

Lab ID#: 49  
Receipt Date: Jan 15, 2018  
Test Date: Jan 22, 2018

Report:

Report Date: Jan 24, 2018

## DUT INFORMATION

|                    |                     |
|--------------------|---------------------|
| Brand              | SeaSonic            |
| Manufacturer (OEM) | Seasonic            |
| Series             | Prime Titanium      |
| Model Number       | SSR-850TD           |
| Serial Number      | R1606TA106460008    |
| DUT Notes          | Retested on 4/28/17 |

## DUT SPECIFICATIONS

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Rated Voltage (Vrms)   | 100-240                                         |
| Rated Current (Arms)   | 11-5.5                                          |
| Rated Frequency (Hz)   | 50-60                                           |
| Rated Power (W)        | 850                                             |
| Type                   | ATX12V                                          |
| Cooling                | 135mm Fluid Dynamic Bearing Fan (HA13525M12F-Z) |
| Semi-Passive Operation | ✓ (selectable)                                  |
| Cable Design           | Fully Modular                                   |

## POWER SPECIFICATIONS

| Rail                 |       | 3.3V | 5V | 12V | 5VSB | -12V |
|----------------------|-------|------|----|-----|------|------|
| Max. Power           | Amps  | 20   | 20 | 70  | 3    | 0.3  |
|                      | Watts | 100  |    | 840 | 15   | 3.6  |
| Total Max. Power (W) |       | 850  |    |     |      |      |

## CABLES AND CONNECTORS

### Modular Cables

| Description                          | Cable Count | Connector Count (Total) | Gauge    | In Cable Capacitors |
|--------------------------------------|-------------|-------------------------|----------|---------------------|
| ATX connector 20+4 pin (600mm)       | 1           | 1                       | 18-22AWG | No                  |
| 4+4 pin EPS12V (650mm)               | 2           | 2                       | 18AWG    | No                  |
| 6+2 pin PCIe (750mm)                 | 6           | 6                       | 18AWG    | No                  |
| SATA (450mm+115mm+115mm+115mm)       | 2           | 8                       | 18AWG    | No                  |
| SATA (350mm+115mm)                   | 1           | 2                       | 18AWG    | No                  |
| 4 pin Molex (450mm+120mm+120mm)      | 1           | 3                       | 18AWG    | No                  |
| 4 pin Molex (350mm+120mm)            | 1           | 2                       | 18AWG    | No                  |
| FDD Adapter (+110mm)                 | 1           | 1                       | 22AWG    | No                  |
| AC Power Cord (1350mm) - C13 coupler | 1           | 1                       | 18AWG    | -                   |

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| Primary Side               |                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Transient Filter           | 6x Y caps, 3x X caps, 2x CM chokes, 1x MOV                                                                                      |
| Inrush Protection          | NTC Thermistor & Relay                                                                                                          |
| Bridge Rectifier(s)        | 2x Vishay LVB2560 (600V, 25A @ 105°C)                                                                                           |
| APFC MOSFETS               | 2x Infineon IPP60R099CP (650V, 19A @ 100°C, 0.099 Ohm)                                                                          |
| APFC Boost Diode           | 1x SCS110AG (600V, 10A @ 117°C)                                                                                                 |
| Hold-up Cap(s)             | 2x Nippon Chemi-Con (400V, 650uF & 450uF or 1100uF combined, 2000h @ 105°C, CE)                                                 |
| Main Switchers             | 4x Infineon IPP50R140CP<br>(550V, 15A @ 100°C, 0.140 Ohm)                                                                       |
| Drivers For Main Switchers | 2x Silicon Labs Si8230BD                                                                                                        |
| APFC Controller            | ON Semiconductor NPC1654                                                                                                        |
| Switching Controller       | Champion CM6901                                                                                                                 |
| Topology                   | Primary side: Full-Bridge & LLC Resonant Converter<br>Secondary side: Synchronous Rectification & DC-DC converters              |
| Secondary Side             |                                                                                                                                 |
| +12V MOSFETS               | 4x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4 mOhm)                                                                           |
| 5V & 3.3V                  | DC-DC Converters: 6x Infineon BSC0906NS<br>PWM Controller: APW7159                                                              |
| Filtering Capacitors       | Electrolytics: Nippon Chemi-Con (105°C, KZE, KZH)<br>1x Rubycon (5VSB circuit, 105°C, YXD)<br>Polymers: FPCAP, Nippon Chemi-Con |
| Supervisor IC              | Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)                                                                                       |
| Fan Model                  | Hong Hua HA13525M12F-Z (135mm, 12V, 0.36A, 1800 RPM, Fluid Dynamic Bearing)                                                     |
| 5VSB Circuit               |                                                                                                                                 |
| Buck Converter             | Leadtrend LD7750R                                                                                                               |
| Rectifiers                 | STMicroelectronics STU6N65K3 (650V, 3A @ 100°C, 1.30), Infineon BSC0906NS(30V, 40A @ 100°C, 4.5 mOhm)                           |
| -12V Circuit               |                                                                                                                                 |
| Buck Converter             | Lite-On LSP5523 (3A max output current)                                                                                         |

## RESULTS

|                             |                                    |
|-----------------------------|------------------------------------|
| Temperature Range (°C /°F)  | 30-32 / 86-89.6 (+-2°C / +- 3.6°F) |
| ErP Lot 3/6 Ready           | ✓                                  |
| (EU) No 617/2013 Compliance | ✓                                  |

### 115V

|                                           |             |
|-------------------------------------------|-------------|
| Average Efficiency                        | 91.986%     |
| Efficiency With 10W (≤500W) or 2% (>500W) | 0.000       |
| Average Efficiency 5VSB                   | 79.413%     |
| Standby Power Consumption (W)             | 0.0574072   |
| Average PF                                | 0.990       |
| Avg Noise Output                          | 16.40 dB(A) |
| Efficiency Rating (ETA)                   | TITANIUM    |
| Noise Rating (LAMBDA)                     | A+          |

### 230V

|                               |             |
|-------------------------------|-------------|
| Average Efficiency            | 94.164%     |
| Average Efficiency 5VSB       | 77.745%     |
| Standby Power Consumption (W) | 0.0987592   |
| Average PF                    | 0.952       |
| Avg Noise Output              | 15.02 dB(A) |
| Efficiency Rating (ETA)       | TITANIUM    |
| Noise Rating (LAMBDA)         | A+          |

## TEST EQUIPMENT

|                  |                                                          |                                                                       |
|------------------|----------------------------------------------------------|-----------------------------------------------------------------------|
| Electronic Loads | Chroma 6314A x2<br>63123A x6<br>63102A<br>63101A         | Chroma 63601-5 x2<br>Chroma 63600-2<br>63640-80-80 x10<br>63610-80-20 |
| AC Sources       | Chroma 6530, Chroma 61604                                |                                                                       |
| Power Analyzers  | N4L PPA1530, N4L PPA5530                                 |                                                                       |
| Oscilloscopes    | Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A |                                                                       |
| Voltmeter        | Keithley 2015 THD 6.5 Digit                              |                                                                       |
| Sound Analyzer   | Bruel & Kjaer 2250-L G4                                  |                                                                       |
| Microphone       | Bruel & Kjaer Type 4189                                  |                                                                       |
| Data Loggers     | Picoscope TC-08 x2, Labjack U3-HV x2                     |                                                                       |

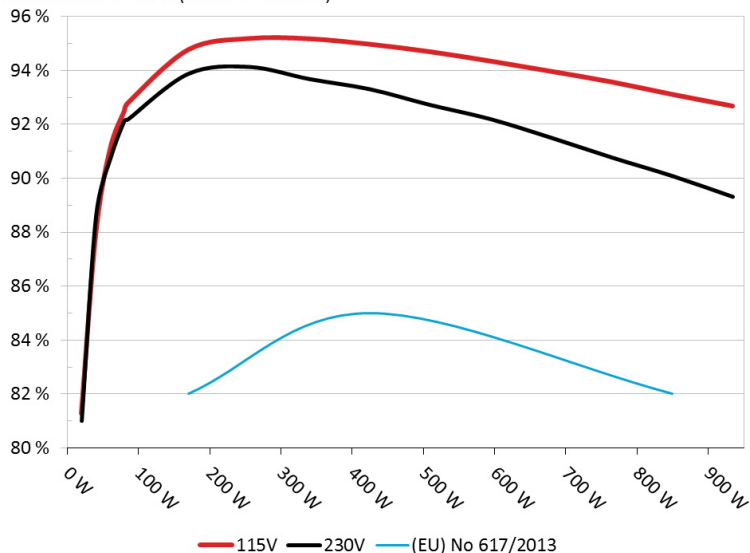
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## EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

### Efficiency: Seasonic SSR-850TD

Ambient: 39°C - 47°C (102.2°F - 116.6°F)



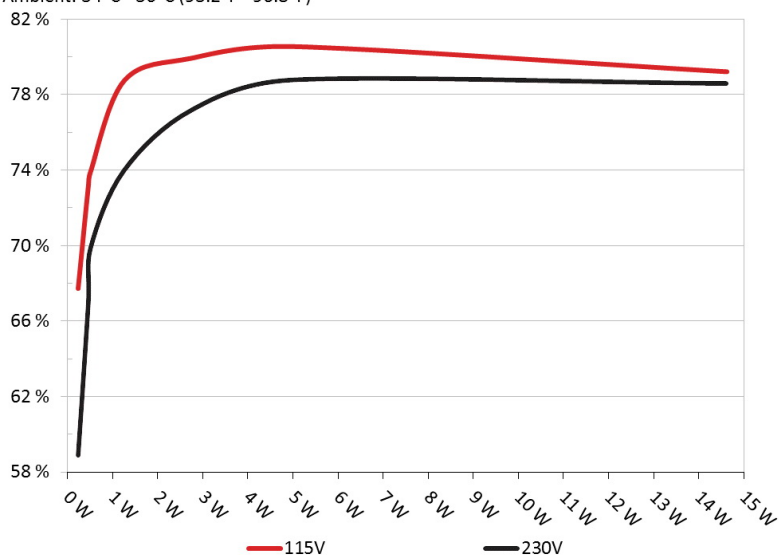
### INFO

The PSU's efficiency under high ambient temperatures with 115V and 230V input. For this graph the results of the 10-110% load regulation table are used

## 5VSB EFFICIENCY

### 5VSB Efficiency: Seasonic SSR-850TD

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



### INFO

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input

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### 5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

| Test # | 5VSB   | DC/AC (Watts) | Efficiency | PF/AC Volts |
|--------|--------|---------------|------------|-------------|
| 1      | 0.041A | 0.208         | 64.596%    | 0.036       |
|        | 5.013V | 0.322         |            | 115.16V     |
| 2      | 0.087A | 0.435         | 71.664%    | 0.067       |
|        | 5.011V | 0.607         |            | 115.12V     |
| 3      | 0.542A | 2.707         | 79.900%    | 0.277       |
|        | 4.991V | 3.388         |            | 115.16V     |
| 4      | 1.003A | 4.983         | 80.087%    | 0.373       |
|        | 4.970V | 6.222         |            | 115.16V     |
| 5      | 1.502A | 7.429         | 79.676%    | 0.425       |
|        | 4.947V | 9.324         |            | 115.16V     |
| 6      | 3.002A | 14.655        | 78.617%    | 0.490       |
|        | 4.882V | 18.641        |            | 115.16V     |

### 5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

| Test # | 5VSB   | DC/AC (Watts) | Efficiency | PF/AC Volts |
|--------|--------|---------------|------------|-------------|
| 1      | 0.041A | 0.208         | 57.778%    | 0.012       |
|        | 5.013V | 0.360         |            | 230.29V     |
| 2      | 0.087A | 0.435         | 66.923%    | 0.022       |
|        | 5.011V | 0.650         |            | 230.29V     |
| 3      | 0.542A | 2.702         | 77.002%    | 0.110       |
|        | 4.989V | 3.509         |            | 230.30V     |
| 4      | 1.002A | 4.974         | 78.430%    | 0.182       |
|        | 4.966V | 6.342         |            | 230.30V     |
| 5      | 1.502A | 7.422         | 79.312%    | 0.241       |
|        | 4.943V | 9.358         |            | 230.30V     |
| 6      | 3.001A | 14.604        | 78.130%    | 0.344       |
|        | 4.866V | 18.692        |            | 230.30V     |

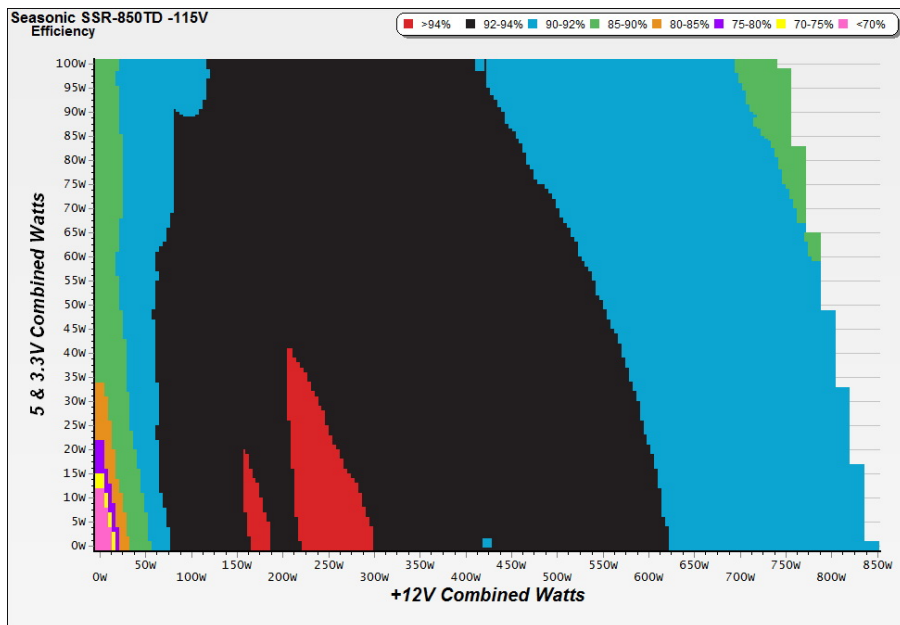
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# 115V

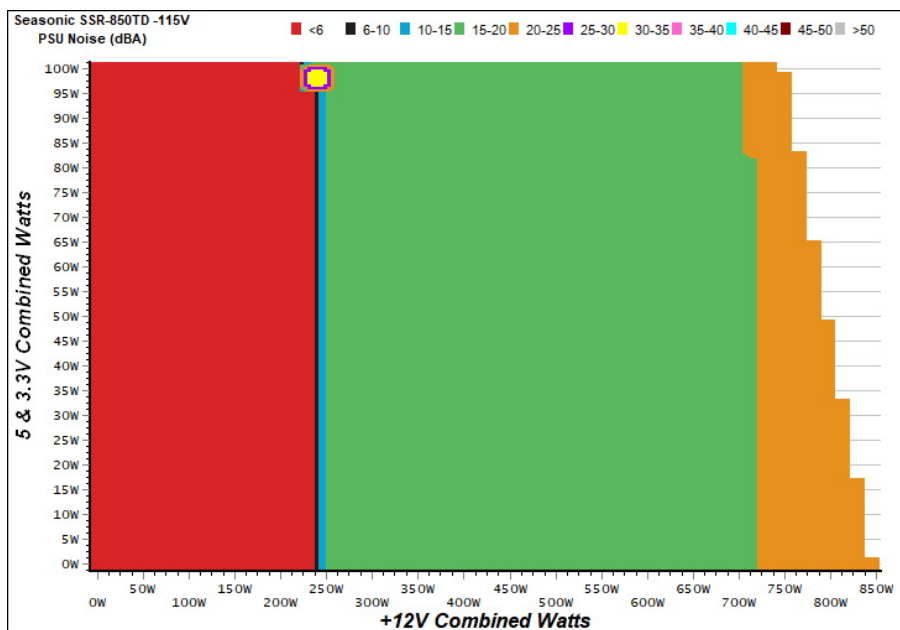
## EFFICIENCY GRAPH 115V



### INFO

This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

## NOISE GRAPH 115V



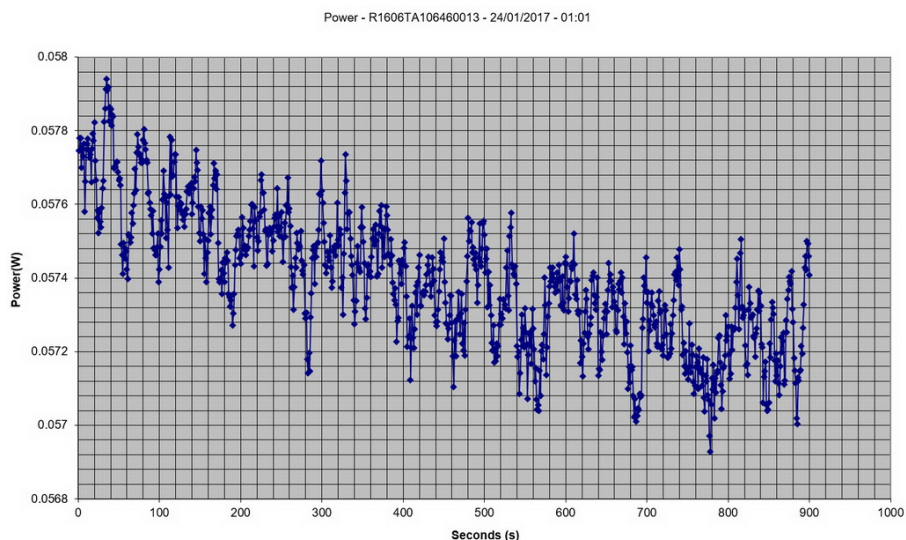
### INFO

The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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## VAMPIRE POWER -115V



### INFO

*This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing*

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**COMMISSION REGULATION (EU) NO 617/2013 TESTING 115V**

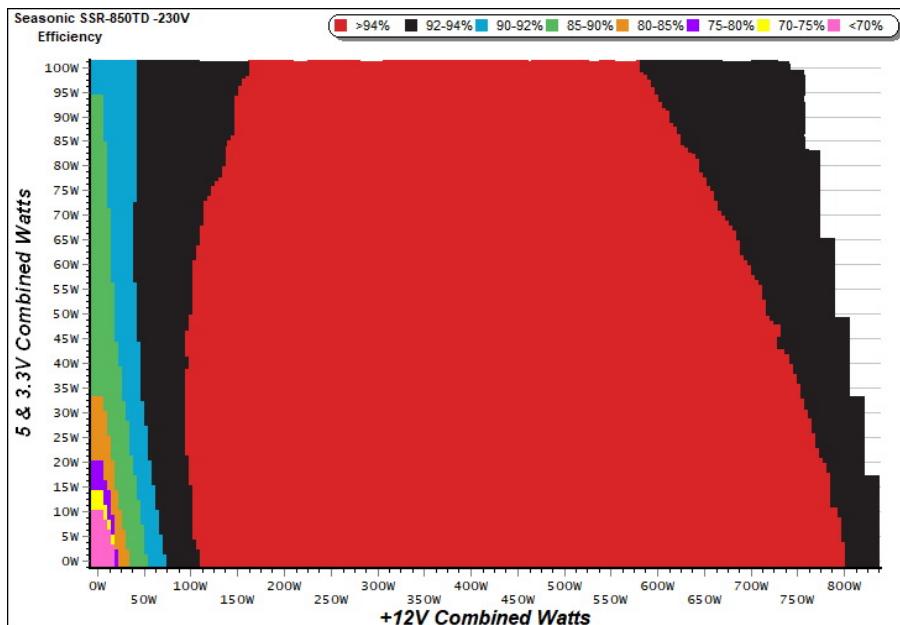
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# 230V

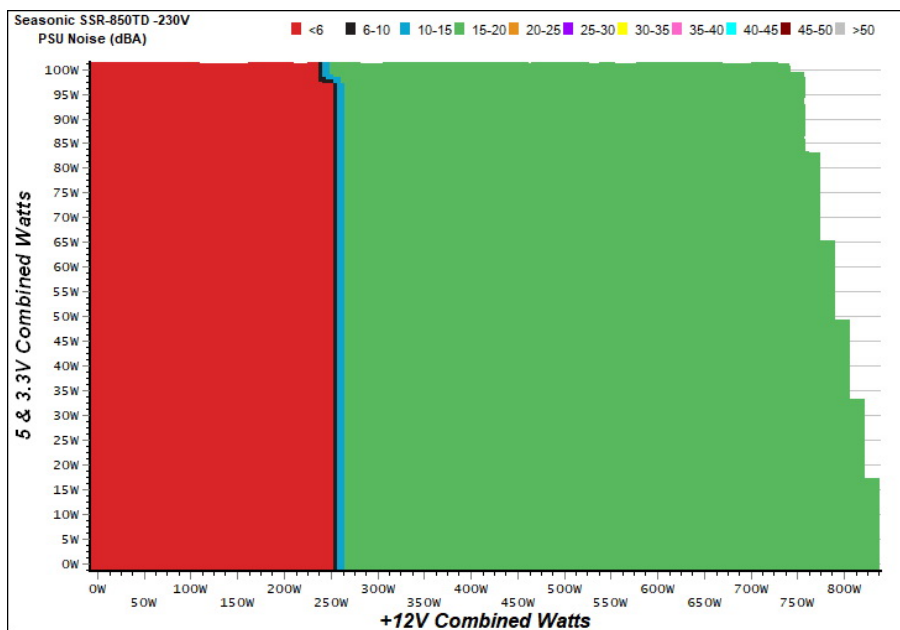
## EFFICIENCY GRAPH 230V



### INFO

This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

## NOISE GRAPH 230V



### INFO

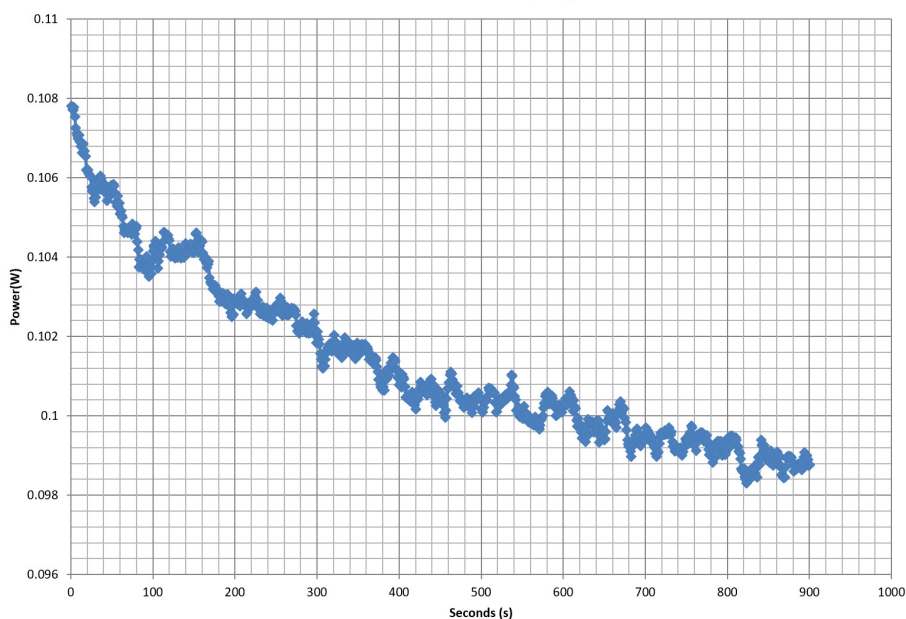
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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## VAMPIRE POWER -230V

Power - R1606TA106460008 - 09/05/2017 - 09:07



### INFO

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**COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V**

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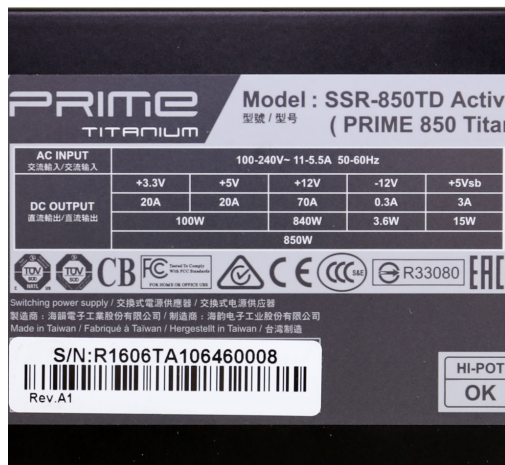
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EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH  
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

## SeaSonic Prime Titanium 850W

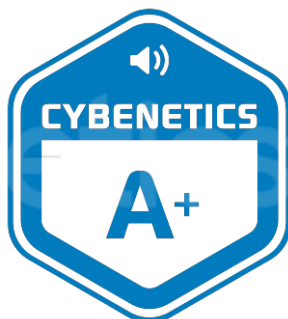
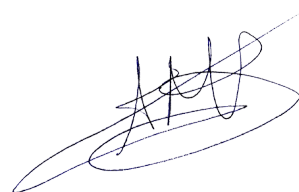


Top side



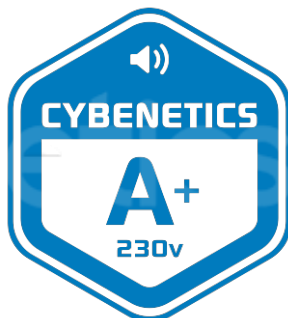
Power specifications label

## CERTIFICATIONS 115V

**Aris Mpitsiopoulos**  
Lab Director

## CERTIFICATIONS 230V



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