SIRECT
ELECTRONIC

MT1117

1A LDO LINEAR VOLTAGE / REGULATORS

◆ DESCRIPTION

The MT1117 series are low-drop-out (LDO) linear regulators. The devices have been optimized for applications where fast transient response and minimum input voltages are critical. The internal over-current protection and thermal protection ,makes the device extremely easy to use in a wide range of applications.

◆ APPLICATIONS

* Active SCSI terminators
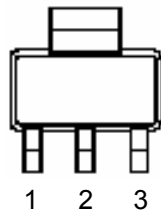* High efficiency linear regulators
* Motherboard clock supplies

◆ FEATURES

* Low dropout performance
* Output current of 800mA typical
* Wide range input supply voltage
* Thermal shutdown protection
* Fixed 1.8V, 2.5V, 3.3V output voltages available
* SOT-223 packages available

◆ PIN CONFIGURATIONS

SOT-223
(Top View)

1: GND, 2: OUT, 3: IN

◆ ABSOLUTE MAXTMUM RETINGS

SYMBOL	PARAMETER	MAXIMUM	UNITS
V_{IN}	Input supply voltage	7	V
θ_{JC}	Thermal resistance junction to case SOT-223 TO-252	15 10	^{O}C/W
θ_{JA}	Thermal resistance junction to ambient SOT-223 TO-252	156 90	^{O}C/W
T_J	Operating junction temperature range	0 to 125	^{O}C
T_{STG}	Storage temperature range	- 40 to 150	^{O}C
T_{LEAD}	Lead temperature (soldering) 10sec	260	^{O}C

Note 1: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

MT1117

◆ **ORDERING INFORMATION**

DEVICE	PACKAGE		V_{OUT} VOLTS	T_A (^oC)
MT1117A	A	SOT-223	X.X_ 1.5 / 1.8 / 2.5 / 2.8 / 3.0 / 3.3	0~70
MT1117-X.X A				

◆ **POWER DISSIPATION TABLE:**

Package	θ_{JA} (^oC /W)	Df(mW/^oC) $T_A \geq 25\,^oC$	$T_A \leq 25\,^oC$ Power rating(mW)	T_A=70^oC Power rating(mW)	T_A= 85^oC Power rating (mW)
A	156	7.35	919	588	478

Note :

1. $\theta_{JA:}$ Thermal Resistance-Junction to Ambient, D_F : Derating factor, Po: Power consumption.

Junction Temperature Calculation:

$$T_J = T_A + (P_D \times \theta_{JA}), Po = D_F \times (T_J - T_A)$$

The θ_{JA} numbers are guidelines for the thermal performance of the device/PC-board system.

All of the above assume no ambient airflow.

2. $\theta_{JT:}$ Thermal Resistance-Junction to Ambient, T_C: case(Tab) temperature, $T_J = T_C + (P_D \times \theta_{JT})$

For A package, θ_{JT} = 15.0 ^oC /W.

For B package, θ_{JT} = 7.0 ^oC /W.

◆ **RECOMMENDED OPERATING CONDITIONS:**

Symbol	Parameter	Recommended Operating			Units
		Min.	Typ.	Max.	
V_{IN}	Input Voltage	3		6	V
I_O	Load Current (with adequate heatsinking)	0.1			mA
C_{IN}	Input Capacitor (V_{IN} to GND)	1.0			μF
C_{OUT}	Output Capacitor with ESR of 10Ω max., (V_{OUT} to GND)	4.7			μF
T_J	Junction temperature			125	^oC

◆ **TYPICAL APPLICATIONS:**

Fixed Voltage Regulator:

MT1117
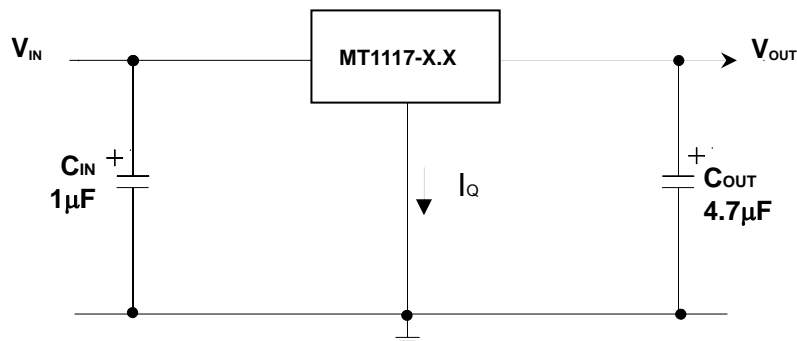
◆ **ELECTRICAL CHARACTERISTICS:**

Operating Conditions: $3V \leq V_{IN} \leq 6V$, $T_J = 0 \sim 125\,^{\circ}C$ unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNITS
V_O	Output Voltage (1)	$10mA \leq I_{OUT} \leq 1A$ $T_A = 25\,^{\circ}C$, MT1117-1.5, $3V \leq V_{IN} \leq 5.5V$ MT1117-1.8, $3V \leq V_{IN} \leq 5.5V$ MT1117-2.5, $3.5V \leq V_{IN} \leq 5.5V$ MT1117-2.8, $3.8V \leq V_{IN} \leq 5.5V$ MT1117-3.0, $4V \leq V_{IN} \leq 5.5V$ MT1117-3.3, $4.3V \leq V_{IN} \leq 5.5V$	1.764 2.450 3.234	1.8 2.5 3.3	1.836 2.550 3.366	V V V
V_{SR}	Line Regulation (1)	$(V_{OUT}+1V) \leq V_{IN} \leq 5.5V$ $I_{OUT}=10mA$		0.005	1.0	%
V_{LR}	Load Regulation (1)	$10mA \leq I_{OUT} \leq 1A$		0.5		%
V_D	Dropout Voltage (2)	$V_{IN} \geq 2V$, $I_{OUT}=1A$		0.65		V
I_{CL}	Current Limit	$(V_{IN}-V_{OUT})=2V$		1.5		A
I_Q	Quiescent Current	$V_{IN}=V_{OUT}+1.25$		1		mA
I_O	Minimum Load Current	$1.5V \leq (V_{IN}-V_{OUT}) \leq 5.75V$	0.1			mA
RA	Ripple Rejection Ratio	$f = 120Hz$,		75		dB

NOTES:

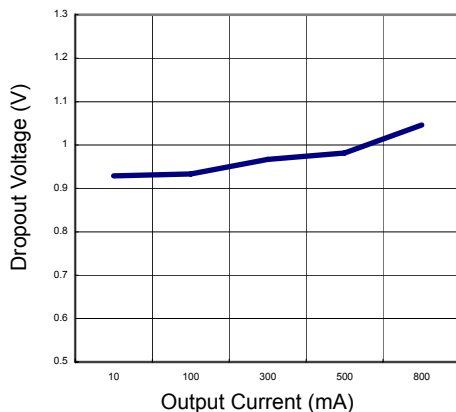(1) Low duty cycle pulse testing with which T_J remain unchanged.

(2) ΔV_{OUT}, $\Delta V_{REF} = 1\%$

◆ **TYPICAL PERFORMANCE CHARACTERISTICS:**

$V_{IN}= 5V$，$C_{IN}=10\mu F$，$C_{OUT}= 22\mu F$，$T_A=25\,^{\circ}C$ unless otherwise specified.

DROPOUT VOLTAGE vs. OUTPUT CURRENT
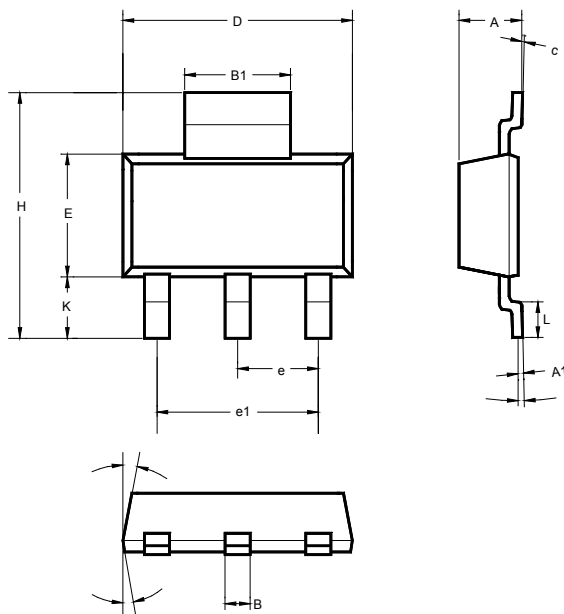
◆ **APPLICATION NOTE:**

1. **Maximum Power Dissipation Calculation:**

$$P_{D(max)} = [(V_{IN(max)} - V_{O(nom)})] \times I_{O(nom)} + V_{IN(max)} \times I_Q$$

Where: $V_{O(nom)}$: The nominal output voltage
$I_{O(nom)}$: The nominal output current, and
I_Q : The quiescent current the regulator consumes at $I_{O(MAX)}$
$V_{IN(max)}$: The maximum input voltage
Then $\theta_{JA} = (150\,^{\circ}C - T_A) / P_D$

◆ **PHYSICAL DIMENSIONS:**

 3-Pin Surface Mount SOT-223(A)

	MILLIMETERS		
	MIN	TYP	MAX
A	1.50	1.65	1.80
A1	0.02	0.05	0.08
B	0.60	0.70	0.80
B1	2.90	-	3.15
c	0.28	0.30	0.32
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	2.3 BSC		
e1	4.6 BSC		
H	6.70	7.00	7.30
L	0.91	1.00	1.10
K	1.50	1.75	2.00
α	0°	5°	10°
β		3°	

http:// www.sirectsemi.com