

General Description

The AAT1117 is a Positive Linear Regulator designed to deliver 1 amp. It features adjustable or fixed output voltages and excellent performance over line and load variations. The device is able to protect itself and the load from short circuit conditions with integrated current limiting circuitry. Thermal shutdown is activated to prevent damage under extreme conditions.

The AAT1117 is available in surface mount SOT-223 or TO-252 (DPAK), and through-hole TO-220 packages.

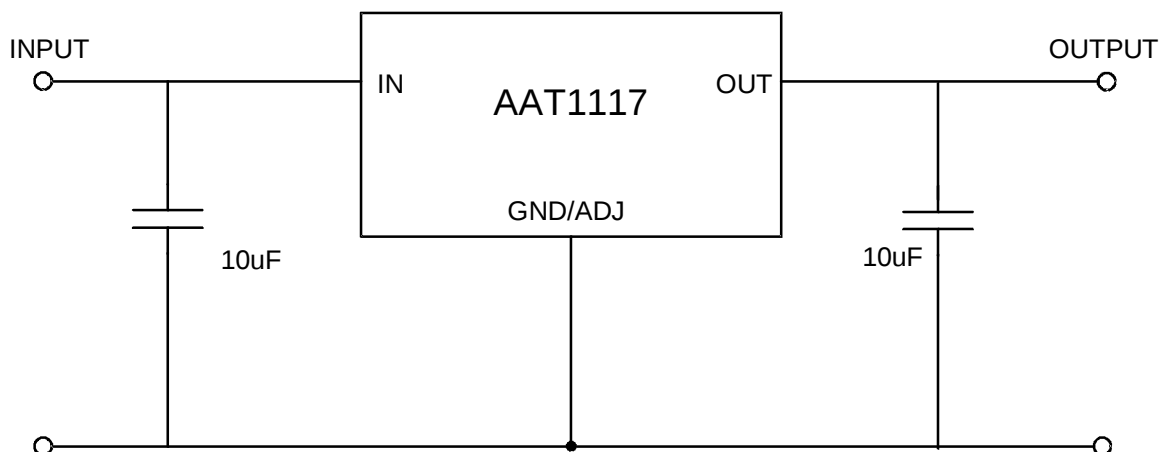
Features

- Guaranteed 1.2V max Dropout at max current
- Adjustable or Factory programmed output voltages
- Excellent performance over line, load
- Current limit protection
- Over-Temperature protection
- SOT-223, TO-252 (DPAK) and TO-220 packages

Applications

- Active SCSI Terminators
- High Efficiency Linear Regulators
- Post Regulators for Switching Supplies
- Battery Chargers
- 5V to 3.3V Linear Regulators

Typical Application



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Description	Max	Units
V _{IN}	Input Voltage	15	V
I _{OUT}	DC Output Current	P _D /(V _{IN} -V _O)	mA
T _J	Operating Junction Temperature Range	0 to 125	°C
Θ _{JA}	Thermal Resistance (SOT-223)	150	°C/W
Θ _{JA}	Thermal Resistance (TO-252)	80	°C/W
Θ _{JA}	Thermal Resistance (TO-220)	60	°C/W
P _D	Maximum Power Dissipation (SOT-223)	Internally Limited	mW
P _D	Maximum Power Dissipation (TO-252)		mW
P _D	Maximum Power Dissipation (SOT-220)		mW
T _{LEAD}	Maximum Soldering Temperature (at leads, 10 sec)	300	°C

Note: Stresses above those listed in Absolute Maximum Ratings may cause permanent damage to the device. Functional operation at conditions other than the operating conditions specified is not implied. Only one Absolute Maximum rating should be applied at any one time.

Recommended Operating Conditions

Symbol	Description	Rating	Units
V _{IN}	Input Voltage	V _{OUT} +1.2 to 13.2	V
T	Ambient Temperature Range	-40 to +85	°C

Electrical Characteristics AAT1117-ADJ (T_J=25°C unless otherwise noted)

Symbol	Description	Conditions	Min	Typ	Max	Units
V _{REF}	Reference Voltage	V _{IN} = 5V, I _{OUT} = 10mA				
		T _J =25°C	1.238	1.250	1.262	V
		Full temp	1.225	1.250	1.275	
ΔV _{OUT} /V _{OUT}	Line Regulation	V _{IN} = 4.75 - 7V, I _{OUT} = 10mA			0.2	%
		T _J =25°C				
		V _{IN} = 4.75 - 15V, I _{OUT} = 10mA			0.3	
		T _J =25°C				
		Full temp			0.4	
ΔV _{OUT} /V _{OUT}	Load Regulation	V _{IN} = 5V, I _{OUT} = 10mA - 1A		0.05	0.3	%
		T _J =25°C				
		Full temp		0.2	0.4	
V _{DO}	Dropout Voltage ¹	I _{OUT} = 10mA - 1A, ΔV _{OUT} = ±1%		1.0	1.2	V
I _{LIM}	Current Limit	V _{IN} = 2.75 - 7V	1.0			A
TC	Output Voltage Temp. Coeff.	V _{IN} = 2.75 - 7V, I _{OUT} = 10mA - 1A		0.005		%/°C
ΔV/ΔT	Temperature Stability	V _{IN} = 5V, I _{OUT} = 100mA, Full temp		0.5		%
I _{ADJ}	Adjust Pin Current	V _{IN} = 2.75 - 7V, I _{OUT} = 10mA - 1A		55		μA
		T _J =25°C				
		Full temp			90	
ΔI _{ADJ}	Adjust Pin Current Change	V _{IN} = 2.75 - 7V, I _{OUT} = 10mA - 1A, Full temp		0.2	5	μA
I _{OUTMIN}	Minimum Load Current	V _{IN} = 5V		5	10	mA
V _N	RMS Output Noise	T _J = 25°C		0.003		%V _{OUT}
PSRR	Ripple Rejection Ratio	V _{IN} = 5V, I _{OUT} = 1A, Full temp	60	72		dB

Advanced Analogic Technologies, Inc.

1250 Oakmead Pkwy, Suite 310, Sunnyvale, CA 94086
(408)524-9684 Fax (408)524-9689

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Electrical Characteristics AAT1117-3.3 (fixed) (T_J=25°C unless otherwise noted)

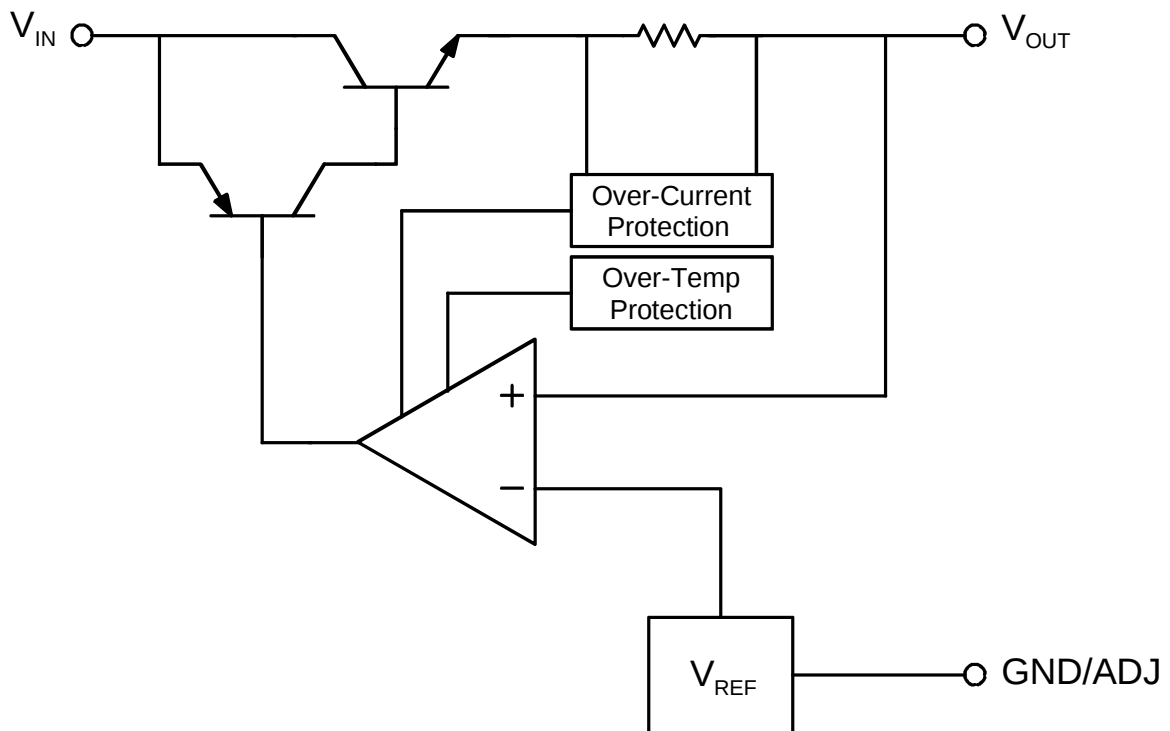
Symbol	Description	Conditions	Min	Typ	Max	Units
V _{OUT}	Output Voltage	V _{IN} = 5V, I _{OUT} = 0A	T _J =25°C 3.270 Full temp 3.234	3.30 3.30	3.330 3.336	V
ΔV _{OUT} / V _{OUT}	Line Regulation	V _{IN} = 4.75 - 7V, I _{OUT} = 0A	T _J =25°C		0.2	%
		V _{IN} = 4.75 - 15V, I _{OUT} = 0A	T _J =25°C		0.3	
			Full temp		0.4	
ΔV _{OUT} / V _{OUT}	Load Regulation	V _{IN} = 5V, I _{OUT} = 0A -1A	T _J =25°C Full temp	0.05 0.2	0.3 0.4	%
V _{DO}	Dropout Voltage ¹	I _{OUT} = 0A -1A, ΔV _{OUT} = ±1%, Full temp		1.0	1.2	V
I _{LIM}	Current Limit	V _{IN} = 4.75 - 7V, Full temp	1.0			A
I _Q	Quiescent Current	V _{IN} = 5V, I _{OUT} = 0-1A, Full temp		6	13	mA
TC	Output Voltage Temp. Coeff.	V _{IN} = 4.75 - 7V, I _{OUT} = 0 - 1A		0.005		%/°C
ΔV/ΔT	Temperature Stability	V _{IN} = 5V, I _{OUT} = 100mA, Full temp		0.5		%
V _N	RMS Output Noise	T _J = 25°C		0.003		%V _{OUT}
PSRR	Ripple Rejection Ratio	V _{IN} = 5V, I _{OUT} = 1A, Full temp	60	72		dB

Note 1: V_{DO} is defined as V_{IN} - V_{OUT} when V_{OUT} is 98% of nominal.

Pin Descriptions

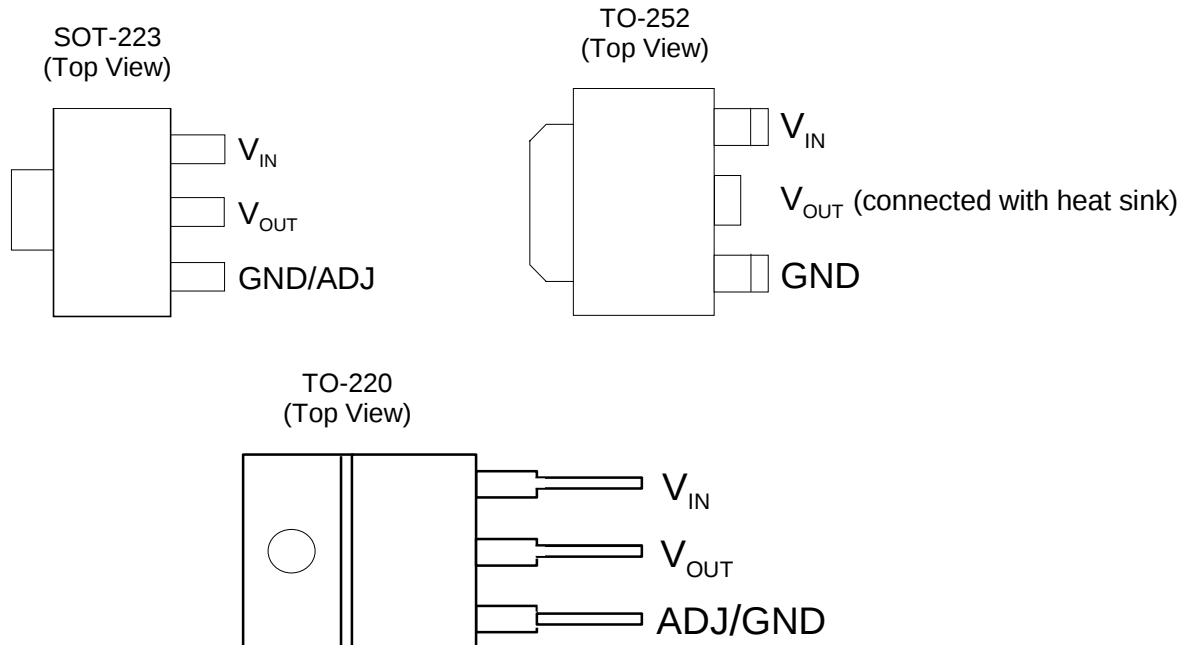
Pin #	Symbol	Function
1	GND/ADJ	For the fixed version of AAT1117, pin 1 is the ground connection. For the adjustable version, this pin is the ADJ pin. See detailed description for further information regarding configurations.
2	OUT	Output pin – should be decoupled with 10 μ F tantalum or greater output capacitor.
3	IN	Input pin - should be decoupled with 10 μ F tantalum or greater capacitor.

Functional Block Diagram



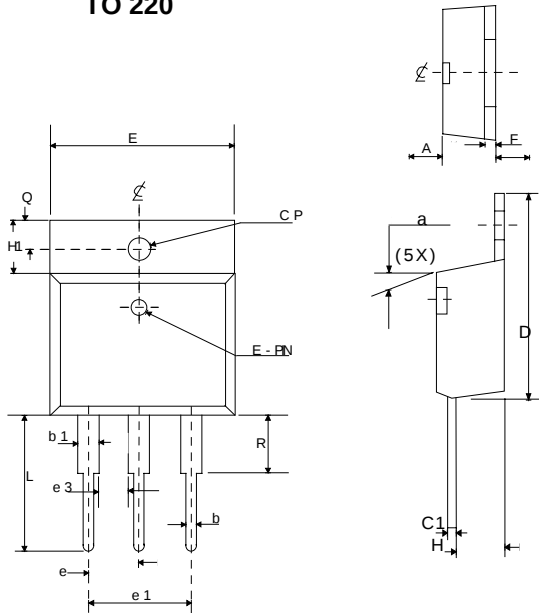
Ordering Information

Output Voltage	Package	Marking	Part Number	
			Bulk	Tape and Reel
3.3V	SOT-223		AAT1117XMY-3.3-B1	AAT1117XMY-3.3-T1
3.3V	TO-252 (DPAK)		N/A	AAT1117XNY-3.3-T1
3.3V	TO-220		AAT1117XPY-3.3-B1	N/A
Adjustable	SOT-223		AAT1117XMY-ADJ-B1	AAT1117XMY-ADJ-T1
Adjustable	TO-252 (DPAK)		N/A	AAT1117XNY-ADJ-T1
Adjustable	TO-220		AAT1117XPY-ADJ-B1	N/A

Pin Configuration

Package Information

TO 220

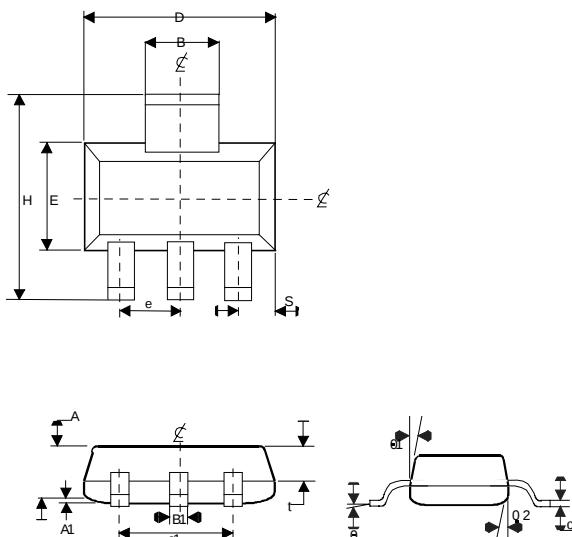


Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	4.06	4.83	0.160	0.190
b	0.63	1.02	0.025	0.040
C1	0.38	0.56	0.015	0.022
D	14.22	14.99	0.560	0.590
E	9.78	10.54	0.385	0.415
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
e3	1.14	1.40	0.045	0.055
F	1.14	1.40	0.045	0.055
H1	5.94	6.55	0.234	0.258
K	2.29	2.92	0.090	0.115
CP	3.71	3.96	0.146	0.156
Q	2.62	2.87	0.103	0.113
L	13.16	13.79	0.518	0.543
a	3°	7°	3°	7°
b1	1.14	1.52	0.045	0.060
R	6.17 REF		0.243 REF	

Note:

1. Dimension C1 apply for TIN plate finish.
2. For solder DIP lead finish dimension, C1 should be 0.015"–0.027" (0.38mm–0.69mm)

SOT 223



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	1.50	4.83	0.060	0.067
A1	0.02	1.02	0.001	0.004
B	2.95	0.56	0.116	0.124
B1	0.65	14.99	0.026	0.033
C	0.25	10.54	0.100	0.014
D	6.30	2.79	0.248	0.264
e	2.30 TYP		0.0905 TYP	
e1	4.60 TYP		0.181 TYP	
E	3.30	1.40	0.130	0.146
H	6.70	6.55	0.264	0.287
S	0.85	2.92	0.033	0.041
t	1.10	3.96	0.043	0.051
θ	10° MAX		10° MAX	
θ1	10	16°	10°	16°
θ2	10	16°	10°	16°

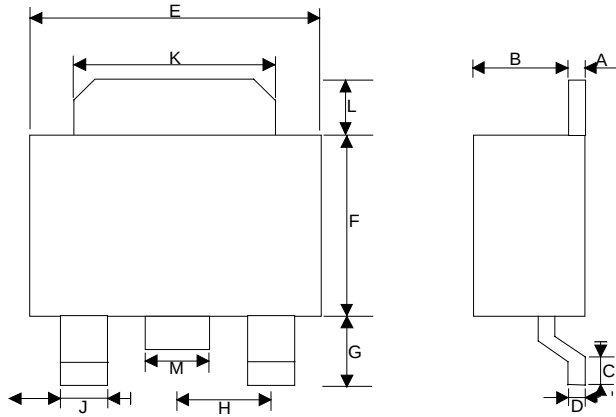
Note:

1. Package outline exclusive of any mold flashes dimension.
2. Package outline exclusive of burr dimension.

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TO - 252 (D P A K)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.45	0.55	0.0177	0.0217
B	1.65	1.95	0.0650	0.0768
C	0.90	1.50	0.0354	0.0591
D	0.45	0.60	0.0177	0.0236
E	6.40	6.80	0.2520	0.2677
F	5.40	5.80	0.2126	0.2283
G	2.20	2.85	0.0866	0.1122
H	0.00	*2.30	0.0000	*0.0906
I	0.00	0.90	0.0000	0.0354
J	0.00	0.80	0.0000	0.0315
K	5.20	5.50	0.2047	0.2165
L	1.20	1.60	0.0472	0.0630

Note:

1. Controlling dimension: Millimeters.
2. Maximum lead thickness includes lead finish thickness; minimum lead thickness is the minimum thickness of base material.