EZ1117
0.8 & 1.0 Amp Positive Voltage Regulators

Description

The EZ1117 series of high performance positive voltage regulators are designed for use in applications requiring low dropout performance at up to 0.8A.

Additionally, the EZ1117 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 EZ1117 series of three terminal regulators offer fixed and adjustable voltage options available in the space saving SOT-223 and TO-263 packages.

Features

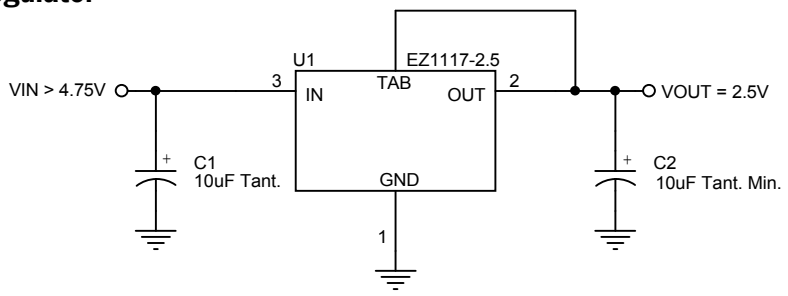
- Low dropout performance: 1.2V max.
- Full current rating over line and temperature
- Fast transient response
- ±2% total output regulation over line, load and temperature
- Adjust pin current max 90µA over temperature
- Fixed/adjustable output voltage
- Line regulation 0.2% max.
- Load regulation 0.4% max.
- SOT-223 and TO-263 packages

Applications

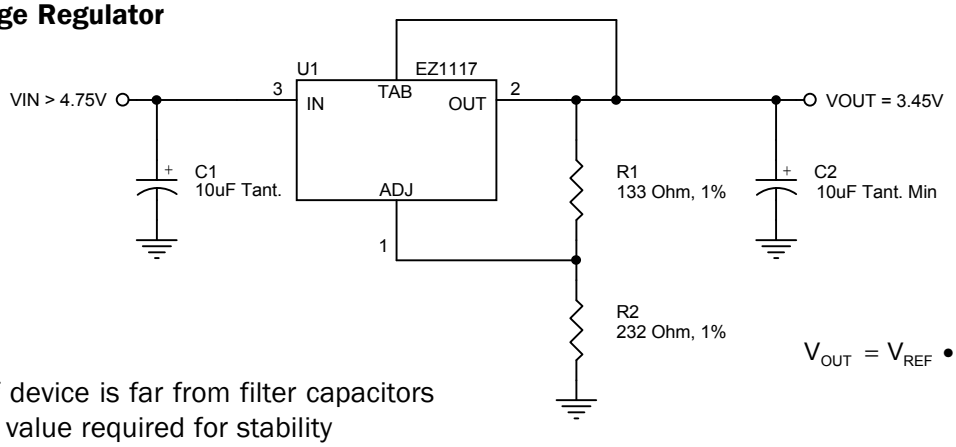
- Low voltage microcontrollers
- Switching power supply post-regulation

Typical Application Circuit

Fixed Voltage Regulator



Adjustable Voltage Regulator



$$V_{OUT} = V_{REF} \bullet \left(1 + \frac{R2}{R1}\right) + I_{ADJ} \bullet R2$$

Notes:

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

(2) C2 minimum value required for stability

Absolute Maximum Ratings

Exceeding the specifications below may result in permanent damage to the device, or device malfunction. Operation outside of the parameters specified in the Electrical Characteristics section is not implied.

Parameter	Symbol	Maximum	Units
Input Supply Voltage	V_{IN}	7	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}	 156 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}	300	°C
ESD Rating (Human Body Model)	ESD	2	kV

Electrical Characteristics(6)

Unless otherwise specified: Adj. Option: V_{IN} = 2.65V to 7.0V and I_O = 10mA to I_{RATED}. Fixed Options: I_O = 0mA to I_{RATED}, V_{IN} (2.5V) = 3.9V to 7.0V.

Parameter	Symbol	V_{IN}	I_O	T_J(5)	Min	Typ	Max	Units
Output Voltage (1)	V_O	5V	OmA	25°C	-1.5%	V_O	+1.5%	V
(Fixed Voltage Versions)				O.T.	-2%		+2%	
Reference Voltage (1)	V_{REF}	5V	10mA	25°C	1.231	1.250	1.269	V
(Adj Voltage Version)				O.T.	1.225		1.275	
Line Regulation (1)	$REG_{(LINE)}$		10mA	O.T.		0.035	0.2	%
Load Regulation (1)	$REG_{(LOAD)}$	5V		O.T.		0.2	0.4	%
Dropout Voltage(1)(2)	V_D		100mA 500mA 800mA	O.T.		1.00 1.05 1.10	1.10 1.15 1.20	V
Current Limit	I_{CL}			O.T.	0.8			A
Quiescent Current Fixed Voltage Version	I_Q	5V		O.T.		10	13	mA
Temperature Coefficient	T_C			O.T.		0.005		%/°C

Electrical Characteristics (Cont.)(6)

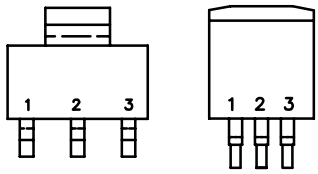
Unless otherwise specified: Adj. Option: V_{IN} = 2.65V to 7.0V and I_O = 10mA to I_{RATED}. Fixed Options: I_O = 0mA to I_{RATED}, V_{IN} (2.5V) = 3.9V to 7.0V.

Parameter	Symbol	V_{IN}	I_O	T_J(5)	Min	Typ	Max	Units
Adjust Pin Current	I_{ADJ}			O.T.		55	90	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	5V		O.T.		5	10	mA
RMS Output Noise(3)	V_N			25°C		0.003		$\%V_O$
Ripple Rejection Ratio(4)	R_A	5V	I_{RATED}	O.T.	60	72		dB

NOTES:

(1) Low duty cycle pulse testing with Kelvin connections required.
(2) ΔV_{OUT}, ΔV_{REF} = 1%.
(3) Bandwidth of 10 Hz to 10kHz.
(4) 120Hz input ripple (C_{ADJ} for ADJ = 25µF).
(5) O.T. = over specified operating junction temperature range.
(6) I_{RATED} = 800mA.

Pin Configuration



SOT-223 TO-263

PIN	FUNCTION
1	ADJ/GND
2	OUTPUT
3	INPUT

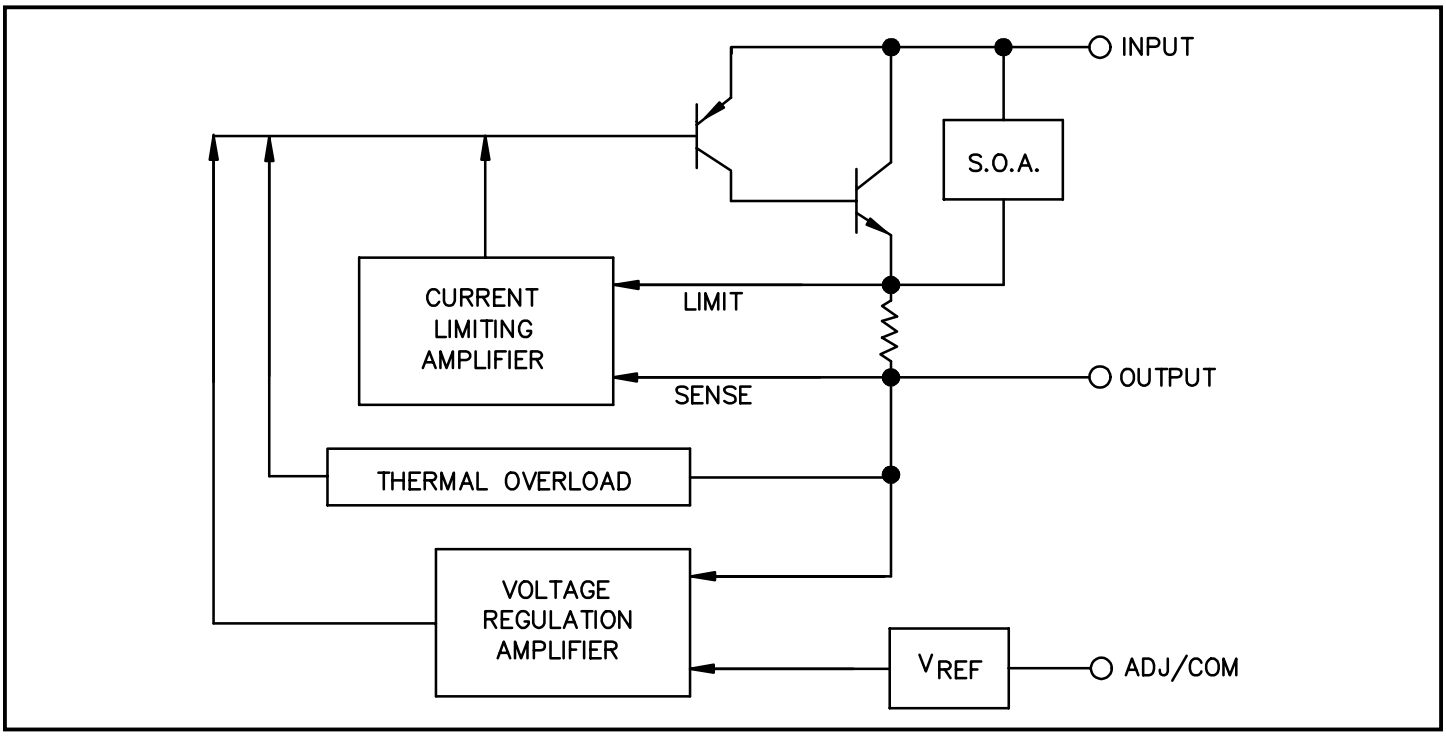
TAB IS OUTPUT

Ordering Information

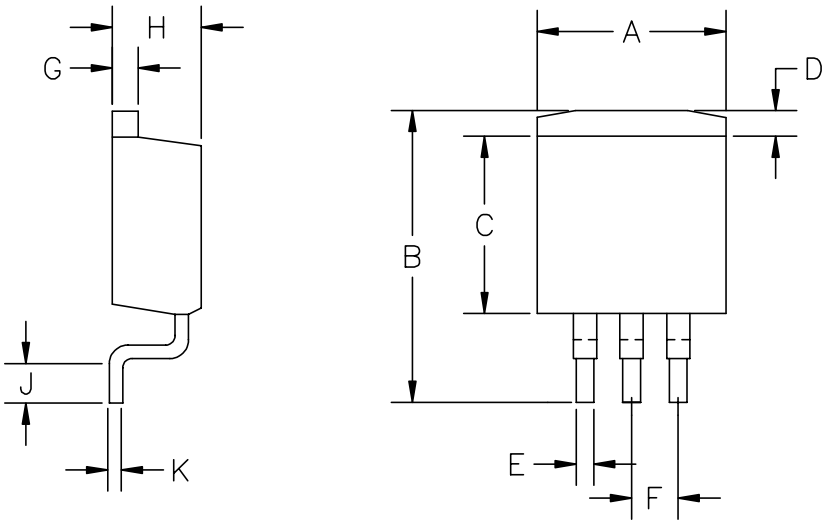
Device (1)(2)	Package
EZ1117CST-X.X.TR	SOT-223
EZ1117CM-X.X.TR	TO-263

Notes:
(1) Where X.X denotes voltage options. Available voltage is: 2.5V. Leave blank for adjustable version (1.3 to 5.7V). Contact factory for additional voltage options.
(2) Only available in tape and reel packaging. A reel contains 2500 (SOT-223) or 800 (TO-263) devices.

Block Diagram



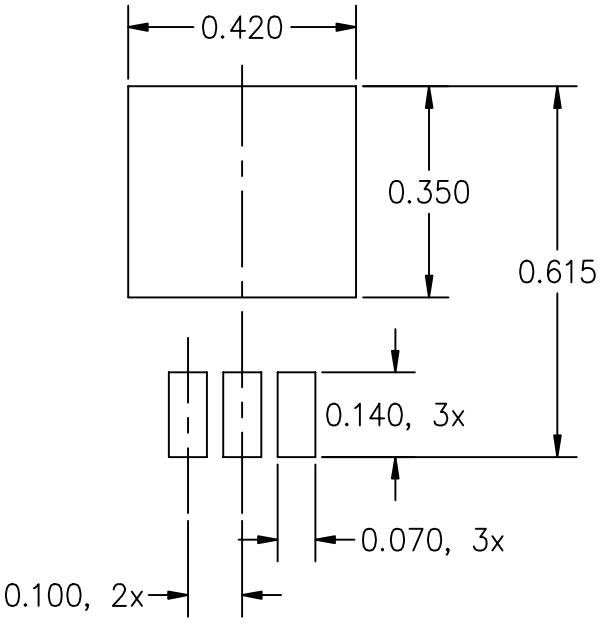
Outline Drawing - TO-263



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	—

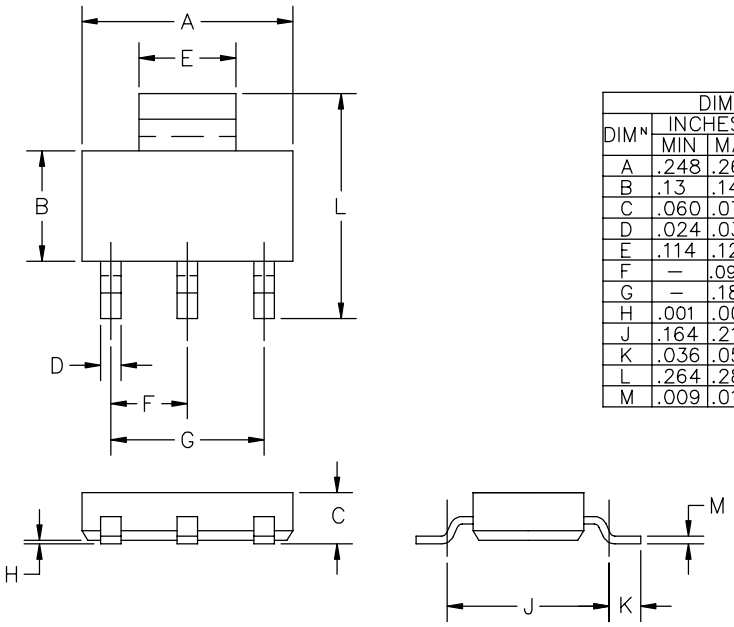
JEDEC TO-263

Land Pattern - TO-263



NOTE: ALL DIMENSIONS ARE IN INCHES

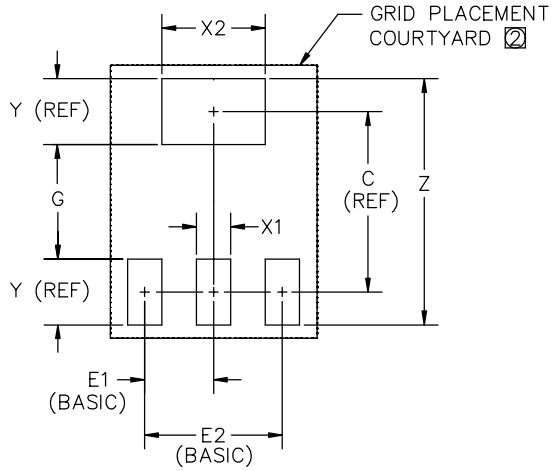
Outline Drawing - SOT-223



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.

Land Pattern - SOT-223



DIMENSIONS (1)					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
C	–	.24	–	6.20	–
E1	–	.09	–	2.30	–
E2	–	.18	–	4.60	–
G	.15	.16	4.00	4.20	–
X1	.03	.04	1.00	1.20	–
X2	.13	.14	3.40	3.60	–
Y	–	.09	–	2.20	–
Z	.32	.33	8.20	8.40	–

(2) GRID PLACEMENT COURTYARD IS 18 x 14 ELEMENTS (9 mm X 7mm) IN ACCORDANCE WITH THE INTERNATIONAL GRID DETAILED IN IEC PUBLICATION 97.

(1) CONTROLLING DIMENSION: MILLIMETERS

Contact Information

Semtech Corporation
Power Management Products Division
200 Flynn Road, Camarillo, CA. 93012
Phone: (805)498-2111 FAX (805)498-3804