

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

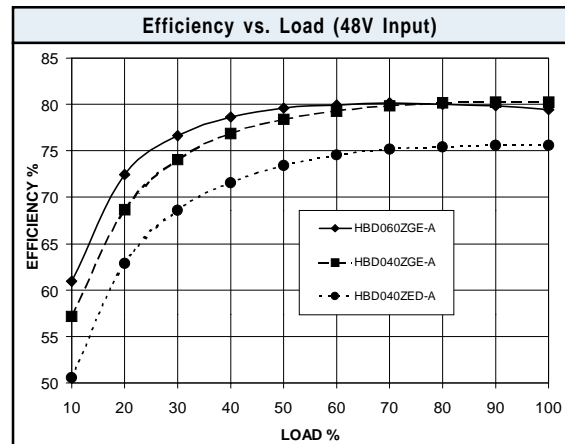
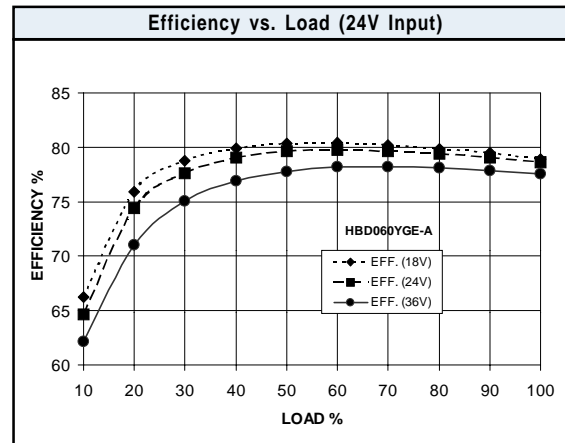
- Independent Dual Outputs
- Flexible Load Sharing
- High Efficiency Topology
- Open-Frame Design
- Planar Magnetics
- Independent Trim For Each Output
- 1500V Isolation
- 100°C Baseplate Operation

TECHNICAL SPECIFICATIONS

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

| 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 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 |



| Notes |
|--|
| † 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.)

| V _{in} (Volts) | V _{in} Range (Volts) | I _{in} Max.* (Amps) | V _{out} (Volts) | I _{out} 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 |

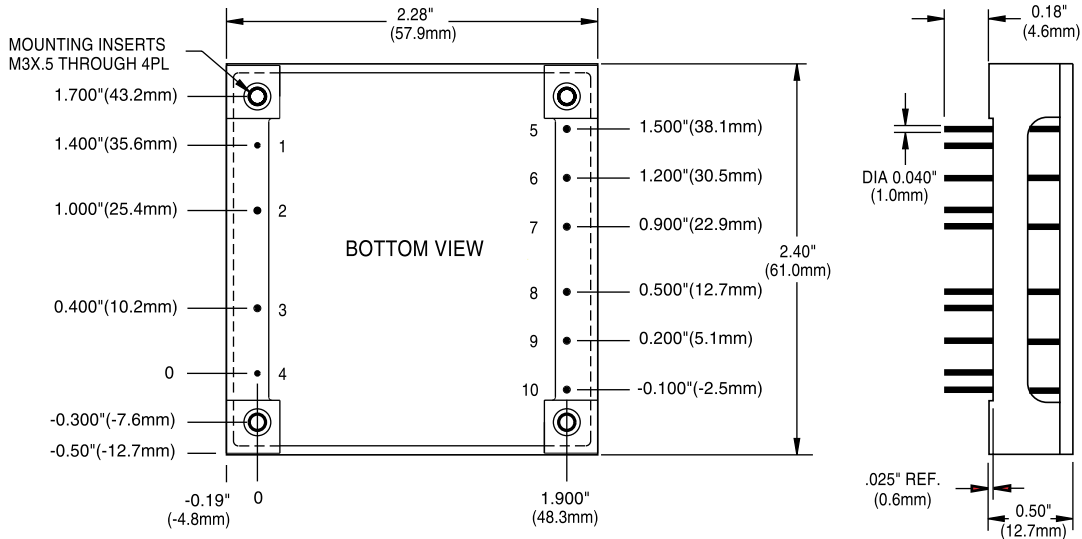
Denotes advanced product release. Consult factory for product availability.

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

** At nominal V_{in}, 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.

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