

### Description

GM6250 combines high accuracy with very low power consumption, and provides high output current even when the application requires extremely low input-output voltage dropout.

GM6250 includes a precision voltage reference, an error correction circuit, over-temperature protection, and a current limited output driver. Fast transient response to load variations provides excellent stability under dynamic loads.

GM6250 comes in SOT-23 (150mW), and SOT-89 (500mW).

### Features

- ◆ Maximum output current up 300mA
- ◆ Output voltage from 1.5V to 5.0V in 0.1V increments
- ◆ Output voltage accuracy :  $\pm 2\%$
- ◆ CMOS low power consumption, typically  $1.0\mu\text{A}$  at  $V_{\text{OUT}} = 5.0\text{V}$
- ◆ Input stability: typically  $0.2\%/V$
- ◆ Ultra low dropout voltage:  $0.38\text{V}$  @  $I_{\text{OUT}} = 200\text{mA}$  at  $V_{\text{OUT}} = 5.0\text{V}$
- ◆ SOT-23 (150mW), SOT-89 (500mW) and TO-92 packages

### Application

Palmtops

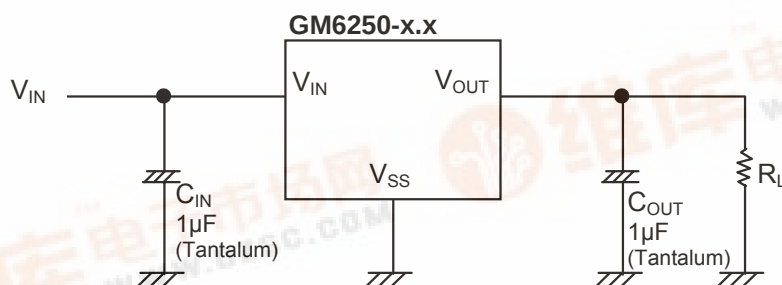
Portable Cameras

Video Recorders

Battery Powered Equipment

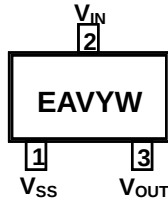
Reference Voltage Sources

### Typical Application Circuits

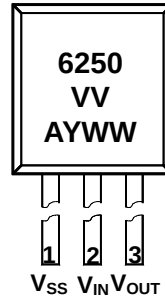


## Marking Information and Pin Configurations (Top View)

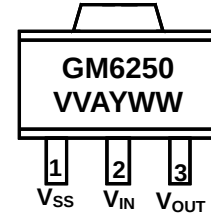
SOT23



TO92



SOT89



EA: Device Code

V: Voltage Code (see next page)

Y: Year (8 = 2008, 9 = 2009 ....)

W: Week Code

Week 1-26 : A – Z

Week 27-52 : A - Z

Week 53 : A

VV: Voltage suffix (18 = 1.8V, 50 = 5.0V...)

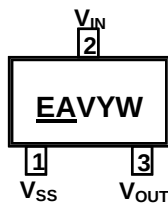
A: Assembly Site Code

Y: Year (8 = 2008, 9 = 2009 ....)

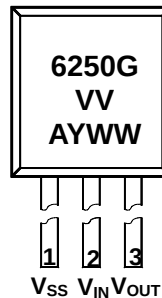
WW: Week Code

## Marking Information and Pin Configurations – Green Product(Top View)

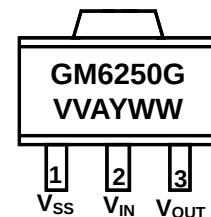
SOT23



TO92



SOT89



EA: Device Code, Green Product

V: Voltage Code (see next page)

Y: Year (8 = 2008, 9 = 2009 ....)

W: Week Code

Week 1-26 : A – Z

Week 27-52 : A - Z

Week 53 : A

G: Green Product

VV: Voltage suffix (18 = 1.8V, 50 = 5.0V...)

A: Assembly Site Code

Y: Year (8 = 2008, 9 = 2009 ....)

WW: Week Code

### Ordering Information

| Ordering Number  | Output Voltage | Voltage Code | Package | Shipping                     |
|------------------|----------------|--------------|---------|------------------------------|
| GM6250-1.5T92B   | 1.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-1.5T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-1.5ST23R  |                | C            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-1.5ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-1.8T92B   | 1.8V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-1.8T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-1.8ST23R  |                | E            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-1.8ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.2T92B   | 2.2V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.2T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.2ST23R  |                | D            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.2ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.5T92B   | 2.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.5T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.5ST23R  |                | G            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.5ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.7T92B   | 2.7V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.7T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.7ST23R  |                | T            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.7ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.8T92B   | 2.8V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.8T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.8ST23R  |                | H            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.8ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.85T92B  | 2.85V          |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.85T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.85ST23R |                | I            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.85ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.0T92B   | 3.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.0T92RL  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.0ST23R  |                | J            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.0ST89R  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |

### Ordering Information (Continued)

| Ordering Number | Output Voltage | Voltage Code | Package | Shipping                     |
|-----------------|----------------|--------------|---------|------------------------------|
| GM6250-3.2T92B  | 3.2V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.2T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.2ST23R |                | U            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.2ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.3T92B  | 3.3V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.3T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.3ST23R |                | K            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.3ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.5T92B  | 3.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.5T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.5ST23R |                | V            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.5ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.6T92B  | 3.6V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.6T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.6ST23R |                | L            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.6ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.0T92B  | 4.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.0T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.0ST23R |                | M            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.0ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.4T92B  | 4.4V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.4T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.4ST23R |                | W            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.4ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.5T92B  | 4.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.5T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.5ST23R |                | N            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.5ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-5.0T92B  | 5.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-5.0T92RL |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-5.0ST23R |                | Q            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-5.0ST89R |                |              | SOT-89  | 1,000 Units/Tape and Reel    |

### Ordering Information – Green Product

| Ordering Number   | Output Voltage | Voltage Code | Package | Shipping                     |
|-------------------|----------------|--------------|---------|------------------------------|
| GM6250-1.5T92BG   | 1.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-1.5T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-1.5ST23RG  |                | C            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-1.5ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-1.8T92BG   | 1.8V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-1.8T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-1.8ST23RG  |                | E            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-1.8ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.2T92BG   | 2.2V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.2T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.2ST23RG  |                | D            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.2ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.5T92BG   | 2.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.5T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.5ST23RG  |                | G            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.5ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.7T92BG   | 2.7V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.7T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.7ST23RG  |                | T            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.7ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.8T92BG   | 2.8V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.8T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.8ST23RG  |                | H            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.8ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-2.85T92BG  | 2.85V          |              | TO-92   | 1,000 Units/Bag              |
| GM6250-2.85T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-2.85ST23RG |                | I            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-2.85ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.0T92BG   | 3.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.0T92RLG  |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.0ST23RG  |                | J            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.0ST89RG  |                |              | SOT-89  | 1,000 Units/Tape and Reel    |

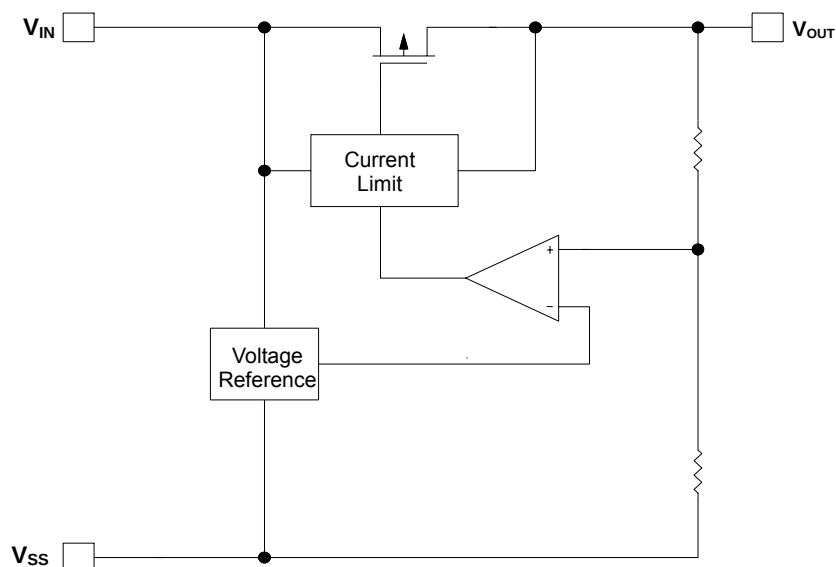
### Ordering Information – Green Product (Continued)

| Ordering Number  | Output Voltage | Voltage Code | Package | Shipping                     |
|------------------|----------------|--------------|---------|------------------------------|
| GM6250-3.2T92BG  | 3.2V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.2T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.2ST23RG |                | U            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.2ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.3T92BG  | 3.3V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.3T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.3ST23RG |                | K            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.3ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.5T92BG  | 3.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.5T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.5ST23RG |                | V            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.5ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-3.6T92BG  | 3.6V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-3.6T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-3.6ST23RG |                | L            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-3.6ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.0T92BG  | 4.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.0T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.0ST23RG |                | M            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.0ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.4T92BG  | 4.4V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.4T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.4ST23RG |                | W            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.4ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-4.5T92BG  | 4.5V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-4.5T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-4.5ST23RG |                | N            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-4.5ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |
| GM6250-5.0T92BG  | 5.0V           |              | TO-92   | 1,000 Units/Bag              |
| GM6250-5.0T92RLG |                |              | TO-92   | 2,000 Units/Ammo Pack (Tape) |
| GM6250-5.0ST23RG |                | Q            | SOT-23  | 3,000 Units/Tape and Reel    |
| GM6250-5.0ST89RG |                |              | SOT-89  | 1,000 Units/Tape and Reel    |

### Absolute Maximum Ratings

| PARAMETER                            |        | SYMBOL    | RATINGS                          | UNITS |
|--------------------------------------|--------|-----------|----------------------------------|-------|
| Input Voltage                        |        | $V_{IN}$  | 12                               | V     |
| Output Current                       |        | $I_{OUT}$ | 500                              | mA    |
| Output Voltage                       |        | $V_{OUT}$ | $V_{SS} - 0.3$ to $V_{IN} + 0.3$ | V     |
| Continuous Total Power Dissipation   | SOT-23 | $P_D$     | 150                              | mW    |
|                                      | SOT-89 |           | 500                              |       |
|                                      | TO-92  |           | 300                              |       |
| Operating Ambient Temperature        |        | $T_A$     | - 40 to 125                      | °C    |
| Storage Temperature                  |        | $T_{stg}$ | - 65 to 150                      | °C    |
| Lead Temperature (Soldering, 10 sec) |        |           | + 260                            | °C    |

### Block Diagram



Electrical Characteristics (T<sub>A</sub> = 25°C, V<sub>IN</sub> = V<sub>OUT</sub> + 1V unless otherwise noted)

| Parameter                     |                                | Symbol           | Condition                                                                 | Min   | Typ   | Max   | Unit |
|-------------------------------|--------------------------------|------------------|---------------------------------------------------------------------------|-------|-------|-------|------|
| Output Voltage                | GM6250-1.5                     | V <sub>OUT</sub> | I <sub>OUT</sub> = 40mA, V <sub>IN</sub> = V <sub>OUT</sub> + 1V          | 1.470 | 1.500 | 1.530 | V    |
|                               | GM6250-2.2                     |                  |                                                                           | 1.764 | 2.200 | 2.236 |      |
|                               | GM6250-2.5                     |                  |                                                                           | 2.450 | 2.500 | 2.550 |      |
|                               | GM6250-2.7                     |                  |                                                                           | 2.646 | 2.700 | 2.754 |      |
|                               | GM6250-2.8                     |                  |                                                                           | 2,744 | 2.800 | 2.856 |      |
|                               | GM6250-3.0                     |                  |                                                                           | 2.940 | 3.000 | 3.060 |      |
|                               | GM6250-3.2                     |                  |                                                                           | 3.136 | 3.200 | 3.264 |      |
|                               | GM6250-3.3                     |                  |                                                                           | 3.234 | 3.300 | 3.366 |      |
|                               | GM6250-3.5                     |                  |                                                                           | 3.430 | 3.500 | 3.570 |      |
|                               | GM6250-3.6                     |                  |                                                                           | 3.528 | 3.600 | 3.672 |      |
|                               | GM6250-4.0                     |                  |                                                                           | 3.920 | 4.000 | 4.080 |      |
|                               | GM6250-4.4                     |                  |                                                                           | 4.312 | 4.400 | 4.488 |      |
|                               | GM6250-4.5                     |                  |                                                                           | 4.410 | 4.500 | 4.590 |      |
|                               | GM6250-5.0                     |                  |                                                                           | 4.900 | 5.000 | 5.100 |      |
| Line Regulation               |                                | ΔV <sub>OI</sub> | I <sub>OUT</sub> = 40mA,<br>V <sub>OUT</sub> + 1V < V <sub>IN</sub> < 10V |       | 0.2   | 0.3   | %/V  |
| Load Regulation               |                                | ΔV <sub>OL</sub> | 1mA < I <sub>OUT</sub> < 80mA                                             |       | 0.02  | 0.03  | %/mA |
| Dropout Voltage               | V <sub>OUT</sub> > 2.7V        | ΔV               | I <sub>OUT</sub> = 160mA                                                  |       | 0.4   | 0.7   | V    |
|                               | 2.0V < V <sub>OUT</sub> < 2.7V |                  |                                                                           |       | 0.55  | 0.85  |      |
|                               | V <sub>OUT</sub> < 2.0V        |                  |                                                                           |       | 0.9   | 1.3   |      |
| Current Consumption           |                                | I <sub>Q</sub>   |                                                                           |       | 1.0   | 2.9   | μA   |
| Output Current Limit          |                                | I <sub>CL</sub>  |                                                                           | 500   |       |       | mA   |
| Power Supply Rejection Ration |                                | PSRR             | 10kHz                                                                     |       | 10    |       | dB   |



### Application Note

#### Notes on Usage

1. It is recommended to operate the GM6250 series within the stipulated absolute maximum ratings as the IC is liable to malfunction if it is operated outside the ratings.
2. There is a possibility of heat or oscillation as a result of the impedance present between the power supply and the IC's input. Where impedance is greater than  $10\Omega$ , it is recommended to use a capacitor ( $C_{IN}$ ) of at least  $1\mu F$  at the input terminal.
3. With a large output current, operations can be stabilized by increasing capacitor size ( $C_{IN}$ ). If  $C_{IN}$  is too small and capacitance of ( $C_L$ ) is increased, there is a possibility of oscillation due to input impedance. In such case, operation can be stabilized by either increasing the size of  $C_{IN}$  or decreasing the size of  $C_L$ .
4. Please ensure the output current ( $I_{OUT}$ ) is less than  $P_d \div (V_{IN} - V_{OUT})$  and does not exceed the stipulated continuous for total power dissipation value ( $P_d$ ) for the package.

#### CALCULATING POWER DISSIPATION

The GM6250 series precision linear regulators include thermal shutdown and current limit circuitry to protect the devices. However, high power regulators normally operate at high junction temperatures so it is important to calculate the power dissipation and junction temperatures accurately to be sure that you use an adequate heat sink.

The thermal characteristics of an IC depend on four factors:

1. Maximum Ambient Temperature  $T_A$  ( $^{\circ}C$ )
2. Power Dissipation  $P_D$  (Watts)
3. Maximum Junction Temperature  $T_J$  ( $^{\circ}C$ )
4. Thermal Resistance Junction to ambient  $R_{JA}$  ( $^{\circ}C/W$ )

These relationships of these four factors is expressed by equation :  $T_J = T_A + P_D \times R_{JA}$

Maximum ambient temperature and power dissipation are determined by the design while the maximum junction temperature and thermal resistance depend on the manufacturer and the package type.

### Typical Performance Characteristics (for GM6250-3.0)

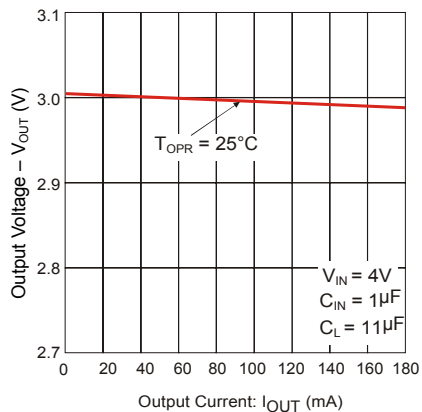


Figure 1: Output Voltage vs. Output Current

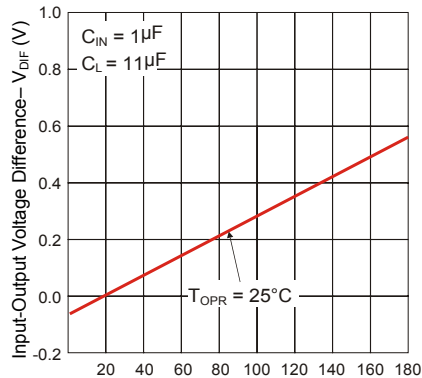


Figure 2: Input/ Output Voltage differential vs. Output Current

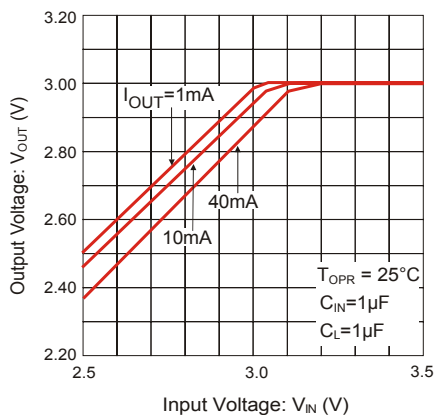


Figure 3: Output Voltage vs. Input voltage

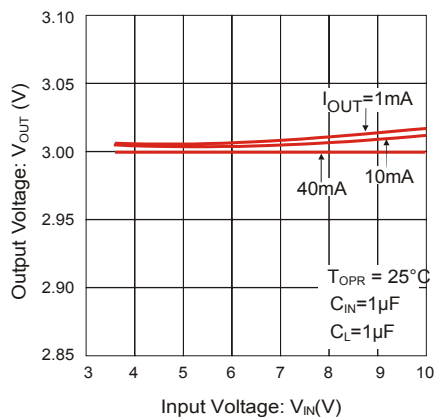


Figure 4: Output Voltage vs. Input voltage

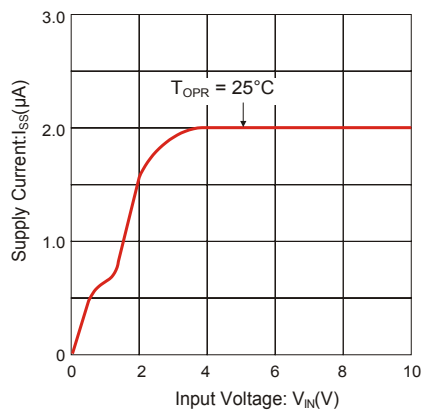


Figure 5: Supply Current vs. Input Voltage

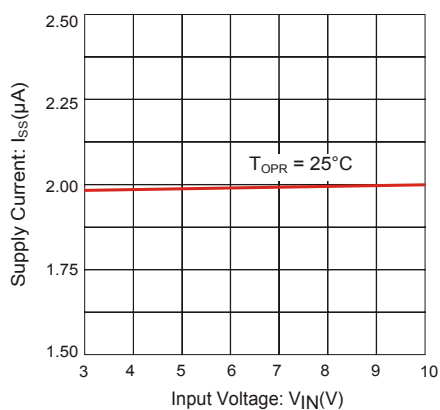


Figure 6: Supply Current vs. Input Voltage

### Typical Performance Characteristics (for GM6250-3.0, continued)

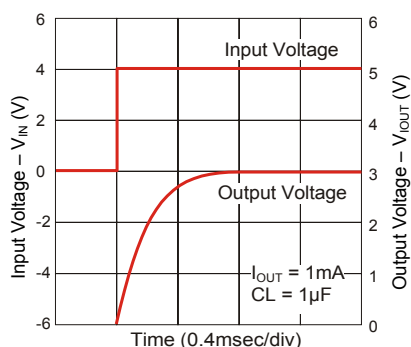


Figure 7: Input Transient Response 1

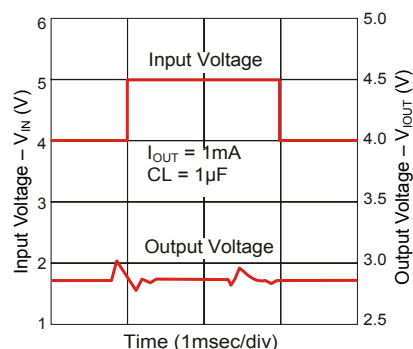


Figure 8: Input Transient Response 2

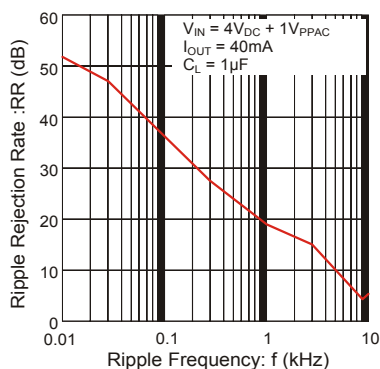
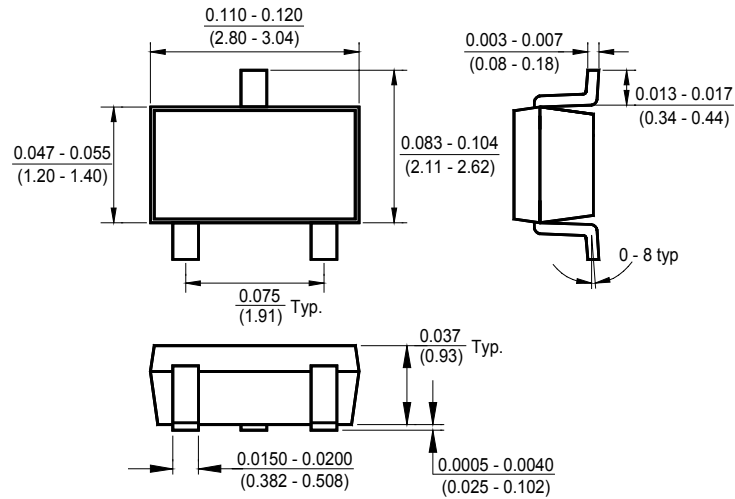
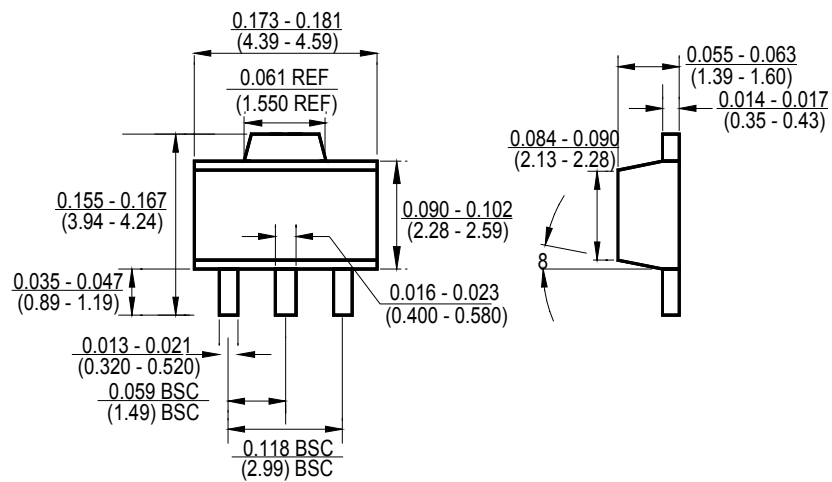


Figure 9: Ripple Rejection Rate

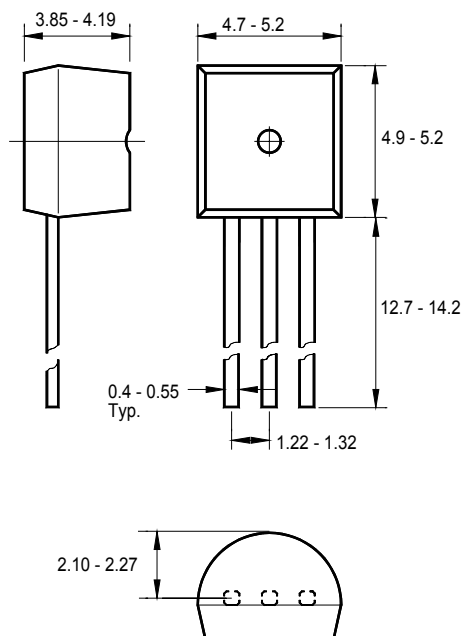
### Package Outline Dimensions – SOT 23



### Package Outline Dimensions – SOT 89



## Package Outline Dimensions – TO 92



Dimensions are in millimeters

## Ordering Number

**GM 6250 - 2.2 T92 B G**

| APM<br>Gamma<br>Micro | Circuit<br>Type | Output<br>Voltage | Package Type | Shipping Type  |                |
|-----------------------|-----------------|-------------------|--------------|----------------|----------------|
|                       |                 | 2.2 = 2.2V        | T92: TO 92   | B: Bag         | Blank: Pb-free |
|                       |                 | 2.5 = 2.5V        | ST89: SOT 89 | RL: Ammo Pack  | G: Green       |
|                       |                 | 3.3 = 3.3V        | ST23: SOT 23 | (Tape)         |                |
|                       |                 | 5.0 = 5.0V        |              | T: Tube        |                |
|                       |                 |                   |              | R: Tape & Reel |                |

Note:

### Pb-free products:

- ◆ RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- ◆ Suitable for use in SnPb or Pb-free soldering processes with 100% matte tin (Sn) plating.

### Green products:

- ◆ Lead-free (RoHS compliant)
- ◆ Halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight)

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