



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 EN55032, 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.

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

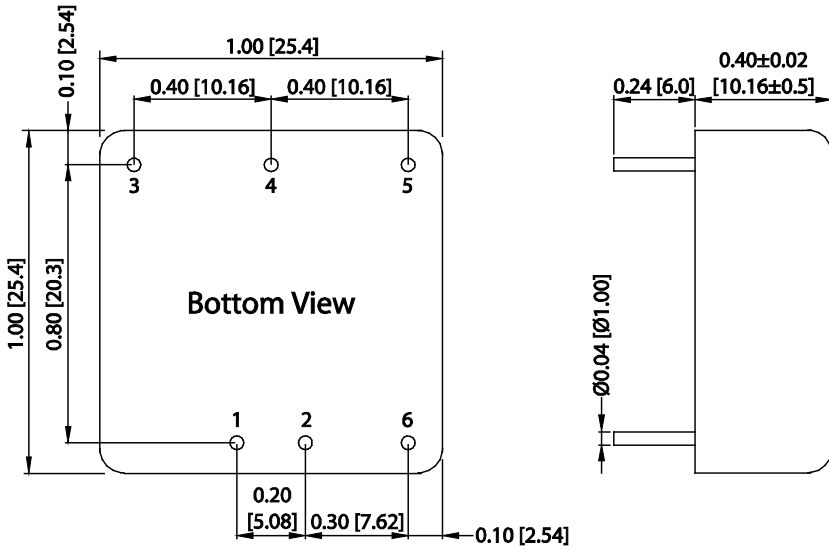
SPECIFICATIONS: DCMJU10 SERIES

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 | | | 2500 | | 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 | | | |
| Input Filter | All Models | Internal Pi Type | | | |
| OUTPUT SPECIFICATIONS | | | | | |
| Output Voltage | | See Table | | | |
| Output Voltage Accuracy | | | | ±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 | | % |
| Minimum Load | | See Table | | | |
| Output Power | | See Table | | | |
| Output Current | | See Table | | | |
| Ripple & Noise (20MHz BW) (Page 5) | 0-20MHz Bandwidth | | | 100 | mVp-p |
| 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 | | Hiccup Mode, Automatic Recovery | | | |
| 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 |
| | 1 second | 1800 | | | |
| Isolation Resistance | 500VDC | 1000 | | | MΩ |
| Isolation Capacitance | 100kHz, 1V | | | 1500 | pF |
| Maximum Capacitive Load | | See Table | | | |
| ENVIRONMENTAL SPECIFICATIONS | | | | | |
| Operating Temperature Range | With derating, Natural Convection | -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 | | EN55032 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

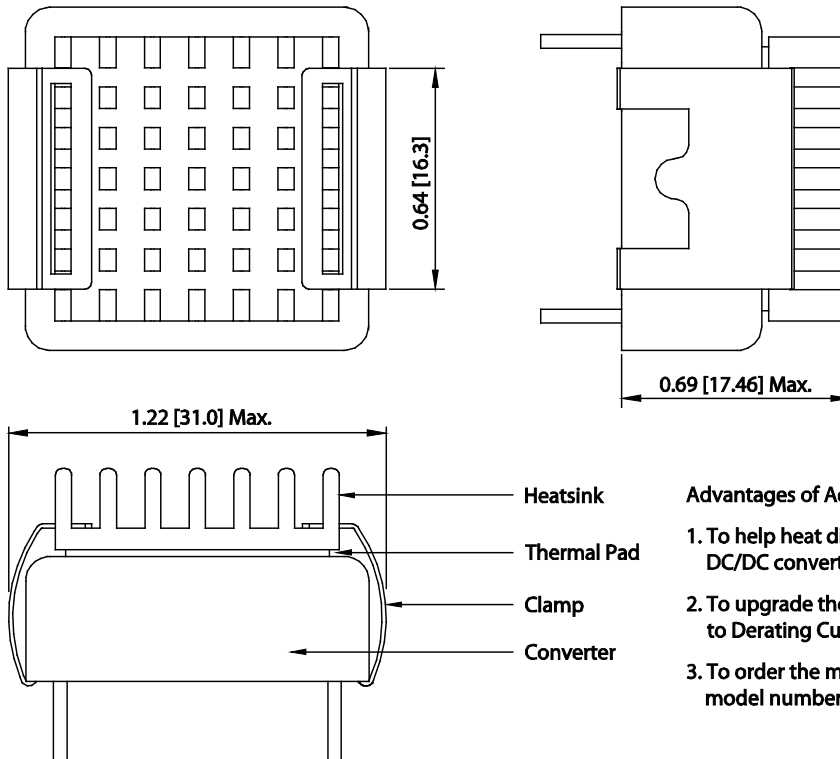
Case Size: 1.0 x 1.0 x 0.4 inches [25.4 x 25.4 x 10.16 mm]

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

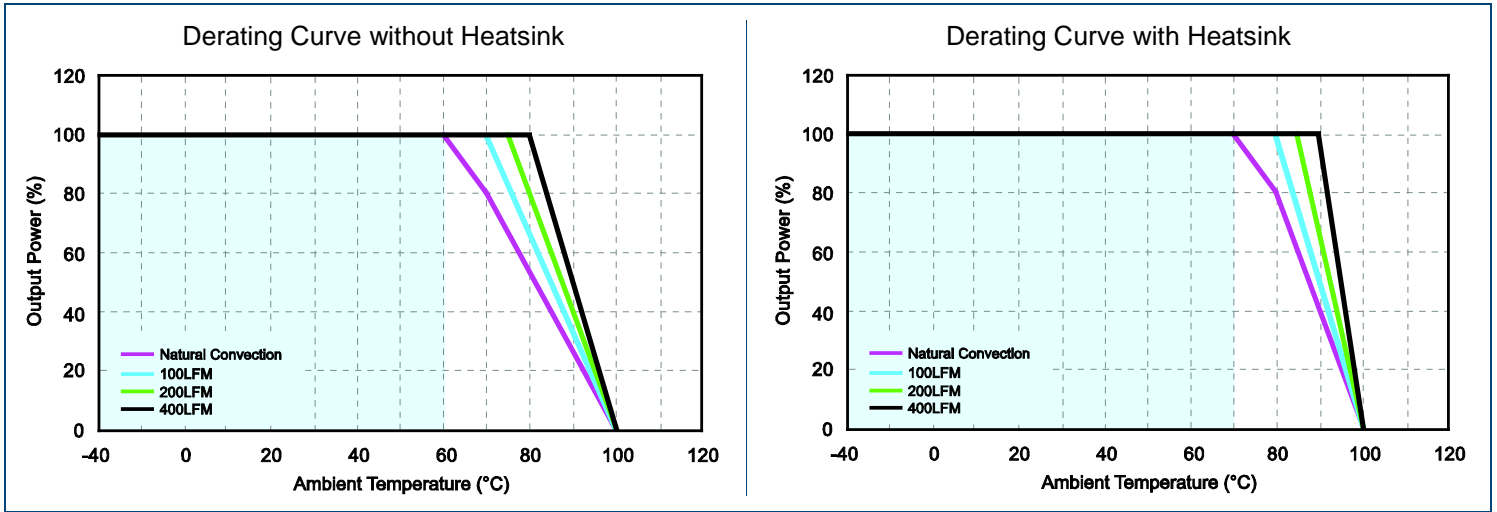
Finish: Anodic treatment (black)

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

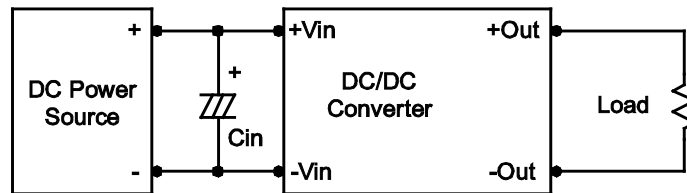
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once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



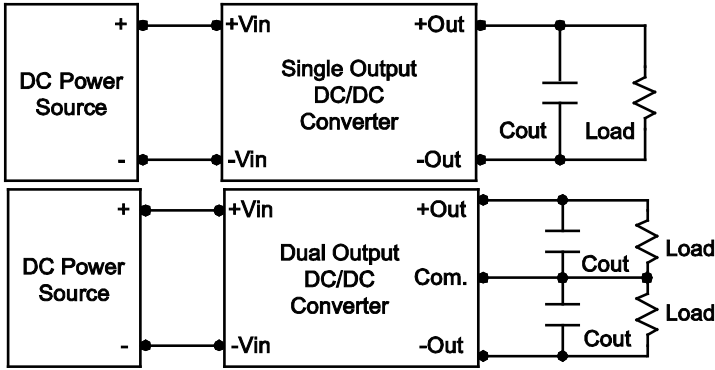
Maximum Capacitive Load

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

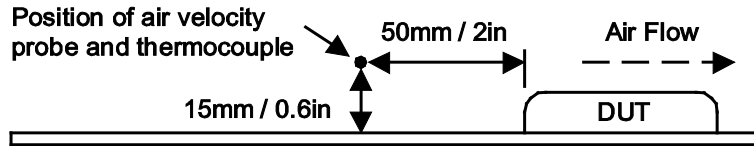
Output Ripple Reduction

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

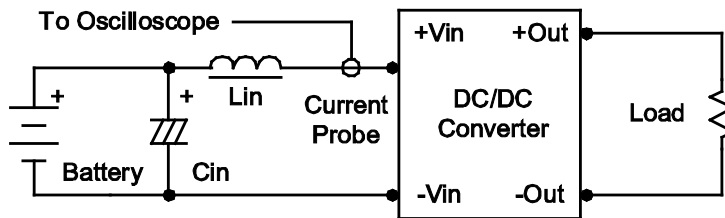
Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 100°C. The derating curves are determined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



TEST CONFIGURATIONS

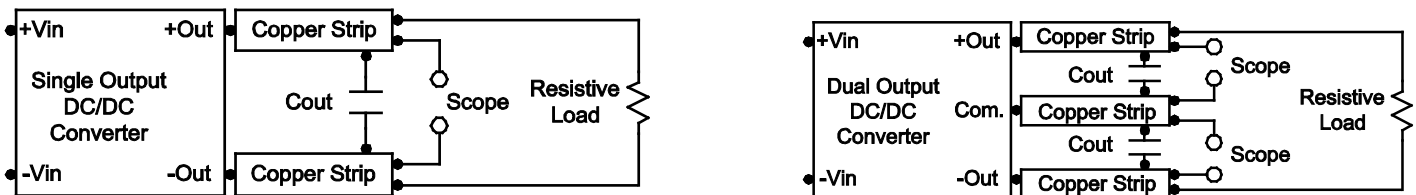
Input Reflected-Ripple Current Test Setup

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 | Ouput Voltage | | Output Power | Heatsink |
| | 24: 9-36 VDC 48: 18-75 VDC | S: Single Output D: Dual Output | 3.3: 3.3 VDC 05: 5 VDC 5.1: 5.1 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 05: ±5 VDC 12: ±12 VDC 15: ±15 VDC | | 10: 10 Watts | None: No Heatsink HS: Heatsink |

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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