HBD SERIES - DUAL OUTPUT, 60 WATT

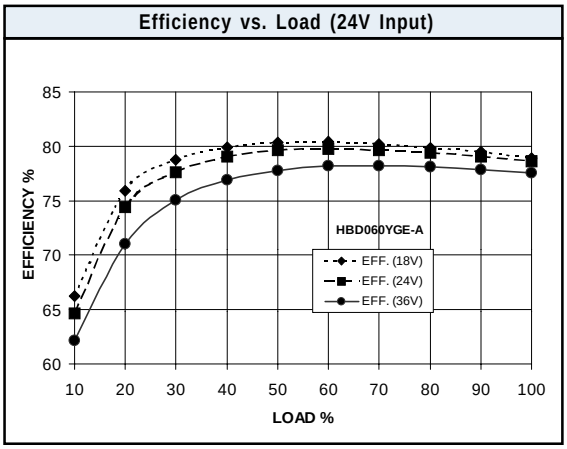
DESCRIPTION

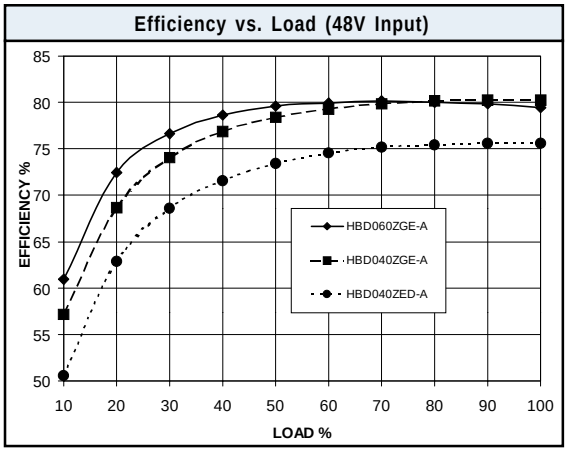
HBD dual output, DC/DC converters feature high efficiency, 1500 VDC isolation, and open-frame packaging. The HBD family allows board designers to deliver any combination of power from either output, up to each model's maximum rating. The HBD is available in 5V/3.3V or 3.3V/2.5V combinations in either a 24V or 48V input version. The HBD uses planar magnetics and has an MTBF of over a million hours.



FEATURES

- Independent Dual Outputs
- Flexible Load Sharing
- High Efficiency Topology
- Open-Frame Design
- Planar Magnetics
- Independent Trim For Each Output
- 1500V Isolation
- 100°C Baseplate Operation





TECHNICAL SPECIFICATIONS

Input	
Voltage Range	
24 VDC Nominal	18.00 - 36.00 VDC
48 VDC Nominal	34.00 - 75.00 VDC
Reflected Ripple	80 mA
Input Reverse Voltage Protection	Shunt Diode

Output	
Setpoint Accuracy	±1%
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated, Output 1	0.2% V_{out}
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated, Output 2	1.0% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom., Output 1	0.5% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom., Output2	1.0% V_{out}
Minimum Output Current	10% I_{out} Rated
Dynamic Regulation, Loadstep	25% I_{out}
Pk Deviation	4% V_{out}
Settling Time	500 µs
Voltage Trim Range (5V/3.3V Units)	±10%
Power Limit Threshold Range, % of I_{out} Rated	110 - 140%
OVP Trip Range (Main Ouput)	115 - 140% V_{out} Nom.

General	
Turn-On Time	10 ms
Remote Shutdown	Positive Logic
Switching Frequency	500 kHz
Isolation	
Input - Output	1500 VDC
Input - Case	1050 VDC
Output - Case	500 VDC
Temperature Coefficient	0.03%/°C
Case Temperature	
Operating Range	-40 To +100°C
Storage Range	-40 To +125°C
Thermal Shutdown Range	105 To 115°C
Humidity Max., Non-Condensing	95%
Vibration, 3 Axes, 5 Min Each	5 g
MTBF† (Bellcore TR-NWT-000332)	1.3 x 10^6 Hrs
Safety	UL, CUL, VDE
Weight (approx.)	2.4 oz

Notes

[1] For negative logic, add suffix "N" to model number.

† MTBF predictions may vary slightly from model to model.

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.

Units are water-washable and fully compatible with commercial spray or immersion post wave-solder washing equipment.

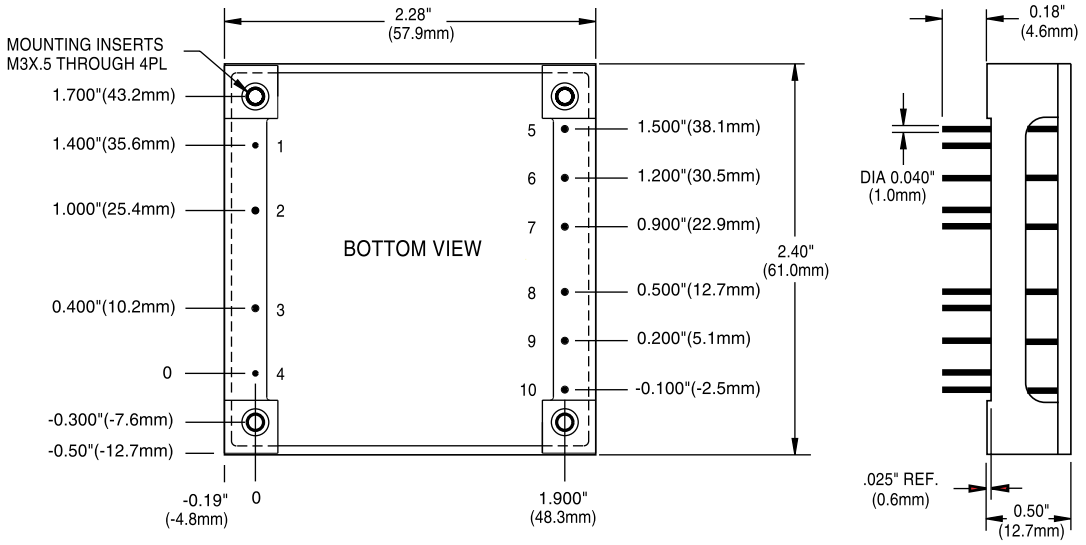
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MODELS - (See the last page of this file for options.)

Vin (Volts)	Vin Range (Volts)	Iin Max.* (Amps)	Vout (Volts)	Iout Rated (Amps)	Ripple & Noise Pk-Pk (mV)	Efficiency Typ. **	Model
24	18 - 36	2.89	3.3/2.5	12/15	75/75	75%	HBD040YED-A
24	18 - 36	4.54	5.0/3.3	12/15	100/75	78%	HBD060YGE-A
24	18 - 36	3.02	5.0/3.3	8/12	100/75	80%	HBD040YGE-A
48	34 - 75	1.51	5.0/3.3	8/12	100/75	80%	HBD040ZGE-A
48	34 - 75	1.62	3.3/2.5	12/15	75/75	75%	HBD040ZED-A
48	34 - 75	2.27	5.0/3.3	12/15	100/75	79%	HBD060ZGE-A

Denotes advanced product release. Consult factory for product availability.
* Maximum input current at minimum input voltage, maximum rated output power.
** At nominal Vin, rated output.
Note: Current can be drawn from either output to its maximum value, or from both outputs to a combined total of 15A.

MECHANICAL DRAWING



Thermal Impedance	
Natural Convection	6.6 °C/W
100 LFM	5.7 °C/W
200 LFM	4.2 °C/W
300 LFM	3.1 °C/W
400 LFM	2.6 °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	$-V_{in}$
2	Case
3	On/Off
4	$+V_{in}$
5	$+V_{out\ 2}$
6	$-V_{out\ 2}$
7	Trim 2
8	$+V_{out\ 1}$
9	$-V_{out\ 1}$
10	Trim 1

Tolerances	
Inches:	(Millimeters)
.XX ± 0.020	.X ± 0.5
.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, 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.