

0.88A 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 of 880mA with a maximum dropout voltage of 0.8 V at 880mA. This series contains two fixed output voltages of 1.2V, 1.8V, 2.5V, 3.3 V, and 5.0 V. On chip trimming adjusts the reference/output voltage to within $\pm 2\%$ 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. Devices are available in SOT223 and TO252.

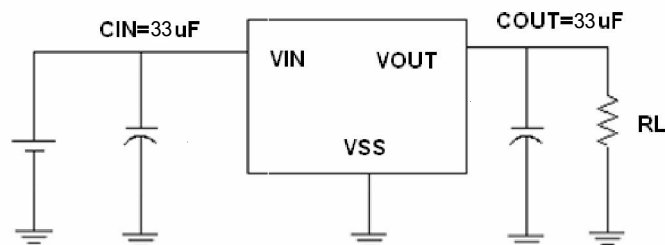
Features

- | Output Current in Excess of 880mA
- | Dropout Voltage: 120mV@ $I_{OUT} = 100mA$
- | Operating Voltage Range: 3.6V ~ 15V
- | Highly Accuracy: $\pm 2\%$
- | Adjustable Output Voltage Option
- | Standby Current: 90uA (TYP.)
- | High Ripple Rejection: 72dB@1KHz
- | Line Regulation: 0.1% (TYP.)
- | Temperature Stability 0.5%
- | Thermal Shutdown Protection : 150
- | Packages: SOT223, TO252

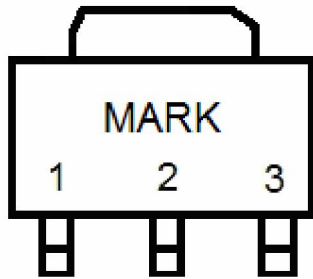
Typical Application

- | Consumer and Industrial Equipment Point of Regulation
- | Switching Power Supply Post Regulation
- | Hard Drive Controllers
- | Battery Chargers

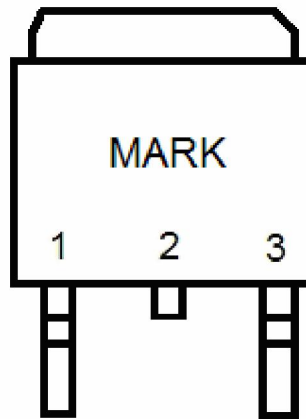
Typical Application Circuit



Pin Configuration



SOT223



TO252-2

Pin Assignment

BM1117N

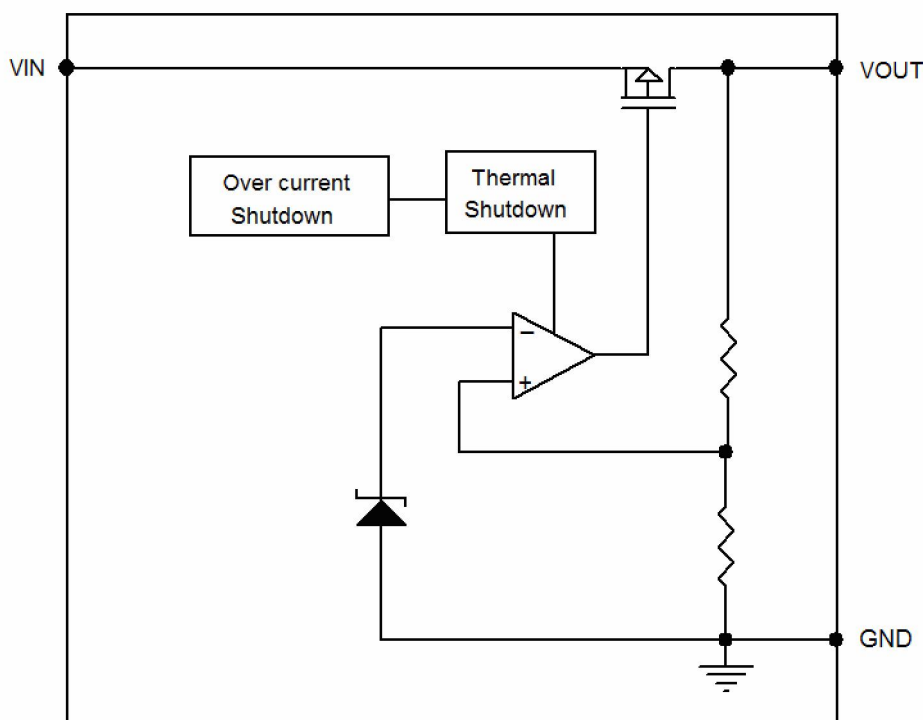
Pin Number		Pin Name	Functions
SOT223	TO252-2		
1	1	GND	Ground
2	2	V _{OUT}	Output
3	3	V _{IN}	Power Input

PART NO. BM1117NS-X.X (X.X =output voltage), S=SOT223 package
 BM1117ND-X.X (X.X=output voltage), D=TO252 package

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Input Voltage	V _{IN}	16	V
Output Current	I _{OUT}	0.88	A
Output Voltage	V _{OUT}	V _{SS} -0.3 ~ V _{IN} +0.3	V
Power Dissipation	SOT223	1000	mW
	TO252-2	1500	mW
Operating Temperature Range	T _{OPR}	- 20 ~ + 85	
Storage Temperature Range	T _{STG}	- 40 ~ + 150	
Lead Temperature		260 , 4sec	

Block Diagram



Electrical Characteristics

BM1117N-3.3

($V_{IN} = V_{OUT} + 1.5V$, $C_{IN} = C_L = 33\mu F$, $T_a = 25^\circ C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 10mA$, $V_{IN} = V_{OUT} + 1.5V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN} = V_{OUT} + 1.5V$		880		mA
Load Regulation	V_{OUT}	$V_{IN} = V_{OUT} + 1.5V$, $0mA \leq I_{OUT} \leq 800mA$		5	10	mV
Dropout Voltage (Note 3)	V_{DIF1}	$I_{OUT} = 100mA$		120		mV
	V_{DIF2}	$I_{OUT} = 500mA$		500		mV
	V_{DIF3}	$I_{OUT} = 800mA$		800		mV
Quiescent Current	I_{SS}	$V_{IN} = V_{OUT} + 1.5V$		90		μA
Line Regulation	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 0mA$ $V_{OUT} + 1.5V \leq V_{IN} \leq 15V$		2	5	mV
Ripple Rejection Rate	PSRR	$V_{IN} = 6.3V$ $+1Vp-pAC$	$I_{OUT} = 100mA, 1kHz$	72		dB
			$I_{OUT} = 200mA, 1kHz$	68		
			$I_{OUT} = 500mA, 1kHz$	61		

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. Figure 1, shows a typical application using a fixed output regulator. The R_{t1} and R_{t2} 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.

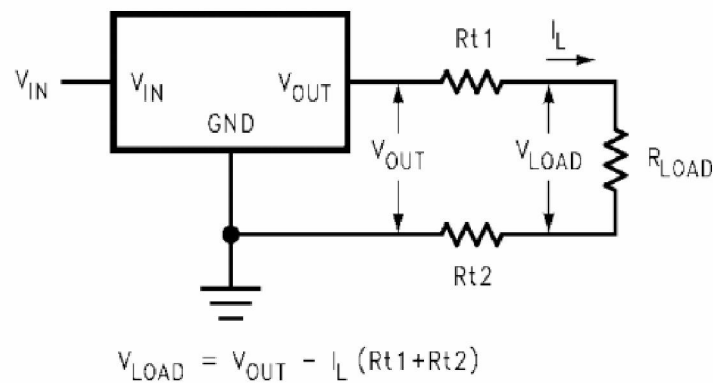
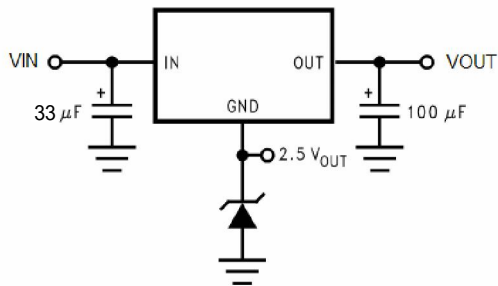


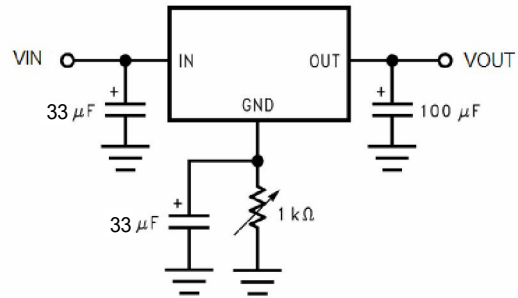
FIGURE 1. Typical Application using Fixed Output Regulator

Application Circuit

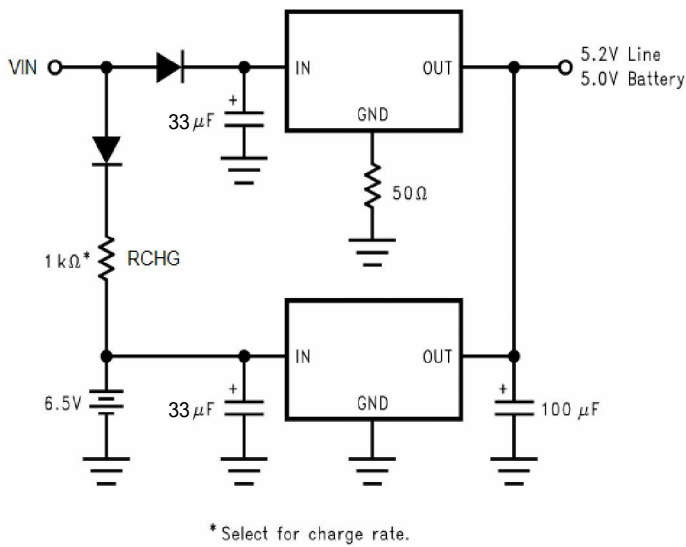
(1) Regulator with Reference



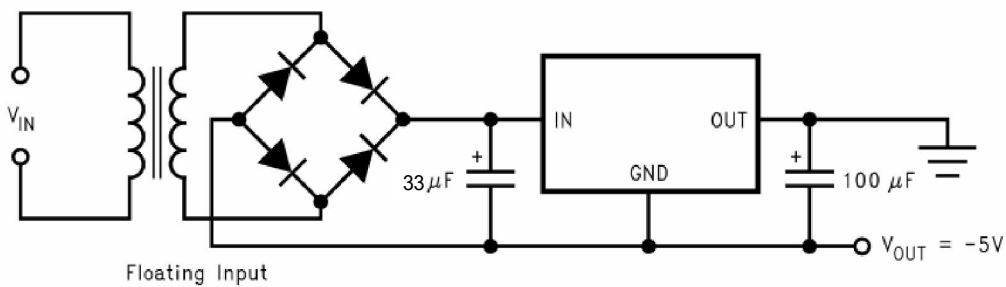
(2) Adjusting Output of Fixed Voltage Regulators



(3) Battery Backed-Up Power Supply

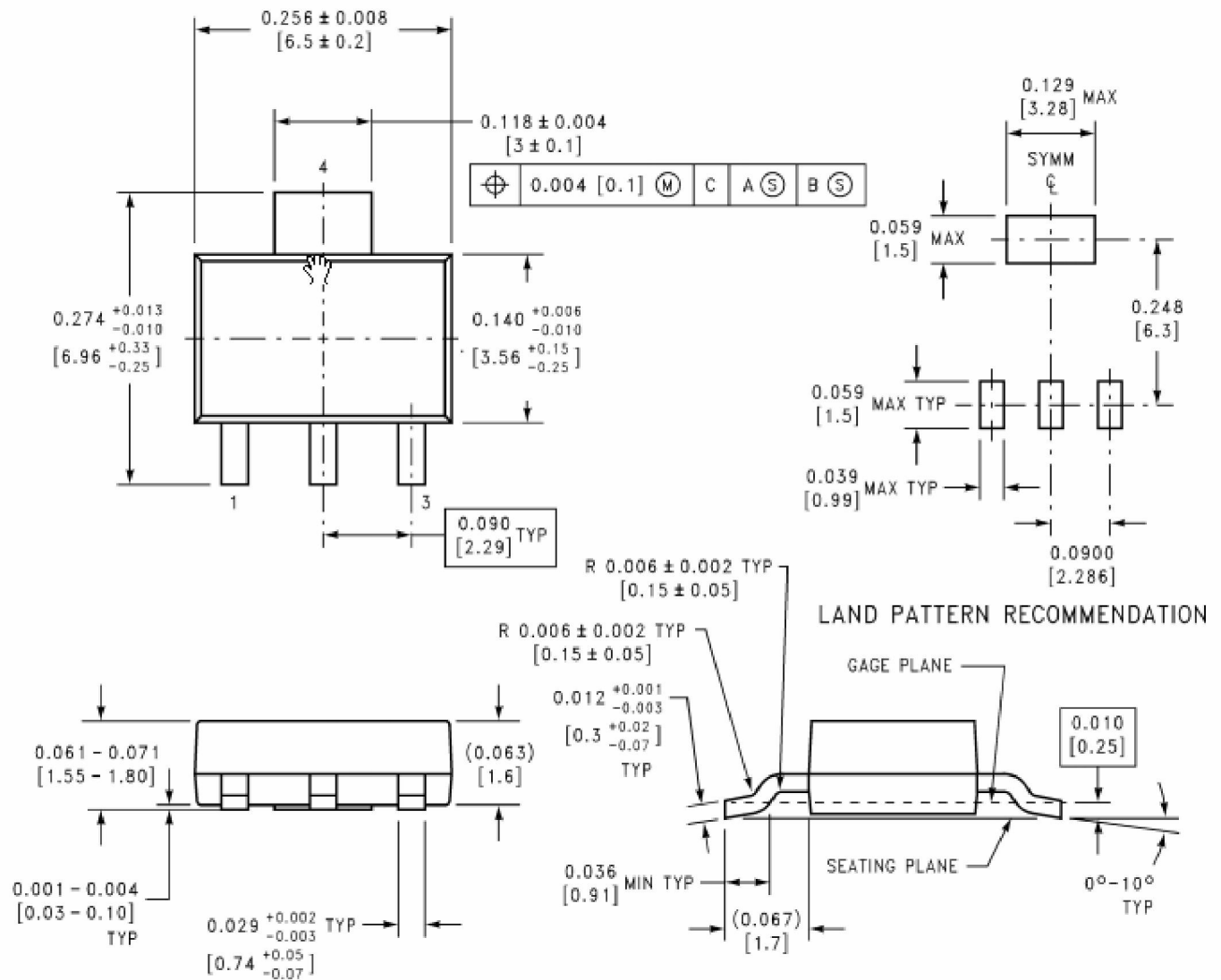


(4) Low Dropout Negative Supply



Packaging Information

SOT223



TO252-2

