Features

- Maximum output current is 1A
- Range of operation input voltage: Max 15V
- Line regulation: 0.03%/V (typ.)
- Standby current: 2mA (typ.)
- Load regulation: 0.2%/A (typ.)
- Environment Temperature: -20℃~85℃

Applications

- Power Management for Computer Mother Board, Graphic Card
- LCD Monitor and LCD TV
- DVD Decode Board
- ADSL Modem
- Post Regulators For Switching Supplies

General Description

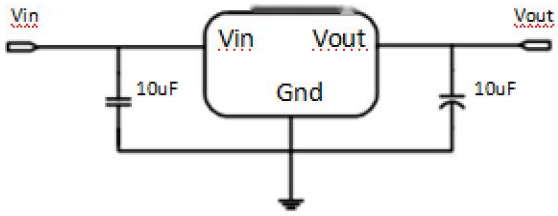
AMS1117C is a series of low dropout three-terminal regulators with a dropout of 1.3V at 800mA load current. AMS1117C features a very low standby current 2mA compared to 5mA of competitor.

Other than a fixed version, Vout = 1.2V, 1.8V, 2.5V, 2.85V, 3.3 V, and 5V, AMS1117C has an adjustable version, which can provide an output voltage from 1.25 to 12V with only two external resistors.

AMS1117C offers thermal shut down function, to assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within 2%. Other output voltage accuracy can be customized on demand, such as 1%.

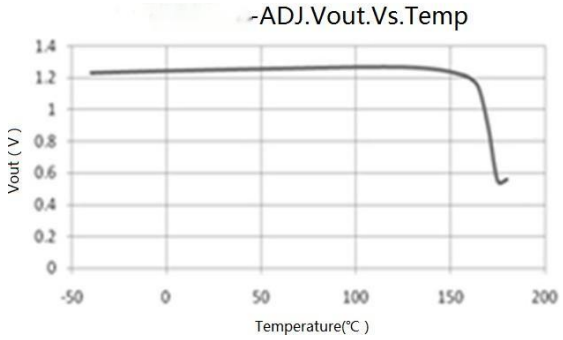
AMS1117C is available in SOT-223, TO-252 power package.

Typical Application



Application circuit of AMS1117C fixed version

Typical Electrical Characteristic



Selection Table

Marking	Part No.	Output Voltage	Package
AMS1117 XX WW	XX=12	1.2V	SOT-223 TO-252
	XX=18	1.8V	
	XX=28	2.85V	
	XX=25	2.5V	
	XX=33	3.3V	
	XX=50	5.0V	
	XX=AD	Adj	

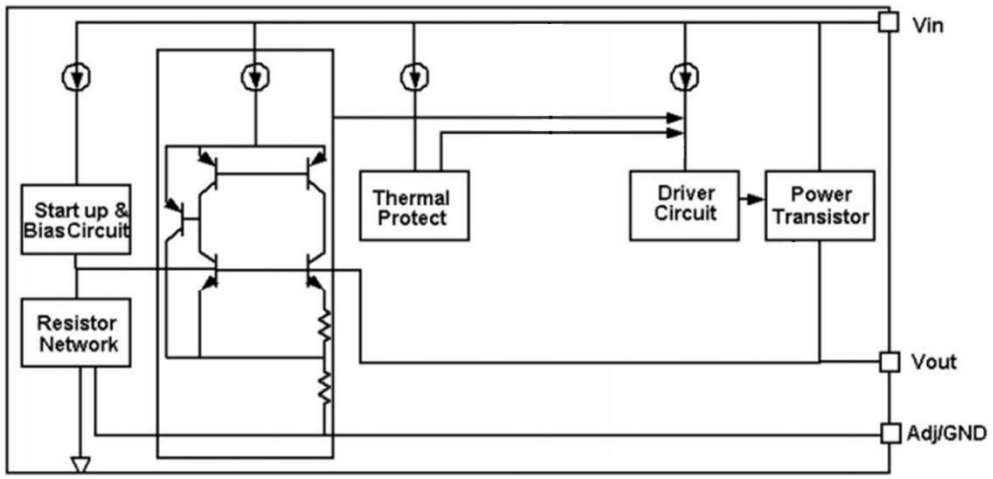
Ordering Information

Marking	Designator	Description
AMS1117 XX WW	1117 C	Product code
	XX	Output Voltage(1.2~12.0V)
	YYWW	DATE CODE

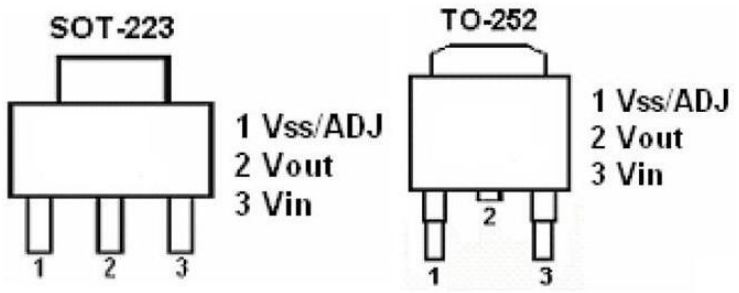
Note:"XX" stands for output voltages. Other voltages can be specially customized

Parameters	Description
Temperature & Rohs	C:-40~85℃ ,Pb Free Rohs Std.
Package type	L:SOT-223 O:TO-252
Packing type:	TR: Tape & Reel (Standard)
Voltage accuracy	2%(Customized)

Block Diagram



Pin Configuration



Absolute Maximum Ratings

Max Input Voltage ····· V

Max Operating Junction Temperature(Tj) ····· 150℃

Ambient Temperature(Ta) ····· -40℃~ 85℃

Storage Temperature(Ts) ····· -40℃~150℃

Lead Temperature & Time ····· 260℃ 10S

Caution: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

Recommended Work Conditions

Recommended maximum input voltage ····· 15V

Recommended operating junction temperature(Tj) ····· -20~125℃

Thermal Information

Parameter	Package	Rating	Unit
Package thermal resistance	SOT-223	20	℃/W
	TO-252	12.5	℃/W

Electrical Characteristics

T_A=25℃， unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Vref	Reference voltage	1117C-Adj 10mA≤Iout≤800mA , Vin=3.25V	1.225	1.25	1.275	V
Vout	Output voltage	1117C-1.2V 0≤Iout≤800mA , Vin=3.2V	1.176	1.2	1.224	V
		1117C-1.8V 0≤Iout≤800mA , Vin=3.8V	1.764	1.8	1.836	V
		1117C-2.5V 0≤Iout≤800mA , Vin=4.5V	2.45	2.5	2.55	V
		1117C-2.85V 0≤Iout≤800mA , Vin=4.85V	2.793	2.85	2.907	V
		1117C-3.3V 0≤Iout≤800mA , Vin=5.3V	3.234	3.3	3.366	V
		1117C-5.0V 0≤Iout≤800mA , Vin=7.0V	4.9	5	5.1	V
△Vout	Line regulation	1117C-1.2V Iout=10mA, 2.7V≤Vin≤10V		0.03	0.2	%/V
		1117C-ADJ Iout=10mA, 2.75V≤Vin≤12V		0.03	0.2	%/V
		1117C-1.8V Iout=10mA, 3.3V≤Vin≤12V		0.03	0.2	%/V
		1117C-2.5V Iout=10mA, 4.0V≤Vin≤12V		0.03	0.2	%/V
		1117C-2.85V Iout=10mA, 4.35V≤Vin≤12V		0.03	0.2	%/V
		1117C-3.3V Iout=10mA, 4.8V≤Vin≤12V		0.03	0.2	%/V
		1117C-5.0V Iout=10mA, 6.5V≤Vin≤12V		0.03	0.2	%/V
		1117C-1.2V Vin =2.7V, 10mA≤Iout≤800mA		2	8	mV
		1117C-ADJ Vin =2.75V, 10mA≤Iout≤800mA		2	8	mV
		1117C-1.8V Vin =3.3V, 10mA≤Iout≤800mA		3	12	mV

△Vout	Load regulation	1117C-2.5V Vin =4.0V, 10mA≤Iout≤800mA		4	16	mV
		1117C-2.85V Vin =4.35V, 10mA≤Iout≤800mA		5	20	mV
		1117C-3.3 Vin =4.8V, 10mA≤Iout≤800mA		6	24	mV
		1117C-5.0 Vin =6.5V, 10mA≤Iout≤800mA		9	36	mV
Vdrop	Dropout voltage	Iout =100mA		1.2	1.3	V
		Iout=800mA		1.3	1.5	V
Imin	Minimum load current	1117C-ADJ		2	10	mA
Iq	Quiescent Current	1117C-1.2V,Vin=10V		2	5	mA
		1117C-1.8V,Vin=12V		2	5	mA
		1117C-2.5V,Vin=12V		2	5	mA
		1117C-2.85V,Vin=12V		2	5	mA
		1117C-3.3V,Vin=12V		2	5	mA
		1117C-5.0V,Vin=12V		2	5	mA
IAdj	Adjust pin current	1117C-ADJ Vin=5V,10mA≤Iout≤800mA		55	120	uA
Ichange	Iadj change	TX1117C-ADJ Vin=5V,10mA≤Iout≤800mA		0.2	10	uA
△V/△T	Temperature coefficien			±100		ppm
θ_{JC}	Thermal resistance	SOT-223		20		℃/W
		TO-252		10		

Note1: All test are conducted under ambient temperature 25° C and within a short period of time 20ms

Note2: Load current smaller than minimum load current of AMS1117C-ADJ will lead to unstable or oscillation output.

Detailed Description

AMS1117C is a series of low dropout voltage, three terminal regulators. Its application circuit is very simple: the fixed version only needs two capacitors and the adjustable version only needs two resistors and two capacitors to work. It is composed of some modules including start-up circuit, bias circuit, bandgap, thermal shutdown, power transistors and its driver circuit and so on.

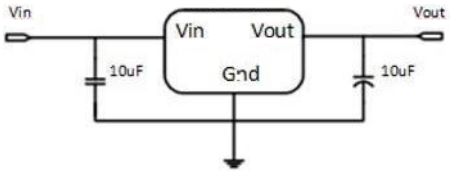
The thermal shut down modules can assure chip and its application system working safety when the junction temperature is larger than 140°C.

The bandgap module provides stable reference voltage, whose temperature coefficient is compensated by careful design considerations. The temperature coefficient is under 100 ppm/°C. And the accuracy of output voltage is guaranteed by trimming technique.

Typical Application

AMS1117C has an adjustable version and six fixed versions (1.2V, 1.8V, 2.5V, 2.85V , 3.3V and 5V)

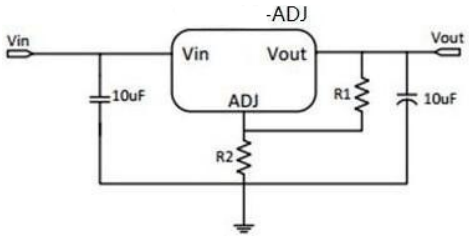
Fixed Output Voltage Version



Application circuit of AMS1117C fixed version

1) Recommend using 10uF tan capacitor as bypass capacitor (C1) for all application circuit.
2) Recommend using 10uF tan capacitor to assure circuit stability.

Adjustable Output Voltage Version



Application Circuit of AMS1117C-ADJ

The output voltage of adjustable version follows the equation: Vout=1.25×(1+R2/R1)+IAdj×R2. We can ignore IAdj because IAdj (about 50uA) is much less than the current of R1 (about 2~10mA).

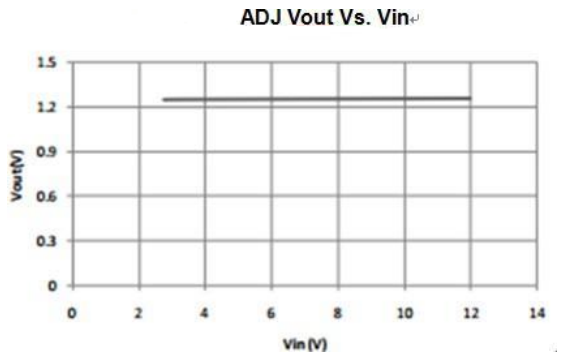
1) To meet the minimum load current (>10mA) requirement, R1 is recommended to be 125ohm or lower. As TX1117C-ADJ can keep itself stable at load current about 2mA, R1 is not allowed to be higher than 625ohm.

2) Using a bypass capacitor (C_{ADJ}) between the ADJ pin and ground can improve ripple rejection. This bypass capacitor prevents ripple from being amplified as the output voltage is increased. The impedance of C_{ADJ} should be less than R1 to prevent ripple from being amplified. As R1 is normally in the range of 100Ω~500Ω, the value of C_{ADJ} should satisfy this equation: $1/(2\pi \times f_{ripple} \times C_{ADJ})<R1$.

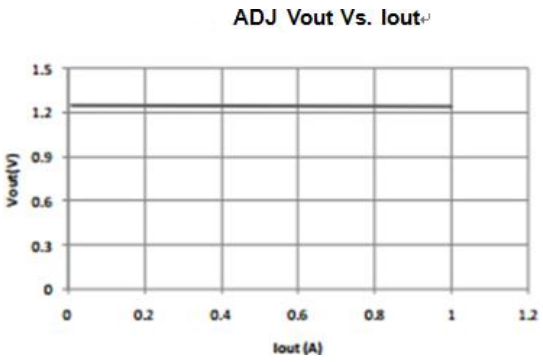
Typical Performance Charcteristics

T_A=25℃， unless otherwise noted.

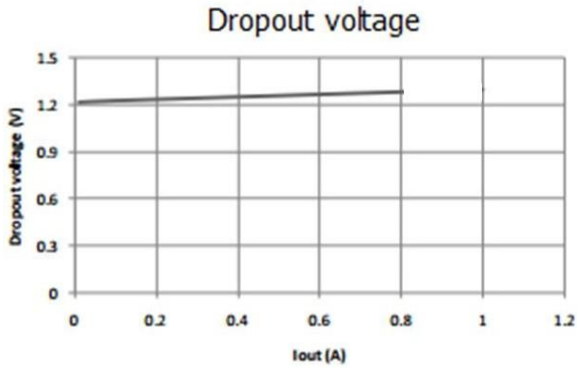
Line regulation



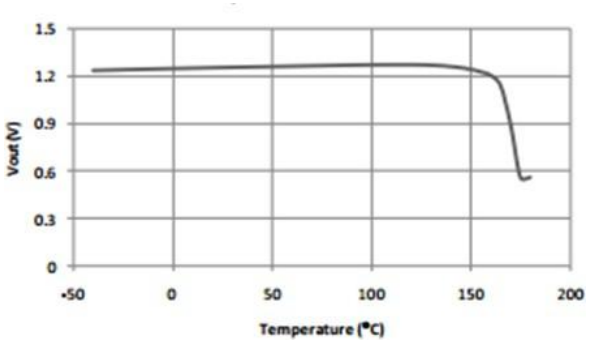
Load regulation



Dropout voltage

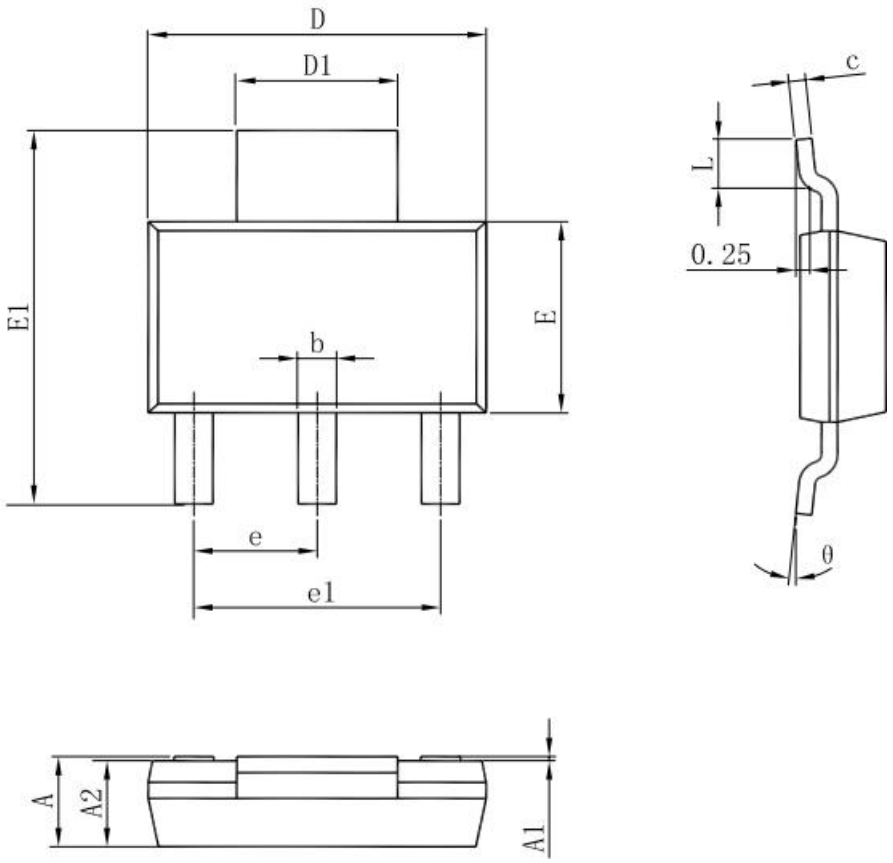


Thermal performance with OTP



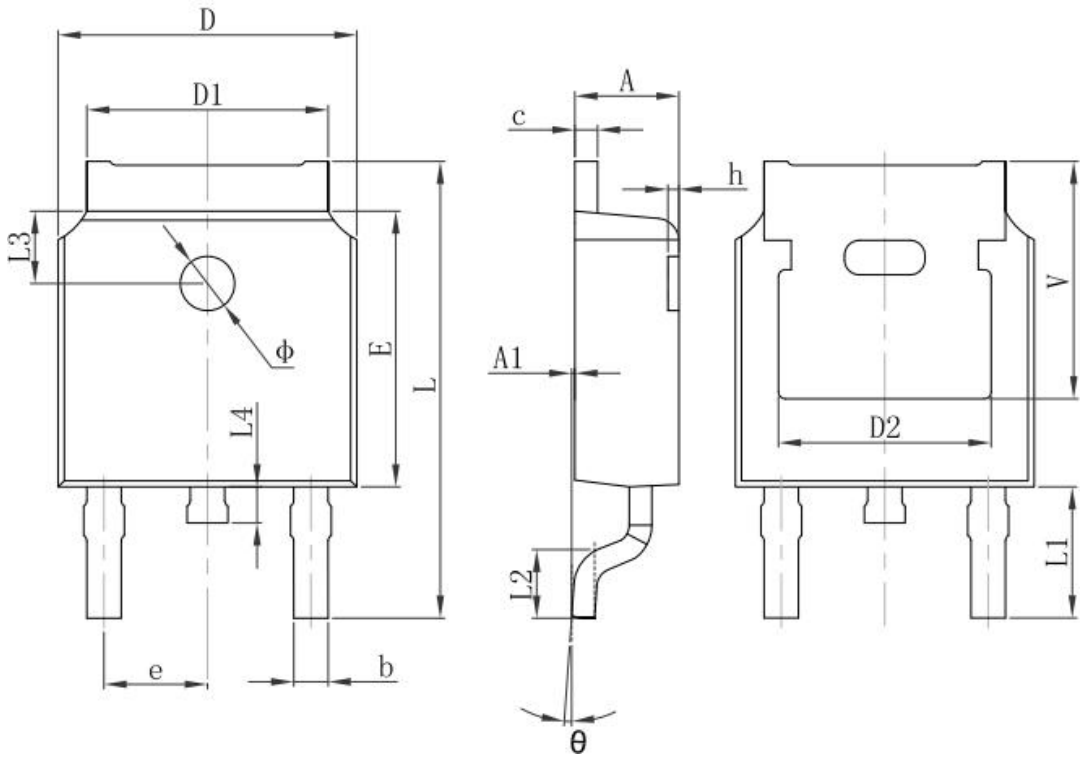
Package Information

SOT-223 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

TO-252-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

Package Outline

Dimensions in mm

