

FEATURES

- Output Current up to 1 A
- **Low Dropout Voltage (700mV at 1A Output Current)**
- Three Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V
- 2.85V Device for SCSI-II Active Terminator
- **0.04% Line Regulaion, 0.1% Load Regulation**
- Very Low Quiescent Current
- Internal Current and Terminal Limit
- Logic-Controlled Electronics Shutdown
- Surface Mount Package SOT-223 & TO-263 (D2-Pack)
- 100% Thermal Limit Burn-In

APPLICATION

- Active SCSI Terminators
- Portable/Plan Top/Notebook Computers
- High Efficiency Linear Regulators
- SMPS Post Regulators
- Mother B/D Clock Supplies
- Disk Drives
- Battery Chargers

DESCRIPTION

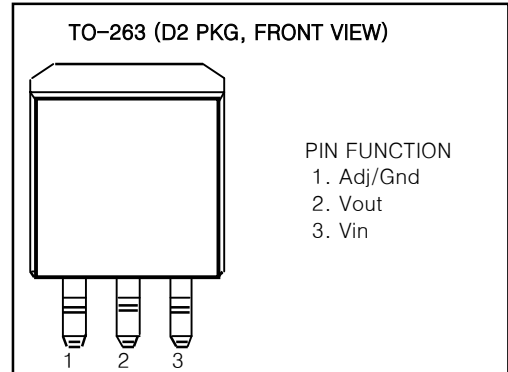
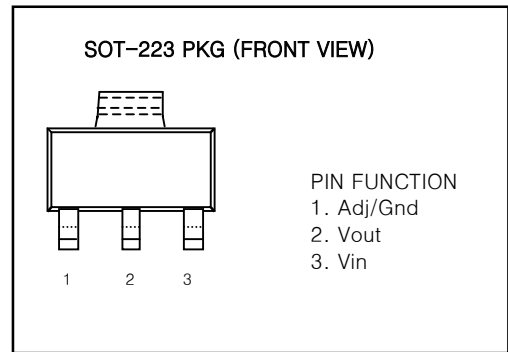
The LM1117 is a low power positive-voltage regulator designed to meet 1A output current and comply with SCSI-II specifications with a fixed output voltage of 2.85V. This device is an excellent choice for use in battery-powered applications, as active terminators for the SCSI bus, and portable computers.

The LM1117 features very low quiescent current and very **low dropout voltage of 700mV at a full load** and lower as output current decreases. LM1117 is available as an adjustable or fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, and 5.0V output voltages.

The LM1117 is offered in a 3-pin surface mount package SOT-223 & TO-263. The output capacitor of 10µF or larger is needed for output stability of LM1117 as required by most of the other regulator circuits.

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
DC Input Voltage	V _{IN}		7	V
Lead Temperature (Soldering, 5 Seconds)	T _{SOL}		260	°C
Storage Temperature Range	T _{STG}	-65	150	°C
Operating Junction Temperature Range	T _{OPR}	0	125	°C



ORDERING INFORMATION

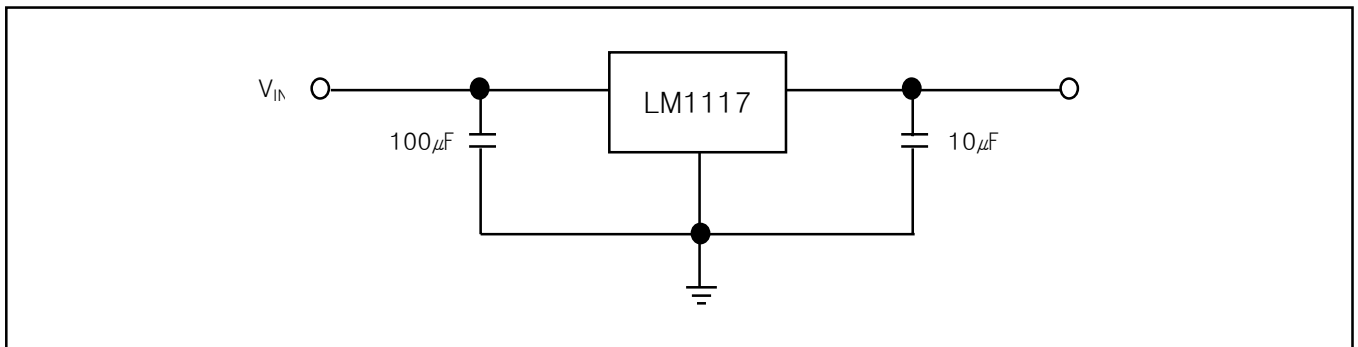
Device (Marking)	Package
LM1117S	SOT-223
LM1117S-XX	
LM1117T	TO-263 (D2)
LM1117T-XX	

(X=Output Voltage=1.5V, 1.8V, 2.5V, 2.85V, '3.0V, 3.3V, 5.0V, Adjustable=AD)

THERMAL DATA

PARAMETER	SYMBOL	SOT-223	TO-263	UNIT
Thermal Resistance Junction-Case	$R_{THJ-CASE}$	15	3	°C

TYPICAL APPLICATION



ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-AD(ADJUSTABLE)

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V_{REF}	$V_{IN} - V_O = 2\text{V}$, $I_O = 100\text{mA}$, $T_J = 25^\circ\text{C}$	1.238	1.25	1.262	V
Reference Voltage	V_{REF}	$I_O = 10$ to 1A , $V_{IN} - V_O = 1.4$ to 10V	1.230		1.270	V
Line Regulation	ΔV_O	$V_{IN} - V_O = 1.5$ to 13.75V , $I_O = 10\text{mA}$		0.035	0.2	%
Load Regulation	ΔV_O	$V_{IN} - V_O = 3\text{V}$, $I_O = 10\text{mA}$ to 1A		0.1	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}				7	V
Adjustment Pin Current	I_{ADJ}	$V_{IN} \leq 15\text{V}$, $I_{Load} = 10\text{mA}$		50	120	μA
Adjustment Pin Current Change	ΔI_{ADJ}	$V_{IN} - V_O = 1.4$ to 10V , $I_O = 10\text{mA}$ to 1A		1	5	μA
Minimum Load Current	$I_{O(MIN)}$	$V_{IN} = 15\text{V}$		1.7	5	mA
Output Current	I_O	$V_{IN} - V_O = 5\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise (% V_O)	ϵ_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		0.003		%
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} - V_O = 3\text{V}$, $V_{NIPPLE} = 1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$, $V_{IN} = V_{OUT} + 0.8\text{V}$		1	1.1	V
		$I_O = 500\text{mA}$, $V_{IN} = V_{OUT} + 0.8\text{V}$		1.00	1.15	V
		$I_O = 1\text{A}$, $V_{IN} = V_{OUT} + 0.8\text{V}$		1.0	1.3	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-1.5

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN} = 4.5\text{V}$, $I_O = 10\text{mA}$, $T_J = 25^\circ\text{C}$	1.485	1.5	1.515	V
Output Voltage	V_O	$I_O = 0$ to 1A , $V_{IN} = 3.9$ to 10V	1.475		1.525	V
Line Regulation	ΔV_O	$V_{IN} = 3.9$ to 10V , $I_O = 0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN} = 3.9\text{V}$, $I_O = 0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O = 100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN} \leq 10\text{V}$		5	10	mA
Output Current	I_O	$V_{IN} = 7.5\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} = 5.5\text{V}$, $V_{NIPPLE} = 1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$		1	1.1	V
		$I_O = 500\text{mA}$		1.05	1.15	V
		$I_O = 800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-1.8

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN} = 4.5\text{V}$, $I_O = 10\text{mA}$, $T_J = 25^\circ\text{C}$	1.782	1.8	1.818	V
Output Voltage	V_O	$I_O = 0$ to 1A , $V_{IN} = 3.9$ to 10V	1.772		1.828	V
Line Regulation	ΔV_O	$V_{IN} = 3.9$ to 10V , $I_O = 0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN} = 3.9\text{V}$, $I_O = 0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O = 100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN} \leq 10\text{V}$		5	10	mA
Output Current	I_O	$V_{IN} = 7.5\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} = 5.5\text{V}$, $V_{NIPPLE} = 1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$		1	1.1	V
		$I_O = 500\text{mA}$		1.05	1.15	V
		$I_O = 800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-2.5

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN} = 4.5\text{V}$, $I_O = 10\text{mA}$, $T_J = 25^\circ\text{C}$	2.475	2.5	2.525	V
Output Voltage	V_O	$I_O = 0$ to 1A , $V_{IN} = 3.9$ to 10V	2.46		2.54	V
Line Regulation	ΔV_O	$V_{IN} = 3.9$ to 10V , $I_O = 0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN} = 3.9\text{V}$, $I_O = 0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O = 100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN} \leq 10\text{V}$		5	10	mA
Output Current	I_O	$V_{IN} = 7.5\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} = 5.5\text{V}$, $V_{NIPPLE} = 1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$		1	1.1	V
		$I_O = 500\text{mA}$		1.05	1.15	V
		$I_O = 800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.01	0.1	%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-2.85

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN} = 4.85\text{V}$, $I_O = 10\text{mA}$, $T_J = 25^\circ\text{C}$	2.821	2.85	2.879	V
Output Voltage	V_O	$I_O = 0$ to 1A , $V_{IN} = 4.25$ to 10V	2.805		2.895	V
Line Regulation	ΔV_O	$V_{IN} = 4.25$ to 10V , $I_O = 0\text{mA}$		0.004	0.2	mV
Load Regulation	ΔV_O	$V_{IN} = 4.25\text{V}$, $I_O = 0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O = 100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN} \leq 10\text{V}$		5	10	mA
Output Current	I_O	$V_{IN} = 7.85\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} = 5.85\text{V}$, $V_{NIPPLE} = 1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$		1	1.1	V
		$I_O = 500\text{mA}$		1.05	1.15	V
		$I_O = 800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-3.0

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN}=5\text{V}$, $I_O=10\text{mA}$, $T_J=25^\circ\text{C}$	2.97	3	3.03	V
Output Voltage	V_O	$I_O=0$ to 1A , $V_{IN}=4.5$ to 10V	2.95		3.05	V
Line Regulation	ΔV_O	$V_{IN}=4.5$ to 12V , $I_O=0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN}=4.5\text{V}$, $I_O=0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O=100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN}\leq 12\text{V}$		5	10	mA
Output Current	I_O	$V_{IN}=8\text{V}$, $T_J=25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B=10\text{Hz}$ to 10kHz , $T_J=25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O=40\text{mA}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$ $V_{IN}=6\text{V}$, $V_{NIPPLE}=1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O=100\text{mA}$		1	1.1	V
		$I_O=500\text{mA}$		1.05	1.15	V
		$I_O=800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A=25^\circ\text{C}$ 30ms Pulse		0.003	0.1	%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-3.3

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN}=5.3\text{V}$, $I_O=10\text{mA}$, $T_J=25^\circ\text{C}$	3.267	3.3	3.333	V
Output Voltage	V_O	$I_O=0$ to 1A , $V_{IN}=4.75$ to 10V	3.247		3.353	V
Line Regulation	ΔV_O	$V_{IN}=4.75$ to 15V , $I_O=0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN}=4.75\text{V}$, $I_O=0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O=100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN}\leq 15\text{V}$		5	10	mA
Output Current	I_O	$V_{IN}=8.3\text{V}$, $T_J=25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B=10\text{Hz}$ to 10kHz , $T_J=25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O=40\text{mA}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$ $V_{IN}=6.3\text{V}$, $V_{NIPPLE}=1V_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O=100\text{mA}$		1	1.1	V
		$I_O=500\text{mA}$		1.05	1.15	V
		$I_O=800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A=25^\circ\text{C}$ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/T-5.0

(Refer to the test circuits, $T_J=0$ to 125°C $C_O=10\mu\text{F}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN} = 7\text{V}$, $I_O = 10\text{mA}$, $T_J = 25^\circ\text{C}$	4.95	5	5.05	V
Output Voltage	V_O	$I_O = 0$ to 1A , $V_{IN} = 6.5$ to 15V	4.92		5.08	V
Line Regulation	ΔV_O	$V_{IN} = 6.5$ to 15V , $I_O = 0\text{mA}$		0.04	0.2	mV
Load Regulation	ΔV_O	$V_{IN} = 6.5\text{V}$, $I_O = 0$ to 1A		0.08	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, $T_J = 125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}	$I_O = 100\text{mA}$			7	V
Quiescent Current	I_D	$V_{IN} \leq 15\text{V}$		5	10	mA
Output Current	I_O	$V_{IN} = 8.3\text{V}$, $T_J = 25^\circ\text{C}$	800	950	1200	mA
Output Noise Voltage	e_N	$B = 10\text{Hz}$ to 10kHz , $T_J = 25^\circ\text{C}$		100		μV
Supply Voltage Rejection	SVR	$I_O = 40\text{mA}$, $f = 120\text{Hz}$, $T_J = 25^\circ\text{C}$ $V_{IN} = 6.3\text{V}$, $V_{NIPPLE} = 1\text{V}_{PP}$	60	75		dB
Dropout Voltage	V_D	$I_O = 100\text{mA}$		1	1.1	V
		$I_O = 500\text{mA}$		1.05	1.15	V
		$I_O = 800\text{mA}$		1.1	1.2	V
Thermal Regulation		$T_A = 25^\circ\text{C}$ 30ms Pulse		0.003		%/W

LM1117 (ADJUSTABLE) ELECTRICAL CHARACTERISTICS

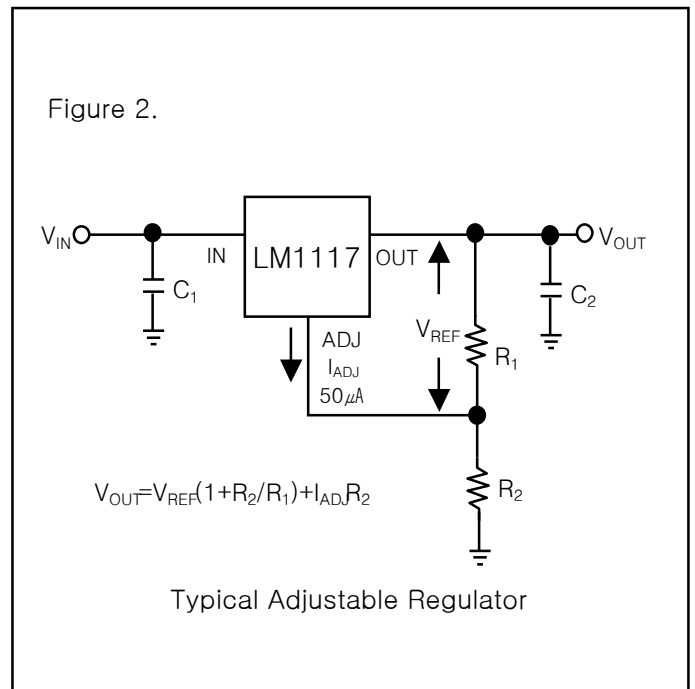
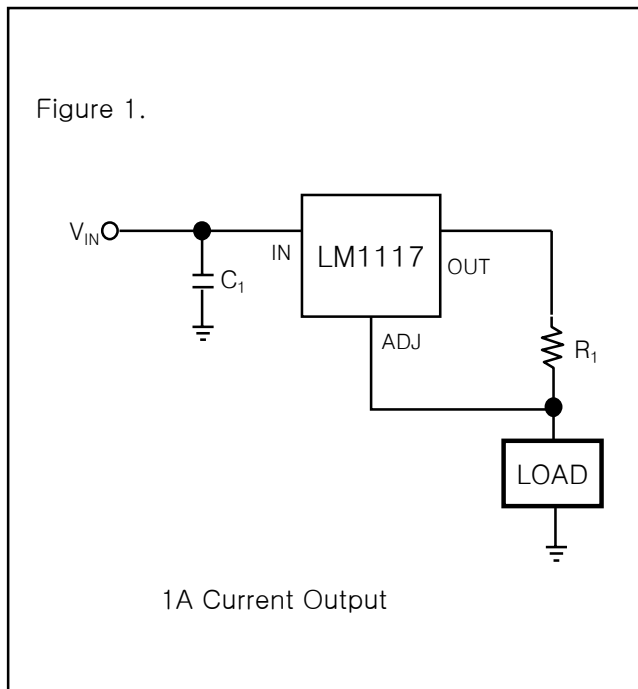


Figure 3. Negative Supply

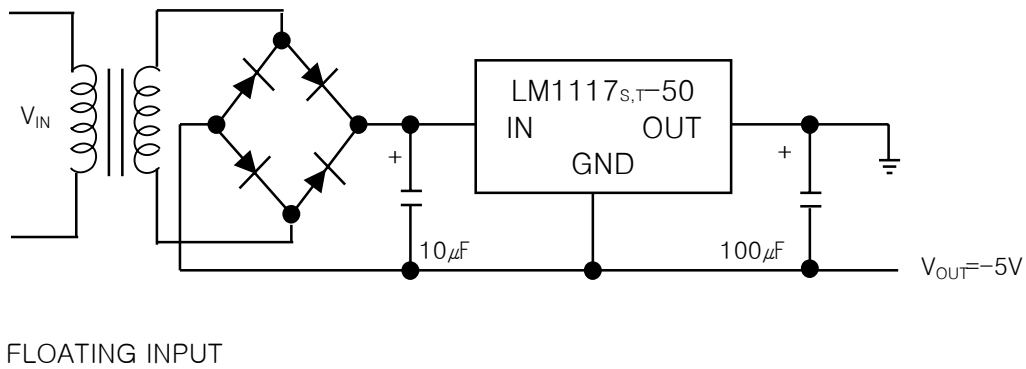


Figure 4. Active Terminator for SCSI-2 BUS

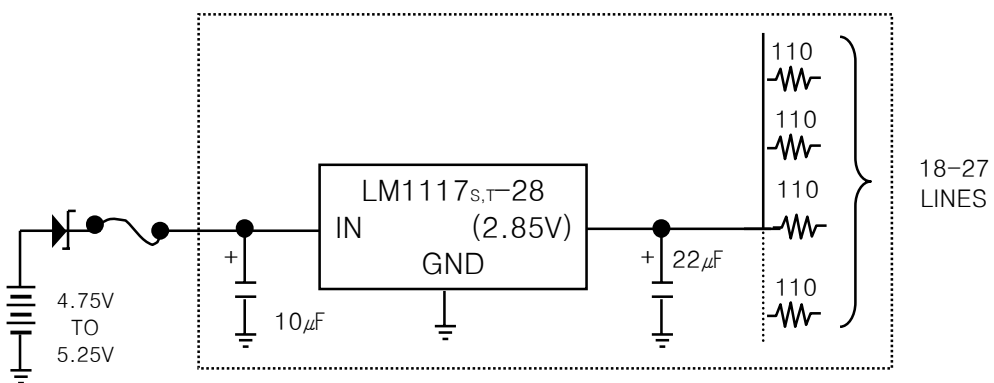


Figure 5. Voltage Regulator With Reference

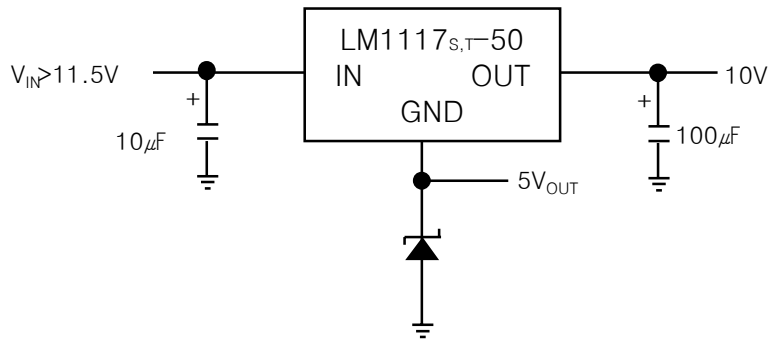


Figure 6. Battery Backed-up Regulated Supply

