

**◆ DESCRIPTION**

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

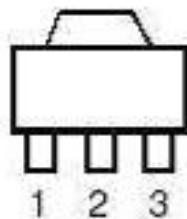
Standard voltage versions are 1.8V, 2.5V, and 3.3V. Beside, MT1119 comes in a miniature 3-pin SOT-89 package.

**◆ 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	$\theta_{JA}$	150	$^{\circ}\text{C}/\text{W}$
Junction temperature	$T_J$	0 to 125	$^{\circ}\text{C}$
Storage temperature range	$T_{STG}$	-40 to 150	$^{\circ}\text{C}$
Lead temperature (soldering) 10sec	$T_{LEAD}$	260	$^{\circ}\text{C}$

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	$T_A$ ( $^{\circ}\text{C}$ )
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	$\theta_{JA}$ ( $^{\circ}\text{C}/\text{W}$ )	$T_A \leq 25^{\circ}\text{C}$ Power rating(mW)	$T_A = 70^{\circ}\text{C}$ Power rating(mW)	$T_A = 85^{\circ}\text{C}$ Power rating (mW)
J	150	1000	700	600

Note :

- Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into Thermal shutdown
- $T_J$  Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$ ,  
The  $\theta_{JA}$  numbers are guidelines for the thermal performance of the device/PC-board system  
All of the above assume no ambient airflow
- $\theta_{JA}$ : 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	$^{\circ}\text{C}$

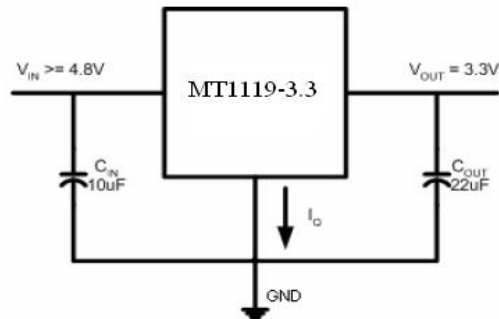
**◆ ELECTRICAL CHARACTERISTICS**
 $V_{IN} (MAX) \leq 8V$ ,  $V_{IN} (MIN) - V_{OUT} = 1.5V$ ,  $I_{OUT} = 10mA$ ;  $C_{IN} = 10\mu F$ ;  $C_{OUT} = 22\mu F$ ,  $T_J = 0 \sim 125^\circ C$ , unless otherwise specified.

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)	$V_{LR}$	$(V_{IN} - V_{OUT}) = 1.5V$ $10mA \leq I_{OUT} \leq 500mA$	-	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	-	%/ $^\circ C$ ,
Thermal Protection	$T_{PRO}$		-	175	-	$^\circ C$ ,
RMS Output Noise	$V_N$	$T_A = 25^\circ C_{\mu}$ $10Hz \leq f \leq 10kHz$	-	0.003	-	%/ $V_O$
Ripple Rejection Ratio	PSRR	$f = 120Hz$ , $C_{OUT} = 22\mu F$ (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)  $\Delta V_{OUT} = 1\%$

**◆ 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 10 $\mu$ F is required. Ceramic or Tantalum can be used. The value can be increased without upper limit.

**Output Capacitor**

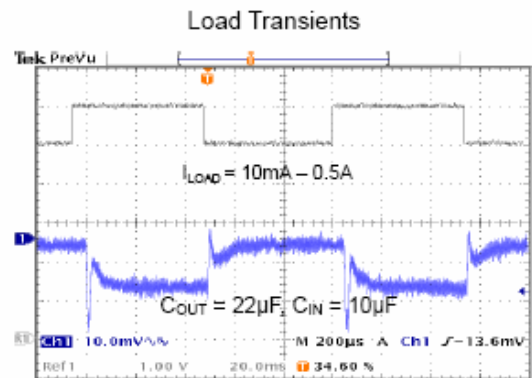
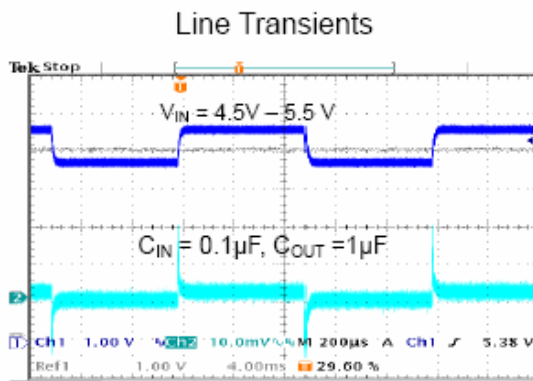
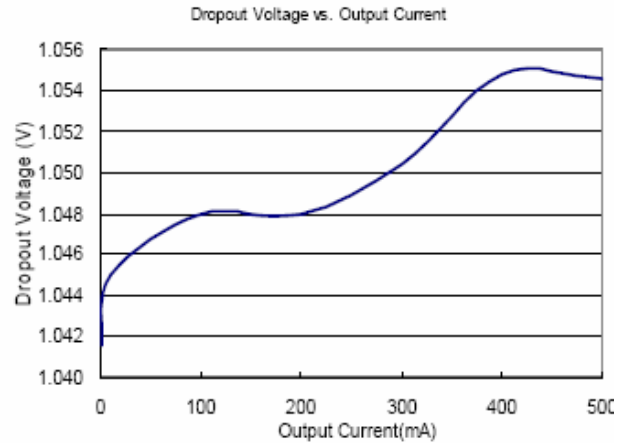
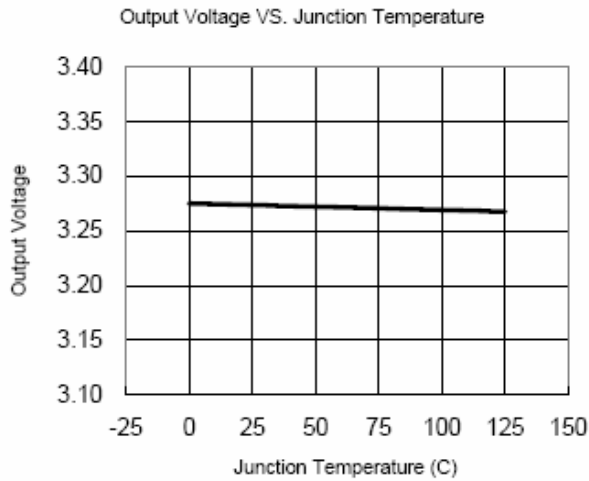
An output capacitor is required for stability. It must be placed no more than 1 cm away from the V<sub>OUT</sub> pin, and connected directly between V<sub>OUT</sub> and GND pins. The minimum value is 22 $\mu$ F but may be increased without limit.

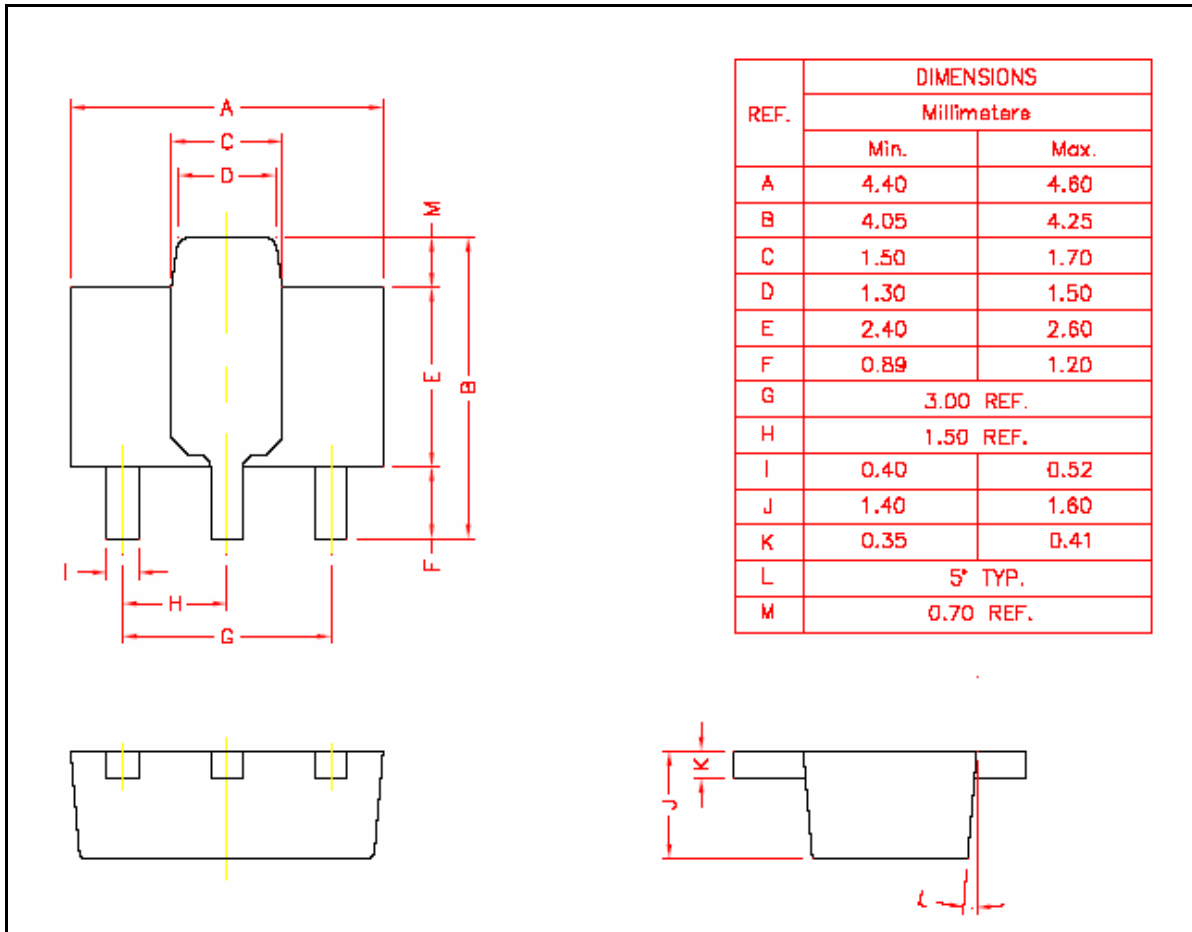
**Thermal Considerations**

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

$$\text{The power dissipation is } P_D = I_{OUT} * [(V_{IN} - V_{OUT})]$$

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  $\Theta_{JA}$  is around 150 $^{\circ}$ C/W for MT1119. MT1119 is designed to enter thermal protection at 175 $^{\circ}$ C. For example, if  $T_A$  is 25 $^{\circ}$ C then the maximum  $P_D$  is limited to about 1.0W. In other words, if  $I_{OUT (MAX)} = 500\text{mA}$ , then  $[V_{IN} - V_{OUT}]$  can not exceed 2.0V.

**◆ TYPICAL PERFORMANCE CHARACTERISTICS**


**◆ PHYSICAL DIMENSIONS**
**3-Pin surface Mount SOT-89(J)**


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	