Size: 1in x 1in x 0.40in (25.4mm x 25.4mm x 10.16mm)

FEATURES

- Wide 2:1 Input Voltage Range
- Fully Regulated Output Voltage
- I/O Isolation 1500VDC
- No Min. Load Requirement
- Compact Size
- RoHS & REACH Compliant
- Over Load, Over Voltage, and Short Circuit Protection
- Shielded Metal Case with Insulated Baseplate
- Remote On/Off Control, Output Voltage Trim
- UL/cUL/IEC/EN 62368-1 (60950-1) Safety Approvals & CE Marking (Pending)

DESCRIPTION

The DCMJW15 series of DC/DC converters offers 15 watts of output power in a compact 1” x 1” x 0.40” package with optional heatsink. This series consists of single and dual fully regulated output models with a wide 2:1 input voltage range. Each model in this series has a I/O isolation of 1500VDC, no minimum load requirement, and over load, over voltage, and short circuit protection. This series is RoHS & REACH compliant and has UL/cUL/IEC/EN 62368-1 (60950-1) pending safety approvals.

MODEL SELECTION TABLE

Single Output Models

Model Number[1]	Input Voltage Range	Output Voltage	Max. Output Current	Input Current		Over Voltage Protection	Maximum Capacitive Load	Efficiency	Reflected Ripple Current	Output Power
				No Load	Max Load					
DCMJW15-12S033	12VDC (9~18VDC)	3.3VDC	3400mA	10mA	1087mA	3.9VDC	5800µF	86%	80mA	15W
DCMJW15-12S05		5VDC	3000mA	10mA	1404mA	6.2VDC	5100µF	89%		
DCMJW15-12S12		12VDC	1250mA	10mA	1404mA	15VDC	870µF	89%		
DCMJW15-12S15		15VDC	1000mA	10mA	1404mA	18VDC	560µF	89%		
DCMJW15-12S24		24VDC	625mA	10mA	1389mA	30VDC	220µF	90%		
DCMJW15-24S033	24VDC (18~36VDC)	3.3VDC	3400mA	8mA	544mA	3.9VDC	5800µF	86%	50mA	15W
DCMJW15-24S05		5VDC	3000mA	8mA	710mA	6.2VDC	5100µF	88%		
DCMJW15-24S12		12VDC	1250mA	8mA	694mA	15VDC	870µF	90%		
DCMJW15-24S15		15VDC	1000mA	8mA	694mA	18VDC	560µF	90%		
DCMJW15-24S24		24VDC	625mA	8mA	687mA	30VDC	220µF	91%		
DCMJW15-48S033	48VDC (36~75VDC)	3.3VDC	3400mA	8mA	269mA	3.9VDC	5800µF	87%	30mA	15W
DCMJW15-48S05		5VDC	3000mA	8mA	355mA	6.2VDC	5100µC	88%		
DCMJW15-48S12		12VDC	1250mA	8mA	347mA	15VDC	870µF	90%		
DCMJW15-48S15		15VDC	1000mA	8mA	347mA	18VDC	560µF	90%		
DCMJW15-48S24		24VDC	625mA	8mA	343mA	30VDC	220µF	91%		

MODEL SELECTION TABLE

Dual Output Models

Model Number[1]	Input Voltage Range	Output Voltage	Max. Output Current	Input Current		Over Voltage Protection	Maximum Capacitive Load[2]	Efficiency	Reflected Ripple Current	Output Power
				No Load	Max Load					
DCMJW15-12D12	12VDC (9~18VDC)	±12VDC	±625mA	15mA	1404mA	±15VDC	440#µF	89%	80mA	15W
DCMJW15-12D15		±15VDC	±500mA	15mA	1389mA	±18VDC	280#µF	90%		
DCMJW15-24D12	24VDC (18~36VDC)	±12VDC	±625mA	10mA	694mA	±15VDC	440#µF	90%	50mA	15W
DCMJW15-24D15		±15VDC	±500mA	10mA	694mA	±18VDC	280#µF	90%		
DCMJW15-48D12	48VDC (36~75VDC)	±12VDC	±625mA	10mA	351mA	±15VDC	440#µF	89%	30mA	15W
DCMJW15-48D15		±15VDC	±500mA	10mA	347mA	±18VDC	280#µF	90%		

SPECIFICATIONS

All specifications are based on 25°C, Resistive Load, Nominal Input Voltage, and Rated 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	12V Input Models			9		18	VDC
	24V Input Models			18		36	
	48V Input Models			36		75	
Input Surge Voltage (100ms Max.)	12V Input Models			-0.7		25	VDC
	24V Input Models			-0.7		50	
	48V Input Models			-0.7		100	
Start-Up Threshold Voltage	12V Input Models					9	VDC
	24V Input Models					18	
	48V Input Models					36	
Under Voltage Shutdown	12V Input Models				7.5		VDC
	24V Input Models				16		
	48V Input Models				34		
Input Filter	All Models				Internal LC Type		
OUTPUT SPECIFICATIONS							
Output Voltage					See Table		
Voltage Accuracy						±1.0	% Vnom.
Line Regulation	Vin=Min. to Max. @ Full Load	Single Outputs				±0.2	%
		Dual Outputs				±0.5	
Load Regulation	Io=0% to 100%	Single Outputs	3.3V &5V			±0.5	%
			12V, 15V, & 24V			±0.2	
		Dual Outputs				±1.0	
Voltage Balance	Dual Output, Balanced Loads					±2.0	%
Load Cross Regulation (Dual Outputs)	Asymmetrical Load 25%/100% Full Load					±5.0	%
Output Power					See Table		
Output Current					See Table		
Minimum Load					No Minimum Load Requirement		
Maximum Capacitive Load					See Table		
Ripple & Noise [4]	3.3V & 5V Models					75	mVp-p
	12V, 15V, & Dual Output Models					100	
	24V Models					150	
Transient Recovery Time[3]	25% Load Step Change				300		µsec
Transient Response Deviation	25% Load Step Change				±3	±5	%
Temperature Coefficient						±0.02	%/ºC
Trim Up/Down Range	% of nominal output voltage					±10%	
Start Up Time	Nominal Vin and Constant Resistive Load	Power Up				30	ms
		Remote On/Off				30	
REMOTE ON/OFF CONTROL							
Converter On					3.5V~12V or Open Circuit		
Converter Off					0V~1.2V or Short Circuit		
Control Input (On)	Vctrl=5.0V					0.5	mA
Control Input (Off)	Vctrl=0V					-0.5	mA
Control Common					Referenced to Negative Input		
Standby Input Current	Supply Off & Nominal Vin				3		mA
PROTECTION							
Short Circuit Protection					Hiccup Mode 0.7Hz typ. Automatic Recovery		
Over Load Protection	Hiccup				150		%
Over Voltage Protection					See Table		
GENERAL SPECIFICATIONS							
Efficiency					See Table		
Switching Frequency					300		KHz
Isolation Voltage	60 Seconds			1500			VDC
	1 Second			1800			
Isolation Resistance	500VDC			1000			MΩ
Isolation Capacitance	1000KHz, 1V					1500	pF

SPECIFICATIONS

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

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	Natural Convection, Nominal Vin, Load 100% Inom.		Min	Max. Without Heatsink	Max. With Heatsink	Unit
		DCMJW15-24S24, 48S24	40	78	82	ºC
		DCMJW15-12S24, 12D15, 24S12, 24S15, 24D12, 24D15, 48S12, 48S15, 48D15	40	75	80	
		DCMJW15-48S033	40	74	79	
		DCMJW15-12S033, 24S033	40	72	77	
		DCMJW15-12S05, 12S12, 12S15, 12D12, 48D12	40	71	77	
		DCMJW15-24S05, 48S05	40	68	74	
Storage Temperature			-50		+125	ºC
Thermal Impedance	20LFM Convection without Heatsink		18.2			ºC/W
	20LFM Convection with Heatsink		15.3			
	100LFM Convection without Heatsink		13.9			
	100LFM Convection with Heatsink		8.8			
	200LFM Convection without Heatsink		12.1			
	200LFM Convection with Heatsink		6.8			
	400LFM Convection without Heatsink		9.1			
	400LFM Convection with Heatsink		4.6			
Humidity	Non-Condensing			95		%RH
Case Temperature					105	ºC
Cooling			Natural Convection			
Lead Temperature	1.5mm from case for 10 sec.				260	ºC
MTBF	MIL-HDBK-217@25ºC, Ground Benign		1,489,680			Hours
PHYSICAL SPECIFICATIONS						
Weight			0.53oz (15g)			
Dimensions (L x W x H)			1in x 1in x 0.40in (25.4mm x 25.4mm x 10.16mm)			
Case Material			Aluminum Alloy, Black Anodized Coating			
Base Material			FR4 PCB (Flammability to UL 94V-0 rated)			
Pin Material			Tinned Copper			
RFI			Six-Sided Shielded, Metal Case			
SAFETY CHARACTERISTICS						
Safety Approvals (Pending)	UL/cUL 60905-1 Recognition (UL Certificate), IEC/EN 60950-1 (CB Report) UL/cUL 62368-1 recognition (UL Certificate), IEC/EN 62368-1 (CB Report)					
EMI		EN55022, FCC part 15				Class A
ESD	EN61000-4-2	Air ±8kV, Contact ±6kV		A		
Radiated Immunity	EN61000-4-3	10V/m		A		
Fast Transient	EN61000-4-4	±2kV		A		
Surge	EN61000-4-5	±1kV		A		
Conducted Immunity	EN61000-4-6	10V/rms		A		
PFMF	EN61000-4-8	3A/m		A		

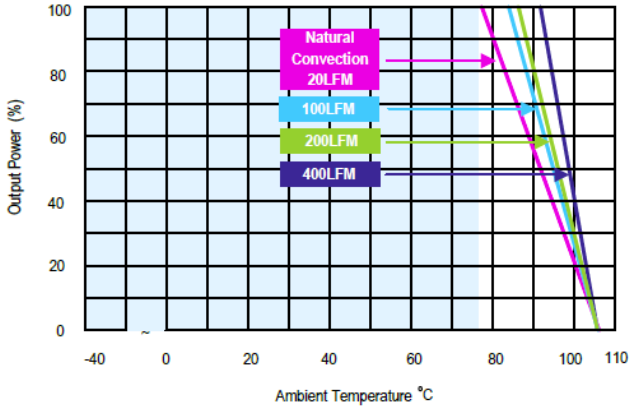
NOTES

1. Heatsink is available for this series. Add “HS” to end of model number to indicated Heatsink.
2. # for each output.
3. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
4. Ripple & Noise measured with a 1µF MLCC.
5. It is recommended to protect the converter by a slow blow fuse in the input supply line.
6. Other input and output voltages may be available, please contact factory.
7. To meet EN61000-4-4 & EN61000-4-5 an external capacitor across the input pins is required.
   Suggested Capacitor: 12XXX, XXS033, XXS05: CHEMI-CON KY Series 470µF/100V.
   Other Models: CHEMI-CON KY Series 220µF/100V.
8. Natural convection is about 20LFM but is not equal to still air (0 LFM).
9. Please note this is a tentative data sheet.

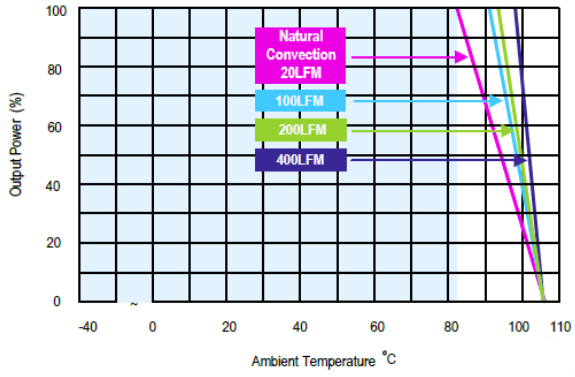
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES

DCMJW15-24S24, 48S24
Derating Curve without Heatsink



DCMJW15-24S24, 48S24
Derating Curve with Heatsink



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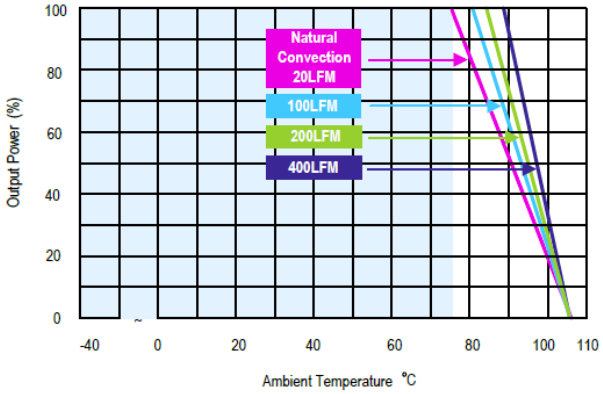

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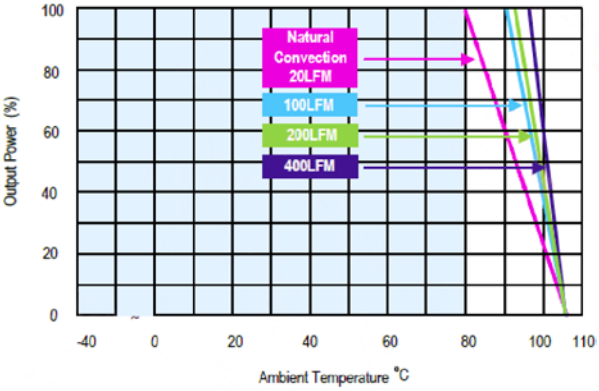
Derating Curve with Heatsink



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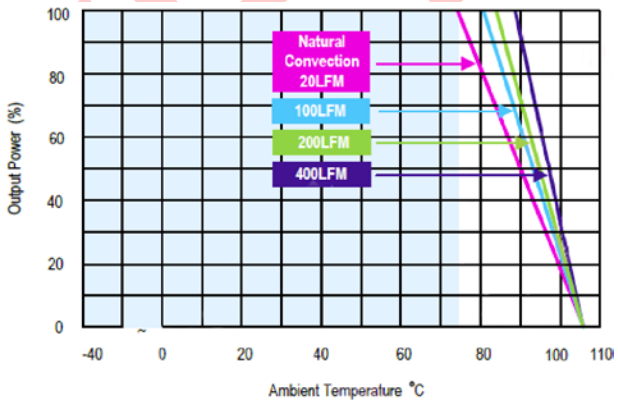
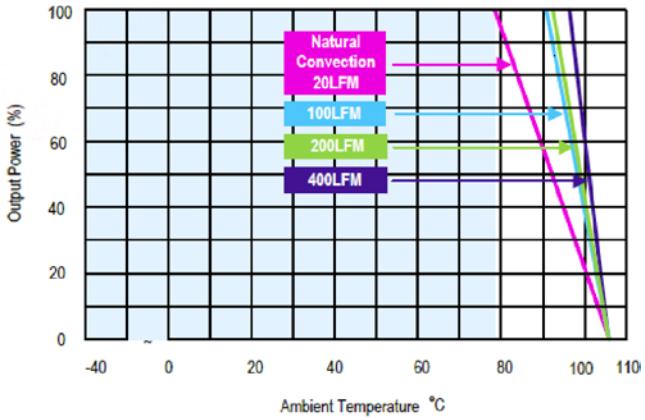
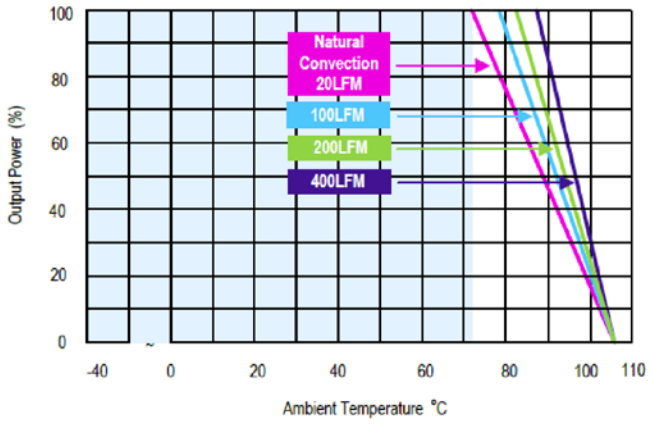


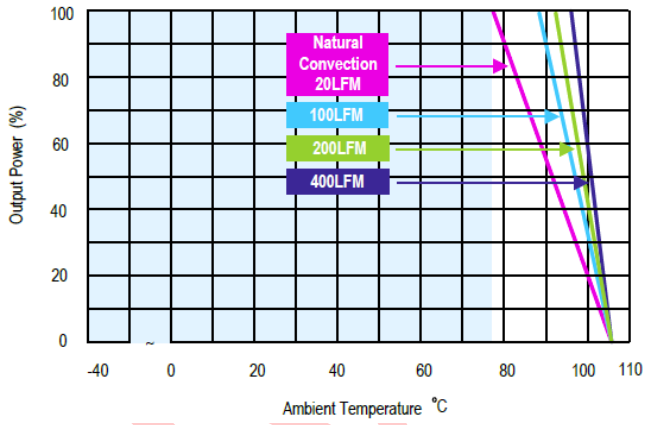
DCMJW-48S033
Derating Curve with Heatsink



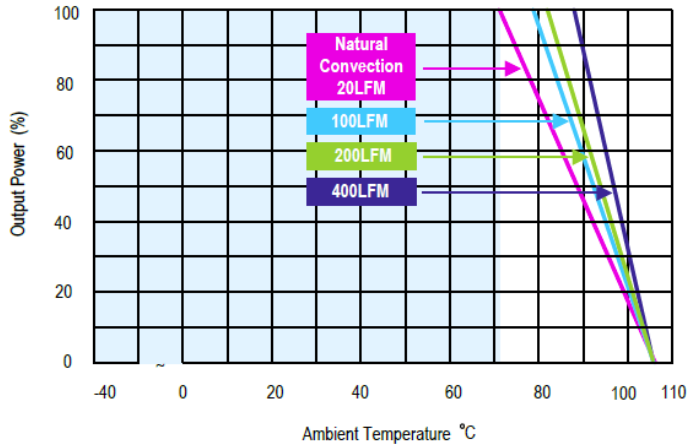
DCMJW15-12S033, 24S033
Derating Curve without Heatsink



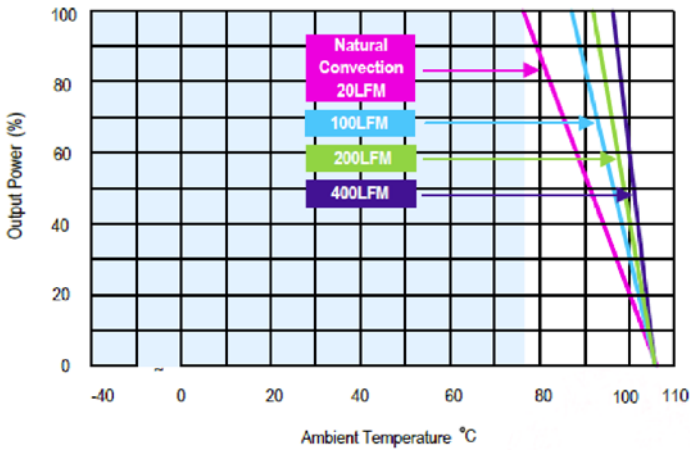
DCMJW15-12S033, 24S033
Derating Curve with Heatsink



DCMJW15-12S05, -12S12, -12S15, -12D12, -48D12
Derating Curve without Heatsink



DCMJW15-12S05, -12S12, -12S15, -12D12, -48D12
Derating Curve with Heatsink



DCMJW15-24S05, 48S05
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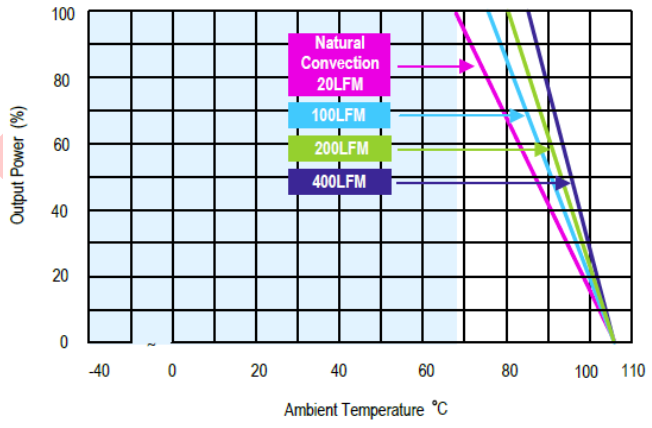
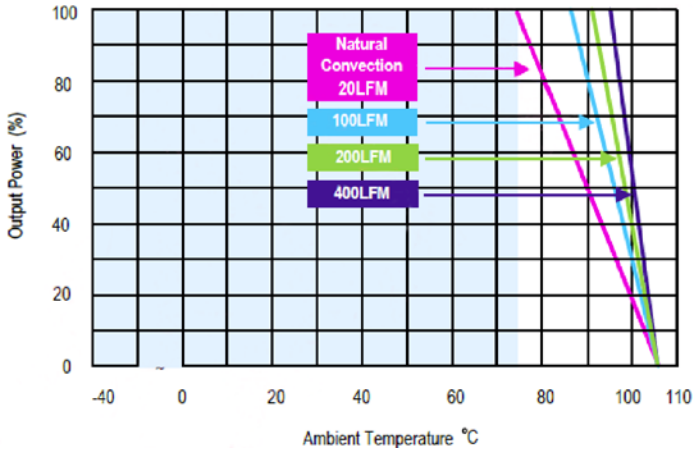
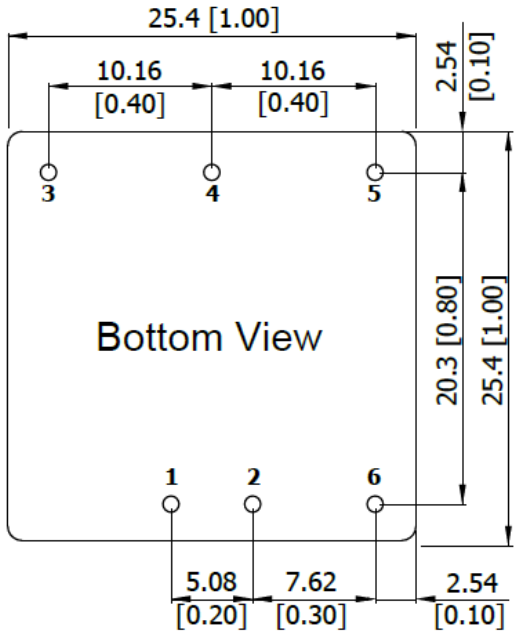
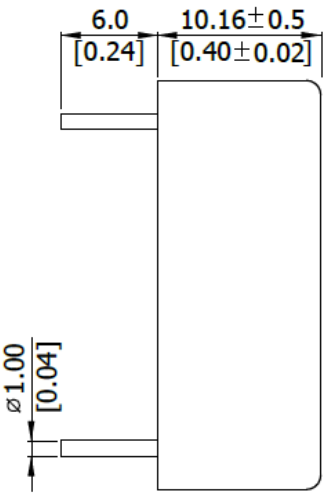


DCMJW15-24S05, 48S05
Derating Curve with Heatsink



MECHANICAL DRAWINGS



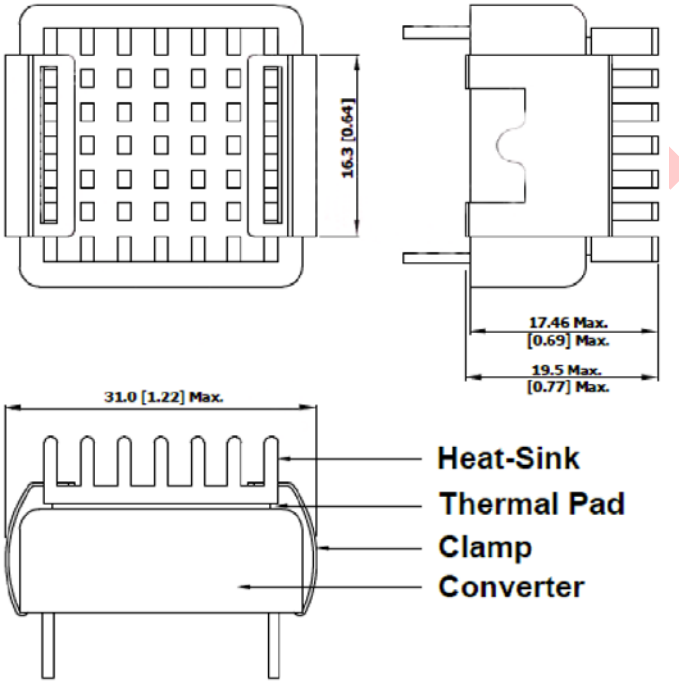


PIN CONNECTIONS

Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

Notes:
All dimensions in mm (inches)
Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin Diameter Ø1.0±0.05 (0.04±0.002)

HEATSINK OPTIONS

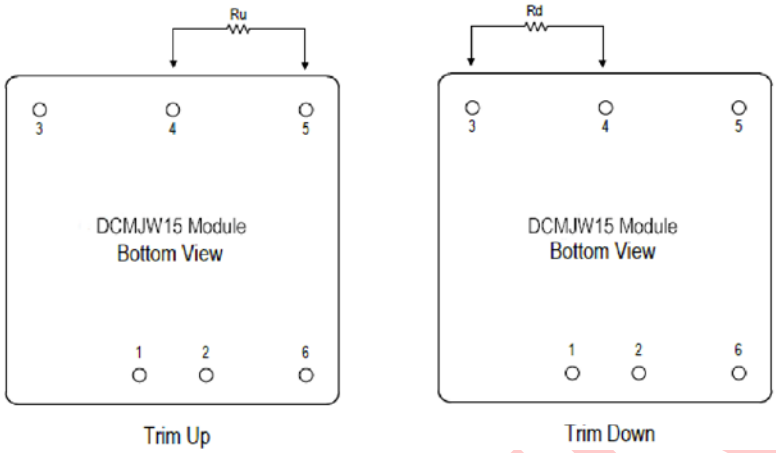


Heatsink Material: Aluminum
Finish: Anodic Treatment (Black)
Weight: 2g

The advantages of adding a heatsink are:
1. To improve heat dissipation and increase the stability and reliability of the DC/DC converters at high operating temperature.
2. To increase operating of the DC/DC converter, refer to derating curves.

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using method shown below.



DCMJW15-XXS033 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	72.61	32.55	19.20	12.52	8.51	5.84	3.94	2.51	1.39	0.50	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	60.84	27.40	16.25	10.68	7.34	5.11	3.51	2.32	1.39	0.65	KOhms

DCMJW15-XXS05 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	138.8	62.41	36.92	24.18	16.53	11.44	7.79	5.06	2.94	1.24	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	106.87	47.79	28.06	18.21	12.30	8.36	5.55	3.44	1.79	0.48	KOhms

DCMJW15-XXS12 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	413.55	184.55	108.22	70.05	47.15	31.88	20.89	12.80	6.44	1.35	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	351.00	157.50	93.00	60.75	41.40	28.50	19.29	12.37	7.00	2.70	KOhms

DCMJW15-XXS15 Trim Table

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	530.73	238.61	141.24	92.56	63.35	43.87	29.96	19.53	11.41	4.92	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	422.77	189.89	112.26	73.44	50.15	34.63	23.54	15.22	8.75	3.58	KOhms

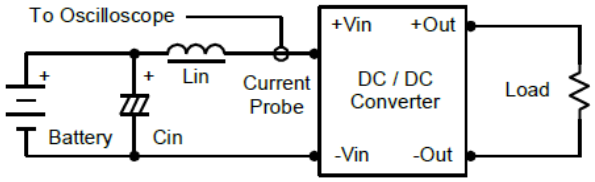
DCMJW15-XXS24

Trim Down	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox0.99	Vox0.98	Vox0.97	Vox0.96	Vox0.95	Vox0.94	Vox0.93	Vox0.92	Vox0.91	Vox0.90	Volts
Rd=	598.66	267.78	157.49	102.34	69.25	47.19	31.44	19.62	10.43	3.08	KOhms
Trim Up	1	2	3	4	5	6	7	8	9	10	%
Vout=	Vox1.01	Vox1.02	Vox1.03	Vox1.04	Vox1.05	Vox1.06	Vox1.07	Vox1.08	Vox1.09	Vox1.10	Volts
Ru=	487.14	218.02	128.31	83.46	56.55	38.61	25.79	16.18	8.70	2.72	KOhms

TEST SETUP

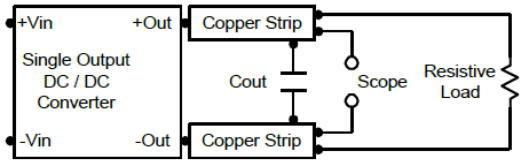
Input Reflected-Ripple Current Test Setup

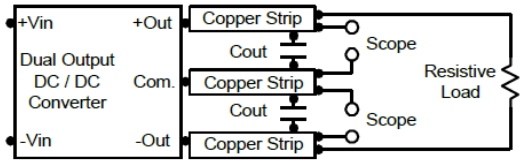
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR <1.0Ω at 100KHz) to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500 KHz.



Peak-to-Peak Output Noise Measurement Test

Use a 1µF 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.





TECHNICAL NOTES

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 0V to 1.2V. A logic high is 3.5V to 12V. The maximum sink current at the on/off terminal (Pin 6) during a logic low is -500µA. The maximum allowable leakage current of a switch connected to the on/off terminal (Pin 6) at logic high (3.5V to 12V) is 10mA.

Overload Protection

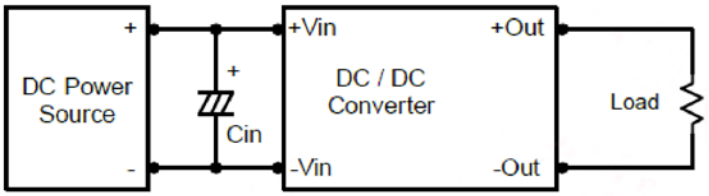
To provide hiccup mode protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration.

Overvoltage 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 overvoltage. The OVP level can be found in the output data.

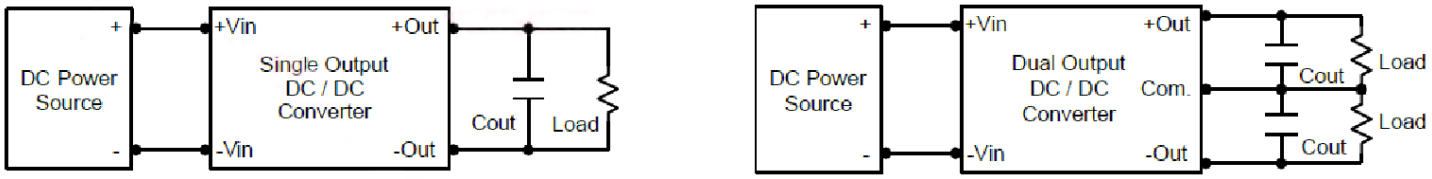
Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the module. In applications where power is supplies over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. 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 <1.0 Ω at 100KHz) capacitor of a 10µF for the 24V and 48V devices.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as practically possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 4.7µF capacitors at the output.

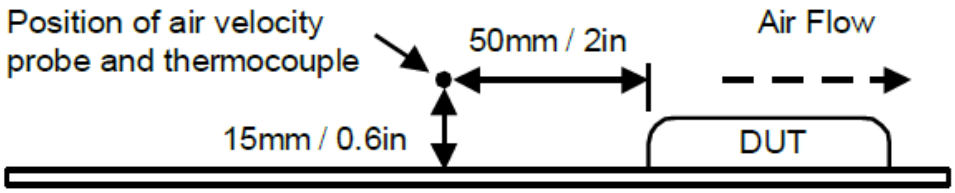


Maximum Capacitive Load

The DCMJW15 series has limitation of maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time. The maximum capacitance can be found in the data sheet.

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 them maximum temperature rating of the components inside the power module, the case temperature must be kept below 105ºC. The derating curves are determined from the measurements obtained in a test setup.



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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