GALAXY POWER Incorporated

DORADO MV

24V or 48V Input,
8.0V, 12.0V DC, 8A Output
15.0V DC, 6A Output



The Dorado MV is available with an optional low profile heatsink for improved thermal performance.

Industry's Lowest Cost High-efficiency DC/DC Converter

- **Industry Standard Quarter Brick Pinout and Footprint**
- **Typical Efficiency: 86% at 12V, 8A**
- **Low Profile**
- **Very Low Common-mode Noise for a Commercial DC/DC Converter**
- **Constant Switching Frequency**
- **Remote Sense**
- **Uses Innovative Control and Power Topology for Lower Parts Count**
- **Single Board Design**
- **Optional Low Profile Heatsink for Improved Thermal Performance**
- **Header with M3 Metal Inserts for Mechanical Connection to PCB**
- **Two Year Warranty**

CONTROL FUNCTIONS

- **Microprocessor Controlled**
- **Primary-side Enable, Choice of Logic**
- **Industry Standard Output Trim**

PROTECTION FEATURES

- **Over Temperature Protection**
- **Over Voltage Protection**
- **Over Current Protection**
- **Over/Under Input Voltage Protection**

TYPICAL CHARACTERISTICS

- **Output Setpoint Accuracy: ±1%**
- **Load Regulation: ±0.2%**
- **Line Regulation: ±0.2%**
- **Regulation over Line, Load, and Temperature: ±2%**
- **Low Output Ripple**

PRELIMINARY

Part No. 01-002 Rev. 1.0–110702

GENERAL SPECIFICATIONS

V_{IN} = 48V_{DC}, T_A@25°C, 300 LFM Airflow, V_{OUT} = 3.3V, I_{OUT} = full load unless otherwise noted.
Available output power depends on ambient temperature and good thermal management. (See application graphs for limits.)

Input Characteristics				
Parameter	**Min**	**Typ**	**Max**	**Units**
Operating Input Voltage	36	48	75	V_{DC}
Input Current			4	A
Input Capacitance		2		µF
Input Hysteresis, Low Line		2		V_{DC}
Output Characteristics				
Regulation Over Line, Load & Temperature	98		102	$\%V_{NOM}$
Voltage Ripple			20	mV_{RMS}
Voltage Ripple, 20MHz BW			100	mV_{P-P}
Current Range	0		8	A
Output Transient Response, 50% to 75% load change, 1A/µsec			5	$\%V_{OUT}$
Settling Time to ±1%			400	µS
Turn-on Time to 98%Vnom			300	mS
Output Overshoot at Turn-on			1	$\%V_{OUT}$
Trim Range	60		110	$\%V_{OUT}$
Overvoltage Protection, Non-latching		130		$\%V_{OUT}$
Isolation				
Isolation Test Voltage, Input/Output (Basic)	2000			V_{DC}
Isolation Resistance	10			MΩ
Features				
Overtemperature Protection, Thermal Sensor, Non-latching*			117	°C
Switching Frequency, Fixed		300		kHz

**PCB less than 130°C*

General Specifications

Operating Temperature	-40°C to +100°C
Storage Temperature	-55°C to +125°C
Relative Humidity	10% to 95% RH, Non-condensing
Vibration	2 to 9Hz, 3mm disp., 9 to 200Hz 1g
Material Flammability	UL V-0
Weight	30 grams
MTBF Telcordia (Bellcore)	2,000,000 hours

Approvals and Standards

UL and c-UL Recognized Component, TUV, UL60950, CSA 22.2 No. 950, IEC/EN 60950**

EMC Characteristics:

Designed to meet emission and immunity requirements per EN55022, CISPR 22, Class B, and CISPR 24.

*** An external fuse shall be used to comply with the requirements.*

CoolConverter™

Galaxy's proprietary **CoolConverter™** provides:

- Patented single-stage power conversion architecture, control, and magnetic design allow unprecedented power density and efficiency in an isolated power supply.
- An advanced microcontroller reduces parts count while adding features, performance, and flexibility in the design.

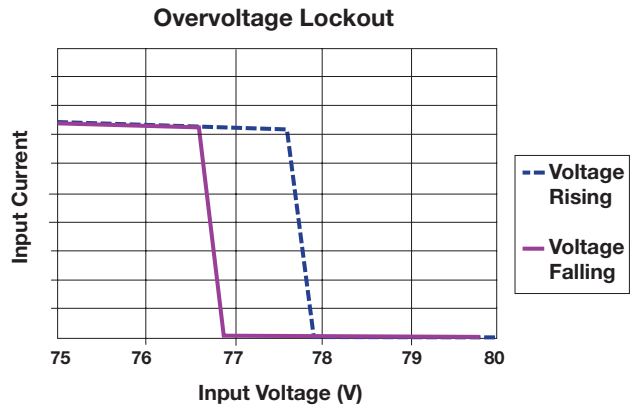
PROTECTION AND CONTROL

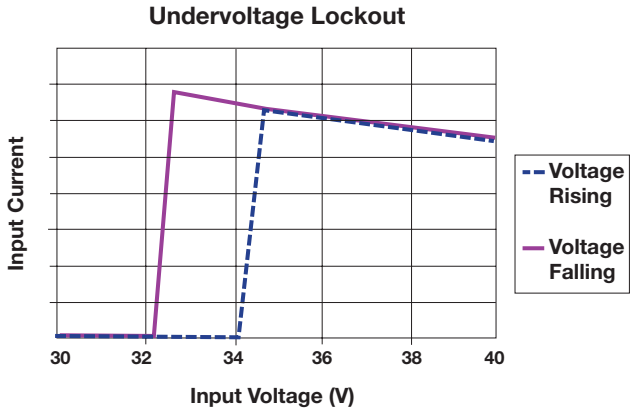
Valid Input Voltage Range:

The converter measures the input voltage and will not allow operation outside of the input voltage specification. As shown by the graphs, hysteresis is added to both the high and low voltage to prevent the converter from turning on and off repeatedly when the voltage is held near either voltage extreme. At low line this assures the maximum input current is not exceeded; at high line this assures the semiconductor devices in the converter are not damaged by excessive voltage stress.

ON/OFF Logic Option:

The ON/OFF control logic can be either Negative (standard) or Positive to enable the converter. For Negative logic, the ON/OFF pin is brought below 1.0V with respect to the –INPUT pin to enable the converter. For Positive logic, the ON/OFF pin is brought to greater than 4.0V with respect to the –INPUT pin. To request the Positive logic version, add the suffix (P) to the standard part number. The Enable pin has a built-in pull up resistor of approximately 100kΩ.





Output Over Voltage Protection:

The output voltage is constantly monitored by the microprocessor and a redundant secondary-side circuit that is set to a higher trip point than the microprocessor protection. If the output voltage exceeds the over-voltage specification, the microprocessor will restart every 4 seconds and limit voltage with a separate reference circuit. This advanced feature prevents the converter from damaging the load if there is a converter failure or application error.

Thermal Shutdown:

The printed circuit board temperature is measured using a semiconductor sensor. If the maximum rated temperature is exceeded, the converter is turned off. It will then restart every 4 seconds.

Remote Sense:

The output voltage is regulated at the point where the sense pins connect to the power output pins. Total sense compensation should not exceed 1V.

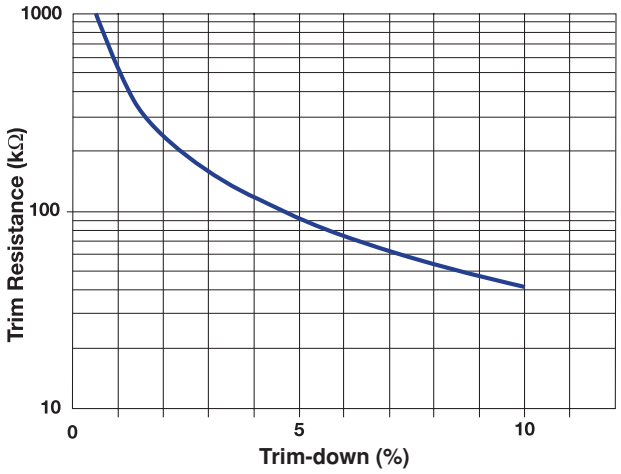
Safety:

An external input fuse must always be used to meet safety requirements.

Trim:

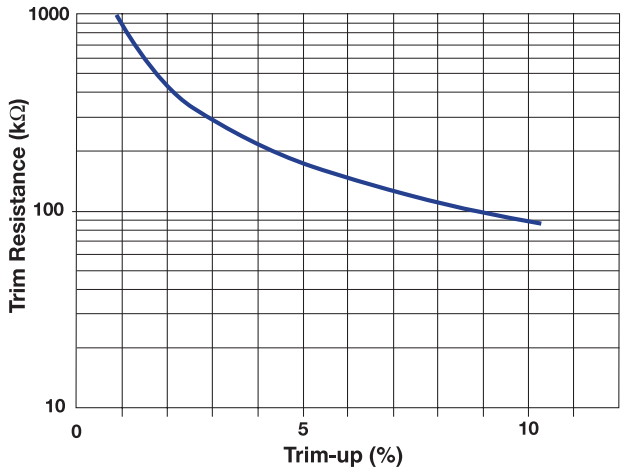
To trim the output voltage higher, connect the required trim resistor from the Trim pin to the +Sense pin. To trim the output voltage lower, connect the required trim resistor from the Trim pin to the –Sense pin. See following diagrams.

Trim-down



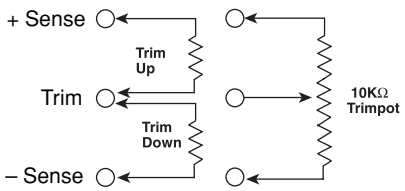
$$R_{TRIM\text{-}DOWN} = \left\{ \frac{100}{\Delta\%} - 2 \right\} \ 5.11k\Omega$$

Trim-up (for 3.3V)

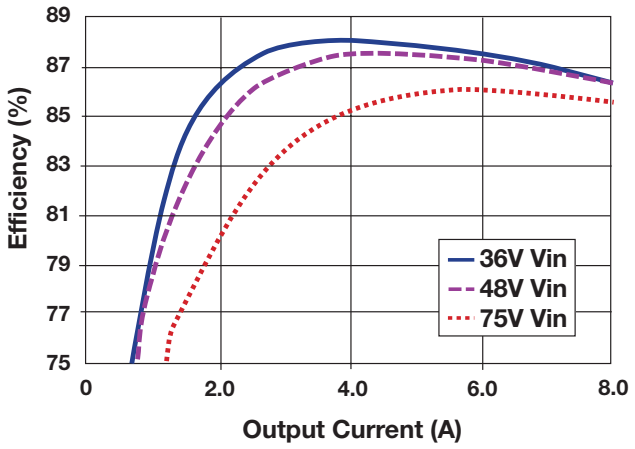


$$R_{TRIM\text{-}UP} = \left\{ \frac{V_O(100+\Delta\%)}{1.225\Delta\%} - \frac{(100+2\Delta\%)}{\Delta\%} \right\} 5.11k\Omega$$

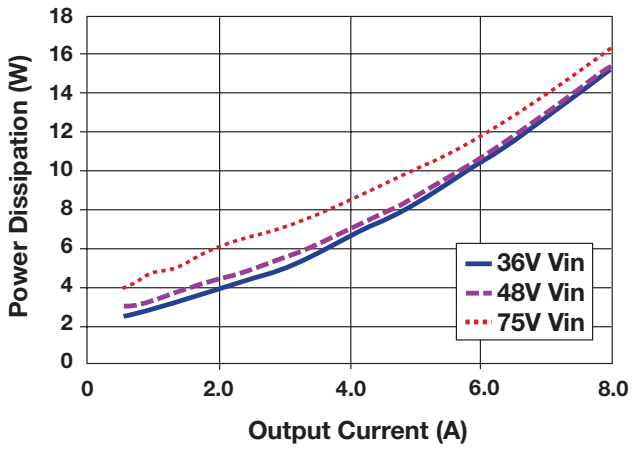
External Output Trimming



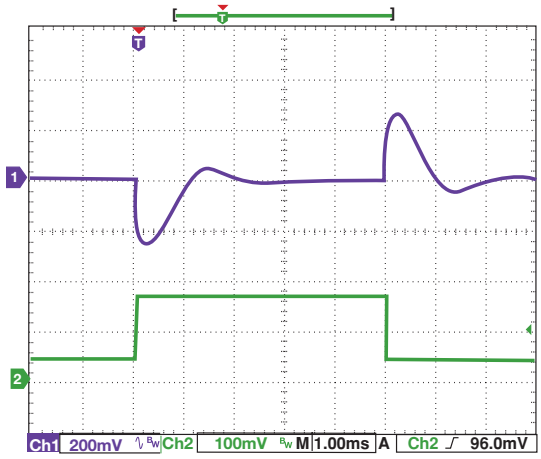
Efficiency



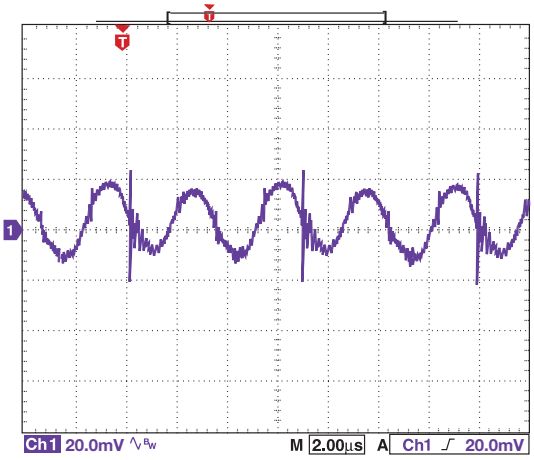
Power Dissipation



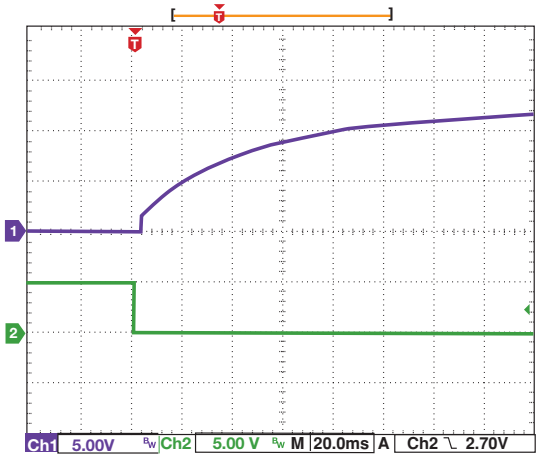
Transient Response



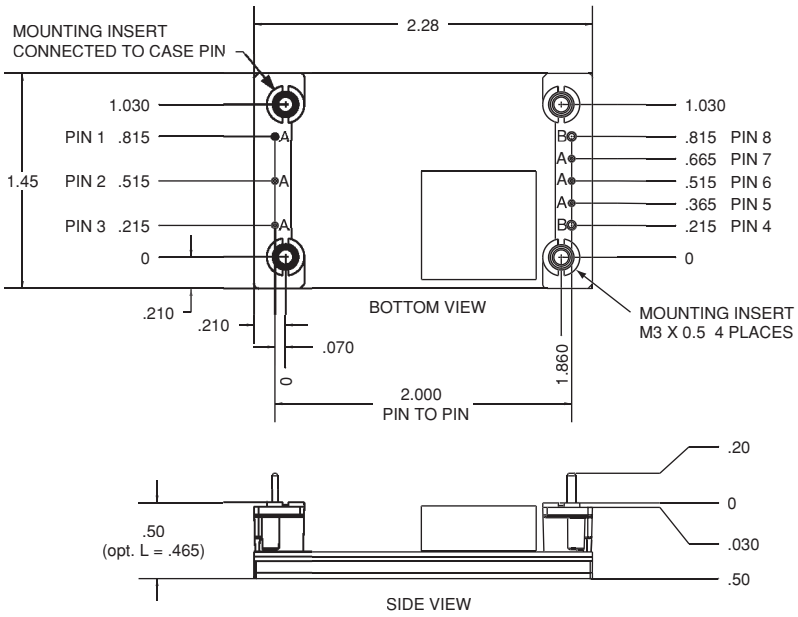
Voltage Ripple



Start-up



PACKAGE DETAIL



Pin	Function	Pin Dia. (in.)
1	– Input	0.040
2	On/Off	0.040
3	+ Input	0.040
4	+ Output	0.060
5	+ Sense	0.040
6	Trim	0.040
7	– Sense	0.040
8	– Output	0.060

Notes:

1. Mechanical tolerances
   x.xxx in. = ±0.005 in.
   x.xx in. = ±0.01 in.
2. Pin material: brass with tin/lead plating over nickel
3. Workmanship: Meets or exceeds IPC-A-610B Class II

ORDERING INFORMATION

Standard Model Number	Output Voltage	Max Current	Typical Efficiency Half Load	Typical Efficiency Full Load
48V Input Models (Designated W)				
GMDW8V08R	8V	8A	TBD	
GMDW12V08R	12V	8A	88	86
GMDW15V06R	15V	6A	TBD	

Standard Model Number	Output Voltage	Max Current	Typical Efficiency Half Load	Typical Efficiency Full Load
24V Input Models (Designated C)				
GMDC8V08R	8V	8A	TBD	
GMDC12V08R	12V	8A	TBD	
GMDC15V06R	15V	6A	TBD	

** Options:*
P = Positive Logic Version: High = On
M = 0.145" Pins (±.01")
S = 0.12" Pins (±.01")
R = Heatsink Ready
L = Low Profile (0.465" height)

Heatsink Part Numbers

Part Number	Height	Typical Thermal Performance Natural Convection Power Dissipation*	Typical Thermal Performance Forced Convection Thermal Resistance**
001	0.25"	5W	5.8°C/W
002	0.50"	7W	3.2°C/W
003	1.00"	11W	2.0°C/W
004	0.13"	TBD	TBD

@ 60°C rise heatsink to ambient* * @ 300'/min.*

Ordering Information

Example Part No:

GMDW12V08R

48V Input
12V@8A Output
Negative Logic
0.20" Pin Length
Heatsink Ready

Options Code:

GMDW12V08 P S R 00X L

Part No.
Options:
Positive Logic Version
Optional Pin Lengths
M = 0.145"
S = 0.12"
Heatsink Ready
Heatsink
Low Profile

Galaxy Power Inc. warrants to the original purchaser that the products conform to this data sheet and are free from material and workmanship defects for a period of two (2) years from the date of manufacture, if this product is used within specified conditions. Galaxy Power Inc. reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such products or information. For additional details on this limited warranty consult the factory.

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