SEAWARD ELECTRONICS

500mA Positive Voltage Regulators (Preliminary)

SE8119

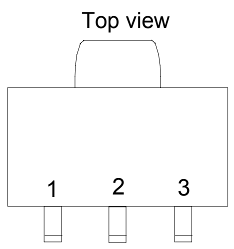
Description

The SE8119 series of high performance low dropout voltage regulators are designed for applications that require efficient conversion and fast transient response.

Features

- Low Dropout Performance.
- Guaranteed 500mA Output Current.
- Wide Input Supply Voltage Range.
- Over-temperature and Over-current Protection.
- Rugged 3KV ESD withstand capability.
- Available in SOT-89-3L Packages.

Pin Configuration

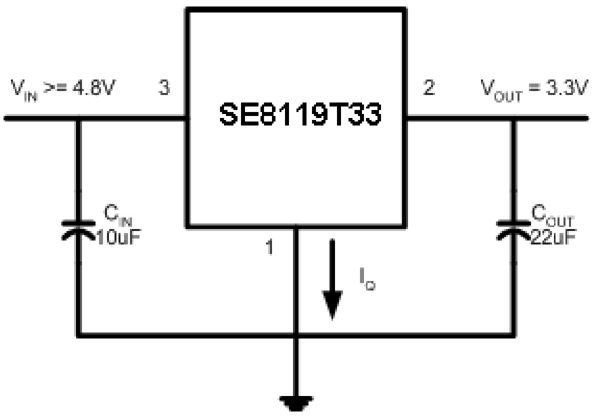


SOT-89

Application

- PC-Camera
- Active SCSI Terminators.
- High Efficiency Linear Regulators.
- 5V to 3.3V Linear Regulators
- Motherboard Clock Supplies.

Typical Application



Ordering Information

SE8119 _ _ _

PIN (1=>3): 1. G: OUT/GND/IN
2. N: GND/IN/OUT

Package Type: 1. K: SOT-89-3L

Output Voltage: A: V_{OUT} = 3.3V

Absolute Maximum Rating

Symbol	Parameter	Maximum	Units
V_{IN}	Input Supply Voltage	9	V
T_J	Operating Junction Temperature Range	0 to 125	°C
T_{STG}	Storage Temperature Range	-40 to 150	°C
T_{LEAD}	Lead Temperature (Soldering 10 Sec)	260	°C

Electrical Characteristic

$V_{IN,MAX} \le 8V$, $V_{IN,MIN} - V_{OUT} = 1.5V$, $I_{OUT} = 10mA$, $C_{IN} = 10\mu F$, $C_{OUT} = 22\mu F$, $T_J = 0 - 125°C$, unless otherwise specified.

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_O	Output Voltage (1)	SE8119T33	3.234	3.3	3.366	V
V_{SR}	Line Regulation (1)	$V_{OUT} + 1.5V < V_{IN} < 8V$ $I_{OUT} = 10mA$	--	0.3	--	%
V_{LR}	Load Regulation (1)	$(V_{IN} - V_{OUT}) = 1.5V$ $10mA \le I_{OUT} \le 500mA$	--	0.4	--	%
I_Q	Quiescent Current		--	10	--	mA
V_D	Dropout Voltage (2)	$I_{OUT} = 500mA$	--	1.0	--	V
I_O	Minimum Load Current		--	4	--	mA
I_{CL}	Current Limit		--	0.8	--	A
T_C	Temperature Coefficient		--	0.07	--	%/°C
OTP	Thermal Protection		--	175	--	°C
V_N	RMS Output Noise	$T_A = 25°C$, $10Hz \le f \le 10kHz$	--	0.003	--	$\%V_O$
R_A	Ripple Rejection Ratio	f = 120Hz, $C_{OUT} = 22\mu F$ (Tantalum), $(V_{IN} - V_{OUT}) = 3V$, $I_{OUT} = 500mA$	--	35	--	dB

Notes:

1. Low duty cycle pulse testing with which T_J remains unchanged.
2. $\Delta V_{OUT} = 1\%$.

Application Hints

Like any linear voltage regulator, SE8119 requires external capacitors to ensure stability. The external capacitors must be carefully selected to ensure performance.

Input Capacitor

An input capacitor of at least 10μF is required. Ceramic or Tantalum can be used. The value can be increase without upper limit.

Output Capacitor

An output capacitor is required for stability. It must be placed no more than 1 cm away from the V_{OUT} pin, and connected directly between V_{OUT} and GND pins. The minimum value is 22μF but may be increase without limit.

Thermal Considerations

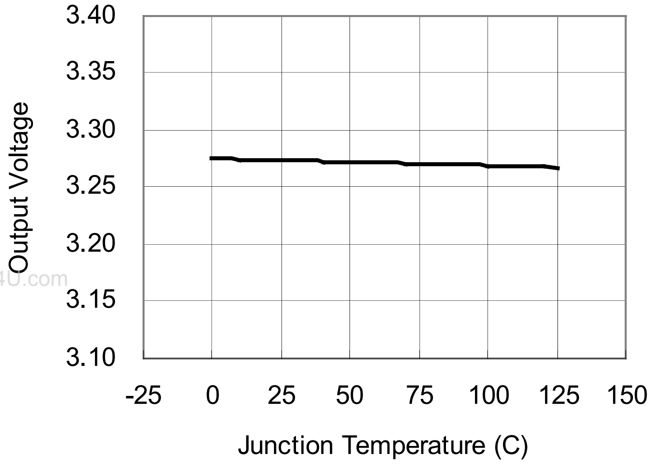
It is important that the thermal limit of the package is not exceeded. The SE8119 has built-in thermal protection. When the thermal limit is exceeded, the IC will enter protection, and V_{OUT} will be pulled to ground. The power dissipation for a given application can be calculated as following:

The power dissipation (P_D) is

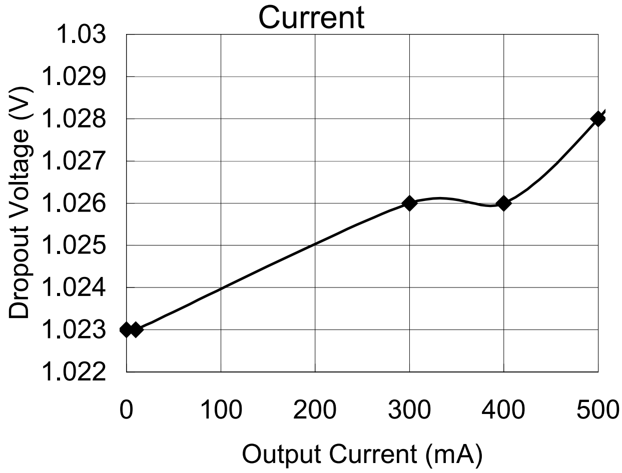
$P_D = I_{OUT} * [V_{IN} – V_{OUT}]$

The thermal limit of the package is then limited to $P_{D(MAX)} = [T_J – T_A]/\Theta_{JA}$ where T_J is the junction temperature, TA is the ambient temperature, and Θ_{JA} is around 150°C/W for SE8119. SE8119 is designed to enter thermal protection at 175°C. For example, if T_A is 25°C then the maximum P_D is limited to about 1.0W. In other words, if $I_{OUT(MAX)}$ = 500mA, then $[V_{IN} – V_{OUT}]$ can not exceed 2.0V.

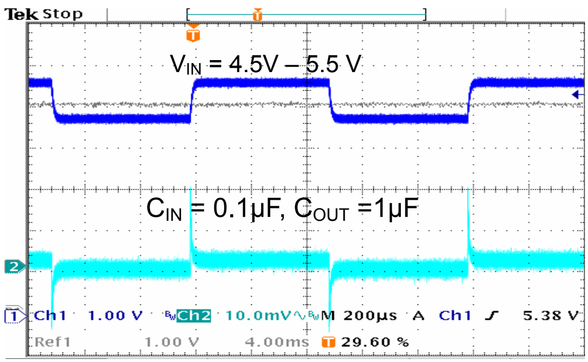
Output Voltage VS. Junction Temperature



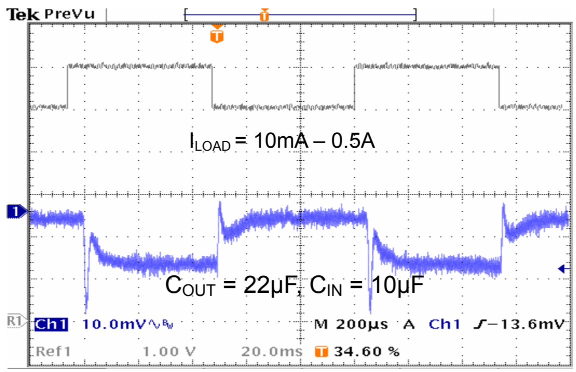
Dropout Voltage vs Output Current



Line Transients

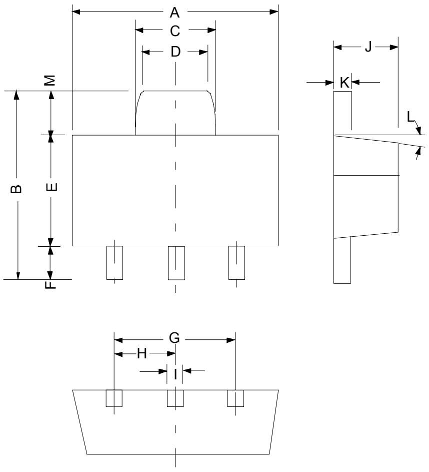


Load Transients



Outline Drawing for SOT-89-3L

SOT-89



DIMENSIONS				
DIM^N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.173	0.181	4.400	4.600
B	0.159	0.167	4.050	4.250
C	0.067	0.075	1.700	1.900
D	0.051	0.059	1.300	1.500
E	0.094	0.102	2.400	2.600
F	0.035	0.047	0.890	1.200
G	0.118REF		3.00REF	
H	0.059REF		1.50REF	
I	0.016	0.020	0.400	0.520
J	0.055	0.063	1.400	1.600
K	0.014	0.016	0.350	0.410
L	10°TYP		10°TYP	
M	0.028REF		0.70REF	

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