

Description

HBS DC/DC converters provide up to 50 watts of output power in an industry-standard, half-brick footprint. The HBS units feature excellent efficiency, Class A conducted noise specs, and fixed switching frequency. The HBS, using open-frame packaging, along with planar magnetics provides maximum useable power with minimal thermal constraints. The HBS Series is especially suited to telecom, networking, and industrial applications.

Technical Specifications

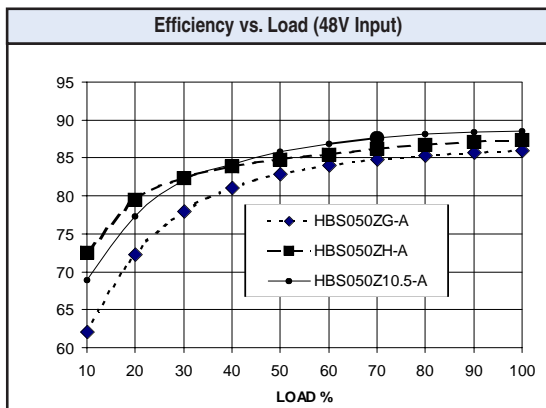
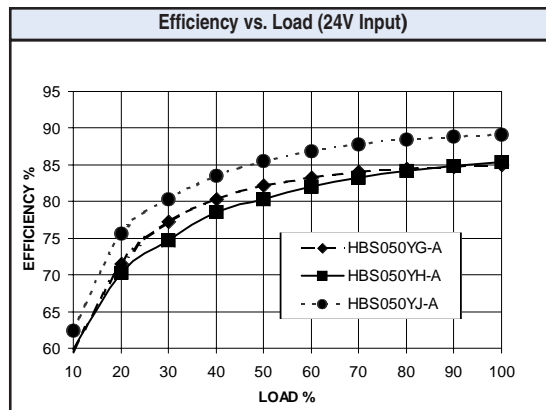
| Input | |
|----------------------------------|----------------|
| Voltage Range | 18 - 36 VDC |
| 24 VDC nominal | 48 VDC nominal |
| 48 VDC nominal | 34 - 75 VDC |
| Reflected Ripple | 25 mA |
| Input Reverse Voltage Protection | Shunt Diode |

| Output | |
|--|---------------------------|
| Setpoint Accuracy | ±1% |
| Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated | ±0.2% V_{out} |
| Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom. | ±0.2% V_{out} |
| Remote Sense Headroom | 0.5 VDC |
| Minimum Output Current | 10%, I_{out} Rated |
| Dynamic Regulation, Loadstep | 25% I_{out} |
| Pk Deviation | 4% V_{out} |
| Settling Time | 500 ms |
| Voltage Trim Range | ±10% |
| Short Circuit / Overcurrent Protection | Hiccup |
| Current Limit Threshold Range, % of I_{out} Rated | 110 - 140% |
| OVP Trip Range | 115 - 140% V_{out} Nom. |
| OVP | Hiccup |

| Notes | |
|--|--|
| † 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. | |

Features

- Industry-standard half-brick
- Open-frame packaging
- 100°C baseplate operation
- Water washable
- “True-trim” option
- 1500V isolation
- Positive or negative logic



| General | |
|--------------------------------|----------------------------|
| Turn-On Time | 10 ms |
| Remote Shutdown | Positive or Negative Logic |
| Remote Shutdown Reference | V_{in} Negative |
| Switching Frequency | 500 kHz |
| Isolation | |
| Input - Output | 1500 VDC |
| Input - Case | 1050 VDC |
| Output - Case | 500 VDC |
| Temperature Coefficient | 0.2%/°C |
| Case Temperature | |
| Operating Range | -40 to +100°C |
| Storage Range | -40 to +125°C |
| Thermal Shutdown Range | 105 to 115°C |
| Vibration, 3 Axes, 5 Min Each | 5 g, 10 - 55 Hz |
| MTBF† (Bellcore TR-NWT-000332) | 2.1×10^6 hrs |
| Safety | UL, cUL |
| Weight (approx.) | 2.5 oz |

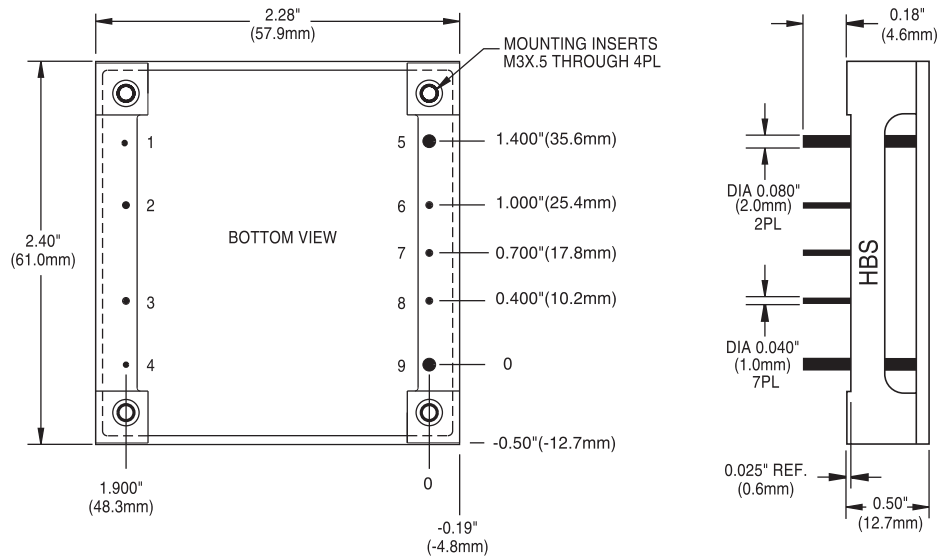
Model Selection

| 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** |
|------------|-----------------------|-----------------------------|-------------------------------|------------------------|-----------------------------|---------------------------|----------------------|
| HBS050YE-A | 24 | 18-36 | 3.50 | 3.3 | 15 | 100 | 80% |
| HBS033YE-A | 24 | 18-36 | 2.30 | 3.3 | 10 | 100 | 80% |
| HBS050YG-A | 24 | 18-36 | 3.60 | 5 | 10 | 100 | 84% |
| HBS050YH-A | 24 | 18-36 | 3.50 | 12 | 4.2 | 150 | 85% |
| HBS050YJ-A | 24 | 18-36 | 3.50 | 15 | 3.3 | 150 | 86% |
| HBS050ZE-A | 48 | 34-75 | 1.32 | 3.3 | 15 | 100 | 80% |
| HBS033ZE-A | 48 | 34-75 | 1.22 | 3.3 | 10 | 100 | 80% |
| HBS050ZG-A | 48 | 34-75 | 1.80 | 5 | 10 | 100 | 82% |
| HBS050ZH-A | 48 | 34-75 | 1.75 | 12 | 4.2 | 150 | 85% |
| HBS050ZJ-A | 48 | 34-75 | 1.75 | 15 | 3.3 | 150 | 87% |

NOTES:

- * Maximum input current at minimum input voltage, maximum rated output power.
- ** At nominal V_{in} , rated output.

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} |
| 6 | -Sense |
| 7 | Trim |
| 8 | +Sense |
| 9 | +V _{out} |

| 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.) | |

This page is offered as a reference. Consult factory for actual availability of options. When ordering equipment options, use the following suffix information. Select preferred option(s) and add the suffix to the model number. Ordering option examples are located below the options table.

| OPTION | SUFFIX | APPLICABLE SERIES | REMARKS |
|--|--------|---|--|
| Negative Logic | N | HAS, HBD, HBS, HES, HLS, HLD, LES, QBS, QES, QLS, TES, TQD | TTL "Low" Turns Module ON TTL "High" Turns Module OFF |
| Lucent-Compatible Trim | T | HAS, HBD, HBS, HES, HLS, QBS, QES, QLS | |
| Trim | 1 | IAS, LES | |
| Enable | 2 | IAD, IAS, LES, SMS | |
| Trim and Enable | 3 | IAS, LES | |
| Pin Length and Heatsink Options | | | Standard Pin Length is 0.180" (4.6mm) |
| 0.110" (2.8mm) Pin Length | 8 | All Leaded Models | |
| 0.150" (3.8mm) Pin Length | 9 | All Leaded Models | |
| 0.24" (6.1mm) Horizontal Heatsink | 1H | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD Packages) | Includes Thermal Pad |
| 0.24" (6.1mm) Vertical Heatsink | 1V | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD Packages) | Includes Thermal Pad |
| 0.45" (11.4mm) Horizontal Heatsink | 2H | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD Packages) | Includes Thermal Pad |
| 0.45" (11.4mm) Vertical Heatsink | 2V | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD Packages) | Includes Thermal Pad |
| 0.95" (24.1mm) Horizontal Heatsink | 3H | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD Packages) | Includes Thermal Pad |
| 0.95" (24.1mm) Vertical Heatsink | 3V | All 1/4-Bricks, 1/2-Bricks, 3/4-Bricks, Full-Bricks (Except HLS, HLD, QLS, TLD, and TKD 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 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.