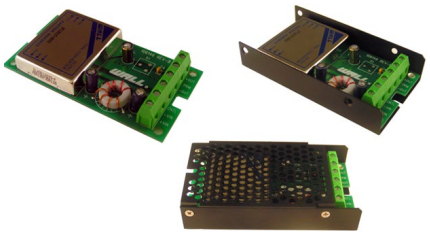
FEATURES



- Soft Start
- Lead-Free Design
- Output Trim Function
- I/O Isolation 1500VDC
- Remote On/Off Control (Optional)
- Call Factory for More Output Power Options
- EMI Complies with RN55022 Class A (Only for CMCG-A Series)
- Chassis Mount Options: Open Frame, U Channel, and Enclosed Types Available

SPECIFICATIONS: *CMCG 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_{in})					
Input Voltage Range	24V input models 48V input models	18 36	24 48	36 75	VDC
Start Voltage	24V input models 48V input models	17 34	17.5 35	18 36	VDC
Under Voltage Shutdown	24V input models 48V input models	16 32	16.5 33	17 34	VDC
Over Voltage Shutdown	24V input models 48V input models	40 80	42 82	44 84	VDC
Input Surge Voltage (1000ms)	24V input models 48V input models	-0.7 -0.7		50 100	VDC
Reverse Polarity Input Current	All models			2	A
Reflected Ripple Current		See Table			
Short Circuit Input Power	All models			4500	mW
OUTPUT (V_o)					
Output Voltage Range		See Table			
Output Voltage Accuracy			±0.5	±1.0	%
Output Voltage Trim	% of nominal output voltage	±9.0	±10.0	±11.0	%
Load Regulation (2.5V, 3.3V, and 5Vout)	Io = No Load to 100% Load		±0.5	±1.0	%
Load Regulation (12V and 15Vout)	Io = 10% to 100% Load		±0.5	±1.0	%
Line Regulation	Vin = Min to Max		±0.1	±0.3	%
Output Power				30	W
Output Current Range		See Table			
Ripple & Noise (20MHz)			75	100	mV_{pk-pk}
Ripple & Noise (20MHz)	Over Line, Load, and Temperature			120	mV_{pk-pk}
Ripple & Noise (20MHz)				10	mVrms
Transient Recovery Time	25% Load Step Change	200		500	µs
Transient Response Deviation	25% Load Step Change		±2	±5	%
Maximum Capacitive Load		See Table			
REMOTE ON/OFF CONTROL					
Supply On		2.5 to 100VDC or Open Circuit			
Supply Off		-1		1	VDC
Device Standby Input Current			2	5	mA
Control Input Current	ON OFF			5 -100	µA
Control Common		Referenced to Negative Input			
PROTECTION					
Over Power Protection		110		160	%
Short Circuit Protection		Continuous			
Over Voltage Protection		See table			
GENERAL					
Efficiency		See Table			
Switching Frequency		280	350	400	KHz
Isolation Voltage Rated	60 seconds	1500			VDC
Isolation Voltage Test	Flash Tested for 1 second	1650			VDC
Isolation Resistance	500VDC	1000			MΩ
Isolation Capacitance	100KHz, 1V		1200	1500	pF
Internal Power Dissipation				5500	mW
ENVIRONMENTAL					
Operating Temperature	Ambient Case	-40 -40		+50 +105	°C
Storage Temperature		-55		+125	°C
Lead Temperature	1.5mm from case for 10 seconds			260	°C
Humidity				95	%
Temperature Coefficient			±0.01	±0.02	%/°C
Cooling		Free air convection			
RFI		Six-sided shielded metal case			
MTBF	MIL-HDBK-217F @ 25°C, Ground Benign	600,000 Hours			
Conducted EMI		EN55022 Class A			
PHYSICAL					
Weight		Approximately 7oz			
Dimensions		4.00(L) x 2.25(W) x 0.81(H) inches			

OUTPUT VOLTAGE / CURRENT RATING CHART

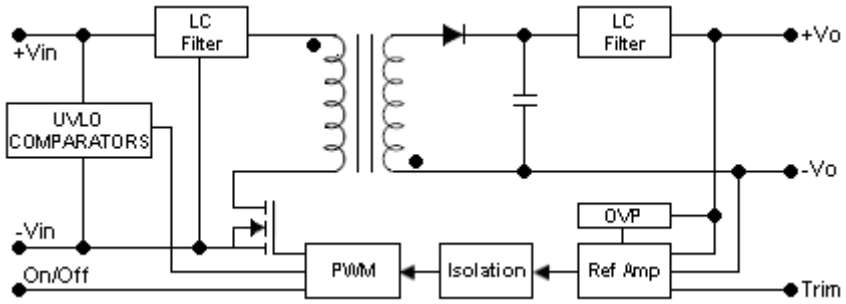
Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Over Voltage Protection	Max Capacitive Load	Eff (Typ)
			Min	Max	No Load	Max Load				
CMCG24S2.5-6000	24 VDC (18 – 36 VDC)	2.5 VDC	0mA	6000mA	50mA	744mA	100mA (typ)	3 VDC	6800µF	84%
CMCG24S3.3-6000		3.3 VDC	0mA	6000mA	50mA	959mA		3.9 VDC	6800µF	86%
CMCG24S5-5000		5 VDC	0mA	5000mA	70mA	1185mA		6.8 VDC	6800µF	88%
CMCG24S5.1-5000		5.1 VDC	0mA	5000mA	70mA	1207mA		6.8 VDC	6800µF	88%
CMCG24S12-2500		12 VDC	166mA	2500mA	20mA	1420mA		15 VDC	680µF	88%
CMCG24S15-2000		15 VDC	133mA	2000mA	20mA	1420mA		18 VDC	680µF	88%
CMCG48S2.5-6000	48 VDC (36 – 75 VDC)	2.5 VDC	0mA	6000mA	40mA	372mA	50mA (typ)	3 VDC	6800µF	84%
CMCG48S3.3-6000		3.3 VDC	0mA	6000mA	40mA	480mA		3.9 VDC	6800µF	86%
CMCG48S5-5000		5 VDC	0mA	5000mA	50mA	604mA		6.8 VDC	6800µF	88%
CMCG48S5.1-5000		5.1 VDC	0mA	5000mA	50mA	604mA		6.8 VDC	6800µF	88%
CMCG48S12-2500		12 VDC	166mA	2500mA	10mA	710mA		15 VDC	680µF	88%
CMCG48S15-2000		15 VDC	133mA	2000mA	10mA	710mA		18 VDC	680µF	88%

NOTES

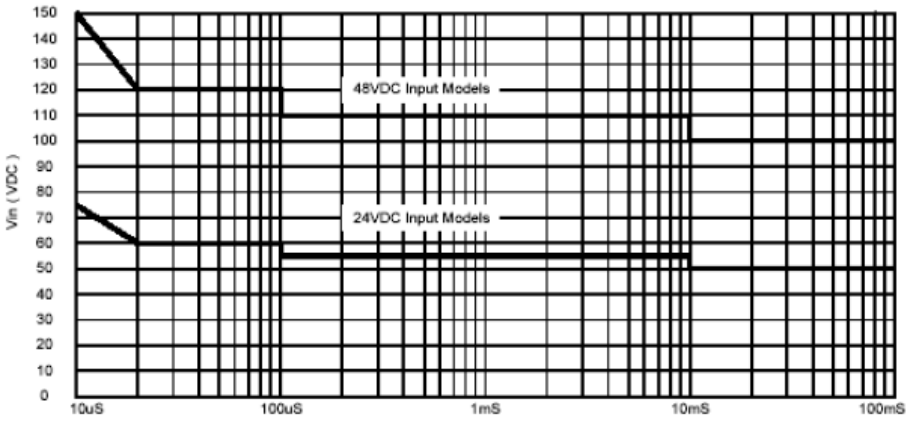
1. Transient Recovery Time is measured to within 1% error band for a step change in output load of 75% to 100%.
2. Ripple & Noise measurement bandwidth is 0~20MHz.
3. These power converters require a minimum output loading to maintain specified regulation. Operation at no-load will not damage these devices, however they may not meet all listed specifications.
4. Other input and output voltages may be available, please contact factory.
5. To order the converter with Remote On/Off function, please add suffix ”-RC” (Ex: CMCG48S5-5000-RC).
6. Chassis Mount Options: No suffix for open frame, “U” suffix for U Channel, and “E” suffix for Enclosed type.

Due to advances in technology, specifications subject to change without notice.

BLOCK DIAGRAM

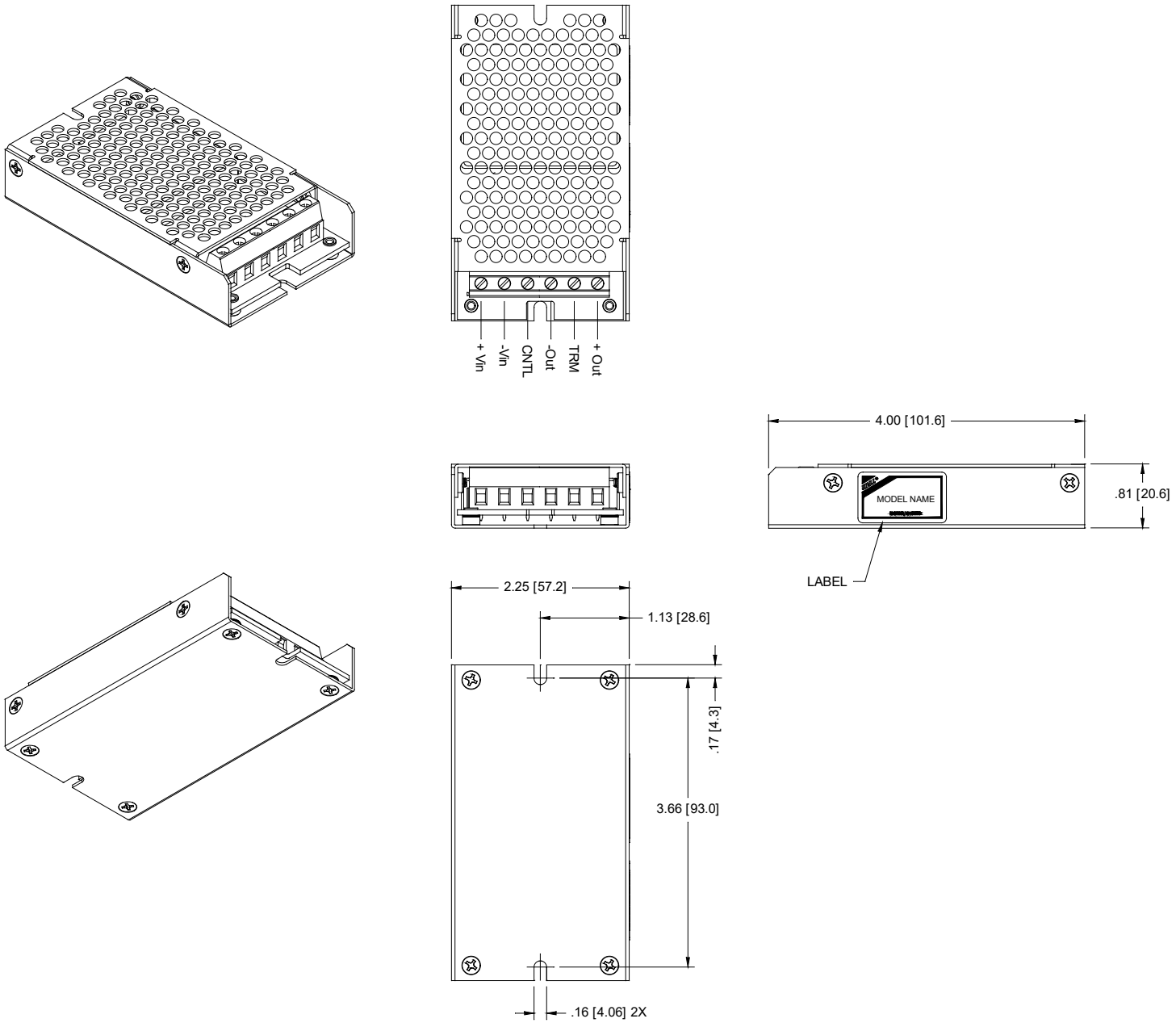


INPUT VOLTAGE TRANSIENT RATING



MECHANICAL DRAWING

Unit: inches [mm]



DESIGN & FEATURE CONSIDERATIONS

Remote On/Off

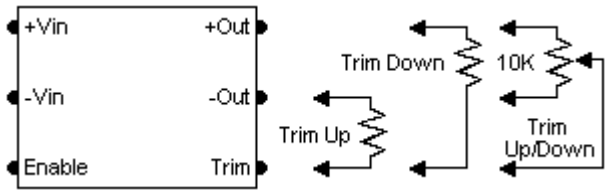
Positive logic remote on/off turns the module on during a logic high voltage on the remote on/off pin and off during a logic low. Negative logic remote on/off turns the module off during a logic low and on during a logic high. To turn the power module on and off, the user must supply a switch to control 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 1.0V.
A logic high is 2.5V to 100V.

The maximum sink current at the On/Off terminal (Pin 3) during a logic low is 100 mA. The maximum allowable leakage current of a switch connected to the On/Off terminal (Pin 3) at logic high (2.5V to 100V) is 5uA.

Output Voltage Trim

Output voltage trim allows the user to increase or decrease the output voltage set point of a module.



The output voltage can be adjusted by placing an external resistor (Radj) between the Trim and +Vout or -Vout terminals. By adjusting Radj, the output voltage can be changed by ±10% of the nominal output voltage.

A 10K, 1 or 10 Turn trimpot is usually specified for continuous trimming. Trim pin may be safely left floating if it is not used.

Connecting the external resistor ($R_{adj\,(up)}$) between the Trim and -Vout pins increases the output voltage set point as defined by the following equation:

$$R_{adj(up)} = \frac{(33 * V_{out}) - (30 * V_{adj})}{V_{adj} - V_{out}}$$

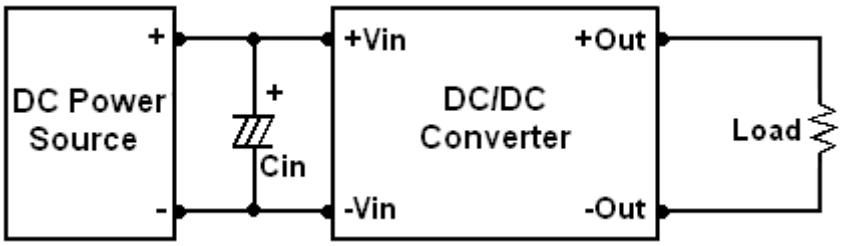
Connecting the external resistor ($R_{adj\,(down)}$) between the Trim and +Vout pins decreases the output voltage set point as defined by the following equation:

$$R_{adj(down)} = \frac{(36.667 * V_{adj}) - (33 * V_{out})}{V_{out} - V_{adj}}$$

Vout: Nominal Output Voltage
Vadj: Adjusted Output Voltage
Units: VDC/KΩ

Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module.



Over Current Protection

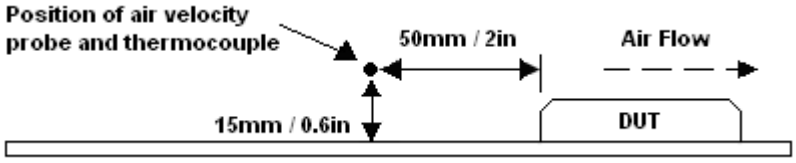
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally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

Output Over Voltage Protection

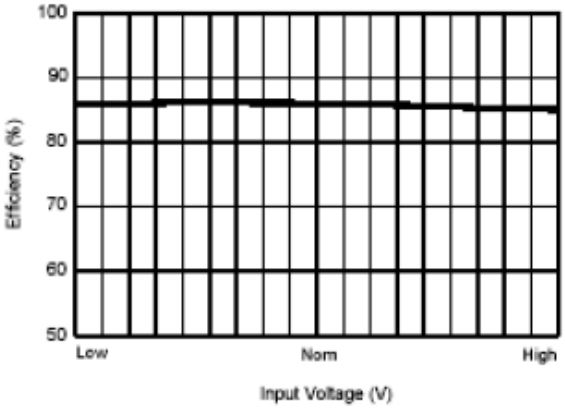
The output over voltage clamp consists of control circuitry, which is independent of the primary regulation loop that monitors the voltage on the output terminals. The control loop of the clamp has a higher voltage set point than the primary loop. This provides a redundant voltage control that reduces the risk of output over voltage. The OVP level can be found in the "Output Voltage / Current Rating Chart."

Thermal Considerations

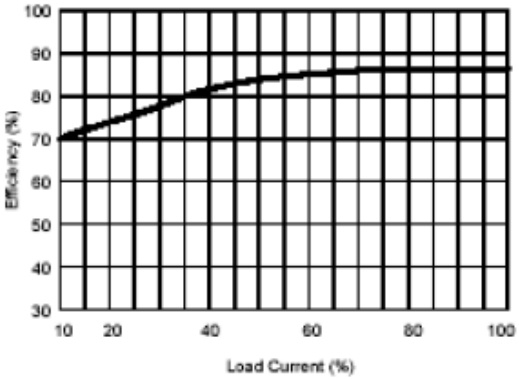
Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 105°C. The derating curves are determined from measurements obtained in an experimental apparatus.



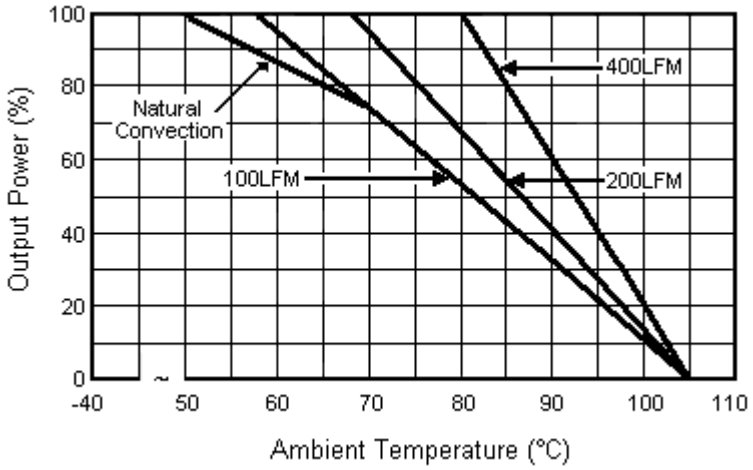
Efficiency vs Input Voltage



Efficiency vs Output Load



DERATING CURVE

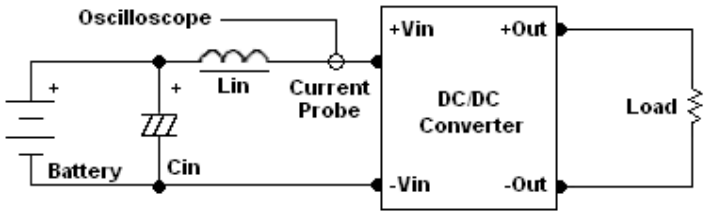


TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup
Input reflected-ripple current is measured with an inductor Lin (4.7uH) and Cin (220uF, ESR < 1.0Ω at 100 KHz) to simulate source impedance.

Capacitor Cin offsets possible battery impedance.

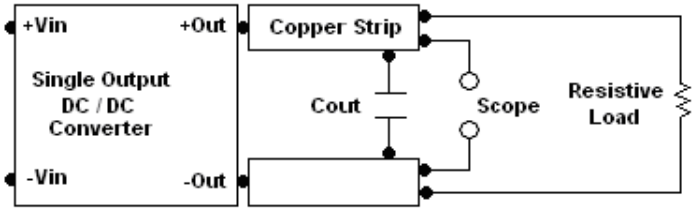
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



Peak-to-Peak Output Noise Measurement Test

Use Cout = 1.0uF ceramic capacitor.

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



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001 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.

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