◆ DESCRIPTION

The MT1119 series of high performance low dropout voltage regulators are designed for applications that require efficient conversion and fast transient response.

Standard voltage versions are 1.8V, 2.5V, and 3.3V. Beside, MT1119 comes in a miniature 3-pin SOT-89 package.

◆ FEATURES

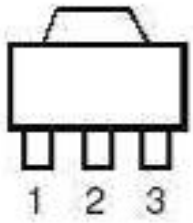
- Low Dropout Performance
- Guaranteed 500mA Output Current
- Wide Input Supply Voltage Range
- Over-temperature and Over-current Protection
- Rugged 3KV ESD withstand capability

◆ APPLICATIONS

- PC-Camera
- Active SCSI Terminators
- High Efficiency Linear Regulators
- Motherboard Clock Supplies

◆ PIN CONFIGURATIONS

SOT-89 (Top View)



MT11191-X.XJ 1:OUT, 2:GND 3:IN

MT11192-X.XJ 1:GND, 2:IN, 3:OUT

◆ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Unit
Input supply voltage	V_{IN}	9	V
Thermal resistance junction to ambient SOT-89	θ_{JA}	150	°C/W
Junction temperature	T_J	0 to 125	°C
Storage temperature range	T_{STG}	-40 to 150	°C
Lead temperature (soldering) 10sec	T_{LEAD}	260	°C

Note:

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.

◆ ORDERING INFORMATION

Device	PIN CONFIGURATIONS	Package		Vout Volts	T_A (°C)
MT11191-X.XJ	OUT/GND/IN	J	SOT-89	X.X_1.5/1.8/2.5//3.3	0 ~ 70
MT11192-X.XJ	GND/IN/OUT				

◆ POWER DISSIPATION TABLE

Package	θ_{JA} (°C /W)	$T_A \leq 25$°C Power rating(mW)	T_A=70 °C Power rating(mW)	T_A= 85 °C Power rating (mW)
J	150	1000	700	600

Note :

1. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into Thermal shutdown
2. T_J Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$,
   The θ_{JA} numbers are guidelines for the thermal performance of the device/PC-board system
   All of the above assume no ambient airflow
3. θ_{JA}: Thermal Resistance-Junction to Ambient, D_F: Derating factor, P_O: Power consumption.

◆ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Operating Conditions			Unit
		Min.	Typ.	Max.	
Input Voltage	V_{IN}	-	-	8	V
Load Current (with adequate heat sinking)	I_O	5	-	-	mA
Junction temperature	T_J	-	-	125	°C

◆ ELECTRICAL CHARACTERISTICS

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.

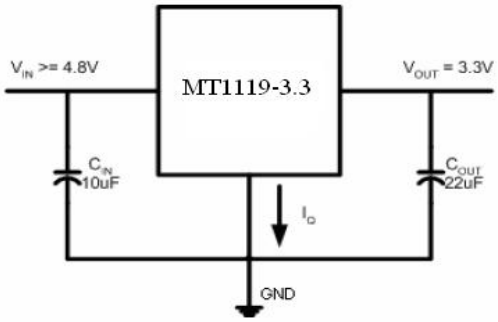
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage (1)	V_{OUT}	MT1119-1.8 MT1119-2.5 MT1119-3.3	1.764 2.450 3.234	1.8 2.5 3.3	1.836 2.550 3.366	V
Line Regulation (1)	V_{SR}	V_{OUT} + 1.5V < V_{IN} < 8V I_{OUT} = 10mA	-	0.3	-	%
Load Regulation (1)	V_{LR}	(V_{IN} - V_{OUT}) = 1.5V 10mA ≤ I_{OUT} ≤ 500mA	-	0.4	-	%
Quiescent Current	I_Q		-	3	-	mA
Dropout Voltage (2)	V_D	I_{OUT} = 500mA	-	1.0	-	V
Minimum Load Current	I_O		-	4	-	mA
Current Limit	I_{CL}		-	0.8	-	A
Temperature Coefficient	T_c		-	0.07	-	%/°C,
Thermal Protection	T_{PRO}		-	175	-	°C,
RMS Output Noise	V_N	T_A = 25°Cμ 10Hz ≤ f ≤ 10kHz	-	0.003	-	%/V_O
Ripple Rejection Ratio	PSRR	f = 120Hz, C_{OUT} = 22μF (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) △V_{OUT} = 1%

◆ TYPICAL APPLICATIONS



◆ APPLICATION NOTE

Application Hints

Like any linear voltage regulator, MT1119 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.

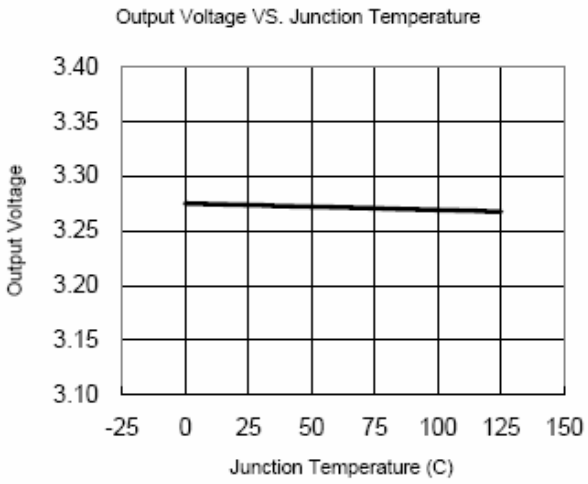
Thermal Considerations

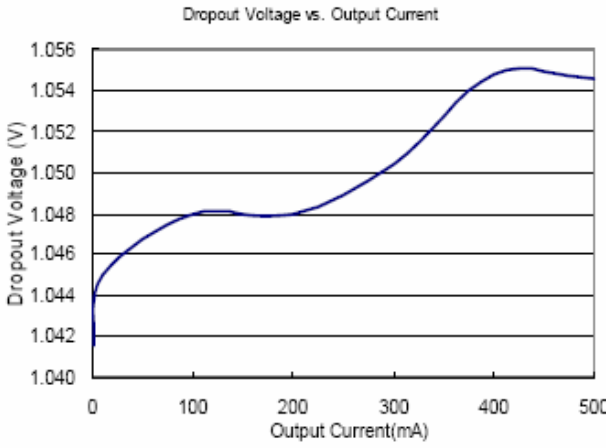
It is important that the thermal limit of the package is not exceeded. The MT1119 has built-in thermal protection. When the thermal limit is exceeded, the IC will enter protection, and V_{OUT} will be pulled to ground. The power dissipation for a given application can be calculated as following:

The power dissipation is $P_D = I_{OUT} * [(V_{IN} – V_{OUT}]$

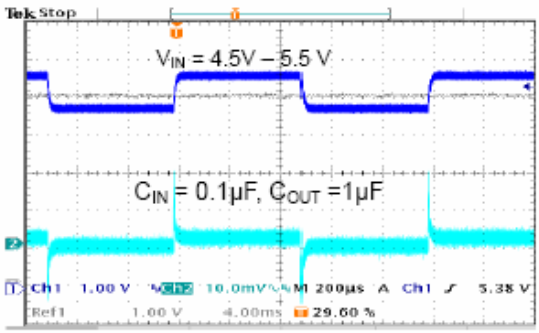
The thermal limit of the package is then limited to $P_{D\ (MAX)} = [T_J – T_A]/\Theta_{JA}$ where T_J is the junction temperature, T_A is the ambient temperature, and Θ_{JA} is around 150°C/W for MT1119. MT1119 is designed to enter thermal protection at 175°C. For example, if T_A is 25°C then the maximum 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.

◆ TYPICAL PERFORMANCE CHARACTERISTICS

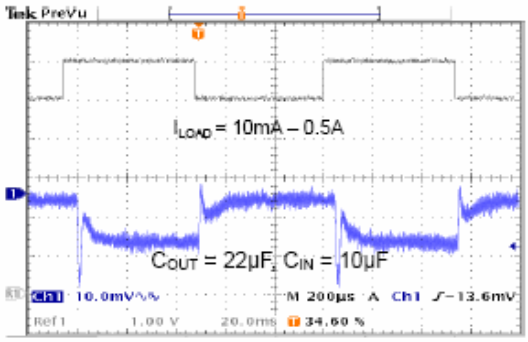




Line Transients

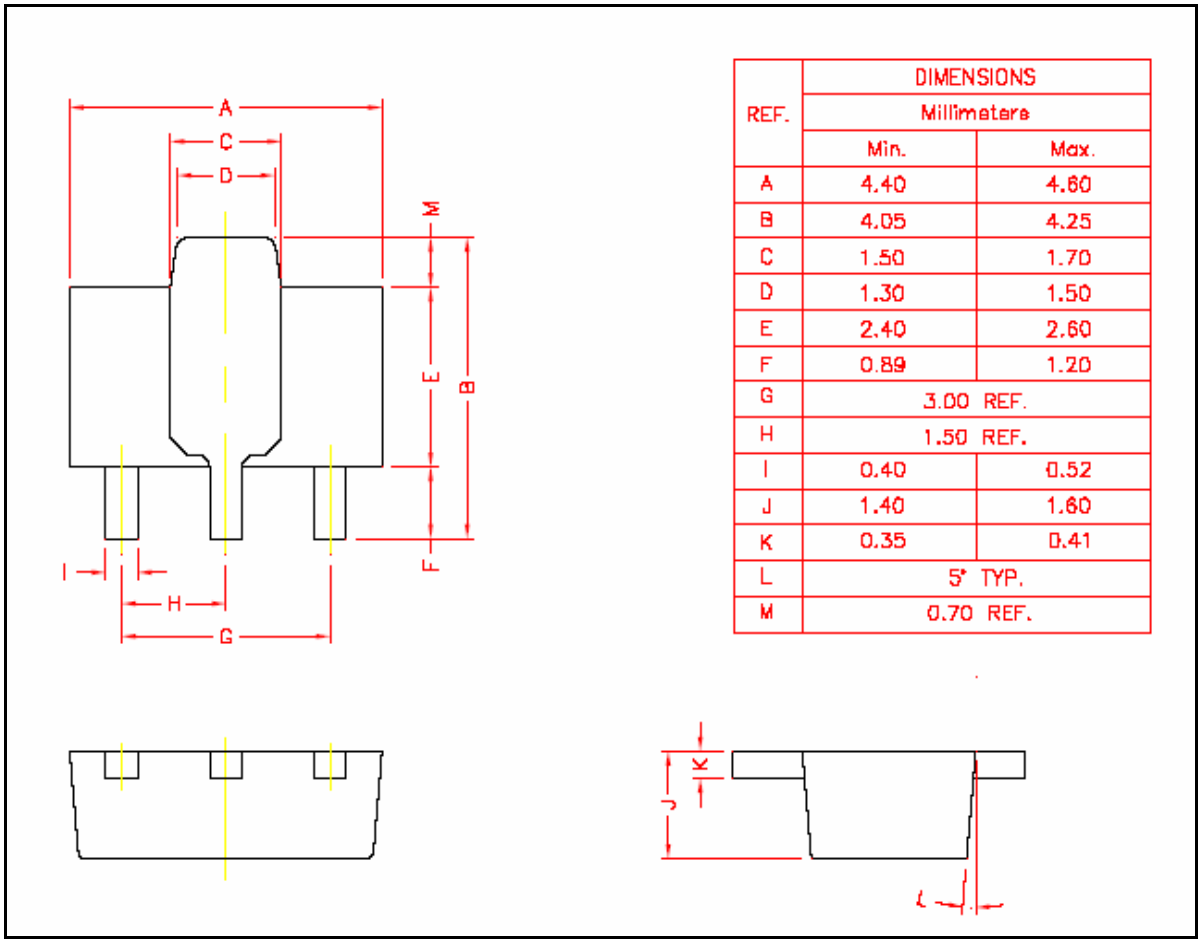


Load Transients



◆ PHYSICAL DIMENSIONS

3-Pin surface Mount SOT-89(J)



REF.	DIMENSIONS Millimeters	
	Min.	Max.
A	4.40	4.60
B	4.05	4.25
C	1.50	1.70
D	1.30	1.50
E	2.40	2.60
F	0.89	1.20
G	3.00 REF.	
H	1.50 REF.	
I	0.40	0.52
J	1.40	1.60
K	0.35	0.41
L	5° TYP.	
M	0.70 REF.	

版本 Rev.	日期 Date	撰寫者 Originator	修改/增加/刪除內容敘述 Description	核准 Approved
V.1.00	2008/8/15	cedric	建立	