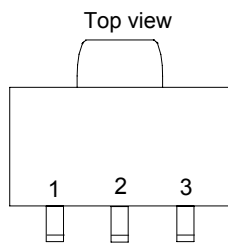




Description

The SE8119C series of high performance low dropout voltage regulators are designed for applications that require efficient conversion and fast transient response.

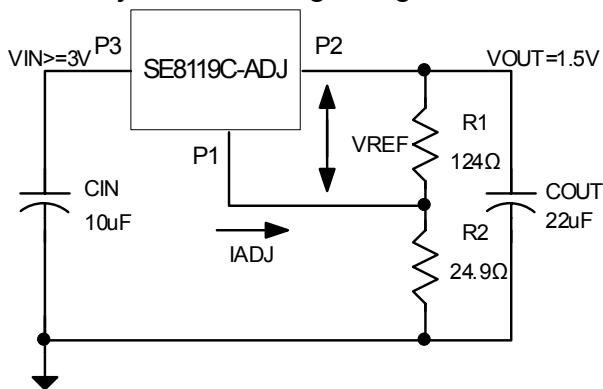
Pin Configuration



SOT-89

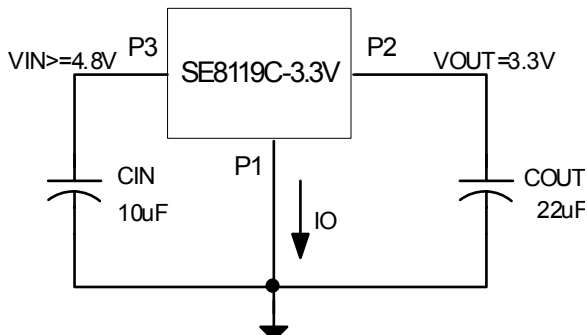
Typical Application

Adjustable Voltage Regulator



$$V_{OUT} = V_{REF} \left(1 + \frac{R_2}{R_1}\right) + I_{ADJ} R_2$$

Fixed Voltage Regulator



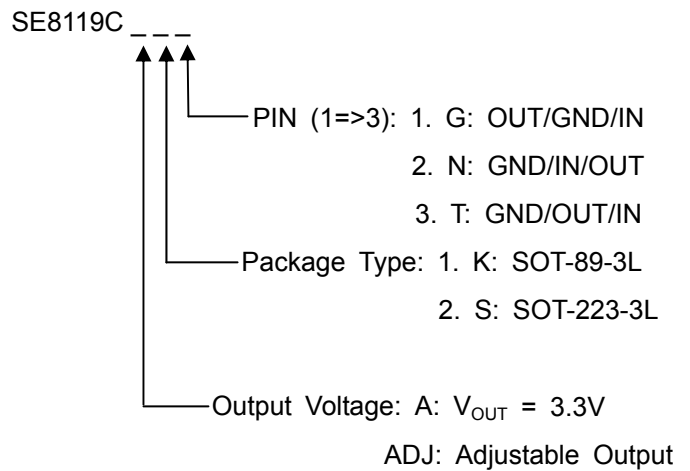
Features

- 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.

Ordering Information





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} ≤ 8V, V_{IN,MIN} - V_{OUT} = 1.5V, I_{OUT} = 10mA, C_{IN} = 10μF, C_{OUT} = 22μF, T_J = 0 - 125°C, unless otherwise specified.

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _O	Output Voltage ⁽¹⁾	SE8119-3.3	3.234	3.3	3.366	V
V _{REF}	Reference Voltage ⁽¹⁾ (Adj. Voltage Version)	(V _{IN} - V _{OUT}) = 1.5V I _{OUT} = 10mA	(-2%)	1.250	(+2%)	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 ≤ I _{OUT} ≤ 800mA	--	0.4	--	%
I _Q	Quiescent Current		--	3	--	mA
I _{ADJ}	Adjust Pin Current		--	65	--	μA
ΔI _{ADJ}	Adjust Pin Current Change	V _{OUT} + 1.5V < V _{IN} < 8V 10mA ≤ I _{OUT} ≤ 1A	--	14	--	μA
V _D	Dropout Voltage ⁽²⁾	I _{OUT} = 800mA	--	1.3	--	V
I _O	Minimum Load Current		--	4	--	mA
V _{ICL}	Current Limit		--	1.0	--	A
T _C	Temperature Coefficient		--	0.07	--	%/°C
OTP	Thermal Protection		--	175	--	°C
V _N	RMS Output Noise	T _A = 25°C, 10Hz ≤ f ≤ 10kHz	--	0.003	--	%V _O
R _A	Ripple Rejection Ratio	f = 120Hz, C _{OUT} = 22μF (Tantalum), (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 50mA	--	35	--	dB

Notes:

1. Low duty cycle pulse testing with which T_J remains unchanged.
2. ΔV_{OUT} = 1%.



Application Hints

Like any linear voltage regulator, SE8119C 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 μ 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 μ F but may be increased without limit.

Thermal Considerations

It is important that the thermal limit of the package is not exceeded. The SE8119C 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:

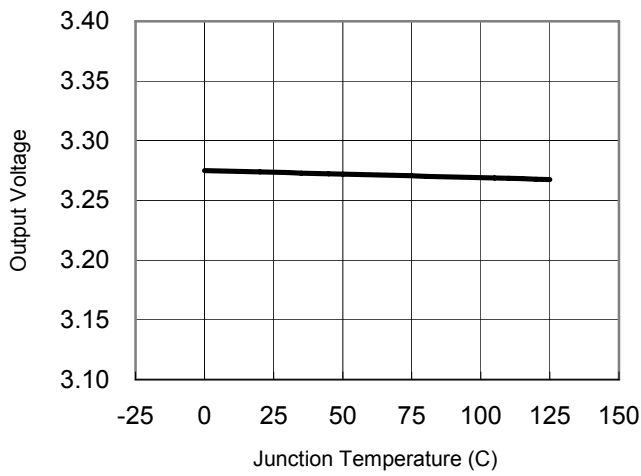
The power dissipation (P_D) is

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

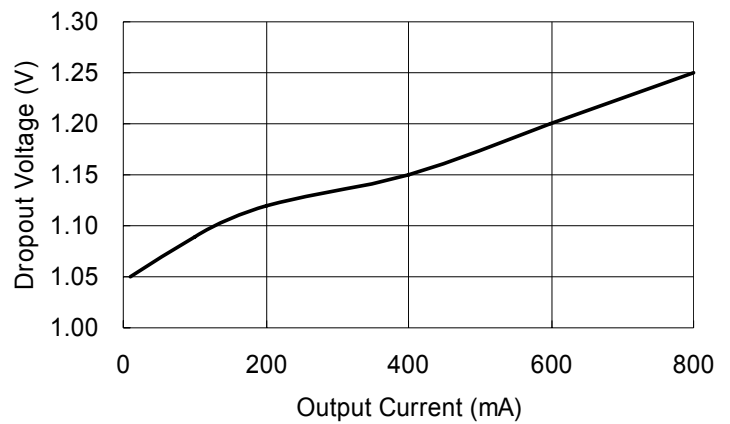
The thermal limit of the package is then limited to P_{D(MAX)} = [T_J - T_A]/ Θ_{JA} where T_J is the junction temperature, T_A is the ambient temperature, and Θ_{JA} is around 150°C/W for SE8119C. SE8119C is designed to enter thermal protection at 175°C. For example, if T_A is 25°C then the maximum P_D is limited to about 1.0W. In other words, if I_{OUT} = 500mA, then [V_{IN} - V_{OUT}] can not exceed 2V.



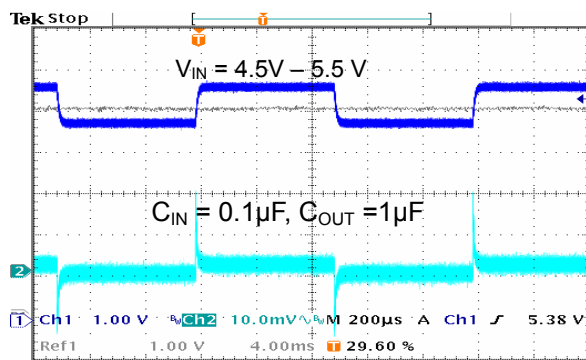
Output Voltage VS. Junction Temperature



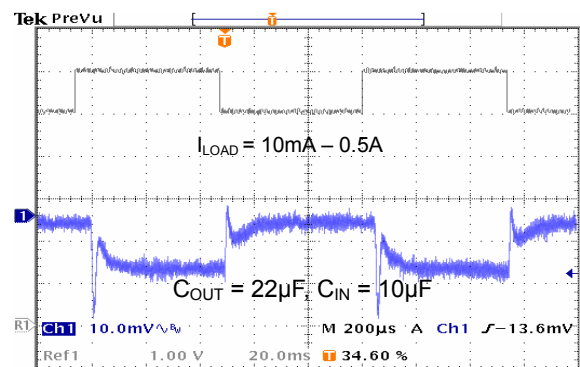
Dropout Voltage VS. Output Current



Line Transients

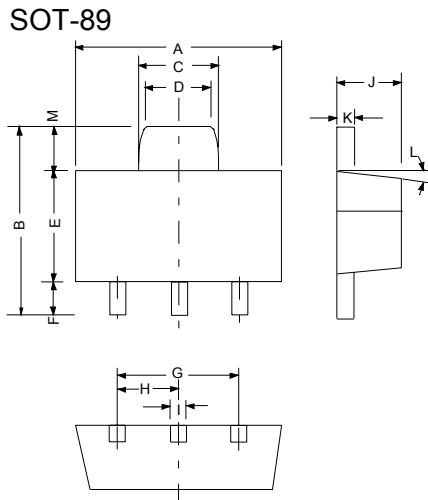


Load Transients





Outline Drawing for SOT-89-3L



DIM ^N	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	

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Last Updated - 12/4/2008