Size:
0.67 x 0.30 x 0.43 inches
17.0 x 7.62 x 11.0 mm

FEATURES

- RoHS Compliant
- 1 Watt Output Power
- Fully Regulated Single & Dual Outputs
- 1500VDC I/O Isolation
- High Efficiency up to 80%
- Low Ripple & Noise
- Compact SIP-6 Package
- 2:1 Wide Input Voltage Ranges
- -40°C to +85°C Operating Temperature Range
- Continuous Short Circuit Protection
- CSA/UL/IEC/EN 60950-1 Safety Approvals (Pending)
- Input Filter Complies to EN55022, Class A & FCC, Level A

DESCRIPTION

The DCMAW1 series of DC/DC power converters consists of fully regulated single and dual output models with 2:1 wide input voltage ranges of 4.5-9 VDC, 9-18 VDC, 18-36 VDC, and 36-75 VDC. These converters provide 1 Watt of output power in a very small SIP-6 package occupying only 0.2 square inches on the PCB. A high efficiency allows these converters to operate at a wide operating temperature range of -40°C to +85°C without derating. Further features include low ripple & noise, 1500VDC I/O isolation, and short circuit protection. These converters are RoHS compliant and have CSA/UL/IEC/EN 60950-1 safety approvals. These converters' very compact dimensions make them an ideal solution for many space critical applications in battery powered instrumentations.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Output Power	Efficiency	Maximum Capacitive Load
			Min	Max	No Load	Max Load				
DCMAW1-05S05	5 VDC (4.5 - 9 VDC)	5 VDC	0mA	200mA	40mA	263mA	80mA	1W	76%	1680µF
DCMAW1-05S12		12 VDC	0mA	83mA		259mA		1W	77%	820µF
DCMAW1-05S15		15 VDC	0mA	67mA		254mA		1W	79%	680µF
DCMAW1-05S24		24 VDC	0mA	42mA		265mA		1W	76%	470µF
DCMAW1-12S05	12 VDC (9 - 18 VDC)	5 VDC	0mA	200mA	20mA	108mA	40mA	1W	77%	1680µF
DCMAW1-12S12		12 VDC	0mA	83mA		108mA		1W	77%	820µF
DCMAW1-12S15		15 VDC	0mA	67mA		105mA		1W	80%	680µF
DCMAW1-12S24		24 VDC	0mA	42mA		109mA		1W	77%	470µF
DCMAW1-24S05	24 VDC (18 - 36 VDC)	5 VDC	0mA	200mA	10mA	54mA	30mA	1W	77%	1680µF
DCMAW1-24S12		12 VDC	0mA	83mA		52mA		1W	80%	820µF
DCMAW1-24S15		15 VDC	0mA	67mA		52mA		1W	80%	680µF
DCMAW1-24S24		24 VDC	0mA	42mA		55mA		1W	77%	470µF
DCMAW1-48S05	48 VDC (36 - 75 VDC)	5 VDC	0mA	200mA	7mA	27mA	20mA	1W	77%	1680µF
DCMAW1-48S12		12 VDC	0mA	83mA		27mA		1W	78%	820µF
DCMAW1-48S15		15 VDC	0mA	67mA		27mA		1W	78%	680µF
DCMAW1-48S24		24 VDC	0mA	42mA		28mA		1W	76%	470µF

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Output Power	Efficiency	Maximum Capacitive Load
			Min	Max	No Load	Max Load				
DCMAW1-05D12	5 VDC (4.5 - 9 VDC)	±12 VDC	0mA	±42mA	40mA	262mA	80mA	1W	77%	±470µF
DCMAW1-05D15		±15 VDC	0mA	±33mA		254mA		1W	78%	±330µF
DCMAW1-12D12	12 VDC (9 - 18 VDC)	±12 VDC	0mA	±42mA	20mA	106mA	40mA	1W	79%	±470µF
DCMAW1-12D15		±15 VDC	0mA	±33mA		106mA		1W	78%	±330µF
DCMAW1-24D12	24 VDC (18 - 36 VDC)	±12 VDC	0mA	±42mA	10mA	53mA	30mA	1W	80%	±470µF
DCMAW1-24D15		±15 VDC	0mA	±33mA		52mA		1W	80%	±330µF
DCMAW1-48D12	48 VDC (36 - 75 VDC)	±12 VDC	0mA	±42mA	7mA	27mA	20mA	1W	79%	±470µF
DCMAW1-48D15		±15 VDC	0mA	±33mA		26mA		1W	79%	±330µF

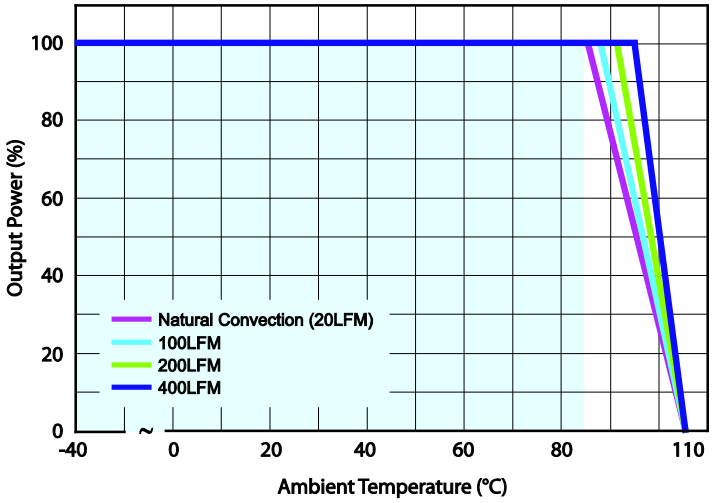
SPECIFICATIONS: DCMAW1 SERIES

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.

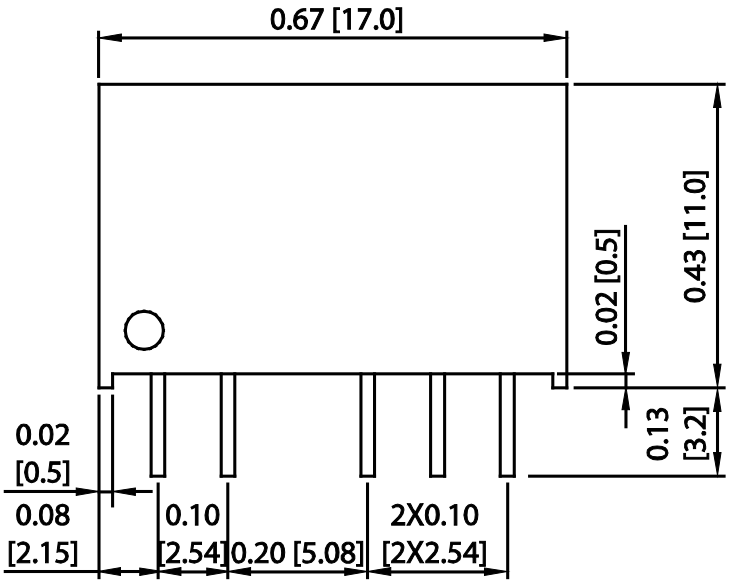
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	5VDC nominal input models		4.5	5	9	VDC
	12VDC nominal input models		9	12	18	
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Input Surge Voltage (1 sec. max.)	5VDC nominal input models		-0.7		15	VDC
	12VDC nominal input models		-0.7		25	
	24VDC nominal input models		-0.7		50	
	48VDC nominal input models		-0.7		100	
Start-up Threshold Voltage	5VDC nominal input models				4.5	VDC
	12VDC nominal input models				9	
	24VDC nominal input models				18	
	48VDC nominal input models				36	
Input Current			See Table			
Reflected Ripple Current			See Table			
Input Fuse	5VDC nominal input models		500mA slow-blow type			
	12VDC nominal input models		250mA slow-blow type			
	24VDC nominal input models		120mA slow-blow type			
	48VDC nominal input models		60mA slow-blow type			
Internal Filter Type	All models		capacitor			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Output Voltage Setting Accuracy	At 50% load and nominal Vin				±1.0	%Vnom.
Line Regulation	Low line to high line				±0.2	%
Load Regulation	No load to full load	Single Output Models			±1.0	%
		Dual Output Models			±1.0	
	10% load to 90% load	Single Output Models			±0.5	%
		Dual Output Models			±0.8	
Minimum Load			No minimum load requirements			
Output Power					1	W
Output Current			See Table			
Ripple & Noise	20MHz bandwidth			50		mVp-p
Transient Recovery Time	25% load step change			250		µs
Temperature Coefficient					±0.02	%/°C
PROTECTION						
Short Circuit Protection			Continuous			
GENERAL						
Efficiency			See Table			
Switching Frequency				220		KHz
Isolation Voltage (Input to Output)	60 seconds		1500			VDC
Isolation Resistance	500VDC		1000			MΩ
Isolation Capacitance	100kHz, 1V				50	pF
Maximum Capacitive Load			See Table			
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature Range	Natural convection		-40		+85	°C
Case Temperature					+105	°C
Storage Temperature			-55		+125	°C
Humidity	Non-condensing				95	% RH
Cooling			natural convection			
Lead Temperature	1.5mm from case for 10 seconds				260	°C
MTBF (calculated)	MIL-HDBK-217F at 25°C, Ground Benign		2,800,000			hours
PHYSICAL SPECIFICATIONS						
Weight			0.46oz (12.9g)			
Dimensions (L x W x H)			0.67 x 0.30 x 0.43 inch (17.0 x 7.62 x 11.0 mm)			
Case Material	Flammability to UL 94V-0 rated		Non-conductive black plastic			
Pin Material			Alloy 42			
SAFETY & EMC						
Safety Approvals (pending)	CSA 60950-1 recognition, IEC/EN 60950-1 (CB-scheme)					

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

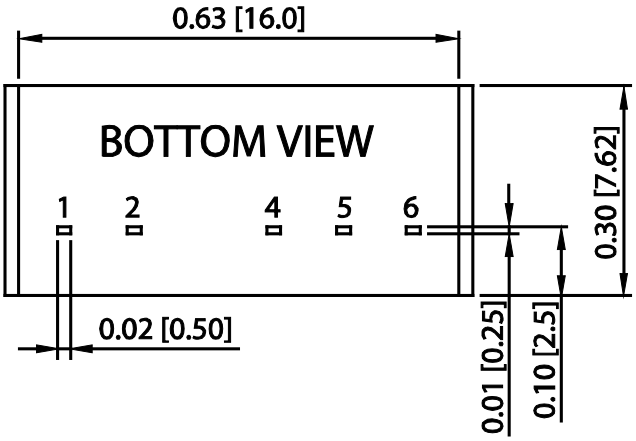
DERATING CURVE



MECHANICAL DRAWINGS



PIN CONNECTIONS		
Pin	Single Outputs	Dual Outputs
1	-Vin	-Vin
2	+Vin	+Vin
4	+Vout	+Vout
5	No Pin	Common
6	-Vout	-Vout

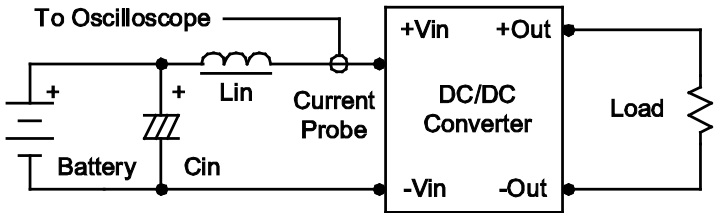


NOTES
1. Unit: inches [mm]
2. Tolerance: X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
3. Pins: ±0.002 [±0.05]
4. Case Material: Non-conductive black plastic (flammability to UL 94V-0 rated)
5. Pin Material: Alloy 42
6. Weight: 0.46oz (12.9g)

TEST CONFIGURATIONS

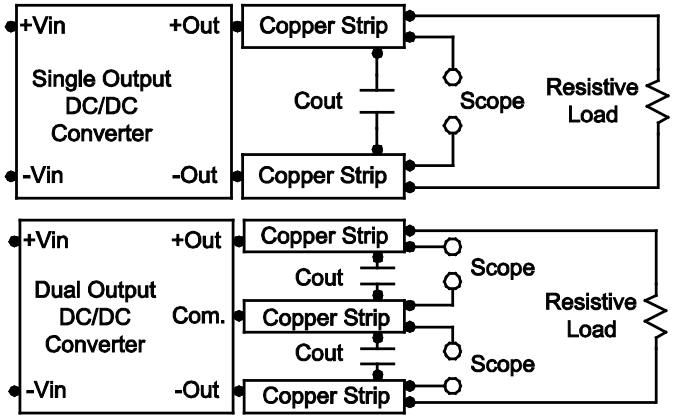
Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, 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 a 0.47µF 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.



DESIGN & FEATURE CONSIDERATIONS

Maximum Capacitive Load

The DCMAW1 series has a limitation of maximum connected capacitance on the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the start-up time. The maximum capacitance can be found in the model selection table.

Over Current Protection

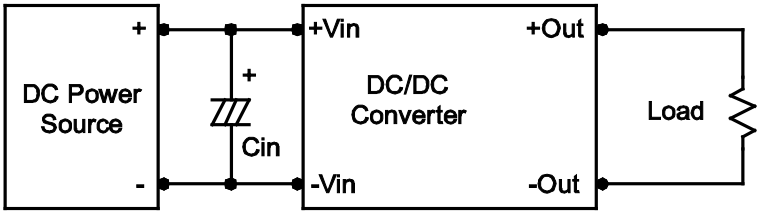
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once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

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.

In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.

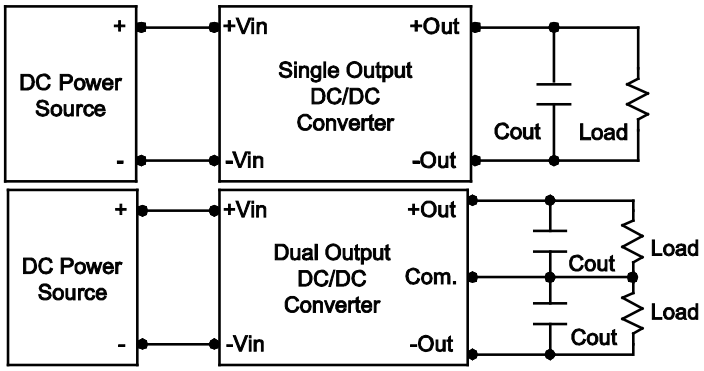
A Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100KHz) capacitor of 8.2µF for 5VDC nominal input models, a 3.3µF for 12VDC input models, and a 1.5µF for 24VDC and 48VDC input models.



DESIGN & FEATURE CONSIDERATIONS

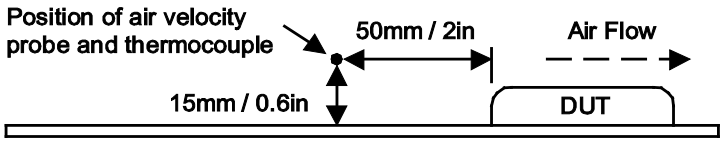
Output Ripple Reduction

A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 3.3µF capacitors at the output.



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 a test setup.



MODEL NUMBER SETUP

DCMAW	1	-	12	S	12
Series Name	Output Power		Input Voltage	No. of Outputs	Output Voltage
	1: 1 Watt		**05:** 4.5 – 9 VDC **12:** 9 – 18 VDC **24:** 18 – 36 VDC **48:** 36 – 75 VDC	**S:** Single Output **D:** Dual Output	**05:** 5 VDC **12:** 12 VDC **15:** 15 VDC **24:** 24 VDC **12:** ±12 VDC **15:** ±15 VDC

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 ISO9001-2008 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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