# Seasonic Prime Gold 850W

Serial Number R1701TA101480009

Lab ID 73

Certification ID 2573

Test Result Report ID: 20PS73A

Certificate Issue Date: Jan 14, 2018

115V

Scheme: ETA-EMI PSU




115V




Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

# General Information

## Test Equipment

| | |
|---|---|
| Electronic Loads | Chroma 63601-5 x2<br>Chroma 63600-2<br>Chroma 63640-80-80 x10<br>Chroma 63610-80-20 |
| AC Sources | Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500 |
| Power Analyzers | Rohde & Schwarz HMC8015 & NPA701 |
| Oscilloscopes | Picoscope 4444, Siglent SDS2104X PLUS |
| Sound Analyzer | Bruel & Kjaer 2270 G4 |
| Microphone | Bruel & Kjaer Type 4955-A |
| Temperature Logger | Picoscope TC-08 |
| Tachometer | UNI-T UT372 |
| Multimeters | Keysight 34465A |
| EMI Analyzer | TekBox TBMR-110M-EU |
| Isolation Transformer | 4kVA |
| UPS | FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA |
| Testing Methodology | Cybenetics PSU Test Protocol |

## DUT Information(Non-accredited measurements)

| | |
|---|---|
| Product Identification Details | |
| Brand | Seasonic |
| Model | Prime Gold 850W |
| OEM/ODM | Sea Sonic Electronics Co., Ltd. |
| Serial Number | R1701TA101480009 |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 11-5.5 |
| Rated Frequency (Hz) | 50-60 |

| | |
|---|---|
| Rated Power (W) | 850 |
| Operating Temperature (Continuous Full Load) (°C) | |
| Type | ATX12V |
| Cable Design | Fully Modular |
| Warranty | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| Weight | |
| Cooling | 135mm Fluid Dynamic Bearing Fan<br>(HA13525M12F-Z) |
| Semi-Passive Operation | ✓ (selectable) |
| Cybenetics Testing Information | |
| Lab ID | 73 |
| Date of receipt | Jan 4, 2018 |
| Testing Date | Jan 10, 2018 |
| Report Issued Date | Jan 14, 2018 |
| Engineer Name | - |
| Authorized By the Laboratory Technical Manager | Aristeidis Bitziopoulos |
| Signature |  |

## Cables and Connectors(Non-accredited measurements)

| Modular Cables | | | |
|---|---|---|---|
| Description | Cable Count | Connector Count (Total) | Gauge |
| ATX connector 20+4 pin (610mm) | 1 | 1 | 18-22AWG |
| 4+4 pin EPS12V (650mm) | 2 | 2 | 18AWG |
| 6+2 pin PCIe (680mm+80mm) | 3 | 6 | 18AWG |
| SATA (460mm+120mm+120mm+120mm) | 2 | 8 | 18AWG |
| SATA (360mm+120mm) | 1 | 2 | 18AWG |
| 4 pin Molex (460mm+130mm+130mm) | 1 | 3 | 18AWG |
| 4 pin Molex (360mm+130mm) | 1 | 2 | 18AWG |
| FDD Adapter (+110mm) | 1 | 1 | 22AWG |

### Power Specifications

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 20 | 20 | 70 | 2.5 | 0.3 |
| | Watts | 100 | | 850 | 12.5 | 3.6 |
| Total Max. Power (W) | | 850 | | | | |

## Test Results

### Temperature & Compliance Info

| | |
|---|---|
| Temperature Range (°C /°F) | 28-32 / 82.4-89.6 |
| ErP Lot 3/6 Ready | ✓ |
| (EU) No 617/2013 Compliance | ✓ |

### Performance Summary 115V

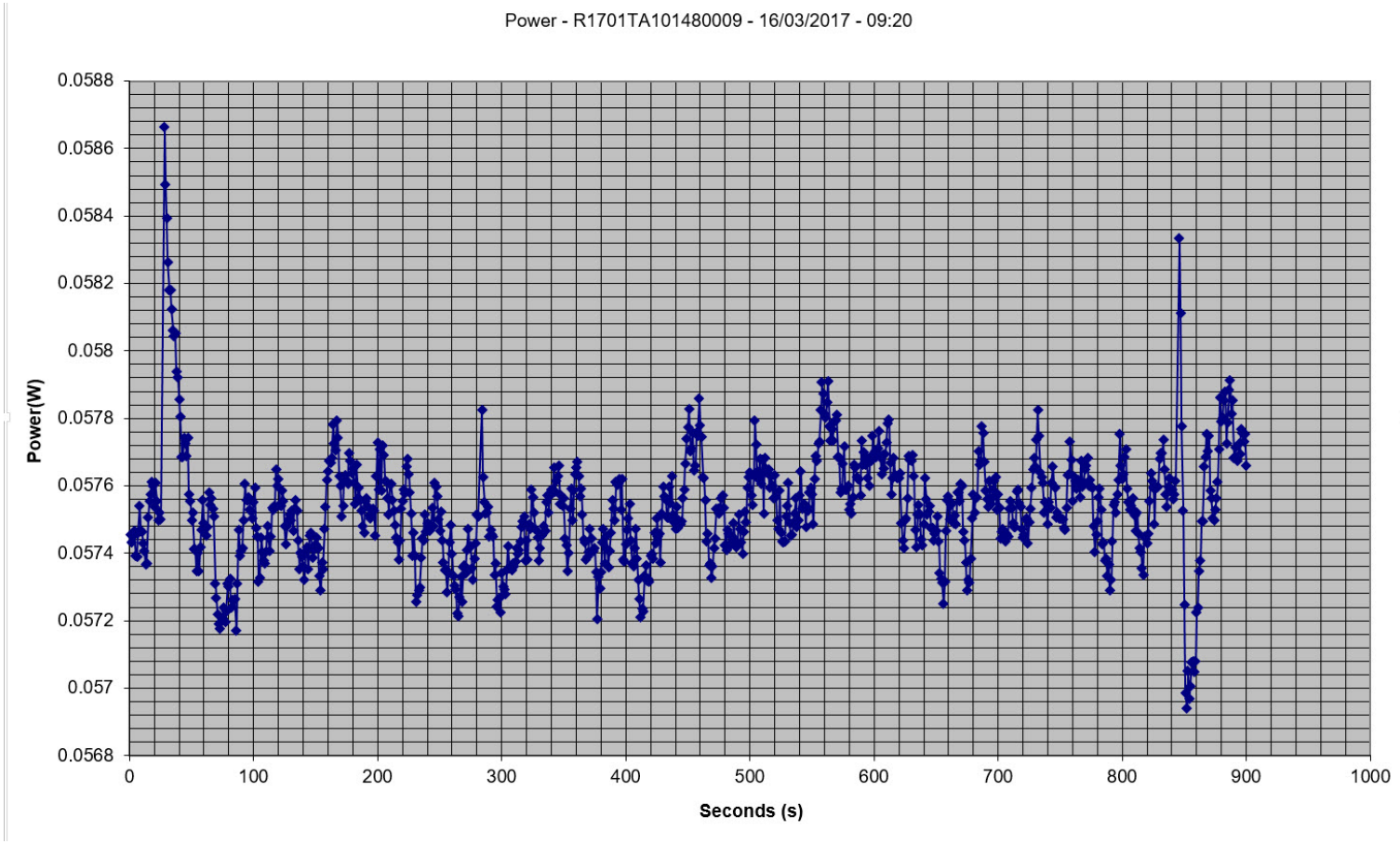
| | |
|---|---|
| Accredited | |
| Average Efficiency (>1450 load combinations) | 89.650% |
| Average Noise Output (>1450 Load Combinations) | 43.25dBA |
| Average PF (>1450 Load Combinations) | 0.989 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | - |
| Standby Power Consumption | 0.0577W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 22.93mV |
| 5V Ripple (Full Load) | 8.44mV |
| 3.3V Ripple (Full Load) | 15.25mV |
| 5VSB Ripple (Full Load) | 19.39mV |
| 12V Load Regulation | 0.66% |
| 5V Load Regulation | 0.10% |
| 3.3V Load Regulation | 0.66% |
| 5VSB Load Regulation | 4.02% |
| Inrush Current | 27.211A |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 24.4 |
| AC Loss to PWR_OK Hold Up Time (ms) | 20 |
| PWR_OK Inactive to DC Loss Delay (ms) | 4.4 |

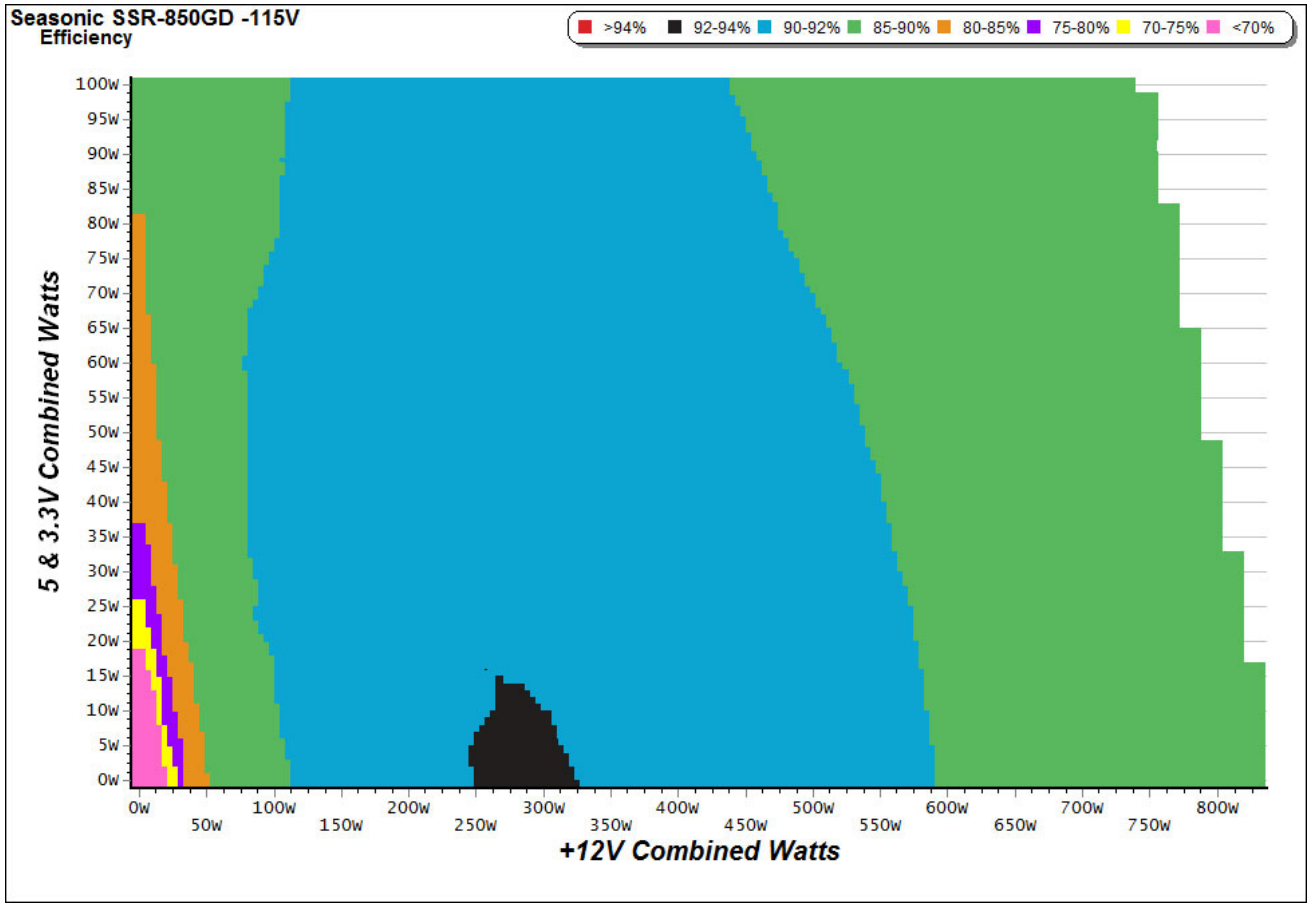
## Stromverbrauch im Ruhezustand

### Graphs 115V



## Efficiency Graph

### 115V

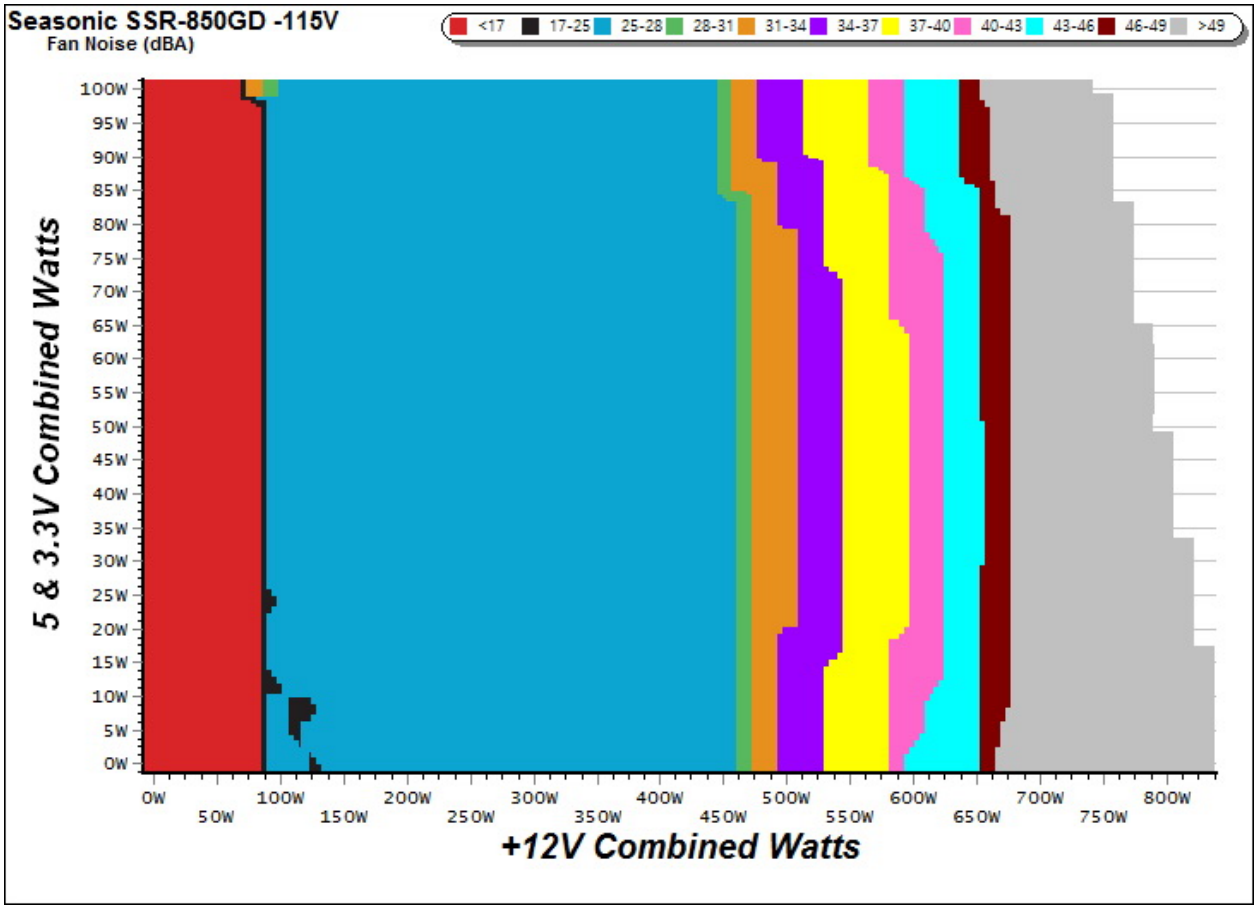



### INFO

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

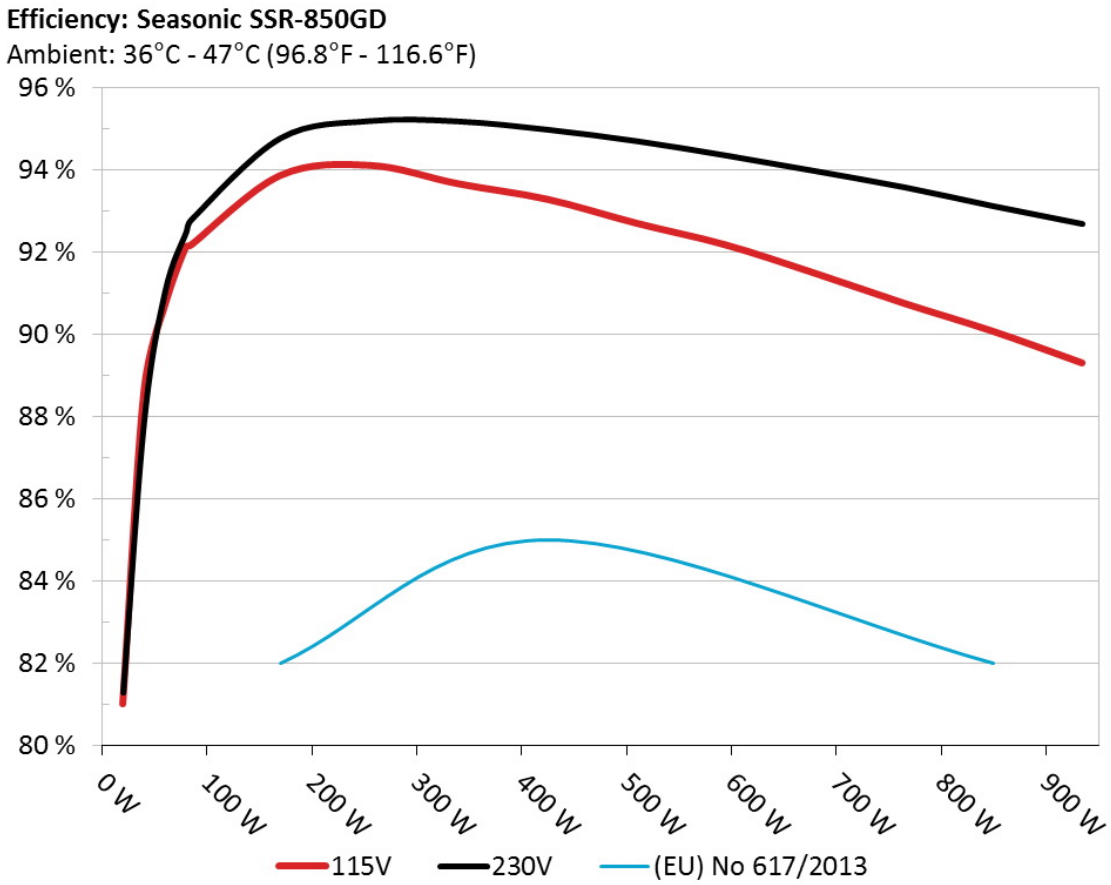



### INFO

The PSU`s noise in its entire operational range and under 30-32 °C 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.

## Indicative Performance

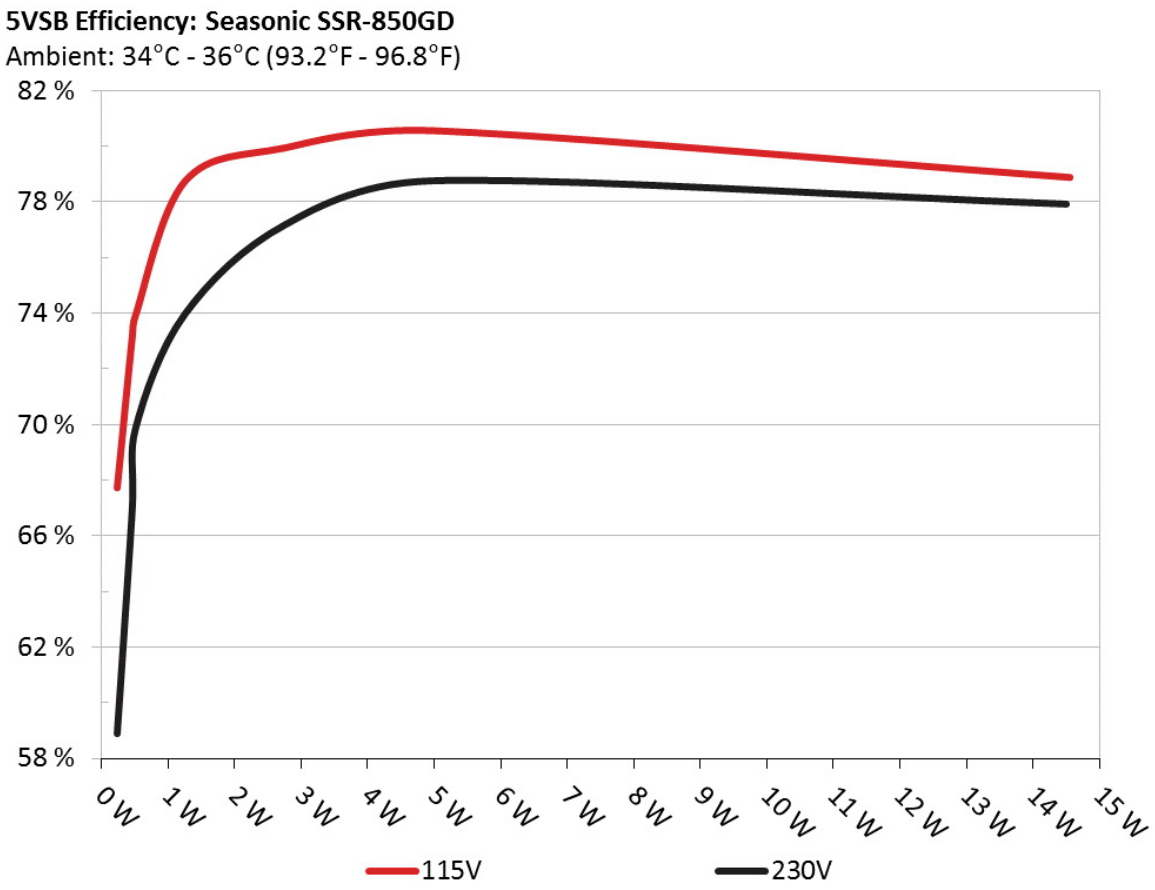
### Efficiency under high ambient temperature




**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




### INFO

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

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

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.041A | 0.212 | 64.634% | 0.036 |
| | 5.111V | 0.328 | | 115.08V |

| | | | | |
|---|---|---|---|---|
| 2 | 0.087A | 0.444 | 71.729% | 0.067 |
| | 5.109V | 0.619 | | 115.08V |
| 3 | 0.532A | 2.705 | 79.653% | 0.278 |
| | 5.088V | 3.396 | | 115.09V |
| 4 | 2.501A | 12.496 | 78.919% | 0.481 |
| | 4.996V | 15.834 | | 115.08V |

## Supplementary Tests (For Reference)

### Typical Load Tests 115V

| Test # | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | Fan Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.169A | 1.985A | 1.983A | 0.986A | 84.798 | 87.211% | 750 | 25.1 | 38.21°C | 0.968 |
| | 12.235V | 5.040V | 3.324V | 5.054V | 97.233 | | | | 41.84°C | 115.12V |
| 2 | 11.352A | 2.970A | 2.976A | 1.190A | 169.643 | 90.569% | 750 | 25.1 | 38.81°C | 0.990 |
| | 12.227V | 5.040V | 3.323V | 5.035V | 187.309 | | | | 43.44°C | 115.11V |
| 3 | 17.907A | 3.477A | 3.489A | 1.395A | 254.921 | 91.390% | 785 | 27.4 | 39.72°C | 0.985 |
| | 12.219V | 5.039V | 3.321V | 5.016V | 278.938 | | | | 45.03°C | 115.10V |
| 4 | 24.452A | 3.970A | 3.974A | 1.601A | 339.720 | 91.269% | 1111 | 39.0 | 40.05°C | 0.988 |
| | 12.210V | 5.038V | 3.319V | 4.996V | 372.218 | | | | 45.53°C | 115.10V |
| 5 | 30.667A | 4.968A | 4.972A | 1.805A | 424.656 | 90.702% | 1584 | 44.3 | 41.01°C | 0.991 |
| | 12.202V | 5.037V | 3.317V | 4.978V | 468.186 | | | | 46.10°C | 115.10V |
| 6 | 36.897A | 5.954A | 5.971A | 2.015A | 509.621 | 90.008% | 1842 | 49.8 | 41.41°C | 0.993 |
| | 12.192V | 5.037V | 3.315V | 4.960V | 566.196 | | | | 46.73°C | 115.10V |
| 7 | 43.133A | 6.950A | 6.972A | 2.225A | 594.584 | 89.209% | 2061 | 52.4 | 42.11°C | 0.995 |
| | 12.184V | 5.036V | 3.313V | 4.939V | 666.505 | | | | 47.84°C | 115.10V |
| 8 | 49.375A | 7.943A | 7.974A | 2.437A | 679.539 | 88.503% | 2061 | 52.4 | 43.06°C | 0.996 |
| | 12.174V | 5.036V | 3.310V | 4.920V | 767.816 | | | | 49.59°C | 115.10V |
| 9 | 56.052A | 8.445A | 8.489A | 2.441A | 764.528 | 87.641% | 2061 | 52.4 | 44.27°C | 0.996 |
| | 12.166V | 5.036V | 3.310V | 4.910V | 872.345 | | | | 51.87°C | 115.11V |
| 10 | 62.683A | 8.941A | 8.979A | 2.551A | 849.283 | 86.672% | 2061 | 52.4 | 45.99°C | 0.995 |
| | 12.157V | 5.036V | 3.307V | 4.892V | 979.886 | | | | 55.03°C | 115.10V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 69.725A | 8.940A | 8.984A | 2.555A | 934.095 | 85.576% | 2061 | 52.4 | 46.53°C | 0.993 |
| | 12.147V | 5.035V | 3.305V | 4.885V | 1091.540 | | | | 56.84°C | 115.08V |
| CL1 | 0.098A | 12.012A | 12.005A | 0.004A | 101.816 | 83.508% | 2061 | 52.4 | 43.43°C | 0.983 |
| | 12.248V | 5.057V | 3.317V | 5.084V | 121.923 | | | | 48.43°C | 115.14V |
| CL2 | 69.948A | 1.003A | 1.003A | 1.002A | 862.778 | 87.012% | 2061 | 52.4 | 44.20°C | 0.996 |
| | 12.142V | 5.026V | 3.315V | 4.985V | 991.563 | | | | 52.59°C | 115.11V |

The results above are not used in the certification process

## Light Load Tests 115V

| Test # | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | Fan Noise (dB[A]) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.193A | 0.493A | 0.480A | 0.195A | 19.672 | 69.878% | 750 | 25.1 | 0.833 |
| | 12.240V | 5.043V | 3.331V | 5.097V | 28.152 | | | | 115.12V |
| 2 | 2.411A | 0.991A | 0.989A | 0.391A | 39.762 | 80.778% | 750 | 25.1 | 0.924 |
| | 12.238V | 5.041V | 3.329V | 5.086V | 49.224 | | | | 115.12V |
| 3 | 3.628A | 1.477A | 1.500A | 0.590A | 59.803 | 84.782% | 750 | 25.1 | 0.956 |
| | 12.236V | 5.040V | 3.327V | 5.074V | 70.537 | | | | 115.12V |
| 4 | 4.841A | 1.985A | 1.983A | 0.787A | 79.793 | 86.887% | 750 | 25.1 | 0.965 |
| | 12.235V | 5.041V | 3.325V | 5.064V | 91.835 | | | | 115.12V |

The results above are not used in the certification process

## Ripple Measurements 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 9.6 mV | 6.3 mV | 7.0 mV | 7.3 mV | Pass |
| 20% Load | 12.9 mV | 5.4 mV | 9.6 mV | 8.2 mV | Pass |
| 30% Load | 15.7 mV | 6.6 mV | 12.4 mV | 9.7 mV | Pass |
| 40% Load | 17.8 mV | 7.9 mV | 14.1 mV | 10.7 mV | Pass |
| 50% Load | 15.1 mV | 8.0 mV | 14.6 mV | 11.6 mV | Pass |
| 60% Load | 12.4 mV | 7.6 mV | 14.5 mV | 13.5 mV | Pass |
| 70% Load | 13.8 mV | 7.8 mV | 14.5 mV | 15.6 mV | Pass |
| 80% Load | 14.6 mV | 7.8 mV | 14.0 mV | 16.8 mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 90% Load | 18.2 mV | 8.1 mV | 14.1 mV | 18.6 mV | Pass |
| 100% Load | 22.9 mV | 8.4 mV | 15.3 mV | 19.4 mV | Pass |
| 110% Load | 26.7 mV | 9.3 mV | 19.2 mV | 21.2 mV | Pass |
| Crossload 1 | 9.2 mV | 5.9 mV | 8.9 mV | 7.3 mV | Pass |
| Crossload 2 | 22.5 mV | 8.5 mV | 13.5 mV | 18.1 mV | Pass |

The results above are not used in the certification process

## Seasonic Prime Gold 850W



Top side




Power specifications label

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern

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