

TS1117B

800mA Low Dropout Positive Voltage Regulator

General Description

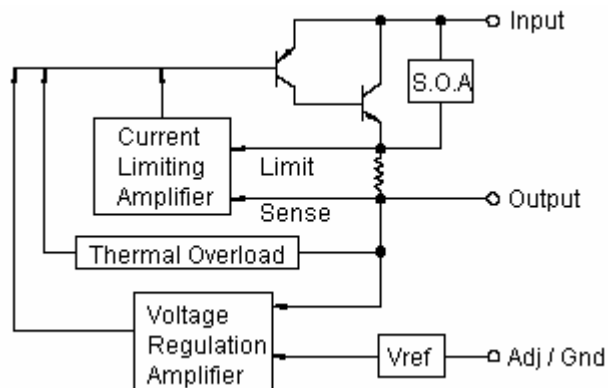
The TS1117B Series are high performance positive voltage regulators are designed for use in applications requiring low dropout performance at full rated current, Additionally, the TS1117B Series provides excellent regulation over variations due to changes in line, load and temperature. Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device. The TS1117B Series are three terminal regulators with fixed and adjustable voltage options available in popular packages.

This series is offered in 3-pin TO-252 SOT-223 and 8-pin SOP package.

Features

- ◇ 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 90uA (typ.)
- ◇ Line regulation typical 0.015%.
- ◇ Load regulation typical 0.05%.
- ◇ Fixed/adjustable output voltage
- ◇ TO-252 SOT-223 and SOP-8 package

Block Diagram



Ordering Information

Part No.	Operating Temp. (Junction)	Package
TS1117BCS xx	-20 ~ +85 °C	SOP-8
TS1117BCP xx		TO-252
TS1117BCW xx		SOT-223

Note: Where **xx** denotes voltage option,
50= 5.0V
33= 3.3V
25= 2.5V
18= 1.8V
Leave blank for adjustable version.

Absolute Maximum Rating

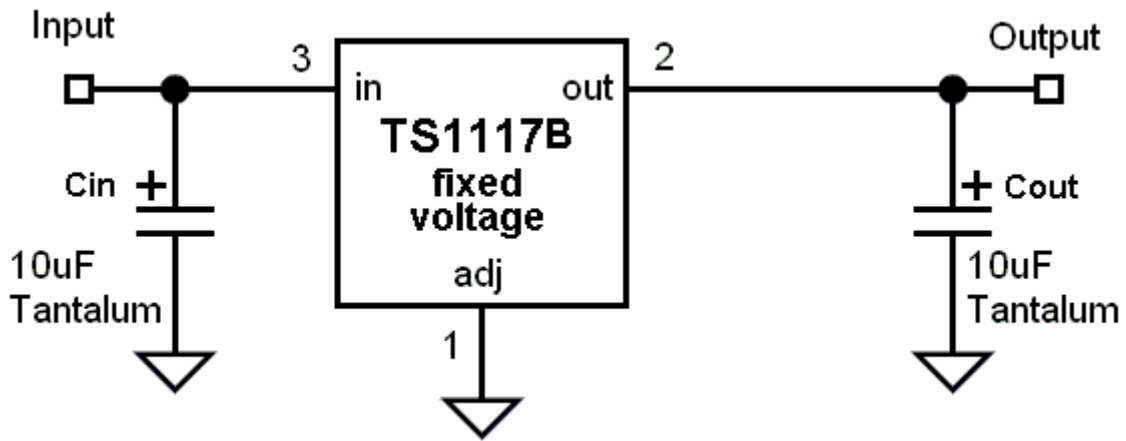
Input Supply Voltage	V _{in}	15	V
Operation Input Supply Voltage	V _{in} (opt. Typ.)	12	V
Power Dissipation	P _D	Internally Limited	W
Operating Junction Temperature Range	T _J	-20 ~ +125	°C
Storage Temperature Range	T _{STG}	-65 ~ +150	°C
Lead Soldering Temperature (260 °C)		5	S

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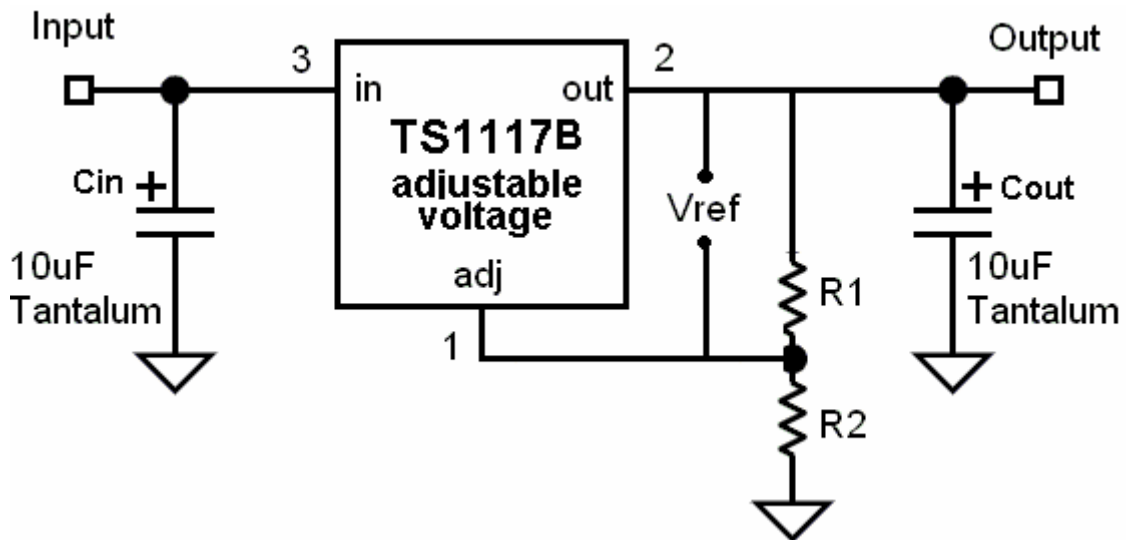
Electrical Characteristics					
Ta = 25 °C, unless otherwise specified. Adjustable version test with Vout = 2.5V.					
Parameter	Conditions	Min	Typ	Max	Unit
Output Voltage	Vout+1.5V ≤ Vin ≤ 12V, Io=10mA	0.990 Vo	5.0 / 3.3	1.010 Vo	V
	Vout+1.5V ≤ Vin ≤ 12V, Io=800mA	0.980 Vo	2.5 / 1.8	1.020 Vo	V
Reference Voltage	(Vin-out) = 1.5V, Io=10mA	0.990 Vo	1.25	1.010 Vo	V
	(Vin-out) = 1.5V, Io=800mA	0.980 Vo		1.020 Vo	V
Input Supply Voltage		--	--	12	V
Line Regulation	Vout+1.5V ≤ Vin ≤ 12V, Io=10mA	--	0.015	0.3	%
Load Regulation (note 1,2)	Vin=Vout+1.5V, 10mA ≤ Io ≤ 800mA	--	0.05	1.0	%
					%
Dropout Voltage	Io=800mA, ΔVout=1%Vout	--	1.0	1.3	V
Minimum Load Current	Vin=5V	--	8	10	mA
Adjustable Pin Current		--	90	--	uA
Current Limit	Vin - Vout=3V	1.1	--	--	A
Temperature Stability	Io=10mA	--	0.5	--	%
Ripple Rejection	F = 120Hz, Io=1A Cout=25uF, Vin=Vout + 3V	--	60	70	dB
Thermal Performance					
Condition	Package type	Typ		Unit	
Thermal Resistance Junction to Ambient	TO-252	90		°C/W	
	SOP-8	160			
	SOT-223	165			
<p>Note 1: See thermal regulation specification for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead = 1/18" from the package.</p> <p>Note 2: Line and load regulation are guaranteed up to the maximum power dissipation of 15W. Power dissipation is determined by the input / output voltage difference and the output current. Guaranteed maximum power dissipation will not be available over the full input / output voltage range.</p> <p>Note 3: Quiescent current is defined as the minimum output current required to maintain the regulation.</p>					

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Typical Application Circuit



Fixed output voltage version



$$V_{out} = V_{ref} * (1 + R2 / R1)$$

* C_{in} is requested if regulator is located Far from power supply filter

** Design C_{out} as close to V_{out} pin as possible

Adjustable output voltage version

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Electrical Characteristics Curve

Figure 1: dropout voltage v.s. output current

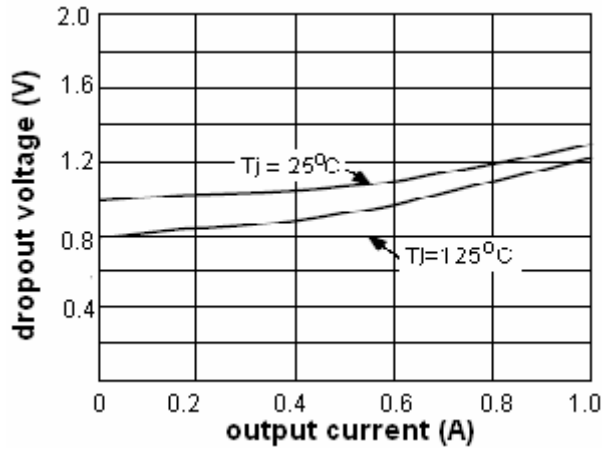


Figure 2: load regulation v.s. temp.

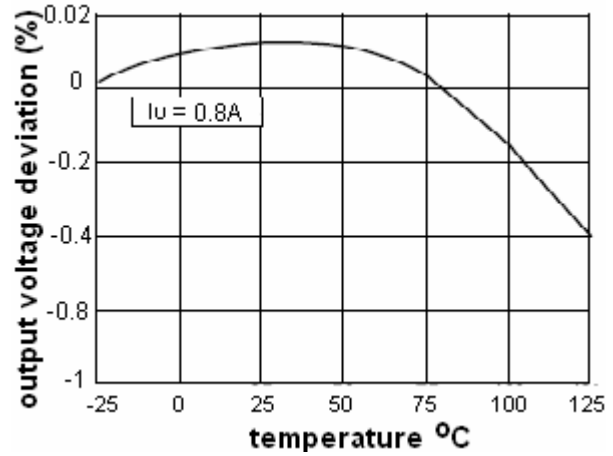


Figure 3: output change v.s. temp.

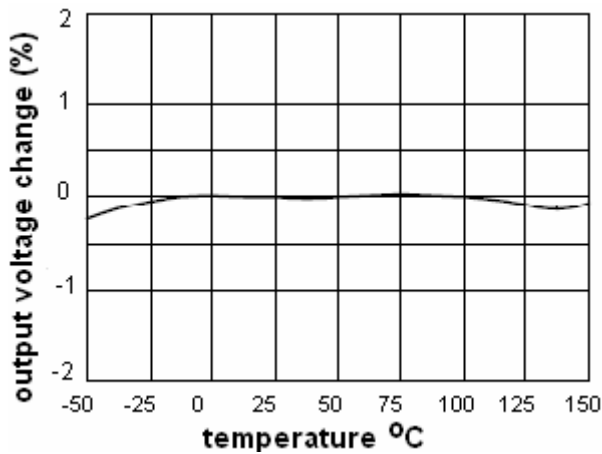


Figure 4: line regulation

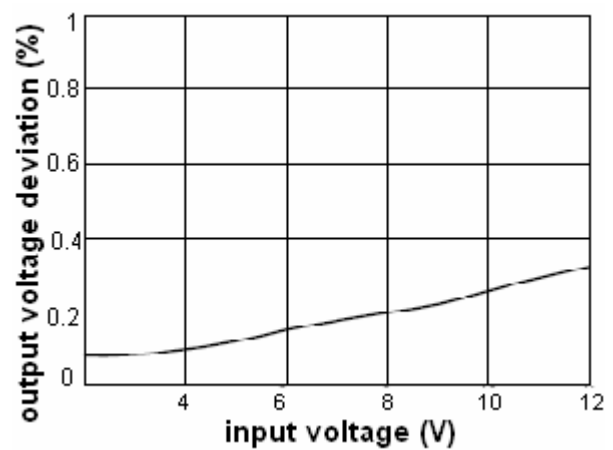


Figure 5: line transient response

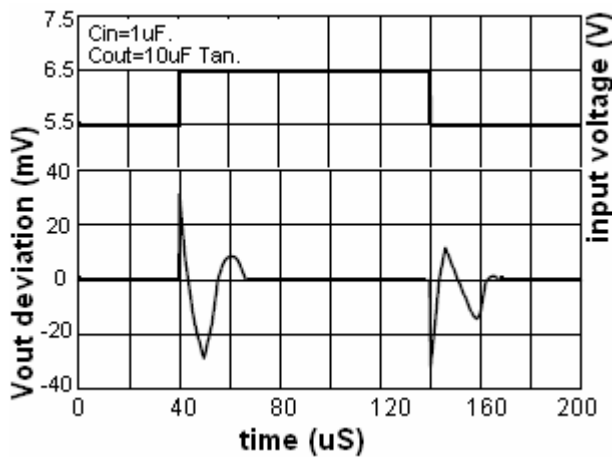
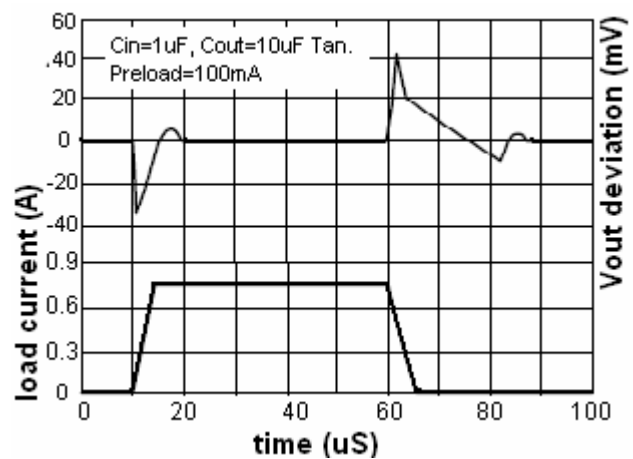
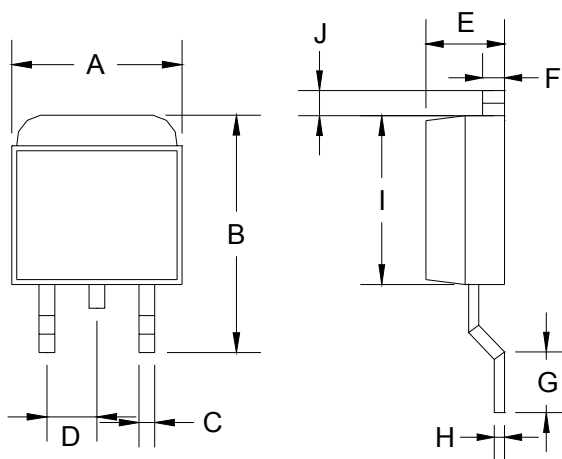


Figure 6: load transient response



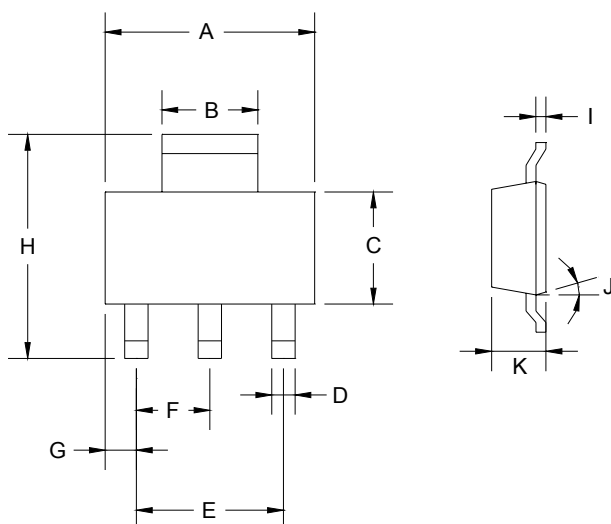
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TO-252 Mechanical Drawing



DIM	TO-252 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.570	6.840	0.259	0.269
B	9.250	10.400	0.364	0.409
C	0.550	0.700	0.022	0.028
D	2.560	2.670	0.101	0.105
E	2.300	2.390	0.090	0.094
F	0.490	0.570	0.019	0.022
G	1.460	1.580	0.057	0.062
H	0.520	0.570	0.020	0.022
I	5.340	5.550	0.210	0.219
J	1.460	1.640	0.057	0.065

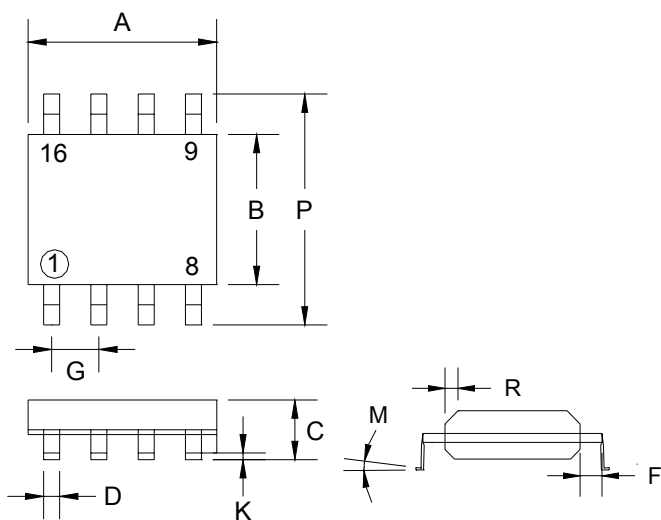
SOT-223 Mechanical Drawing



DIM	SOT-223 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.350	6.850	0.250	0.270
B	2.900	3.100	0.114	0.122
C	3.450	3.750	0.136	0.148
D	0.595	0.635	0.023	0.025
E	4.550	4.650	0.179	0.183
F	2.250	2.350	0.088	0.093
G	0.835	1.035	0.032	0.041
H	6.700	7.300	0.263	0.287
I	0.250	0.355	0.010	0.014
J	10°	16°	10°	16°
K	1.550	1.800	0.061	0.071

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SOP-8 Mechanical Drawing



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 (typ)		0.05 (typ)	
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019