

## BWS SERIES - 2.5 WATT

### DESCRIPTION

BWS DC/DC converters offer excellent regulation and isolation in an industry-standard DIP package. The BWS is ideal for industrial, telecom, and networking applications, and features short circuit protection, low profile, and 500 VDC isolation. Please see the BWD series for dual output applications.

### FEATURES

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

### TECHNICAL SPECIFICATIONS

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

Output	
Setpoint Accuracy	±5%
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, Loadstep	25% $I_{out}$
Pk Deviation	1% $V_{out}$
Settling Time	500 ms
Temperature Coefficient	0.02%/°C
Ripple And Noise, 20 MHz BW	150 mV
Short Circuit Protection <sup>1</sup>	Continuous
Current Limit	180%

General	
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
No Load Input Power	0.70 W
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.)	0.6 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.

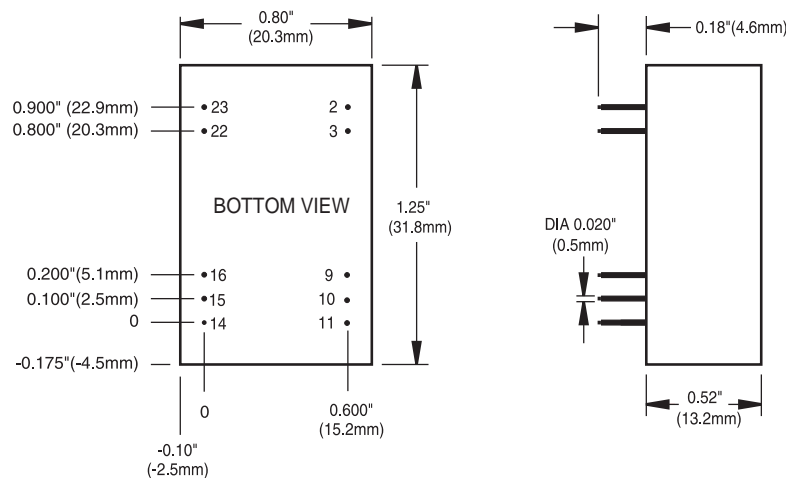
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MODELS - (See the last page of section for options.)

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**
BWS0505	5	4.5 - 9	0.85	5	0.5	150	71%
BWS0512	5	4.5 - 9	0.95	12	0.25	150	79%
BWS1205	12	9 - 18	0.45	5	0.5	150	70%
BWS1212	12	9 - 18	0.5	12	0.25	150	79%
BWS1215	12	9 - 18	0.5	12	0.2	150	79%
BWS4805	48	36 - 72	0.10	5	0.5	150	74%

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

### MECHANICAL DRAWING



Thermal Impedance	
Natural Convection	23.6 °C/W
100 LFM	16.7 °C/W
200 LFM	13.1 °C/W
300 LFM	9.4 °C/W
400 LFM	8.5 °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	NC / $-V_{out}$
10 & 15	NC / NC
11 & 14	NC / $+V_{out}$
12 & 13	No Pin

Tolerances	
Inches:	(Millimeters)
.XX ± 0.040	.X ± 1.0
.XXX ± 0.010	.XX ± 0.25
Pin:	± 0.002 ± 0.05
(Dimensions 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, HLS, HLD, LES, QBS, QES, QLS, TES, TQD	TTL "Low" Turns Module ON TTL "High" Turns Module OFF
Lucent-Compatible	T	HAS, HBD, HBS, HES, HLS, QBS, QES, QLS	
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 (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD Packages)	Includes Thermal Pad
0.24" (6.1mm) Vertical Heatsink	1V	All Units (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD Packages)	Includes Thermal Pad
0.45" (11.4mm) Horizontal Heatsink	2H	All Units (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD Packages)	Includes Thermal Pad
0.45" (11.4mm) Vertical Heatsink	2V	All Units (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD Packages)	Includes Thermal Pad
0.95" (24.1mm) Horizontal Heatsink	3H	All Units (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD Packages)	Includes Thermal Pad
0.95" (24.1mm) Vertical Heatsink	3V	All Units (All Units Except DIP, HLS, HLD, QLS, SIP, SM, TLD, and TKD 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.

**For the Most Up-To-Date Information**

**[www.power-one.com](http://www.power-one.com)**

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