power-one®
Changing the Shape of Power


## Features

- Industry-standard DIP package
- Industry-standard pinout
- 85°C case operation
- Wide-range input
- Input pi filter
- 500V isolation
- Short-circuit protection

## Description

BWD dual-output dc-dc converters offer excellent regulation and isolation in an industry-standard DIP package. With several input voltage ranges, the BWD is ideal for industrial, telecom, and networking applications. The BWD features short-circuit protection, a low profile, and 500 VDC isolation. Please see the BWS Series for single-output applications.

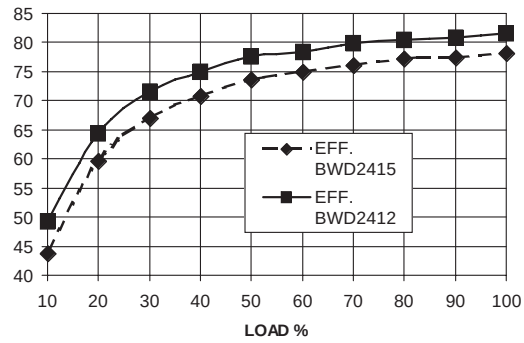
## Technical Specifications

| Input | |
|---|---|
| Voltage Range | |
| 5 VDC Nominal | 4.5 - 9 VDC |
| 12 VDC Nominal | 9 - 18 VDC |
| 24 VDC Nominal | 19 - 36 VDC |
| 48 VDC Nominal | 36 - 72 VDC |
| Reflected Ripple | 20% $I_{in}$ Max. |
| Reverse Input Current | 100% $I_{in}$ Max. |

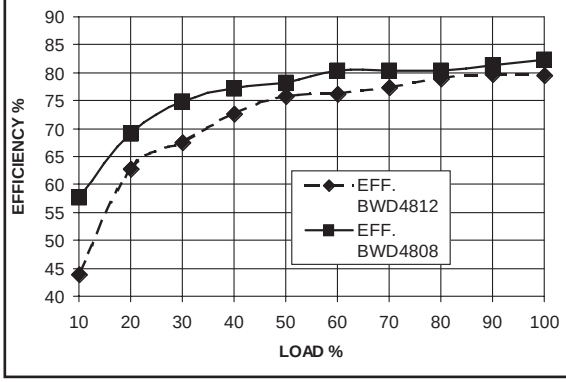
| Output | |
|---|---|
| Setpoint Accuracy | ±1% |
| Line Regulation $V_{in}$ Min. - $V_{in}$ Max., $I_{out}$ Rated | ±1.5% $V_{out}$ |
| Load Regulation $I_{out}$ Min. - $I_{out}$ Max., $V_{in}$ Nom. | ±2.5% $V_{out}$ |
| Minimum Output Current | 10 % $I_{out}$ Rated |
| Dynamic Regulation, 1/4 to Full Load Step | 25% $I_{out}$ |
| Pk Deviation | 4% $V_{out}$ |
| Settling Time | 500 µs |
| Temperature Coefficient | 0.02%/°C |
| Ripple and Noise, 20 MHz BW | 150 mV |
| Short Circuit Protection [1] | Continuous Auto-restart |
| Current Limit | 180% |

| General | |
|---|---|
| No Load Input Power | 0.7 W |
| Switching Frequency | 200 kHz |
| Isolation | |
| Input - Output | 500 VDC |
| Input - Case | 500 VDC |
| Output - Case | 500 VDC |
| Isolation Resistance - Input to Output | $10^9$ Ohms |
| Isolation Capacitance - Input to Output | 80 pF |
| Case Temperature | |
| Standard Operating Range | -25 to +85°C |
| Storage Range | -40 to +125°C |
| Humidity Max., Non-Condensing | 95% |
| Vibration, 3 Axes, 5 Min Each | 5 g, 10 - 55 Hz |
| Safety | UL, cUL, TUV |
| Weight (Approx.) | 0.7 oz |

**Efficiency vs. Load (24V Input)**




**Efficiency vs. Load (48V Input)**




**Notes**

[1] Continuous short circuit protection is provided. Long-term continuous operation in this mode is not recommended. Converter will auto-restart once fault has been removed.
Specifications typically at 25°C, normal line, and full load, unless otherwise stated.

Soldering Conditions: I/O pins, 260°C, ten seconds; fully compatible with commercial wave-soldering equipment.

Safety: Agency approvals may vary from model to model. Please consult factory for specific model information.

MCD10032 Rev. 1.0

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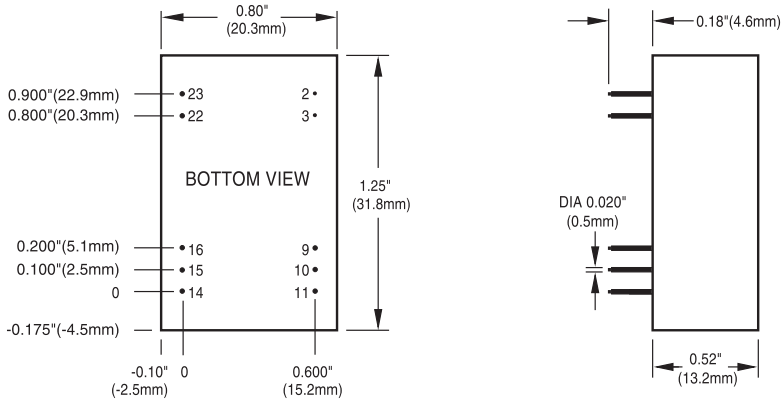
## Model Selection

| MODEL | INPUT VOLTAGE (VOLTS) | INPUT VOLTAGE RANGE (VOLTS) | MAXIMUM INPUT CURRENT (AMPS)* | OUTPUT VOLTAGE (VOLTS) | RATED OUTPUT CURRENT (AMPS) | RIPPLE & NOISE pk-pk (mV) | TYPICAL EFFICIENCY** |
|---|---|---|---|---|---|---|---|
| BWD512 | 5 | 4.5 - 9 | 0.92 | ±12 | ±0.125 | 150 | 79% |
| BWD515 | 5 | 4.5 - 9 | 0.93 | ±15 | ±0.100 | 150 | 73% |
| BWD1205 | 12 | 9 - 18 | 0.42 | ±5 | ±0.250 | 150 | 73% |
| BWD1212 | 12 | 9 - 18 | 0.46 | ±12 | ±0.125 | 150 | 79% |
| BWD1215 | 12 | 9 - 18 | 0.46 | ±15 | ±0.100 | 150 | 79% |
| BWD2405 | 24 | 18 - 36 | 0.46 | ±5 | ±0.250 | 150 | 79% |
| BWD2412 | 24 | 18 - 36 | 0.23 | ±12 | ±0.125 | 150 | 79% |
| BWD2415 | 24 | 18 - 36 | 0.23 | ±15 | ±0.100 | 150 | 78% |
| BWD4805 | 48 | 36 - 72 | 0.10 | ±5 | ±0.250 | 150 | 76% |
| BWD4812 | 48 | 36 - 72 | 0.11 | ±12 | ±0.125 | 150 | 79% |
| BWD4815 | 48 | 36 - 72 | 0.11 | ±15 | ±0.100 | 150 | 79% |

**NOTES:** * Maximum input current at minimum input voltage, maximum rated output power.
** At nominal $V_{in}$, rated output.

Model numbers highlighted in yellow or shaded are not recommended for new designs.

## Mechanical Drawing




| Thermal Impedance | |
|---|---|
| Natural Convection | 2.5 °C/W |
| 100 LFM | 2.1 °C/W |
| 200 LFM | 1.7 °C/W |
| 300 LFM | 1.3 °C/W |

Note:
Thermal impedance data is dependent on many environmental factors. The exact thermal performance should be validated for specific application.

| Pin | Function |
|---|---|
| 1 & 24 | No Pin |
| 2 & 23 | $-V_{in}$ / $+V_{in}$ |
| 3 & 22 | $-V_{in}$ / $+V_{in}$ |
| 4 & 21 | No Pin |
| 5 & 20 | No Pin |
| 6 & 19 | No Pin |
| 7 & 18 | No Pin |
| 8 & 17 | No Pin |
| 9 & 16 | Common |
| 10 & 15 | No Conn. |
| 11 & 14 | $-V_{out}$ / $+V_{out}$ |
| 12 & 13 | No Pin |

| Tolerances | |
|---|---|
| Inches: | (Millimeters) |
| .XX ± 0.020 | .X ± 0.5 |
| .XXX ± 0.010 | .XX ± 0.25 |
| Pin: | |
| ± 0.002 | ± 0.05 |

(Tolerances as listed unless otherwise specified.)



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