1A Voltage High Speed LDO Regulators BM1117N Series

General Description

The BM1117N series are highly accurate, low noise, LDO Voltage Regulators that are capable of providing an output current that is in excess 910mA up to 1A with a maximum dropout of 0.5V, at 800mA. This series contains two fixed output voltages of 1.2V,1.5V,1.8V,2.5V,3.3 V, 5.0 V.On-chip trimming adjusts the reference/output voltage to within ±1.5% accuracy. Internal protection features consist of output current limiting, safe operating area compensation, and thermal shutdown. The BM1117N series can operate with up to 18 V input. There is SOT23,SOT223,SOT89 and TO252 package.

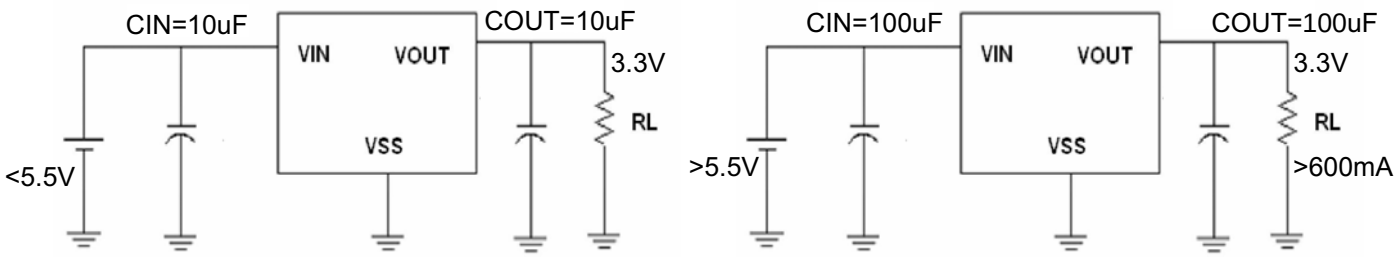
Features

- Output Current up to 1A
- Dropout Voltage: 500mV@ I_{OUT} =800mA
- Operating Voltage Range: 1.6V～16V
- Highly Accuracy: ±2%
- Adjustable Output Voltage Option
- Standby Current:60uA（TYP.）
- High Ripple Rejection: 75dB@1KHz
- Line Regulation: 0.1%（TYP.）
- Temperature Stability≤0.5%
- Thermal Shutdown Protection：150℃
- Packages:SOT223、TO252

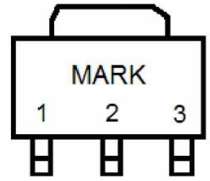
Typical Application

- Consumer and Industrial Equipment Point of Regulation
- Switching Power Supply Post Regulation
- Down:3.7--3.3V;3.3--2.5V;2.5--1.8V;1.8--1.2V
- Battery Chargers

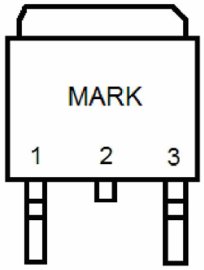
Typical Application Circuit



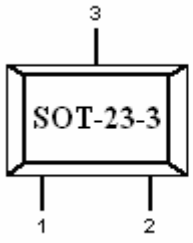
Pin Configuration

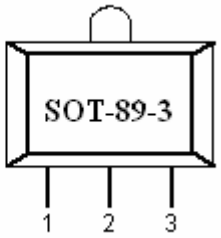


SOT223



TO252-2





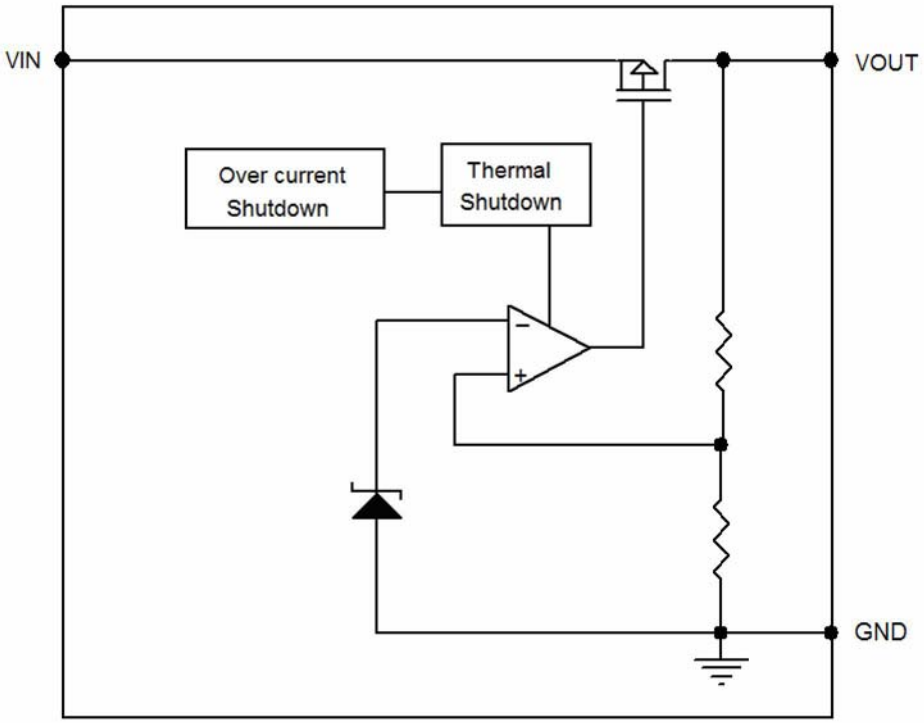
PART NO: BM1117N-x.x =SOT223 ; BM1117NS=SOT23-3 ; BM1117NT= SOT89-3 ; BM1117ND=TO252-2
X.X means output voltage

SOT89	SOT223/23,TO252	Pin Name	Functions
1	1	GND	Ground
3	2	V_{OUT}	Output
2	3	V_{IN}	Power Input

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	18	V
Output Current		I_{OUT}	1	A
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT223	P_D	1500	mW
	TO252-2		2500	mW
Operating Temperature Range		T_{OPR}	－20～＋85	℃
Storage Temperature Range		T_{STG}	－40～＋150	℃
Lead Temperature			260℃，4sec	

Block Diagram



Electrical Characteristics

BM1117N-X.X

(V_{IN}= V_{OUT}+1.5V，C_{IN}=C_L=33uF，Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E)	I_{OUT}=10mA, V_{IN}= V_{OUT}+1.0V		X 0.98	V_{OUT} (T)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.0V			910	1000	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.0V , 0mA≤I_{OUT}≤800mA			10	20	mV
Dropout Voltage	V_{DIF1}	I_{OUT} =200mA			200		mV
	V_{DIF2}	I_{OUT} =500mA			300		mV
	V_{DIF3}	I_{OUT} =800mA			500		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.0V			60		uA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =0mA V_{OUT}+1.0V ≤V_{IN}≤15V			2	5	mV
Ripple Rejection Rate	PSRR	V_{IN} = 6.3V +1Vp-pAC	I_{OUT}=100mA,1kHZ		75		dB
			I_{OUT}=200mA,1kHZ		69		
			I_{OUT}=500mA,1kHZ		62		

Applications Information

1. Input Bypass Capacitor

An input capacitor is recommended.A 33uF tantalum on the input is a suitable input bypassing for almost all applications.

2. Load Regulation

The BM1117N regulates the voltage that appears between its output and ground pins,or between its output and adjust pins. In some cases, line resistances can introduce errors to the voltage across the load. To obtain the best load regulation, a few precautions are needed. Figure1, shows a typical application using a fixed output regulator.The Rt1 and Rt2 are the line resistances.It is obvious that the V_{LOAD} is less than the V_{OUT} by the sum of the voltage drops along the line resistances. In this case, the load regulation seen at the R_{LOAD} would be degraded from the datasheet specification. To improve this , the load should be tied directly to the output terminal on the positive side and directly tied to the ground terminal on the negative side.

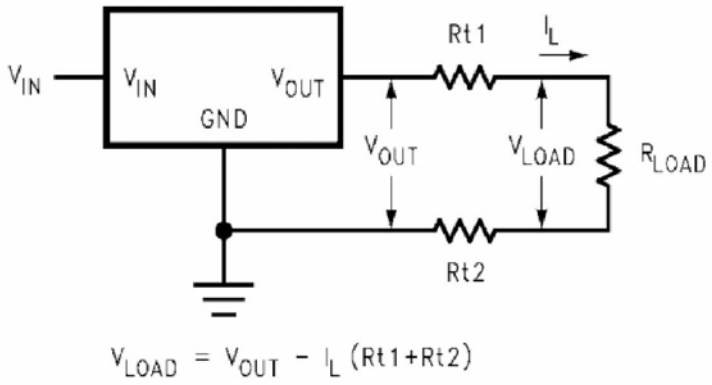
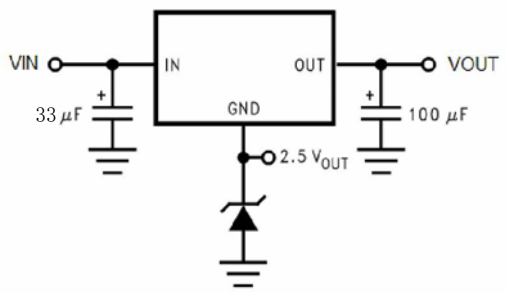


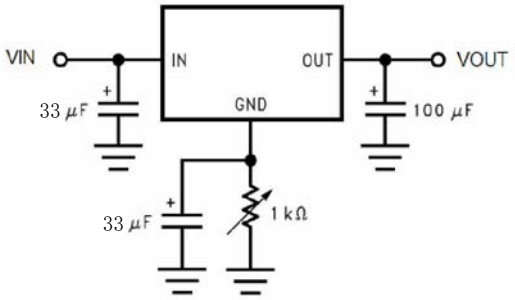
FIGURE 1. Typical Application using Fixed Output Regulator

Application Circuit

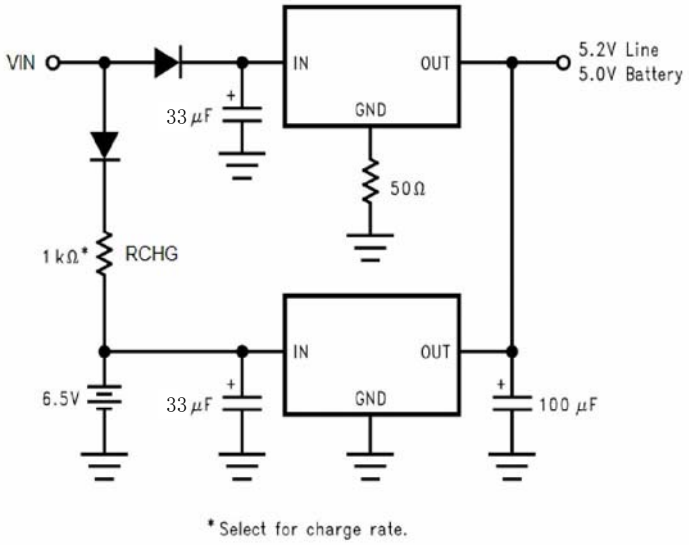
（1）Regulator with Reference



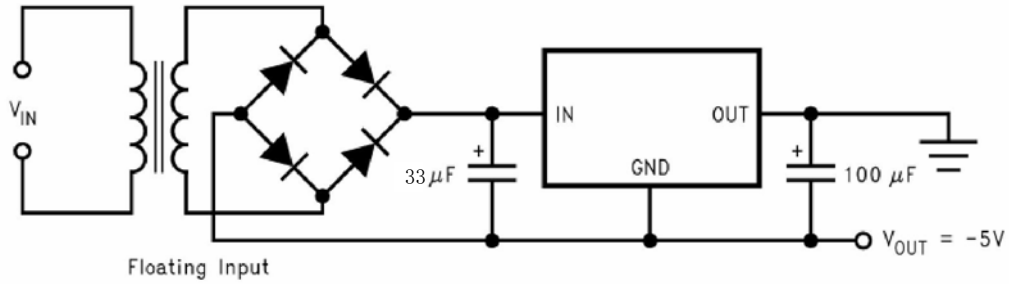
（2）Adjusting Output of Fixed Voltage Regulators



（3）Battery Backed−Up Power Supply

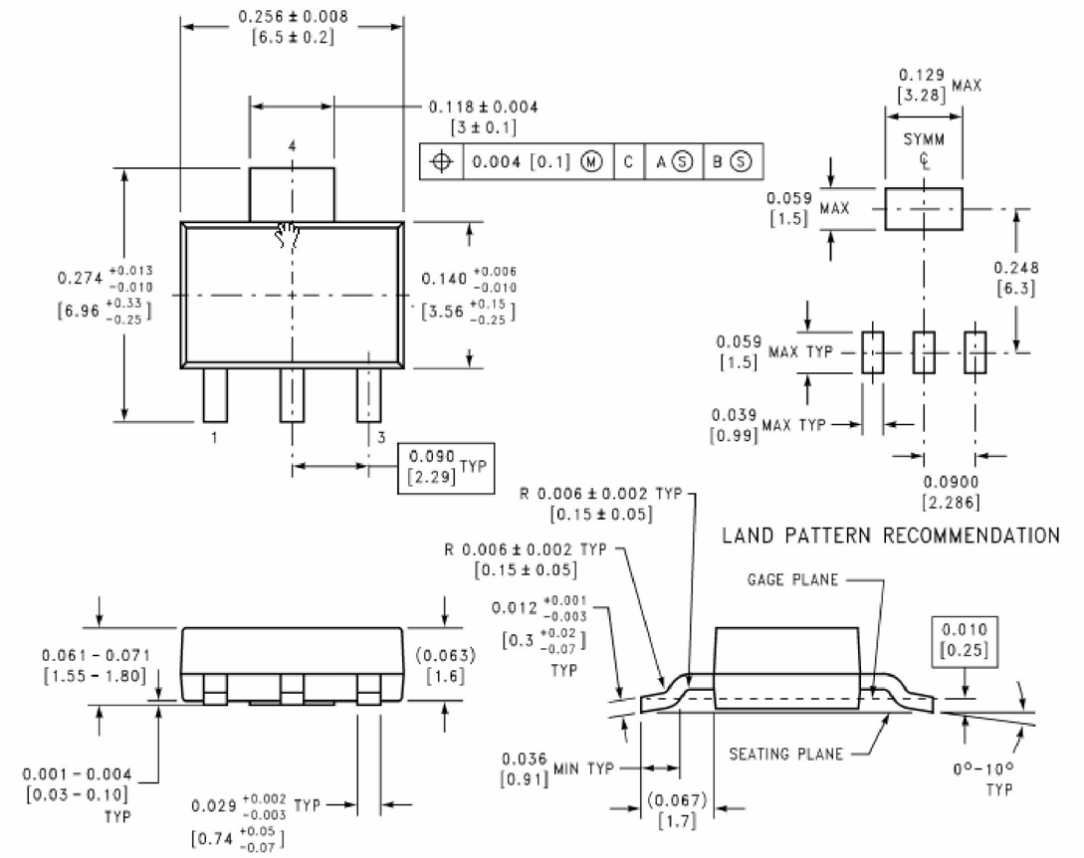


（4）Low Dropout Negative Supply

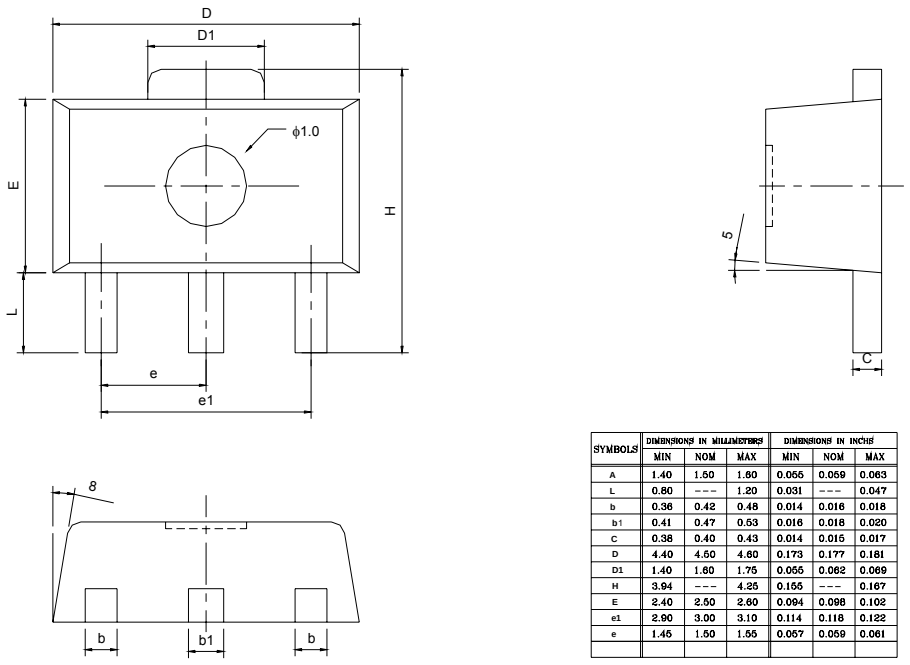


Packaging Information

● SOT223

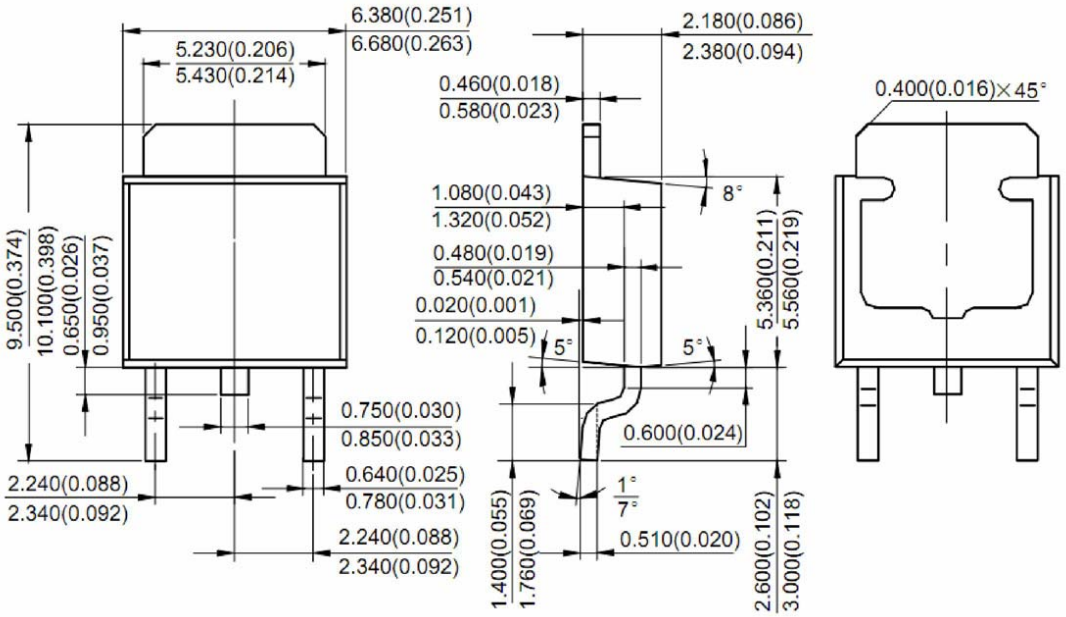


SOT-89 (M89)



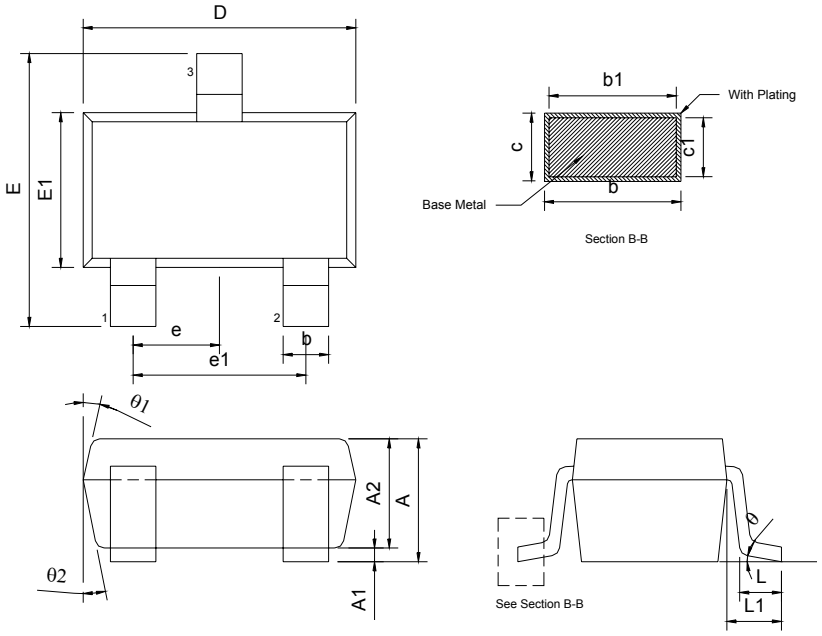
SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
L	0.80	---	1.20	0.031	---	0.047
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	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

● TO252-2



PACKAGE DIMENSION

SOT-23-3 (M23)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.05	---	1.35	0.041	---	0.053
A1	0.05	---	0.15	0.002	---	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	---	0.50	0.010	---	0.020
b1	0.25	0.40	0.45	0.010	0.016	0.018
c	0.08	---	0.20	0.003	---	0.008
c1	0.08	0.11	0.15	0.003	0.004	0.006
D	2.70	2.90	3.00	0.106	0.114	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
L	0.35	0.45	0.55	0.014	0.018	0.022
L1	0.60 REF			0.024 REF		
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
θ	0°	5°	10°	0°	5°	10°
θ1	3°	5°	7°	3°	5°	7°
θ2	6°	8°	10°	6°	8°	10°