AUK Semiconductor

S1117AQ/S1117-xxQ

Adjustable and Fixed LDO Voltage Regulator

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

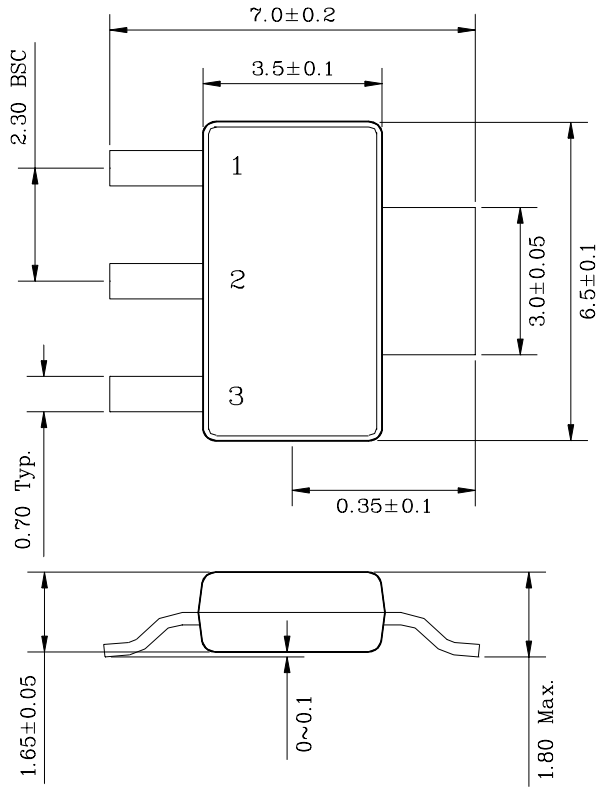
Ordering Information

Type NO.	Marking	Package Code
S1117AQ/S1117xxQ	S1117□□Q	SOT-223

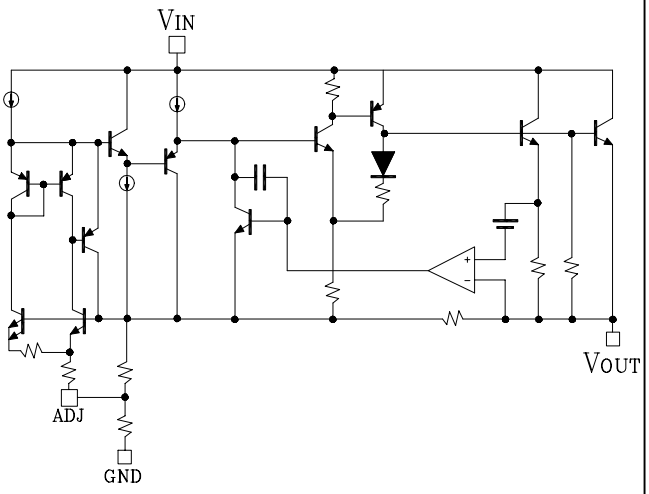
□□:Voltage Code (Aj : 1.25V, 15:1.5V,:18: 1.8V, 25:2.5V, 285:2.85V, 33:3.3V, 50:5.0V)

Outline Dimensions

unit : mm



Block Diagram



PIN Connections

1. GND/ADJ
2. Output
3. Input

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℃ 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℃ and I_{LOAD}=10mA unless otherwise specified.)

Characteristic	Symbol	Device	Test Condition		Min	Typ	Max	Unit
Output Voltage	V_{OUT}	S1117-33	V_{IN} = (V_{out}+1.5V),I_{OUT} = 10mA		3.234	3.3	3.366	V
			V_{IN} = (V_{out}+1.5V) to 12V I_{OUT} = 0 to 1000mA	*	3.168		3.432	
		S1117-50	V_{IN} = (V_{out}+1.5V),I_{OUT} = 10mA		4.9	5.0	5.1	
			V_{IN} = (V_{out}+1.5V) to 12V I_{OUT} = 0 to 1000mA	*	4.8		5.2	
Line Regulation Note1	$\triangle V_{OUT}$	All	(V_{out}+1.5V)≤ V_{In}≤12V I_{OUT}=10mA	*	-	10	30	mV
Load Regulation Note1	$\triangle V_{OUT}$	All	(V_{IN} - V_{out})=2V, 10mA ≤I_{OUT}≤1A	*	-	10	30	mV
Quiescent Current	I_Q	All Fixed Versions	V_{IN}= 11.5V, I_{OUT}=0mA	*	-	3.6	10	mA
Minimum Load Current	I_{LMIN}	S1117A	V_{IN}=(V_{OUT}+1.5), V_{OUT}=0V	*		3	7	mA
Adjust Pin Current	I_{ADJ}	S1117A	V_{IN} = (V_{out}+1.5V) to 12V I_{OUT} = 10mA	*		55	90	uA
Dropout Voltage Note3	V_D	All	I_{OUT} =1000mA	*	-	1.2	1.3	V
Ripple Rejection Note2	RR	All	V_{IN}-V_{OUT}=1.5V, f=120Hz I_{OUT}=1000mA, V_{RIPPLE}=1V_{P-P}		60	72	-	dB
Output Noise Voltage	eN	All	f=10 to 10KHz		-	100	-	uV
Output Current	I_{OUT}	All	(V_{IN}-V_{OUT})=1.5V	*	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=25uF)

Note 3: △ V_{OUT} = 1%

■ Typical Applications

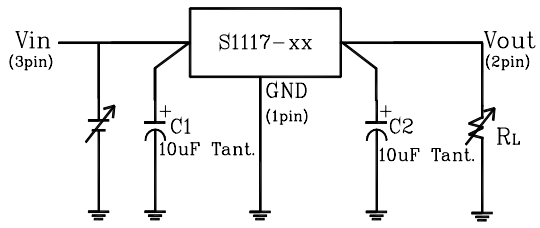


Fig. 1 Fixed Voltage Regulator

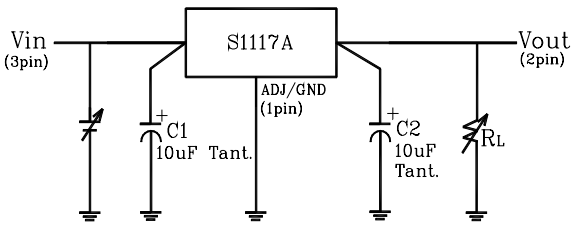
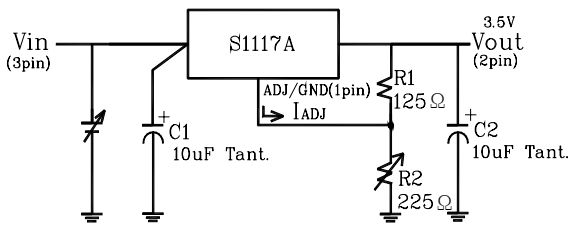


Fig. 2 1.25V Voltage Regulator



$$V_{OUT}=V_{ADJ}\left(1+\frac{R2}{R1}\right)+I_{ADJ}\times R2$$

Fig. 3 Adjustable Voltage Regulator

Electrical Characteristic Curves

Fig. 1 Minimum Load Current(Adjustable)

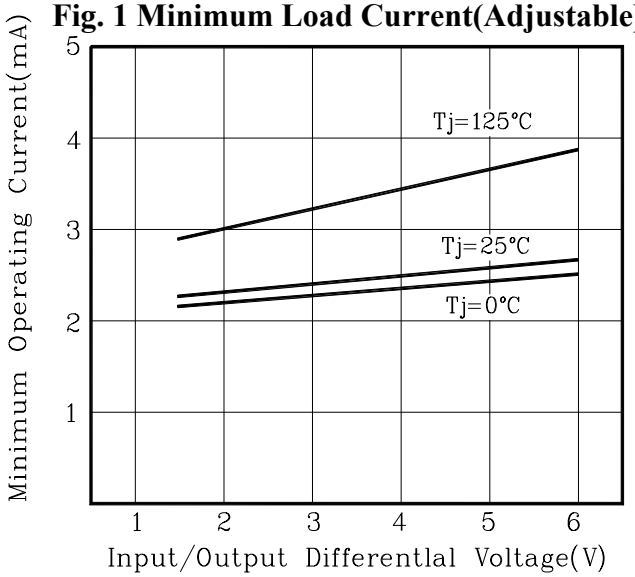


Fig. 2 Adjust Pin Current

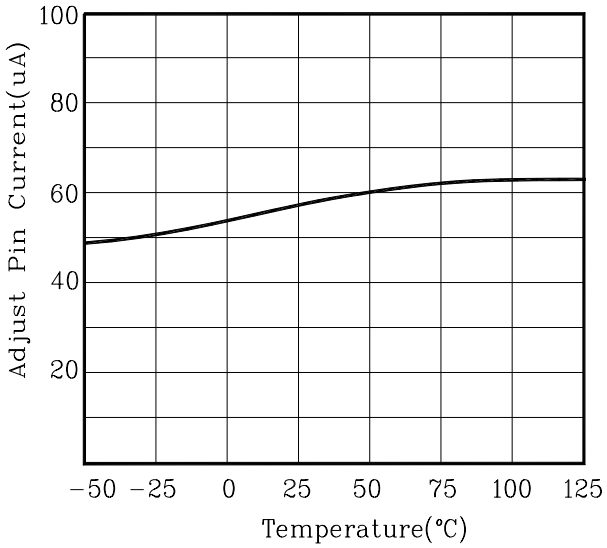


Fig. 3 Temperature Stability

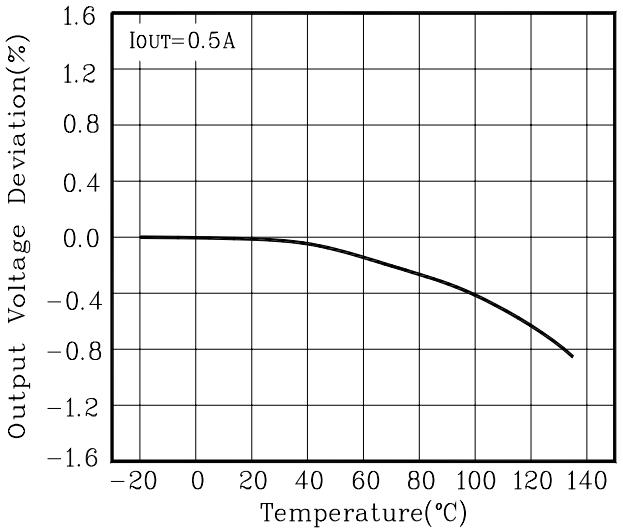


Fig. 4 Load Regulation

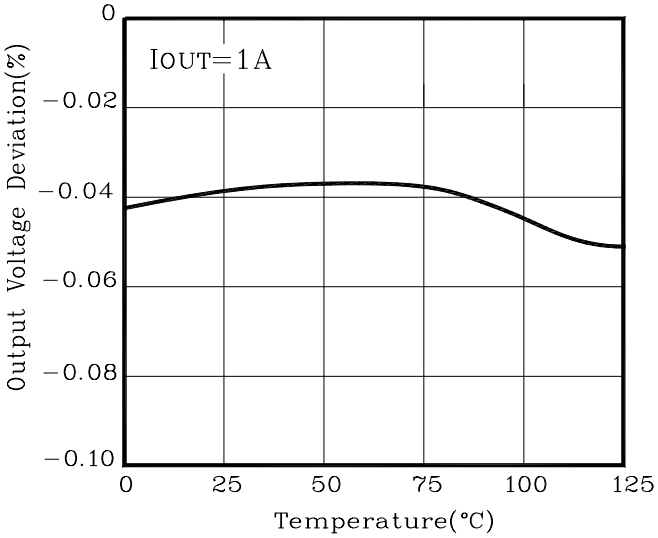


Fig. 5 Dropout Voltage

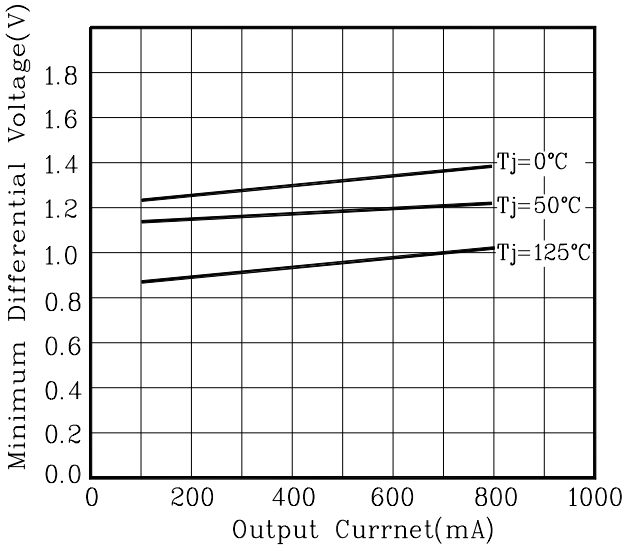
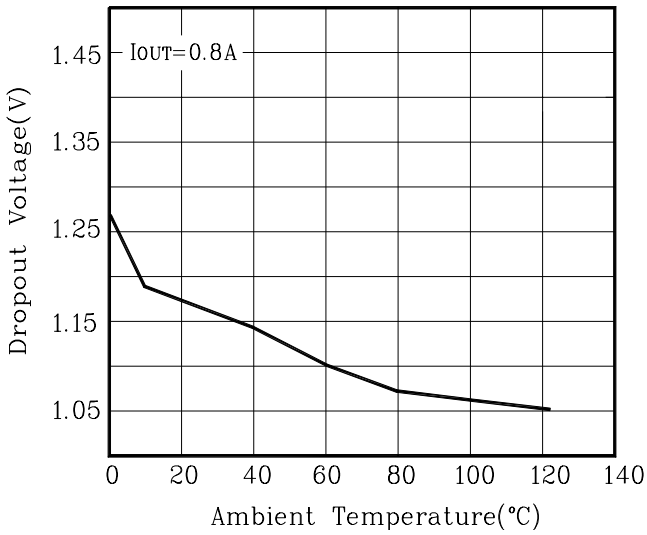


Fig. 6 Dropout Voltage - Temperature



Electrical Characteristic Curves

Fig. 7 Load Transient Response

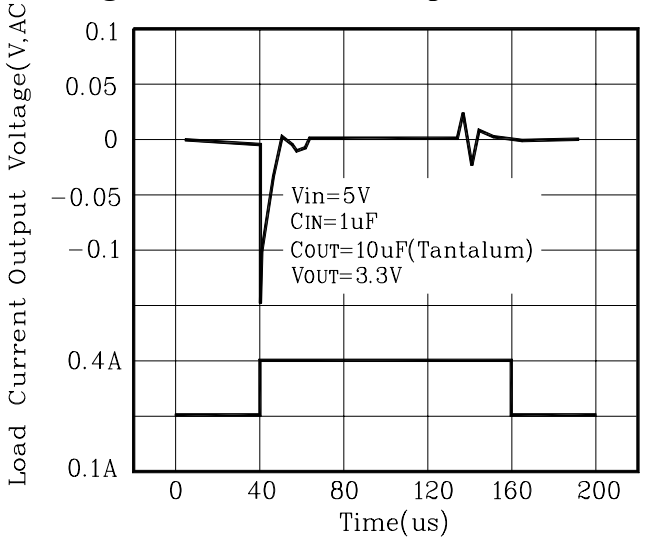


Fig. 8 Line Transient Response

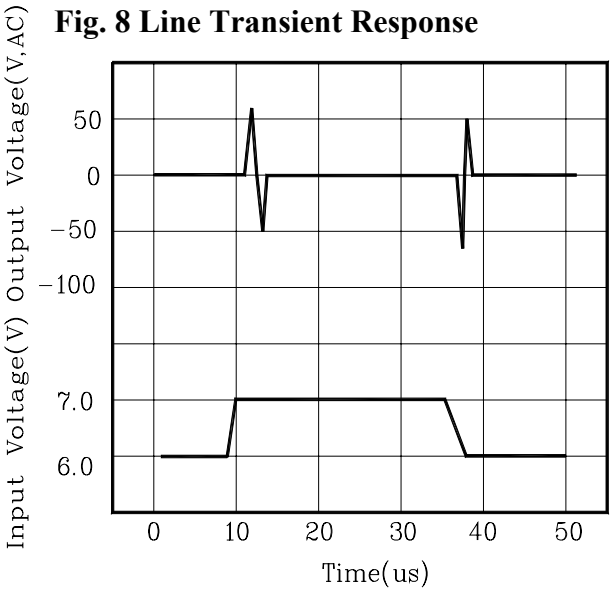
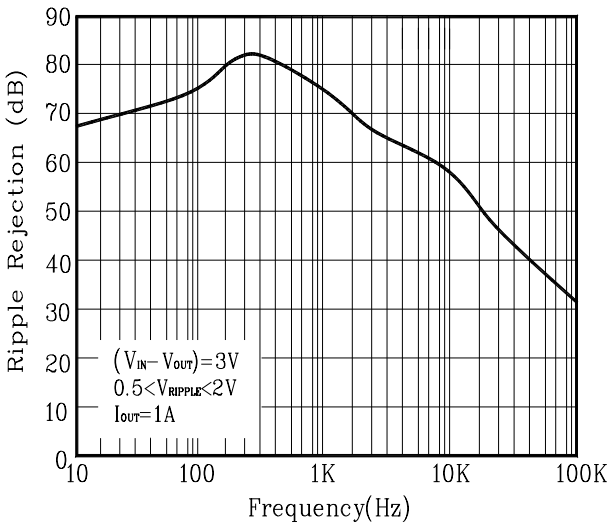


Fig. 9 Ripple Rejection



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