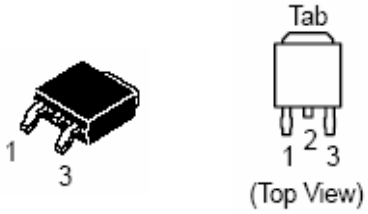
1A L.D.O. VOLTAGE REGULATOR LM1117S/RS

FEATURES

- Output Current up to 1 A
- Low Dropout Voltage (1.2V at 1A Output Current)
- Three Terminal Adjustable or Fixed **1.2V,** 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5.0V
- 2.85V Device for SCSI-II Active Terminator
- Line Regulaion typically at 0.1%
- Load Regulaion typically at 0.2%
- Internal Current and Terminal Protection
- Maximum Input Voltage - 15V
- Surface Mount Package SOT-223
- 100% Thermal Limit Burn-In

SOT-223 PKG

TO-252(D) PKG



Pin 1. Adjust/Ground
2. Output
3. Input

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

ORDERING INFORMATION

Device (Marking)	Package
LM1117S-ADJ	SOT-223
LM1117S-X.X	
LM1117RS-ADJ	TO-252
LM1117RS-X.X	

(X.X=Output Voltage= **1.2V**, 1.5V, 1.8V, 2.5V '2.85V, 3.3V, 5.0V, Adjustable=ADJ)

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 1V 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, 3.3V, 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

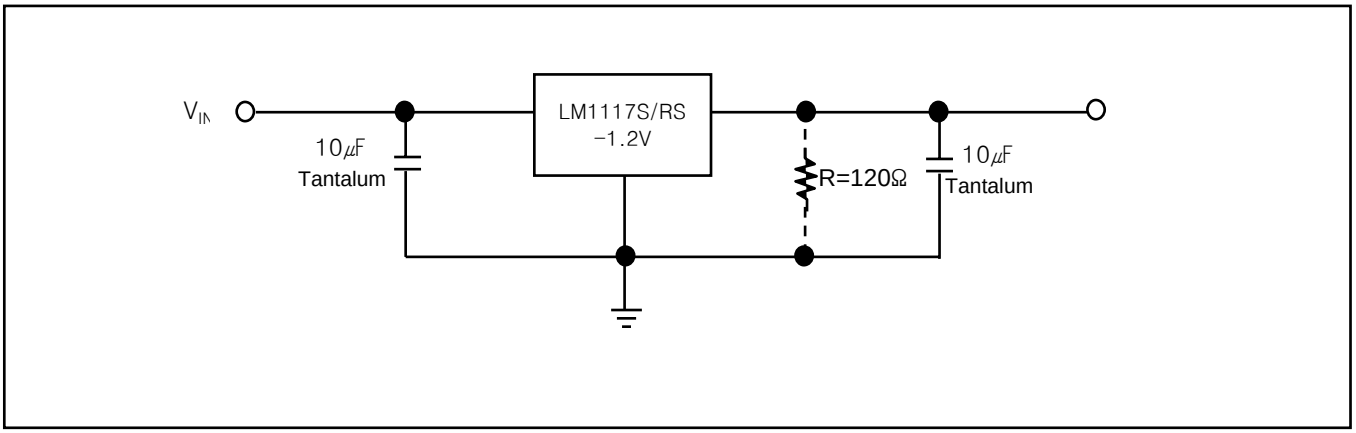
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
DC Input Voltage	V_{IN}		15	V
Lead Temperature (Soldering, 5 Seconds)	T_{SOL}		260	℃
Storage Temperature Range	T_{STG}	-65	150	℃
Operating Junction Temperature Range	T_{OPR}	0	150	℃

THERMAL DATA

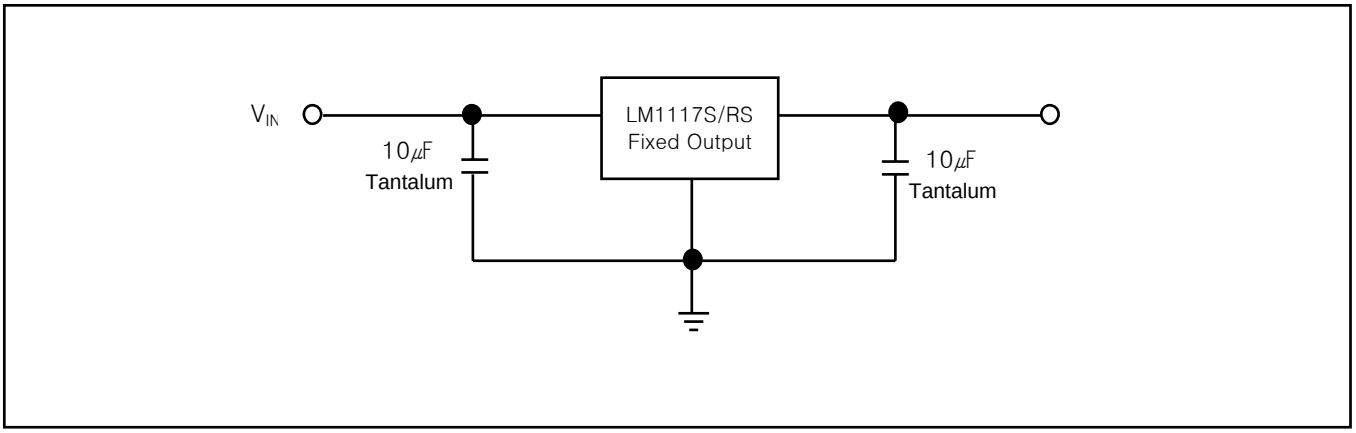
PARAMETER	SYMBOL	SOT-223	TO-252	UNIT
Thermal Resistance Junction-Case	$R_{THJ-CASE}$	15	8	℃/W

TYPICAL APPLICATION

1.2 V FIXED OUTPUT VOLTAGE



OTHER FIXED OUTPUT VOLTAGE



ELECTRICAL CHARACTERISTICS FOR **LM1117S/RS-ADJ**(ADJUSTABLE)

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V_{REF}	I_O = 10mA to 1A, V_{IN} – V_O = 1.5 to 13.75V	1.238	1.25	1.262	V
Reference Voltage(T_J=0~125℃)	V_{REF}	I_O = 10mA to 1A, V_{IN} – V_O = 1.5 to 13.75V	1.219		1.281	V
Line Regulation	ΔV_O	I_O = 10mA , V_{IN} – V_O = 1.5 to 13.75V		0.1	0.2	%
Load Regulation	ΔV_O	I_O = 10mA to 1A, V_{IN} – V_O = 2 V		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}				15	V
Adjustment Pin Current	I_{ADJ}	V_{IN} – V_O = 1.5 to 12V I_O = 100mA		50	120	μA
Adjustment Pin Current Change	ΔI_{ADJ}	V_{IN} – V_O = 1.5 to 12V, I_O = 10mA to 1A		0.5	5	μA
Minimum Load Current	$I_{O(MIN)}$	V_{IN} – V_O = 12V		5	10	mA
Current Limit	I_O	V_{IN} – V_O = 5V	1000	1250	1600	mA
Output Noise (%V_O)	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		0.003		%
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} – V_O = 3V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-1.2

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 3.2V I_O = 0mA to 1A	1.176	1.20	1.224	V
Reference Voltage(T_J=0~125℃)	V_{REF}	I_O = 10mA to 1A, V_{IN} – V_O = 1.5 to 13.75V	1.152	1.200	1.248	V
Line Regulation	ΔV_O	I_O = 10mA , V_{IN} – V_O = 1.5 to 13.75V		0.1	0.2	%
Load Regulation	ΔV_O	I_O = 10mA to 1A, V_{IN} – V_O = 2 V		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}				15	V
Adjustment Pin Current	I_{ADJ}	V_{IN} – V_O = 1.5 to 12V I_O = 100mA		50	120	μA
Adjustment Pin Current Change	ΔI_{ADJ}	V_{IN} – V_O = 1.5 to 12V, I_O = 10mA to 1A		0.5	5	μA
Minimum Load Current	$I_{O(MIN)}$	V_{IN} – V_O = 12V		5	10	mA
Current Limit	I_O	V_{IN} – V_O = 5V	1000	1250	1600	mA
Output Noise (%V_O)	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		0.003		%
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} – V_O = 3V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-1.5

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 3.0 to 12V, I_O = 0mA to 1A	1.485	1.5	1.515	V
Output Voltage	V_O	V_{IN}=3.0 to 12V, I_O=0mA to 1A (Tj = 0~125℃)	1.470		1.530	V
Line Regulation	ΔV_O	V_{IN} = 3.0 to 12V, I_O = 0mA		0.1	0.2	%
Load Regulation	ΔV_O	V_{IN} = 3.5V, I_O = 0 to 1A		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			12	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 5.5V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-1.8

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 3.3 to 12V, I_O = 0mA to 1A	1.782	1.8	1.818	V
Output Voltage	V_O	V_{IN}=3.3 to 12V, I_O=0mA to 1A (Tj = 0~125℃)	1.764		1.836	V
Line Regulation	ΔV_O	V_{IN} = 3.3 to 12V, I_O = 0mA		0.1	0.2	mV
Load Regulation	ΔV_O	V_{IN} = 3.8V, I_O = 0 to 1A		0.2	0.4	mV
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			12	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 5.5V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-2.5

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 4.0 to 12V, I_O = 0mA to 1A	2.475	2.5	2.525	V
Output Voltage	V_O	V_{IN}=4.0 to 12V, I_O=0mA to 1A (Tj = 0~125℃)	2.450		2.550	V
Line Regulation	ΔV_O	V_{IN} = 4.0 to 12V, I_O = 0mA		0.1	0.2	%
Load Regulation	ΔV_O	V_{IN} = 4.5V, I_O = 0 to 1A		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			12	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 5.5V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.01	0.1	%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-2.85

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 4.4 to 12V, I_O = 0mA to 1A	2.821	2.85	2.878	V
Output Voltage	V_O	V_{IN}=4.4 to 12V, I_O=0mA to 1A (Tj = 0~125℃)	2.793		2.907	V
Line Regulation	ΔV_O	V_{IN} = 4.4 to 12V, I_O = 0mA		0.1	0.2	%
Load Regulation	ΔV_O	V_{IN} = 4.85V, I_O = 0 to 1A		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			12	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 5.85V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-3.3

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 4.8 to 12V, I_O = 0mA to 1A	3.267	3.3	3.333	V
Output Voltage	V_O	V_{IN}=4.8 to 12V, I_O=0mA to 1A (Tj = 0~125℃)	3.234		3.366	V
Line Regulation	ΔV_O	V_{IN} = 4.8 to 12V, I_O = 0mA		0.1	0.2	%
Load Regulation	ΔV_O	V_{IN} = 5.3V, I_O = 0 to 1A		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			12	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 6.3V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

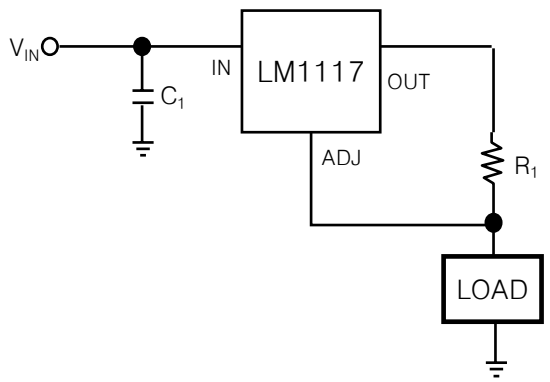
ELECTRICAL CHARACTERISTICS FOR LM1117 S/RS-5.0

(Refer to the test circuits, T_J=25℃ C_O=10μF unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN} = 6.5 to 15V, I_O = 0mA to 1A	4.950	5.0	5.050	V
Output Voltage	V_O	V_{IN}=6.5 to 15V, I_O=0mA to 1A (Tj = 0~125℃)	4.900		5.100	V
Line Regulation	ΔV_O	V_{IN} = 6.5 to 15V, I_O = 0mA		0.1	0.2	%
Load Regulation	ΔV_O	V_{IN} = 7.0V, I_O = 0 to 1A		0.2	0.4	%
Temperature Stability	ΔV_O			0.5		%
Long Term Stability	ΔV_O	1000 hrs, T_J = 125℃		0.3		%
Operating Input Voltage	V_{IN}	I_O = 100mA			15	V
Quiescent Current	I_D	V_{IN} - Vo = 5V		5	10	mA
Current Limit	I_O	V_{IN} - Vo = 5V	1000	1250	1600	mA
Output Noise Voltage	$_EN$	B = 10Hz to 10kHz, T_J = 25℃		100		μV
Supply Voltage Rejection	SVR	I_O = 40mA , f = 120Hz, T_J = 25℃ V_{IN} = 6.3V, V_{NIPPLE} = $1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_O = 100mA		1.0	1.1	V
		I_O = 500mA		1.1	1.2	V
		I_O = 1A		1.2	1.3	V
Thermal Regulation		T_A = 25℃ 30ms Pulse		0.003		%/W

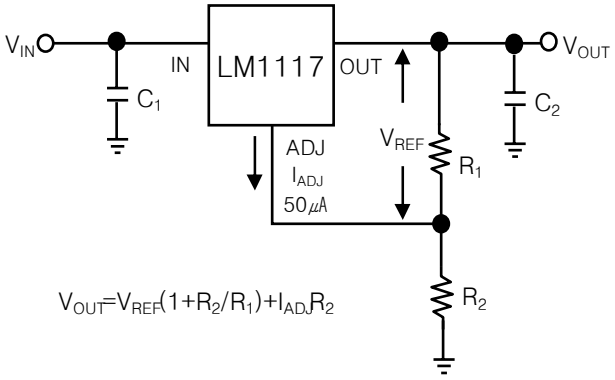
APPLICATION CIRCUITS

Figure 1.



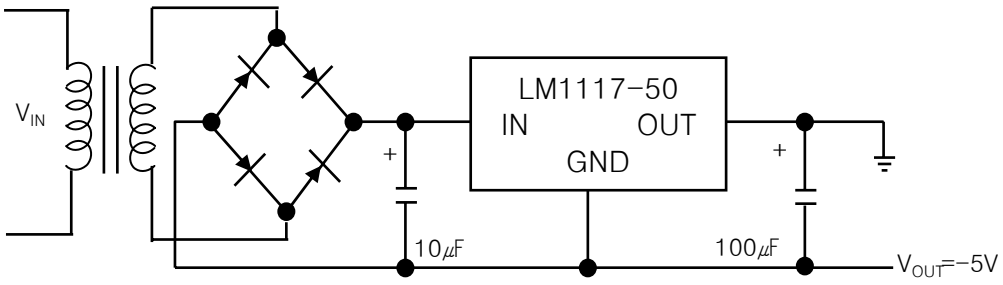
1A Current Output

Figure 2.



Typical Adjustable Regulator

Figure 3. Negative Supply



FLOATING INPUT

Figure 4. Active Terminator for SCSI-2 BUS

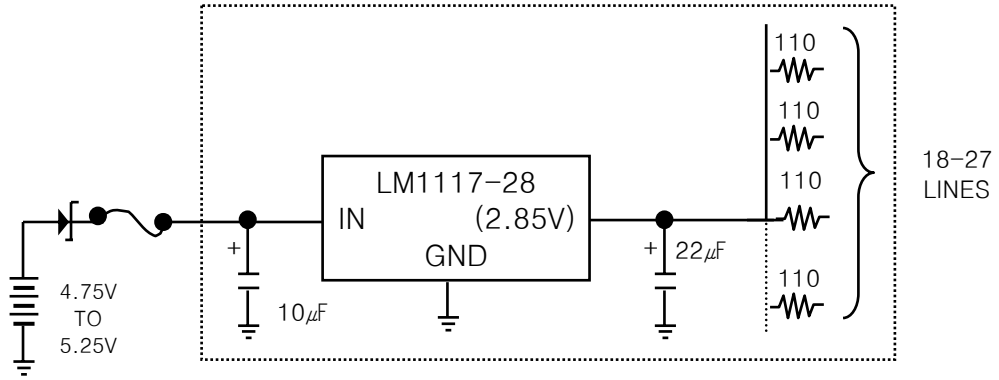


Figure 5. Voltage Regulator With Reference

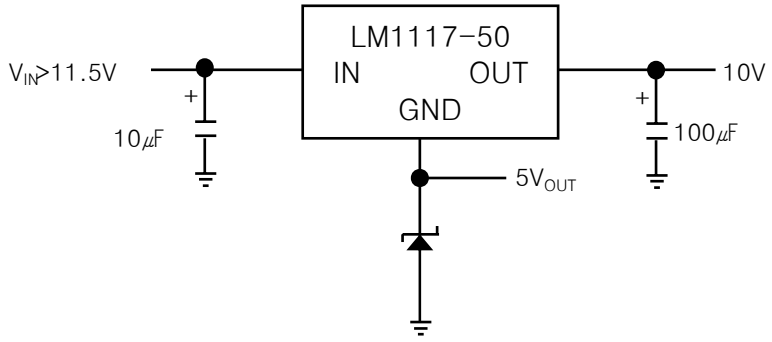
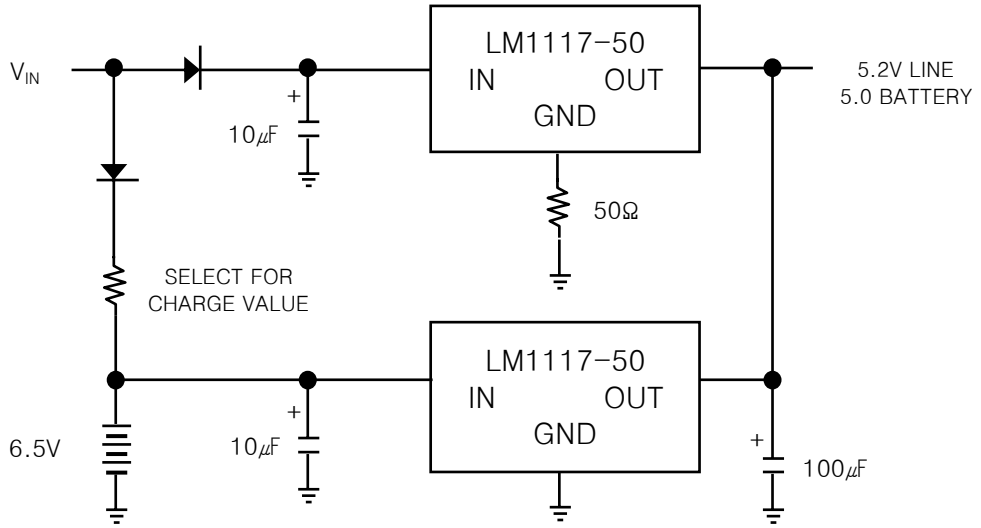


Figure 6. Battery Backed-up Regulated Supply



* NOTES : IF ANYTHING WILL BE CHANGED FOR THIS SPECIFICATION,
TAEJIN TECHNOLOGY MUST INFORM PCC BEFORE THE CHANGE

Typical Performance Characteristics

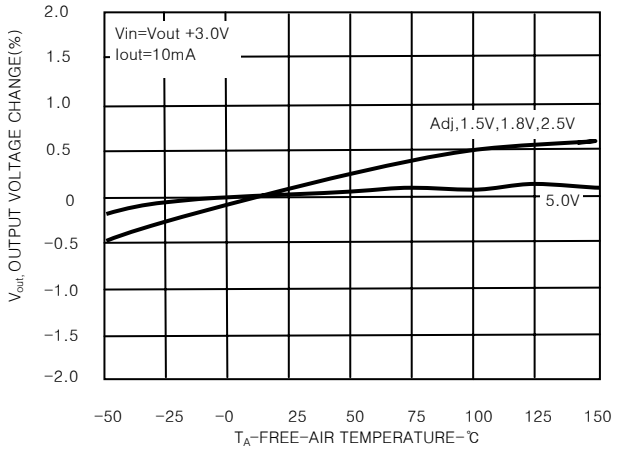


FIG 1. OUTPUT VOLTAGE CHANGE vs TEMPERATURE(℃)

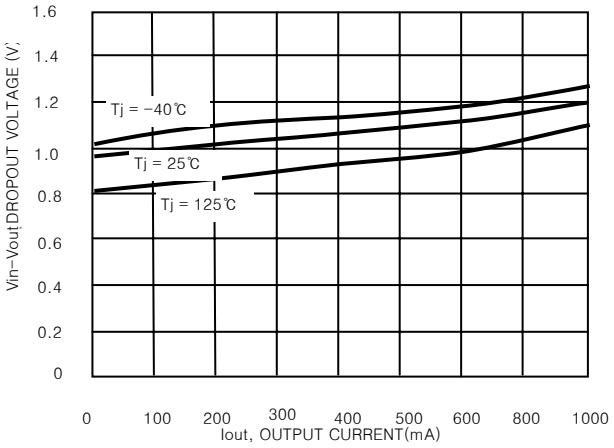


FIG 2. DROPOUT VOLTAGE vs OUTPUT CURRENT

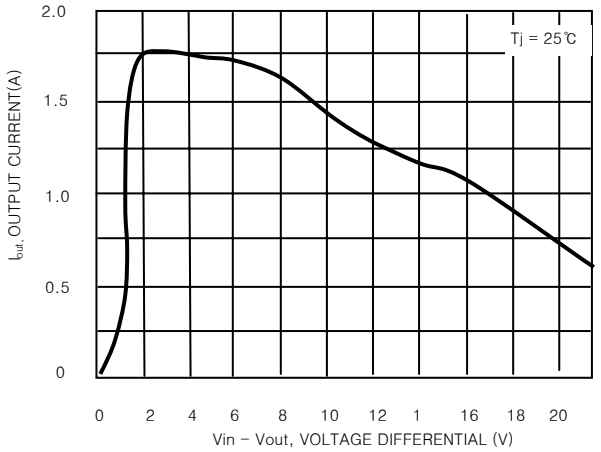


FIG 3. OUTPUT SHORT CIRCUIT CURRENT
vs DIFFERENTIAL VOLTAGE

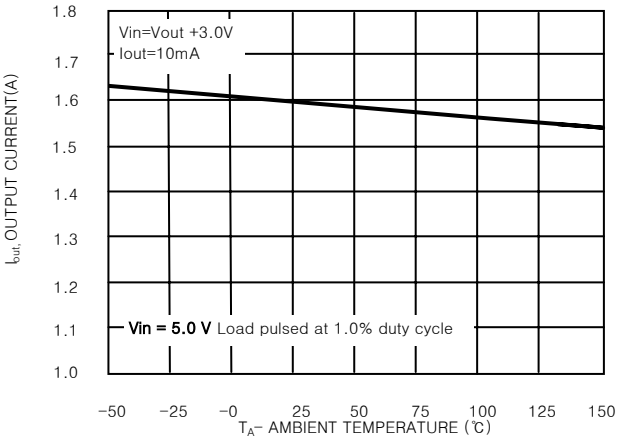


FIG 4. OUTPUT SHORT CIRCUIT CURRENT
vs TEMPERATURE

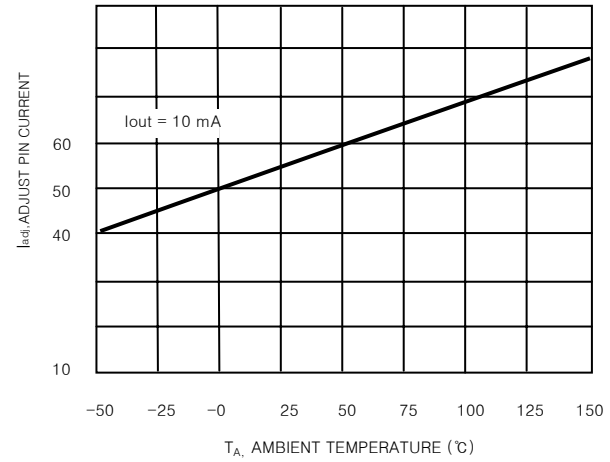


FIG 5. ADJ PIN CURRENT vs TEMPERATURE (℃)

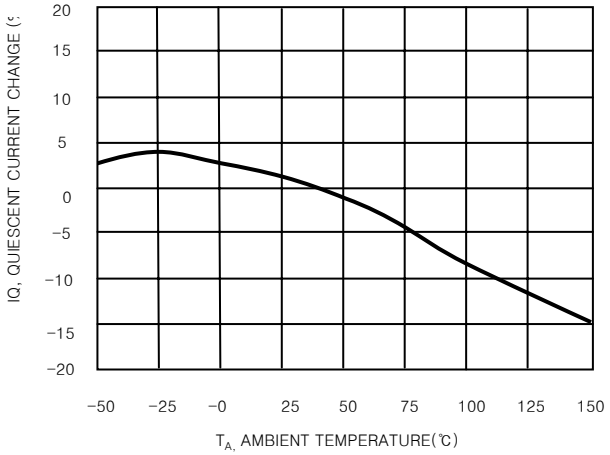


FIG 6. QUIESCENT CURRENT CHANGE vs TEMPERATURE
(℃)