

Description

The GM1112 is a positive low dropout regulator and is available in an adjustable version and fixed output voltage at 1.2V. All internal circuitry is designed to operate down to 800mV input to output differential and the dropout voltage is fully specified as a function of load current. On chip trimming adjusts the reference/output voltage to within $\pm 1\%$. Current limit is also trimmed in order to minimize the stress on both the regulator and the power source circuitry under overloaded conditions.

Features

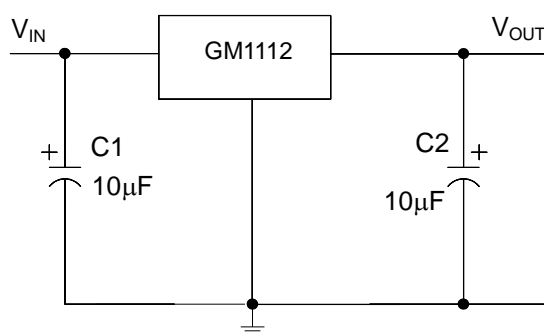
- ◆ Fixed Output, 1.2V
- ◆ Output Current of 1.0A
- ◆ Dropout Voltage 1.3V max @ 1.0A
- ◆ Line Regulation 0.2% max.
- ◆ Load Regulation 0.4% max.
- ◆ Fast Transient Response
- ◆ Current Limit Protection
- ◆ Thermal Shutdown Protection

Application

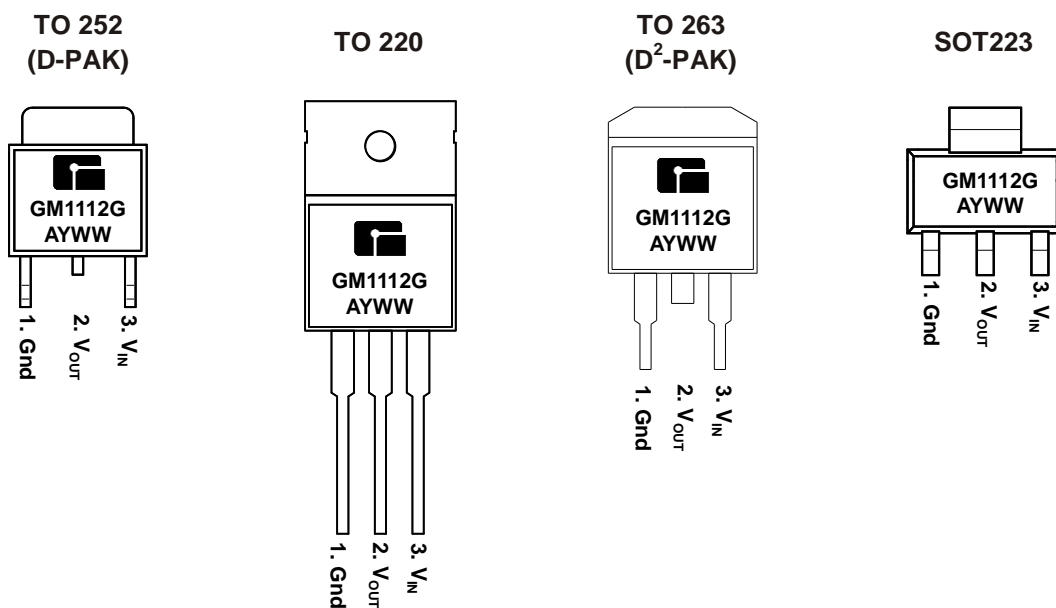
High Efficiency Linear Regulators
Post Regulators for Switching Supplies
Microprocessor Supply

Battery Powered Equipment
Reference Voltage Sources
Hard Drive Controllers
Battery Chargers
Adjustable Power Supply

Typical Application Circuits



Marking Information and Pin Configurations (Top View) – Green Product



G: Green Product
A: Assembly / Test site code
Y: Year
WW: Week

Ordering Information

Ordering Number	Package	Shipping
GM1112ST3TG	SOT-223	80 Units/Tube
GM1112ST3RG	SOT-223	2,500 Units / Tape & Reel
GM1112TC3TG	TO-252	80 Units/Tube
GM1112TC3RG	TO-252	2,500 Units / Tape & Reel
GM1112TB3TG	TO-220	50 Units/Tube
GM1112TA3TG	TO-263	50 Units/Tube
GM1112TA3RG	TO-263	800 Units / Tape & Reel

Absolute Maximum Ratings

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	15	V
Thermal Resistance, Junction to Case	SOT-223	θ_{JA}	15.0	$^{\circ}\text{C}/\text{W}$
	TO-252 (D PAK)		6.0	
	TO-263 (D ² PAK)		3.0	
Operating Junction Temperature		T_J	0 to 150	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	- 65 to 150	$^{\circ}\text{C}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$I_{OUT} = 10\text{mA}$, $V_{IN} = 5\text{V}$	1.18	1.20	1.26	V
		$10\text{mA} \leq I_{OUT} \leq 1.0\text{A}$, $2.65\text{V} \leq V_{IN} \leq 7\text{V}$	1.17	1.20	1.27	
Line Regulation	ΔV_{OI}	$I_{OUT} = 10\text{mA}$, $2.75\text{V} \leq V_{IN} \leq 7\text{V}$		0.04	0.2	%/V
Load Regulation	ΔV_{OL}	$V_{IN} = V_{OUT} + 1\text{V}$ $10\text{mA} \leq I_{OUT} \leq 1.0\text{A}$		0.2	0.4	%/mA
Dropout Voltage	ΔV	$I_{OUT} = 1\text{A}$		1.15	1.3	V
Current Limit	I_{CL}	$V_{IN} = V_{OUT} + 3\text{V}$	1.1	3.1		A
Quiescent Current (Fixed Output Voltage Versions)	I_Q	$V_{IN} = V_{OUT} + 1\text{V}$ $10\text{mA} \leq I_{OUT} \leq 1.0\text{A}$		7	13	mA
Temperature Coefficient		$V_{IN} = V_{OUT} + 1.5\text{V}$ $I_{OUT} = 10\text{mA}$		0.005		%/ $^\circ\text{C}$
Thermal Regulation	T_C	$T_A = 25^\circ\text{C}$, 30ms pulse		0.003		%/W
Ripple Rejection	R_A	$V_{IN} = V_{OUT} + 1.5\text{V}$ $I_{OUT} = 10\text{mA}$	60	75		dB

Application Information

Stability Considerations

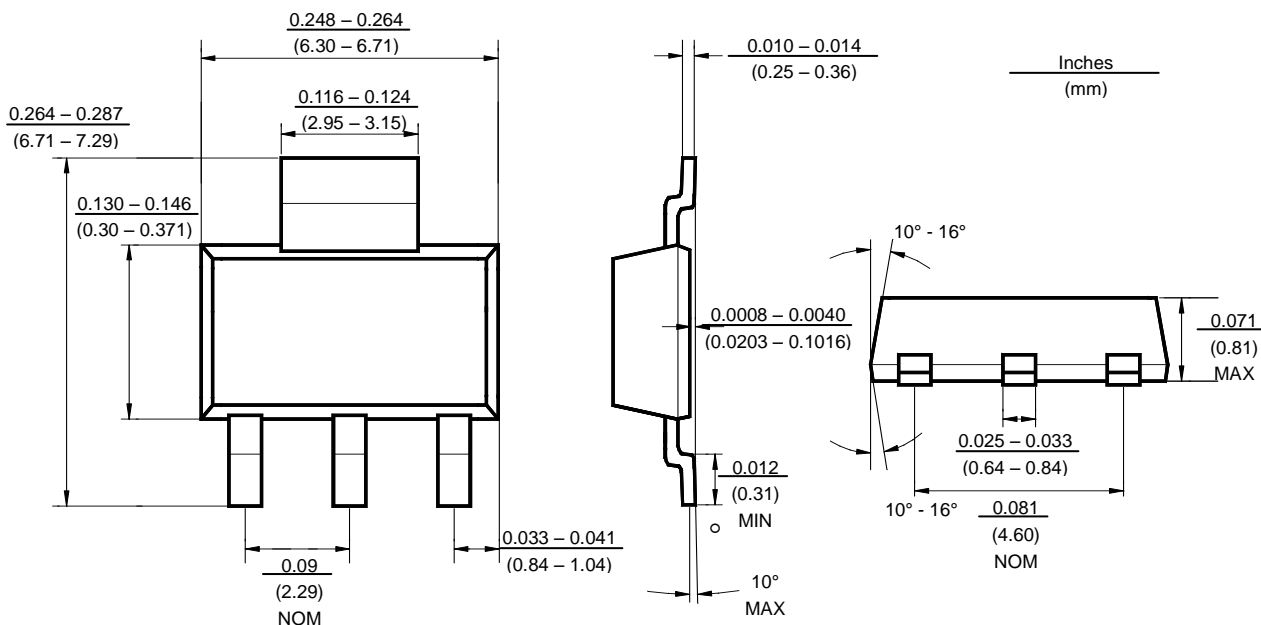
A capacitor of 10 μ F as a minimum is suggested to be connected in the input terminal and to be as close as to the input source for better stability consideration. See typical application circuit page 1 for reference.

The output compensation capacitor helps to determine three main characteristics of a linear regulator's performance: start-up delay, load transient response, and loop stability. The capacitor value and type is based on cost, availability, size and temperature constraints. A tantalum or aluminum electrolytic capacitor is preferred, as a film or ceramic capacitor with almost zero ESR can cause instability. An aluminum electrolytic capacitor is the least expensive type, but when the circuit operates at low temperatures, both the value and ESR of the capacitor will vary widely. For optimum performance over the full operating temperature range, a tantalum capacitor is best. A 22 μ F tantalum capacitor will work fine in most applications, but with high current regulators such as the GM1112, higher capacitance values will improve the transient response and stability. Most applications for the GM1112 involve large changes in load current, so the output capacitor must supply instantaneous load current. The ESR of the output capacitor causes an immediate drop in output voltage given by:

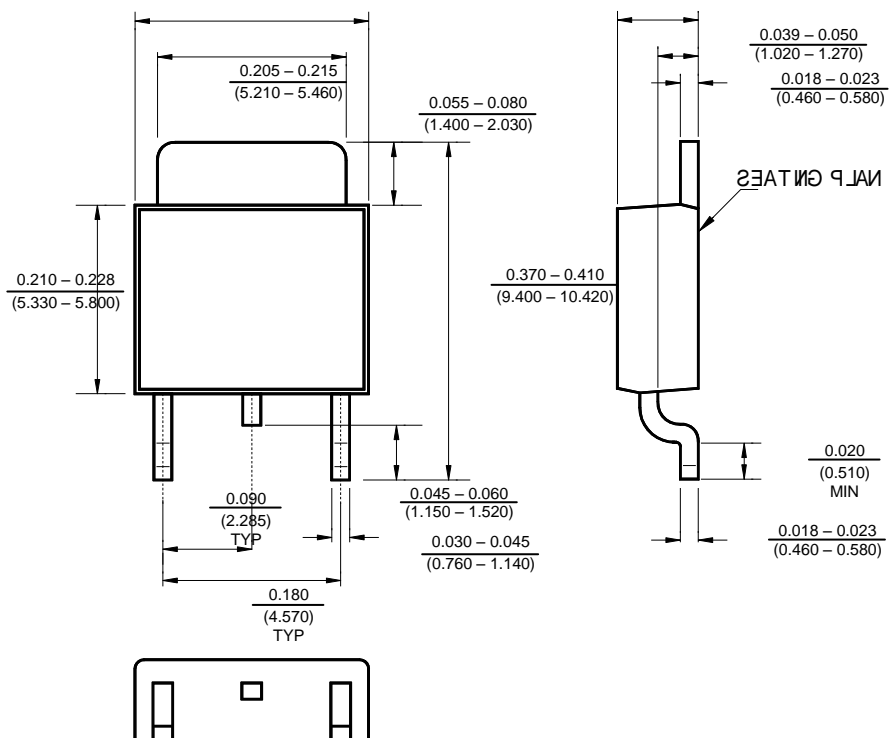
$$\Delta V = \Delta I \times \text{ESR}$$

In microprocessor applications an output capacitor network of several tantalum and ceramic capacitors in parallel is commonly used. This reduces overall ESR and minimizes the instantaneous output voltage drop under transient load conditions. The output capacitor network should be placed as close to the load as possible for the best results.

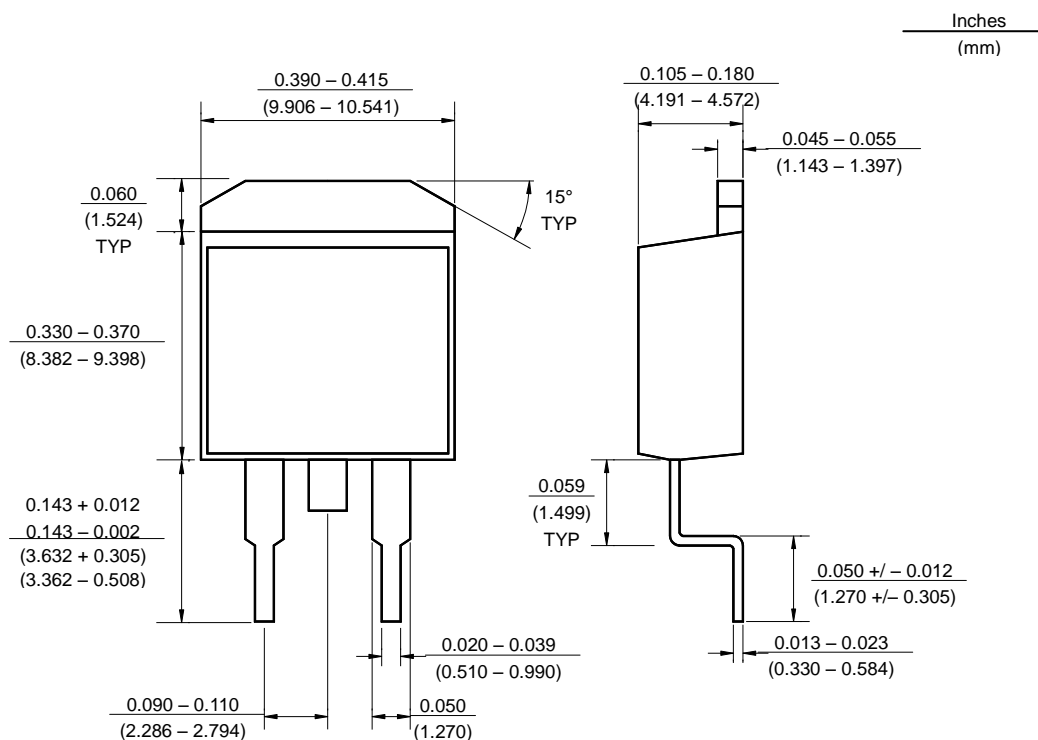
Package Outline Dimensions – SOT223



Package Outline Dimensions – TO252



Package Outline Dimensions – TO263



Ordering Number

GM 1112 ST3 R G

APM Gamma Micro	Circuit Type	Package Type	Shipping Type
		ST3: SOT223 TA3: TO263 TB3: TO220 TC3: TO252	R: Taping & Reel T: Tube
			G:Green