



LT1117-xx

800mA Low-Dropout Linear Regulator

PRODUCT DESCRIPTION

The LT1117 is a positive low dropout regulator designed to provide up to 800mA of output current with higher efficiency than currently available devices (National LM1117, or Linear LT1117). The device is available in an adjustable version and fixed output voltages of 1.5V, 2.5V, 2.85V, 3.0V, 3.3V, 3.5V and 5V. The 2.85V version is designed specifically to be used in Active Terminators for the SCSI bus. All internal circuitry is designed to operate down to 0.7V input to output differential and the dropout voltage is fully specified as a function of load current. Dropout voltage of the device is 100mV at light loads and rising to 0.7V at maximum 800mA output current. A second low current input is required to achieve this dropout. On chip trimming adjusts the reference voltage to 1%.

FEATURES

- Adjustable or Fixed Output
- Output Current of 800mA
- Low Dropout 700mV at 800mA Output Current
- 0.015% Line Regulation
- 0.01% Load Regulation
- 100% Thermal Limit Burn-In
- Fast Transient Response

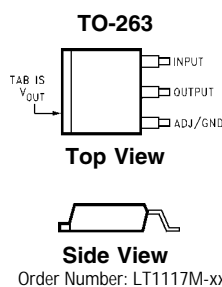
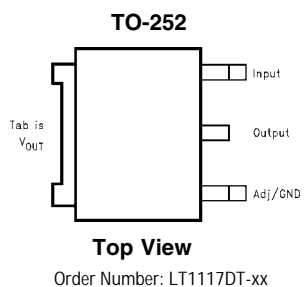
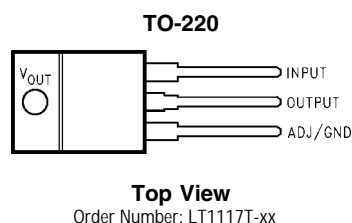
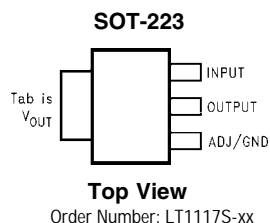
APPLICATIONS

- Active SCSI Terminators
- High Efficiency Linear Regulators
- Post Regulators for Switching DC/DC Converter
- Battery Chargers
- Battery Powered Instrumentation
- Adjustable Power Supply
- 5V to 3.3V Linear Regulators

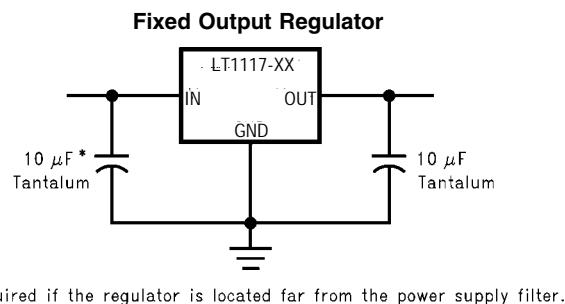
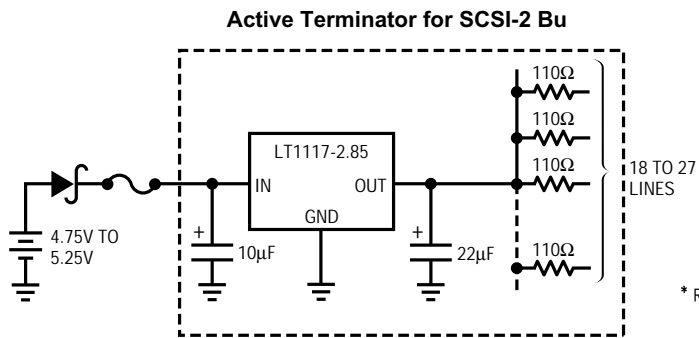
ORDERING INFORMATION

Device	Output Voltage
LT1117-1.5	1.5V
LT1117-2.5	2.5V
LT1117-2.85	2.85V
LT1117-3.0	3.0V
LT1117-3.3	3.3V
LT1117-3.5	3.5V
LT1117-5.0	5.0V
LT1117-ADJ	ADJ

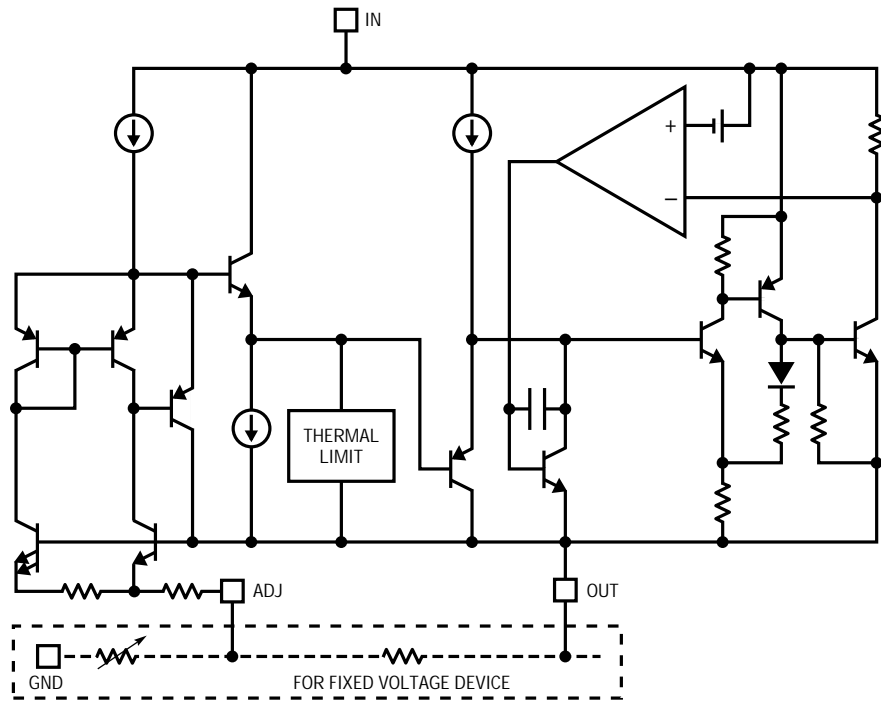
PACKAGE INFORMATION



TYPICAL APPLICATIONS



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Maximum	Units
P_D	Power Dissipation	Internally Limited	W
V_{IN}	Input Voltage	7	V
T_J	Operating Junction Temperature Range	1 to 125	°C
T_{STG}	Storage Temperature	-65 to +150	°C
T_{LEAD}	Lead Temperature (Soldering, 10sec)	300	°C

ELECTRICAL CHARACTERISTICS (Note 1)

Electrical Characteristics at $I_{LOAD}=0mA$ and $T_J = 25^\circ C$ unless otherwise specified.

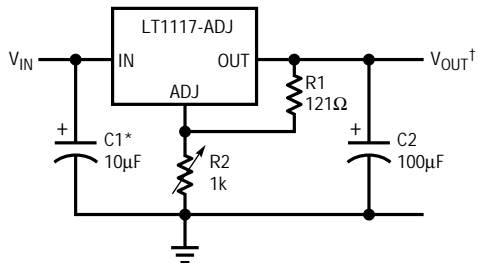
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{REF}	Reference Voltage	LT1117-ADJ $I_{OUT} = 10mA, V_{IN}-V_{OUT} = 2V, T_J = 25^\circ C$ $10mA \leq I_{OUT} \leq 800mA, 1.4V \leq V_{IN}-V_{OUT} \leq 5V$	1.238	1.250	1.262	V
			1.230	1.250	1.270	V
V_{OUT}	Output Voltage	LT1117-1.5 $I_{OUT} = 10mA, V_{IN} = 3.8V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 3.2V \leq V_{IN} \leq 7V$	1.485	1.500	1.515	V
			1.475	1.500	1.525	V
		LT1117-2.5 $I_{OUT} = 10mA, V_{IN} = 4.5V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 3.9V \leq V_{IN} \leq 7V$	2.475	2.500	2.525	V
			2.460	2.500	2.540	V
		LT1117-2.85 $I_{OUT} = 10mA, V_{IN} = 4.85V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 4.25V \leq V_{IN} \leq 7V$	2.821	2.850	2.879	V
			2.805	2.850	2.895	V
		LT1117-3.0 $I_{OUT} = 10mA, V_{IN} = 5V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 4.5V \leq V_{IN} \leq 7V$	2.970	3.000	3.030	V
	2.950	3.000	3.050	V		
	LT1117-3.3 $I_{OUT} = 10mA, V_{IN} = 5V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 4.75V \leq V_{IN} \leq 7V$	3.267	3.300	3.333	V	
	3.247	3.300	3.353	V		
	LT1117-3.5 $I_{OUT} = 10mA, V_{IN} = 6V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 5V \leq V_{IN} \leq 7V$	3.465	3.500	3.535	V	
	3.445	3.300	3.555	V		
	LT1117-5.0 $I_{OUT} = 10mA, V_{IN} = 7V, T_J = 25^\circ C$ $0 \leq I_{OUT} \leq 800mA, 6.5V \leq V_{IN} \leq 7V$	4.950	5.000	5.050	V	
	4.920	5.000	5.080	V		
ΔV_{OUT}	Line Regulation (All) (Note 6)	$I_{OUT} = 10mA, 1.5V \leq V_{IN}-V_{OUT} \leq 5V$		0.04	0.2	%
ΔV_{OUT}	Load Regulation (All) (Note 6)	$V_{IN}-V_{OUT} = 3V, 10 \leq I_{OUT} \leq 800mA$		0.08	0.4	%
$V_{IN}-V_{OUT}$	Dropout Voltage (Note 7)	$I_{OUT} = 100mA$		1.10	1.20	V
		$I_{OUT} = 800mA$		1.15	1.30	V
I_{LIMIT}	Current Limit (All)	$V_{IN}-V_{OUT} = 3V, T_J = 25^\circ C$	800	1100		mA
	Thermal Regulation	$T_A = 25^\circ C, 30ms$ Pulse		0.003		%/W
	Ripple Regulation	$f_{RIPPLE} = 120Hz, V_{IN}-V_{OUT} = 3V$ $V_{RIPPLE} = 1V_{PP}$	60	75		dB
	Adjust Pin Current Change	$I_{OUT} = 10mA, 1.4V \leq V_{IN}-V_{OUT} \leq 5V$		50	120	μA

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not guaranteed. For guaranteed specifications and the test conditions, see the Electrical Characteristics.

Note 2: For the adjustable device the minimum load current is the minimum current required to maintain regulation. Normally the current in the resistor divider used to set the output voltage is selected to meet the minimum load current requirement.

TYPICAL APPLICATION CIRCUITS

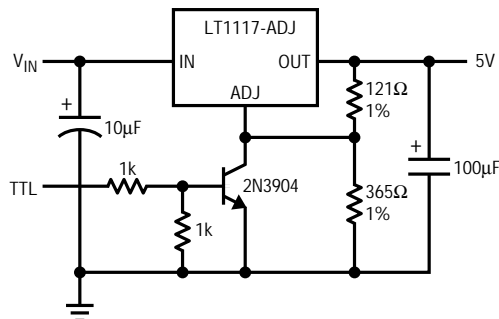
1.2V to 10V Adjustable Regulator



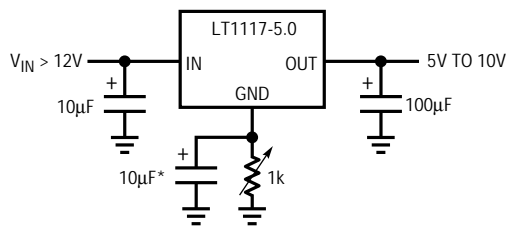
* NEEDED IF DEVICE IS FAR FROM FILTER CAPACITORS

$$V_{OUT} = 1.25V \left(1 + \frac{R2}{R1}\right)$$

5V Regulator with Shutdown

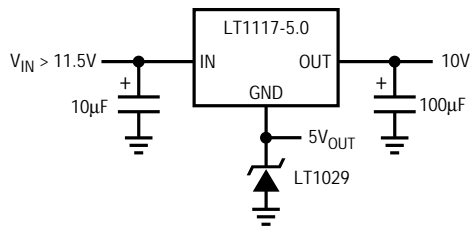


Adjusting Output Voltage of Fixed Regulators

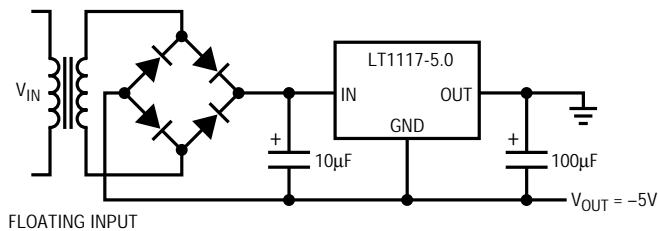


* OPTIONAL IMPROVES RIPPLE REJECTION

Regulator with Reference



Low Dropout Negative Supply



FLOATING INPUT