S1117APIC/S1117-xxPIC

Adjustable and Fixed Voltage Regulator

Descriptions

The S1117 series of positive adjustable and fixed regulators are designed to provide 1A with high 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

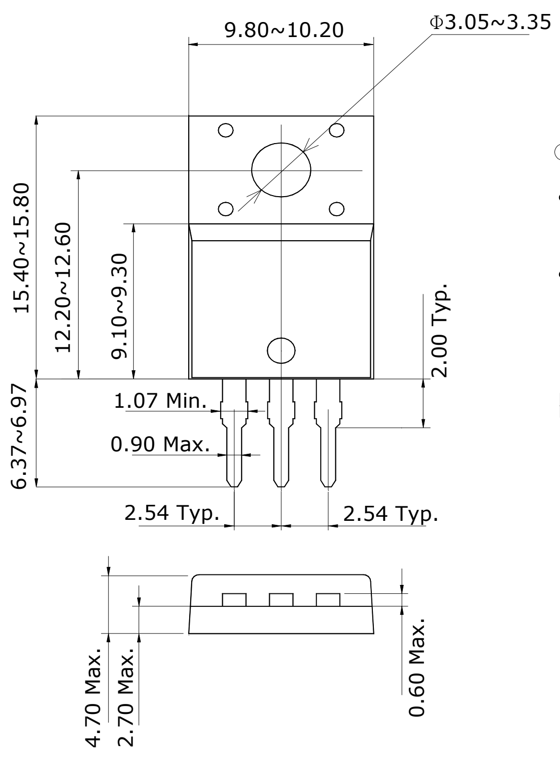
- Adjustable or fixed output
- Output current of 1A
- Low dropout, 1.3V maximum at 1A output current
- Thermal shutdown protection

Ordering Information

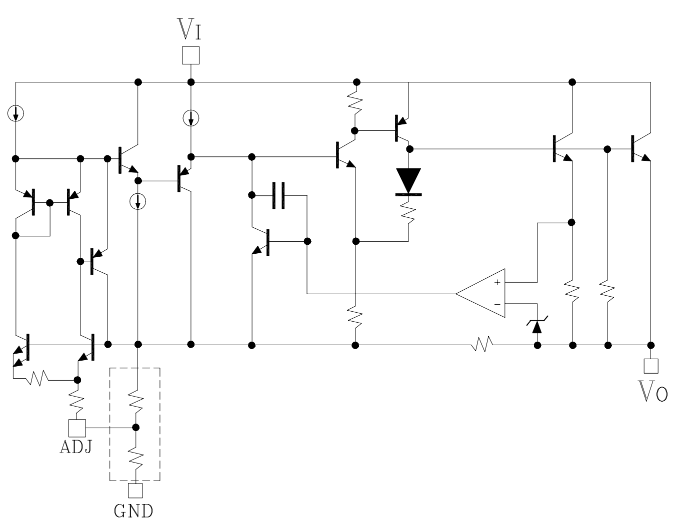
Type NO.	Marking	Package Code
S1117APIC/S1117xxPIC	S1117□□PI/ S1117□□□PI	TO-220F-3SL

□□: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. Output
3. Input

Absolute Maximum Ratings

[Ta=25°C]

Characteristic	Symbol	Rating	Unit
Input voltage	V_I	16	V
Power Dissipation	P_D	2.0	W
Junction Temperature	T_J	150	°C
Operating temperature range	T_{opr}	0 ~ +125	℃
Storage temperature range	T_{stg}	-55 ~ +150	°C

Recommended operating conditions

Characteristic	Symbol	Min.	Max.	Unit
Input voltage	V_I	V_O+1.5V	V_O+7V	V
Output current	I_O	1	1000	mA

Device Selection Guide

Device	Output Voltage
S1117APIC	Adjustable
S1117-15PIC	1.50V
S1117-18PIC	1.80V
S1117-25PIC	2.50V
S1117-285PIC	2.85V
S1117-33PIC	3.30V
S1117-50PIC	5.00V

Note 1 : Other fixed versions are available V_O=1.5V ~ 5V

Electrical Characteristics

(Electrical Characteristics at 0℃≤T_a≤125℃ and V_I=(V_O+1.5V), Io=10mA, C_O=10µF, unless otherwise specified.)

Characteristic	Symbol	Device	Test Condition		Min	Typ	Max	Unit
Output voltage	V_O	S1117A		*	1.23	1.25	1.28	V
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		1.20		1.30	
		S1117-15		*	1.47	1.50	1.53	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		1.44		1.56	
		S1117-18		*	1.76	1.80	1.84	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		1.73		1.87	
		S1117-25		*	2.45	2.50	2.55	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		2.40		2.60	
		S1117-285		*	2.79	2.85	2.91	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		2.74		2.96	
		S1117-33		*	3.23	3.30	3.37	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		3.17		3.43	
		S1117-50		*	4.90	5.00	5.10	
			V_I = (V_O+1.5V) to 7V I_O = 0 to 1000mA		4.80		5.20	
Line regulation (Note2)	$\lvert \triangle V_{O(\triangle VI)} \rvert$	All	1.5V≤ V_I-V_O≤7V I_O=10mA	*	-	5	10	mV
Load regulation (Note2)	$\lvert \triangle V_{O(\triangle IL)} \rvert$	All	1.5V≤ V_I-V_O≤7V I_O=10mA ~ 1000mA	*	-	10	30	mV
Quiescent current	I_{QC}	All	I_O=0		-	7	13	mA
Minimum load current	$I_{L(MIN)}$	S1117A	V_{Adj}=0V			3	7	mA
Adjust pin current	I_{ADJ}	S1117A	V_I = (V_O+1.5V) to 7V I_O = 100mA			55	90	µA
Adjust pin current change	$\lvert \Delta I_{ADJ} \rvert$	S1117A	1.5V ≤ V_I - V_O ≤ 7V I_O=10mA ~ 1000mA			1	5	µA
Dropout voltage	V_{DROP}	All	I_O =1000mA	*	-	1.2	1.3	V
Ripple rejection ratio	RR	All	I_O=1000mA V_{Ripple}=1V_{P-P} , f=120 Hz	*	60	72	-	dB
Current limit	I_{LIMIT}	All	I_O≥1000mA	*	1.1			A

[*] Ta=25℃

Note 2: Low duty pulse testing with Kelvin connections required.

Typical Applications

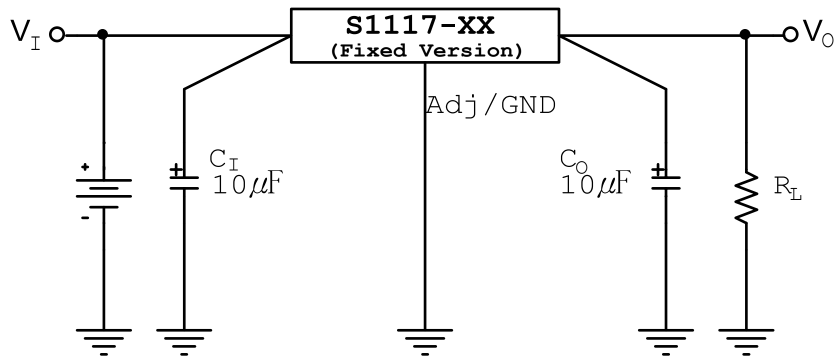
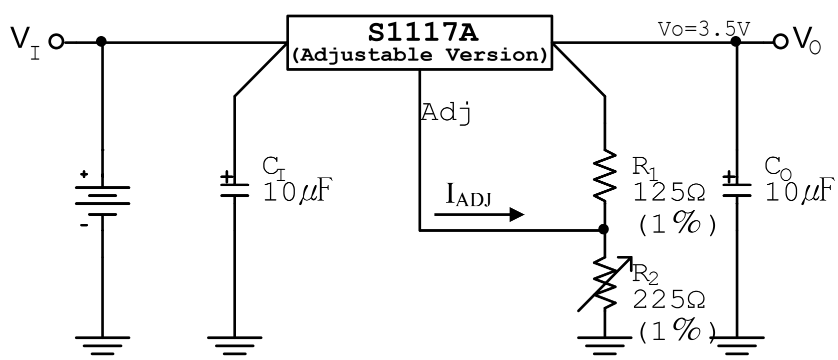


Fig. 1 Fixed Voltage Regulator



$$Vo = V_{ADJ} \times (1 + \frac{R_2}{R_1}) + I_{ADJ} \times R_2$$

Fig. 2 Adjustable Voltage Regulator

Notes 3:

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_O

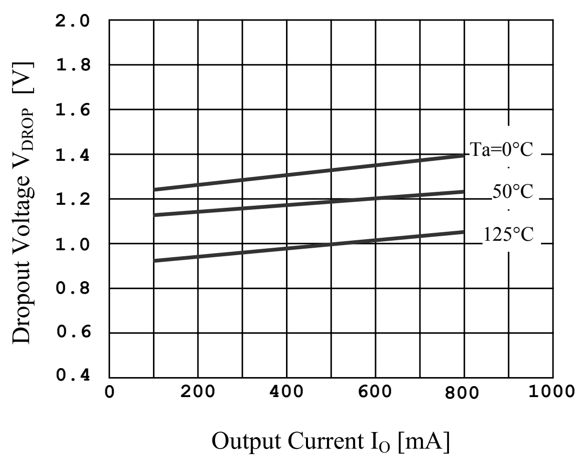


Fig.4 Vo vs T_a

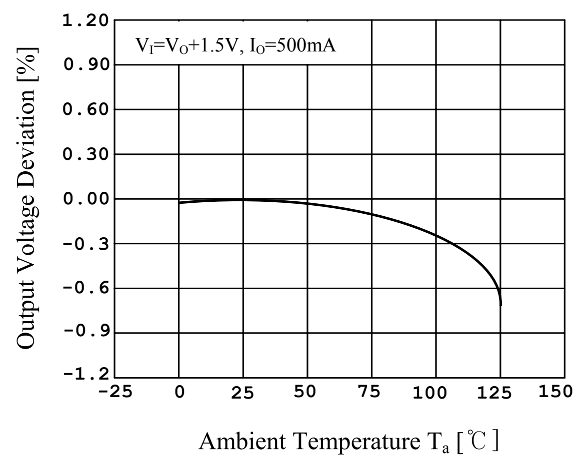


Fig.5 $I_{L(MIN)}$ vs V_I-V_O

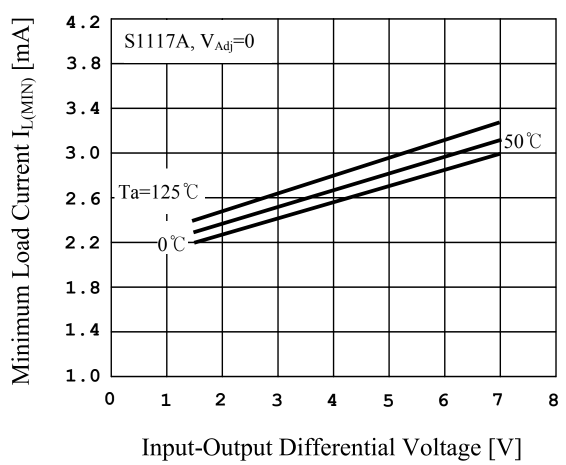


Fig.6 I_{Adj} vs Ta

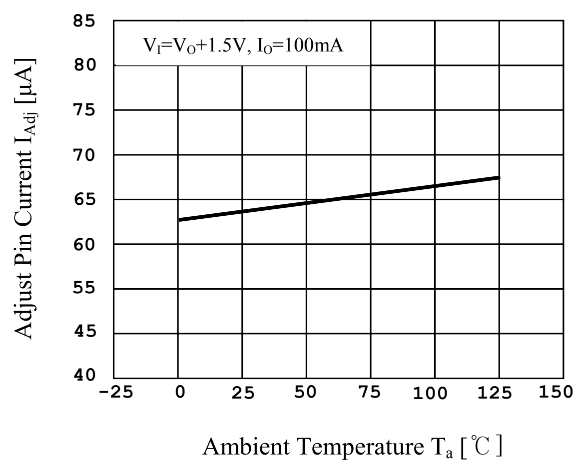
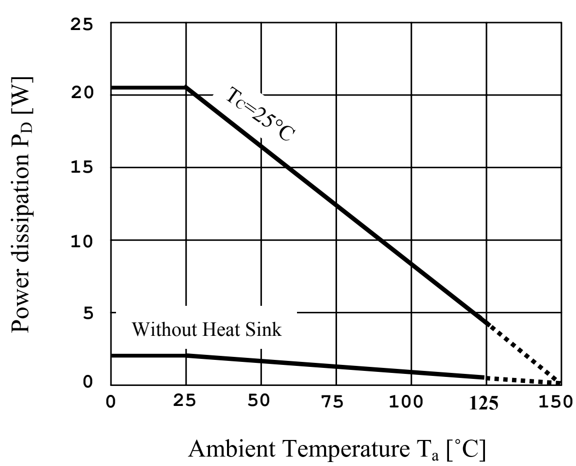


Fig.7 P_D vs T_a



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