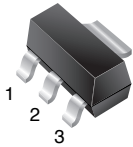


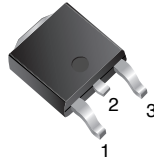
1A Low Dropout Positive Adjustable Regulator

SOT-223



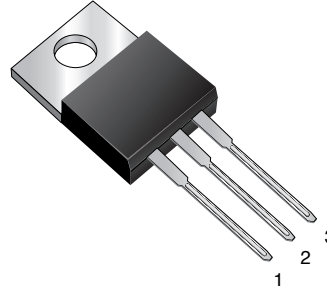
GS1117CST

**TO-252
(DPak)**



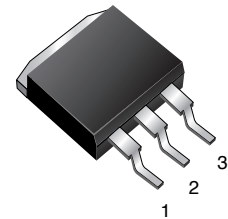
GS1117CE

TO-220AB



GS1117CT

**TO-263AB
(D²Pak)**



GS1117CM

Pin Definition

1. Adjust/Gnd.
2. V_{out} (tab)
3. V_{in}

Features

- Dropout Voltage 1.1V at 1A Output Current
- Fast Transient Response
- Line Regulation typically at 0.04%
- Load Regulation typically at 0.1%
- Internal thermal limiting
- Adjustable Output Voltage or Fixed 1.8V, 2.5V, 2.85V, 3.3V, 5V
- Standard 3-Pin Power Packages

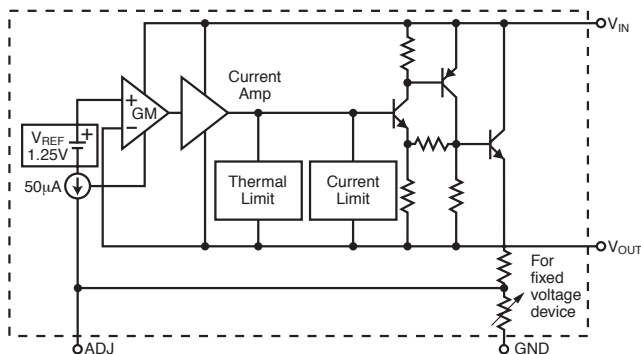
Description

The GS1117 is a low dropout three terminal regulator with 1A output current capability. The output voltage is adjustable with the use of a resistor divider. For fixed output voltage versions, the output voltage is internally set at 1.8V, 2.5V, 2.85V, 3.3V or 5V. Dropout is guaranteed at a maximum of 1.3V at maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Internal thermal limiting provides protection against any overload condition that would create excessive junction temperatures.

Applications

- SCSI-2 Active Terminator
- Post Regulator for Switching Supply
- Battery Chargers
- Constant-Current Regulators
- PC Add-On Card

Functional Block Diagram



Mechanical Data

Case: TO-220AB, TO-263AB (D²PAK), TO-252 (DPAK) and SOT-223

High temperature soldering guaranteed:

260°C/10 seconds at terminals

Case outlines are on the back page

Maximum Ratings and Thermal Characteristics ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Vin Pin to ADJ/GND Pin	Vin	7	V
Thermal Resistance – Junction to Case	R _{θJC}	3.0	°C/W
TO-220AB		8.0	
TO-252		3.0	
TO-263AB SOT-223		15.0	
Operating Junction Temperature Range	T _J	-20 to +125	°C
Storage Temperature Range	T _{stg}	-65 to 150	°C

Electrical Characteristics $T_J = 25\text{ }^\circ\text{C}$, $I_o = 10\text{ mA} - 1\text{ A}$, $V_{IN} = 4.75\text{V} - 7\text{V}$, unless otherwise noted.

Parameter	Symbol	Test Conditions			Test Limits			Unit	
		V _{IN}	I _o	T _J	Min	Typ	Max		
Output Voltage ⁽¹⁾ Fixed Voltage	V _O	5 V	10 mA	0°C ≤ T _J ≤ 125°C	0.99 V _N	V _N	1.01 V _N	V	
Reference Voltage ⁽¹⁾ Adj Voltage	V _{REF}	5 V	10 mA		1.238	1.250	1.262		
Line Regulation ⁽¹⁾	REG _(LINE)		10 mA	0°C ≤ T _J ≤ 125°C			0.03	0.3	%V _O
Load Regulation ⁽¹⁾	REG _(LOAD)	5 V					0.035	0.35	
						0.1	0.3		
Dropout Voltage ΔV _{out} = 1%	V _{DROP}		1A	0°C ≤ T _J ≤ 125°C		1.15	1.3	V	
			500mA				1.05		1.15
			100mA				1.0		1.1
Current Limit	I _{CL}	5 V		0°C ≤ T _J ≤ 125°C	1.0	1.1		A	
Quiescent Current Fixed Model	I _Q	5 V					12	14	mA
Temperature Coefficient	T _C	5 V	0.5 A				0.005		%V _O /°C
Adjust Pin Current	I _{ADJ}						55	120	μA
Adjust Pin Current Change	ΔI _{ADJ}						0.2	5	
Minimum Load Current Adjustable Version	I _O	5 V					5	14	mA
RMS Output Noise ⁽²⁾	V _N	5 V					0.003		%V _O
Ripple Rejection Ratio ⁽³⁾	RR	5 V	10 mA	0°C ≤ T _J ≤ 125°C	60	72		dB	

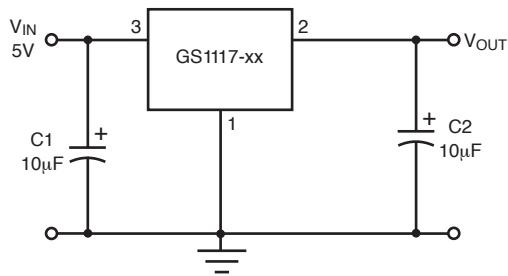
Notes:

(1) Low duty cycle pulse testing with Kelvin connections required..

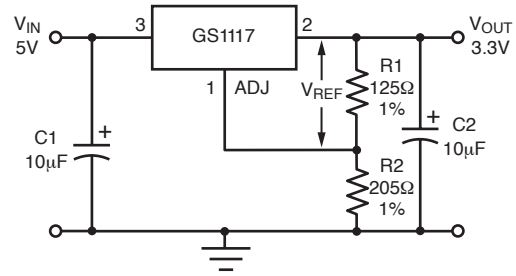
(2) Bandwidth of 10 Hz to 10 KHz.

(3) 120 Hz input ripple (C_{ADJ} for ADJ) = 25 μF.

Typical Application Circuit



Fixed Voltage Regulator



Adjustable Voltage Regulator

Notes:

$V_{REF} = V_{OUT} - V_{ADJ} = 1.25V$ (typ.)

$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$

$I_{ADJ} = 50\mu A$ (typ.)

(1) C1 needed if device is far away from filter capacitors

(2) C2 required for stability

Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig. 1 – Dropout Voltage

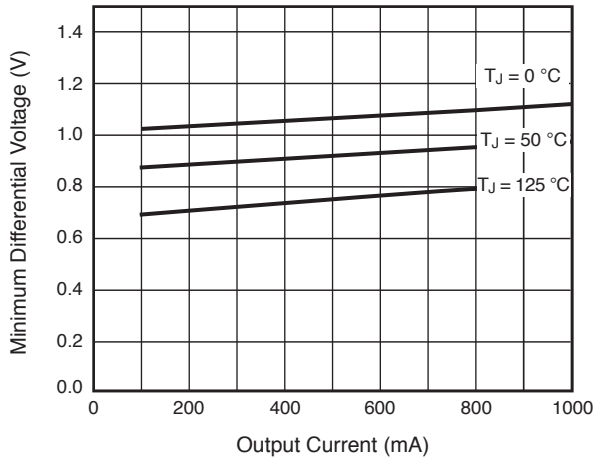


Fig. 2 – Dropout Voltage v.s. Temperature

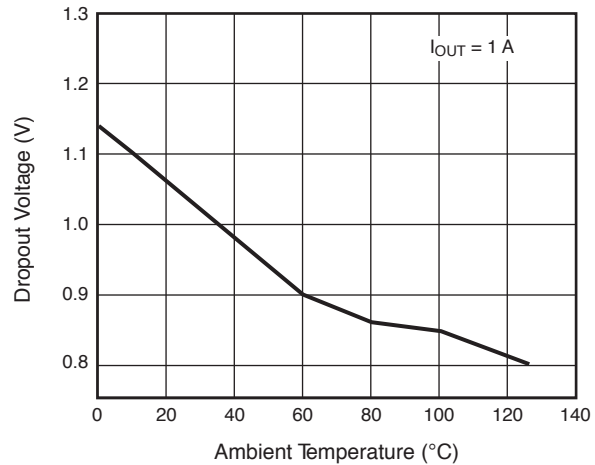


Fig. 3 – Minimum Load Current (Adjustable Version)

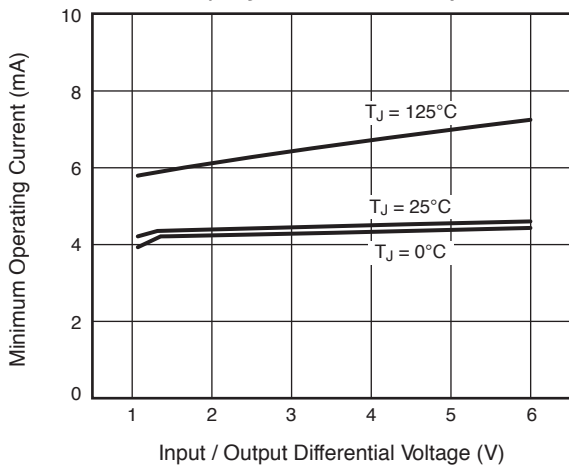


Fig. 4 – Adjust Pin Current

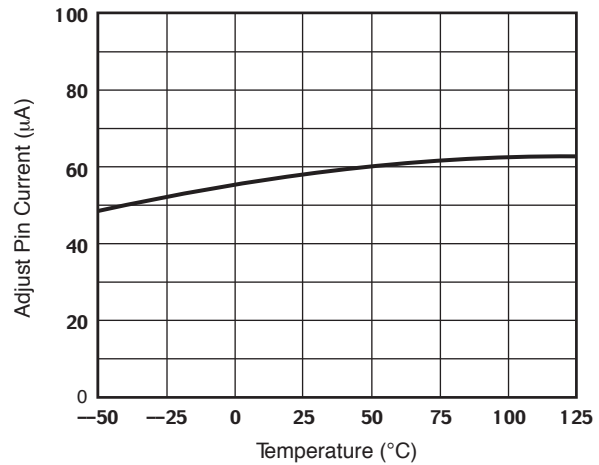


Fig. 5 – Temperature Stability

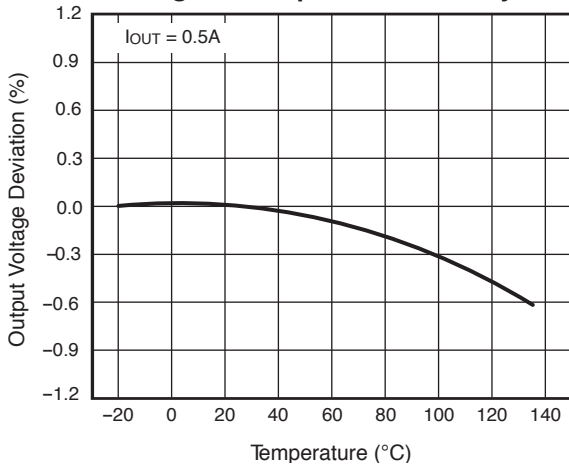
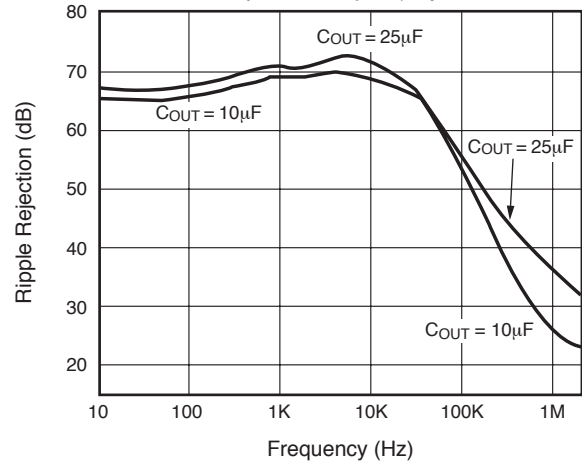


Fig. 6 – Ripple Rejection (with $C_{adj} 25\mu\text{F}$)



Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig. 7 – Load Transient Response

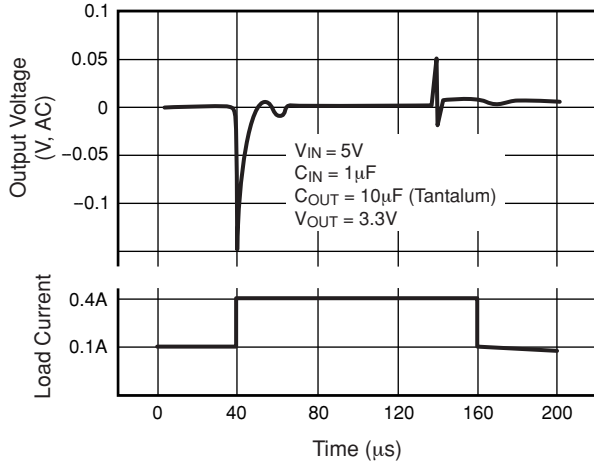
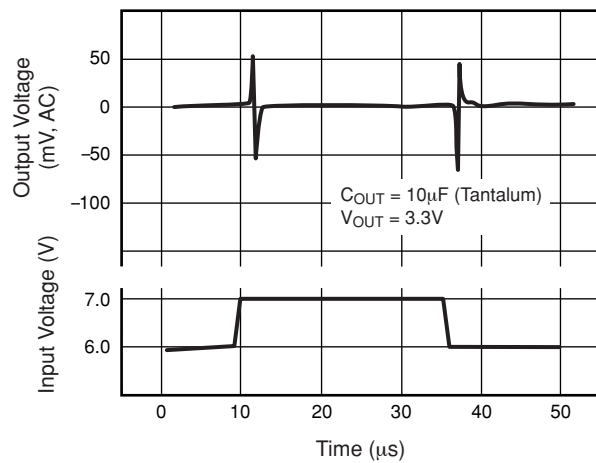


Fig. 8 – Line Transient Response

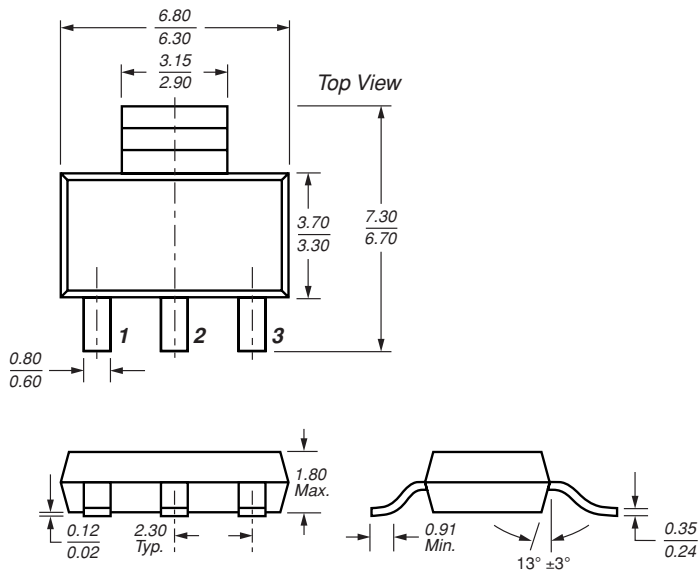


Ordering Information

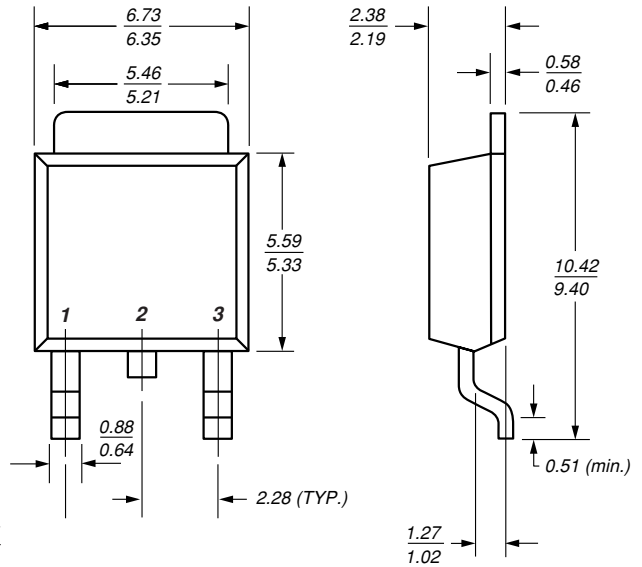
Part Number	Output Voltage (V)	Package
GS1117CST/2F-E3	Adjustable	SOT-223
GS1117CST-18/2F-E3	1.8	
GS1117CST-25/2F-E3	2.5	
GS1117CST-28/2F-E3	2.85	
GS1117CST-33/2F-E3	3.3	
GS1117CST-5/2F-E3	5.0	
GS1117CE/27H	Adjustable	TO-252 DPAK
GS1117CE-1.8/27H	1.8	
GS1117CE-2.5/27H	2.5	
GS1117CE-2.85/27H	2.85	
GS1117CE-3.3/27H	3.3	
GS1117CE-5/27H	5.0	
GS1117CM/31F-E3	Adjustable	TO-263 DPAK
GS1117CM-18/31F-E3	1.8	
GS1117CM-25/31F-E3	2.5	
GS1117CM-28/31F-E3	2.85	
GS1117CM-33/31F-E3	3.3	
GS1117CM-5/31F-E3	5.0	
GS1117CT/45H	Adjustable	TO-220
GS1117CT-1.8/45H	1.8	
GS1117CT-2.5/45H	2.5	
GS1117CT-2.85/45H	2.85	
GS1117CT-3.3/45H	3.3	
GS1117CT-5/45H	5.0	

Case Outlines

SOT-223

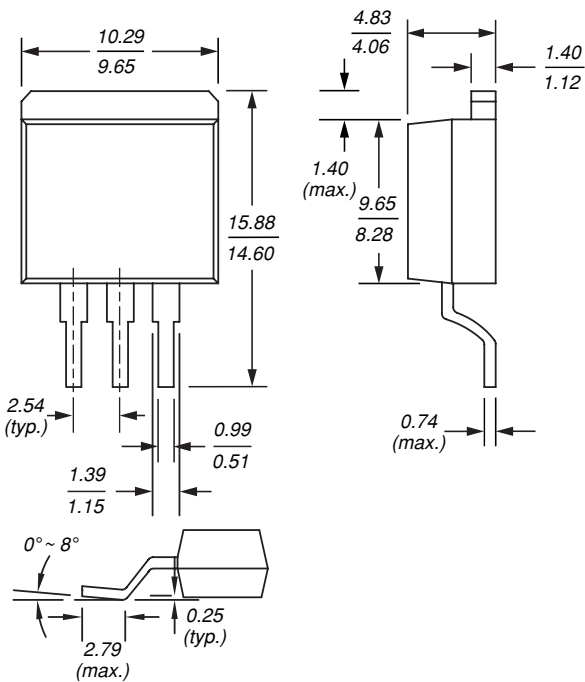


TO-252 (DPAK)



Dimensions in millimeters

TO-263-3L



TO-220

