Size:
1.0 x 1.0 x 0.4 inches
25.4 x 25.4 x 10.16 mm

Weight:
0.53oz (15g)

Applications:
- Battery Operated Equipment
- Instrumentation
- Distributed Power Architectures
- Communication & Industrial Electronics

FEATURES

- RoHS Compliant
- Up to 10 Watts Output Power
- Single & Dual Outputs
- Remote On/Off Control
- 1500VDC I/O Isolation
- High Efficiency up to 87%
- 1.0" x 1.0" x 0.4" Package Size
- 4:1 Ultra Wide Input Voltage Ranges
- Shielded Metal Case with Isolated Base-plate
- -40°C to +80°C Operating Temperature Range
- Over Load & Short Circuit Protection
- UL/IEC/EN 60950-1 Safety Approvals (Pending)
- Input Filter Complies to EN55022, Class A & FCC, Level A
- Heatsink (Optional)

DESCRIPTION

The DCMJU10 series of DC/DC power converters offers 10 Watts of output power in a 1.0" x 1.0" x 0.4" shielded metal package with an industry standard pin-out. This series consists of single and dual output models with a 4:1 ultra wide input voltage range and tight output voltage regulation. State-of-the-art circuit topology provides a very high efficiency up to 87% and an operating temperature range of -40°C to +80°C. Further features include remote on/off control, 1500VDC I/O isolation, and over load and short circuit protection. These converters are RoHS compliant and are ideal for use in battery operated equipment, instrumentation, distributed power architectures in communication and industrial electronics and many other space critical applications.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Output Power	Efficiency	Maximum Capacitive Load
			Min [1]	Max	No Load	Max Load			
DCMJU24S33-10	24 VDC (9 - 36 VDC)	3.3 VDC	330mA	2200mA	30mA	352mA	7.26W	86%	560µF
DCMJU24S05-10		5 VDC	300mA	2000mA		496mA	10W	84%	560µF
DCMJU24S51-10		5.1 VDC	300mA	2000mA		506mA	10.2W	84%	560µF
DCMJU24S12-10		12 VDC	125mA	830mA		483mA	10W	86%	150µF
DCMJU24S15-10		15 VDC	100mA	660mA		474mA	10W	87%	150µF
DCMJU24S24-10		24 VDC	62mA	410mA		477mA	9.84W	86%	68µF
DCMJU48S33-10	48 VDC (18 - 75 VDC)	3.3 VDC	330mA	2200mA	20mA	180mA	7.26W	85%	560µF
DCMJU48S05-10		5 VDC	300mA	2000mA		248mA	10W	84%	560µF
DCMJU48S51-10		5.1 VDC	300mA	2000mA		253mA	10.2W	84%	560µF
DCMJU48S12-10		12 VDC	125mA	830mA		241mA	10W	86%	150µF
DCMJU48S15-10		15 VDC	100mA	660mA		237mA	10W	87%	150µF
DCMJU48S24-10		24 VDC	62mA	410mA		238mA	9.84W	86%	68µF

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Output Power	Efficiency	Maximum Capacitive Load
			Min [1]	Max	No Load	Max Load			
DCMJU24D05-10	24 VDC (9 - 36 VDC)	±5 VDC	±150mA	±1000mA	30mA	496mA	10W	84%	±220µF
DCMJU24D12-10		±12 VDC	±62mA	±410mA		477mA	9.84W	86%	±100µF
DCMJU24D15-10		±15 VDC	±50mA	±330mA		474mA	10W	87%	±100µF
DCMJU48D05-10	48 VDC (18 - 75 VDC)	±5 VDC	±150mA	±1000mA	20mA	248mA	10W	84%	±220µF
DCMJU48D12-10		±12 VDC	±62mA	±410mA		238mA	9.84W	86%	±100µF
DCMJU48D15-10		±15 VDC	±50mA	±330mA		237mA	10W	87%	±100µF

NOTES

1. The DCMJU10 series requires a minimum output loading to maintain specified regulations. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
2. Transient recovery time is measured to within 1% error band for a step change in output load from 75% to 100%.
3. All DC/DC converters should be externally fused at the front end for protection.
4. To order the converter with a heatsink, please add the suffix "HS" to the model number. (Ex: DCMJU24S12-10HS)
5. Other input and output voltages may be available; please call factory for ordering details.

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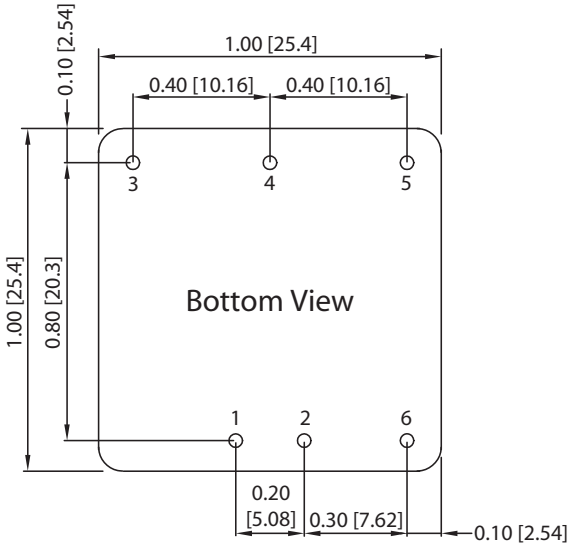
SPECIFICATIONS: DCMJU10 SERIES

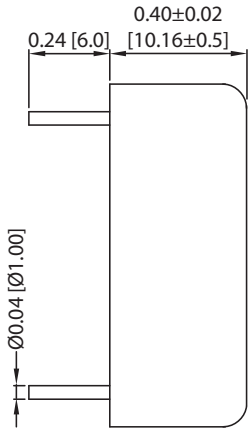
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range		24VDC nominal input models	9	24	36	VDC
		48VDC nominal input models	18	48	75	
Input Surge Voltage (100ms max.)		24VDC nominal input models	-0.7		50	VDC
		48VDC nominal input models	-0.7		100	
Start-up Voltage		24VDC nominal input models			9	VDC
		48VDC nominal input models			18	
Under Voltage Shutdown		24VDC nominal input models			8.5	VDC
		48VDC nominal input models			17	
Input Current			See Table			
Reverse Polarity Input Current					1.5	A
Short Circuit Input Power					3000	mW
Internal Power Dissipation					5000	mW
Input Fuse *(Note 3)*		24VDC nominal input models	2000mA slow-blow type			
		48VDC nominal input models	1000mA slow-blow type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Output Voltage Accuracy				±1.0	±2.0	%
Output Voltage Balance (Dual Outputs)		Balanced loads		±1.0	±2.0	%
Line Regulation		Low line to high line at full load		±0.3	±1.0	%
Load Regulation		15% load to 100% load		±0.5	±1.2	%
Minimum Load			See Table			
Output Power			See Table			
Output Current			See Table			
Ripple & Noise (20MHz BW) *(Page 5)*				60	100	mVp-p
		Over line, load, and temperature			150	
Transient Recovery Time *(Note 2)*		25% load step change		300	600	µs
Transient Response Deviation		25% load step change		±3	±6	%
Temperature Coefficient				±0.01	±0.02	%/°C
PROTECTION						
Over Load Protection		foldback	110	150		%
Short Circuit Protection			Continuous			
REMOTE ON/OFF *(Page 4)*						
Positive Logic	Converter On		2.5V~50V or open circuit			
	Converter Off		0V~1.0V or short circuit (Pin 2 and Pin 6)			
Control Input Current	On	Vctrl = 5V			500	µA
	Off	Vctrl = 0V			-500	
Control Common			Referenced to negative input			
Stand-by Input Current		Nominal Vin			10	mA
GENERAL						
Efficiency			See Table			
Switching Frequency				450		KHz
Isolation Voltage (Input to Output)		60 seconds	1500			VDC
Isolation Resistance		500VDC	1000			MΩ
Isolation Capacitance		100kHz, 1V			1500	pF
Maximum Capacitive Load			See Table			
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature Range		With derating	-40		+80	°C
Case Temperature					+100	°C
Storage Temperature			-50		+125	°C
Humidity		Non-condensing			95	% RH
RFI			Six-sided shielded metal case			
Cooling			natural convection			
Lead Temperature		1.5mm from case for 10 seconds			260	°C
MTBF (calculated)		MIL-HDBK-217F at 25°C, Ground Benign	350,000			hours
PHYSICAL SPECIFICATIONS						
Weight			0.53oz (15g)			
Dimensions (L x W x H)			1.00 x 1.00 x 0.43 inches (25.4 x 25.4 x 10.16 mm)			
Case Material			Aluminum alloy, black anodized coating			
Base Material			FR4 PCB (flammability to UL 94V-0 rated)			
SAFETY & EMC						
Safety Approvals (pending)		UL/cUL 60950-1 recognition (CSA certificate), IEC/EN 60950-1 (CB-scheme)				
Conducted EMI		EN55022 Class A & FCC part 15 Class A Compliance				

MECHANICAL DRAWINGS

Standard Models





PIN CONNECTIONS		
PIN	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

Unit: inches [mm]

Tolerance: X.XX±0.01 [X.X±0.25]
X.XXX±0.005 [X.XX±0.13]

Pin Diameter: Ø0.04±0.002 [Ø1.0±0.05]

Physical Characteristics

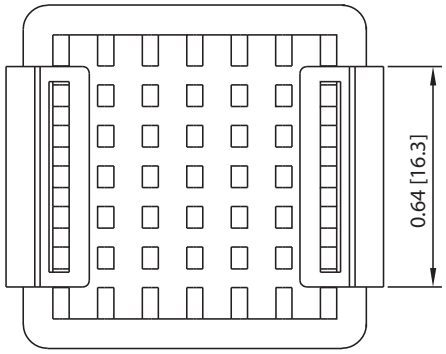
Case Size: 1.0 x 1.0 x 0.4 inches [25.4 x 25.4 x 10.16 mm]

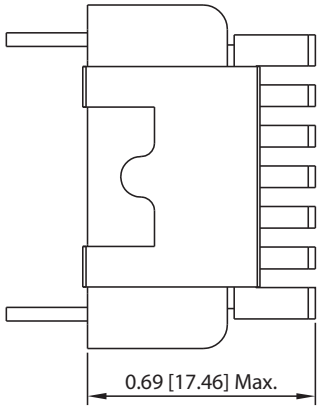
Case Material: Aluminum alloy, black anodized coating

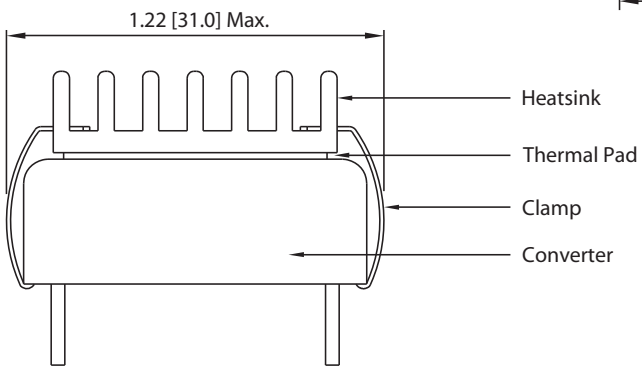
Base Material: FR4 PCB (flammability to UL 94V-0 rated)

Weight: 0.53oz (15g)

Heatsink Option (Suffix "HS")







Unit: inches [mm]

Physical Characteristics

Heatsink Material: Aluminum

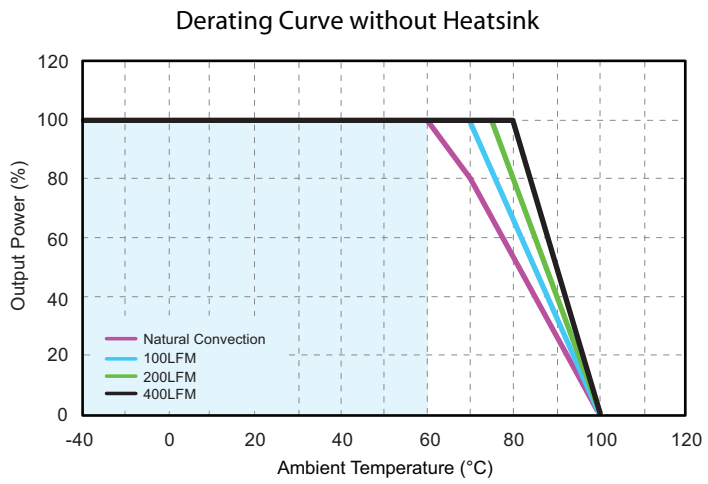
Finish: Anodic treatment (black)

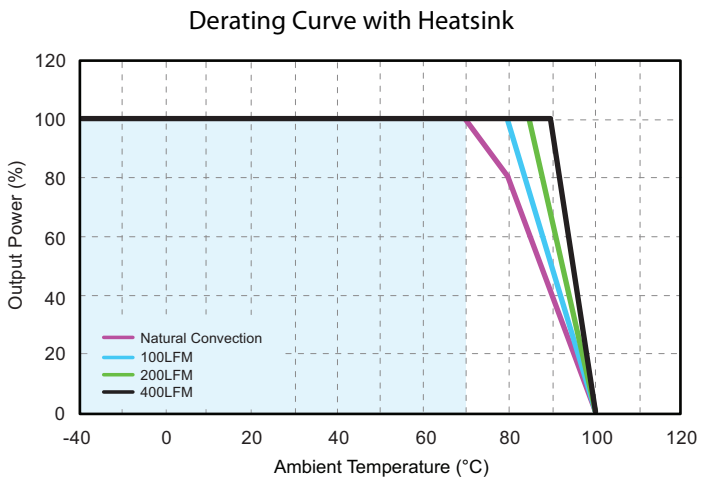
Heatsink Weight: 0.07oz (2g)

Advantages of Adding a Heatsink

1. To help heat dissipation and increase the stability and reliability of DC/DC converters at high operating temperature atmosphere.
2. To upgrade the operating temperature of DC/DC converters, please refer to Derating Curves.
3. To order the module with a heatsink please add the suffix "HS" to the model number (Ex: DCMJU24S12-10HS)

DERATING CURVES





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. To turn the 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 1V. A logic high is 2.5V to 50V. The maximum sink current at on/off terminal during a logic low is -500µA. The maximum allowable leakage current of the switch at on/off terminal (2.5V to 50V) is 500µA.

Over Current Protection

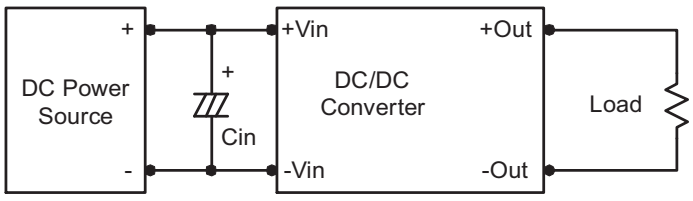
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once 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 6.8µF for the 24V and 48V devices.



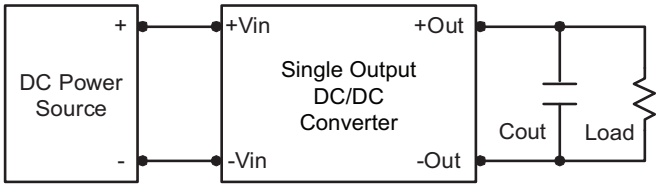
Maximum Capacitive Load

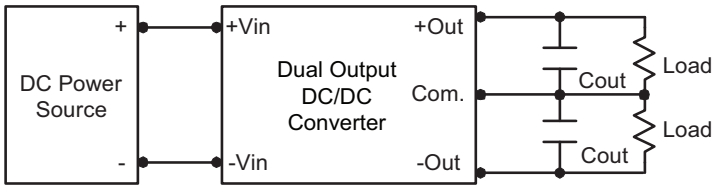
The DCMJU10 series has a limitation of maximum connected capacitance on the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the start-up time. The maximum capacitance can be found in the model selection table.

DESIGN & FEATURE CONSIDERATIONS

Output Ripple Reduction

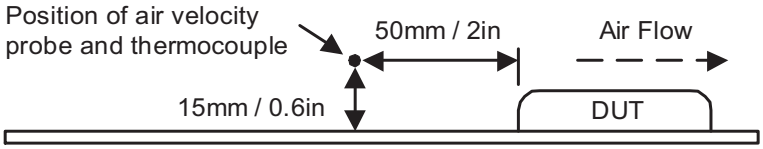
A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 4.7µF capacitors at the output.





Thermal Considerations

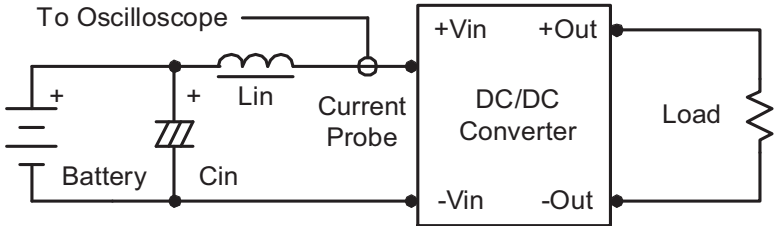
Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 100°C. The derating curves are determined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



TEST CONFIGURATIONS

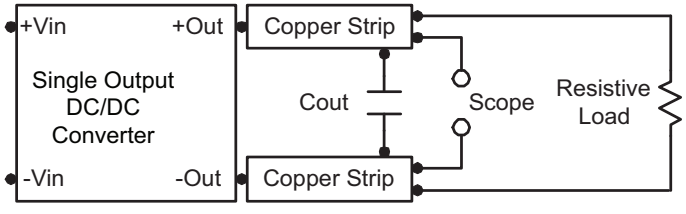
Input Reflected-Ripple Current Test Setup

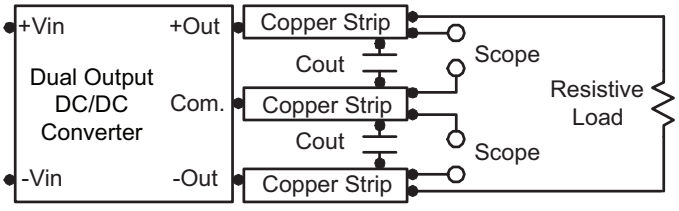
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100 KHz) to simulate source impedance. Capacitor Cin offsets possible battery impedance. Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



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.





MODEL NUMBER SETUP

DCMJU	24	S	12	-	10	HS
Series Name	Input Voltage	Output Quantity	Ouptut Voltage		Output Power	Heatsink
	24: 9-36 VDC **48:** 18-75 VDC	**S:** Single Output	**3.3:** 3.3 VDC **05:** 5 VDC **5.1:** 5.1 VDC **12:** 12 VDC **15:** 15 VDC **24:** 24 VDC		**10:** 10 Watts	**None:** No Heatsink **HS:** Heatsink
		D: Dual Output	**05:** ±5 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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