# ME6118

## 1A Adjustable Voltage High Speed LDO Regulators ME6118 Series

### General Description

The ME6118 series are highly accurate, low noise, LDO Voltage Regulators that are capable of providing an output current that is in excess of 1A with a maximum dropout voltage of 1.3V at 1A （ME6118A33）.This series contains four fixed output voltages of 1.2V, 1.8V, 2.5V and 3.3V that have no minimum load requirement to maintain regulation. On chip trimming adjusts the reference/output voltage to within ±2% accuracy. Internal protection features consist of output current limiting, safe operating area compensation, and thermal shutdown. The ME6118series can operate with up to 18V input.

### Features

- Output Current in Excess of 1A
- Dropout Voltage:80mV@ $I_{OUT}$ =100mA （ME6118A33）
- Operating Voltage Range: 2.5V～18V
- Highly Accuracy: ±2％
- Adjustable Output Voltage Option
- Standby Current: 52uA（TYP.）
- High Ripple Rejection: 70dB@1KHz（ME6118A33）
- Line Regulation:　2mV（TYP.）
- Temperature Stability≤0.5%
- Thermal Shutdown Protection：160℃

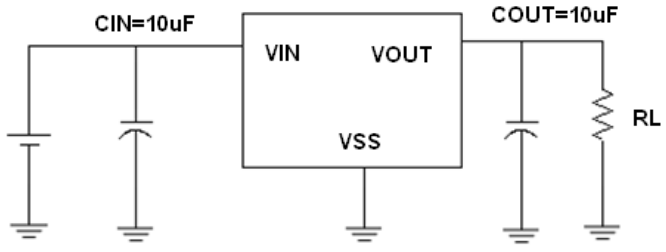
### Typical Application

- Consumer and Industrial Equipment Point of Regulation
- Switching Power Supply Post Regulation
- Hard Drive Controllers
- Battery Chargers

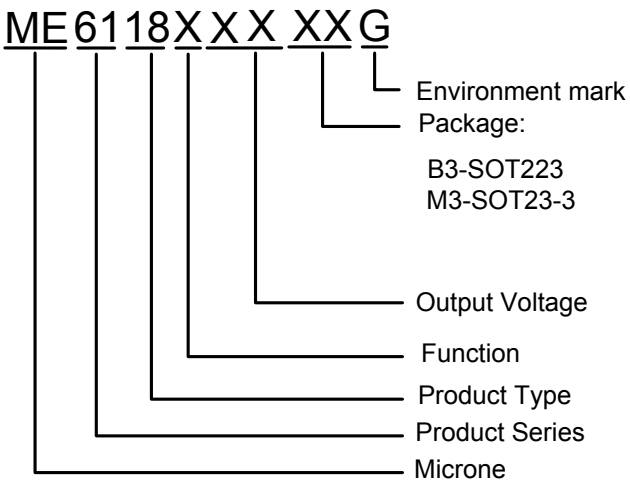
### Package

- 3-pin　SOT223 ，SOT23-3

### Typical Application Circuit

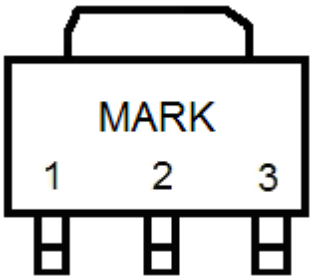


## Selection Guide




| product series | product description |
|---|---|
| ME6118A12B3G | $V_{OUT}$ =1.2V； Package：SOT223 |
| ME6118A18B3G | $V_{OUT}$ =1.8V； Package：SOT223 |
| ME6118A25B3G | $V_{OUT}$ =2.5V； Package：SOT223 |
| ME6118A33B3G | $V_{OUT}$ =3.3V； Package： SOT223 |
| ME6118A50B3G | $V_{OUT}$ =5.0V； Package：SOT223 |
| ME6118E25B3G | $V_{OUT}$ =2.5V； Package：SOT223； Different pin |
| ME6118E33B3G | $V_{OUT}$ =3.3V； Package：SOT223； Different pin |
| ME6118A33M3G | $V_{OUT}$ =3.3V； Package：SOT23-3 |

## Pin Configuration




SOT223

SOT23-3

## Pin Assignment

ME6118AXX

| Pin Number | | Pin Name | Functions |
|---|---|---|---|
| SOT223 | SOT23-3 | | |
| 1 | 1 | GND | Ground |
| 2 | 2 | $V_{OUT}$ | Output |
| 3 | 3 | $V_{IN}$ | Power Input |

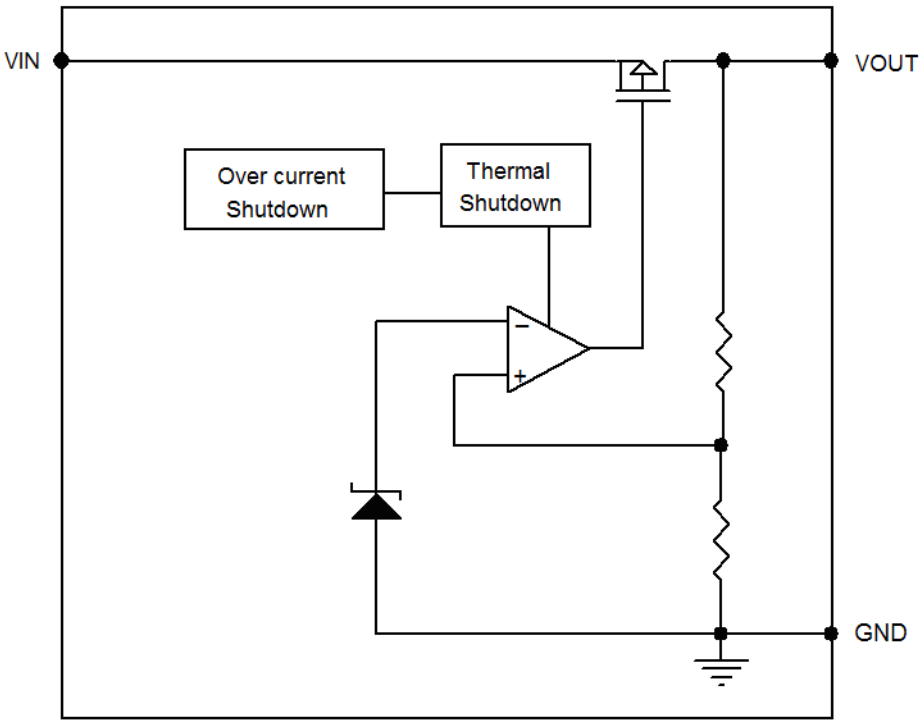
ME6118EXX

| Pin Number | Pin Name | Functions |
|---|---|---|
| SOT223 | | |
| 1 | GND | Ground |
| 2 | $V_{IN}$ | Power Input |
| 3 | $V_{OUT}$ | Output |

## Absolute Maximum Ratings

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | 18 | V |
| Output Current | | $I_{OUT}$ | 1.1 | A |
| Output Voltage | | $V_{OUT}$ | Vss-0.3～$V_{IN}$ +0.3 | V |
| Power Dissipation | SOT223 | $P_D$ | 750 | mW |
| | SOT23-3 | | 300 | |
| Operating Temperature Range | | $T_{OPR}$ | －40～＋125 | ℃ |
| Storage Temperature Range | | $T_{STG}$ | －40～＋150 | ℃ |
| Lead Temperature | | | 260℃，4sec | |

## Block Diagram




## Electrical Characteristics

**ME6118A12/E12** **(**Packages:SOT223**)**

($V_{IN}$= $V_{OUT}$+1.3V，$C_{IN}$=$C_L$=10uF，Ta=25$^{O}$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.3V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.3V | | 800 | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.3V , 1mA≤$I_{OUT}$≤800mA | | 3 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 195 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =400mA | | 665 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =800mA | | 1250 | | mV |
| | $V_{DIF4}$ | $I_{OUT}$ =1000mA | | 1600 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.3V | | 53 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.3V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.3V | | 155 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=3V | | 1.1 | | A |

**ME6118A18/E18 (**Packages:SOT223**)**

($V_{IN}$= $V_{OUT}$+1.2V，$C_{IN}$=$C_L$=10uF，Ta=25$^O$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA $V_{IN}$= $V_{OUT}$+1.2V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 800 | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.2V , 1mA≤$I_{OUT}$≤800mA | | 5 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 115 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =400mA | | 450 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =800mA | | 940 | | mV |
| | $V_{DIF4}$ | $I_{OUT}$ =1000mA | | 1600 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 52 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.2V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA $V_{IN}$= $V_{OUT}$+1.2V | | 160 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=3.5V | | 1.1 | | A |

**ME6118A25/E25 (**Packages:SOT223**)**

($V_{IN}$= $V_{OUT}$+1.2V，$C_{IN}$=$C_L$=10uF，Ta=25$^O$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 800 | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.2V , 1mA≤$I_{OUT}$≤800mA | | 5 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 90 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =500mA | | 450 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =800mA | | 790 | | mV |
| | $V_{DIF4}$ | $I_{OUT}$ =1000mA | | 1300 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 53 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.2V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | | 160 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=4.0V | | 1.1 | | A |

**ME6118A33/E33 (**Packages:SOT223**)**

($V_{IN}$= $V_{OUT}$+1.2V，$C_{IN}$=$C_L$=10uF，Ta=25$^O$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 800 | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.2V , 1mA≤$I_{OUT}$≤800mA | | 7 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 80 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =500mA | | 400 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =800mA | | 680 | | mV |
| | $V_{DIF4}$ | $I_{OUT}$ =1000mA | | 1300 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 53 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.2V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | | 160 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=5.0V | | 1.1 | | A |

**ME6118A33 (**Package: SOT23-3 **)**

($V_{IN}$= $V_{OUT}$+1.2V，$C_{IN}$=$C_L$=10uF，Ta=25$^O$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 500 | 600 | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.2V , 1mA≤$I_{OUT}$≤500mA | | 10 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 70 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =300mA | | 220 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =500mA | | 385 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 53 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.2V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | | 160 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=5.0V | | 1.1 | | A |

**ME6118A50/E50 (**Packages:SOT223**)**

($V_{IN}$= $V_{OUT}$+1.2V，$C_{IN=}C_L$=10uF，Ta=25$^O$C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$(E) (Note 2) | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | X 0.98 | $V_{OUT}$ (T) (Note 1) | X 1.02 | V |
| Maximum Output Current | $I_{OUTMAX}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 800 | | mA |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$+1.2V , 1mA≤$I_{OUT}$≤800mA | | 8 | | mV |
| Dropout Voltage (Note 3) | $V_{DIF1}$ | $I_{OUT}$ =100mA | | 60 | | mV |
| | $V_{DIF2}$ | $I_{OUT}$ =500mA | | 300 | | mV |
| | $V_{DIF3}$ | $I_{OUT}$ =800mA | | 500 | | mV |
| | $V_{DIF4}$ | $I_{OUT}$ =1000mA | | 900 | | mV |
| Quiescent Current | $I_{ss}$ | $V_{IN}$= $V_{OUT}$+1.2V | | 53 | | uA |
| Line Regulation | $\Delta V_{OUT}$ | $I_{OUT}$ =0mA $V_{OUT}$+1.2V ≤$V_{IN}$≤18V | | 2 | | mV |
| Thermal Shutdown Protection | $T_{sd}$ | $I_{OUT}$=10mA, $V_{IN}$= $V_{OUT}$+1.2V | | 160 | | ℃ |
| Over Current Protection | $I_{limit}$ | $V_{IN}$=6.5V | | 1.1 | | A |

Note ：

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

2.$V_{OUT}$ (E) ： Effective Output Voltage ( ie. The output voltage when “$V_{OUT}$ (T)+1.2V”is provided at the Vin pin while maintaining a certain Iout value.)

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

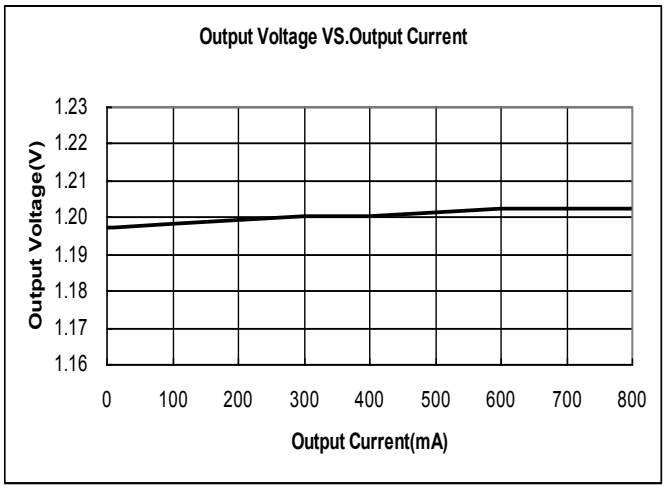
$V_{IN1}$ ： The input voltage when $V_{OUT}$(E)’ appears as input voltage is gradually decreased.

$V_{OUT}$ (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout and {$V_{OUT}$ (T)+1.2V} is input.

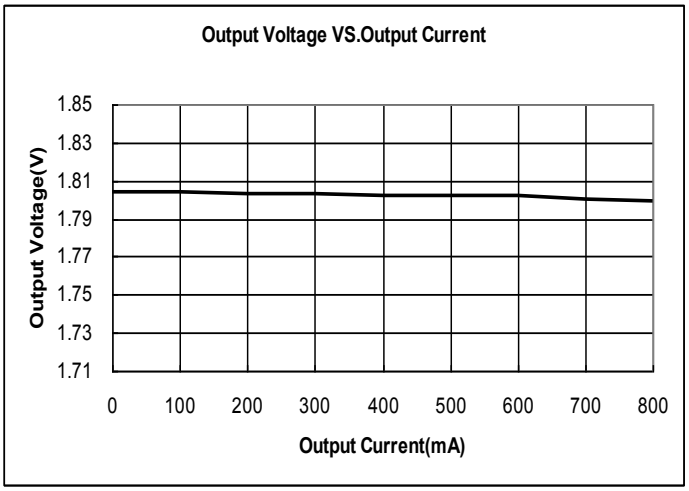
## Type Characteristics

（1） Output Voltage VS. Output Current

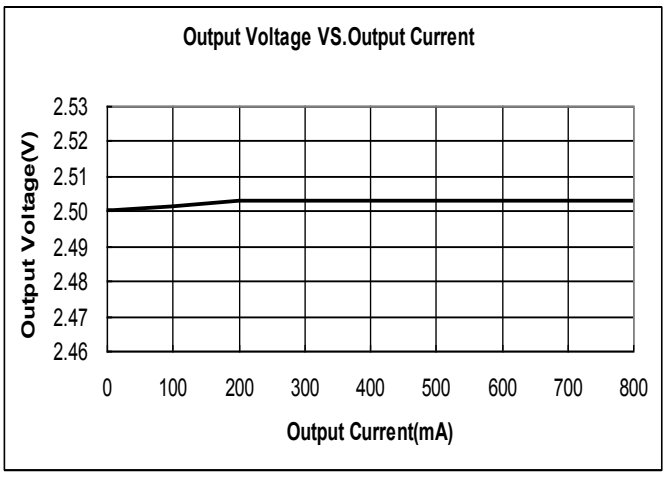
**ME6118A12B3G**（VIN=$V_{OUT}$+1.3V）



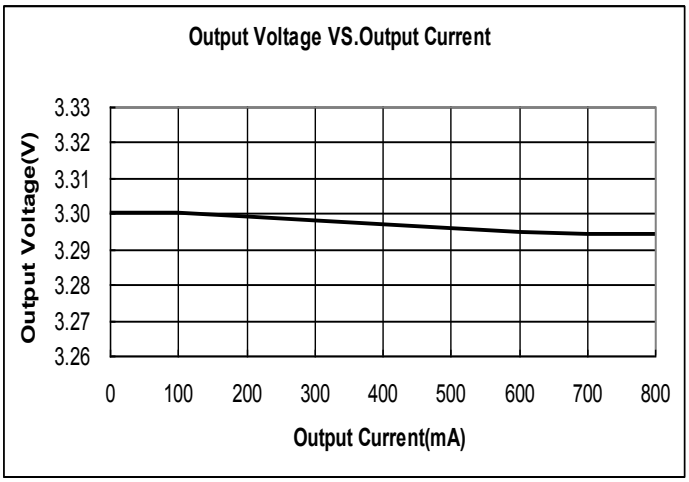

**ME6118A18B3G**（VIN=$V_{OUT}$+1.2V）




**ME6118A25B3G**（VIN=$V_{OUT}$+1.2V）

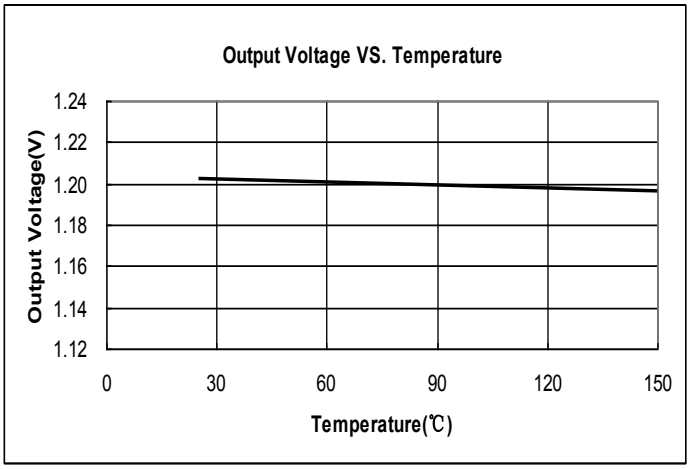



**ME6118A33B3G**（VIN=$V_{OUT}$+1.2V）

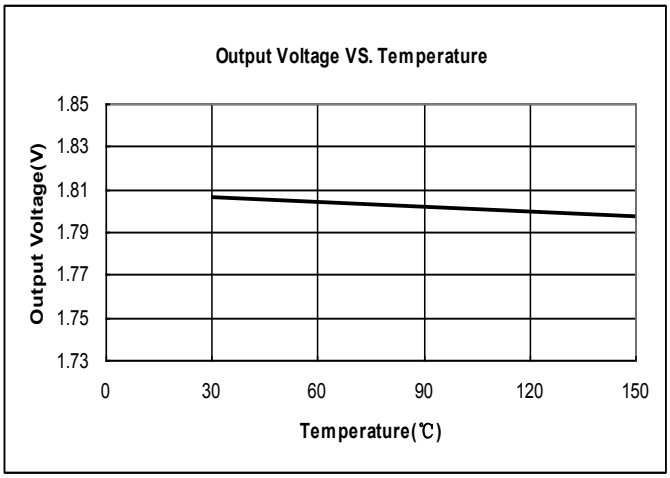



（2） Output Voltage VS. Temperature

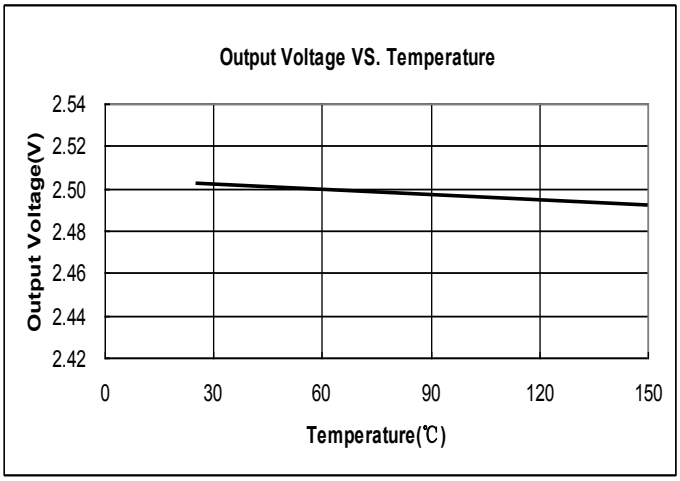
**ME6118A12B3G**（VIN=$V_{OUT}$+1.3V , $I_{OUT}$=10mA）



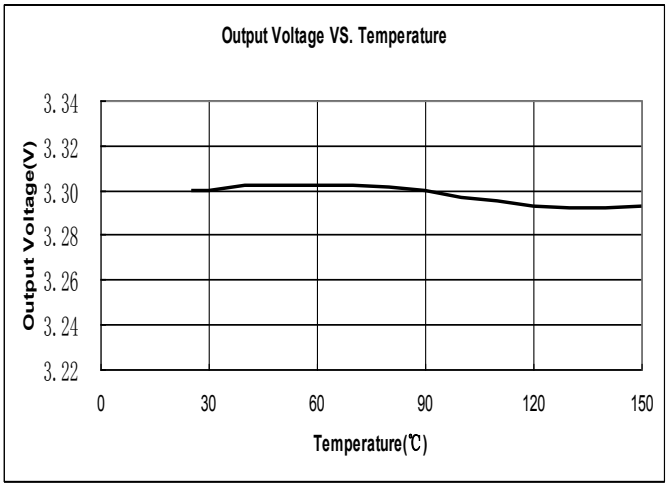

**ME6118A18B3G**（VIN=$V_{OUT}$+1.2V , $I_{OUT}$=10mA）



**ME6118A25B3G**（VIN=$V_{OUT}$+1.2V , $I_{OUT}$=10mA）

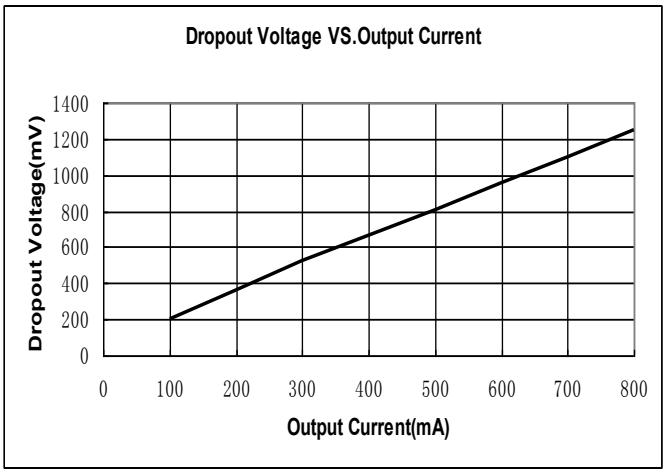



**ME6118A33B3G**（VIN=$V_{OUT}$+1.2V , $I_{OUT}$=10mA）




（3）Dropout Voltage VS. Output Current（Ta = 25 °C）

**ME6118A12B3G**

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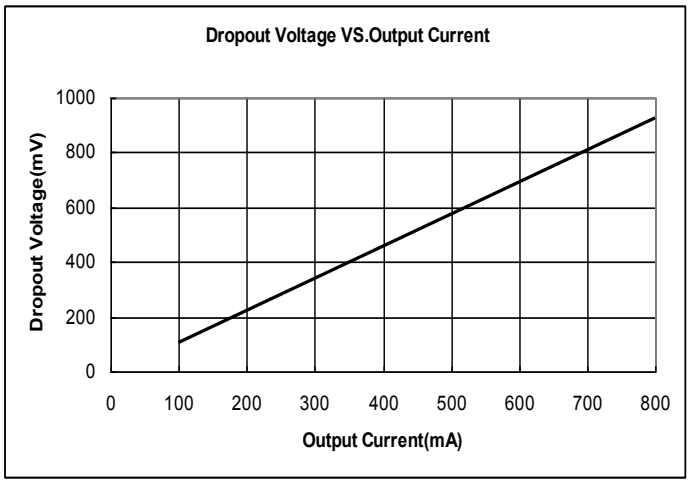
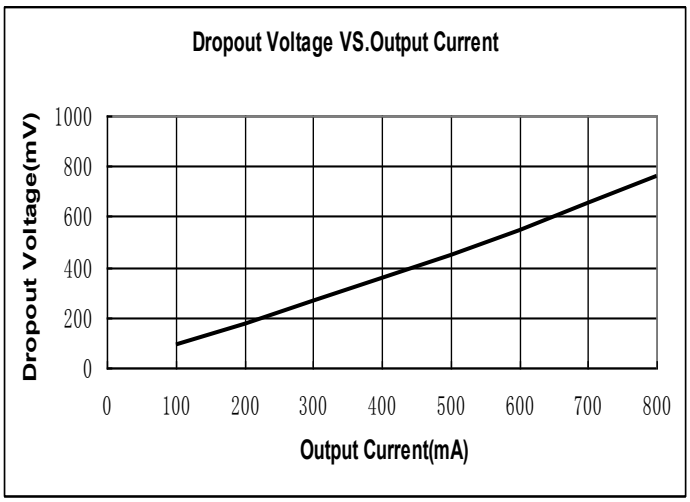
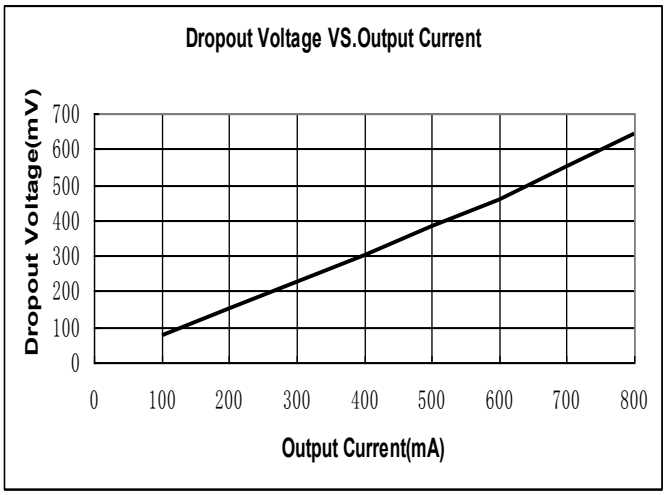



**ME6118A25B3G**

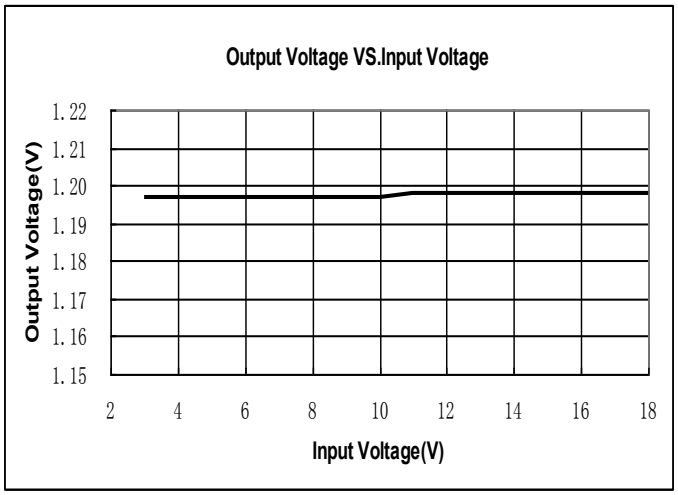



**ME6118A33B3G**

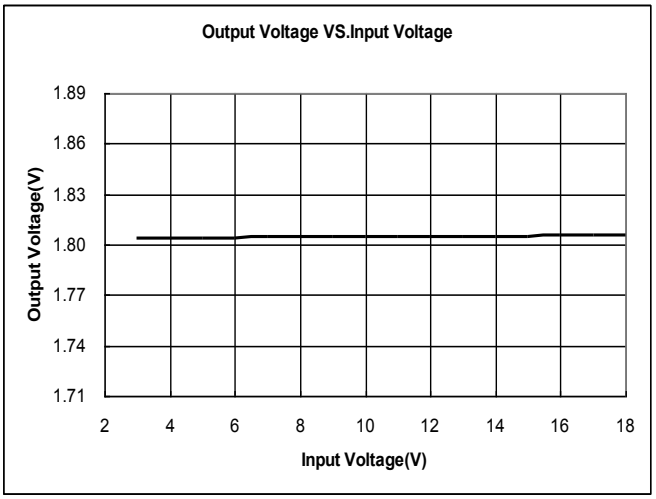


（4）Output Voltage VS. Input Voltage（Ta = 25 °C）

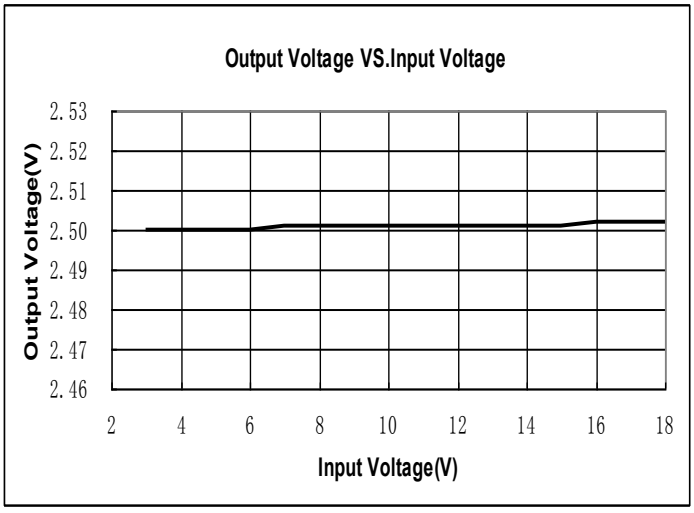
**ME6118A12B3G**



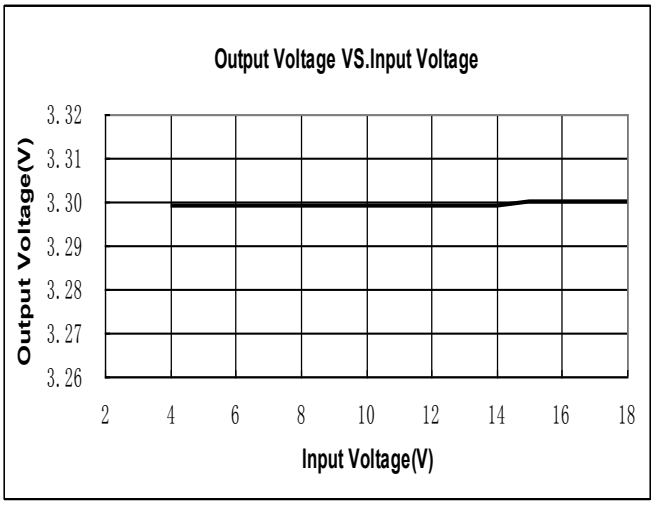

**ME6118A18B3G**




**ME6118A25B3G**

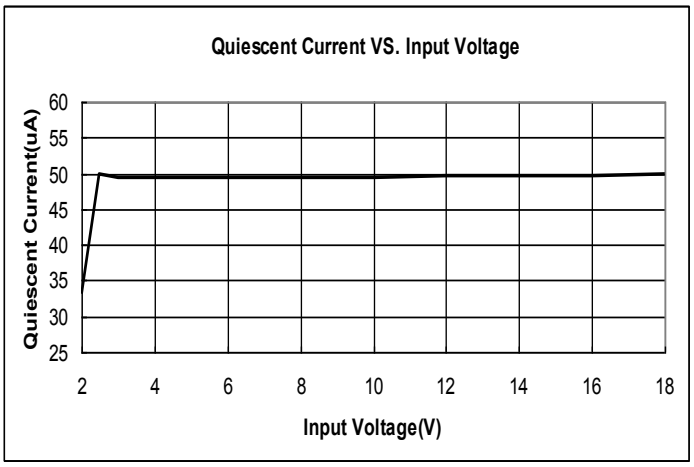



**ME6118A33B3G**

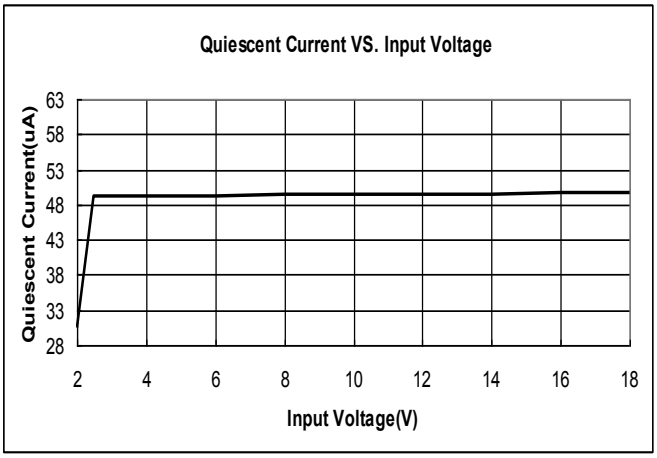



（5）Quiescent Current VS. Input Voltage

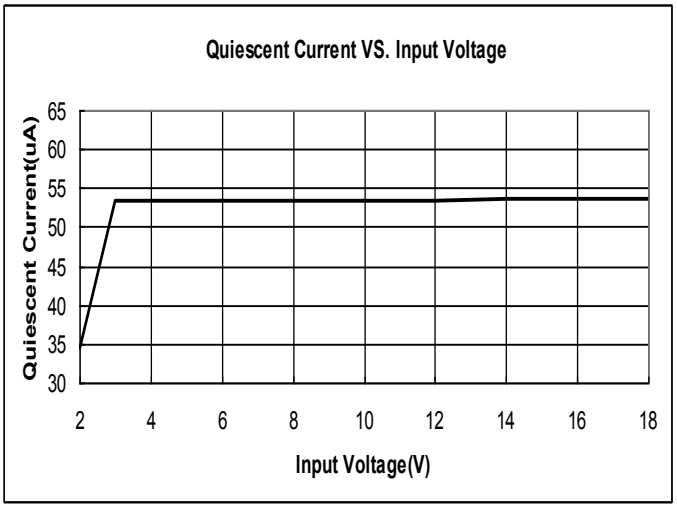
**ME6118A12B3G**




**ME6118A18B3G**



**ME6118A25B3G**

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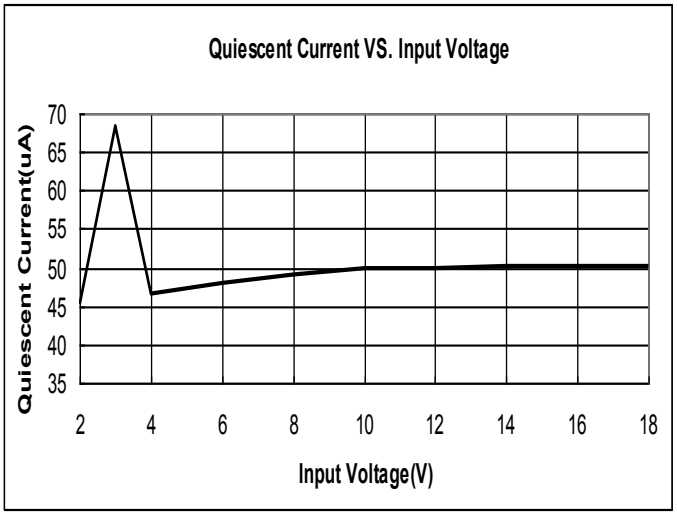



## Applications Information

**1. Input Bypass Capacitor**

An input capacitor is recommended. A 10uF tantalum on the input is a suitable input bypassing for almost all applications.

**2. Output Capacitor**

The output capacitor is critical in maintaining regulator stability, and must meet the required conditions for both minimum amount of capacitance and ESR (Equivalent Series Resistance).The minimum output capacitance required by the ME6118 is 10μF,if a tantalum capacitor is used. Any increase of the output capacitance will merely improve the loop stability and transient response. The ESR of the output capacitor should be less than 0.5Ω .

**3. Load Regulation**

The ME6118 regulates the voltage that appears between its output and ground pins, or between its output and adjust pins. In some cases, line resistances can introduce errors to the voltage across the load. To obtain the best load regulation, a few precautions are needed. Figure1, shows a typical application using a fixed output regulator. The Rt1 and Rt2 are the line resistances. It is obvious that the $V_{LOAD}$ is less than the $V_{OUT}$ by the sum of the voltage drops along the line resistances. In this case, the load regulation seen at the $R_{LOAD}$ would be degraded from the datasheet specification. To improve this , the load should be tied directly to the output terminal on the positive side and directly tied to the ground terminal on the negative side.

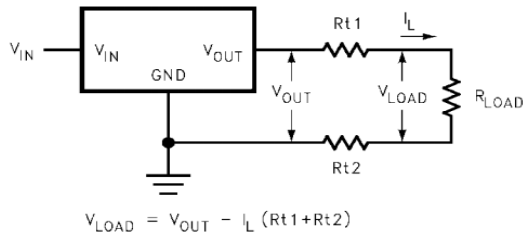
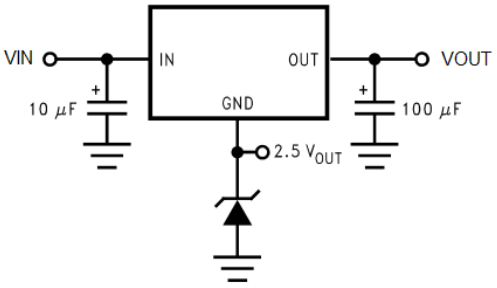


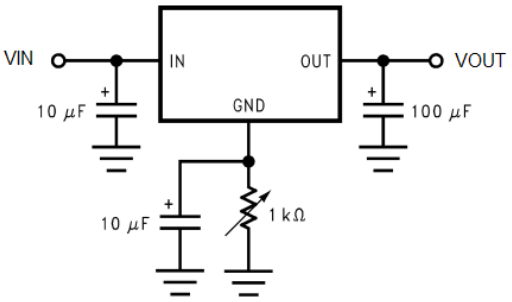

FIGURE 1. Typical Application using Fixed Output Regulator

## Application Circuit

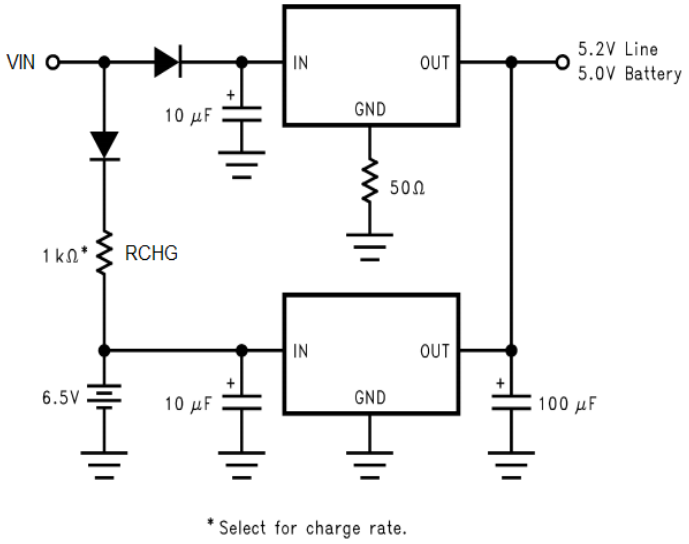
（1）Regulator with Reference




（2）Adjusting Output of Fixed Voltage Regulators

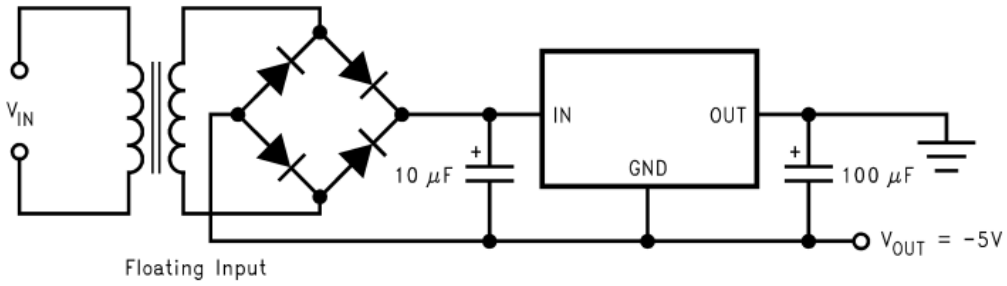



（3）Battery Backed-Up Power Supply



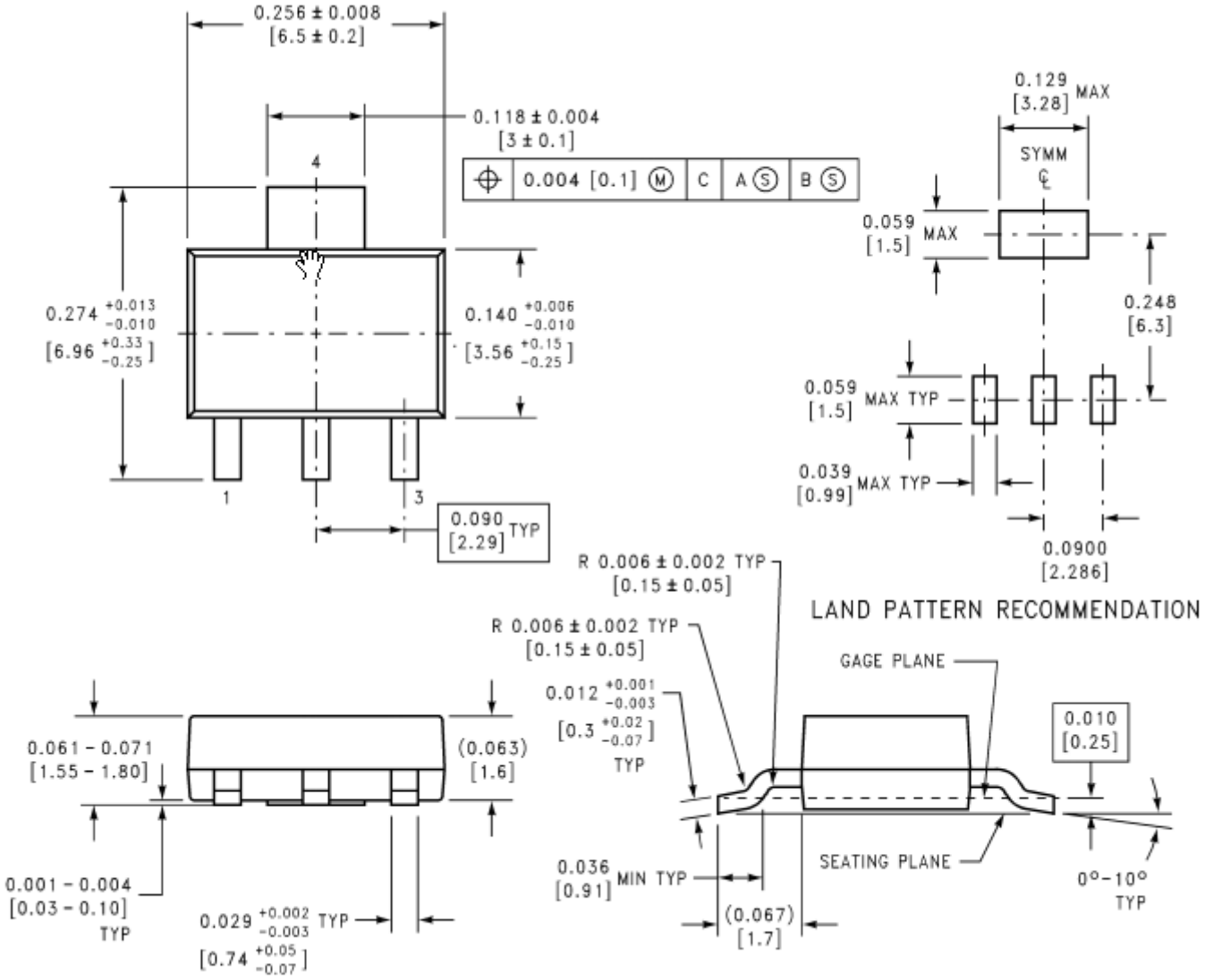

* Select for charge rate.

（4）Low Dropout Negative Supply

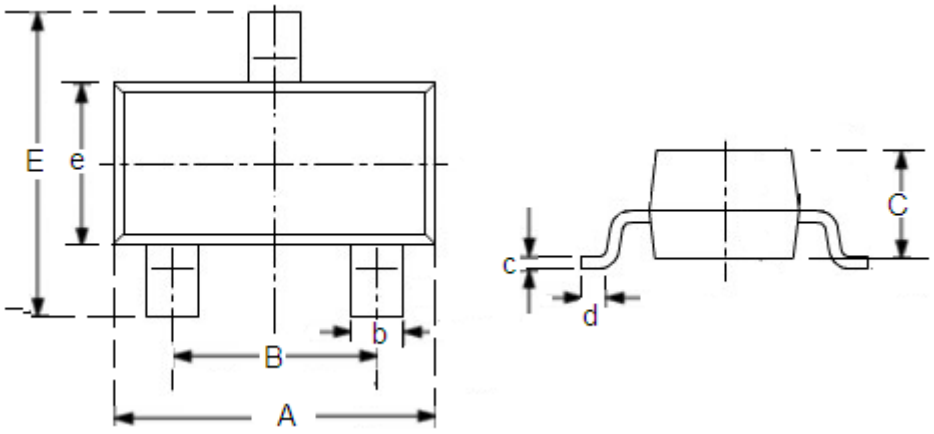


## Packaging Information

● SOT223



● SOT23-3




| DIM | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 2.7 | 3.1 | 0.1063 | 0.122 |
| B | 1.7 | 2.1 | 0.0669 | 0.0827 |
| b | 0.35 | 0.5 | 0.0138 | 0.0197 |
| C | 1.0 | 1.2 | 0.0394 | 0.0472 |
| c | 0.1 | 0.25 | 0.0039 | 0.0098 |
| d | 0.2 | - | 0.0079 | - |
| E | 2.6 | 3.0 | 0.1023 | 0.1181 |
| e | 1.5 | 1.8 | 0.059 | 0.0708 |