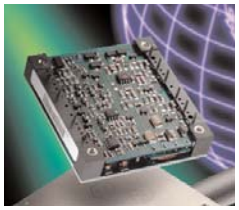
power-one™
Changing the Shape of Power



RoHS Compliant

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 24 V or 48 V input version. The HBD uses planar magnetics and has an MTBF of over a million hours.

Features

- RoHS lead solder exemption compliant
- Independent dual outputs
- Flexible load sharing
- High efficiency topology
- Open-frame design
- Planar magnetics
- Independent trim for each output
- 1500 V Isolation
- 100 °C baseplate operation

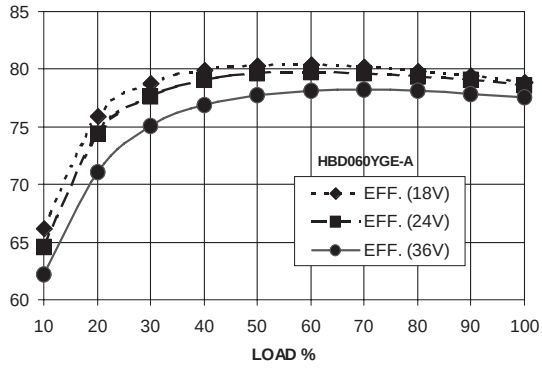
Technical Specifications

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

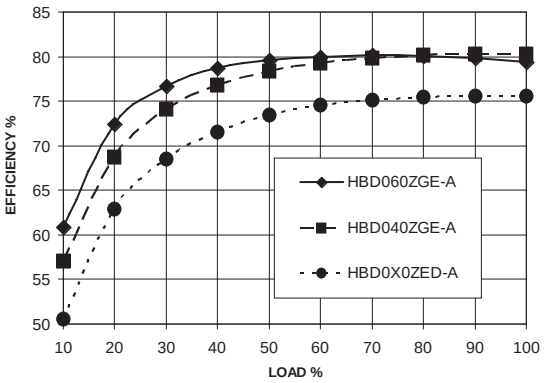
Output	
Setpoint Accuracy	±1%
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated, Output 1	0.2% V_{out}
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated, Output 2	1.0% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom., Output 1	0.5% V_{out}
Load Regulation I_{out} Min. - 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

Efficiency vs. Load (24V Input)



Efficiency vs. Load (48V Input)



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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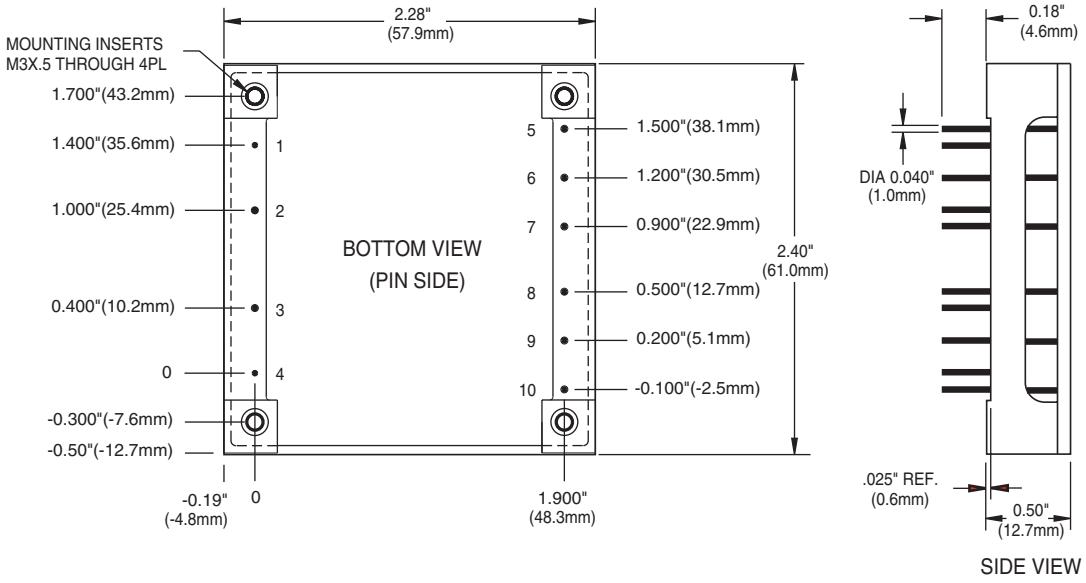
Model Selection

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**
HBD040YED-A	24	18-36	2.89	3.3/2.5	12/15	75/75	75%
HBD060YGE-A	24	18-36	4.54	5.0/3.3	12/15	100/75	78%
HBD040YGE-A	24	18-36	3.02	5.0/3.3	8/12	100/75	80%
HBD030ZED-A	48	34-75	1.50	3.3/2.5	9/12***	75/75	75%
HBD040ZGE-A	48	34-75	1.51	5.0/3.3	8/12	100/75	80%
HBD040ZED-A	48	34-75	1.62	3.3/2.5	12/15	75/75	75%
HBD060ZGE-A	48	34-75	2.27	5.0/3.3	12/15	75/75	75%

NOTES: * Maximum input current at minimum input voltage, maximum rated output power.
** At nominal V_{in}, rated output.
*** Total output power to be restricted to 30 Watts.
&& Current can be drawn from either output to its maximum value, or from both outputs to a combined total of 15A.

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

Mechanical Drawing



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

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.

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.)

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Ordering Information

Suffix Code Identification:

Series Applicability: HAS, HBD, HBS, HES, QBS, QES, TES, TQD

Features & Options	Descriptions	Suffix Code
Remote ON/OFF	Positive Logic	None
	Negative Logic	N
Trim	Standard Power-One (Negative)	None
	Industry-standard (Positive)	T
Pin Length	0.18” (4.6mm), standard model length	None
	0.145” (3.68mm)	7
	0.110” (2.8mm)	8
Special Options	Customer-specific models	S#

NOTE: Contact factory for availability of specific options.

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.

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.

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