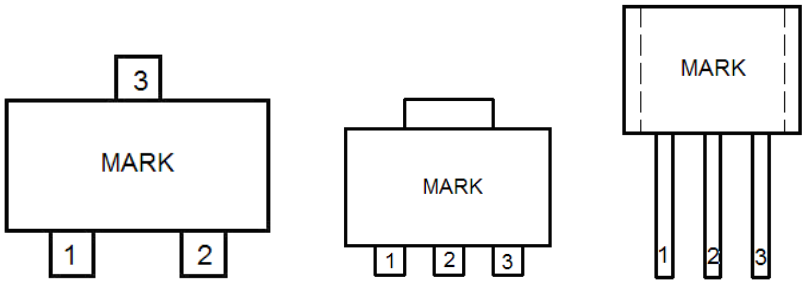
Temperature range：
P：Standard
（Default、lead free）
C：Standard
（customized）

Output Voltage：
33……3.3V
40……4.0V
45……4.5V
50……5.0V

## ■ Typical Application Circuit



## ■ Pin Configuration




SOT23-3 SOT89-3 TO-92

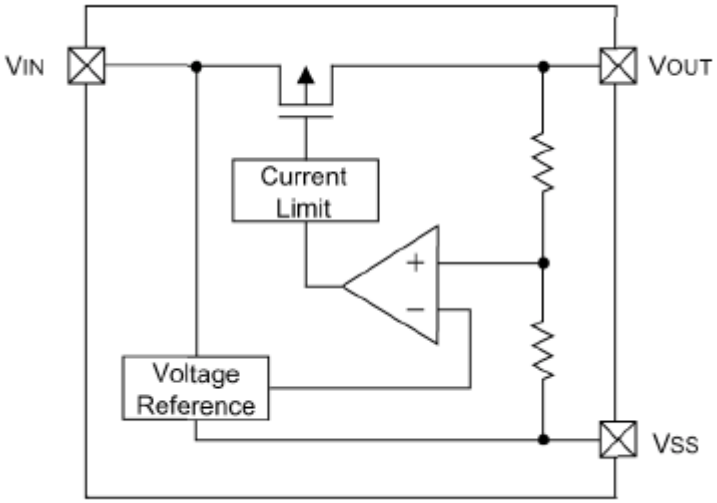
## ■ Pin Description

| Pin Number | | Pin Name | Functions |
|---|---|---|---|
| SOT89-3/TO-92 | SOT23-3 | | |
| 1 | 1 | $V_{SS}$ | Ground |
| 2 | 3 | $V_{IN}$ | Input |
| 3 | 2 | $V_{OUT}$ | Output |

## ■ Absolute Maximum Ratings

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | 18 | V |
| Output Voltage | | $V_{OUT}$ | Vss-0.3～$V_{IN}$ +0.3 | V |
| Output Current | | Iout | 500 | mA |
| Operating Temperature Range | | $T_{OPR}$ | -40～＋85 | ℃ |
| Storage Temperature Range | | $T_{STG}$ | －40～＋125 | ℃ |
| Power Dissipation | SOT89-3 | $P_D$ | 500 | mW |
| | TO-92 | | 500 | |
| | SOT23-3 | | 300 | |

## ■ Block Diagram




## ■ Electrical Characteristics

**BL9103-33**

($V_{IN}$= $V_{OUT}$+1.0V，$C_{IN}$=$C_L$=10uF，Ta=25$^{O}$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=40mA, $V_{IN}$=Vout+1V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Input Voltage | $V_{IN}$ | | | | 18 | V |
| Maximum Output Voltage | $I_{OUT}$ _max | $V_{IN}$=Vout+1V | 250 | | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$=Vout+1V, 1mA≤$I_{OUT}$≤60mA | | 15 | 40 | mV |
| Dropout Voltage (Note 3) | $V_{dif}$ | $I_{OUT}$ =40mA | | 80 | | mV |
| Supply Current | $I_{SS}$ | $V_{IN}$=Vout+1V | | 3 | 4 | μ A |
| Line Regulations | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | $I_{OUT}$ =40mA Vout+1V ≤$V_{IN}$≤18V | | 0.1 | 0.2 | %/V |
| △VOUT/△Ta | Temperature Coefficient | $V_{IN}$=Vout+1V, $I_{OUT}$ =40mA -40℃<Ta<85℃ | | ±0.7 | | mV/℃ |

**BL9103-40**

($V_{IN}$= $V_{OUT}$+1.0V，$C_{IN}$=$C_L$=10uF，Ta=25°C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=40mA, $V_{IN}$=Vout+1V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Input Voltage | $V_{IN}$ | | | | 18 | V |
| Maximum Output Voltage | $I_{OUT}$ _max | $V_{IN}$=Vout+1V | 250 | | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$=Vout+1V, 1mA≤$I_{OUT}$≤60mA | | 15 | 40 | mV |
| Dropout Voltage (Note 3) | $V_{dif}$ | $I_{OUT}$ =40mA | | 70 | | mV |
| Supply Current | $I_{SS}$ | $V_{IN}$=Vout+1V | | 3 | 4 | μ A |
| Line Regulations | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | $I_{OUT}$ =40mA Vout+1V ≤$V_{IN}$≤18V | | 0.1 | 0.2 | %/V |
| △VOUT/△Ta | Temperature Coefficient | $V_{IN}$=Vout+1V, $I_{OUT}$ =40mA -40℃<Ta<85℃ | | ±0.7 | | mV/℃ |

Note ：

1. $V_{OUT}$ (T) ： Specified Output Voltage

2.$V_{OUT}$ (E) ：Effective Output Voltage ( ie. The output voltage when “$V_{OUT}$ (T)+1.0V”is provided at the Vin pin while maintaining a certain Iout value.)

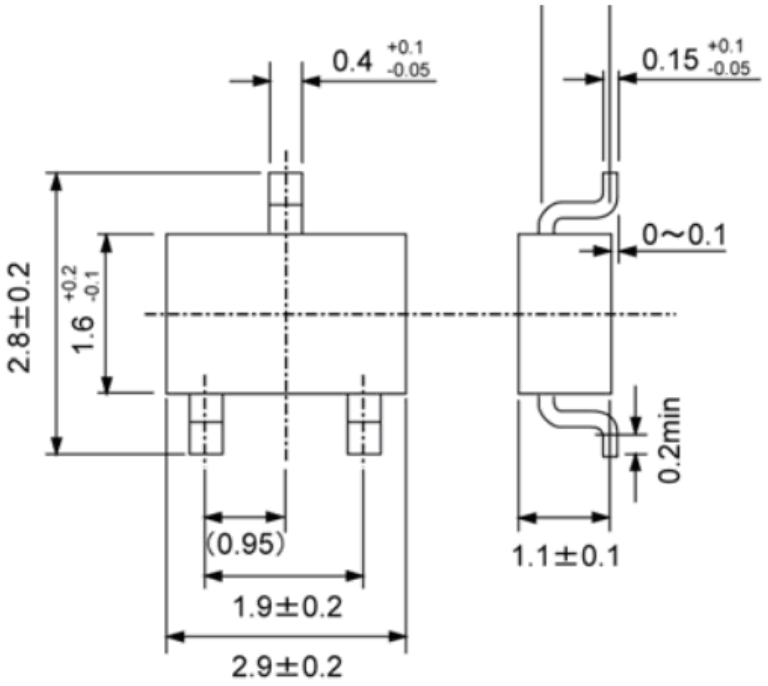
3.$V_{DIF}$： $V_{IN1}$ –$V_{OUT}$ (E)’

$V_{IN1}$ ： The input voltage when $V_{OUT}$(E)’ appears as input voltage is gradually decreased.

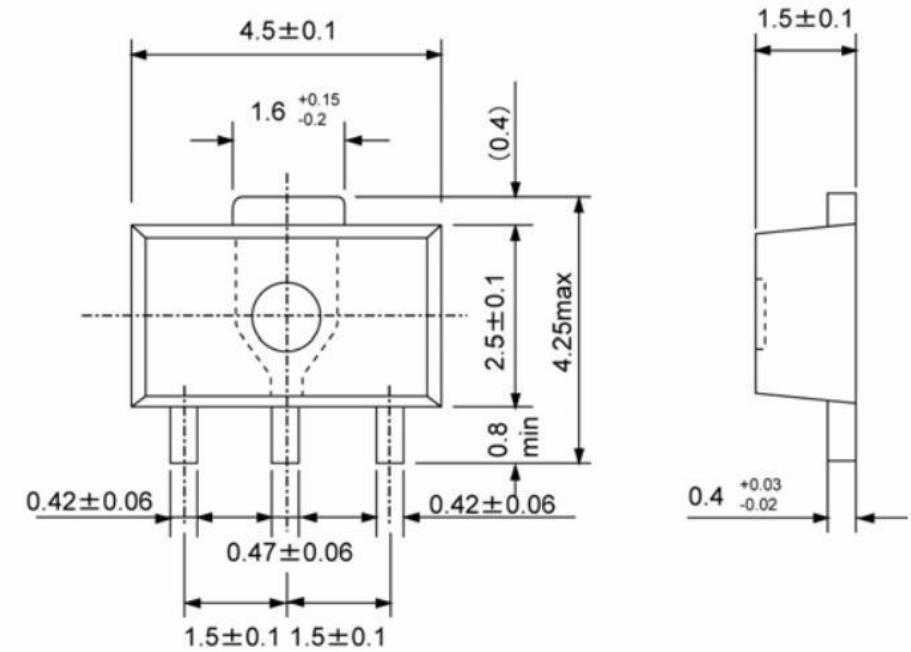
$V_{OUT}$ (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout and {$V_{OUT}$ (T)+1.0V} is input.

## ■ Packaging Information

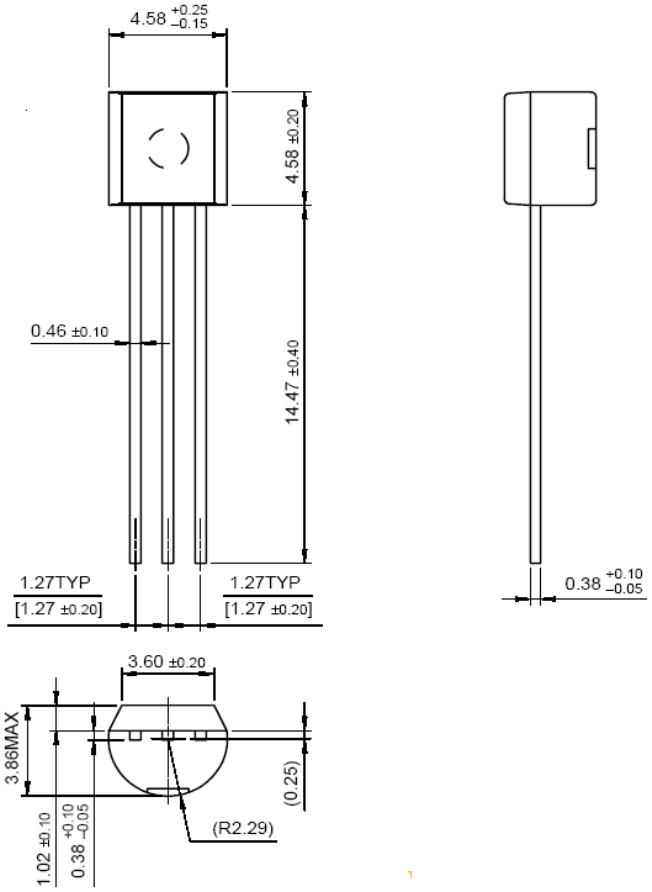
● SOT23-3




● SOT89-3



- TO-92


4.58 +0.25 −0.15
4.58 ±0.20
0.46 ±0.10
14.47 ±0.40
1.27TYP
[1.27 ±0.20]
1.27TYP
[1.27 ±0.20]
0.38 +0.10 −0.05
3.60 ±0.20
3.86MAX
(0.25)
(R2.29)
1.02 ±0.10
0.38 +0.10 −0.05