# HVP450 SERIES

**450 Watt 53VDC / 12VDC Dual Output Model**

- 10.23 x 3.23 x 1.57" Hot-Swap Package

**Features:**

- Universal AC Input Range (90-264 VAC)
- Active Power Factor Correction (0.98 PF Typical)
- Hot-Swap / N+1 Redundant Operation
- Analog / I²C / PMBus Interface for Status & Control
- Front Panel LED Indicators
- Class B Emissions
- 2 Year Warranty

## INPUT:

| | |
|---|---|
| Input Voltage | 90~264 VAC (Universal AC Input) |
| Input Frequency | 47-63Hz |
| Inrush Current | 35.2Arms @ 230 VAC Cold Start |
| Input Current | 4.4 / 2.24A @ 115 / 230 VAC |
| Input Protection | Single Fuse |
| Hold-Up Time | 10ms Minimum @ 115 VAC Minimum |
| Leakage Current | <1000 µA @ 230 VAC Maximum |
| Power Factor | EN61000-3-2 (0.99 PF Typical) |
| No Load power | 9 Watt Typical |

## GENERAL:

| | |
|---|---|
| Efficiency | Up to 92% (see 80 Plus test, page 3) |
| Operating Temperature | -10-70°C, derate linearly to 60% load at 50-70°C |
| Storage Temperature | -40°C to +85°C |
| Over-Temp Protection | Auto-Recovery |
| Cooling | Internal Ball Bearuing Fans |
| Operating Humidity | 5-90% RH, Non-Condensing |
| Vibration | 5 ~ 50 Hz, acceleration 7.35 m/s*s on X,Y and Z Axis |
| MTBF | >100k Hrs (according to MIL-HBK-217F) at 30°C |

## OUTPUT:

| | |
|---|---|
| Adjustment Range | Via I²C / PMBus Interface |
| Minimum Load | none required |
| Line Regulation | ±1% |
| Load Regulation | ±2% (5VSB = ±5%) |
| Ripple & Noise | ±1% pk-pk @ 20MHz |
| Overload Protection | 120-135% of max power (Foldback) |
| Over Voltage | Latching before 130% of nominal |
| Short Circuit Protection | Trip without damage & auto-recovery |
| Transient Response | recovers <2ms following a 25% load change |
| Switching Frequency | 55KHz |

## EMC:

| | |
|---|---|
| Electrostatic Discharge | EN61000-4-2, ±4KV Contact / ±8KV Air Discharge |
| Radiated Susceptibility | EN61000-4-3, 26-1000MHz, 10V/M, 80% AM |
| EFT / Bursts | EN61000-4-4, ±2KV |
| Surges | EN61000-4-5, ±2KV Line-Earth, ±1KV Line-Line |
| Conducted Immunity | EN61000-4-6, 0.15-800MHz, 10V, 80% AM |
| Voltage Dips | EN61000-4-100, 95% Dip & 10ms, 30% Dip & 500ms |
| Voltage Interruptions | EN61000-4-11, 95% reduction, 5s |
| Fluctuations & Flicker | EN61000-3-3 |

## STATUS / CONTROL:

| | |
|---|---|
| 5VSB | 500mA (Always present and on) |
| DC Okay | Active Low |
| Fan Fail | Active Low |
| Enable | Active Low |
| P/S Present | Pull to Low |
| Current Share | V1 Only |
| AC Fail | Active Low |

## APPROVALS:

| | |
|---|---|
| Emissions | EN55022 "B", FCC Part 15 Subject J Class B |
| Safety Approvals | IEC 60950-1 Class I |

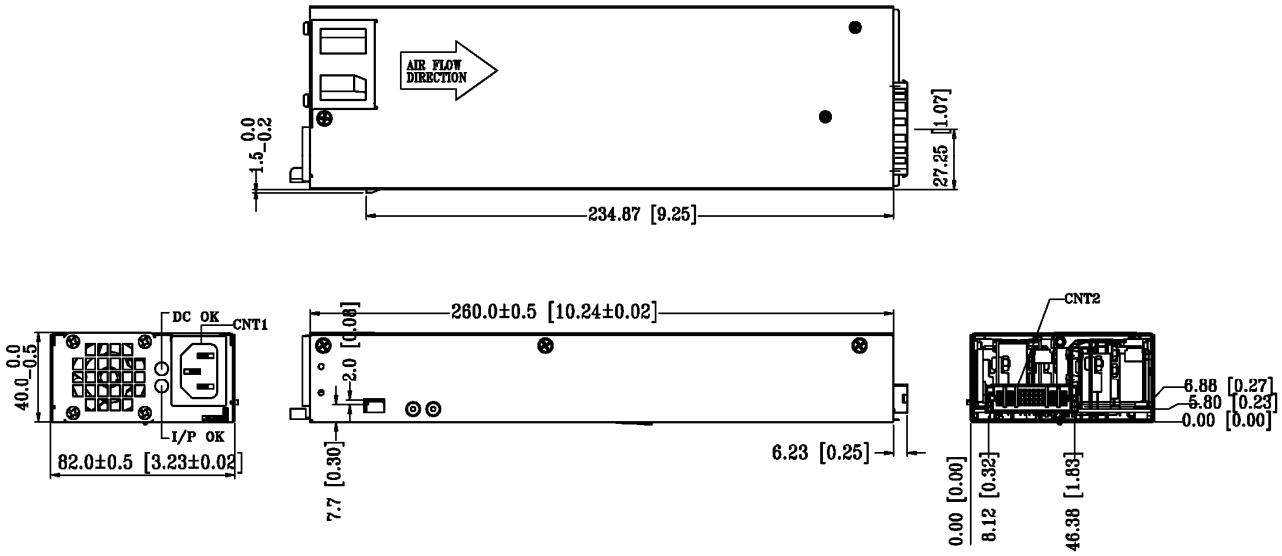
# HVP450 SERIES

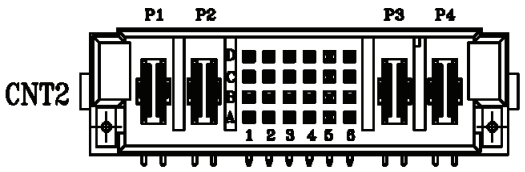
**Ouput Specifications:**

| Model: | V1 | Iout | V2 | Iout | V3 | Iout |
|---|---|---|---|---|---|---|
| HVP450-D530I | +53V | 6.5A | +12V | 9A | 5Vsb | 500mA |

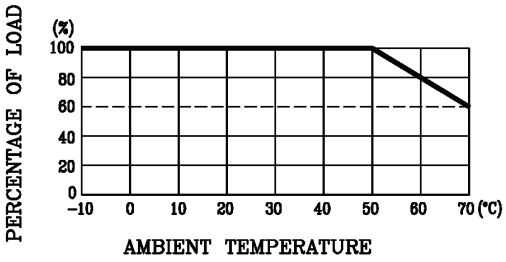
* Maximum Output Power ≤450 Watts

**Mechanical Dimensions:**




## DERATING CHART




## INPUT & OUTPUT CONNECTORS PIN ASSIGNMENT

| CNT1 | | | CNT2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | N | G | P1 | P2 | D1 | D2 | D3 | D4 | D5 | D6 | P3 | P4 |
| LINE | NEUTRAL | GND | VO2 | COM | Albet | A2 | DGND | 5VSB | N/A | 53V_CS | VO1 RTN | VO1 |
| | | | | | **C1** | **C2** | **C3** | **C4** | **C5** | **C6** | | |
| | | | | | PS_PRNT | A1 | PS_EN_IN | DCOK_12V_L | N/A | N/A | | |
| | | | | | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | | |
| | | | | | 12V_CS | A0 | PS_EN_OUT | DCOK_53V_L | N/A | N/A | | |
| | | | | | **A1** | **A2** | **A3** | **A4** | **A5** | **A6** | | |
| | | | | | SCL | SDA | AC_FAIL | FAN_FAL | N/A | N/A | | |

# HVP450 SERIES

## 80 PLUS Verification and Testing Report

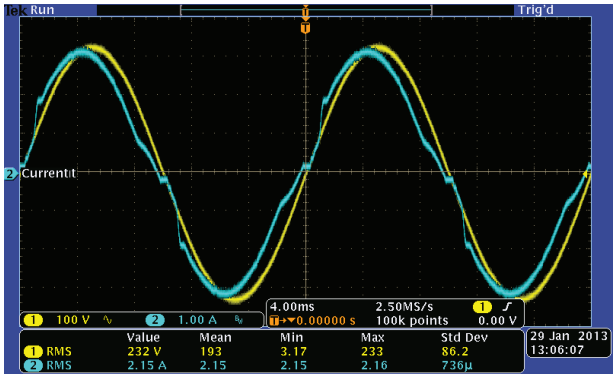
| | |
|---|---|
| TYPICAL EFFICIENCY (50% Load): | 91.22% |
| AVERAGE EFFICIENCY: | 89.65% |
| 80 PLUS COMPLIANT: | YES |

Input Current and Voltage Waveforms

| | |
|---|---|
| Manufacturer | HiTRON Electronic Corporation |
| Moder Number | HVP450-D530I |
| Serial Number | N/A |
| Year | 2013 |
| Type | 1U |
| Test Date | 29-Jan-13 |

| Rated Specifications | Value | Units |
|---|---|---|
| Input Voltage | 100~240 | Volts |
| Input Current | | Amps |
| Input Frequency | 50~60 | Hz |
| Rated Output Power | 452.5 | Watts |

Note: All measurements were taken with input voltage at 230V nominal and 50 Hz




Input AC current Waveform ($I_{THD}$ = 9.17% , 100% Load)

| I RMS A | PF | I THD % | Load % | Fraction of Load | Input Watts | Interbal Fan Power (W) | DC Terminal Voltage(V) / DC Load Current (A) | | | | | Output Watts | Efficiency % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 56V | 12V | N/A | N/A | N/A | | |
| 0.3603 | 0.7337 | 17.89 | *10% | Low | 60.81 | 0.549 | 53 / 0.65 | 12 / 0.9 | | | | 45.437 | 75.62% |
| 0.5412 | 0.8682 | 13.41 | 20% | Light | 108.09 | 0.549 | 53 / 1.3 | 12 / 1.8 | | | | 91.3 | 84.97% |
| 1.1355 | 0.9545 | 11.18 | 50% | Typical | 249.51 | 0.549 | 53 / 3.25 | 12 / 4.5 | | | | 227.05 | 91.22% |
| 2.1773 | 0.9759 | 9.17 | 100% | Full | 489.73 | 1.548 | 53 / 6.5 | 12 / 9.0 | | | | 452.72 | 92.76% |

* 10% load results are for informative purposes only and not included in certification requirements.

** Fan power should be recorded if Fan exists, but is not included in the efficiency calculations.