

RoHS Compliant Product
A suffix of "-C" specifies halogen free

DESCRIPTION

The SL117B is a low dropout three-terminal regulator with 1A output current capability. In order to obtain lower dropout voltage and fast transient response, this is critical for low voltage applications. The SL117B has been optimized. The device is available in an adjustable version and fixed output voltage of 1.2V, 1.5V, 1.8V, 2.5V, 3.3V and 5V. Dropout voltage is guaranteed at a maximum of 1.3V at 1A.

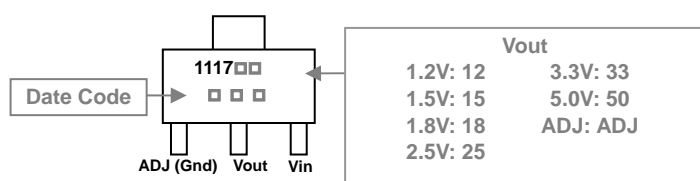
FEATURES

- Three Terminal Adjustable or Fixed Voltages 1.2V , 1.5V , 1.8V , 2.5V , 3.3V and 5.0V
- Current Limit and Thermal Protection
- Output Current of 1A
- 1.3V Dropout Voltage
- Output Noise from 10Hz to 10KHz : 0.003% of V_{OUT}
- PSRR at $I_{OUT}=300mA$ and $f=120Hz$: 70dB

APPLICATIONS

- Battery-Power Circuitry
- Post Regulator for Switching Power Supply
- Low Voltage Logic Suppliers
- USB Device
- PC Motherboard

MARKING



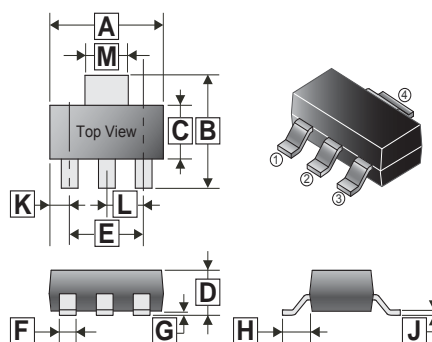
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-223	2.5K	13' inch

PIN DESCRIPTIONS

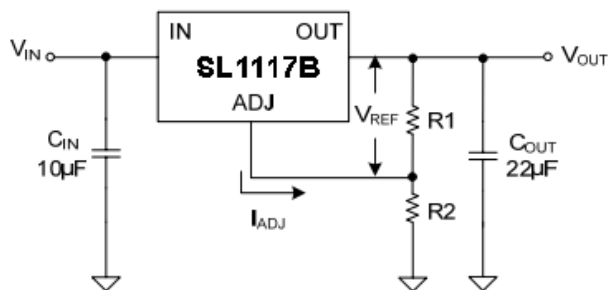
Name	I/O	Pin#	Description
ADJ (Gnd)		1	A resistor divider from this pin to the V_{OUT} pin and ground sets the output voltage (Ground only for fixed mode)
V_{OUT}	O	2	The output pin of regulator. A min. of 10 μ F capacitor must be connected from this pin to ground to insure stability.
V_{IN}	I	3	The input pin of regulator. Typically a large storage capacitor is connected from this pin to ground to insure that the input voltage does not sag below the min. dropout voltage during the load transient response. This pin must always be 1.3V higher than V_{OUT} in order for the device to regulate properly.

SOT-223



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.30	6.70	G	0.02	0.10
B	6.70	7.30	H	1.50	2.00
C	3.30	3.70	J	0.23	0.35
D	1.42	1.90	K	0.85	1.05
E	4.60 REF.		L	2.30 REF.	
F	0.60	0.80	M	2.90	3.10

TYPICAL CIRCUIT



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

Figure 1. Adjustable Voltage Regulator

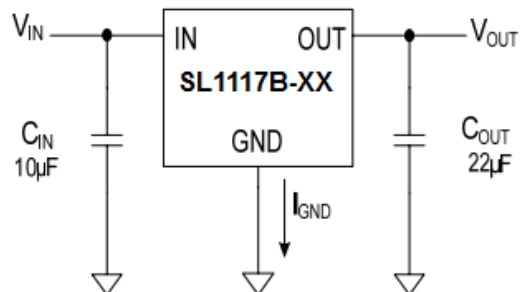
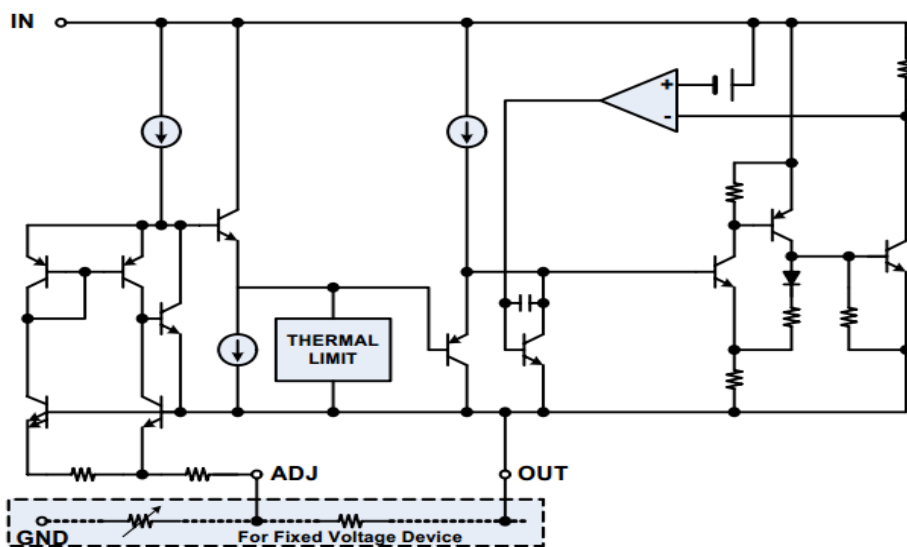


Figure 2. Fixed Voltage Regulator

*The SL1117B is compatible with low ESR ceramic capacitor. A minimum of 10µF output capacitor is required.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
DC Supply Voltage	V _{in}	15	V
Power Dissipation	P _D	900	mW
Operating, Storage Temperature Range	T _{OPR} , T _{STG}	-40~125, -65~150	°C
Lead Temperature (Soldering, 10 sec)	T _{LEAD}	260	°C
Thermal Resistance Junction to Ambient	R _{θJA}	130	°C/W
Thermal Resistance Junction to Case	R _{θJC}	19	°C/W

NOTE:

- Stresses above 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 above those indicated in the operation sections of the specifications is not implied. Exposure to Absolute Maximum Ratings conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS ($T_J=+25\text{ }^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Min.	Typ.	Max	Unit	
Reference Voltage	SL1117B-ADJ $I_{LOAD} = 10\text{mA}$, $V_{IN} = 2.75\text{V}$	1.238	1.25	1.262	V	
	$2.7\text{V} \leq V_{IN} \leq 10\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	1.225	1.25	1.27		
Output Voltage	SL1117B-1.2	$V_{IN} = 3.7\text{V}$	1.176	1.2	1.224	V
		$V_{IN} = 3\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	1.152	1.2	1.228	
	SL1117B-1.5	$V_{IN} = 4\text{V}$	1.485	1.5	1.515	V
		$V_{IN} = 3\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	1.47	1.5	1.53	
	SL1117B-1.8	$V_{IN} = 4.3\text{V}$	1.782	1.8	1.818	V
		$V_{IN} = 3.3\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	1.764	1.8	1.836	
	SL1117B-2.5	$V_{IN} = 5\text{V}$	2.475	2.5	2.525	V
		$V_{IN} = 4\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	2.455	2.5	2.545	
	SL1117B-3.3	$V_{IN} = 5.8\text{V}$	3.267	3.3	3.333	V
		$V_{IN} = 4.8\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	3.235	3.3	3.365	
	SL1117B-5.0	$V_{IN} = 7.5\text{V}$	4.95	5	5.05	V
		$V_{IN} = 6.5\text{V}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	4.9	5	5.1	
	Line Regulation ¹	SL1117B-ADJ $I_{LOAD} = 10\text{mA}$, $3\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	0.2	%
		All $I_{LOAD} = 10\text{mA}$, $(1.5 + V_{OUT}) \leq V_{IN} \leq 10\text{V}$	-	5	10	mV
Load Regulation	SL1117B-ADJ $V_{IN} = 3\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$	-	0.4	1	%	
	All $V_{IN} = 1.5 + V_{OUT}$, $10\text{mA} \leq I_{LOAD} \leq 1\text{A}$ ¹	-	2	15	mV	
Minimum Load Current ¹	SL1117B-ADJ $V_{IN} = 5\text{V}$, $V_{ADJ} = 0$	-	1.7	5	mA	
Ground Pin Current ¹	SL1117B-XX $I_{LOAD} = 0$	-	4	6	mA	
Adjust Pin Current ¹	SL1117B-ADJ $V_{IN} = 2.65\text{V} \sim 10\text{V}$, $I_{LOAD} = 10\text{mA}$	-	60	120	μA	
Current Limit	All	1	1.35	-	A	
Current Limit Response Time	All	-	10	100	μs	
Ripple Rejection	All $f = 120\text{Hz}$, $C_{OUT} = 22\mu\text{F}$ $(V_{IN} - V_{OUT}) = 3\text{V}$, $I_{LOAD} = 0.3\text{A}$	-	70	-	dB	
Dropout Voltage ¹	All $V_{IN} \geq 2.65\text{V}$, $I_{LOAD} = 0.8\text{A}$	-	1.3	1.4	V	
OTP	All	-	160	-	$^\circ\text{C}$	
RMS Output Noise (% of V_{OUT})	All $T_A = 25\text{ }^\circ\text{C}$, $10\text{Hz} \leq f \leq 10\text{KHz}$	-	0.003	-	%	
Temperature Stability	All	-	0.5	-	%	

Note:

1. Denotes the specifications which apply over the full temperature range.

CHARACTERISTIC CURVES

Dropout Voltage vs. Output Current

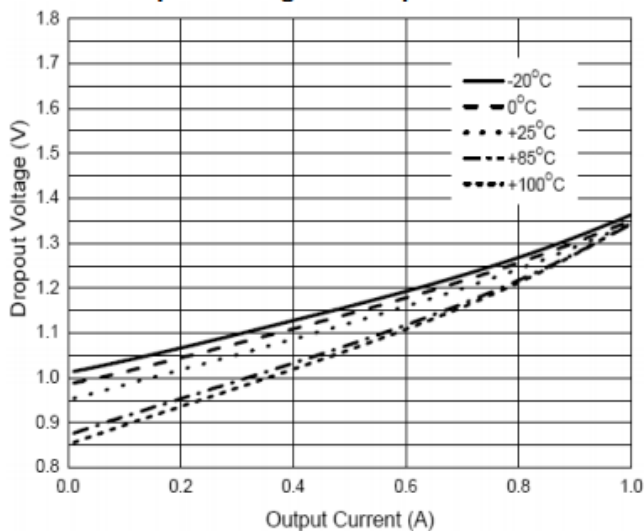


Figure 3.

PSRR vs. Frequency

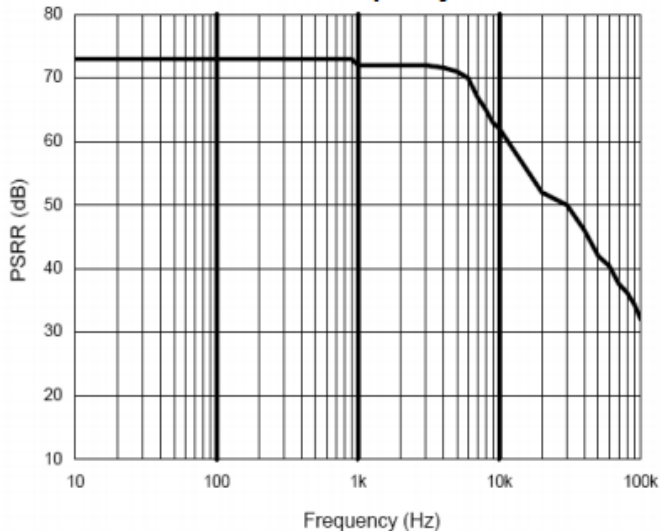


Figure 4.

Line Transient Response

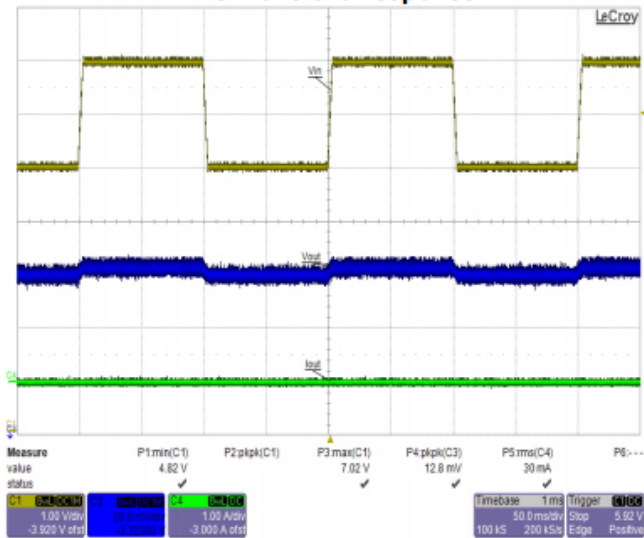


Figure 5.

Load Transient Response

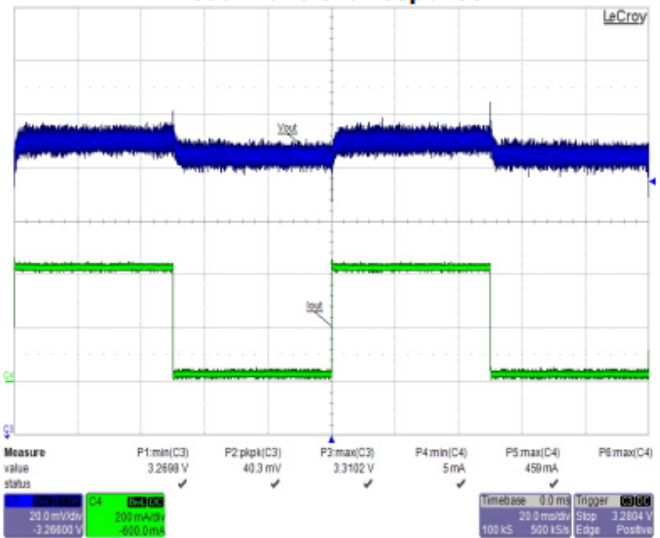


Figure 6.