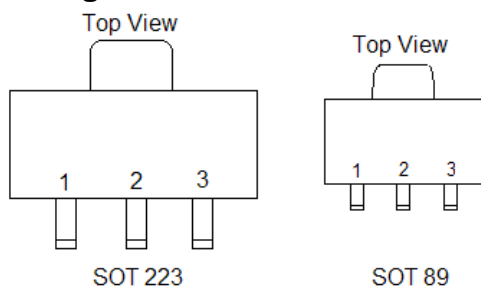




## Description

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

## Pin Configuration



## Features

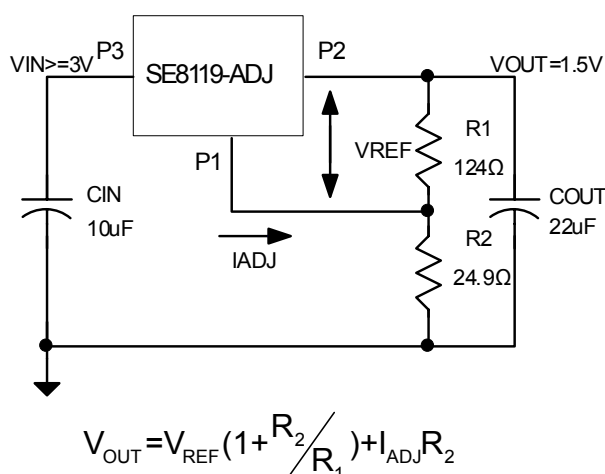
- Low Dropout Performance.
- Guaranteed 800mA Output Current.
- Wide Input Supply Voltage Range.
- Over-temperature and Over-current Protection.
- Rugged 3KV ESD withstand capability.
- Available in SOT-89-3L and SOT-223-3L Packages.

## Application

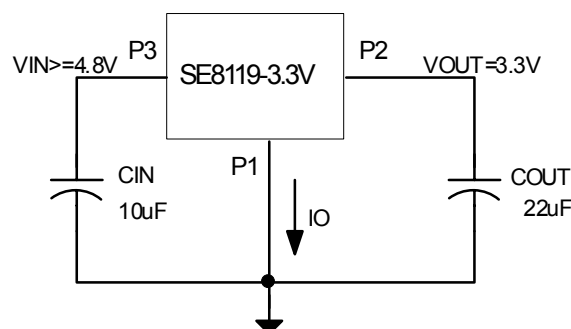
- PC-Camera
- Active SCSI Terminators.
- High Efficiency Linear Regulators.
- 5V to 3.3V Linear Regulators
- Motherboard Clock Supplies.

## Typical Application

### Adjustable Voltage Regulator



### Fixed Voltage Regulator



## Ordering/Marking Information

Device	Marking Information	Package	Information
SE8119AKXLF	SE8119AKXLF	SOT-89	A denotes 3.3V, K denotes SOT-89, X denotes pin options (G:OUT/GND/IN N: GND/IN/OUT T:GND/OUT/IN)
SE8119ADJLF	SE8119ADJLF		Adjustable output voltage.



## Ordering/Marking Information

Device	Marking Information	Package	V <sub>OUT</sub>
SE8119TXXLF	SE8119TXXLF	SOT-223	Fixed output voltages; X denotes voltage options (1.5V, 1.8V, 2.5V, 3.3V and 5.0V).
SE8119TALF	SE8119TALF		Adjustable output voltage.

## Absolute Maximum Rating

Symbol	Parameter	Maximum	Units
V <sub>IN</sub>	Input Supply Voltage	9	V
T <sub>J</sub>	Operating Junction Temperature Range	0 to 125	°C
T <sub>STG</sub>	Storage Temperature Range	-40 to 150	°C
T <sub>LEAD</sub>	Lead Temperature (Soldering 10 Sec)	260	°C

## Electrical Characteristic

V<sub>IN,MAX</sub> ≤ 8V, V<sub>IN,MIN</sub> – V<sub>OUT</sub> = 1.5V, I<sub>OUT</sub> = 10mA, C<sub>IN</sub> = 10μF, C<sub>OUT</sub> = 22μF, T<sub>J</sub> = 0 – 125°C, unless otherwise specified.

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>O</sub>	Output Voltage	SE8119-3.3	3.234	3.3	3.366	V
V <sub>REF</sub>	Reference Voltage (Adj. Voltage Version)	(V <sub>IN</sub> - V <sub>OUT</sub> ) = 1.5V I <sub>OUT</sub> = 10mA	(-2%)	1.250	(+2%)	V
V <sub>SR</sub>	Line Regulation	V <sub>OUT</sub> + 1.5V < V <sub>IN</sub> < 8V I <sub>OUT</sub> = 10mA	--	0.3	--	%
V <sub>LR</sub>	Load Regulation <sup>(1)</sup>	(V <sub>IN</sub> - V <sub>OUT</sub> ) = 1.5V 10mA ≤ I <sub>OUT</sub> ≤ 800mA	--	1.2	--	%
I <sub>Q</sub>	Quiescent Current		--	2.6	--	mA
I <sub>ADJ</sub>	Adjust Pin Current		--	51	--	μA
ΔI <sub>ADJ</sub>	Adjust Pin Current Change	V <sub>OUT</sub> + 1.5V < V <sub>IN</sub> < 8V 10mA ≤ I <sub>OUT</sub> ≤ 800mA	--	6	--	μA
V <sub>D</sub>	Dropout Voltage <sup>(1), (2)</sup>	I <sub>OUT</sub> = 800mA	--	1.5	--	V
I <sub>O</sub>	Minimum Load Current		--	0.4	--	mA
V <sub>ICL</sub>	Current Limit <sup>(1)</sup>		--	0.9	--	A
T <sub>C</sub>	Temperature Coefficient		--	0.05	--	%/°C
OTP	Thermal Protection		--	150	--	°C
V <sub>N</sub>	RMS Output Noise	T <sub>A</sub> = 25°C, 10Hz ≤ f ≤ 10kHz	--	0.003	--	%V <sub>O</sub>
R <sub>A</sub>	Ripple Rejection Ratio	f = 120Hz, C <sub>OUT</sub> = 22μF (Tantalum), (V <sub>IN</sub> - V <sub>OUT</sub> ) = 2V, I <sub>OUT</sub> = 10mA	--	58	--	dB

Notes:

1. Low duty cycle pulse testing with which T<sub>J</sub> remains unchanged.

2. ΔV<sub>OUT</sub> = 1%.

Revision 1/4/2010

**Preliminary and all contents are subject to change without prior notice.**

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### 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 10 $\mu$ F is required. Ceramic or Tantalum can be used. The value can be increased 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 22 $\mu$ F but may be increased 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:

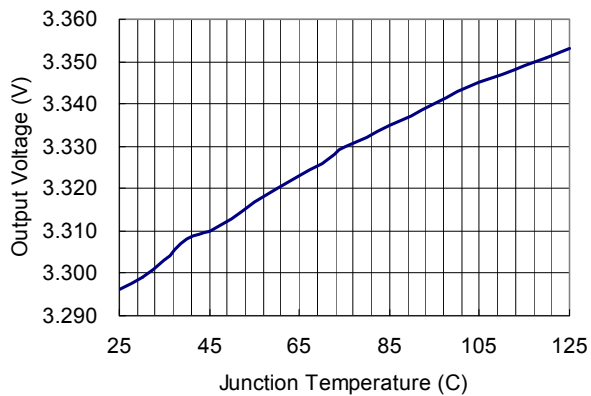
The power dissipation ( $P_D$ ) is

$$P_D = I_{OUT} * [V_{IN} - V_{OUT}]$$

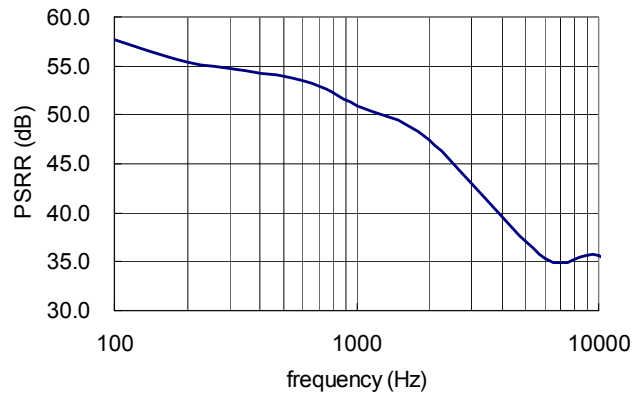
The thermal limit of the package is then limited to  $P_{D(MAX)} = [T_J - T_A]/\Theta_{JA}$  where  $T_J$  is the junction temperature,  $T_A$  is the ambient temperature, and  $\Theta_{JA}$  is around 150°C/W for SE8119. SE8119 is designed to enter thermal protection at 150°C. For example, if  $T_A$  is 25°C then the maximum  $P_D$  is limited to about 1.0W. In other words, if  $I_{OUT} = 500mA$ , then  $[V_{IN} - V_{OUT}]$  can not exceed 2V.



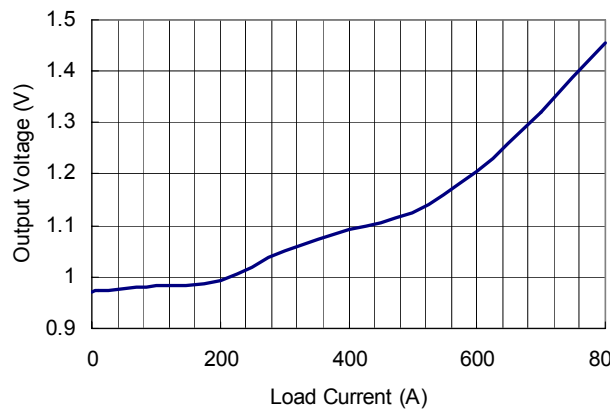
Output Voltage vs Junction Temperature



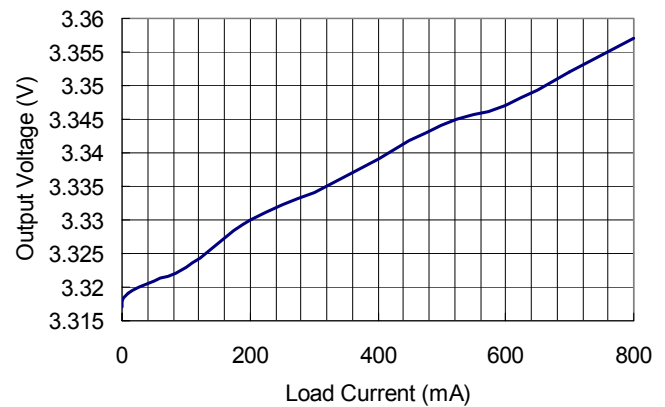
PSRR vs Frequency



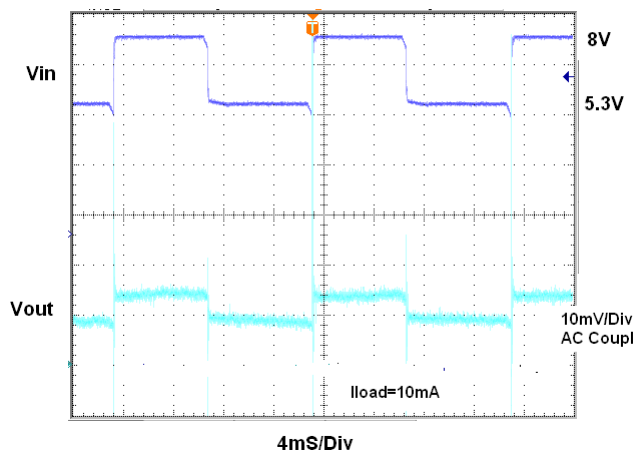
Dropout Voltage vs Load Current



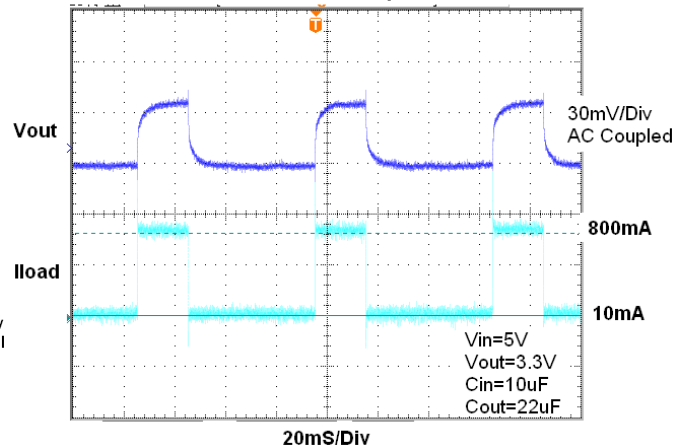
Output Voltage vs Load Current



Line Transient Response

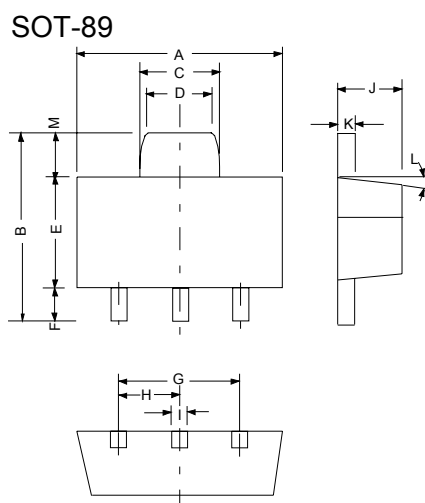


Load Transient Response



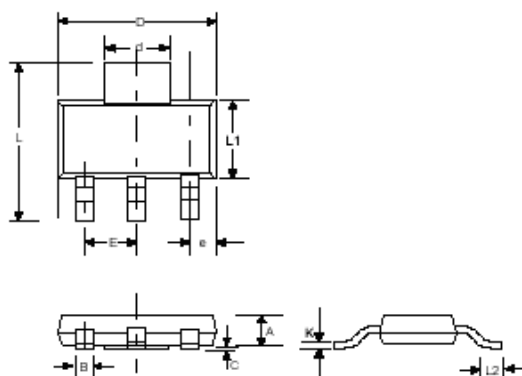


## Outline Drawing for SOT-89-3L



DIM <sup>N</sup>	DIMENSIONS			
	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	

## Outline Drawing for SOT-223



DIM <sup>N</sup>	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	—	0.071	—	1.80
B	0.025	0.033	0.640	0.840
C	0.012	—	0.31	—
D	0.248	0.264	6.30	6.71
d	0.115	0.124	2.95	3.15
E	—	0.090	—	2.29
e	0.033	0.041	0.840	1.04
L	0.264	0.287	6.71	7.29
L1	0.130	0.148	3.30	3.71
L2	0.012	—	0.310	—
K	0.010	0.014	0.250	0.360