

ANALOG PWM IC

1. General Description

G1138 is a high performance offline PWM Power switch for low power AC/DC charger and adaptor applications up to 16W. It operates in primary-side regulation. Consequently, opto-coupler and TL431 could be eliminated.

Proprietary Constant Voltage (CV) and Constant Current (CC) control is integrated as shown in the Fig.1. In CC control, the current and output power setting can be adjusted externally by the sense resistor R_S at CS pin. In CV control, multi-mode operations are utilized to achieve high performance and high efficiency.

In addition, good load regulation is achieved by the built-in cable drop compensation. Device operates in PFM in CC mode as well at large load condition and it operates in PWM with frequency reduction at light/medium load.

G1138 offers power on soft start control and protection coverage with auto-recovery features including Cycle-by-Cycle current limiting, VDD OVP, VDD clamp and UVLO. Excellent EMI performance is achieved with frequency jitter technique.

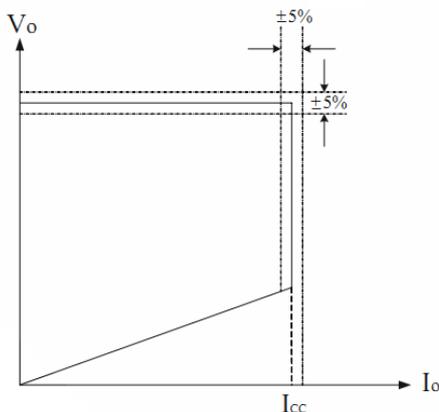


Fig.1. Typical CC/CV Curve

Features

- ◆ 5% CV and CC Regulation at Universal AC input
- ◆ Primary-side Regulation Without TL431 and Opto-coupler
- ◆ Built-in High-Voltage Power MOS
- ◆ Programmable CV and CC Regulation
- ◆ Adjustable Constant Current and Output Power Setting
- ◆ Built-in Secondary Constant Current Control with Primary Side Feedback
- ◆ Built-in Primary winding inductance compensation
- ◆ Programmable cable drop compensation
- ◆ Built-in Leading Edge Blanking (LEB)
- ◆ Power on Soft-start
- ◆ Built-in adaptive current peak regulation
- ◆ Cycle-by-Cycle Current Limiting
- ◆ VDD Under Voltage Lockout with Hysteresis (UVLO)
- ◆ VDD OVP and VDD Clamp
- ◆ Pb-free DIP-7

Applications

- ◆ Cell Phone Charger
- ◆ Digital Cameras Charger
- ◆ LED Driver
- ◆ Small Power Adaptor
- ◆ Auxiliary Power for PC, TV etc.
- ◆ Linear Regulator/RCC Replacement

G1138 is offered in DIP-7 package.

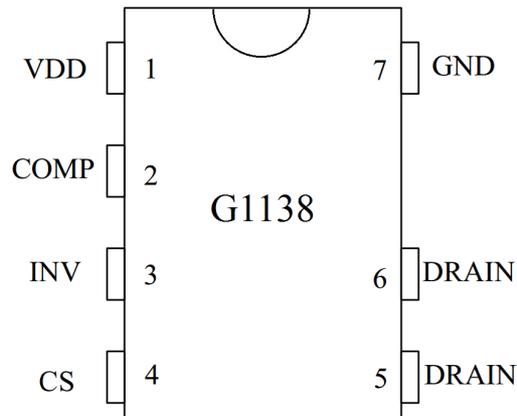
2. Products Information**2.1 Pin configuration**

Fig.2. G1138 Pin Configuration (DIP-7)

Pin Name	I/O	Description
VDD	P	Power Supply
COMP	I	Loop Compensation for CV Stability
INV	I	The Voltage feedback from auxiliary winding. Connected to resistor divider from auxiliary winding reflecting output voltage. PWM duty cycle is determined by EA output and current sense signal at pin 4.
CS	I	Current sense input. Connected to primary current sensing resistor.
DRAIN	O	HV MOSFET Drain Pin. The Drain pin is connected to the primary lead of the transformer
GND	P	Ground

2.2 Output Power Table

Product	85~264VAC
	Adapter ¹
G1138P	16W

Notes:

1. Maximum practical continuous power in an Adapter design with sufficient drain pattern as a heat sink, at 50°C ambient. Higher output power is possible with extra added heat sink or air circulation to reduce thermal resistance.

2.3 Block diagram

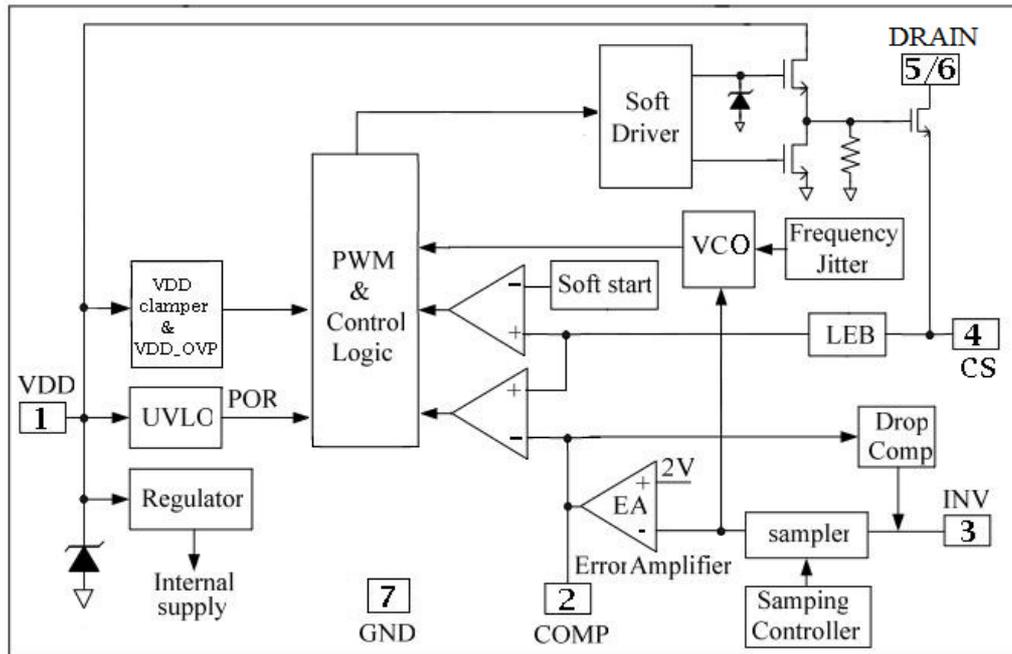


Fig.3. G1138 Block Diagram

3. Absolute Maximum Ratings

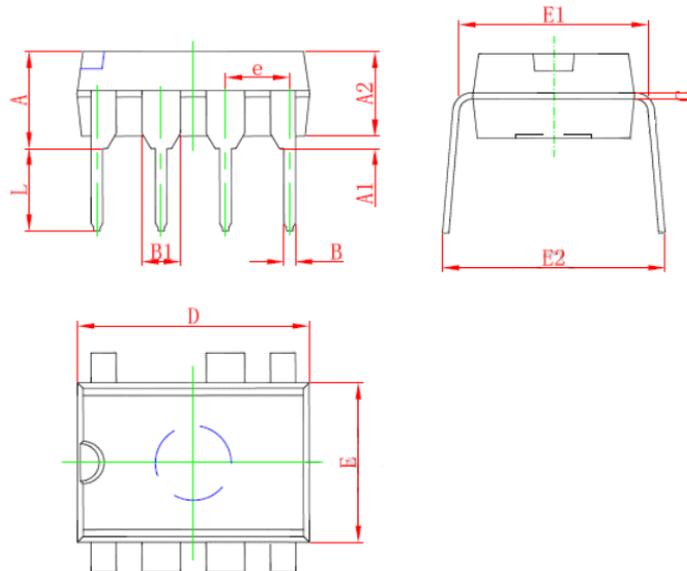
Description	Absolute Maximum Ratings
VDD Voltage	-0.3 to VDD_clamp
HV MOSFET Drain Voltage	-0.3 to BVdss
VDD Zener Clamp Continuous Current	10 mA
COMP Voltage	-0.3 to 7V
CS Input Voltage	-0.3 to 7V
INV Input Voltage	-0.3 to 7V
Max Operating Junction Temperature T _J	150°C
Min/Max Storage Temperature T _{stg}	-55 to 150°C
Lead Temperature (Soldering, 10secs)	260°C
Package Dissipation Rating R _{θJA} ²	75°C/W

Notes:

- Stress beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability
- Drain Pin Connected to 100mm² PCB copper clad.

7. Package Information

DIP-7:



Symbol	Dimension in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.710	5.334	0.146	0.210
A1	0.381		0.015	
A2	2.921	4.953	0.115	0.195
B	0.350	0.650	0.014	0.026
B1	1.524(BSC)		0.06(BSC)	
C	0.200	0.360	0.008	0.014
D	9.000	10.160	0.354	0.400
E	6.096	7.112	0.240	0.280
E1	7.320	8.255	0.288	0.325
e	2.540(BSC)		0.1(BSC)	
L	2.921	3.810	0.115	0.150
E2	7.620	10.920	0.300	0.430

Data and specifications subject to change without notice.

This product has been designed and qualified for Industrial Level and Lead-Free.

Qualification Standards can be found on GS's Web site.

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