

**Features**

- Triple-output 2" X 2"
- Open-frame packaging
- 2.5 million hours MTBF
- Short-circuit and overvoltage protection
- 500V isolation
- Input undervoltage lockout
- 3-1 wide voltage input
- 100°C baseplate operation

**Description**

HPT triple output dc-dc converters provide 15 watts of output power in an industry standard package. HPT's feature excellent efficiency and industry-leading power density. The HPT has open-frame packaging to provide maximum useable power with minimal thermal constraints. These units are fully compatible with production board washing processes.

**Technical Specifications**

Input	
Voltage Range	
24 VDC Nominal	10 - 30 VDC
48 VDC Nominal	34 - 75 VDC
48 VDC Wide	20 - 60 VDC

Output	
Setpoint Accuracy	±1%
Auxiliary Setpoint Accuracy	5%
Line Regulation $V_{in}$ Min. - $V_{in}$ Max., $I_{out}$ Rated	±1% $V_{out}$
Load Regulation $I_{out}$ Min. - $I_{out}$ Max., $V_{in}$ Nom.	±1% $V_{out}$
Minimum Output Current	10 % $I_{out}$ Rated
Dynamic Regulation, Loadstep	25% $I_{out}$
Pk Deviation	1% $V_{out}$
Settling Time	250 $\mu$ s
Ripple and Noise w/ 25 MHz BW, Pk-Pk / RMS	1% / 0.3% $V_{out}$
Current Limit Type	Hiccup
Current Limit Threshold Range, % of $I_{out}$ Rated	110 - 140%
Short Circuit Current Max.	200% $I_{out}$ Nom.
OVP Trip Range	110 - 140% $V_{out}$ Nom.
OVP Type	Second Control Loop

General	
Switching Frequency	200 kHz
Isolation	
Input - Output	500 VDC
Input - Case	500 VDC
Output - Case	500 VDC
Temperature Coefficient	0.02 ppm/°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	2 g
MTBF <sup>†</sup> (Bellcore TR-NWT-000332)	2.5 x 10 <sup>6</sup> hrs
Safety	Consult Factory
Weight (approx.)	0.85 oz

Notes
<sup>1</sup> For negative logic, add suffix "N" to model number.
<sup>†</sup> 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.

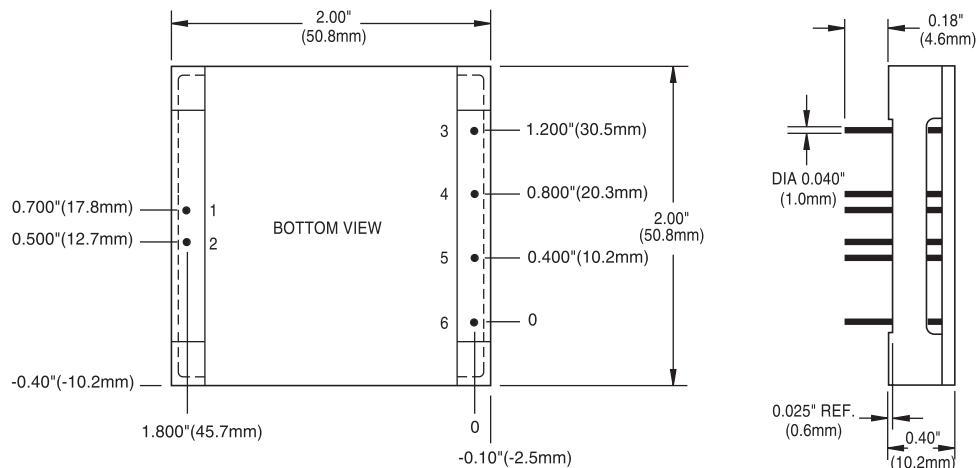
**Model Selection**

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**
<b>HPT015YEHH-A</b>	24	18-36	1.90	3.3, ±12	2.3, ±0.31	100, ±200	80%
<b>HPT015YEJJ-A</b>	24	18-36	1.90	3.3, ±15	2.3, ±0.25	100, ±200	80%
<b>HPT015YGHH-A</b>	24	18-36	1.84	5, ±12	1.5, ±0.31	100, ±200	83%
<b>HPT015YGJJ-A</b>	24	18-36	1.84	5, ±15	1.5, ±0.25	100, ±200	83%
<b>HPT015ZEHH-AS1</b>	48	34-75	0.56	3.3, ±12	2.3, ±0.31	100, ±200	80%
<b>HPT015ZEJJ-AS1</b>	48	34-75	0.56	3.3, ±15	2.3, ±0.25	100, ±200	80%
<b>HPT015ZGHH-AS1</b>	48	34-75	0.54	5, ±12	1.5, ±0.31	100, ±200	83%
<b>HPT015ZGJJ-AS1</b>	48	34-75	0.54	5, ±15	1.5, ±0.25	100, ±200	83%
<b>HPT015ZEHH-A</b>	48 WIDE	20-60	0.95	3.3, ±12	2.3, ±0.31	100, ±200	80%
<b>HPT015ZEJJ-A</b>	48 WIDE	20-60	0.95	3.3, ±15	2.3, ±0.25	100, ±200	80%
<b>HPT015ZGHH-A</b>	48 WIDE	20-60	0.92	5, ±12	1.5, ±0.31	100, ±200	83%
<b>HPT015ZGJJ-A</b>	48 WIDE	20-60	0.92	5, ±15	1.5, ±0.25	100, ±200	83%

**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**



Thermal Impedance	
Natural Convection	11.2 °C/W
100 LFM	9.6 °C/W
200 LFM	6.8 °C/W
300 LFM	5.1 °C/W
400 LFM	4.2 °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 <sub>in</sub>
2	-V <sub>in</sub>
3	+V <sub>out</sub>
4	+V <sub>out</sub>
5	-V <sub>out</sub>
6	-V <sub>out</sub>

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	
<b>Pin Length and Heat Sink Options</b>			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 Heat Sink	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 Heat Sink	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 Heat Sink	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 Heat Sink	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 Heat Sink	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 Heat Sink	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 heat sink.

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.