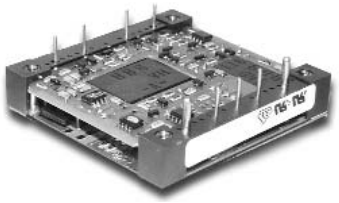
power-one®
Changing the Shape of Power



RoHS Compliant

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.

Features

- RoHS lead solder exemption compliant
- Industry-standard half-brick
- Open-frame packaging
- 100 °C base plate operation
- Water washable
- "True-trim" option
- 1500 V isolation
- Positive or negative logic

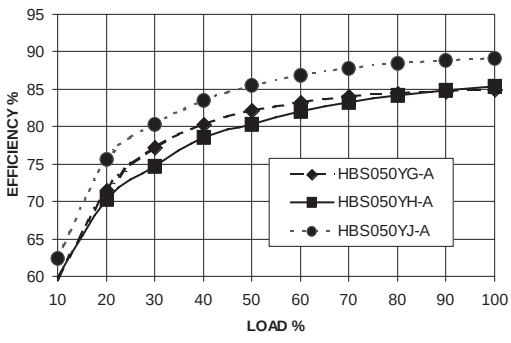
Technical Specifications

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

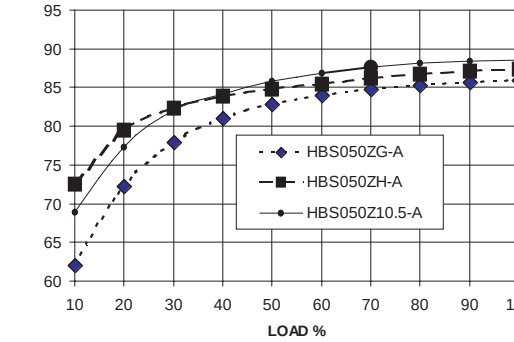
Output	
Setpoint Accuracy	±1%
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated	±0.2% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom.	±0.2% V_{out}
Remote Sense Headroom	0.5 VDC
Minimum Output Current	10%, I_{out} Rated
Dynamic Regulation, Loadstep	25% I_{out}
Pk Deviation	4% V_{out}
Settling Time	500 µs
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.

Efficiency vs. Load (24V Input)



Efficiency vs. Load (48V Input)



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 x 10^6 hrs
Safety	UL, cUL
Weight (approx.)	2.5 oz

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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**
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%
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%

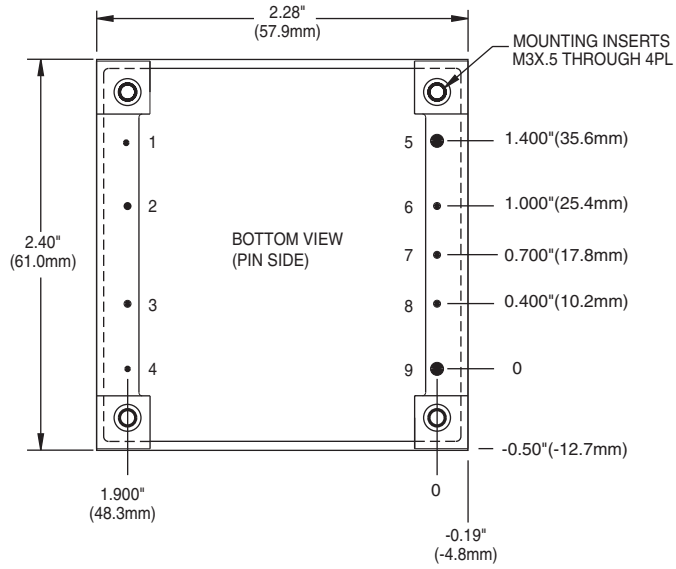
NOTES:

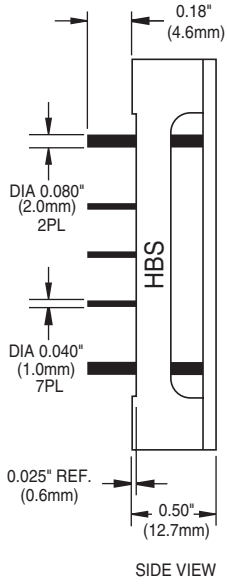
* Maximum input current at minimum input voltage, maximum rated output power.

** At nominal V_{in}, rated output.

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

Mechanical Drawing





SIDE VIEW

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.)

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.