



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.

Technical Specifications

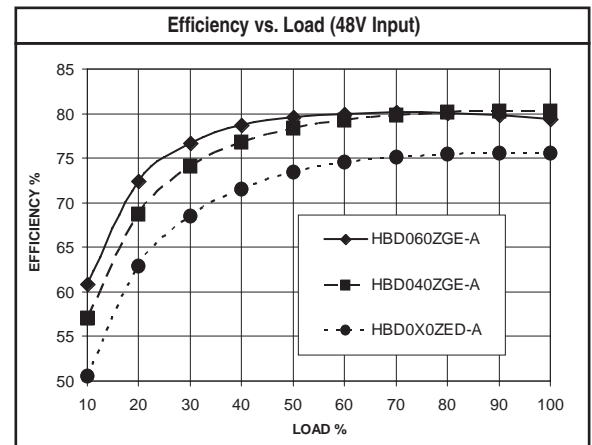
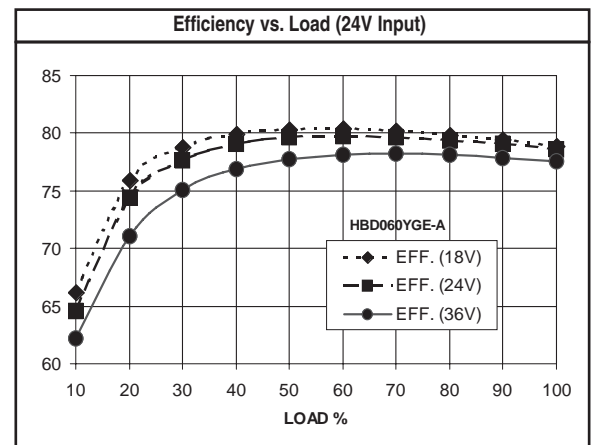
Input	
Voltage Range	
24 VDC Nominal	18.00 - 36.00 VDC
48 VDC Nominal	34.00 - 75.00 VDC
Reflected Ripple	80 mA
Input Reverse Voltage Protection	Shunt Diode

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., Output 2	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 μ s
Voltage Trim Range (5V/3.3V Units)	±10%
Power Limit Threshold Range, % of I_{out} Rated	110 - 140%
OVP Trip Range (Main Output)	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

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



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.

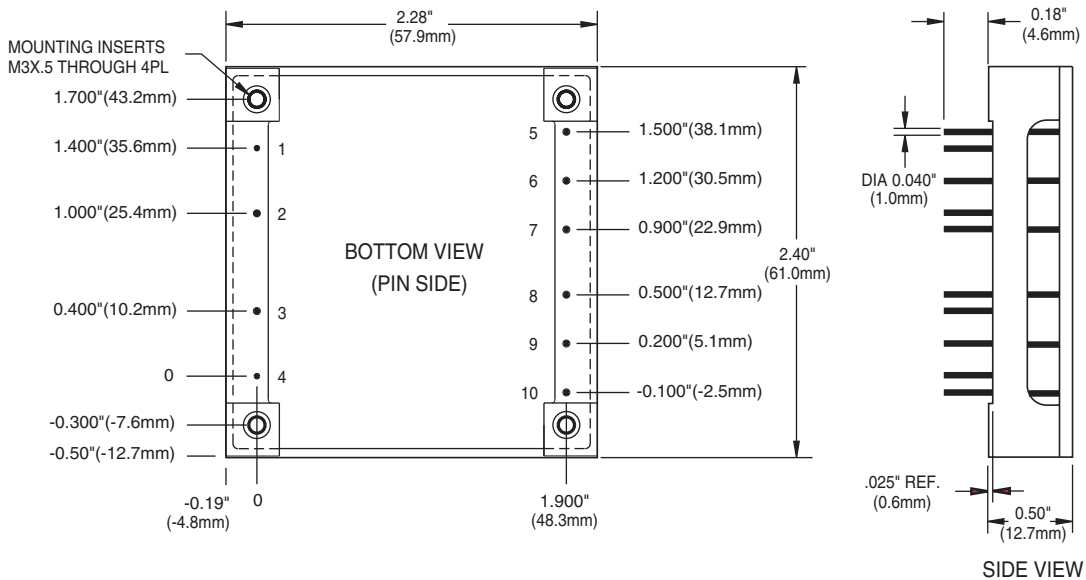
Model Selection

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**
HBDO40YED-A	24	18-36	2.89	3.3/2.5	12/15	75/75	75%
HBDO60YGE-A	24	18-36	4.54	5.0/3.3	12/15	100/75	78%
HBDO40YGE-A	24	18-36	3.02	5.0/3.3	8/12	100/75	80%
HBDO30ZED-A	48	34-75	1.50	3.3/2.5	9/12***	75/75	75%
HBDO40ZGE-A	48	34-75	1.51	5.0/3.3	8/12	100/75	80%
HBDO40ZED-A	48	34-75	1.62	3.3/2.5	12/15	75/75	75%
HBDO60ZGE-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

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.)	

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.	

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.		

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