

## SOT-89-3L SOT-223 Three Terminal Regulator 三端稳压 IC

### ■Features 特点

FS1117 内置热保护和电流限制保护功能，当结温超过 125℃或者负载电流大于 1.2A 时，过热保护和电流限制模块能够保证芯片和应用系统安全工作。通过电流限制保护 + 过热保护，提供了有效的短路和过载保护能力。

**Low Dropout Voltage 低落差电压**

1.Vss/Adj 2.Vo 3.Vi

### ■Application 应用

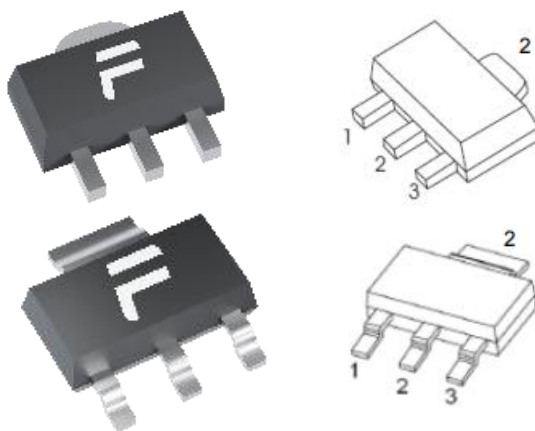
PC Motherboard 主板

LCD Monitor 液晶屏

Graphic Card 显卡

Modem 调制解调器

Printer 打印机



### ■Absolute Maximum Ratings 最大额定值

(TA=25℃ unless otherwise noted 如无特殊说明，温度为 25℃)

| Characteristic 特性参数                         | Symbol 符号       | Rat 额定值    | Unit 单位 |
|---------------------------------------------|-----------------|------------|---------|
| Input Voltage 输入电压                          | $V_i$           | 15         | V       |
| Operating Current 工作电流                      | $I_o$           | 1000       | mA      |
| Thermal Resistance Junction-Ambient 热阻      | $R_{\theta JA}$ | 250        | ℃/W     |
| Solder Temperature 焊接温度                     | $T_d$           | 260        | ℃       |
| Solder Time 焊接时间                            | $T_d$           | 10         | S       |
| Operating Ambient Temperature 工作温度          | $T_A$           | +85        | ℃       |
| Junction and Storage Temperature<br>结温和储藏温度 | $T_J, T_{stg}$  | -40to+125℃ |         |

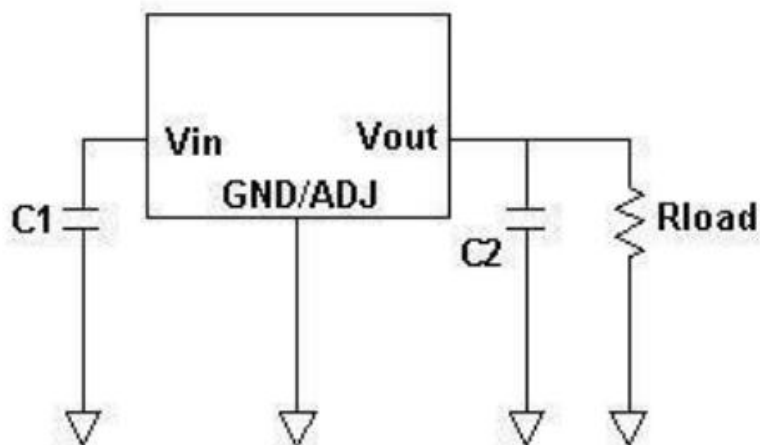
**■Electrical Characteristics 电特性**

 ( $V_{IN} \leq 10V$   $T_J = 25^\circ C$  unless otherwise noted 如无特殊说明)

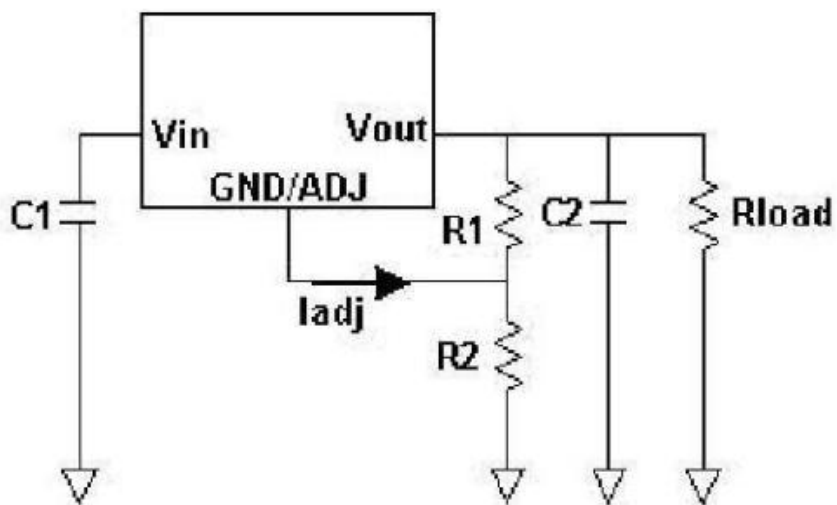
| Characteristic<br>特性参数          | Symbol<br>符号     | Part No.<br>料号 | Test Condition<br>测试条件                                 | Min<br>最小值 | Type<br>典型值 | Max<br>最大值 | Unit<br>单位 |
|---------------------------------|------------------|----------------|--------------------------------------------------------|------------|-------------|------------|------------|
| Reference Voltage<br>基准电压       | $V_{RO}$         | 1117-Adj       | $I_O = 10mA$ $V_I - V_O = 2V$                          | 1.231      | 1.250       | 1.269      | V          |
|                                 |                  |                | $10mA \leq I_O \leq 1A$ $1.4V \leq V_I - V_O \leq 12V$ | 1.225      | 1.250       | 1.275      |            |
| Output Voltage<br>输出电压          | $V_O$            | 1117-1.8       | $I_O = 10mA$ $V_I = 3.8V$                              | 1.773      | 1.8         | 1.827      | V          |
|                                 |                  |                | $10mA \leq I_O \leq 1A$ $3.2V \leq V_I \leq 12V$       | 1.764      | 1.8         | 1.836      |            |
|                                 |                  | 1117-2.5       | $I_O = 10mA$ $V_I = 4.5V$                              | 2.463      | 2.5         | 2.538      |            |
|                                 |                  |                | $10mA \leq I_O \leq 1A$ $4V \leq V_I \leq 12V$         | 2.450      | 2.5         | 2.550      |            |
|                                 |                  | 1117-3.3       | $I_O = 10mA$ $V_I = 5V$                                | 3.251      | 3.3         | 3.350      |            |
|                                 |                  |                | $10mA \leq I_O \leq 1A$ $5V \leq V_I \leq 12V$         | 3.234      | 3.3         | 3.366      |            |
|                                 |                  | 1117-5.0       | $I_O = 10mA$ $V_I = 7V$                                | 4.925      | 5.0         | 5.075      |            |
|                                 |                  |                | $10mA \leq I_O \leq 1A$ $7V \leq V_I \leq 12V$         | 4.9        | 5.0         | 5.1        |            |
| Line Regulation<br>线性调整率        | LNR              | 1117-Adj       | $I_O = 10mA$ $1.5V \leq V_I - V_O \leq 12V$            |            | 0.03        | 0.2        | %          |
|                                 |                  | 1117-1.8       | $I_O = 10mA$ $1.5V \leq V_I - V_O \leq 10.2V$          |            | 1           | 7          | mV         |
|                                 |                  | 1117-2.5       | $I_O = 10mA$ $1.5V \leq V_I - V_O \leq 9.5V$           |            | 1           | 7          |            |
|                                 |                  | 1117-3.3       | $I_O = 10mA$ $1.5V \leq V_I - V_O \leq 8.7V$           |            | 1           | 7          |            |
|                                 |                  | 1117-5.0       | $I_O = 10mA$ $1.5V \leq V_I - V_O \leq 7V$             |            | 1           | 10         |            |
| Load Regulation<br>负载调整率        | LDR              | 1117-Adj       | $10mA \leq I_O \leq 1A$ $V_I - V_O = 1.5V$             |            | 0.2         | 0.4        | %          |
|                                 |                  | 1117-1.8       |                                                        |            |             | 7.2        | mV         |
|                                 |                  | 1117-2.5       |                                                        |            |             | 10         |            |
|                                 |                  | 1117-3.3       |                                                        |            |             | 13.2       |            |
|                                 |                  | 1117-5.0       |                                                        |            |             | 20         |            |
| Dropout Voltage                 | $V_D$            | 落差电压           | $\Delta V_R = 1\%$ $I_O = 1A$                          |            | 1.1         | 1.3        | V          |
| Adjust Pin Current              | $I_{adj}$        | 电流调整           | $I_O = 10mA$                                           |            |             | 120        | $\mu A$    |
| Adjust Current Change           | $\Delta I_{adj}$ | 电流调整率          | $1.5 \leq V_I - V_O \leq 12$ $I_O = 10mA$              |            |             | 5          | $\mu A$    |
| Min Load Current                | $I_L$            | 负载电流           | $V_I = 5V$ $V_{adj} = 0V$                              |            |             | 7          | mA         |
| Quiescent Current               | $I_q$            | 静态电流           | $V_I = V_O + 1.25$                                     |            | 2           | 5          | mA         |
| Temperature Stability 温度稳定性     |                  |                |                                                        |            | 0.5         |            | %          |
| Long Term Stability 长期稳定性       |                  |                | $T_A = 125^\circ C$ 1000hrs                            |            | 0.3         |            | %          |
| RMS Output Noise(% of Vout)输出噪声 |                  |                | $T_A = 125^\circ C$                                    |            | 0.003       |            | %          |
| Thermal Shutdown Hysteresis 热特性 |                  |                |                                                        |            | 25          |            | $^\circ C$ |

## ■Application 应用

固定输出电压:

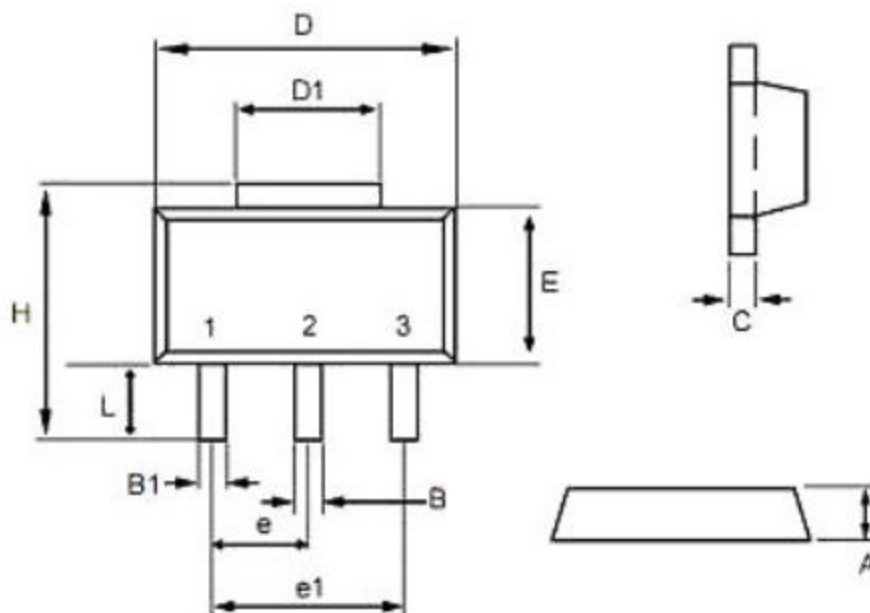


可调输出电压:



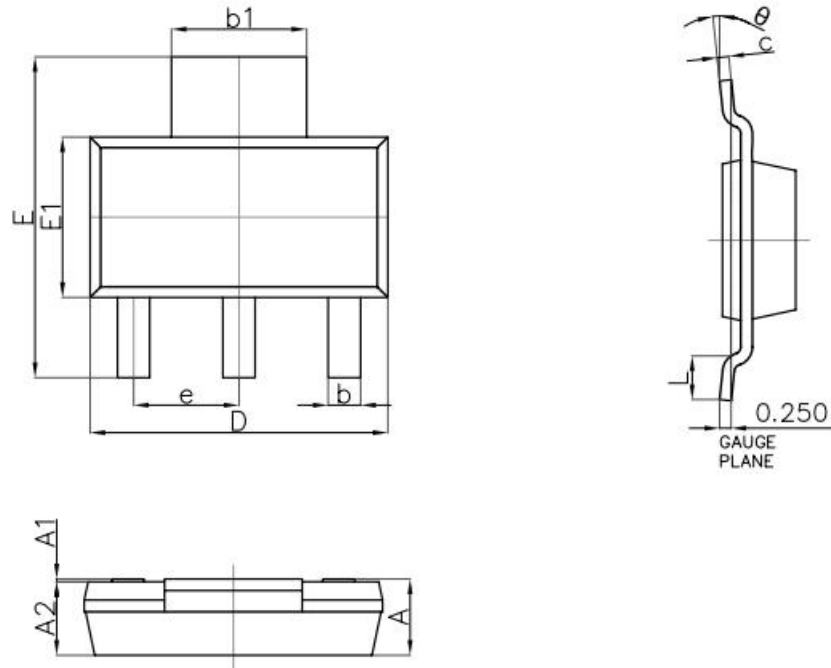
可调电压型提供 1.25V 的基准电压，任何在 1.25 至 13.8V 之间的输出电压可以通过选择两个外接电阻来获得， $R1$ 、 $R2$  两个外接电阻连接方法如上。 $R1$  的阻值一般在 200  $\Omega$  到 350  $\Omega$  之间。

■ SOT-89-3L Dimension 外形封装尺寸



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | Min                       | Max  | Min                  | Max   |
| A      | 1.40                      | 1.60 | 0.055                | 0.063 |
| B      | 0.40                      | 0.56 | 0.016                | 0.022 |
| B1     | 0.35                      | 0.48 | 0.014                | 0.019 |
| C      | 0.35                      | 0.44 | 0.014                | 0.017 |
| D      | 4.40                      | 4.60 | 0.173                | 0.181 |
| D1     | 1.35                      | 1.83 | 0.053                | 0.072 |
| e      | 1.45                      | 1.55 | 0.057                | 0.061 |
| e1     | 2.95                      | 3.05 | 0.116                | 0.120 |
| E      | 2.29                      | 2.60 | 0.090                | 0.102 |
| H      | 3.75                      | 4.25 | 0.148                | 0.167 |
| L      | 0.80                      | 1.20 | 0.031                | 0.047 |

■ SOT-223 Dimension 外形封装尺寸



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | —                         | 1.800 | —                    | 0.071 |
| A1     | 0.020                     | 0.100 | 0.001                | 0.004 |
| A2     | 1.500                     | 1.700 | 0.059                | 0.067 |
| b      | 0.660                     | 0.840 | 0.026                | 0.033 |
| b1     | 2.900                     | 3.100 | 0.114                | 0.122 |
| c      | 0.230                     | 0.350 | 0.009                | 0.014 |
| D      | 6.300                     | 6.700 | 0.248                | 0.264 |
| E      | 6.700                     | 7.300 | 0.264                | 0.287 |
| E1     | 3.300                     | 3.700 | 0.130                | 0.146 |
| e      | 2.300(BSC)                |       | 0.091(BSC)           |       |
| L      | 0.750                     | —     | 0.030                | —     |
| θ      | 0°                        | 10°   | 0°                   | 10°   |