

Descriptions

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

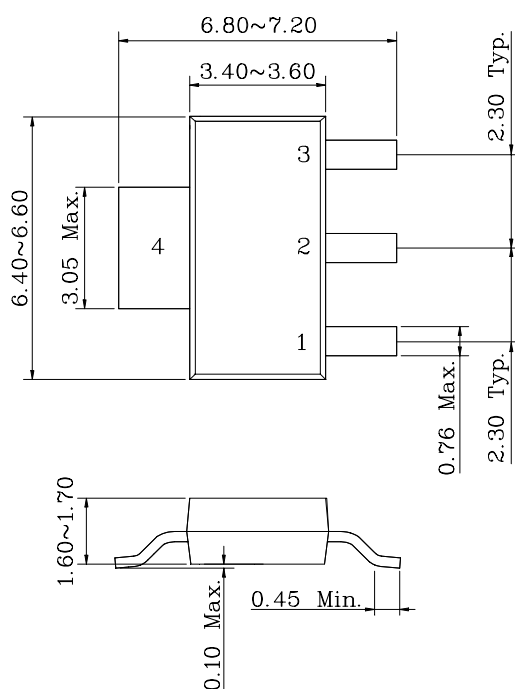
Features

- Adjustable or Fixed output
- Output Current of 1A
- Low Dropout, 1.3V maximum at 1A Output Current
- Thermal Shutdown Protection
- Fast Transient Response

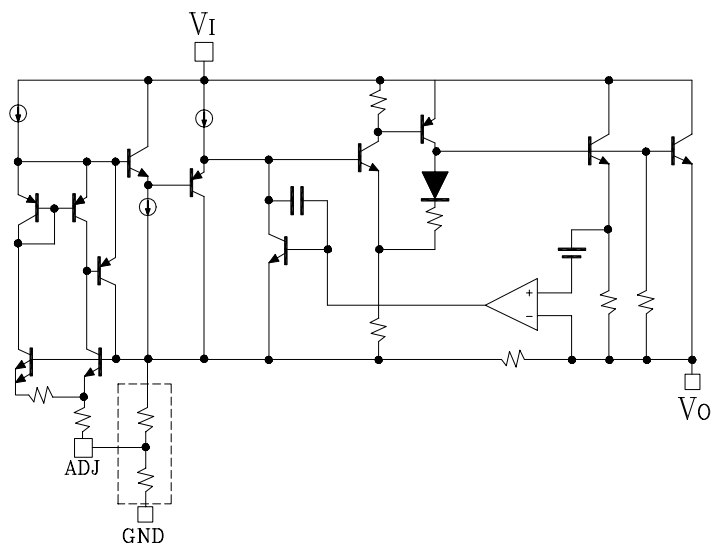
Ordering Information

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

Outline Dimensions (Unit : mm)



BLOCK DIAGRAM



PIN Connections

1. GND/ADJ
- 2,4. Output voltage
3. Input voltage

Absolute Maximum Ratings**T_a=25°C**

Characteristic	Symbol	Rating	Unit
Input Voltage	V _I	16	V
Power Dissipation	P _D 1 (Note1)	1.5	W
	P _D 2 (Note2)	0.8	
Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{stg}	-55 ~ 150	°C

Note 1 : Mounted on a glass epoxy circuit board of 25.4 x 25.4mm. (at 1oz copper area)

Note 2 : No Heat sink

Device Selection Guide (NOTE3)

Device	Output Voltage
S1117AQ	Adjustable
S1117-15Q	1.5V
S1117-18Q	1.8V
S1117-25Q	2.5V
S1117-285Q	2.85V
S1117-33Q	3.3V
S1117-50Q	5.0V

Note 3 : Other fixed versions are available V_o=1.5V to 5V

Electrical Characteristics

(Electrical Characteristics at $T_j = 25^\circ\text{C}$ and $V_I = (V_O + 1.5\text{V})$, $I_L = 10\text{ mA}$, $C_O = 10\text{ }\mu\text{F}$ unless otherwise specified.)

Characteristic	Symbol	Device	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_O	S1117A	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		1.225	1.25	1.275	V
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	1.200		1.300	
		S1117-15	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		1.470	1.5	1.530	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	1.440		1.560	
		S1117-18	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		1.764	1.8	1.836	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	1.728		1.872	
		S1117-25	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		2.450	2.5	2.550	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	2.400		2.600	
		S1117-285	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		2.793	2.85	2.907	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	2.736		2.964	
		S1117-33	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		3.234	3.3	3.366	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	3.168		3.432	
		S1117-50	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		4.900	5.0	5.100	
			$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 0 \text{ to } 1000\text{ mA}$	*	4.800		5.200	
Line Regulation (Note4)	$\Delta V_{O(\Delta V_I)}$	All	$1.5\text{V} \leq V_I - V_O \leq 7\text{V}$ $I_O = 10\text{ mA}$		-	5	10	mV
Load Regulation (Note4)	$\Delta V_{O(\Delta I_L)}$	All	$V_I = (V_O + 1.5\text{V})$ $I_O = 10\text{ mA} \sim 1000\text{ mA}$		-	10	30	mV
Quiescent Current	I_{QC}	All	$V_I = V_O + 1.5\text{V}$ $V_{ADJ} = 0\text{V}$	*	-	7	13	mA
Minimum Load Current	$I_{L(MIN)}$	S1117A	$V_I = (V_O + 1.5\text{V}), V_O = 0\text{V}$	*		3	7	mA
Adjust Pin Current	I_{ADJ}	S1117A	$V_I = (V_O + 1.5\text{V}) \text{ to } 7\text{V}$ $I_O = 10\text{ mA}$	*		55	90	μA
Dropout Voltage (Note6)	V_{DROP}	All	$I_O = 1000\text{ mA}$	*	-	1.2	1.3	V
Ripple Rejection (Note5)	RR	All	$V_I - V_O = 1.5\text{V}, I_O = 1000\text{ mA}$ $V_{Ripple} = 1\text{V}_{P-P}, f = 120\text{ Hz}$		60	72	-	dB
Current Limit	I_{LIMIT}	All	$(V_I - V_O) = 1.5\text{V}$	*	1			A

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

Note 4: Low duty pulse testing with Kelvin connections required.

Note 5: 120 Hz input ripple (C_{ADJ} for $ADJ = 25\text{ }\mu\text{F}$)

Note 6: $\Delta V_O = 1\%$

■ Typical Applications

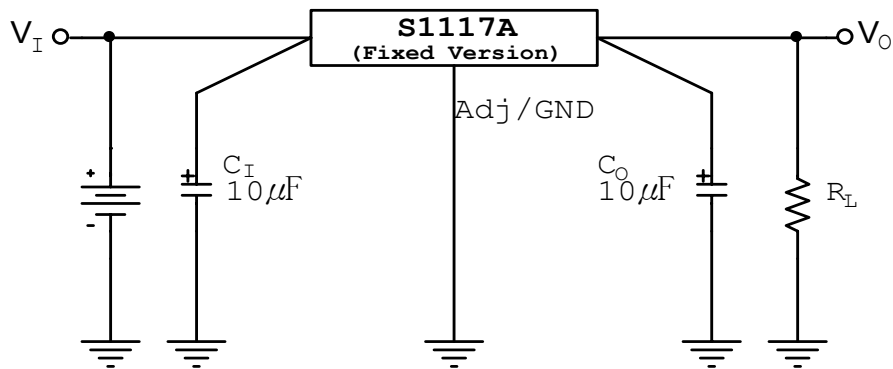
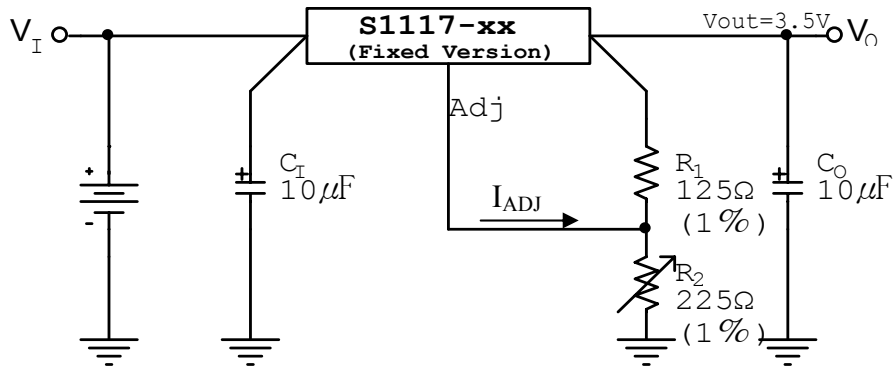


Fig. 1 Fixed Voltage Regulator



$$V_O = V_{ADJ} * (1 + R_2/R_1) + I_{ADJ} * R_2$$

Fig. 2 Adjustable Voltage Regulator

Notes:

- 1) C_I needed if device is far from filter capacitors
- 2) C_O minimum value required for stability

Electrical Characteristic Curves

Fig. 3 V_{DROP} vs. I_{OUT}

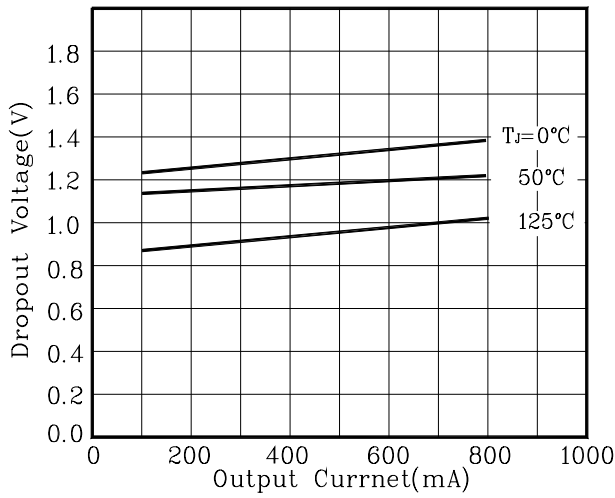


Fig. 4 ΔV_{OUT} vs. T_a

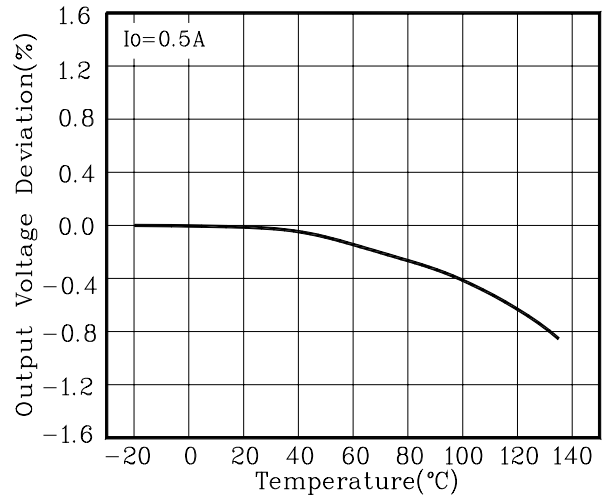


Fig. 5 RR vs. Frequency

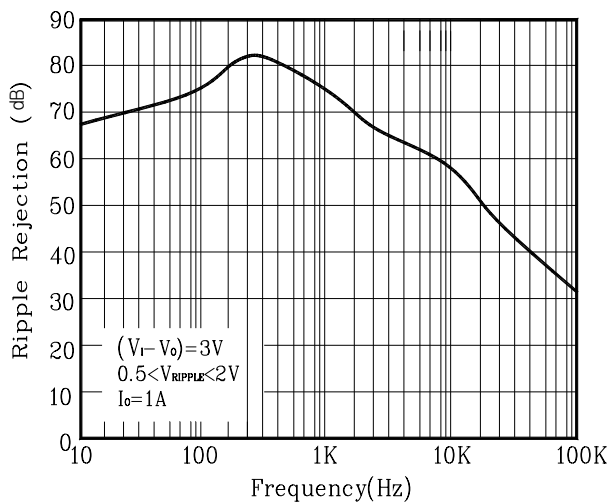


Fig. 6 Temperature Stability

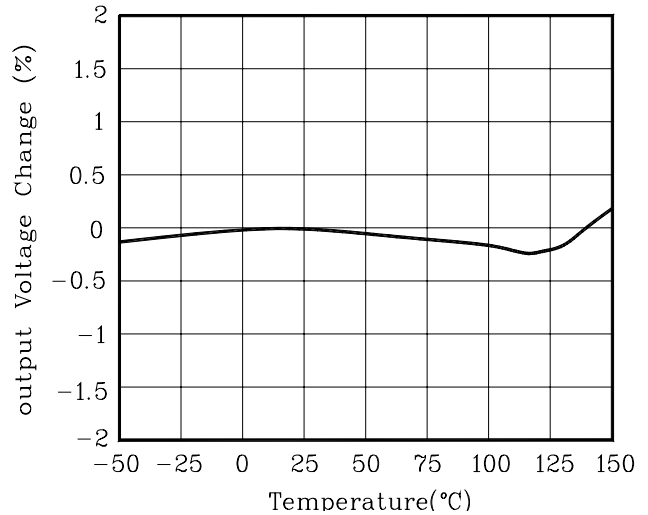


Fig. 7 I_{ADJ} vs. T_a

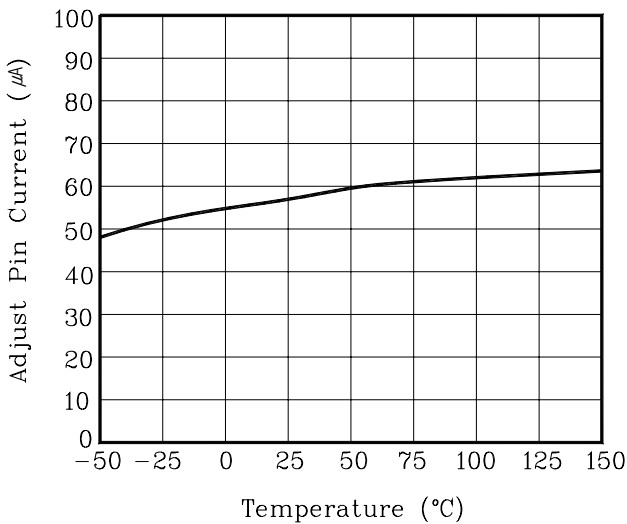
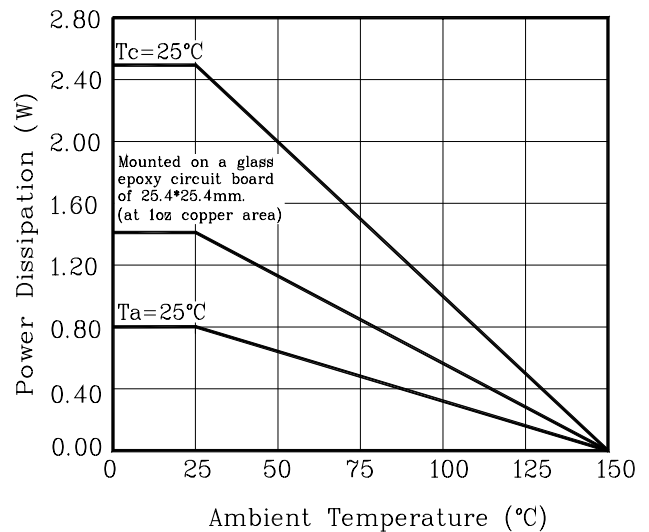


Fig. 8 P_D vs. T_a



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