

**GENERAL DESCRIPTION**

The GP1102 is a 200mA Low Dropout and Micro-Power Voltage Regulator suitable for battery powered portable equipments.

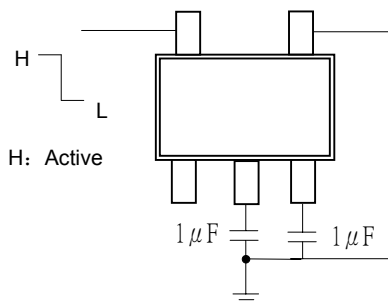
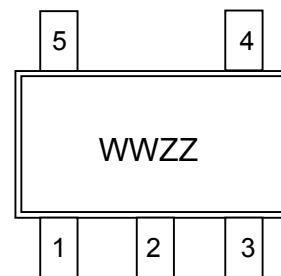
The GP1102 built-in with internal low $R_{DS(on)}$ PMOS as the pass device, which does not cause extra ground current in different load and high dropout conditions. The extremely low of maximum 19uA operation current makes the chip suitable for battery-powered devices. Built-in high precision voltage reference, and Current Limit circuits.

FEATURES

- **Guaranteed 200mA Output**
- **Very Low Dropout Voltage of 400mV**
- **low quiescent current - 19uA max.**
- **Output voltages range from 2.0V to 6.0V in 100mV increments**
- **Accuracy within $\pm 2\%$**
- **Low temperature draft**
- **Built in Current Limiting**
- **SOT23-5 Package**

APPLICATIONS

- Cellular Telephones
- Battery-powered Equipment
- Hand-held Equipment
- DSC, Laptop, Notebook, and Palmtop Computers

TYPICAL APPLICATION CIRCUIT**Package and Pin Configuration****SOT23-5****GP1102**

- | | |
|---------|--------|
| 1. NC | 5. EN |
| 2. VIN | |
| 3. VOUT | 4. GND |

ORDER INFORMATION

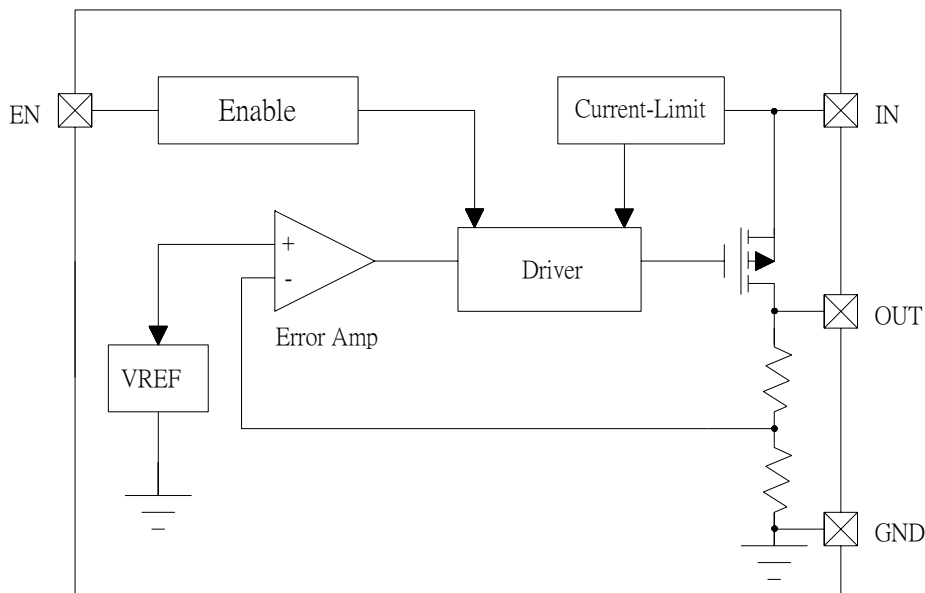
GP1102-XX 200mA Output current, SOT23-5 package
 XX : Output voltage: 20: 2.0V, 33: 3.3V, 50: 5.0V

Marking Information

wwzz : zz : Output voltage: 20: 2.0V, 33: 3.3V, 50: 5.0V
 ww : production week code

1. For special output voltages contact GPS marketing.
2. Order quantity
SOT23-5 order minimum 3,000 ea per Tape/Reel
3. GPS Pb-free plus anneal products employ with molding compounds, die attach material and 100% matte tin plate termination finish which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Note a)	
Input Voltage	12V
Continuous Total Power Dissipation, SOT-23-5	0.15W
Operating Junction Temperature Range	-40°C to 125°C
Storage Temperature Range	-55°C to 150°C
Package Thermal Resistance, SOT-23-5, θ_{JA}	250°C/W
Lead Temperature (Soldering, 5 sec.)	260°C
Note a: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground.	

RECOMMENDED OPERATING CONDITIONS							
Parameter	Symbol	Recommended Operating			Units		
		Min.	Typ.	Max.			
Input Voltage	V_{IN}	2.0		12.0	V		
Input Capacitor (V_{IN} to GND)		1.0			μ F		
Output Capacitor with ESR of 10Ω max.,		1.0		10	μ F		
Ambient Temperature Range	T_A	- 40		85	$^{\circ}$ C		
Junction temperature	T_J	- 40		150	$^{\circ}$ C		
ELECTRICAL CHARACTERISTICS							
Unless otherwise specified, $V_{IN} = 5V$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $T_A = 25^{\circ}C$.							
Parameter	Symbol	Test Conditions	GP1102			Units	
			Min	Typ	Max		
Output Voltage Accuracy	V_O	$I_O = 40mA$, $V_{in} = 4.3V$	-2.0		2.0	%	
Output Current	I_O		200			mA	
Line Regulation	ΔV_{OI}	$I_O = 40mA$, $(V_{in}+1V) < V_{IN} < 10V$		0.2	0.3	%V	
Load Regulation	ΔV_{OL}	$I_O = 1mA$ to $100mA$			0.03	%mA	
Dropout Voltage	ΔV	$I_O = 100mA$	$2.0V < V_O$ (nom) $\leq 2.8V$		280	500	mV
			$2.8V < V_O$ (nom)		240	450	
Quiescent Current	I_Q	$I_O = 0mA$, $V_{in} = V_{en} = V_{out} + 1V$		15	19	μ A	
GND Pin Current	I_G	$I_O = 100mA$		15	19	μ A	
GND Pin Current	I_{G1}	$I_O = 0mA$, $V_{in} = V_{en} = V_{out} + 1V$			0.1	μ A	
Current Limit	I_{CL}	$R_{LOAD} = 1\Omega$	300			mA	
EN Input High	Enh		1.5			V	
EN Input Low	Enl				0.25	V	
EN Input current "High"	Enih	$V_{en} = V_{in}$			1	μ A	
EN Input current "Low"	Enil	$V_{en} = Gnd$	-0.2	-0.05	0	μ A	
Power Supply Rejection Ratio (Note a)	PSRR	Freq = 100Hz, $C_{OUT} = 10\mu F$		65		dB	
Vout Temperature Draft	Tcoef	$I_{out} = 10mA$, $-40 \leq T_{opp} \leq 80^{\circ}C$		± 100		ppm/ $^{\circ}$ C	
Note a: These parameters, although guaranteed, are not tested in production.							

Detailed Description

The GP1102 is 200mA CMOS LDO designed with a Low $R_{DS(on)}$ PMOS pass transistor, Bandgap voltage reference, Error amplifier, Current limit function. The P-channel pass transistor receives control signal from the Error amplifier, Current limit circuits. During normal operation, the Error amplifier compares the output voltage to an internal trimmed precision Bandgap reference to regulate and output a preset voltage.

External Capacitor Selection

The GP1102 is stable with an output capacitor to ground of 1 μ F or greater and > 100m ohm ESR. Ceramic or tantalum capacitors can be used. The capacitor with larger value and lower ESR provides better PSRR and line-transient response. Ceramic capacitors have the lowest ESR, and will offer the best AC performance. Aluminum Electrolytic capacitors present

the highest ESR and resulting in the poorest AC response.

In addition to the >1 μ F capacitor connect to V_{in} , recommend to add a >0.1 μ F capacitor between V_{in} to Ground to stabilize V_{in} .

Current Limit

GP1102 built-in with Current Limit protection circuit, which monitors and controls the gate of the pass transistor and limiting the output current to 300mA (Min.).

Dropout Voltage

Current flow through regulator's pass PMOS transistor cause Input-Output voltage drop, it determines the lowest usable supply voltage. The GP1102 PMOS pass switch low $R_{DS(on)}$ only present 250mV dropout voltage at 100mA I_{out} , it further extend the battery useful end-of-life voltage.

Package Information

5-Pin Surface Mount SOT23-5

Symbol	Dimensions in millimeters		Dimensions in inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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