



Powering Communications and Technology



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	
Reflected Ripple	20% I_{in} Max.
Reverse Input Current	100% I_{in} Max.

General	
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
No Load Input Power	0.70 W
Case Temperature	
Standard Operating Range	-25 to +85°C
Industrial Range (Add -I to p/n)	-40 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

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 μ s
Temperature Coefficient	0.02%/°C
Ripple And Noise, 20 MHz BW	150 mV
Short Circuit Protection ¹	Continuous
Current Limit	180%

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.



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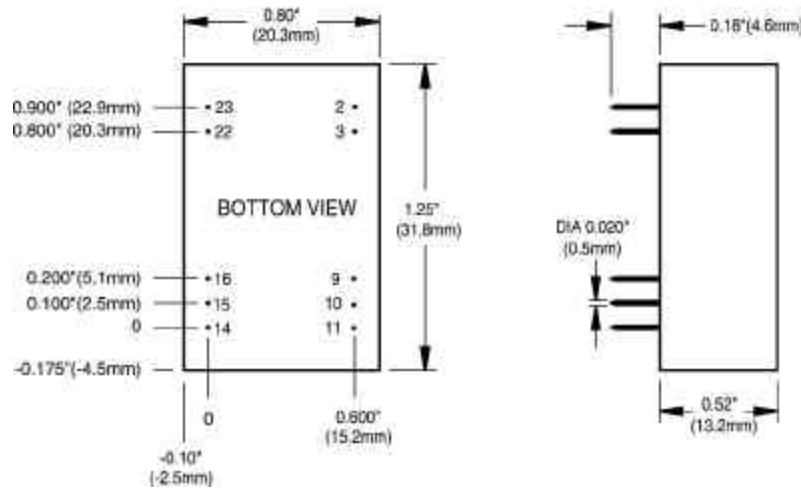
MODELS - (See the last page of Section for options.)

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	0.85	5	0.50	150	71%	BWS0505
5	4.5 - 9	0.95	12	0.25	150	79%	BWS0512
12	9 - 18	0.45	5	0.50	150	70%	BWS1205
12	9 - 18	0.50	12	0.25	150	79%	BWS1212
12	9 - 18	0.50	15	0.20	150	79%	BWS1215

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

** At nominal Vin, rated output.

MECHANICAL DRAWING



High Density - Board Mounted Power Division

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	-Vin / +Vin
3 & 22	-Vin / +Vin
4 & 21	No Pin
5 & 20	No Pin
6 & 19	No Pin
7 & 18	No Pin
8 & 17	No Pin
9 & 16	NC / -Vout
10 & 15	NC / NC
11 & 14	NC / +Vout
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

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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.

OPTIONS	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	
PIN LENGTH AND HEATSINK OPTIONS			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.