

## 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%

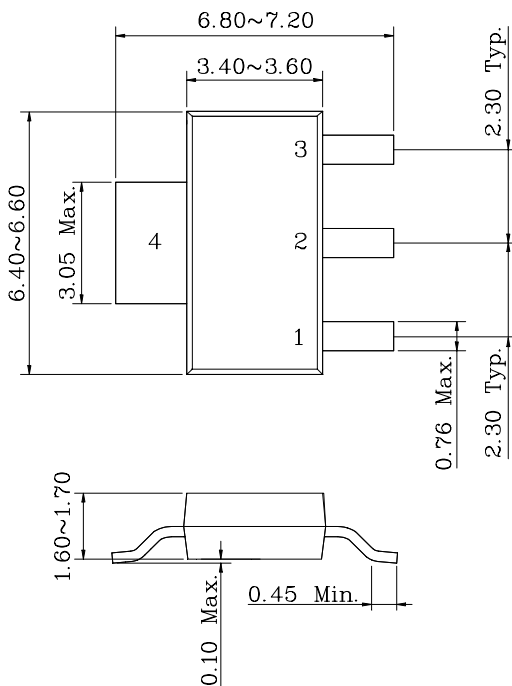
## Features

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

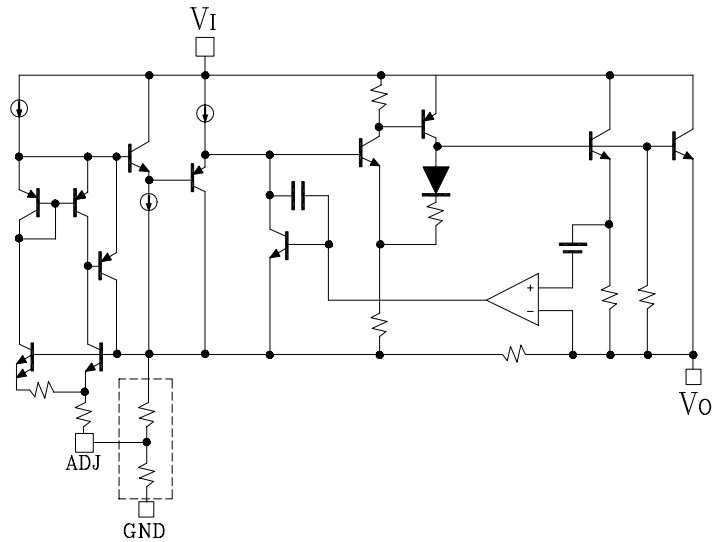
## Ordering Information

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

Ta=25°C

Characteristic	Symbol	Rating	Unit
Input Voltage	V <sub>I</sub>	16	V
Power Dissipation	P <sub>D1</sub> (Note1)	1.5	W
	P <sub>D2</sub> (Note2)	0.8	
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-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 Vo=1.5V to 5V

## Electrical Characteristics

(Electrical Characteristics at  $T_j = 25^\circ\text{C}$  and  $V_I = (V_O + 1.5\text{V})$ ,  $I_L = 10\text{ mA}$ ,  $C_O = 10\ \mu\text{F}$  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	1.275	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	1.530		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	1.440	1.560		
		S1117-18	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		1.764	1.836		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	1.728	1.872		
		S1117-25	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		2.450	2.550		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	2.400	2.600		
		S1117-285	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		2.793	2.907		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	2.736	2.964		
		S1117-33	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		3.234	3.366		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	3.168	3.432		
		S1117-50	$V_I = (V_O + 1.5\text{V}), I_O = 10\text{ mA}$		4.900	5.100		
			$V_I = (V_O + 1.5\text{V})\text{ to }7\text{V}$ $I_O = 0\text{ to }1000\text{ mA}$	*	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	$I_{L(\text{MIN})}$	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	$\mu\text{A}$
Dropout Voltage (Note6)	$V_{\text{DROP}}$	All	$I_O = 1000\text{ mA}$	*	-	1.2	1.3	V
Ripple Rejection (Note5)	RR	All	$V_I - V_O = 1.5\text{V}, I_O = 1000\text{ mA}$ $V_{\text{Ripple}} = 1\text{V}_{\text{P-P}}, f = 120\text{ Hz}$		60	72	-	dB
Current Limit	$I_{\text{LIMIT}}$	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  $\mu\text{F}$ )

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

## ■ Typical Applications

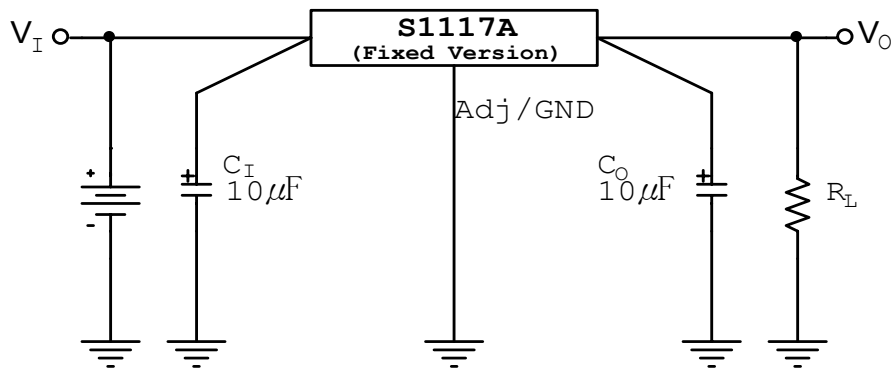
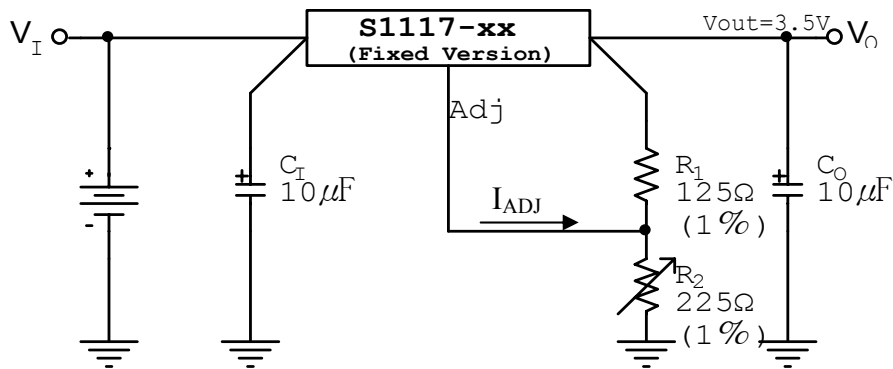


Fig. 1 Fixed Voltage Regulator



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

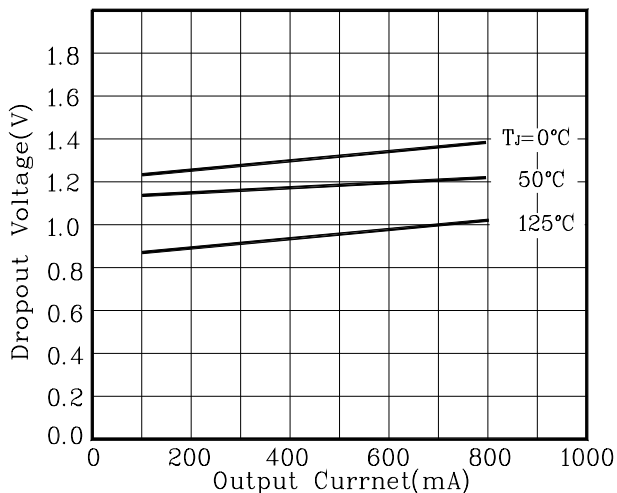
Fig. 2 Adjustable Voltage Regulator

### Notes:

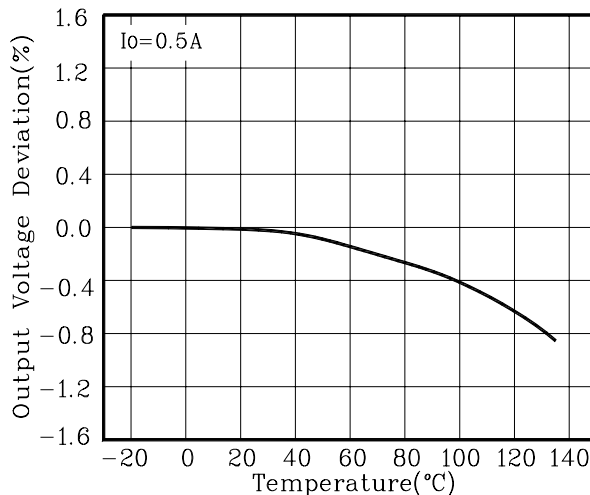
- 1)  $C_I$  needed if device is far from filter capacitors
- 2)  $C_O$  minimum value required for stability

## Electrical Characteristic Curves

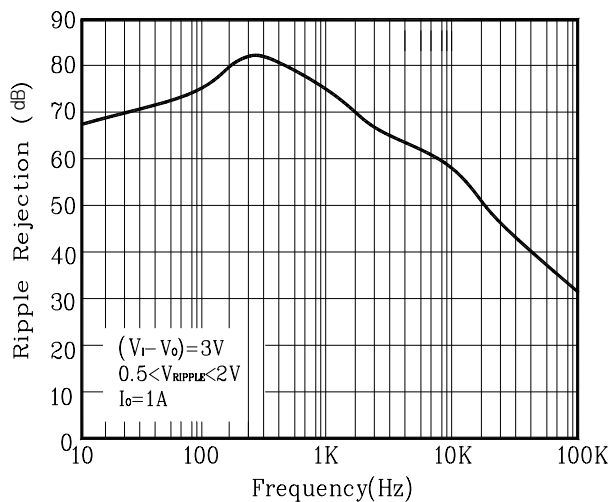
**Fig. 3  $V_{DROP}$  vs.  $I_{OUT}$**



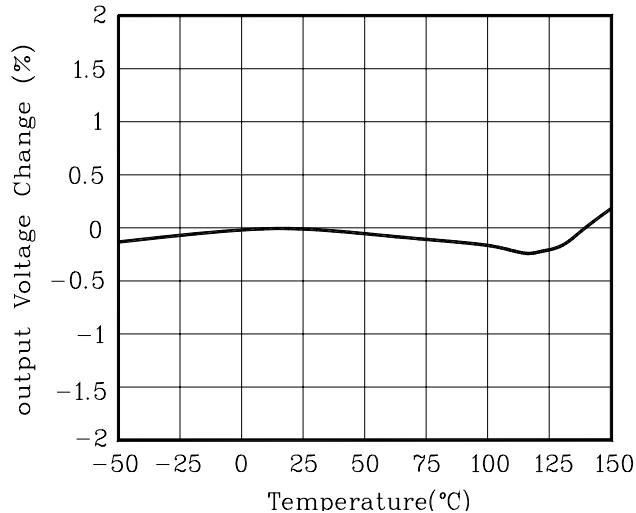
**Fig. 4  $\Delta V_{OUT}$  vs.  $T_a$**



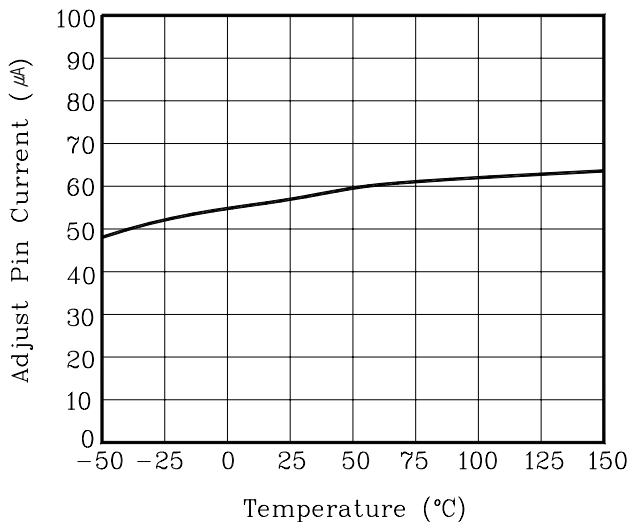
**Fig. 5 RR vs. Frequency**



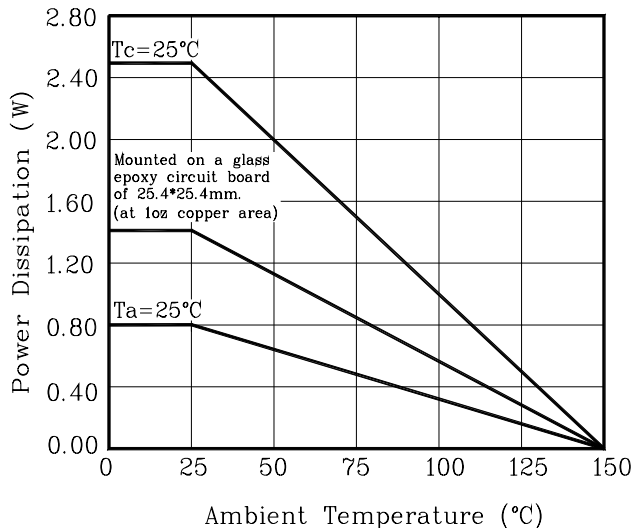
**Fig. 6 Temperature Stability**



**Fig. 7  $I_{ADJ}$  vs.  $T_a$**



**Fig. 8  $P_D$  vs.  $T_a$**



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