

Descriptions

The S1117A and S1117 series of positive adjustable and fixed regulators are designed to provide 1A with higher efficiency than currently available devices. All internal circuitry is designed to operate down to 1.3V input to output differential. On-Chip trimming adjusts reference Voltage to 2%

Features

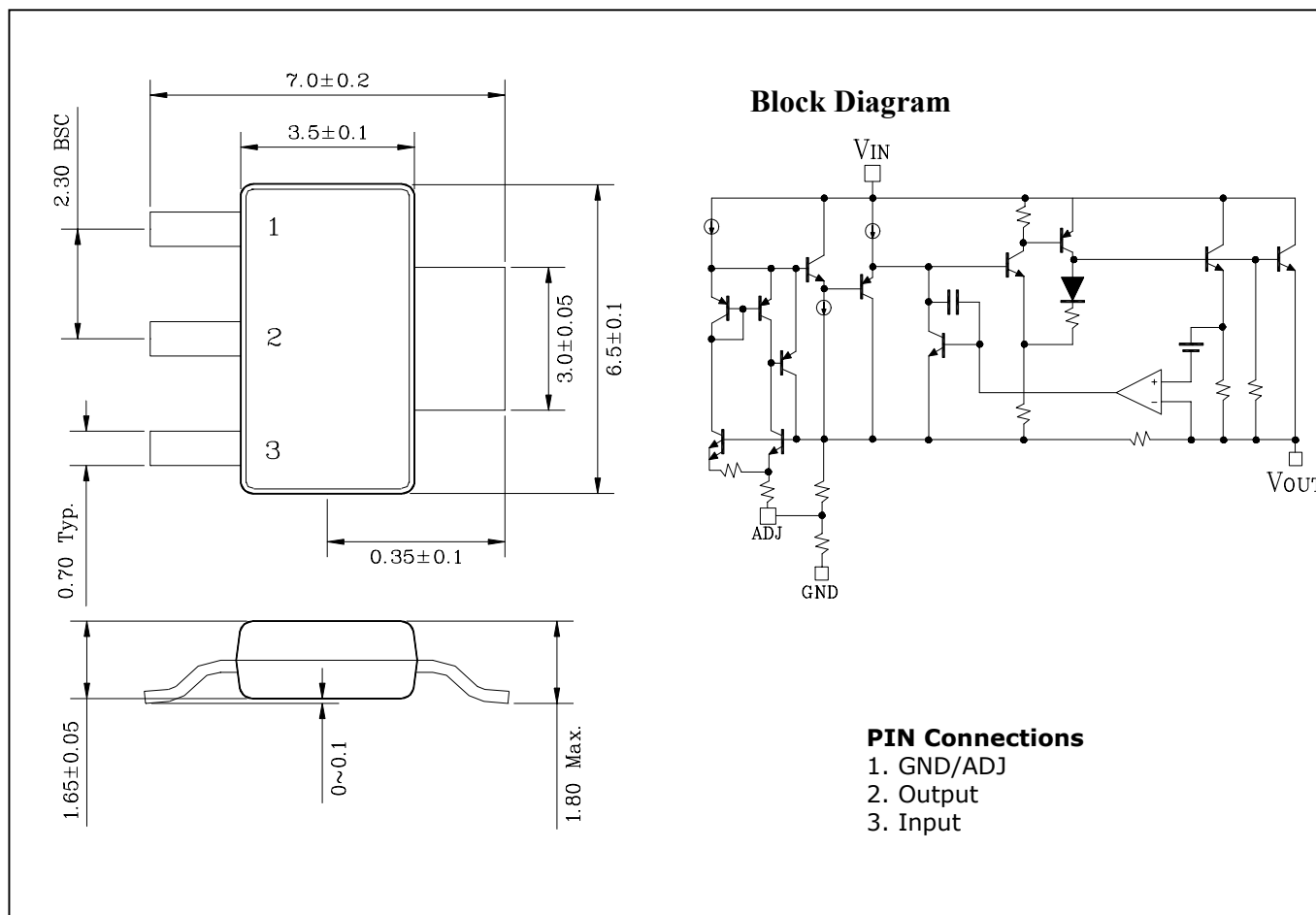
- Output Current of 1A
- 1.3V Maximum Dropout voltage at 1A Output Current
- 100% Thermal Limit Burn-In
- Fast Transient Response

Ordering Information

Type NO.	Marking	Package Code
S1117AQ/S1117xxQ	S1117□□Q	SOT-223
□□:Voltage Code (Aj : 1.25V, 15:1.5V,:18: 1.8V, 25:2.5V, 285:2.85V, 33:3.3V, 50:5.0V)		

Outline Dimensions

unit : mm



Absolute Maximum Ratings

Ta=25°C

Characteristic	Symbol	Ratings		Unit
Operating Input voltage	V _{IN}	V _{out} = 1.25, 1.5, 1.8	16	V
		V _{out} = 2.5 2.8 3.3 5.0	20	
Power Dissipation	P _D	0.8		W
Lead Temperature (Soldering, 10 sec)	T _{LEAD}	300		°C
Operating Junction Temperature	T _J	-30 ~ 125		°C
Storage Temperature	T _{STG}	-55 ~ 150		°C

Device Selection Guide (NOTE1)

Device	Output Voltage
S1117A	Adj
S1117-1.5	1.5V
S1117-1.8	1.8V
S1117-2.5	2.5V
S1117-2.85	2.85V
S1117-3.3	3.3V
S1117-5.0	5V

Note 1 : Other Fixed Versions are available Vout=1.5V to 5V

Electrical Characteristics

(Electrical Characteristics at T_J = 25°C and I_{Load}=10mA unless otherwise specified.)

Characteristic	Symbol	Device	Test Condition		Min	Typ	Max	Unit
Output Voltage	V _{OUT}	S1117A	V _{IN} = (V _{out} +1.5V), I _{OUT} = 10mA		1.238	1.25	1.262	V
			V _{IN} = (V _{out} +1.5V) to 12V I _{OUT} = 0 to 1000mA	*	1.225		1.275	
		S1117-15	V _{IN} = (V _{out} +1.5V), I _{OUT} = 10mA		1.47	1.5	1.53	
			V _{IN} = (V _{out} +1.5V) to 12V I _{OUT} = 0 to 1000mA	*	1.44		1.56	
		S1117-18	V _{IN} = (V _{out} +1.5V), I _{OUT} = 10mA		1.764	1.8	1.836	
			V _{IN} = (V _{out} +1.5V) to 12V I _{OUT} = 0 to 1000mA	*	1.728		1.872	
		S1117-25	V _{IN} = (V _{out} +1.5V), I _{OUT} = 10mA		2.45	2.5	2.55	
			V _{IN} = (V _{out} +1.5V) to 12V I _{OUT} = 0 to 1000mA	*	2.4		2.6	
		S1117-285	V _{IN} = (V _{out} +1.5V), I _{OUT} = 10mA		2.793	2.85	2.907	
			V _{IN} = (V _{out} +1.5V) to 12V I _{OUT} = 0 to 1000mA	*	2.736		2.964	

Electrical Characteristics (Continued)

(Electrical Characteristics at $T_j = 25^\circ\text{C}$ and $I_{\text{LOAD}}=10\text{mA}$ unless otherwise specified.)

Characteristic	Symbol	Device	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	S1117-33	$V_{\text{IN}} = (V_{\text{out}}+1.5\text{V}), I_{\text{OUT}} = 10\text{mA}$	3.234	3.3	3.366	V
			$V_{\text{IN}} = (V_{\text{out}}+1.5\text{V}) \text{ to } 12\text{V}$ $I_{\text{OUT}} = 0 \text{ to } 1000\text{mA}$	* 3.168		3.432	
		S1117-50	$V_{\text{IN}} = (V_{\text{out}}+1.5\text{V}), I_{\text{OUT}} = 10\text{mA}$	4.9	5.0	5.1	
			$V_{\text{IN}} = (V_{\text{out}}+1.5\text{V}) \text{ to } 12\text{V}$ $I_{\text{OUT}} = 0 \text{ to } 1000\text{mA}$	* 4.8		5.2	
Line Regulation Note1	ΔV_{OUT}	All	$(V_{\text{out}}+1.5\text{V}) \leq V_{\text{IN}} \leq 12\text{V}$ $I_{\text{OUT}}=10\text{mA}$	*	-	10	mV
Load Regulation Note1	ΔV_{OUT}	All	$(V_{\text{IN}} - V_{\text{out}})=2\text{V}, 10\text{mA} \leq I_{\text{OUT}} \leq 1\text{A}$	*	-	10	mV
Quiescent Current	I_{Q}	All Fixed Versions	$V_{\text{IN}}= 11.5\text{V}, I_{\text{OUT}}=0\text{mA}$	*	-	3.6	mA
Minimum Load Current	I_{LMIN}	S1117A	$V_{\text{IN}}=(V_{\text{OUT}}+1.5), V_{\text{OUT}}=0\text{V}$	*	3	7	mA
Adjust Pin Current	I_{ADJ}	S1117A	$V_{\text{IN}} = (V_{\text{out}}+1.5\text{V}) \text{ to } 12\text{V}$ $I_{\text{OUT}} = 10\text{mA}$	*	55	90	μA
Dropout Voltage Note3	V_{D}	All	$I_{\text{OUT}} = 1000\text{mA}$	*	-	1.2	V
Ripple Rejection Note2	RR	All	$V_{\text{IN}}-V_{\text{OUT}}=1.5\text{V}, f=120\text{Hz}$ $I_{\text{OUT}}=1000\text{mA}, V_{\text{RIPPLE}}=1\text{V}_{\text{P-P}}$	60	72	-	dB
Output Noise Voltage	eN	All	$f=10 \text{ to } 10\text{KHz}$	-	100	-	μV
Output Current	I_{OUT}	All	$(V_{\text{IN}}-V_{\text{OUT}})=1.5\text{V}$	*	1	1.5	A

The * denotes the specifications which apply over the full temperature range.

Note 1: Low duty pulse testing with Kelvin connections required.

Note 2: 120Hz input ripple (C_{ADJ} for ADJ=25 μF)

Note 3: $\Delta V_{\text{OUT}} = 1\%$

Typical Applications

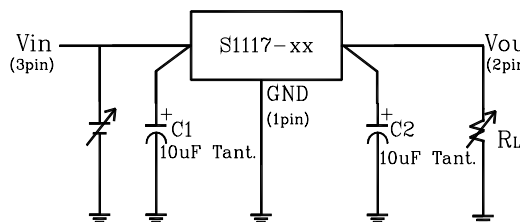


Fig. 1 Fixed Voltage Regulator

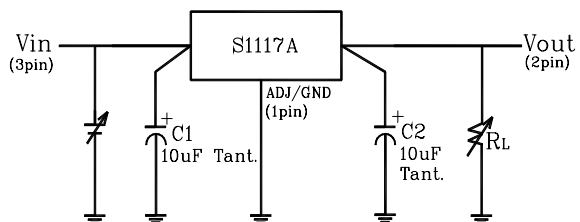
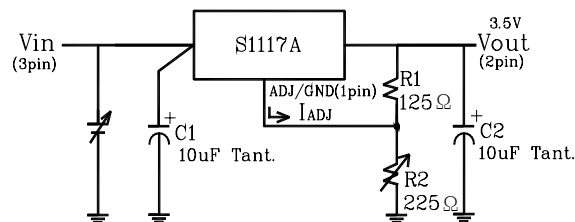


Fig. 2 1.25V Voltage Regulator



$$V_{\text{OUT}} = V_{\text{ADJ}} \left(1 + \frac{R_2}{R_1}\right) + I_{\text{ADJ}} \times R_2$$

Fig. 3 Adjustable Voltage Regulator

Electrical Characteristic Curves

Fig. 1 Minimum Load Current(Adjustable)

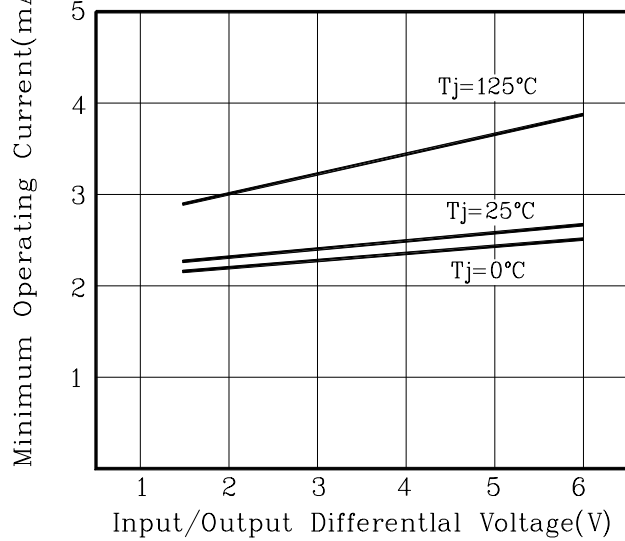


Fig. 2 Adjust Pin Current

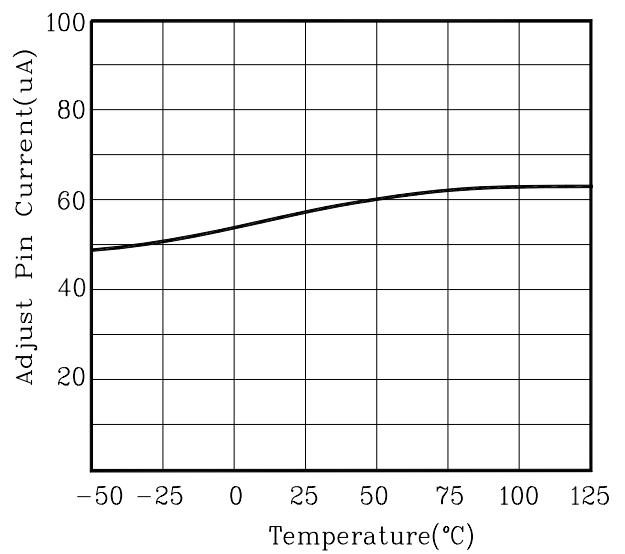


Fig. 3 Temperature Stability

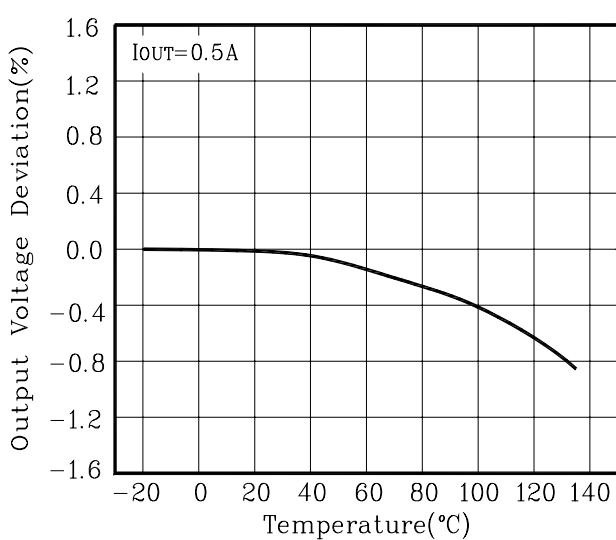


Fig. 4 Load Regulation

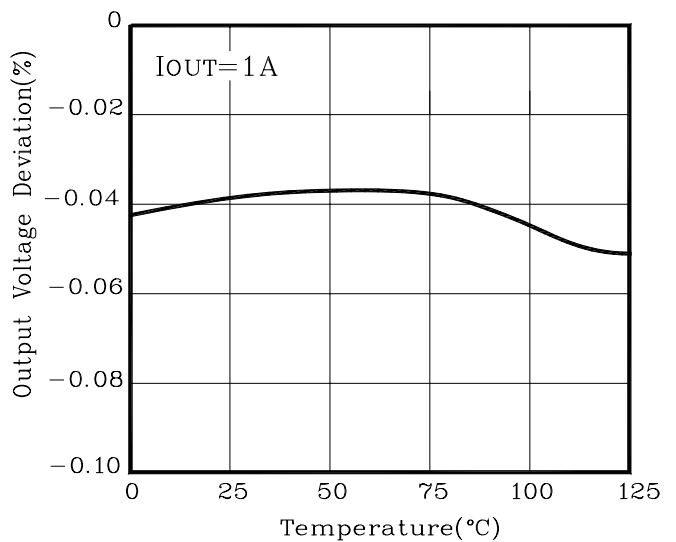


Fig. 5 Dropout Voltage

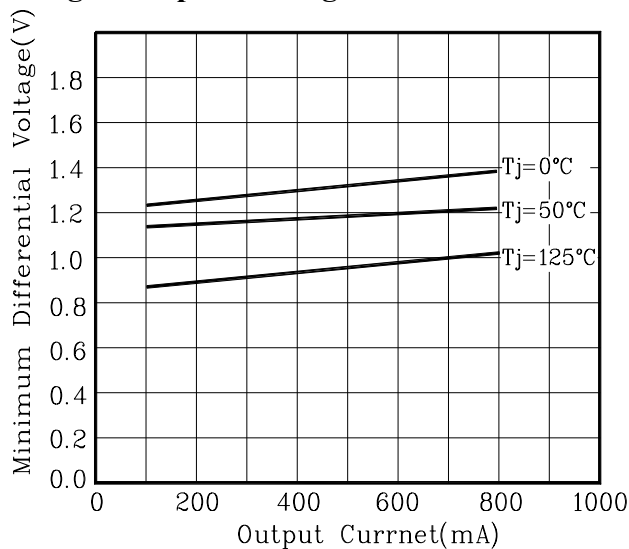
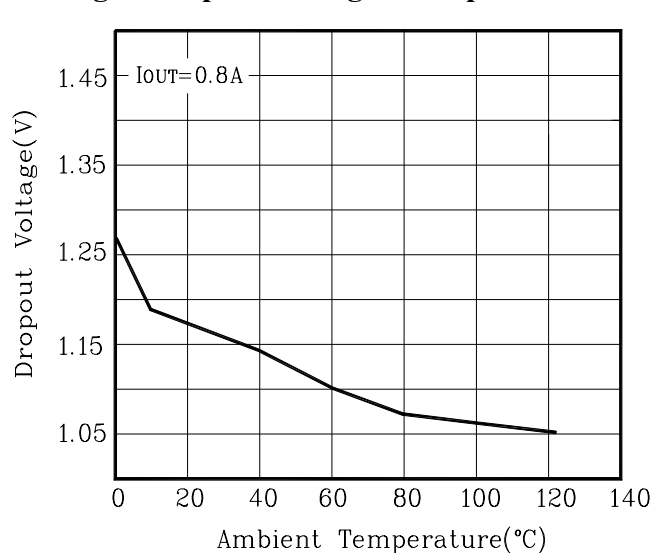


Fig. 6 Dropout Voltage - Temperature



Electrical Characteristic Curves

Fig. 7 Load Transient Response

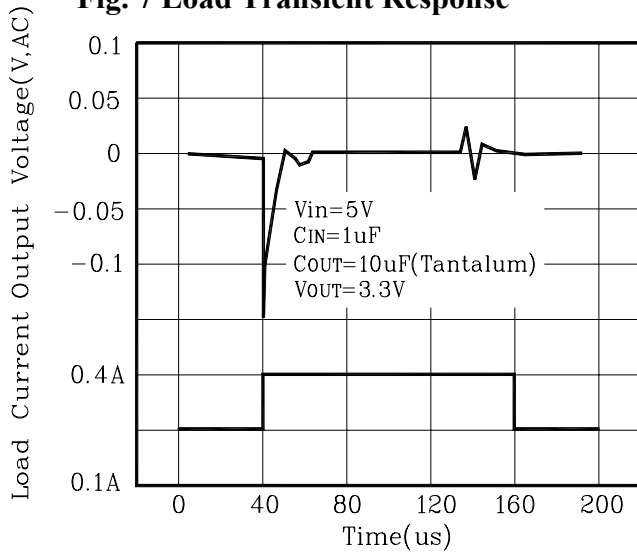


Fig. 8 Line Transient Response

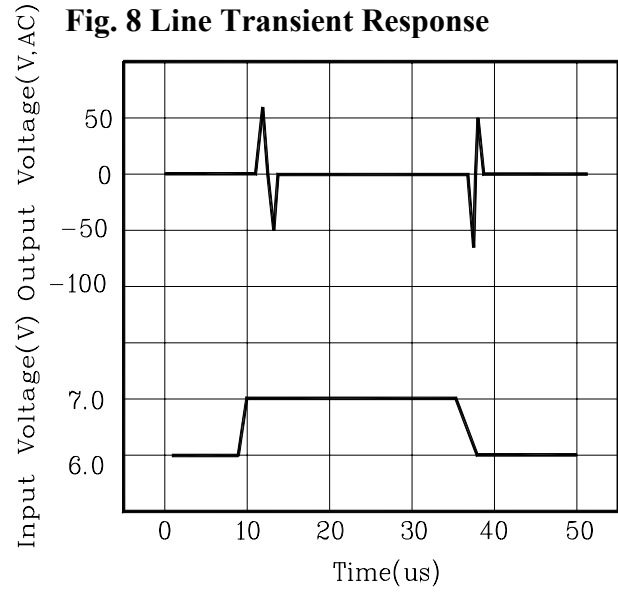
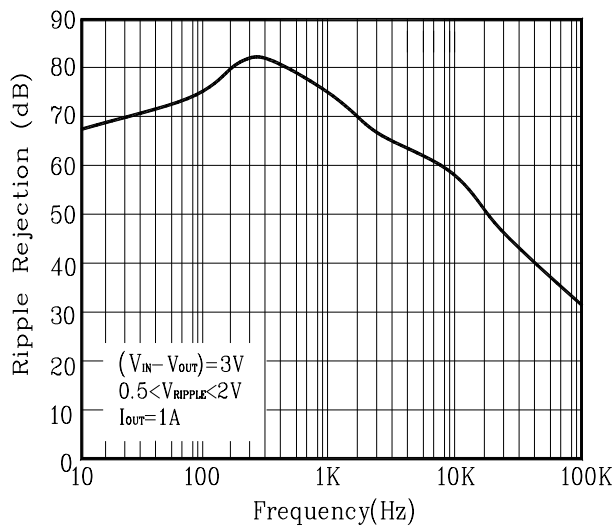


Fig. 9 Ripple Rejection



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