



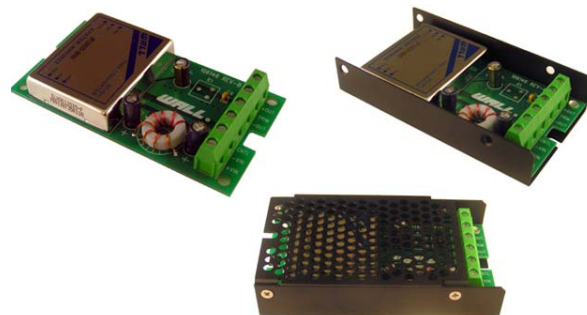
Wall Industries, Inc.

Rev. B

**CMDMW Series**  
**15 Watt Single Output**  
**Chassis Mount DC/DC Converter**  
**4:1 Ultra Wide Input Voltage Range**

## FEATURES

- 1500VDC Isolation
- Six-Sided Shielding
- MTBF>700,000 Hours
- Remote On/Off Control
- UL1950 Safety Approval
- Internal SMT Construction
- 4:1 Ultra Wide Input Range
- UL 94V-0 Package Material
- Complies with EN55022 Class A
- **Call Factory for More Output Power Options**
- Chassis Mount Options: Open Frame, U Channel, and Enclosed Types Available



## SPECIFICATIONS: CMDMW Series

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.  
 We reserve the right to change specifications based on technological advances.

| SPECIFICATION                   | TEST CONDITIONS                     | Min                                | Nom   | Max   | Unit                |
|---------------------------------|-------------------------------------|------------------------------------|-------|-------|---------------------|
| INPUT (V <sub>in</sub> )        |                                     |                                    |       |       |                     |
| Operating Voltage Range         |                                     | 9-36, 18-75                        |       |       | VDC                 |
| Start Voltage                   | 24V input models                    | 8                                  | 8.5   | 9     | VDC                 |
|                                 | 48V input models                    | 15                                 | 17    | 18    | VDC                 |
| Under Voltage Shutdown          | 24V input models                    | 7                                  | 8     | 8.5   | VDC                 |
|                                 | 48V input models                    | 13                                 | 15    | 17    | VDC                 |
| Reverse Polarity Input Current  |                                     |                                    |       | 1     | A                   |
| Short Circuit Input Power       |                                     |                                    | 3500  |       | mW                  |
| Input Surge Voltage (1000ms)    | 24V input models                    | -0.7                               |       | 50    | VDC                 |
|                                 | 48V input models                    | -0.7                               |       | 100   | VDC                 |
| OUTPUT (V <sub>o</sub> )        |                                     |                                    |       |       |                     |
| Output Voltage Range            |                                     | See Rating Chart                   |       |       |                     |
| Output Voltage Accuracy         |                                     |                                    | ±1.0  | ±2.0  | %                   |
| Load Regulation                 | I <sub>o</sub> = 10% to 100%        |                                    | ±0.5  | ±1.0  | %                   |
| Line Regulation                 | V <sub>in</sub> = min. to max.      |                                    | ±0.1  | ±0.5  | %                   |
| Output Power                    |                                     |                                    |       | 15    | W                   |
| Output Current Range            |                                     | See Rating Chart                   |       |       |                     |
| Ripple & Noise (peak to peak)   | 20MHz                               |                                    | 55    | 80    | mV <sub>pk-pk</sub> |
| Ripple & Noise (peak to peak)   | Over Line, Load, and Temperature    |                                    |       | 100   | mV <sub>pk-pk</sub> |
| Ripple & Noise                  |                                     |                                    |       | 15    | mVrms               |
| Transient Recovery Time         | 25% load step change                |                                    | 300   | 500   | µs                  |
| Transient Response Deviation    | 25% load step change                |                                    | ±2    | ±4    | %                   |
| REMOTE ON/OFF                   |                                     |                                    |       |       |                     |
| Supply On                       |                                     | 2.5 to 5.5VDC or Open Circuit      |       |       |                     |
| Supply Off                      |                                     | -0.7                               |       | 0.8   | VDC                 |
| Standby Input Current           |                                     |                                    |       | 10    | mA                  |
| Control Input Current (On)      | V <sub>in</sub> – RC = 5.0V         |                                    |       | 50    | mA                  |
| Control Input Current (Off)     | V <sub>in</sub> – RC = 0V           |                                    |       | -1    | mA                  |
| Control Common                  |                                     | Referenced to negative input       |       |       |                     |
| PROTECTION                      |                                     |                                    |       |       |                     |
| Over Power Protection           |                                     | 120                                |       |       | %                   |
| Short Circuit Protection        |                                     | Continuous                         |       |       |                     |
| GENERAL                         |                                     |                                    |       |       |                     |
| Efficiency                      |                                     | See Rating Chart                   |       |       |                     |
| Switching Frequency             |                                     | 290                                | 330   | 400   | KHz                 |
| Isolation Voltage Rated         | 60 seconds                          | 1500                               |       |       | VDC                 |
| Isolation Voltage Test          | Flash Test for 1 second             | 1650                               |       |       | VDC                 |
| Isolation Resistance            | 500VDC                              | 1000                               |       |       | MΩ                  |
| Isolation Capacitance           | 100KHz, 1V                          |                                    | 1200  | 1500  | pF                  |
| Internal Power Dissipation      |                                     |                                    |       | 5,000 | mW                  |
| ENVIRONMENTAL                   |                                     |                                    |       |       |                     |
| Operating Temperature (Ambient) |                                     | -40                                |       | +60   | °C                  |
| Operating Temperature (Case)    |                                     | -40                                |       | +100  | °C                  |
| Storage Temperature             |                                     | -50                                |       | +125  | °C                  |
| Lead Temperature                | 1.5mm from case for 10 seconds      |                                    |       | 260   | °C                  |
| Humidity                        |                                     |                                    |       | 95    | %                   |
| Cooling                         |                                     | Free air convection                |       |       |                     |
| RFI                             |                                     | Six-sided shielding, metal case    |       |       |                     |
| Temperature Coefficient         |                                     |                                    | ±0.01 | ±0.02 | %/°C                |
| MTBF                            | MIL-HDBK-217F @ 25°C, Ground Benign | 700                                |       |       | Khours              |
| Conducted EMI                   |                                     | EN55022 Class A                    |       |       |                     |
| PHYSICAL                        |                                     |                                    |       |       |                     |
| Weight                          |                                     | Approximately 6oz                  |       |       |                     |
| Dimensions                      |                                     | 4.00(L) x 2.25(W) x 0.81(H) inches |       |       |                     |
| Flammability                    |                                     | UL94V-0                            |       |       |                     |
| Heatsink material               |                                     | Aluminum                           |       |       |                     |
| Heatsink finish                 |                                     | Anodic treatment (black)           |       |       |                     |

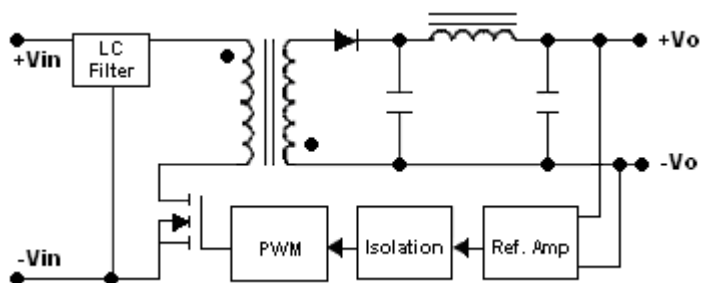
## OUTPUT VOLTAGE / CURRENT RATING CHART

| Model Number     | Input Voltage           | Output Voltage | Output Current |         | Input Current |          | Reflected Ripple Current | Efficiency (Typ) | Max Capacitive Load |
|------------------|-------------------------|----------------|----------------|---------|---------------|----------|--------------------------|------------------|---------------------|
|                  |                         |                | Min            | Max     | No Load       | Max Load |                          |                  |                     |
| CMDMW24S3.3-3000 | 24 VDC<br>(9 - 36 VDC)  | 3.3 VDC        | 300 mA         | 3000mA  | 25mA (typ)    | 528 mA   | 40mA (typ)               | 78%              | 470 $\mu$ F         |
| CMDMW24S5-3000   |                         | 5 VDC          | 300 mA         | 3000 mA |               | 762 mA   |                          | 82%              | 470 $\mu$ F         |
| CMDMW24S5.1-3000 |                         | 5.1 VDC        | 300 mA         | 3000 mA |               | 735 mA   |                          | 81%              | 470 $\mu$ F         |
| CMDMW24S12-1250  |                         | 12 VDC         | 125 mA         | 1250 mA |               | 726 mA   |                          | 85%              | 470 $\mu$ F         |
| CMDMW24S15-1000  |                         | 15 VDC         | 100 mA         | 1000 mA |               | 771 mA   |                          | 86%              | 470 $\mu$ F         |
| CMDMW48S3.3-3000 | 48 VDC<br>(18 - 75 VDC) | 3.3 VDC        | 300 mA         | 3000 mA | 15mA (typ)    | 26 mA    | 30mA (typ)               | 78%              | 470 $\mu$ F         |
| CMDMW48S5-3000   |                         | 5 VDC          | 300 mA         | 3000 mA |               | 381 mA   |                          | 82%              | 470 $\mu$ F         |
| CMDMW48S5.1-3000 |                         | 5.1 VDC        | 300 mA         | 3000 mA |               | 368 mA   |                          | 81%              | 470 $\mu$ F         |
| CMDMW48S12-1250  |                         | 12 VDC         | 125 mA         | 1250 mA |               | 363 mA   |                          | 85%              | 470 $\mu$ F         |
| CMDMW48S15-1000  |                         | 15 VDC         | 100 mA         | 1000 mA |               | 386 mA   |                          | 86%              | 470 $\mu$ F         |

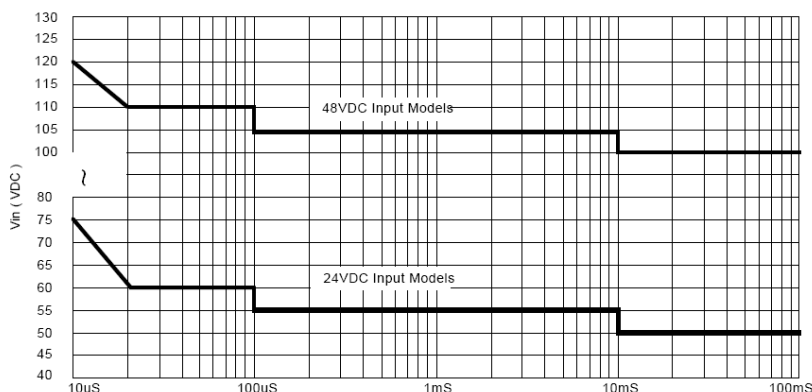
## NOTES

1. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
2. Ripple and noise measured at 20MHz bandwidth.
3. The CMDMW series requires a minimum 10% load on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specifications.
4. Other input and output voltages may be available, please contact factory.
5. On/Off control is optional, please contact factory. Control voltage referenced to negative input (-Vin).
6. Heat-sink is optional, consult factory.
7. Chassis Mount Options: No suffix for open frame, "U" suffix for U Channel, and "E" suffix for Enclosed type.

## BLOCK DIAGRAM

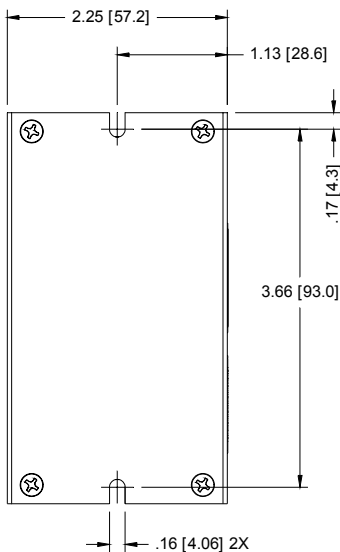
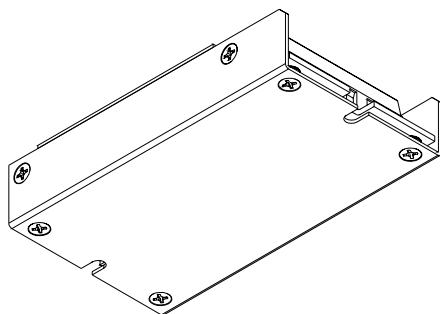
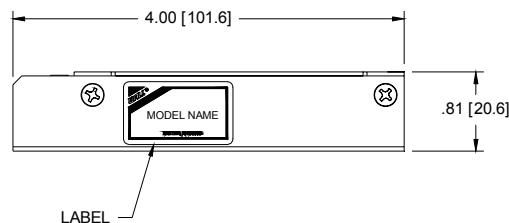
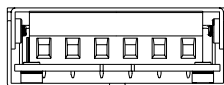
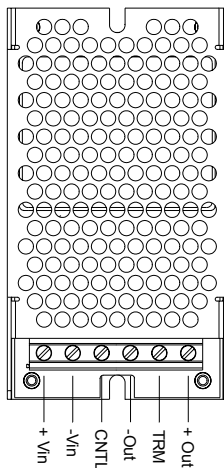
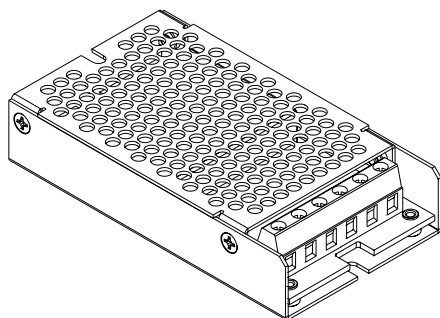


## INPUT VOLTAGE TRANSIENT RATING



**MECHANICAL DRAWING**

Unit: inches [mm]



## **DESIGN & FEATURE CONSIDERATONS**

### **Remote On/Off**

Positive logic remote on/off turns the module on during a logic high voltage on the remote on/off pin, and off during a logic low. To turn the power module on and off, the user must supply a switch to control the voltage between the on/off terminal and the -Vin terminal. The switch can be an open collector or equivalent.

A logic low is -0.7V to 0.8V.

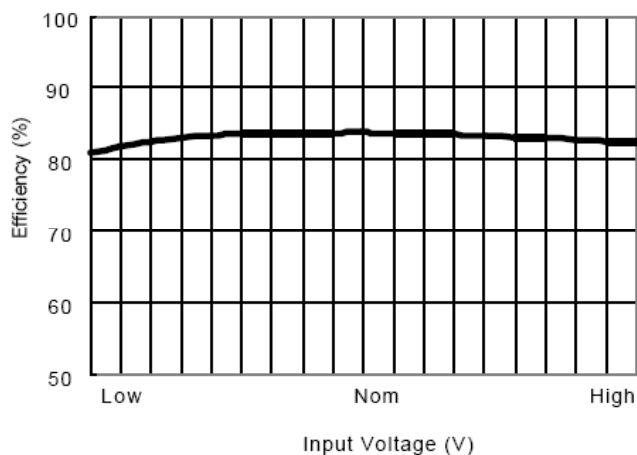
A logic high is 2.5V to 5.5V.

The maximum sink current at on/off terminal during a logic low is -1mA. The maximum allowable leakage current of the switch at on/off terminal (2.5 to 5.5V) is 50uA.

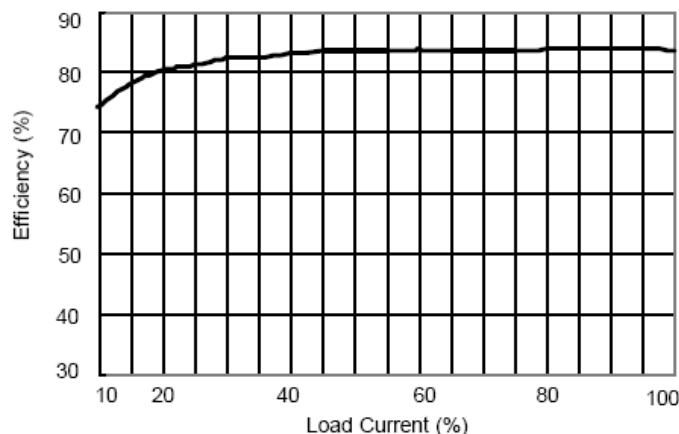
### **Over Current Protection**

To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specified range.

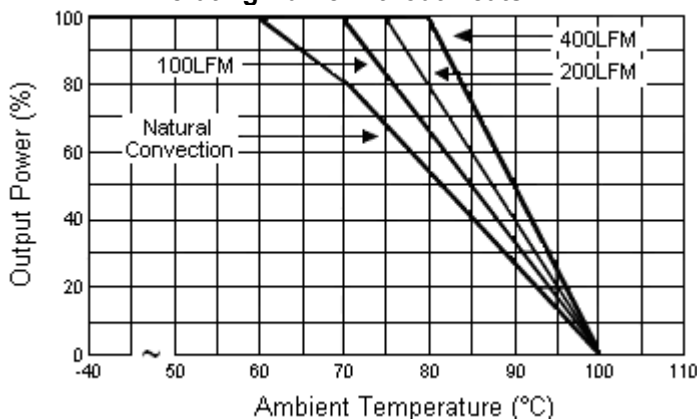
**Efficiency vs Input Voltage**



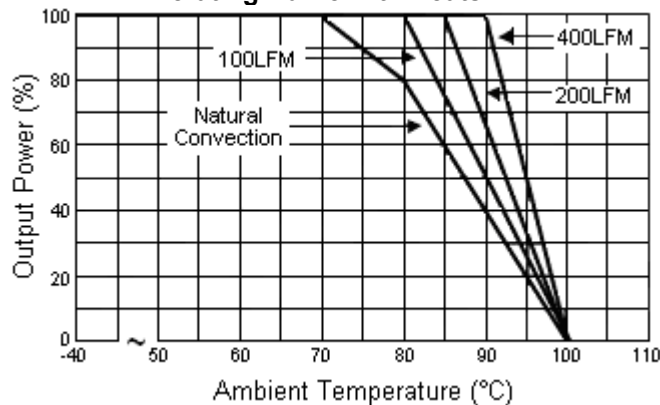
**Efficiency vs Output Load**



**Derating Curve without Heatsink**



**Derating Curve with Heatsink**



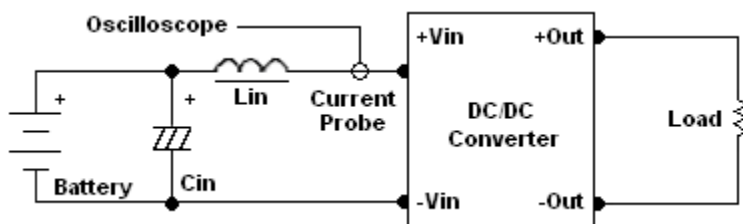
## TEST CONFIGURATIONS

### Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor  $L_{in}$  (4.7uH) and  $C_{in}$  (220uF, ESR < 1.0Ω at 100 KHz) to simulate source impedance.

Capacitor  $C_{in}$  offsets possible battery impedance.

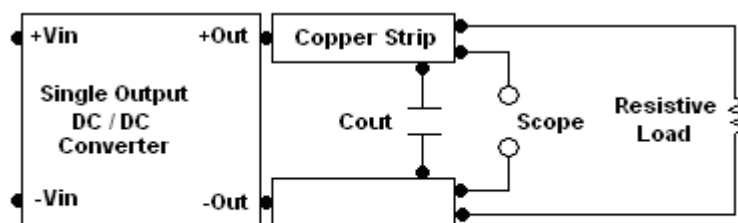
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



### Peak-to-Peak Output Noise Measurement Test

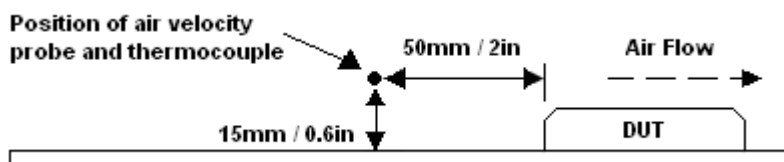
Use a  $C_{out}$  0.47uF ceramic capacitor.

Scope measurement should be made by using a BNC socket; measurement bandwidth is 0-20 MHz. Position the load between 50 mm and 75 mm from the DC/DC Converter.



### Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 100°C. The derating curves are determined from measurements obtained in an experimental apparatus.





Wall Industries, Inc.

Rev. B

CMDMW Series  
15 Watt Single Output  
Chassis Mount DC/DC Converter  
4:1 Ultra Wide Input Voltage Range

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**COMPANY INFORMATION:**

Wall Industries, Inc. has created custom and modified units for over 40 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on time and on budget. Our ISO9001-2000 certification is just one example of our commitment to producing a high quality, well documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| <u>Phone:</u>     | ☎(603)778-2300                                                         |
| <u>Toll Free:</u> | ☎(888)587-9255                                                         |
| <u>Fax:</u>       | ☎(603)778-9797                                                         |
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