

## BWD SERIES - DUAL OUTPUT, 2.5 WATT

### 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 perfect for industrial, telecom, and networking applications. The BWD features short circuit protection, low profile, and 500 VDC isolation. Please see the BWS series for single output applications.



### FEATURES

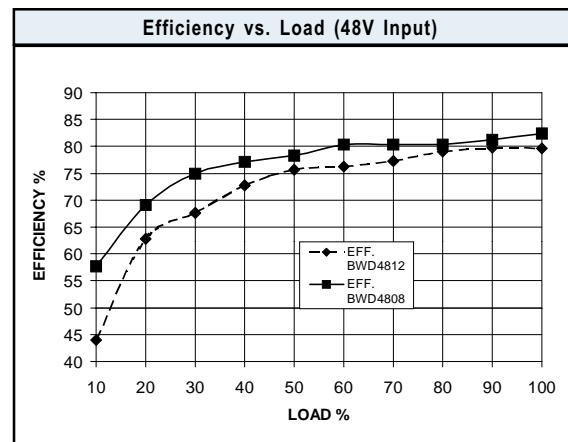
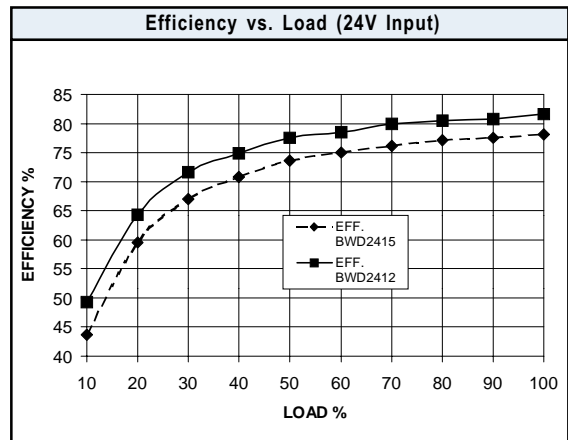
- Industry Standard Dip Package
- Wide Range Input
- Industry Standard Pinout
- Input Pi Filter
- 85°C Case Operation
- 500V Isolation
- Short Circuit Protection

### TECHNICAL SPECIFICATIONS

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

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 $\mu$ s
Temperature Coefficient	0.02%/°C
Ripple and Noise, 20 MHz BW	150 mV
Short Circuit Protection <sup>1</sup>	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 <sup>9</sup> 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



Notes
<sup>1</sup> 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.

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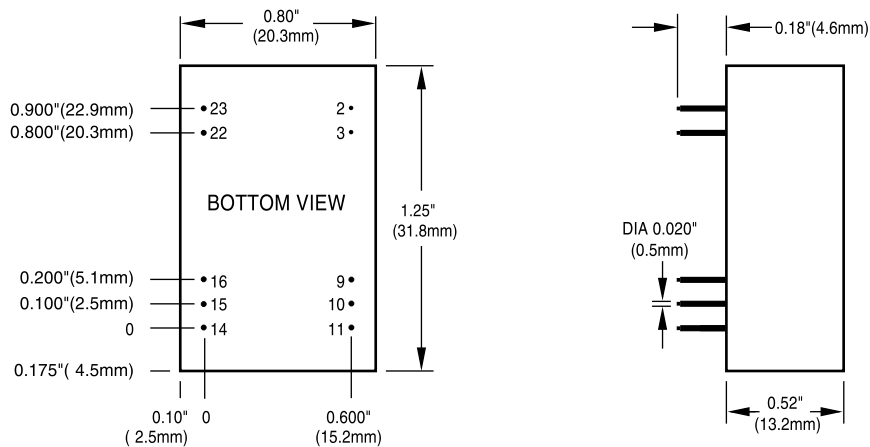
MODELS - (See the last page of this file for options.)

Vin (Volts)	Vin Range (Volts)	Iin Max.* (Amps)	Vout (Volts)	Iout Rated (Amps)	Ripple & Noise Pk-Pk (mV)	Efficiency Typ. **	Model
5	4.5 - 9.0	0.92	±12	±0.125	150	79%	BWD512
5	4.5 - 9.0	0.93	±15	±0.100	150	73%	BWD0515
12	9.0 - 18.0	0.42	±5	±0.250	150	73%	BWD1205
12	9.0 - 18.0	0.46	±12	±0.125	150	79%	BWD1212
12	9.0 - 18.0	0.46	±15	±0.100	150	79%	BWD1215
24	18.0 - 36.0	0.20	±5	±0.250	150	75%	BWD2405
24	18.0 - 36.0	0.23	±12	±0.125	150	79%	BWD2412
24	18.0 - 36.0	0.23	±15	±0.100	150	78%	BWD2415
48	36.0 - 72.0	0.10	±5	±0.250	150	76%	BWD4805
48	36.0 - 72.0	0.11	±12	±0.125	150	79%	BWD4812
48	36.0 - 72.0	0.11	±15	±0.100	150	79%	BWD4815

\* Maximum input current at minimum input voltage, maximum rated output power.

\*\* At nominal Vin, rated output.

### 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 <sub>in</sub> / +V <sub>in</sub>
3 & 22	- V <sub>in</sub> / +V <sub>in</sub>
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 <sub>out</sub> / +V <sub>out</sub>
12 & 13	No Pin

Tolerances	
Inches:	(Millimeters)
.XX ± 0.040	.X ± 1.0
.XXX ± 0.010	.XX ± 0.25
Pin:	
± 0.002	± 0.05
(Tolerances as listed unless otherwise specified.)	

## OPTIONS

When ordering equipment options, use the following suffix information. Select the option(s) that you prefer and add them to the model number. Example ordering options are located below the options table.

OPTION	SUFFIX	APPLICABLE SERIES	REMARKS
Negative Logic	N	HAS, HBD, HBS, HES, LES, QBS, QES, TES, TQD	TTL "Low" Turns Module ON TTL "High" Turns Module OFF
Lucent Compatible Trim	T	HAS, HBD, HBS, HES, QBS, QES	
Terminal Strip	TS	XWS, XWD, XWT	
Trim	1	IAS, LES	
Enable	2	IAD, IAS, LES, SMS	
Trim and Enable	3	IAS, LES	
Current Share	4	SMS	
Headerless	Y	Encapsulated EWS, IWS, OWS	
<b>PIN LENGTH AND HEATSINK OPTIONS</b>			Standard Pin Length is 0.180" (4.6mm)
0.110" (2.8mm) Pin Length	8	All Units (Except SMS)	
0.150" (3.8mm) Pin Length	9	All Units (Except SMS)	
0.24" (6.1mm) Horizontal Heatsink	1H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.24" (6.1mm) Vertical Heatsink	1V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.45" (11.4mm) Horizontal Heatsink	2H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.45" (11.4mm) Vertical Heatsink	2V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.95" (24.1mm) Horizontal Heatsink	3H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.95" (24.1mm) Vertical Heatsink	3V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad

Example Options: HBS050ZG-ANT3V = HBS050ZG-A with negative logic, Lucent compatible trim, and 0.95" vertical heatsink.

LES015YJ-3N = LES015YJ with optional trim and enable, negative logic.

QBS066ZG-AT8 = QBS066ZG-A with Lucent compatible trim and 0.110" pin length.

**NUCLEAR AND MEDICAL APPLICATIONS** Power-One products are not authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the President of Power-One, Inc.

**TECHNICAL REVISIONS** The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.