

1A Adjustable/Fixed Low Dropout Linear Regulator

General Description

The AMS1117 is a low dropout three-terminal regulator with a dropout of 1.4V at 1A output current. The AMS1117 series provides current limiting and thermal shutdown. Its circuit includes a trimmed band-gap reference to assure output voltage accuracy to be within 2% for 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V and adjustable versions. Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal shutdown provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

The AMS 1117 has an adjustable version that can provide the output voltage from 1.25V to 5V with only two external resistors.

Key Features

- Low dropout voltage
- Optimized for Low Voltage
- On-chip thermal limiting
- Standard SOT-223 and TO-252 packages
- Three-terminal adjustable or fixed low dropout 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V. Regulators

Applications

- High efficiency linear regulators
- Telecom equipment
- Battery chargers
- Motherboard clock supplies
- LCD monitor
- DVD-video player

The AMS1117 series regulators are available in the industry-standard SOT-223 and TO-252 power packages.

Typical Application

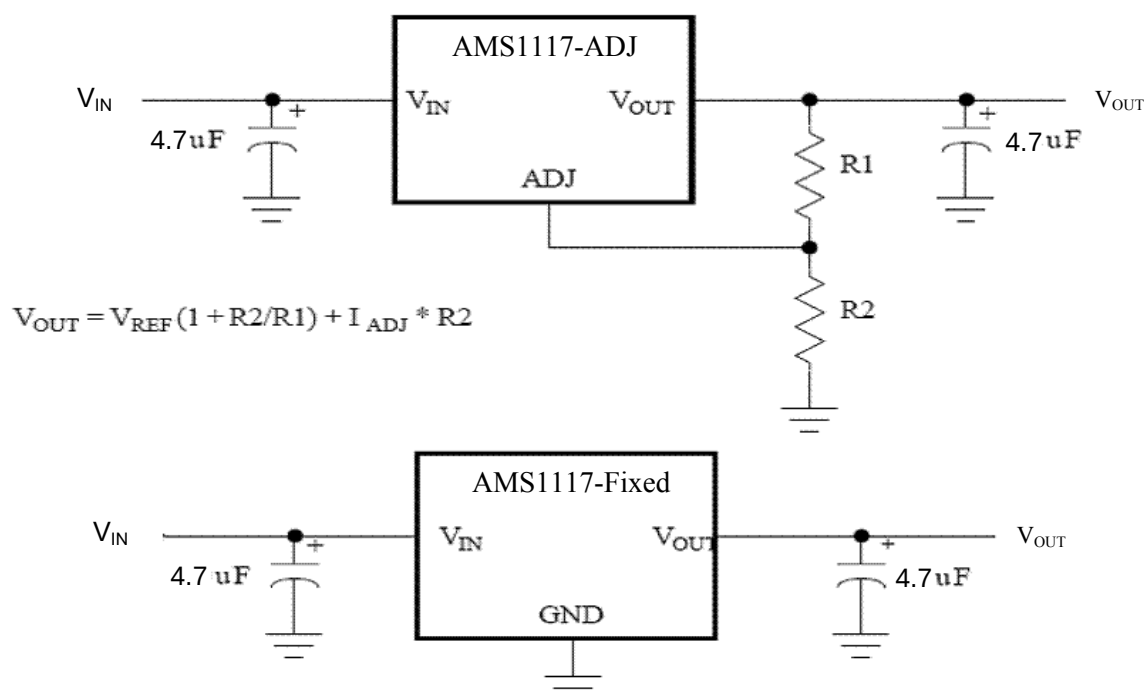


Figure 1. Typical Applications of AMS1117

Notice: The distance between Vout pin and Capacitor should not exceed 4cm for excellent performance

1A Adjustable/Fixed Low Dropout Linear Regulator

Pin Assignments

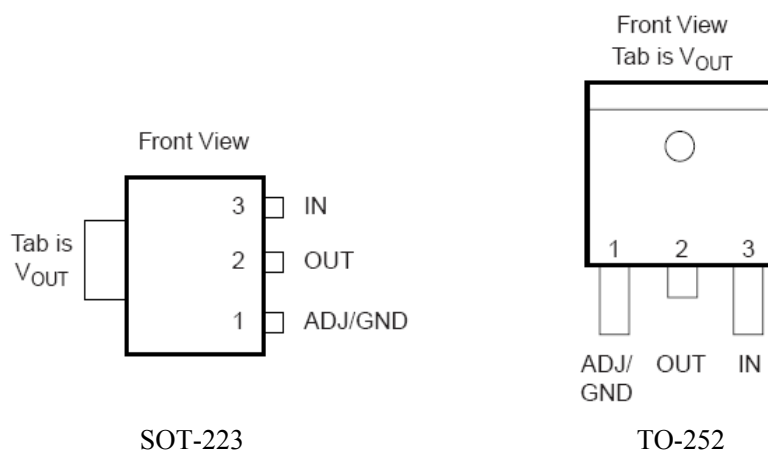


Figure 2. Pin Assignments of AMS1117

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V _{CC}	V _{CC} Pin Voltage	-0.3 to 9	V
V _{FB}	Feedback Pin Voltage	-0.3 to V _{CC}	V
P _D	Power Dissipation @ T _A = 25°C	TBD	W
T _{ST}	Storage Temperature Range	-65 to +150	°C
T _{MJ}	Maximum Junction Temperature	150	°C

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V _{IN}	Input Voltage		7	V
I _{OUT}	Output Current	0	1000	mA
T _J	Operating Junction Temperature Range	0	125	°C

1A Adjustable/Fixed Low Dropout Linear Regulator

Block Diagram

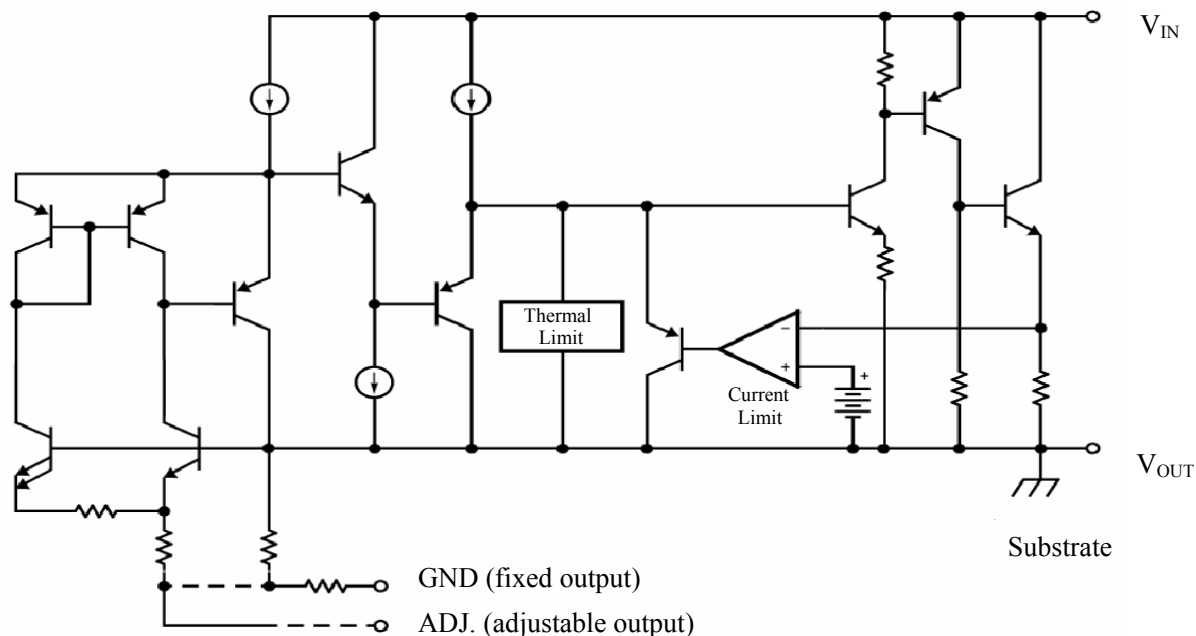


Figure 4. Block Diagram of AMS1117

Electrical Characteristic

Typicals and limits appearing in normal type apply for $T_J=25^{\circ}\text{C}$. Limits appearing in Boldface type apply over the entire junction temperature for operation, 0°C to 125°C .

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{REF}	Reference Voltage	AMS1117 $1.5\text{V} \leq (V_{IN} - V_{OUT}) \leq 7\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$	1.225	1.250	1.275	V
V_{OUT}	Output Voltage	$I_{OUT} = 10\text{mA}$	AMS1117-1.2, $3.3\text{V} \leq V_{IN} \leq 7\text{V}$	1.200	1.224	V
			AMS1117-1.5, $3.3\text{V} \leq V_{IN} \leq 7\text{V}$	1.500	1.530	V
			AMS1117-1.8, $3.3\text{V} \leq V_{IN} \leq 7\text{V}$	1.800	1.836	V
			AMS1117-2.5, $5\text{V} \leq V_{IN} \leq 7\text{V}$	2.500	2.550	V
			AMS1117-3.3, $5\text{V} \leq V_{IN} \leq 7\text{V}$	3.300	3.365	V
			AMS1117-5.0, $6.5\text{V} \leq V_{IN} \leq 7\text{V}$	5.000	5.100	V

1A Adjustable/Fixed Low Dropout Linear Regulator

Electrical Characteristic (Continued)

Typicals and limits appearing in normal type apply for $T_J=25^{\circ}\text{C}$. Limits appearing in Boldface type apply over the entire junction temperature for operation, 0°C to 125°C .

Symbol	Parameter	Conditions	Min	Typ	Max	Units
ΔV_{OUT}	Line Regulation	$I_{\text{OUT}}=10\text{mA}$, $(V_{\text{OUT}}+1.5\text{V})\leq V_{\text{IN}}\leq 7\text{V}$		0.035	0.3	%
	Load Regulation	AMS1117-ADJ $V_{\text{IN}}=3.3\text{V}$, $V_{\text{adj}}=0$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		0.2	1	%
		AMS1117-1.2 $V_{\text{IN}}=3.3\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		10	12	mV
		AMS1117-1.5 $V_{\text{IN}}=3.3\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		12	15	mV
		AMS1117-1.8 $V_{\text{IN}}=3.3\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		15	18	mV
		AMS1117-2.5 $V_{\text{IN}}=5.0\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		20	25	mV
		AMS1117-3.3 $V_{\text{IN}}=5.0\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		26	33	mV
		AMS1117-5.0 $V_{\text{IN}}=5.0\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		40	50	mV
$V_{\text{IN}}-V_{\text{OUT}}$	Dropout Volage	$I_{\text{OUT}}=1\text{A}$, $\Delta V_{\text{OUT}}=1\%V_{\text{OUT}}$		1.4		V
I_{Limit}	Current Limit	$V_{\text{IN}}-V_{\text{OUT}}=2\text{V}$, $T_J=25^{\circ}\text{C}$	1.1			A
	Minimum Load Current	AMS1117-ADJ	10			mA
	Quiescent Curent	$V_{\text{IN}}=V_{\text{OUT}}+1.25\text{V}$		5	13	mA
	Thermal Regulation	$T_A=25^{\circ}\text{C}$, 30ms pulse		0.01	0.1	%/W
	Ripple Rejection	$f=120\text{Hz}$, $V_{\text{IN}}-V_{\text{OUT}}=3\text{V}$, $V_{\text{Ripple}}=1\text{V}_{\text{PP}}$	60	72		dB
	Adjust Pin Current			50	120	μA
	Adjust Pin Current Change	$1.5\text{V}\leq V_{\text{IN}}-V_{\text{OUT}}\leq 7\text{V}$, $10\text{mA}\leq I_{\text{OUT}}\leq 1\text{A}$		0.2	5	μA
	Temperature Stability	$I_{\text{OUT}}=10\text{mA}$		0.5		%

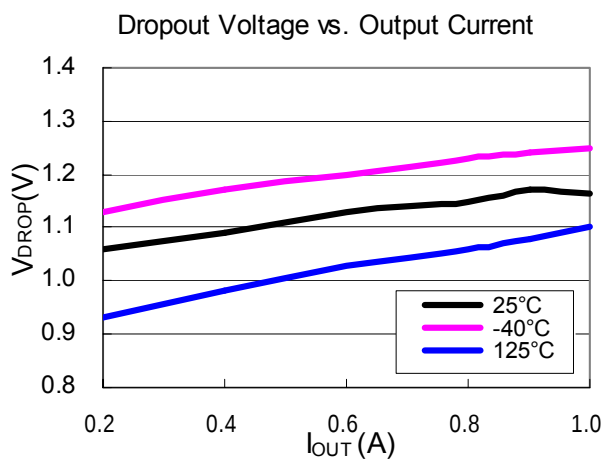
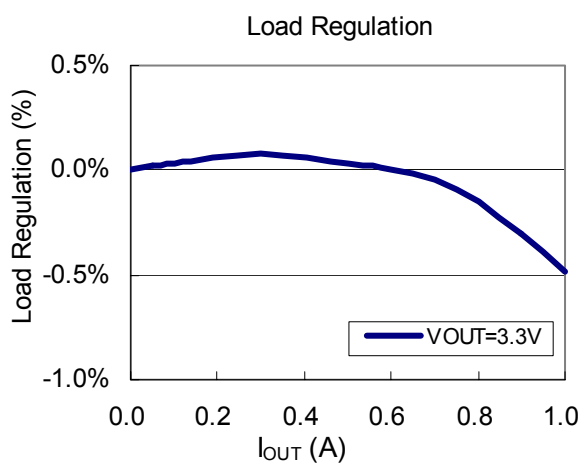
1A Adjustable/Fixed Low Dropout Linear Regulator

Electrical Characteristic (Continued)

Typicals and limits appearing in normal type apply for $T_J=25^{\circ}\text{C}$. Limits appearing in Boldface type apply over the entire junction temperature for operation, 0°C to 125°C .

Symbol	Parameter	Conditions	Min	Typ	Max	Units
I_{Limit}	Thermal Resistance, Junction to Ambient	SOT-223		75		$^{\circ}\text{C}/\text{W}$
		TO-252		55		$^{\circ}\text{C}/\text{W}$
	Thermal Resistance, Junction to Case	SOT-223		15		$^{\circ}\text{C}/\text{W}$
		TO-252		10		$^{\circ}\text{C}/\text{W}$
	Thermal Shutdown	Junction Temperature		140		$^{\circ}\text{C}$
	Thermal Shutdown Hysteresis			25		$^{\circ}\text{C}$

Typical Performance Characteristics



1A Adjustable/Fixed Low Dropout Linear Regulator

Typical Performance Characteristics

