



# 0.8 AMP POSITIVE VOLTAGE REGULATOR

SC1117

April 13, 1998

TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

## DESCRIPTION

The SC1117 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current. Additionally, the SC1117 series provides excellent regulation over variations in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The SC1117 series of three terminal regulators offer fixed and adjustable voltage options available in both space saving SOT-223 and TO-263 packages.

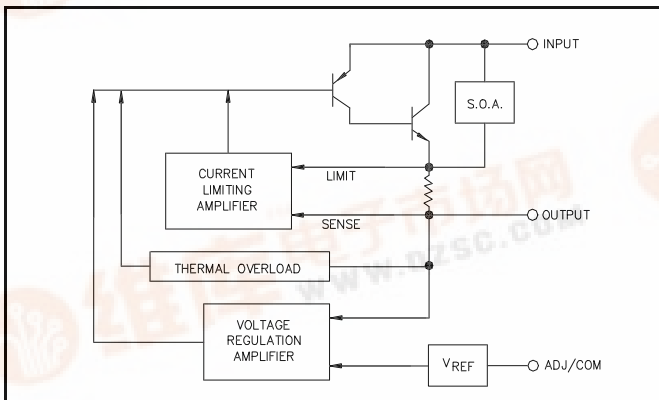
## FEATURES

- $V_{IN}$  15V max.
- Low dropout performance, 1.3V max.
- Full current rating over line and temperature
- Fast transient response
- $\pm 2\%$  total output regulation over line, load and temperature
- Adjust pin current max 120 $\mu$ A over temperature
- Fixed/adjustable output voltage
- Line regulation 0.2% max.
- Load regulation 0.4% max.
- SOT-223 and TO-263 packages

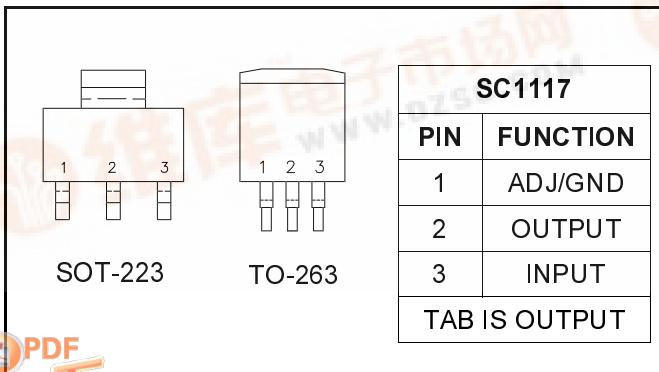
## APPLICATIONS

- Low voltage microcontrollers
- Switching power supply post-regulator

## BLOCK DIAGRAM



## PIN CONFIGURATIONS



## ORDERING INFORMATION

DEVICE <sup>(1)(2)</sup>	PACKAGE	$V_{OUT}$ VOLTS
SC1117CM-X.X SC1117CM	TO-263	See Note (1) 1.30 to 13.5
SC1117CST-X.X SC1117CST	SOT-223	See Note (1) 1.30 to 13.5

Notes:

(1) Where X.X denotes voltage options. Available voltages are: 2.85V, 3.3V and 5V. Leave blank for adjustable version (1.3 to 13.5V). Contact factory for additional voltage options.

(2) Add suffix 'TR' for tape and reel.

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Units
Input Voltage	$V_{IN}$	15	V
Power Dissipation	$P_D$	Internally Limited	W
Thermal Resistance Junction to Case SOT-223 TO-263	$\theta_{JC}$	15 3	$^{\circ}C/W$
Thermal Resistance Junction to Ambient SOT-223 TO-263	$\theta_{JA}$	150 60	$^{\circ}C/W$
Operating Junction Temperature Range	$T_J$	0 to 125	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-65 to 150	$^{\circ}C$
Lead Temperature (Soldering) 10 Sec.	$T_{LEAD}$	260	$^{\circ}C$



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**ELECTRICAL CHARACTERISTICS**

 Unless otherwise noted: Adj  $V_{IN} = 2.65V$  to  $15V$  and Adj  $I_o = 10mA$  to  $800mA$ ;  
 Fixed  $V_{IN} = (V_{OUT} + 1.5)$  to  $15V$  and Fixed  $I_o = 0mA$  to  $800mA$ .

Parameter	Symbol	Test Conditions			Test Limits			Units
		$V_{IN}$	$I_o$	$T_j^{(4)}$	Min	Typ	Max	
Output Voltage <sup>(1)</sup> (Fixed Voltage Versions)	$V_o$	$V_o + 2V$	10mA	25°C	0.99  $V_o$	$V_o$	1.01  $V_o$	V
		( $V_o + 1.5V$ ) to 12V		O.T.	0.98  $V_o$	$V_o$	1.02  $V_o$	
Reference Voltage <sup>(1)</sup> (Adjustable Voltage Version)	$V_{REF}$	5V	10mA	25°C	1.238	1.250	1.262	V
				O.T.	1.225	1.250	1.270	
Line Regulation <sup>(1)</sup>	$REG_{(LINE)}$		10mA	O.T.		0.035	0.2	%
Load Regulation <sup>(1)</sup>	$REG_{(LOAD)}$	6.5V		O.T.		0.2	0.4	%
Dropout Voltage $\Delta V_{OUT}, \Delta V_{REF} = 1\%$	$V_D$		800mA	O.T.		1.2	1.3	V
Current Limit	$I_{CL}$			O.T.	0.8			A
Quiescent Current Fixed Voltage Version	$I_Q$	15V		O.T.		10	14	mA
Temperature Coefficient	$T_C$			O.T.		0.005		%/°C
Adjust Pin Current	$I_{ADJ}$			O.T.		55	120	μA
Adjust Pin Current Change	$\Delta I_{ADJ}$			O.T.		0.2	5	μA
Temperature Stability	$T_S$			O.T.		0.5		%
Minimum Load Current Adj Voltage Version	$I_o$	$V_o + 5V$		O.T.		5	10	mA
RMS Output Noise <sup>(2)</sup>	$V_N$			25°C		0.003		% $V_o$
Ripple Rejection Ratio <sup>(3)</sup>	$R_A$	$V_o + 5V$		O.T.	60	72		dB

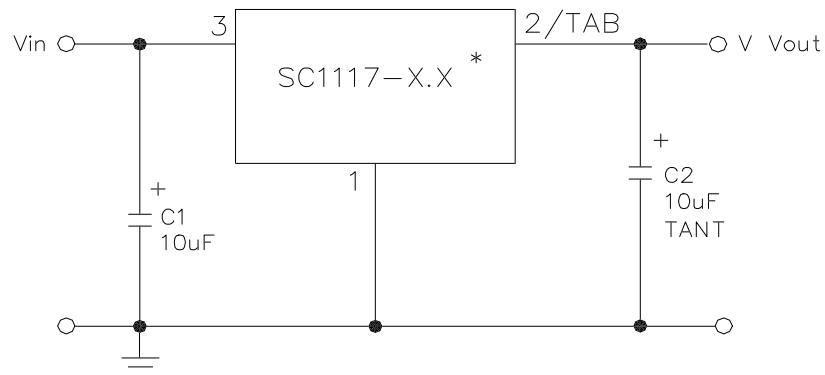
**NOTES:**

1. Low duty cycle pulse testing with Kelvin connections required.
2. Bandwidth of 10 Hz to 10kHz.
3. 120Hz input ripple ( $C_{ADJ}$  for ADJ = 25μF).
4. Over Temp. (O.T.) = over specified operating junction temperature range.

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**TYPICAL APPLICATIONS**

**FIXED VOLTAGE REGULATOR<sup>(1)(2)</sup>**

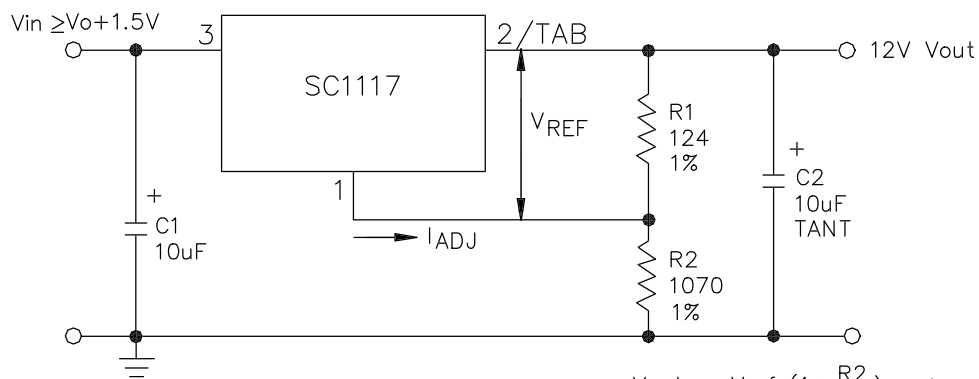


(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.

(2) C2 REQUIRED FOR STABILITY.

\* X.X = 2.85, 3.3 OR 5.0

**ADJUSTABLE VOLTAGE REGULATOR<sup>(1)(2)</sup>**



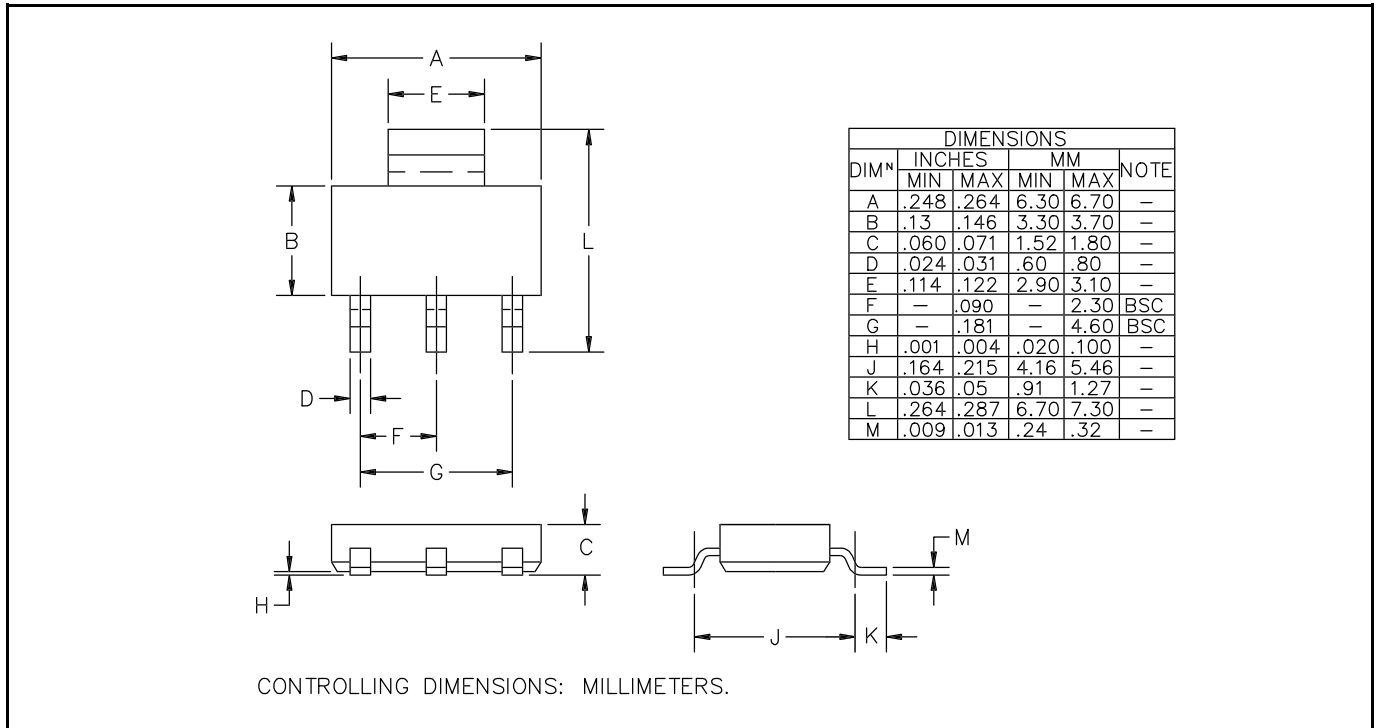
$$V_{out} = V_{ref} \left(1 + \frac{R_2}{R_1}\right) + I_{ADJ} R_2$$

(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.

(2) C2 REQUIRED FOR STABILITY.

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**DEVICE OUTLINE - SOT-223**



**DEVICE OUTLINE - TO-263**

