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.

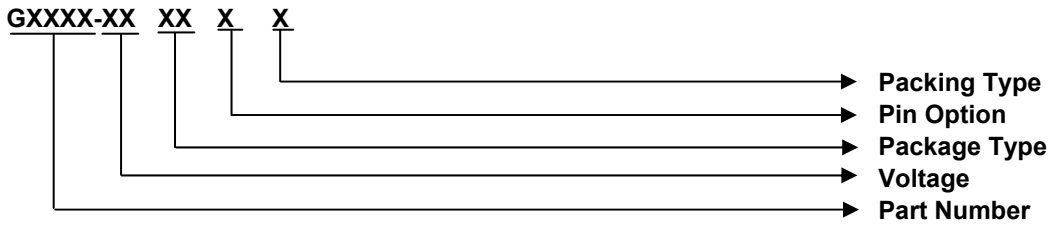
The G1117-XX is available in SOT-223 packages. A minimum of 10μF tantalum electrolytic capacitor is required at the output to improve the transient response and stability.

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}

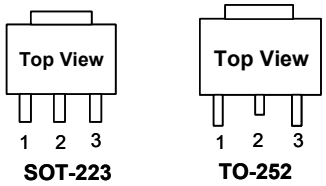
* For other package types and pin options, please contact us at sales@gmt.com.tw

Order Number Identification



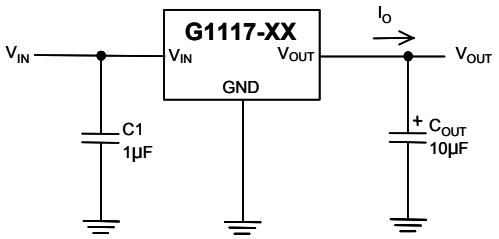
PACKAGE TYPE	PIN OPTION			PACKING
	1	2	3	
T4: TO-252				U : Tape & Reel
T6: SOT-223	3: GND	V_{OUT}	V_{IN}	

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, (θ_{JA})
SOT-223(1). . . . . .116°C/W
TO-252(1) . . . . . 86°C/W
Thermal Resistance Junction to Case, (θ_{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	ΔV_{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, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is T_{jmax}-T_A / θ_{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; θ_{JA} is 116°C/W; in the TO-252 package, θ_{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.

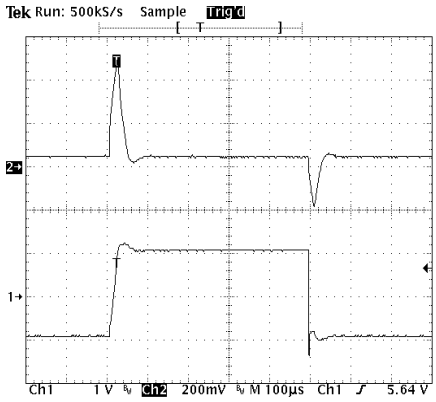
Quiescent Bias Current

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

Typical Performance Characteristics

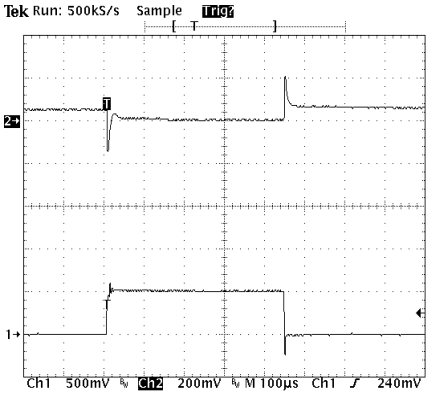
V_{IN}= 5V, C_{IN}=1µF, C_{OUT}=10µF, T_A=25°C, unless otherwise noted.
(G1117-25)

Line Transient



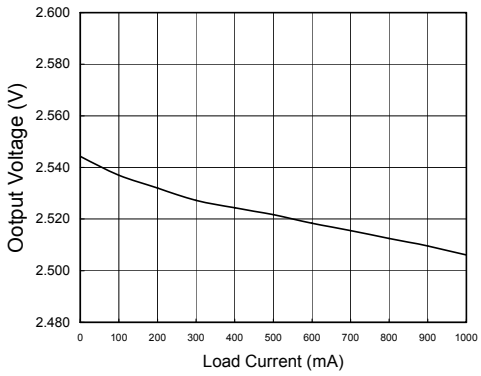
Ch1: Vin (offset=5.0V)
Ch2: Vout (offset=2.50V)
CIN = 1uF
Iout=100mA

Load Transient

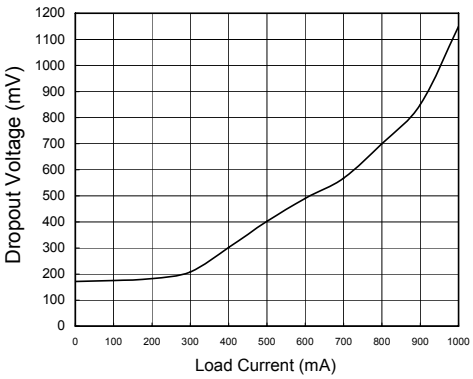


Ch1: Iout (1A/div)
Ch2: Vout (offset=2.50V)

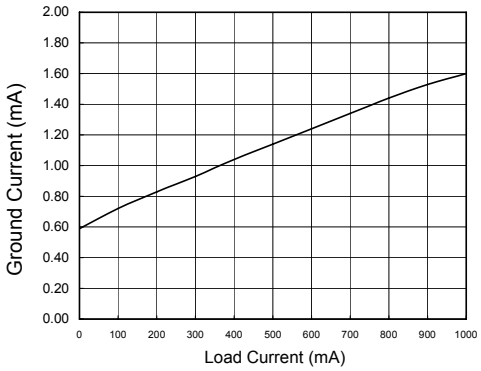
Output Voltage vs. Load Current



Dropout Voltage vs. Load Current

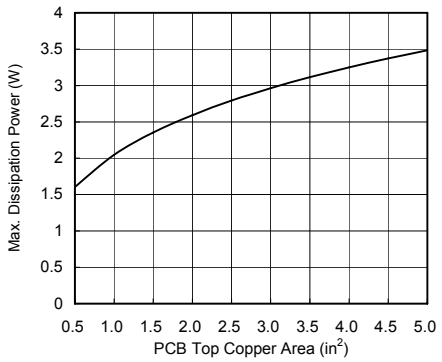


Ground Current vs. Load Current

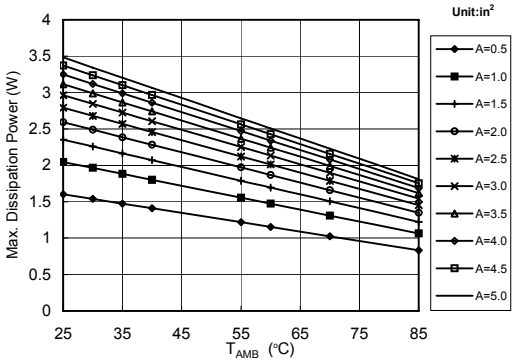


Typical Performance Characteristics (continued)

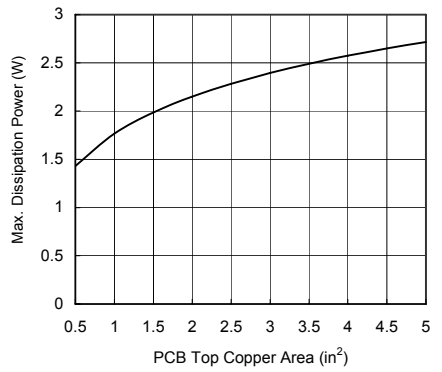
TO-252 Max. Power Dissipation vs. PCB Top Copper Area



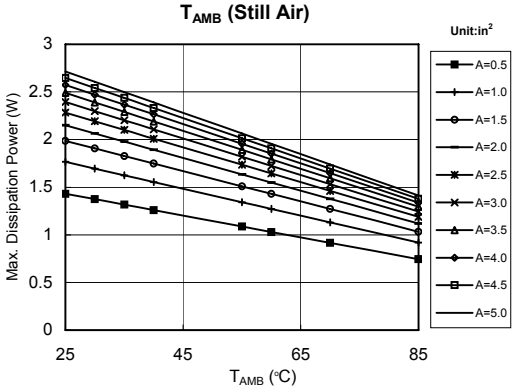
TO-252 Max. Power Dissipation vs. T_{AMB} (Still Air)



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

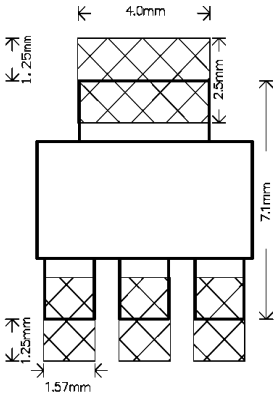


SOT-223 Max. Power Dissipation vs. PCB Top Copper Area T_{AMB} (Still Air)

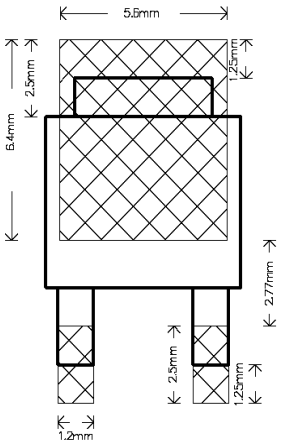


Recommend Minimum Footprint

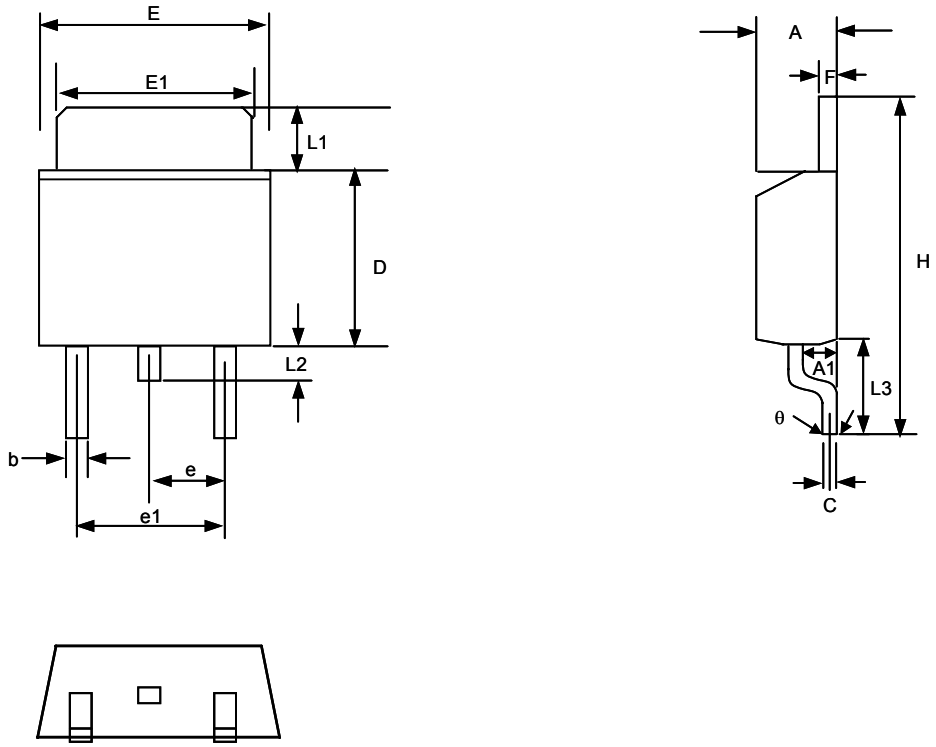
SOT-223



TO-252

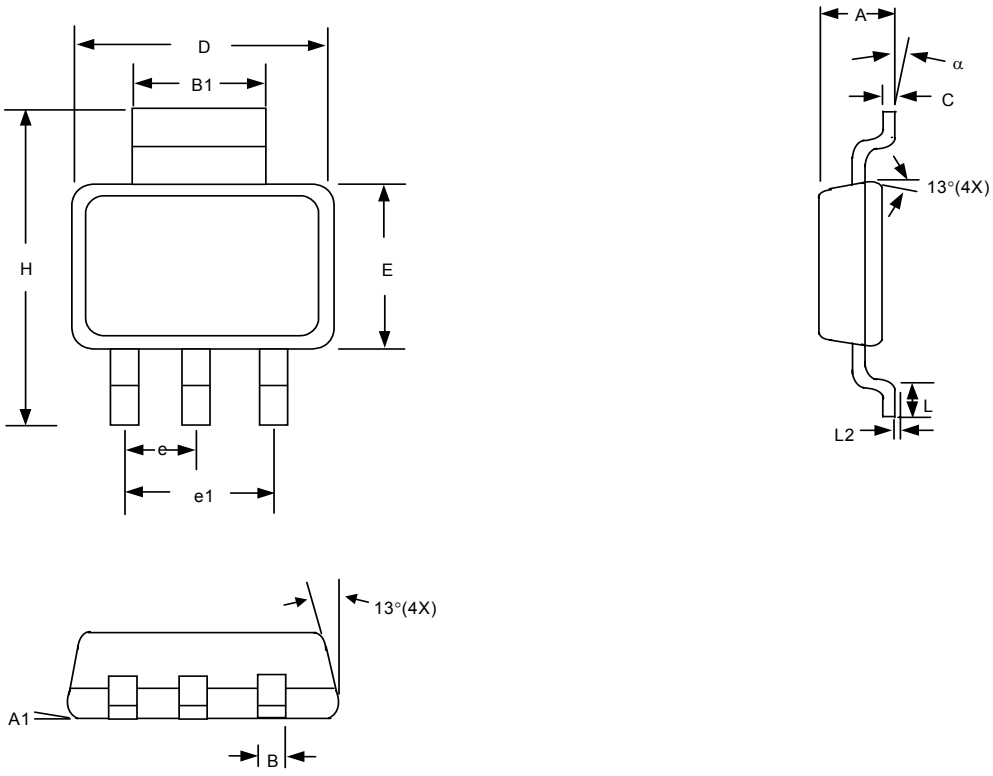


Package Information



TO-252 (T4) Package

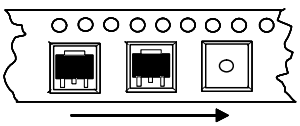
SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.19	2.38	0.086	0.094
A1	0.89	1.27	0.035	0.050
b	0.64	0.89	0.025	0.035
C	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.35	6.73	0.250	0.265
E1	5.21	5.46	0.205	0.215
e	2.26BSC		0.09BSC	
e1	3.96	5.18	0.156	0.204
F	0.46	0.58	0.018	0.023
L1	0.89	2.03	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°



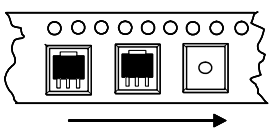
SOT-223 (T6) Package

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	
α	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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