

**Features**

- RoHS lead solder exemption compliant
- Industry-standard DIP package
- Industry-standard pinout
- 85 °C case operation
- Short circuit protection
- Wide range inputs
- Input pi filter
- Regulated outputs
- 500 V isolation

**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, a low profile, and 500 VDC isolation. Please see the BWD Series for dual-output applications.

**Technical Specifications**

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

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 $\mu$ s
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
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

<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.



**Model Selection**

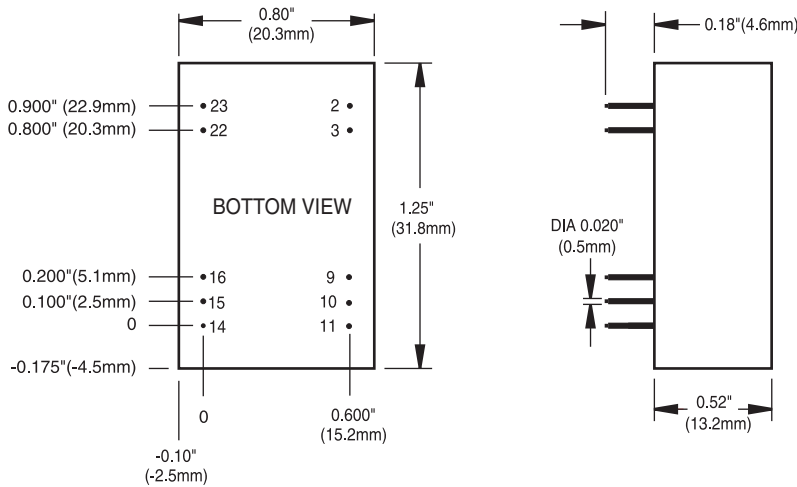
MODEL	INPUT VOLTAGE (VOLTS)	INPUT VOLTAGE RANGE (VOLTS)	MAXIMUM INPUT CURRENT (AMPS)*	OUTPUT VOLTAGE (VOLTS)	RATED OUTPUT CURRENT (AMPS)	RIPPLE & NOISE pk-pk (mV)	TYPICAL EFFICIENCY**
<b>BWS505</b>	5	4.5 - 9	0.85	5	0.5	150	71%
<b>BWS512</b>	5	4.5 - 9	0.95	12	0.25	150	79%
<b>BWS1205</b>	12	9 - 18	0.45	5	0.5	150	70%
<b>BWS1212</b>	12	9 - 18	0.5	12	0.25	150	79%
<b>BWS4805</b>	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.

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

**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.)	

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or 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 respective divisional president of Power-One, Inc.

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