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.

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

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

Typical Application

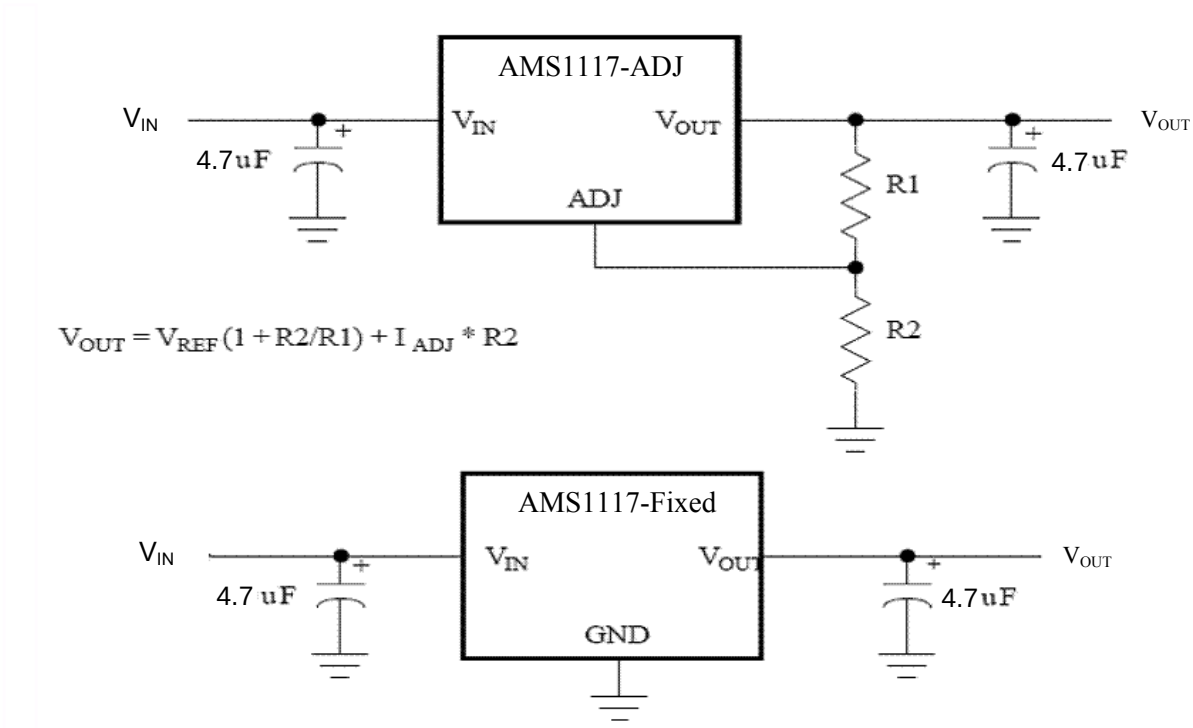

Figure 1. Typical Applications of AMS1117

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

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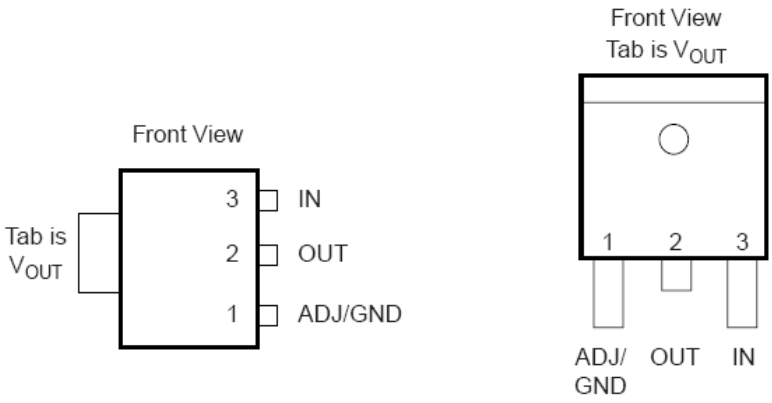
Pin Assignments



SOT-223 TO-252

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

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Block Diagram

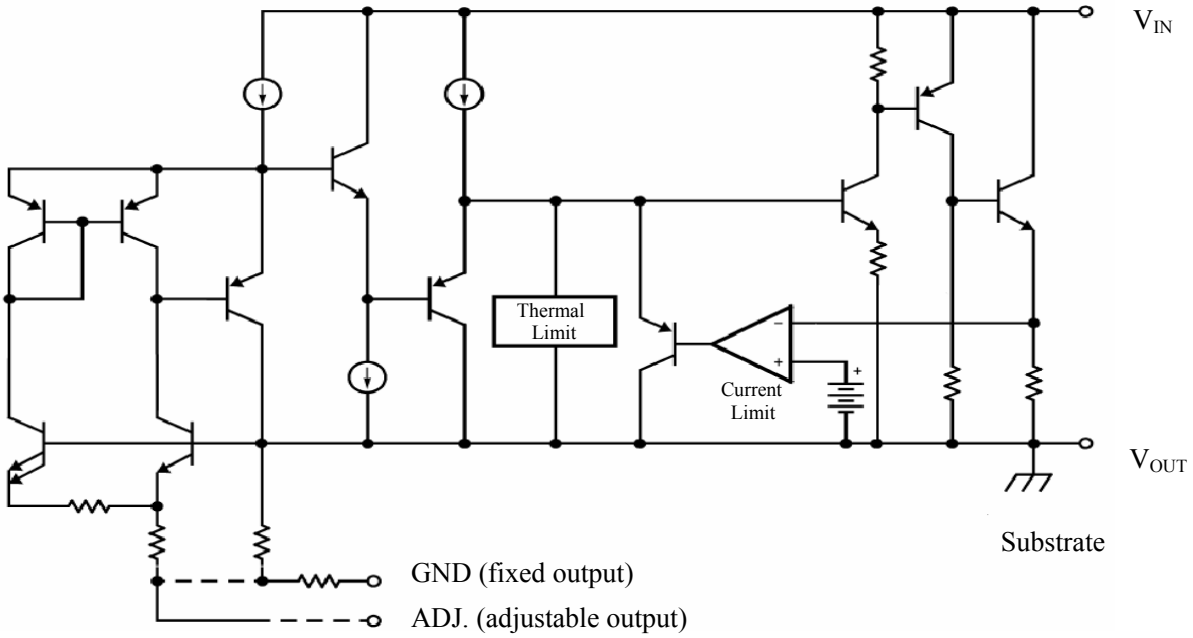

Figure 4. Block Diagram of AMS1117

Electrical Characteristic

Typicals and limits appearing in normal type apply for T_J=25℃.Limits appearing in Boldface type apply over the entire junction temperature for operation,0℃to 125℃.

Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{REF}	Reference Voltage	AMS1117 1.5V<=(V_{IN}-V_{OUT})<=7V,10mA<=I_{OUT}<=1A		**1.225**	1.250	**1.275**	V
V_{OUT}	Output Voltage	I_{OUT}= 10mA	AMS1117-1.2 ,3.3V<= V_{IN}<=7V	**1.176**	1.200	**1.224**	V
			AMS1117-1.5 ,3.3V<= V_{IN}<=7V	**1.470**	1.500	**1.530**	V
			AMS1117-1.8 ,3.3V<= V_{IN}<=7V	**1.764**	1.800	**1.836**	V
			AMS1117-2.5 ,5V<= V_{IN}<= 7V	**2.450**	2.500	**2.550**	V
			AMS1117-3.3 ,5V<= V_{IN}<= 7V	**3.235**	3.300	**3.365**	V
			AMS1117-5.0 ,6.5V<= V_{IN}<= 7V	**4.900**	5.000	**5.100**	V

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Electrical Characteristic (Continued)

Typicals and limits appearing in normal type apply for T_J=25℃.Limits appearing in Boldface type apply over the entire junction temperature for operation,0℃ to 125℃.

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

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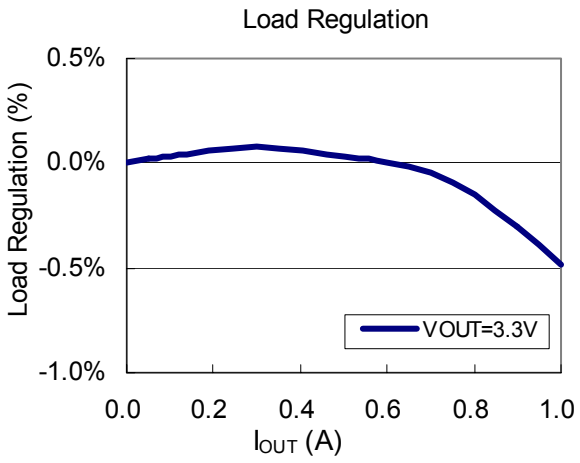
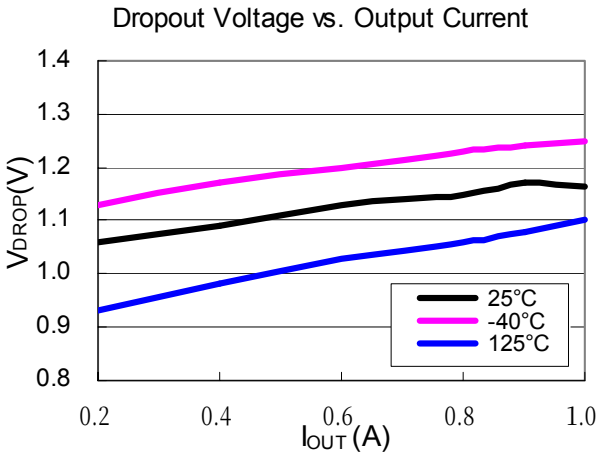
Electrical Characteristic (Continued)

Typicals and limits appearing in normal type apply for T_J=25℃.Limits appearing in Boldface type apply over the entire junction temperature for operation,0℃to 125℃.

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

Typical Performance Characteristics





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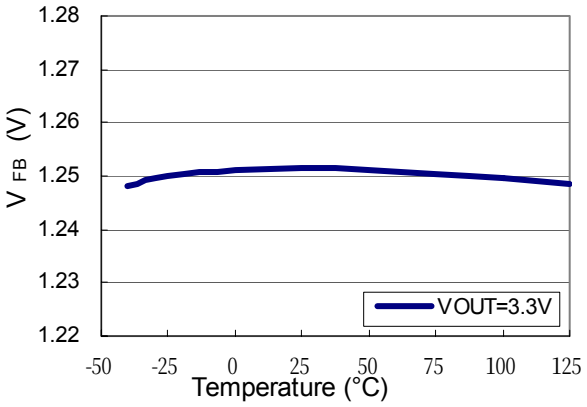
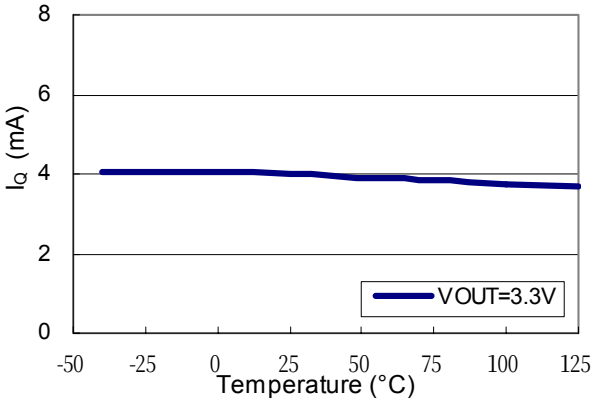
Typical Performance Characteristics

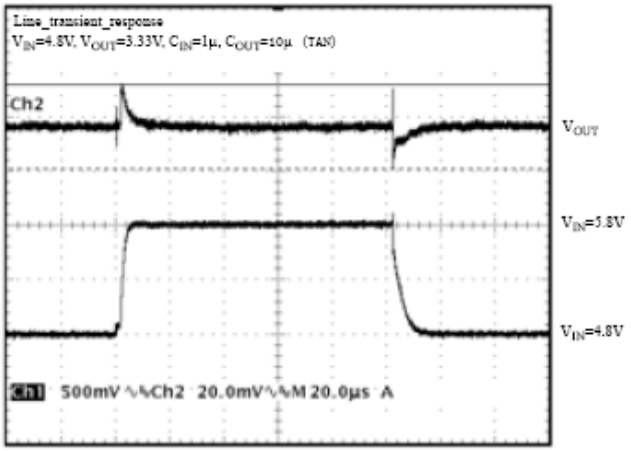
Reference Voltage



Quiescent Current vs. Output Current



Line Transient Response



Load Transient Response