# 1A Low-Dropout Linear Regulator

## Features

- **Available in 1.5V, 1.8V, 2.5V, 3.3V,3.5V Version**
- **Space Saving SOT-223 Package**
- **Internal Short Circuit Current Limiting**
- **Internal Over Temperature Protection**
- **Output Current in Excess of 1A**

## Applications

- **Post Regulation for Switching DC/DC Converter**
- **High Efficiency Linear Regulator**
- **Battery Charger**
- **Battery Powered Instrumentation**
- **Motherboard**

## General Description

The G1117-XX is a low dropout linear regulator with a dropout of 1.3V at 1A of load current. It is available in four fixed voltage: 1.5V, 1.8V, 2.5V, 3.3 and 3.5V versions.

The G1117-XX provides over temperature and over current protection circuits to prevent it from being damaged by abnormal operating conditions.

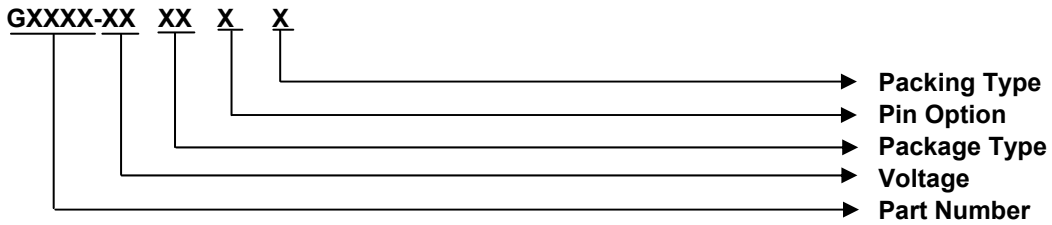
The G1117-XX is available in SOT-223 packages. A minimum of 10μF tantalum electrolytic capacitor is required at the output to improve the transient response and stability.

## Ordering Information

| ORDER NUMBER | ORDER NUMBER (Pb free) | MARKING | TEMP. RANGE | PACKAGE | PIN OPTION | | |
|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 |
| G1117-15T43U | G1117-15T43Uf | 1117-15 | -40°C~85°C | TO-252 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-18T43U | G1117-18T43Uf | 1117-18 | -40°C~85°C | TO-252 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-25T43U | G1117-25T43Uf | 1117-25 | -40°C~85°C | TO-252 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-33T43U | G1117-33T43Uf | 1117-33 | -40°C~85°C | TO-252 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-35T43U | G1117-35T43Uf | 1117-35 | -40°C~85°C | TO-252 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-15T63U | G1117-15T63Uf | 1117-15 | -40°C~85°C | SOT-223 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-18T63U | G1117-18T63Uf | 1117-18 | -40°C~85°C | SOT-223 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-25T63U | G1117-25T63Uf | 1117-25 | -40°C~85°C | SOT-223 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-33T63U | G1117-33T63Uf | 1117-33 | -40°C~85°C | SOT-223 | GND | $V_{OUT}$ | $V_{IN}$ |
| G1117-35T63U | G1117-35T63Uf | 1117-35 | -40°C~85°C | SOT-223 | GND | $V_{OUT}$ | $V_{IN}$ |

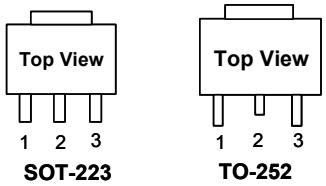
* For other package types and pin options, please contact us at sales@gmt.com.tw

## Order Number Identification



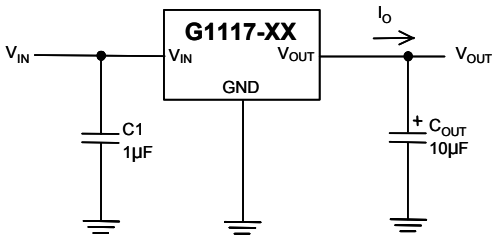

| PACKAGE TYPE | PIN OPTION | | | PACKING |
|---|---|---|---|---|
| | 1 | 2 | 3 | |
| T4: TO-252 | | | | U : Tape & Reel |
| T6: SOT-223 | 3: GND | $V_{OUT}$ | $V_{IN}$ | |

## Package Type




## Typical Application

[Note 4]: Type of $C_{OUT}$



## Absolute Maximum Ratings (Note 1)

Input Voltage. . . . . 7V
Power Dissipation Internally Limited (Note 2)
Maximum Junction Temperature. . . . . .150°C
Storage Temperature Range . . . -65°C ≤ $T_J$ ≤+150°C
Reflow Temperature (soldering, 10sec) . . . . . .260°C
Thermal Resistance Junction to Ambient, ( $\theta_{JA}$)
SOT-223(1). . . . . .116°C/W
TO-252(1) . . . . . 86°C/W
Thermal Resistance Junction to Case, ( $\theta_{JC}$)
SOT-223. . . . . .21°C/W
TO-252. . . . . 10°C/W

Note (1): See Recommended Minimum Footprint

## Operating Conditions (Note 1)

Input Voltage. . . . . .3V~6V
Temperature Range . . . . . -40°C ≤ $T_A$ ≤ 85°C

## Electrical Characteristics

**Operating Conditions: $V_{IN}$ ≤ 6V, $T_J$ = 25°C unless otherwise specified. [Note3]**

| PARAMETER | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| Output Voltage | 10mA≤ $I_{OUT}$ ≤ 1A | 2% | $V_O$ | 3% | V |
| Line Regulation | ($V_{OUT}$ + 1.5V) ≤ $V_{IN}$ ≤ 6V, $I_{OUT}$ = 10mA | --- | 3 | 30 | mV |
| Load Regulation | $V_{IN}$ = 5V, 10mA ≤ $I_{OUT}$ ≤ 1A | --- | 35 | 50 | mV |
| Dropout Voltage | $\Delta V_{OUT}$ = 2%, $I_{OUT}$ = 1A | --- | 1.3 | 1.4 | V |
| Short Circuit Current | | --- | 1.6 | --- | A |
| Quiescent Current | | 0.3 | 0.6 | 1.5 | mA |
| Ripple Rejection | f = 120Hz, $C_{OUT}$ = 10μF Tantalum, $V_{ripple}$ = $2V_{P-P}$, $I_{OUT}$ = 100mA | --- | 50 | --- | dB |
| Thermal Resistor Junction-to-Ambient (No heat sink; No air flow) | SOT-223; Recommended Minimum Footprint | --- | 116 | --- | °C/W |
| Thermal Shutdown | Junction Temperature | --- | 150 | --- | °C |

**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

**Note2:** The maximum power dissipation is a function of the maximum junction temperature, $T_{Jmax}$; total thermal resistance, $\theta_{JA}$, and ambient temperature $T_A$. The maximum allowable power dissipation at any ambient temperature is $T_{jmax}$-$T_A$ / $\theta_{JA}$. If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown. For the G1117-XX in SOT-223 package; $\theta_{JA}$ is 116°C/W; in the TO-252 package, $\theta_{JA}$ is 86°C/W (See recommend minimum footprint). The safe operation in SOT-223, TO-252 package, it can see "Typical Performance Characteristics" (Safe Operating Area).

**Note3:** Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

**Note4:** The type of output capacitor should be tantalum or aluminum.

## Definitions

### Output Voltage

The G1117-XX provides in four fixed voltages = 1.5V, 1.8V, 2.5V, 3.3V and 3.5V. Its quiescent current is typically 600μA.

### Dropout Voltage

The input/output Voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 2% below its nominal value. Dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

### Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

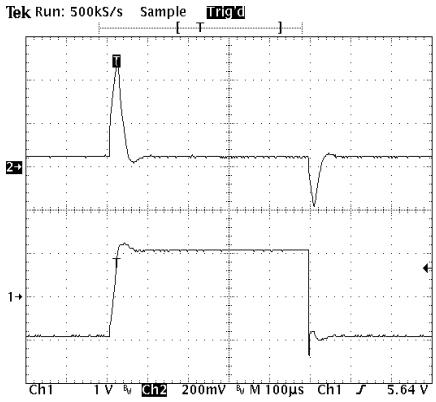
### Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

## Typical Performance Characteristics

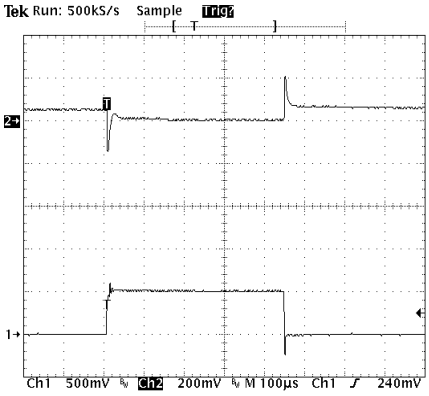
**$V_{IN}$= 5V, $C_{IN}$=1µF, $C_{OUT}$=10µF, $T_A$=25°C, unless otherwise noted.**
**(G1117-25)**

### Line Transient



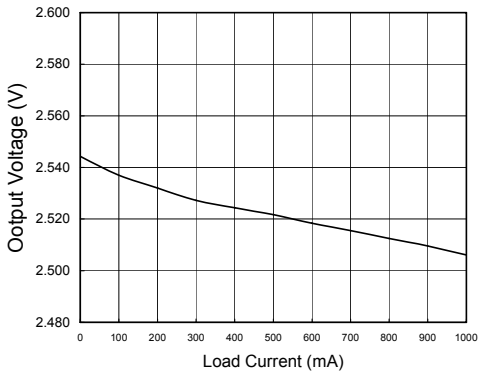

Ch1: Vin (offset=5.0V)
Ch2: Vout (offset=2.50V)
CIN = 1uF
Iout=100mA

### Load Transient

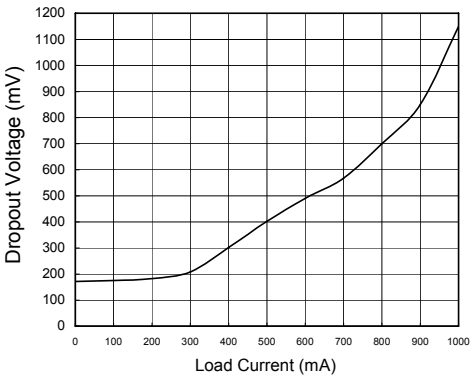



Ch1: Iout (1A/div)
Ch2: Vout (offset=2.50V)

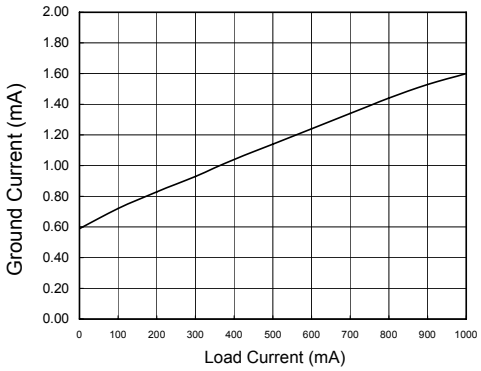
### Output Voltage vs. Load Current




### Dropout Voltage vs. Load Current

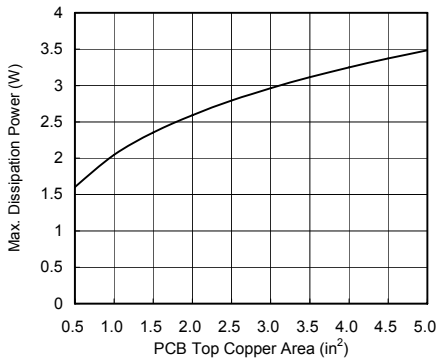



### Ground Current vs. Load Current

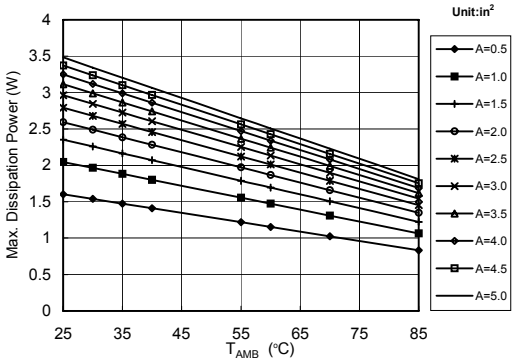


## Typical Performance Characteristics (continued)

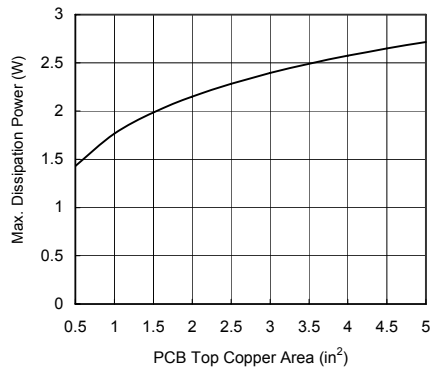
**TO-252 Max. Power Dissipation vs. PCB Top Copper Area**



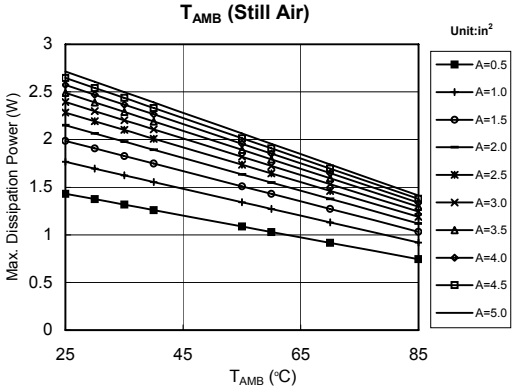

**TO-252 Max. Power Dissipation vs. $T_{AMB}$ ( Still Air)**




**SOT-223 Max. Power Dissipation vs. PCB Top Copper Area**

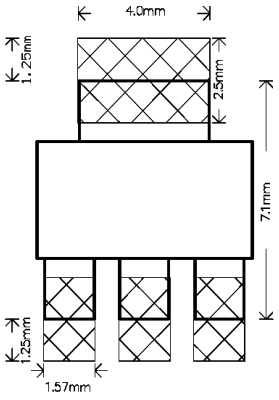



**SOT-223 Max. Power Dissipation vs. PCB Top Copper Area $T_{AMB}$ (Still Air)**

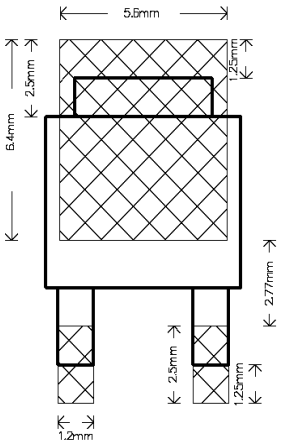



### Recommend Minimum Footprint

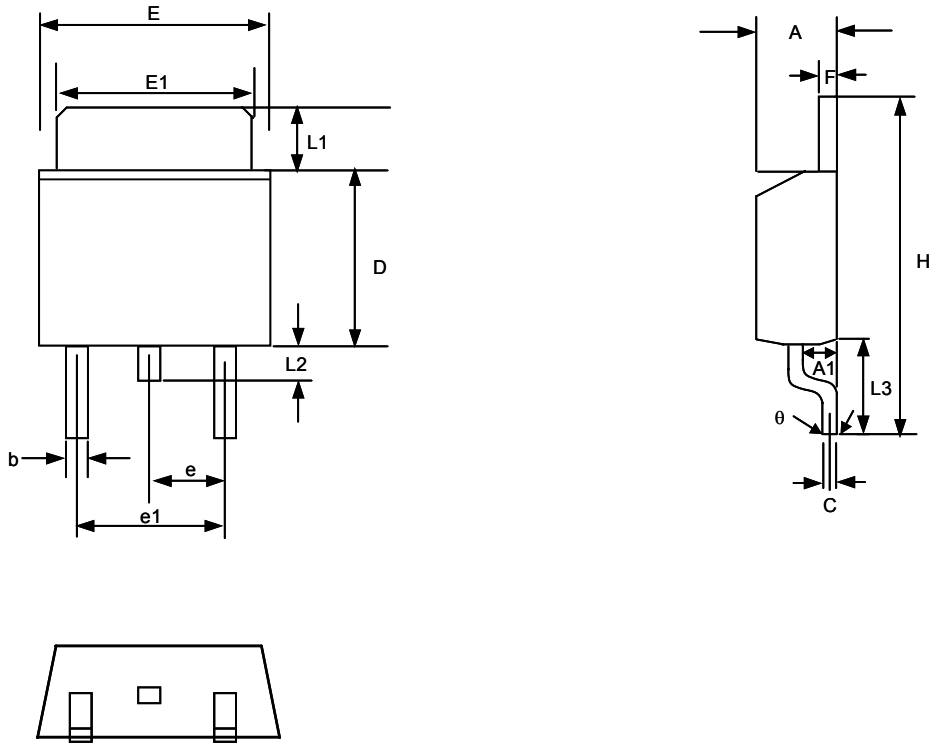
**SOT-223**




**TO-252**

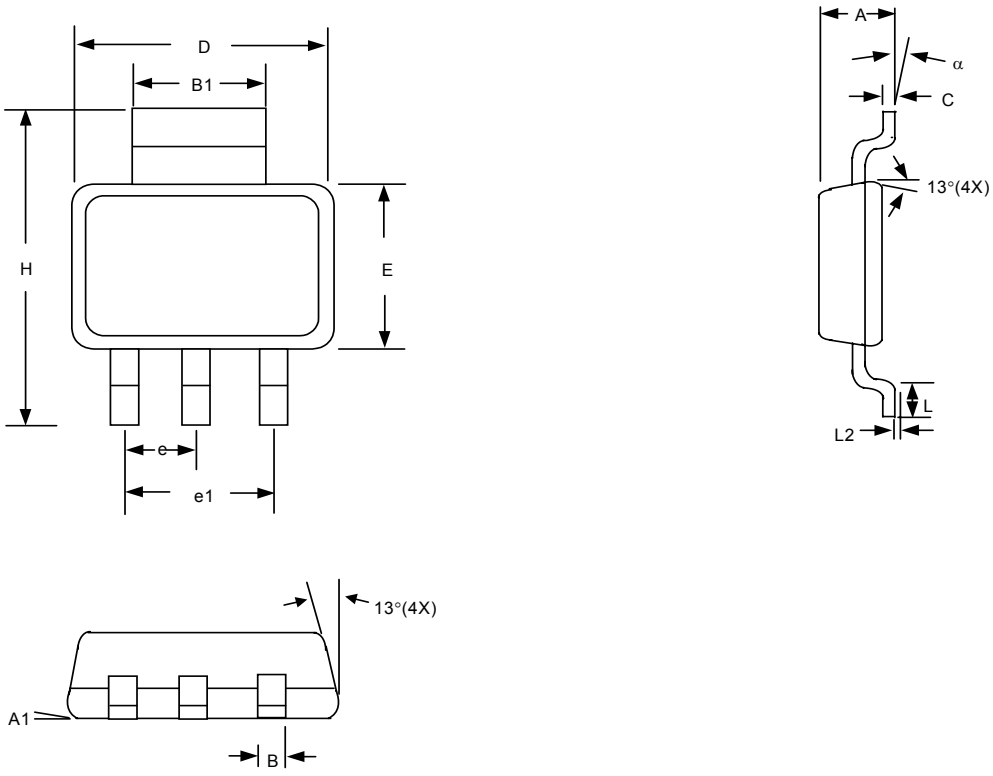


## Package Information




**TO-252 (T4) Package**

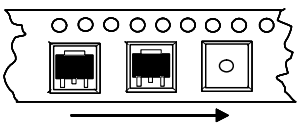
| SYMBOL | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.19 | 2.38 | 0.086 | 0.094 |
| A1 | 0.89 | 1.27 | 0.035 | 0.050 |
| b | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 0.46 | 0.58 | 0.018 | 0.023 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 5.21 | 5.46 | 0.205 | 0.215 |
| e | 2.26BSC | | 0.09BSC | |
| e1 | 3.96 | 5.18 | 0.156 | 0.204 |
| F | 0.46 | 0.58 | 0.018 | 0.023 |
| L1 | 0.89 | 2.03 | 0.035 | 0.080 |
| L2 | 0.64 | 1.02 | 0.025 | 0.040 |
| L3 | 2.40 | 2.80 | 0.095 | 0.110 |
| H | 9.40 | 10.40 | 0.370 | 0.410 |
| θ | 0° | 4° | 0° | 4° |



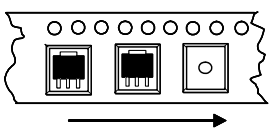

**SOT-223 (T6) Package**

| SYMBOLS | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.55 | 1.80 | 0.061 | 0.071 |
| A1 | 0.02 | 0.12 | 0.0008 | 0.0047 |
| B | 0.60 | 0.80 | 0.024 | 0.031 |
| B1 | 2.90 | 3.10 | 0.114 | 0.122 |
| C | 0.24 | 0.32 | 0.009 | 0.013 |
| D | 6.30 | 6.70 | 0.248 | 0.264 |
| E | 3.30 | 3.70 | 0.130 | 0.146 |
| e | 2.30 BSC | | 0.090 BSC | |
| e1 | 4.60 BSC | | 0.181 BSC | |
| H | 6.70 | 7.30 | 0.264 | 0.287 |
| L | 0.90 MIN | | 0.036 MIN | |
| L2 | 0.06 BSC | | 0.0024 BSC | |
| $\alpha$ | 0° | 10° | 0° | 10° |

## Taping Specification



Feed Direction
TO-252 Package Orientation



Feed Direction
SOT-223 Package Orientation

| PACKAGE | Q'TY/REEL |
|---|---|
| SOT-223 | 2,500 ea |
| TO-252 | 2,500 ea |

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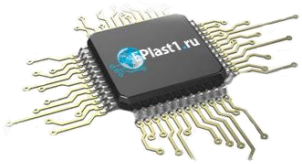
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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