0.8 AMP POSITIVE VOLTAGE REGULATOR

SC1117

April 13, 1998

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

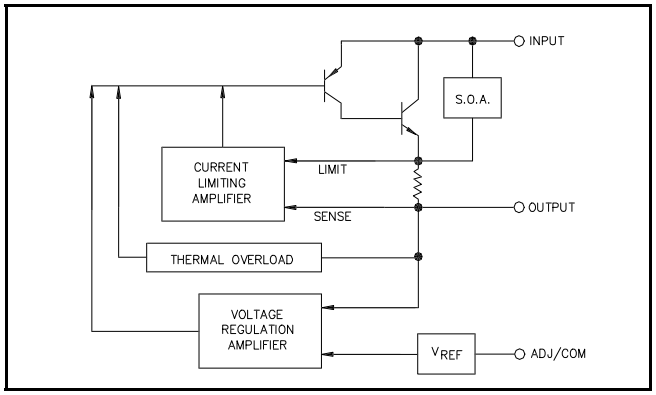
DESCRIPTION

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.

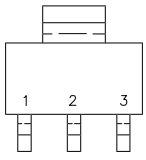
APPLICATIONS

- Low voltage microcontrollers
- Switching power supply post-regulator

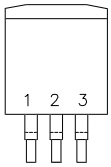
BLOCK DIAGRAM



PIN CONFIGURATIONS



SOT-223



TO-263

SC1117	
PIN	**FUNCTION**
1	ADJ/GND
2	OUTPUT
3	INPUT
TAB IS OUTPUT	

FEATURES

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

ORDERING INFORMATION

DEVICE(1)(2)	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	Vin	15	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction to Case SOT-223 TO-263	θ_{JC}	 15 3	°C/W
Thermal Resistance Junction to Ambient SOT-223 TO-263	θ_{JA}	 150 60	°C/W
Operating Junction Temperature Range	T_J	0 to 125	°C
Storage Temperature Range	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering) 10 Sec.	T_{LEAD}	260	°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.

		Test Conditions			Test Limits			
Parameter	**Symbol**	**V_{IN}**	**I_O**	**T_j (4)**	**Min**	**Typ**	**Max**	**Units**
Output Voltage (1)	V_O	V_O + 2V	10mA	25°C	0.99V_O	V_O	1.01V_O	V
(Fixed Voltage Versions)		(V_O + 1.5V) to 12V		O.T.	0.98V_O	V_O	1.02V_O	
Reference Voltage(1)	V_{REF}	5V	10mA	25°C	1.238	1.250	1.262	V
(Adjustable Voltage Version)				O.T.	1.225	1.250	1.270	
Line Regulation(1)	$REG_{(LINE)}$		10mA	O.T.		0.035	0.2	%
Load Regulation(1)	$REG_{(LOAD)}$	6.5V		O.T.		0.2	0.4	%
Dropout Voltage ΔV_{OUT}, ΔV_{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	ΔI_{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(2)	V_N			25°C		0.003		%V_O
Ripple Rejection Ratio(3)	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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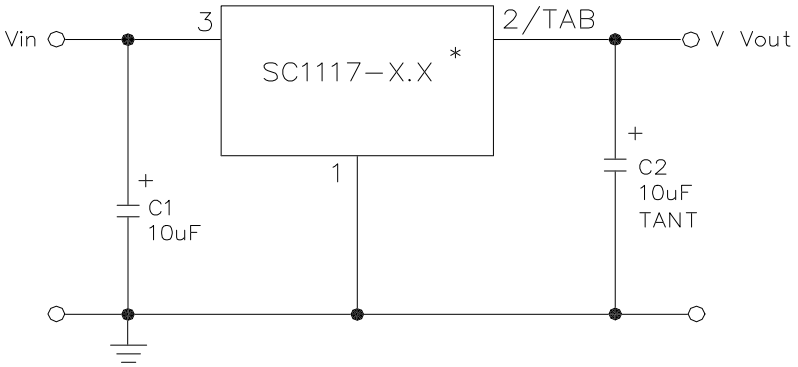
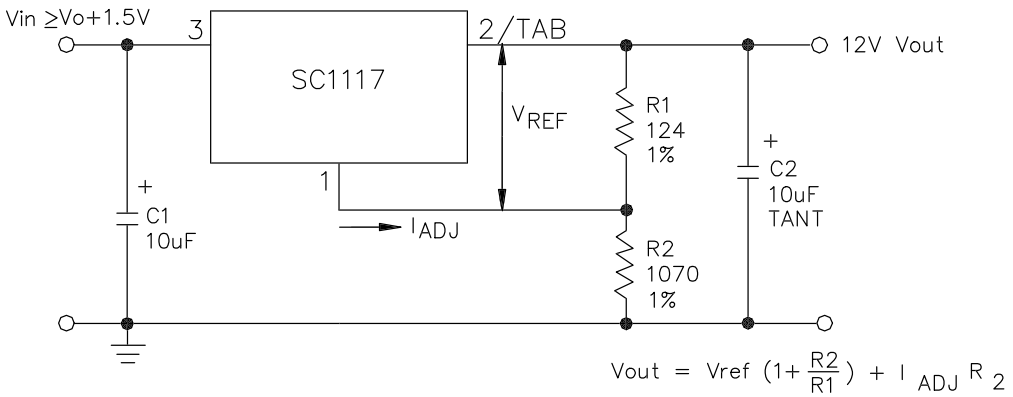
TYPICAL APPLICATIONS

FIXED VOLTAGE REGULATOR[1][2]



(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[1][2]



(1) C1 NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS.
(2) C2 REQUIRED FOR STABILITY.

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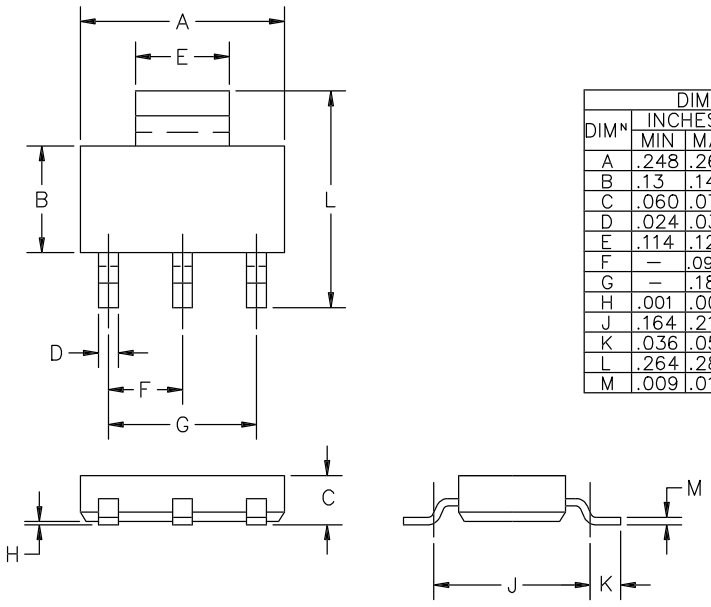
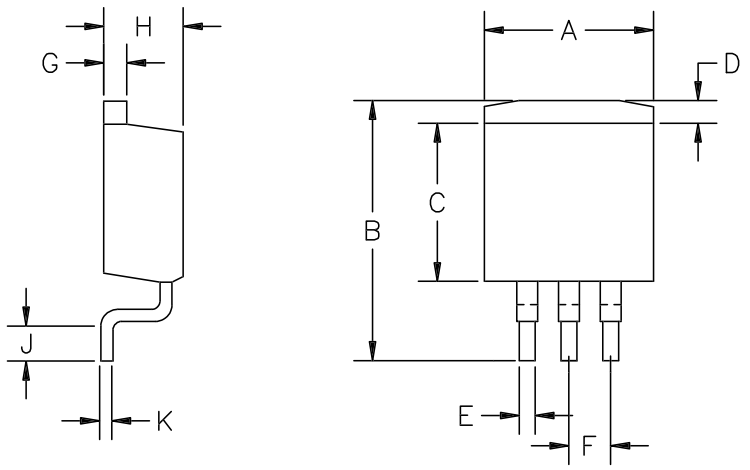
DEVICE OUTLINE - SOT-223



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.248	.264	6.30	6.70	–
B	.13	.146	3.30	3.70	–
C	.060	.071	1.52	1.80	–
D	.024	.031	.60	.80	–
E	.114	.122	2.90	3.10	–
F	–	.090	–	2.30	BSC
G	–	.181	–	4.60	BSC
H	.001	.004	.020	.100	–
J	.164	.215	4.16	5.46	–
K	.036	.05	.91	1.27	–
L	.264	.287	6.70	7.30	–
M	.009	.013	.24	.32	–

CONTROLLING DIMENSIONS: MILLIMETERS.

DEVICE OUTLINE - TO-263



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.380	.405	9.65	10.29	–
B	.575	.625	14.60	15.88	–
C	.325	.340	8.25	8.64	–
D	.055	.066	1.40	1.68	–
E	.020	.039	.50	.99	–
F	.100 BSC		2.54 BSC		–
G	.045	.055	1.14	1.40	–
H	.160	.190	4.06	4.83	–
J	.090	.110	2.28	2.80	–
K	.018	.029	.457	.736	–

JEDEC TO-263