GENERAL DESCRIPTION

The CM1117A is a series of low dropout three-terminal regulators with a dropout of 1.1V at 600mA output current.

These products have been optimized for low voltage where transient response and minimum input voltage are critical. These CM1117A provide current limit and thermal shutdown. Its circuit includes a trimmed band-gap reference to assure output voltage accuracy to be within ± 1%. On –chip thermal shutdown provides protection against any combination of overload and ambient temperatures that would create excessive junction temperatures.

The CM1117A is available in 2.5V and 3.3V versions. The fixed versions integrate the adjust resistors. It is also available in an adjustable version which can set the output voltage with two external resistors.

FEATURES

- Low Dropout Voltage: 1.1V at 600mA output Current.
- Output Noise from 10Hz to 10KHz: 0.003%
- PSRR at Io = 300mA and f =120Hz: 75dB
- Output Voltage Accuracy: ± 1%
- On-Chip Thermal Shutdown
- Maximum Quiescent Current: I_{QMAX} =5mA
- ESD (Human Body Model): 3.5KV
- Operation Junction Temperature –40 to 125℃

APPLICATIONS

- DVD/CD-ROM
- USB Device
- Add-on Card
- DVD Player
- PC Motherboard

PIN CONFIGURATION

SOT-89
Front View

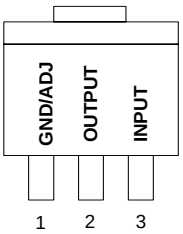


Figure 1. Package Types of CM1117A

ORDERING INFORMATION

Package Type	Operating Temperature Range (T_A)	Output Voltage
SOT-89		
CM1117AKCM89	0℃ ~ +85℃	2.5V
CM1117ASCM89	0℃ ~ +85℃	3.3V
CM1117ACM89	0℃ ~ +85℃	ADJ.
CM1117AGKCM89	0℃ ~ +85℃	2.5V
CM1117AGSCM89	0℃ ~ +85℃	3.3V
CM1117AGCM89	0℃ ~ +85℃	ADJ.

***Note:** G : Suffix for Pb Free Product

BLOCK DIAGRAM

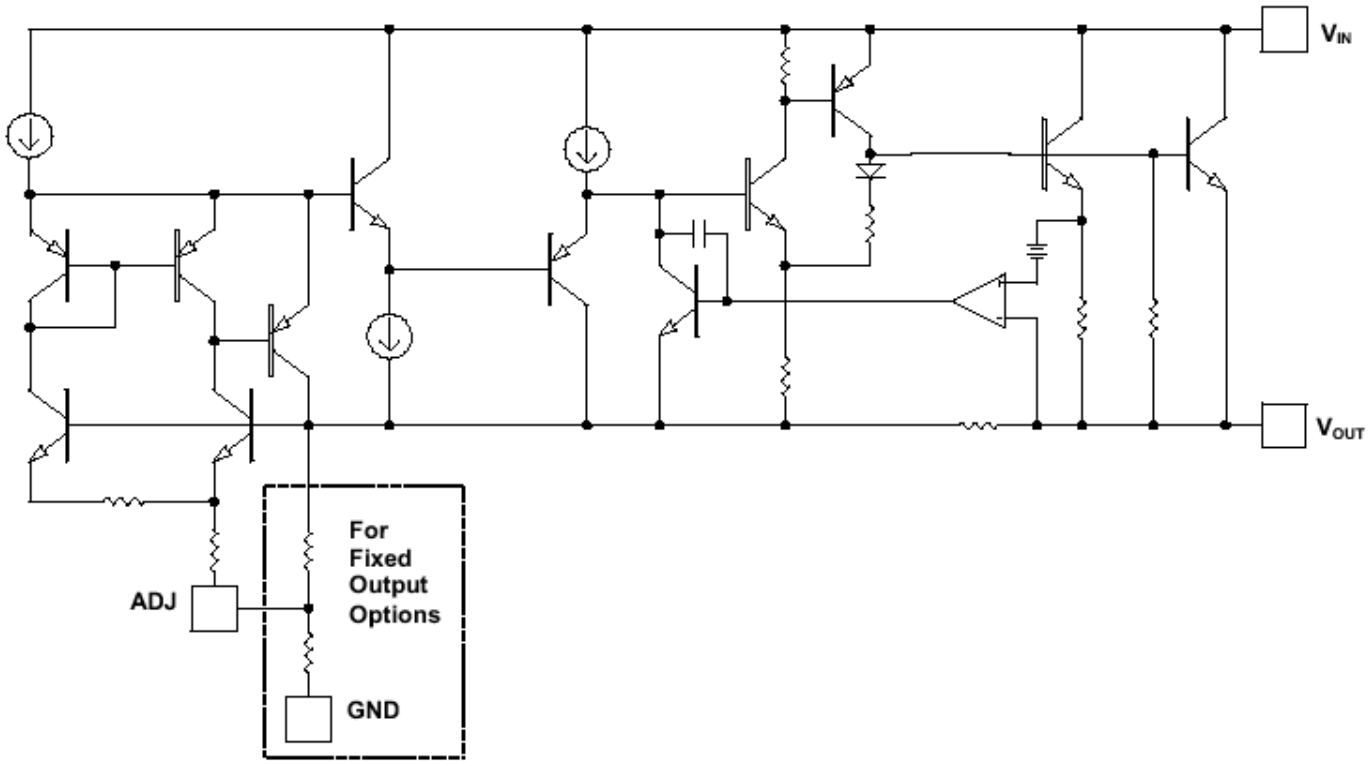


Figure 2. Functional Block Diagram of CM1117A

ABSOLUTE MAXIMUM RATINGS (Note 1)

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	15	V
Operating Junction Temperature Range	T_J	150	℃
Storage Temperature Range	T_{STG}	-65 to 150	℃
Lead Temperature (Soldering, 10sec)	T_{LEAD}	300	℃
ESD (Human Body Model)	ESD	3500	V
ESD (Machine Model)	ESD	400	V

Note 1: Stresses greater than those listed under ”Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “ Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

RESOMMENDED OPERATING CONDITIONS

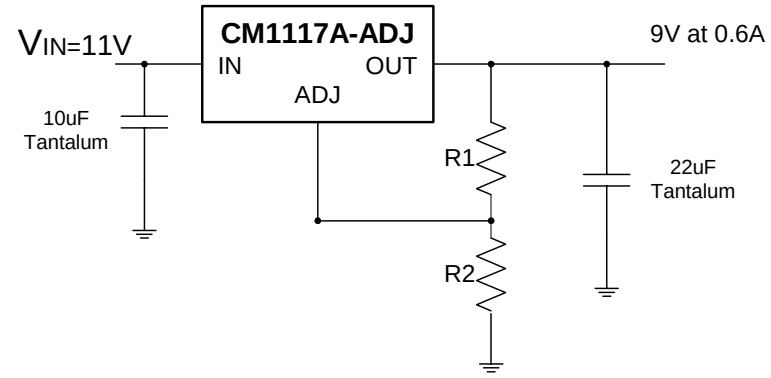
Parameter	Symbol	Min.	Max	Units
Input Voltage	V_{IN}		12	V
Operating Junction Temperature Range	T_J	-40	125	℃
Storage Temperature Range	T_{STG}	-65	150	℃

ELECTRICAL CHARACTERISTICS

Operating Conditions: $V_{IN} \leq$ 10V, T_J =25℃,unless otherwise specified. (P≤maximum power dissipation) Limit appearing in Boldface type apply over the entire junction temperature range for operation, -40℃ to 125℃

Parameter	Symbol	Test Conditions	CM1117A			Unit
			Min.	Typ.	Max.	
Reference Voltage	V_{REF}	CM1117A-ADJ I_{OUT} = 10mA, V_{IN}= V_{OUT} 2V, T_J=25℃	1.238	1.250	1.262	V
		10mA≤ I_{OUT}≤600mA, 1.4V≤ V_{IN} - V_{OUT} ≤8V				
		P≤maximum power dissipation	1.225	1.250	1.270	
Output Voltage	V_{OUT}	CM1117A-2.5 I_{OUT} = 10mA, V_{IN}= 4.5V, T_J=25℃	2.475	2.5	2.525	V
		10mA≤ I_{OUT}≤600mA, 3.9V≤ V_{IN} ≤10V	2.450	2.5	2.550	
		CM1117A-3.3 I_{OUT} = 10mA, V_{IN}= 5.0V, T_J=25℃	3.267	3.3	3.333	V
		10mA≤ I_{OUT}≤600mA, 4.75V≤ V_{IN} ≤10V	3.235	3.3	3.365	
Line Regulator	ΔV_{OUT}	CM1117A-ADJ I_{OUT} = 10mA, 1.5V≤ V_{IN} - V_{OUT} ≤10V		0.035	0.2	%
		CM1117A-3.3 I_{OUT} = 10mA, 1.5V≤ V_{IN} - V_{OUT} ≤10V		1.0	6.0	mV
		CM1117A-2.5 I_{OUT} = 10mA, 1.5V≤ V_{IN} - V_{OUT} ≤10V		1.0	6.0	mV
Load Regulation	ΔV_{OUT}	CM1117A-ADJ (V_{IN}= V_{OUT}) = 2V, 10mA≤ I_{OUT}≤600mA		0.20	0.40	%
		CM1117A-3.3 (V_{IN}= V_{OUT}) = 2V, 10mA≤ I_{OUT}≤600mA		1.0	10.0	mV
		CM1117A-2.5 (V_{IN}= V_{OUT}) = 2V, 10mA≤ I_{OUT}≤600mA		1.0	10.0	mV
Dropout Voltage		ΔV_{REF} =1% , I_{OUT} = 0.6A		1.1	1.3	V
Current Limit	I_{LIMIT}	(V_{IN} – V_{OUT}) = 2V	0.75	0.9		A
Adjust Pin Current				60	120	μA
Adjust Pin Current Change		1.4V≤(V_{IN} - V_{OUT})≤10V, 10mA≤ I_{OUT}≤600mA		0.2	5.0	
Minimum Load Current		1.5V≤(V_{IN} - V_{OUT})≤10V(ADJ only)		1.7	5.0	mA
Quiescent Current		V_{IN}= V_{OUT} + 1.25V			5.0	mA
Ripple Rejection		f = 120Hz, C_{OUT} =22 μF Tantalum (V_{IN} – V_{OUT})= 3V, I_{OUT} =300 mA	60	75		dB
Temperature Stability				0.5		%
Long-Term Stability		T_A = 125℃, 1000hrs.		0.3		%
RMS Output Noise (% of V_{OUT})		T_A = 25℃, 10Hz≤f≤10KHz		0.003		%
Thermal Shutdown		Junction Temperature		150		℃
Thermal Shutdown Hysteresis				25		℃
Thermal Resistance (Junction to case)	θ_{JC}	SOT-89		100		℃/W
		SOT-223		33		℃/W

APPLICATION CIRCUIT



$$V_{OUT} = V_{REF} * (1+R2/R1) + I_{ADJ} * R2$$

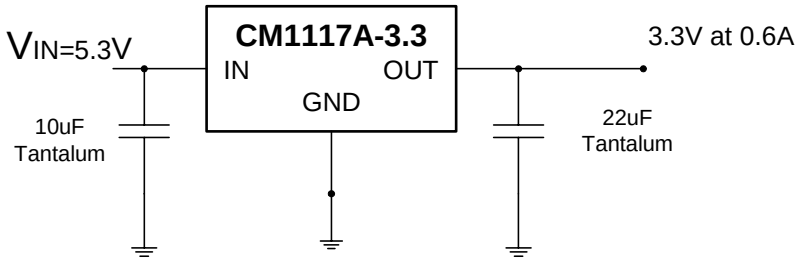


Figure 3. Typical Applications of CM1117A

TYPICAL PERFORMANCE CHARACTERISTICS

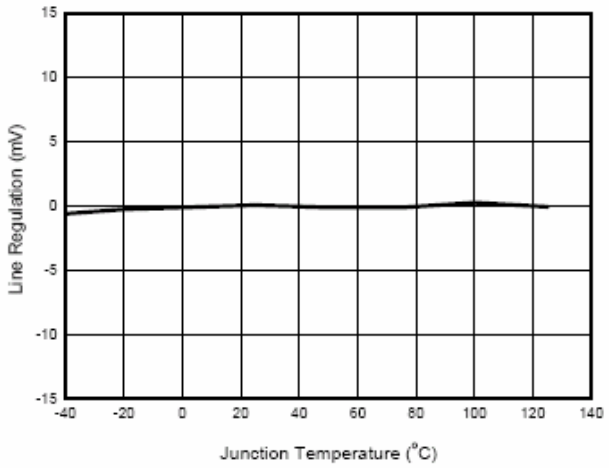


Figure 4. Line Regulation vs. Junction Temperature

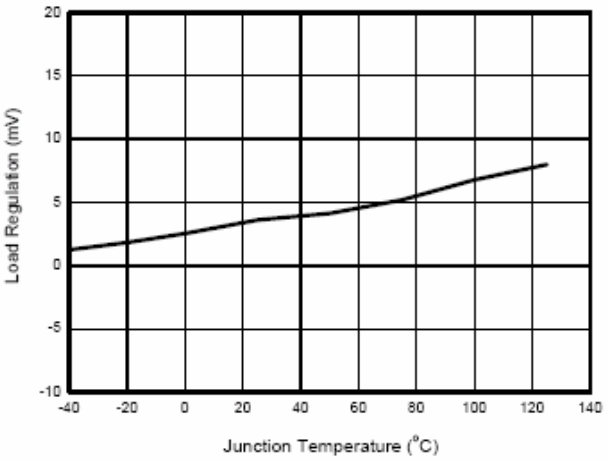


Figure 5. Load Regulation vs. Junction Temperature

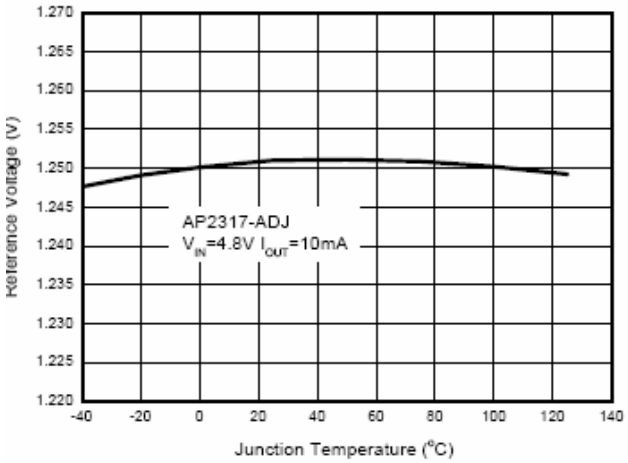


Figure 6. Reference Voltage vs. Junction Temperature

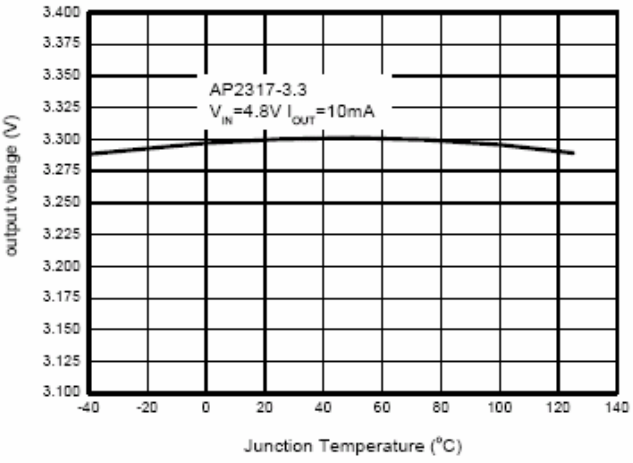


Figure 7. Output Voltage vs. Junction Temperature

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

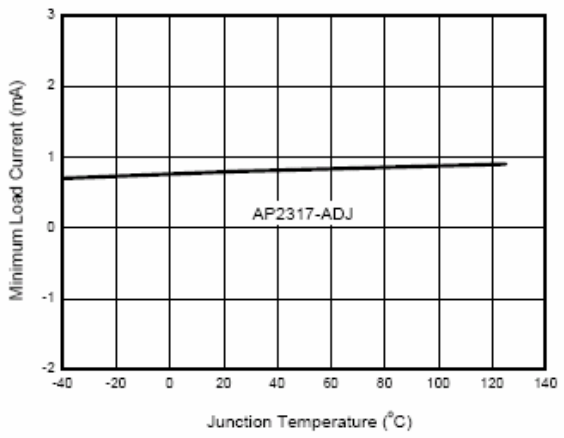


Figure 8. Minimum Load Current vs. Junction Temperature

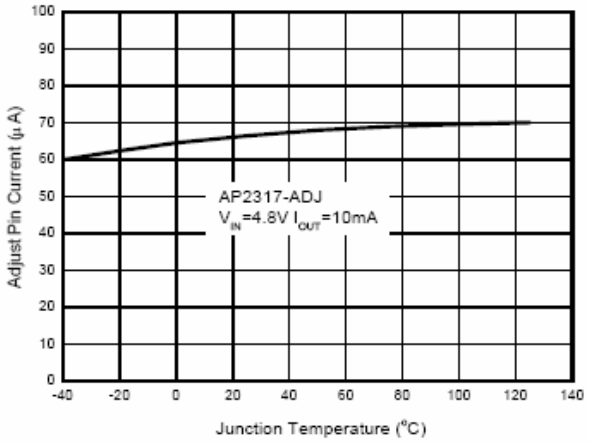


Figure 9. Adjust Pin Current vs. Junction Temperature

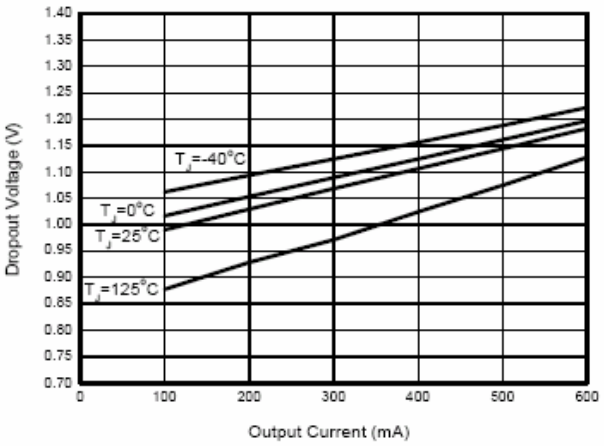


Figure 10. Dropout Voltage vs. Output Current

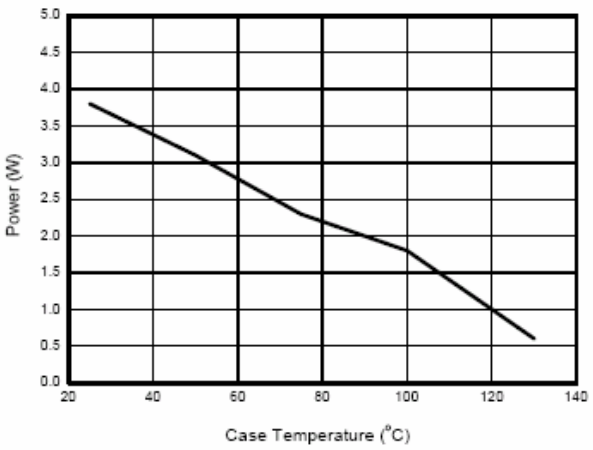
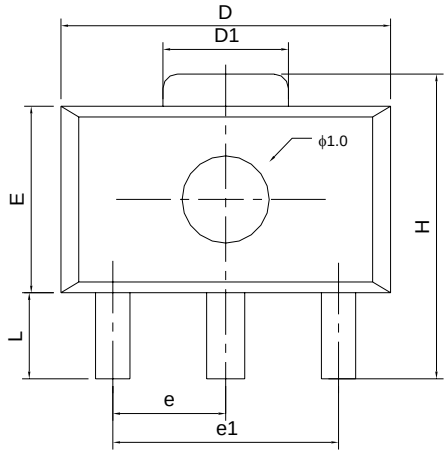
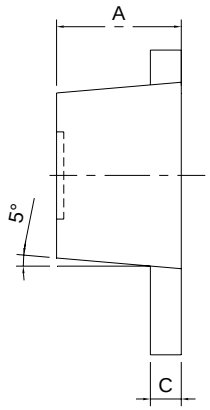


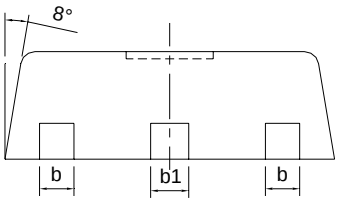
Figure 11. Maximum Power Dissipation

PACKAGE DIMENSION

SOT-89 (M89)







SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
L	0.80	---	1.20	0.031	---	0.047
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
H	3.94	---	4.25	0.155	---	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e1	2.90	3.00	3.10	0.114	0.118	0.122
e	1.45	1.50	1.55	0.057	0.059	0.061

IMPORTANT NOTICE

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