

Size: 1in x 1in x 0.46in (25.4mm x 25.4mm x 11.7mm)

FEATURES

- 4:1 Wide Input Voltage Range
- High Efficiency up to 88%
- I/O Isolation Test Voltage: 1.5KVDC
- Industry Standard Pin-Out
- Input Under-Voltage, Output Over Voltage, Over Current, and Short Circuit Protection
- RoHS Compliant
- EN62368 Approved

APPLICATIONS

- Industrial
- Communication
- Robotics

DESCRIPTION

The DCURB30 series of DC/DC converters offers up to 30 watts of output power in a 1" x 1" x 0.46" compact through hole case. This series consists of single output models with a wide 4:1 input voltage range. Each model in this series is RoHS compliant, has high efficiency, and I/O isolation test voltage of 1.5kVDC. This series has input under-voltage, and output over voltage, over current, and short circuit protection as well as EN62368 approvals.

MODEL SELECTION TABLE

| Model Number | Input Voltage Range | | Output Voltage | Output Current | | Output Power | Maximum Capacitive Load | Full Load Efficiency ⁽²⁾ | | Certification |
|---------------|---------------------|---------------------|----------------|----------------|--------|--------------|-------------------------|-------------------------------------|------|---------------|
| | Nominal | Max. ⁽¹⁾ | | Min | Max | | | Min. | Typ. | |
| DCURB4805-30W | 48VDC (18-75) | 80VDC | 5VDC | 0mA | 6000mA | 30W | 7200µF | 86% | 88% | UL/CE/CB |
| DCURB4812-30W | | | 12VDC | 0mA | 2500mA | | 2000µF | 86% | 88% | |
| DCURB4815-30W | | | 15VDC | 0mA | 2000mA | | 1500µF | 86% | 88% | - |
| DCURB4824-30W | | | 24VDC | 0mA | 1250mA | | 470µF | 86% | 88% | UL/CE/CB |

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load 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 | 48VDC Input | | 18 | 48 | 75 | VDC | |
| Input Current | Full Load, Nominal Input Voltage | | | 710 | 735 | mA | |
| | No Load, Nominal Input Voltage | | | 8 | 15 | | |
| Reflected Ripple Current | Nominal Input Voltage | | | 40 | | mA | |
| Surge Voltage (1 sec. max.) | Nominal Input Voltage | | -0.7 | | 100 | VDC | |
| Start Up Voltage | Nominal Input Voltage | | | | 18 | VDC | |
| Under-Voltage Protection | Nominal Input Voltage | | 12 | 15.5 | | VDC | |
| Ctrl ⁽³⁾ | Module On | | Ctrl Pin Open or Pulled High (TTL 3.5-12VDC) | | | | |
| | Module Off | | Ctrl Pin Pulled Low to GND (0-1.2VDC) | | | | |
| | Input Current When Switched Off | | | 2 | 7 | mA | |
| Input Filter | | | Capacitance Filter | | | | |
| Hot Plug | | | Unavailable | | | | |
| OUTPUT SPECIFICATIONS | | | | | | | |
| Output Voltage | | | See Table | | | | |
| Voltage Accuracy | 5%-100% Load | | | ±1 | ±3 | % | |
| Linear Regulation | Input voltage variation from low to high line at full load | | | ±0.2 | ±0.5 | % | |
| Load Regulation | 5%-100% Load | | | ±0.5 | ±1 | % | |
| Output Power | | | See Table | | | | |
| Output Current | | | See Table | | | | |
| Maximum Capacitive Load | | | See Table | | | | |
| Ripple & Noise ⁽⁴⁾ | 20MHz bandwidth, Nominal Input Voltage, 5%-100% Load | | 5V/12V/15V Output | | 60 | 120 | mVp-p |
| | | | 24V Output | | 60 | 150 | |
| Trim | Input Voltage Range | | 90 | | 110 | %Vo | |
| Transient Response Deviation | 25% Load Step Change, Nominal Input Voltage | | 5V Output | | ±3 | ±8 | % |
| | | Others | | ±3 | ±5 | | |
| Transient Recovery Time | 25% Load Step Change, Nominal Input Voltage | | | 250 | 500 | µs | |
| Temperature Coefficient | Full Load | | | | ±0.03 | %/°C | |
| Start-Up Time | Nominal input voltage & constant resistance load | | | 10 | | ms | |
| PROTECTION | | | | | | | |
| Short Circuit Protection | Input Voltage Range | | Continuous, Self-Recovery | | | | |
| Over Current Protection | Input Voltage Range | | 110 | 170 | 260 | %Io | |
| Over Voltage Protection | Input Voltage Range | | 110 | | 160 | %Vo | |

SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load unless otherwise noted. We reserve the right to change specifications based on technological advances.

| SPECIFICATION | | TEST CONDITIONS | Min | Typ | Max | Unit |
|--------------------------------------|--|-----------------|---|------|-----|------------------------|
| ENVIRONMENTAL SPECIFICATIONS | | | | | | |
| Operating Temperature | See Fig. 1 | | -40 | | 85 | °C |
| Storage Temperature | | | -55 | | 125 | °C |
| Storage Humidity | Non-Condensing | | 5 | | 95 | %RH |
| Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds | | | | 300 | °C |
| Vibration | | | 10-150Hz, 5G, 0.75mm, along X, Y, and Z | | | |
| MTBF | MIL-HDBK-217F@25°C | | 1000 | | | K hours |
| GENERAL SPECIFICATIONS | | | | | | |
| Efficiency | Full Load | | See Table | | | |
| Switching Frequency ⁽⁵⁾ | PWM Mode | | | 270 | | kHz |
| Isolation | Input-Output, Electric Strength Test for 1 minute with leakage current of 1mA max. | | 1500 | | | VDC |
| Insulation Resistance | Input-Output, Resistance at 500VDC | | 1000 | | | MΩ |
| Isolation Capacitance | Input-Output capacitance at 100KHz/0.1V | | | 2000 | | pF |
| PHYSICAL SPECIFICATIONS | | | | | | |
| Weight | Horizontal Package | | 0.65oz (18.4g) | | | |
| Dimensions (L x W x H) | Horizontal Package | | 1in x 1in x 0.46in (25.40mm x 25.40mm x 11.70mm) | | | |
| Case Material | | | Aluminum Alloy | | | |
| Cooling Method | | | Free Air Convection | | | |
| SAFETY CHARACTERISTICS | | | | | | |
| Approvals | | | EN62368 | | | |
| EMI | CE | CISPR32/EN55032 | | | | Class B ⁽⁷⁾ |
| | RE | CISPR32/EN55032 | | | | Class B ⁽⁷⁾ |
| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6kV | | | Perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m | | | Perf. Criteria B |
| | EFT | IEC/EN61000-4-4 | ±2kV ⁽⁶⁾ | | | Perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | Line to Line ±2kV ⁽⁶⁾ | | | Perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 3 Vr.m.s | | | Perf. Criteria B |

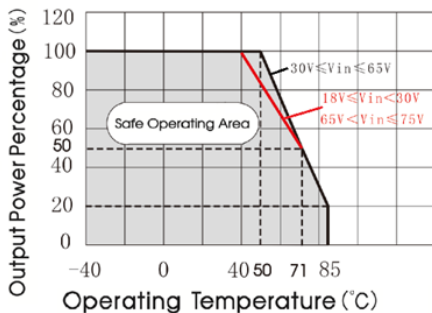
NOTES

- Exceeding maximum input voltage may cause permanent damage.
- Efficiency measured at nominal input and rated output load.
- Ctrl pin voltage is referenced to input GND.
- Ripple & Noise at <5% load is 300mV max. Parallel cable method is used for Ripple & Noise test.
- Switching frequency is measured at full load. Module reduces switching frequency for light load (below 50%) efficiency improvement.
- See Fig. 3-① for recommended circuit
- See Fig. 3-② for recommended circuit
- Maximum capacitive load offered were tested at input voltage range and full load
- Customization is available
- Products shall be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

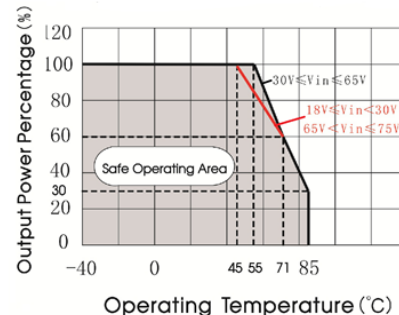
*Due to advances in technology, specifications subject to change without notice.

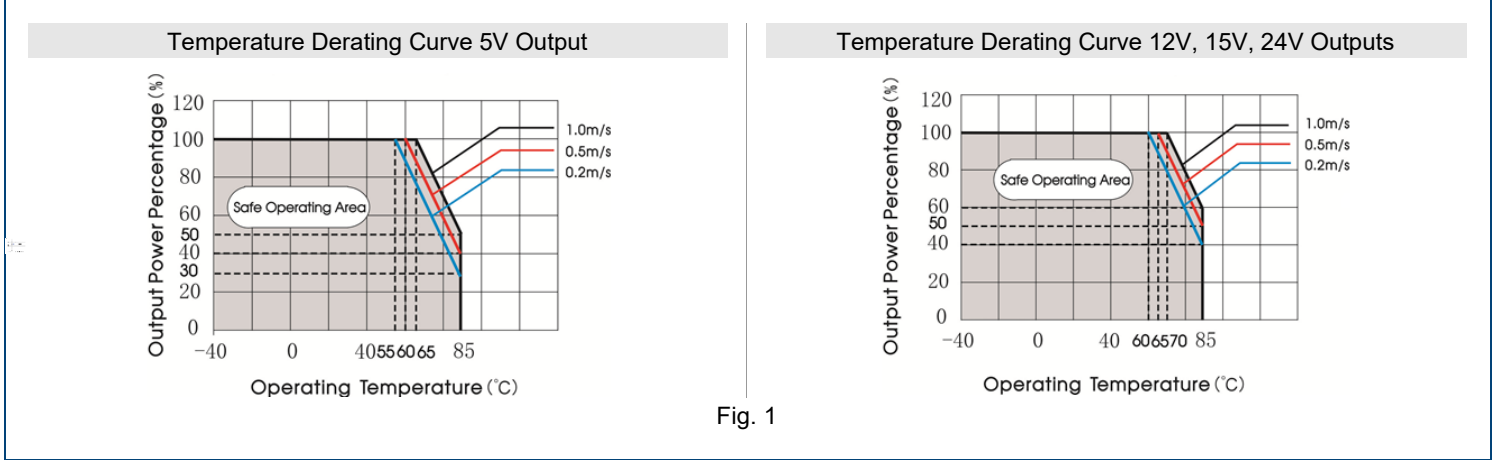
DERATING CURVES

Temperature Derating Curve 5V Output

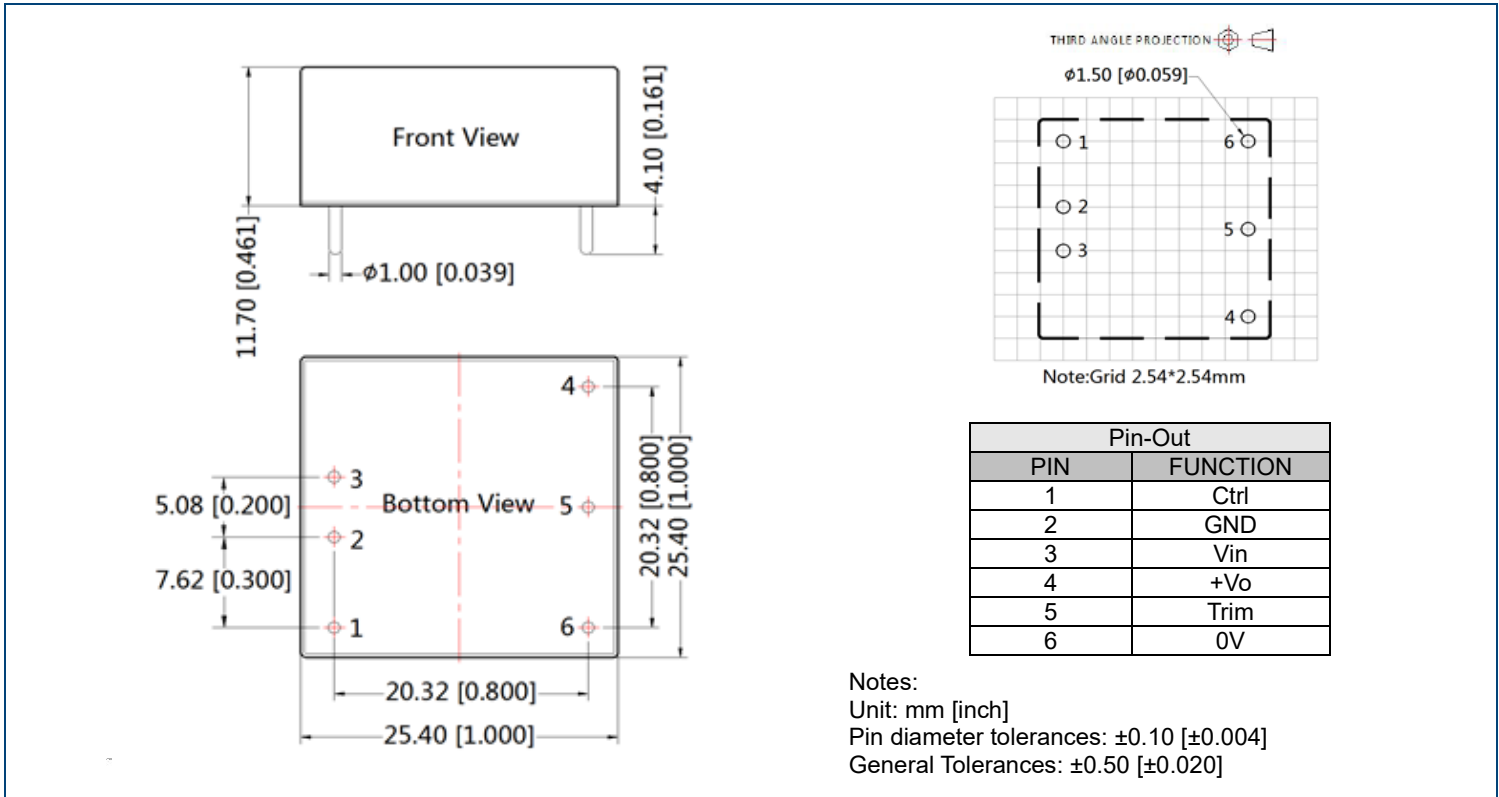


Temperature Derating Curve 12V, 15V, 24V Outputs





MECHANICAL DRAWINGS



DESIGN REFERENCES

1. Typical Application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown below in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance does not exceed the specified max. capacitive load value of the product.

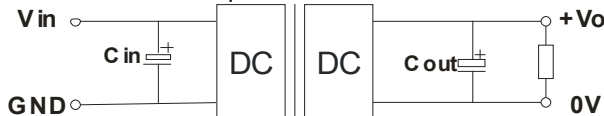


Fig. 2

| Vout (VDC) | Cin (μ F) | Cout (μ F) |
|------------|----------------|-----------------|
| 5/12/15 | 100 | 100 |
| 24 | | 47 |

2. EMC Compliance Circuit

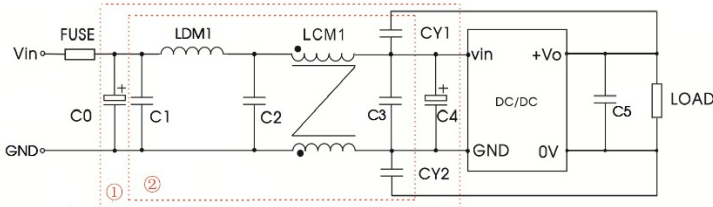


Fig. 3

Note: We use part ① in Fig. 3 for immunity tests and part ② for emissions test. Select based on needs.

| Parameter Description | |
|-----------------------|--|
| Model | Vin:48V |
| Fuse | Choose according to actual input current |
| C0, C4 | 470μF/100V |
| C1 | 10μF/100V |
| LDM1 | 22uH/3A |
| C2 | 22uF/100V |
| LCM1 | 10mH, contact factory for recommendation |
| C3 | 22uF/100V |
| C5 | Refer to Cout in Fig. 2 |
| CY1, CY2 | 1nF/2KV |

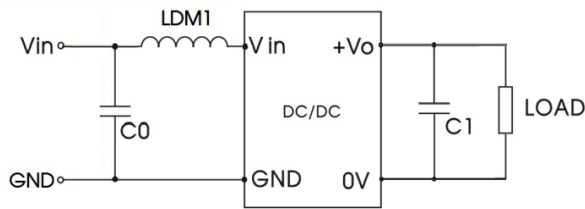
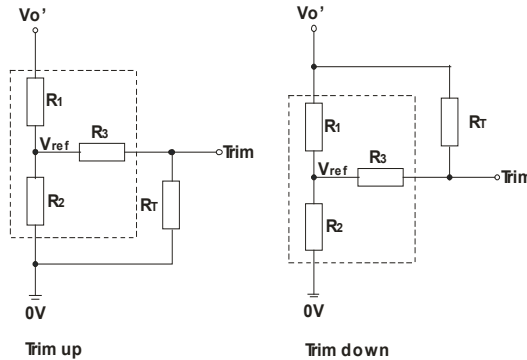


Fig. 4

| Parameter Description | |
|-----------------------|-------------------------|
| Model | Vin:48V |
| C0 | 4.7μF/100V |
| LDM1 | 22uH/3A |
| C1 | Refer to Cout in Fig. 2 |

3. Trim Function for Output Voltage Adjustment (Open if Unused)



TRIM Resistor Connection (dashed line shows internal resistor network)

Calculating Trim resistance Values

$$\begin{aligned}
 \text{up: } R_T &= \frac{aR_2}{R_2 - a} - R_3 & a &= \frac{V_{ref}}{V_{O'} - V_{ref}} \cdot R_1 \\
 \text{down: } R_T &= \frac{aR_1}{R_1 - a} - R_3 & a &= \frac{V_{O'} - V_{ref}}{V_{ref}} \cdot R_2
 \end{aligned}$$

RT= Trim Resistor Value
a= self-defined parameter with no real meaning

| Vout(V) | R1(KΩ) | R2(KΩ) | R3(KΩ) | Vref(V) |
|---------|--------|--------|--------|---------|
| 5 | 8.832 | 2.87 | 10 | 1.24 |
| 12 | 11 | 2.87 | 8.2 | 2.5 |
| 15 | 14.4 | 2.87 | 10 | 2.5 |
| 24 | 24.87 | 2.87 | 7.5 | 2.5 |

4. Products do not support parallel connection of their output.

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: 2015 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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