









# Seasonic Focus SGX-500W (#2)

序号 R2008AA164510249

Lab ID SS50001840

认证 ID 251840

测试结果报告 ID: 21PS1840A

证书签发日期 : Apr 26, 2021

115V 230V

认证方案: ETA-EMI PSU

115V 230V

认证方案: LAMBDA PSU

Aristeidis Bitziopoulos, 认证机构总经理

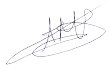
# General Information

## 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 | Focus SGX-500W (#2) |
| OEM/ODM | Seasonic |
| Serial Number | R2008AA164510249 |
| Product Specifications | |
| Manufacturer-Provided Information | |
| □□□□ (Vrms) | 100-240 |
| □□□□ (Arms) | 6-3 |



| | |
|---|---|
| 额定频率 (Hz) | 50-60 |
| 额定功率 (W) | 500 |
| 工作温度（持续满载） (°C) | |
| 类别 | SFX-L |
| 线材设计 | Fully Modular |
| 质保 | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| 重量 | |
| 散热 | 120mm Fluid Dynamic Bearing Fan (S1201512HB) |
| 半被动运行 | ✓ |
| Cybenetics Testing Information | |
| Lab ID | SS50001840 |
| Date of receipt | Feb 27, 2021 |
| Testing Date | Apr 26, 2021 |
| Report Issued Date | Apr 26, 2021 |
| Engineer Name | - |
| Authorized By the Laboratory Technical Manager | Aristeidis Bitziopoulos |
| Signature |  |

线材与接头

## (Non-accredited measurements)

| 模组化线材 | | | | |
|---|---|---|---|---|
| 描述 | 线材数量 | 总连接器数量 | Gauge | In Cable Capacitors |
| ATX 接头 20+4 pin (360mm) | 1 | 1 | 18AWG | 否 |
| 4+4 EPS12V接口 (410mm) | 1 | 1 | 18AWG | 否 |
| 6+2 pin PCIe接口 (410mm+110mm) | 1 | 2 | 18AWG | 否 |
| SATA接头 (310mm+200mm+100mm) | 1 | 3 | 18AWG | 否 |
| 4-pin Molex (300mm+200mm+200mm) | 1 | 3 | 18AWG | 否 |

| | | | | | |
|---|---|---|---|---|---|
| AC Power Cord (1400mm) - C13 coupler | 1 | 1 | 18AWG | - |

电源规格

| 供电轨 | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| 最大功率 | 安培 | 20 | 20 | 41 | 3 | 0.3 |
| | 瓦 | 100 | | 492 | 15 | 3.6 |
| 最大总功率 (W) | | 500 | | | | |

# Test Results

## Temperature & Compliance Info

| | |
|---|---|
| 温度范围 (°C /°F) | 28-32 / 82.4-89.6 |
| 符合 ErP Lot 3/6 | ✓ |
| 符合 (EU) No 617/2013规范 | ✓ |

## Performance Summary

### 115V

| | |
|---|---|
| Accredited | |
| 平均效率 (>1450 load combinations) | 88.959% |
| Average Noise Output (>1450 Load Combinations) | 25.45dBA |
| PF平均值 (>1450 Load Combinations) | 0.977 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 63.323% |
| 待机功耗 | 0.0435W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 30.28mV |
| 5V Ripple (Full Load) | 14.36mV |
| 3.3V Ripple (Full Load) | 15.78mV |
| 5VSB Ripple (Full Load) | 17.76mV |
| 12V Load Regulation | 0.11% |

| | |
|---|---|
| 5V Load Regulation | 0.44% |
| 3.3V Load Regulation | 2.19% |
| 5VSB Load Regulation | 2.01% |
| Inrush Current | 64.550A |

## 230V

| | | |
|---|---|---|
| Accredited | | |
| □□□□ (>1450 load combinations) | | 90.836% |
| Average Noise Output (>1450 Load Combinations) | | 25.53dBA |
| PF□□□ (>1450 Load Combinations) | | 0.916 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | | - |
| □□□□ | | 0.0687W |
| Non-Accredited | | |
| 12V Ripple (Full Load) | | 32.14mV |
| 5V Ripple (Full Load) | | 14.83mV |
| 3.3V Ripple (Full Load) | | 17.40mV |
| 5VSB Ripple (Full Load) | | 17.63mV |
| 12V Load Regulation | | 0.05% |
| 5V Load Regulation | | 0.42% |
| 3.3V Load Regulation | | 0.84% |
| 5VSB Load Regulation | | 1.88% |
| Inrush Current | | 81.240A |
| □□□□ & PWR_OK □□ | | 25.60ms |
| AC Loss to PWR_OK Hold Up Time | | 21.60ms |
| PWR_OK Inactive to DC Loss Delay | | 4.00ms |
| PSU Timings: T1 (20% / 100%) | 88.0ms | 87.0ms |
| PSU Timings: T3 (20% / 100%) | 311.0ms | 310.0ms |
| OPP (24.61°C / 41.20°C) | 139.97% | 139.99% |

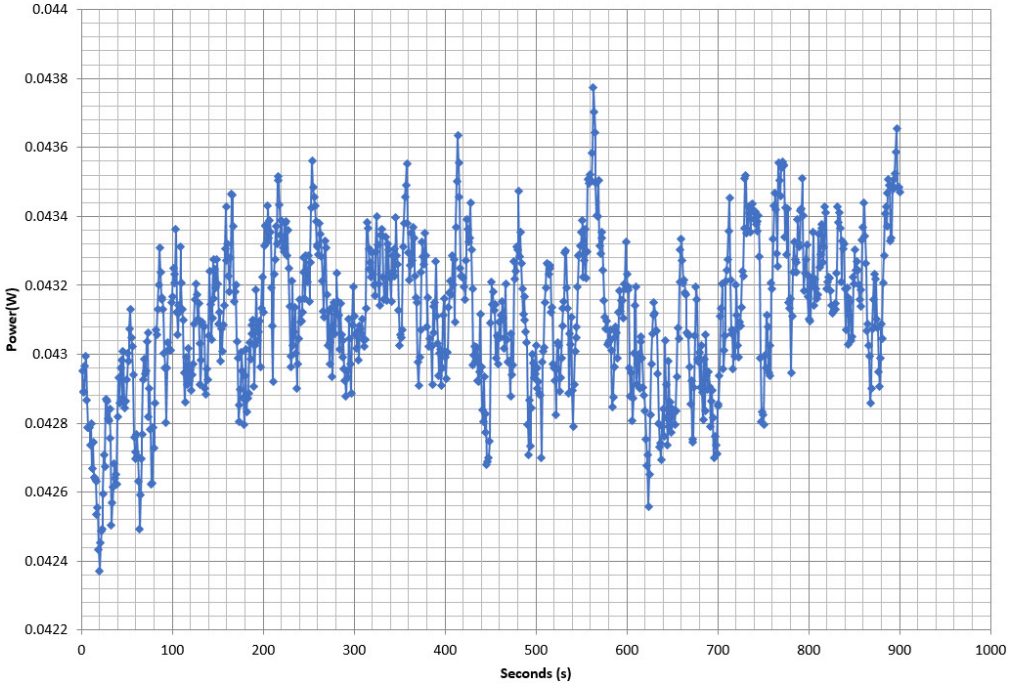
## □□□□ & PWR_OK □□

| | |
|---|---|
| Hold-Up Time (ms) | 25.6 |
| AC Loss to PWR_OK Hold Up Time (ms) | 21.6 |
| PWR_OK Inactive to DC Loss Delay (ms) | 4 |

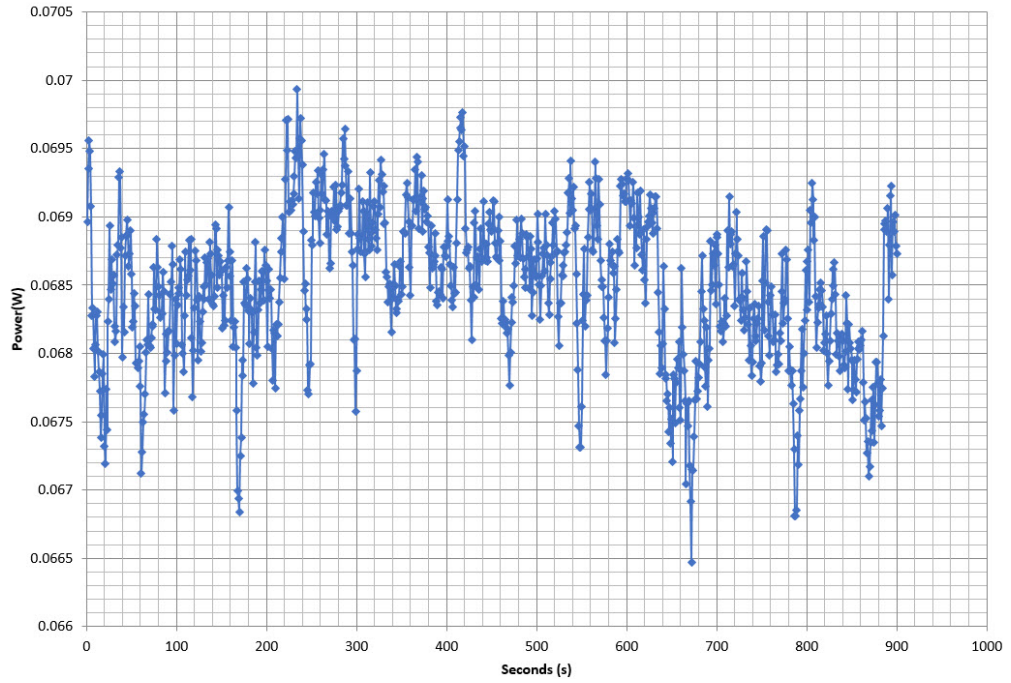
## □□□□

### Graphs

**115V**

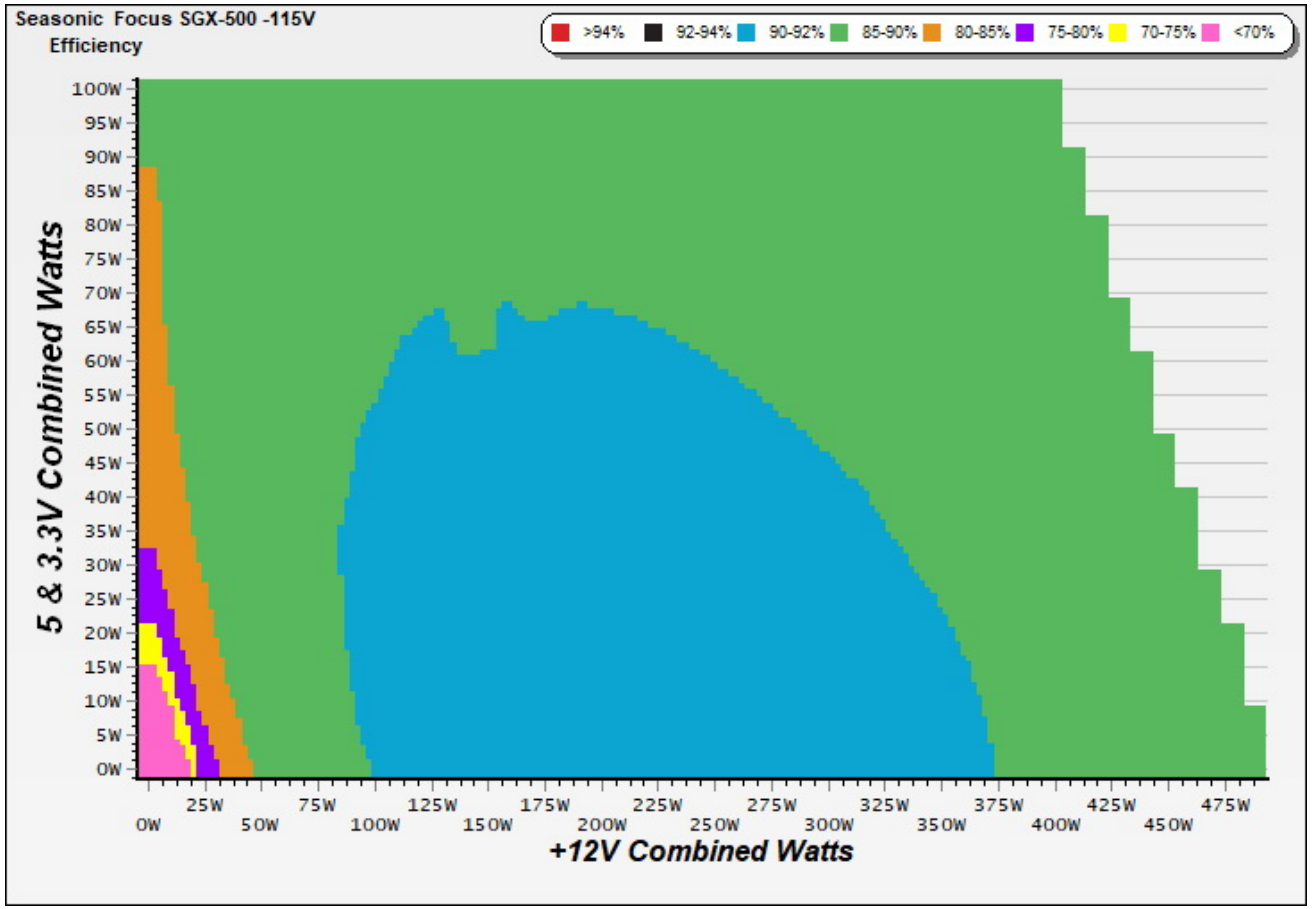



**230V**



## □□□□□□

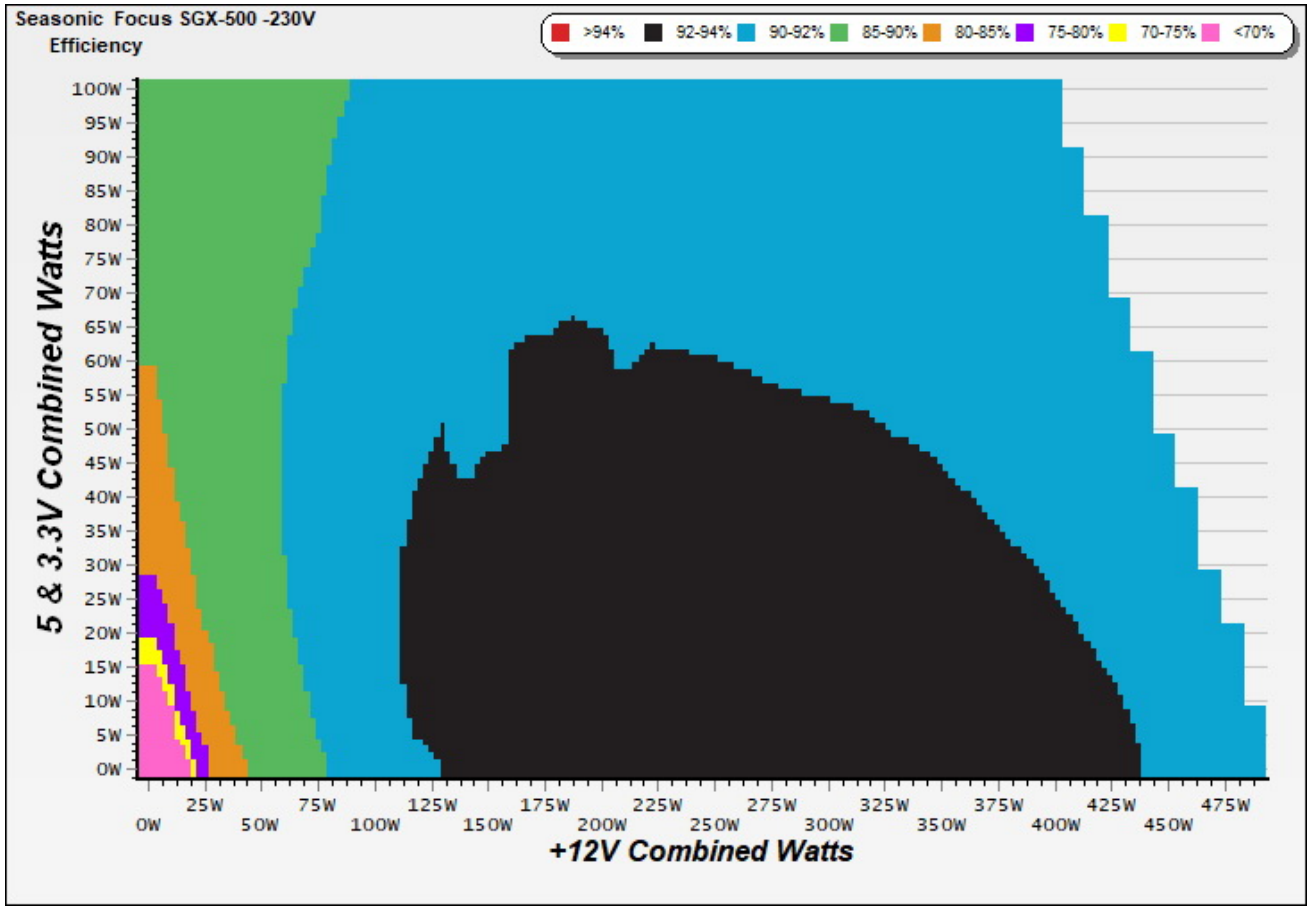
### 115V




□□

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

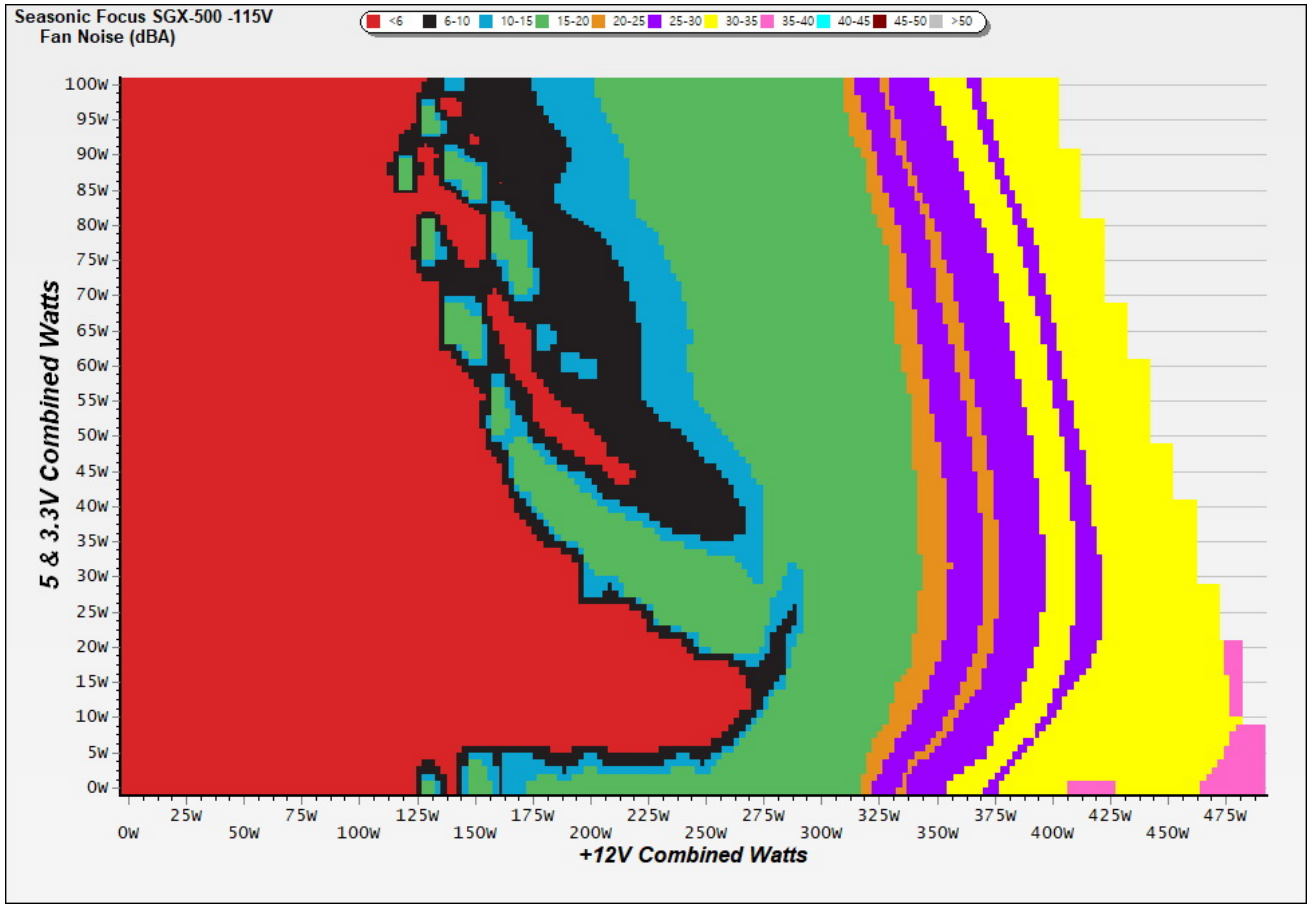
## 230V




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

## □□□

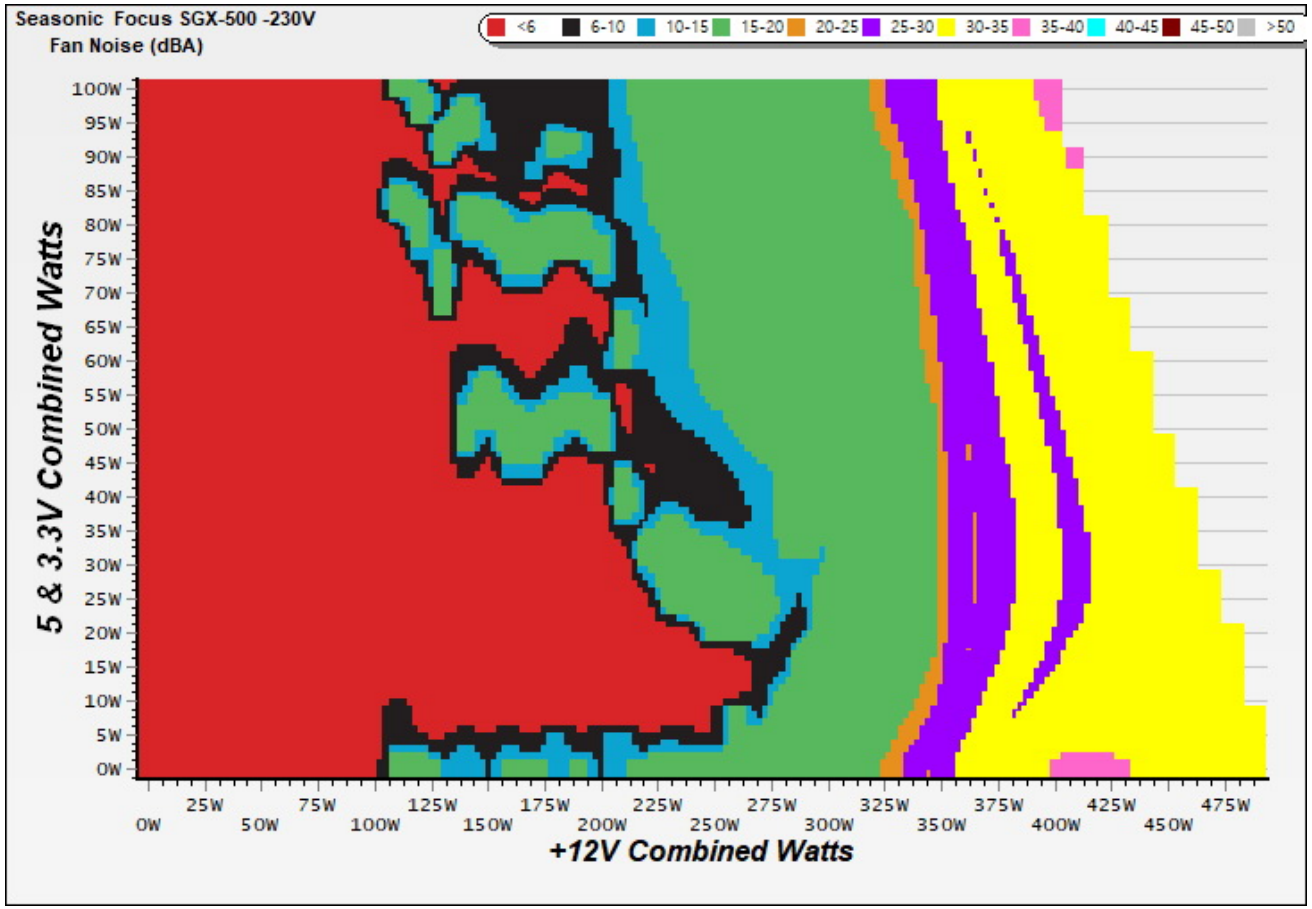
### 115V




□□

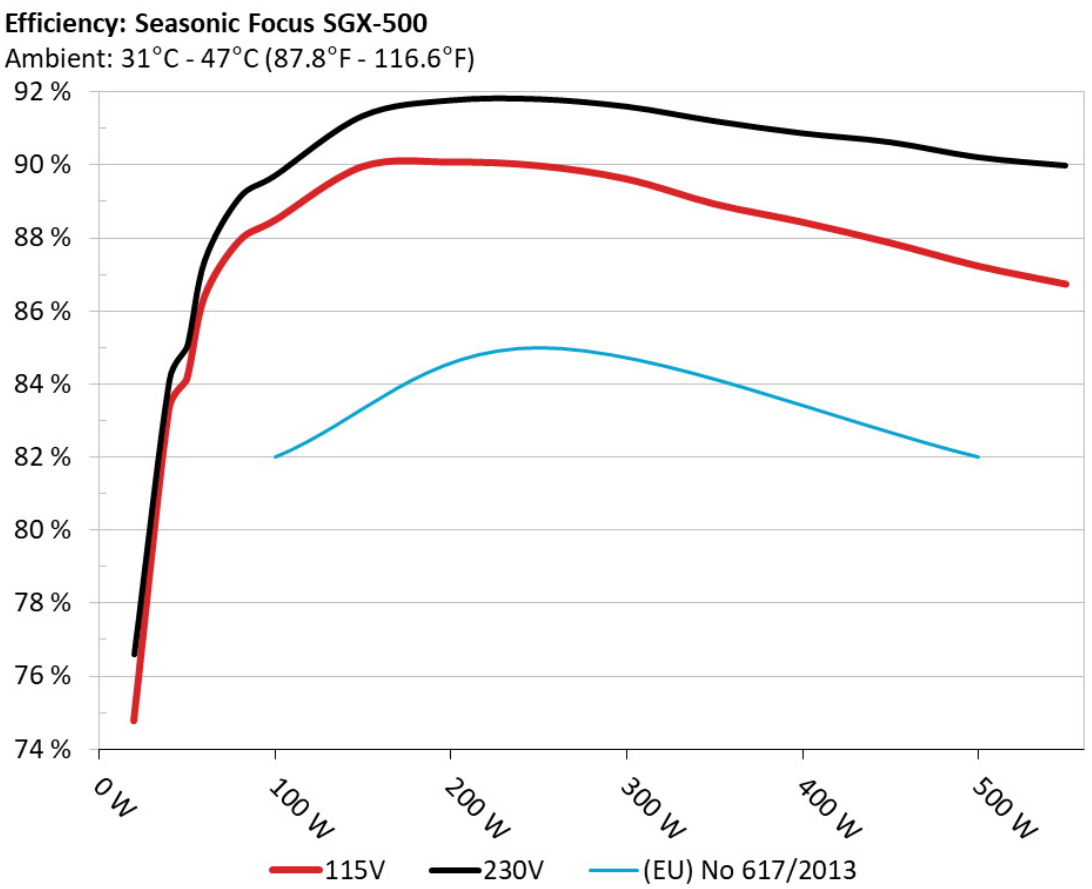
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

## 230V



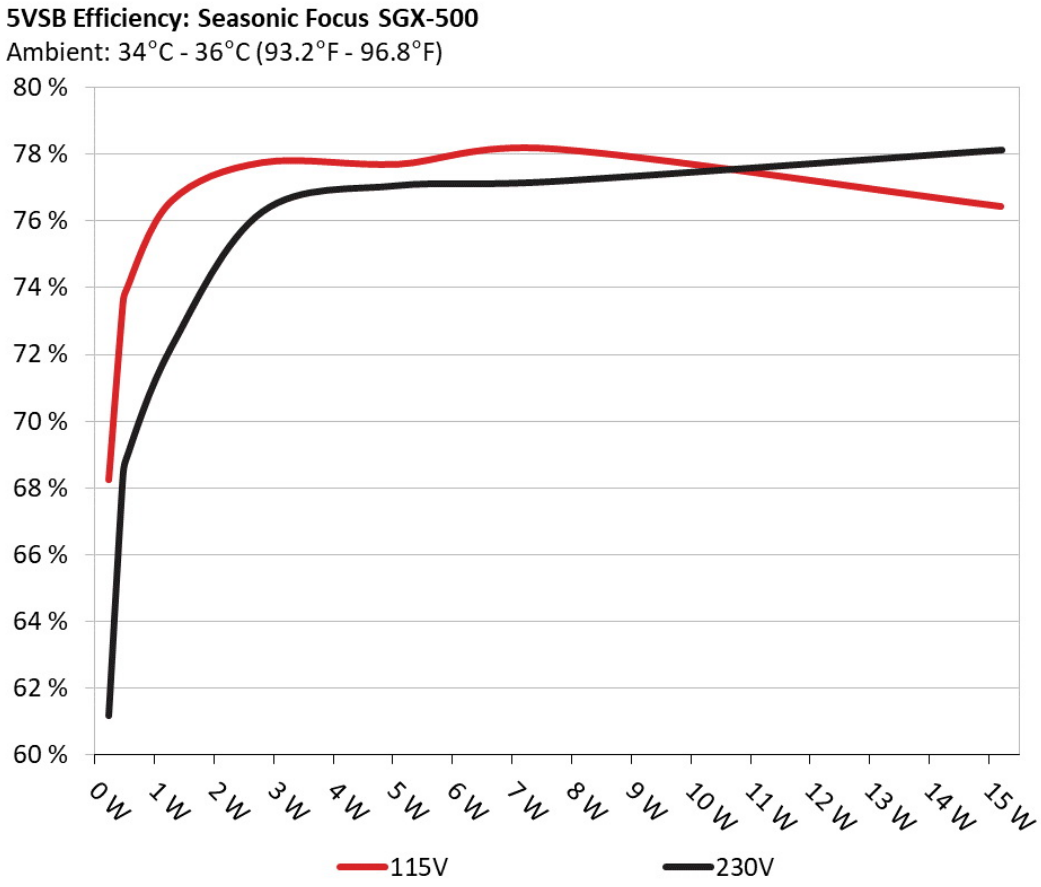

The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

## Indicative Performance




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□□**




□□

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

## 5VSB□□□ ERP LOT 3/6□ CEC□

### 115V

| □□ # | 5VSB | DC/AC (□ ) | □□ | PF/AC □□ |
|---|---|---|---|---|
| 1 | 0.045A | 0.230 | 68.249% | 0.053 |
| | 5.123V | 0.337 | | 115.14V |
| 2 | 0.090A | 0.461 | 73.408% | 0.097 |
| | 5.122V | 0.628 | | 115.14V |
| 3 | 0.550A | 2.812 | 77.744% | 0.332 |
| | 5.114V | 3.617 | | 115.14V |
| 4 | 1.000A | 5.106 | 77.693% | 0.402 |
| | 5.106V | 6.572 | | 115.15V |
| 5 | 1.500A | 7.647 | 78.158% | 0.438 |
| | 5.098V | 9.784 | | 115.15V |
| 6 | 2.999A | 15.204 | 76.429% | 0.489 |
| | 5.069V | 19.893 | | 115.15V |

### 230V

| □□ # | 5VSB | DC/AC (□ ) | □□ | PF/AC □□ |
|---|---|---|---|---|
| 1 | 0.045A | 0.230 | 61.170% | 0.019 |
| | 5.122V | 0.376 | | 230.30V |
| 2 | 0.090A | 0.461 | 68.195% | 0.033 |
| | 5.121V | 0.676 | | 230.30V |
| 3 | 0.550A | 2.812 | 76.289% | 0.159 |
| | 5.113V | 3.686 | | 230.30V |
| 4 | 1.000A | 5.105 | 77.068% | 0.240 |
| | 5.106V | 6.624 | | 230.31V |
| 5 | 1.500A | 7.646 | 77.186% | 0.296 |
| | 5.097V | 9.906 | | 230.31V |
| 6 | 2.999A | 15.215 | 78.130% | 0.371 |
| | 5.073V | 19.474 | | 230.31V |

## Supplementary Tests (For Reference)

□□□□□□

### 115V

| □□ # | 12V | 5V | 3.3V | 5VSB | DC/AC (□ ) | □□ | □□□□ (RPM) | PSU □□ (dB[A]) | □□□□□□□□□ | PF/AC □□ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.360A | 1.983A | 1.985A | 0.980A | 49.986 | 84.133% | 0 | <6.0 | 36.38°C | 0.930 |
| | 12.029V | 5.042V | 3.325V | 5.101V | 59.413 | | | | 40.77°C | 115.14V |
| 2 | 10.397A | 2.722A | 1.502A | 1.315A | 100.418 | 88.503% | 0 | <6.0 | 26.71°C | 0.629 |
| | 12.018V | 5.041V | 3.326V | 5.107V | 113.463 | | | | 31.48°C | 115.14V |
| 3 | 9.468A | 3.473A | 3.479A | 1.377A | 149.937 | 89.966% | 0 | <6.0 | 36.58°C | 0.983 |
| | 12.031V | 5.039V | 3.320V | 5.084V | 166.660 | | | | 41.92°C | 115.13V |
| 4 | 13.198A | 3.973A | 3.978A | 1.576A | 199.975 | 90.091% | 850 | 17.3 | 42.40°C | 0.985 |
| | 12.031V | 5.035V | 3.318V | 5.075V | 221.970 | | | | 48.96°C | 115.13V |
| 5 | 16.584A | 4.968A | 4.976A | 1.776A | 249.997 | 89.989% | 952 | 20.1 | 42.63°C | 0.986 |
| | 12.031V | 5.032V | 3.316V | 5.066V | 277.808 | | | | 49.47°C | 115.13V |
| 6 | 19.960A | 5.964A | 5.976A | 1.977A | 299.941 | 89.626% | 1129 | 27.6 | 43.35°C | 0.985 |
| | 12.031V | 5.031V | 3.313V | 5.057V | 334.658 | | | | 50.33°C | 115.14V |
| 7 | 23.351A | 6.963A | 7.098A | 2.179A | 350.033 | 88.941% | 1500 | 36.2 | 43.49°C | 0.985 |
| | 12.031V | 5.028V | 3.256V | 5.046V | 393.556 | | | | 51.04°C | 115.14V |
| 8 | 26.722A | 7.962A | 7.987A | 2.382A | 399.867 | 88.443% | 1642 | 40.5 | 44.46°C | 0.985 |
| | 12.031V | 5.026V | 3.304V | 5.036V | 452.120 | | | | 52.74°C | 115.14V |
| 9 | 30.515A | 8.458A | 8.478A | 2.385A | 449.602 | 87.879% | 1909 | 43.2 | 44.77°C | 0.985 |
| | 12.031V | 5.024V | 3.302V | 5.030V | 511.616 | | | | 53.55°C | 115.15V |
| 10 | 34.075A | 8.960A | 9.000A | 2.990A | 499.633 | 87.243% | 2052 | 44.4 | 45.66°C | 0.985 |
| | 12.031V | 5.023V | 3.299V | 5.015V | 572.690 | | | | 55.80°C | 115.15V |
| 11 | 38.229A | 8.961A | 9.003A | 2.994A | 549.641 | 86.745% | 2108 | 44.8 | 46.46°C | 0.986 |
| | 12.032V | 5.022V | 3.298V | 5.010V | 633.631 | | | | 57.91°C | 115.14V |
| CL1 | 0.116A | 11.999A | 11.998A | 0.000A | 101.435 | 84.177% | 1159 | 29.5 | 46.47°C | 0.975 |
| | 12.035V | 5.034V | 3.303V | 5.100V | 120.502 | | | | 53.26°C | 115.17V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CL2 | 40.996A | 1.000A | 1.000A | 1.000A | 506.721 | 88.176% | 2104 | 44.6 | 45.67°C | 0.985 |
| | 12.034V | 5.032V | 3.316V | 5.057V | 574.672 | | | | 57.56°C | 115.15V |

□□□□□□□□□□□

**230V**

| □□ # | 12V | 5V | 3.3V | 5VSB | DC/AC (□ ) | □□ | □□□□ (RPM) | PSU □□ (dB[A]) | □□□□□□□□□ | PF/AC □□ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.360A | 1.983A | 1.986A | 0.980A | 49.983 | 85.033% | 0 | <6.0 | 38.52°C | 0.664 |
| | 12.028V | 5.042V | 3.324V | 5.100V | 58.781 | | | | 42.96°C | 230.27V |
| 2 | 5.744A | 2.976A | 2.982A | 1.178A | 99.991 | 89.717% | 0 | <6.0 | 38.74°C | 0.838 |
| | 12.029V | 5.040V | 3.320V | 5.091V | 111.452 | | | | 43.36°C | 230.27V |
| 3 | 9.468A | 3.473A | 3.481A | 1.377A | 149.937 | 91.354% | 0 | <6.0 | 39.43°C | 0.903 |
| | 12.031V | 5.039V | 3.318V | 5.083V | 164.127 | | | | 44.54°C | 230.27V |
| 4 | 13.198A | 3.973A | 3.981A | 1.576A | 199.968 | 91.779% | 597 | 7.8 | 41.78°C | 0.932 |
| | 12.031V | 5.036V | 3.316V | 5.075V | 217.881 | | | | 47.59°C | 230.27V |
| 5 | 16.584A | 4.969A | 4.980A | 1.776A | 249.992 | 91.811% | 950 | 19.9 | 42.65°C | 0.947 |
| | 12.030V | 5.032V | 3.313V | 5.066V | 272.290 | | | | 49.26°C | 230.27V |
| 6 | 19.960A | 5.965A | 5.982A | 1.977A | 299.938 | 91.608% | 1135 | 28.1 | 43.45°C | 0.956 |
| | 12.031V | 5.031V | 3.310V | 5.057V | 327.414 | | | | 50.54°C | 230.27V |
| 7 | 23.348A | 6.961A | 6.985A | 2.178A | 349.999 | 91.211% | 1456 | 33.5 | 43.85°C | 0.962 |
| | 12.031V | 5.029V | 3.307V | 5.048V | 383.724 | | | | 51.85°C | 230.27V |
| 8 | 26.708A | 7.960A | 7.987A | 2.380A | 399.712 | 90.878% | 1625 | 39.5 | 43.91°C | 0.966 |
| | 12.031V | 5.027V | 3.304V | 5.039V | 439.835 | | | | 52.54°C | 230.27V |
| 9 | 30.502A | 8.456A | 8.476A | 2.383A | 449.428 | 90.635% | 1858 | 41.8 | 44.64°C | 0.969 |
| | 12.031V | 5.025V | 3.302V | 5.034V | 495.865 | | | | 54.26°C | 230.27V |
| 10 | 34.059A | 8.956A | 8.998A | 2.988A | 499.448 | 90.221% | 2046 | 44.2 | 44.65°C | 0.971 |
| | 12.032V | 5.024V | 3.300V | 5.019V | 553.582 | | | | 55.56°C | 230.27V |
| 11 | 38.218A | 8.959A | 9.001A | 2.990A | 549.464 | 89.993% | 2097 | 44.4 | 46.19°C | 0.973 |
| | 12.032V | 5.022V | 3.298V | 5.014V | 610.563 | | | | 57.97°C | 230.27V |
| CL1 | 0.115A | 11.998A | 11.997A | 0.000A | 101.410 | 85.692% | 935 | 19.2 | 39.73°C | 0.850 |
| | 12.033V | 5.034V | 3.304V | 5.101V | 118.342 | | | | 46.20°C | 230.27V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CL2 | 40.981A | 1.000A | 1.000A | 1.000A | 506.456 | 91.240% | 1957 | 43.8 | 43.18°C | 0.971 |
| | 12.032V | 5.031V | 3.317V | 5.060V | 555.082 | | | | 53.55°C | 230.27V |

上述结果不用于认证过程

轻载测试

## 115V

| 测试 # | 12V | 5V | 3.3V | 5VSB | DC/AC (瓦 ) | 效率 | 风扇转速 (RPM) | PSU 噪音 (dB[A]) | PF/AC 电压 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.233A | 0.495A | 0.495A | 0.195A | 19.978 | 74.782% | 0 | <6.0 | 0.762 |
| | 12.024V | 5.046V | 3.331V | 5.118V | 26.715 | | | | 115.14V |
| 2 | 2.468A | 0.991A | 0.991A | 0.391A | 39.967 | 83.332% | 0 | <6.0 | 0.904 |
| | 12.024V | 5.045V | 3.329V | 5.112V | 47.961 | | | | 115.14V |
| 3 | 3.705A | 1.488A | 1.488A | 0.587A | 59.998 | 86.389% | 0 | <6.0 | 0.947 |
| | 12.026V | 5.041V | 3.326V | 5.107V | 69.451 | | | | 115.14V |
| 4 | 4.935A | 1.984A | 1.985A | 0.784A | 79.950 | 87.935% | 0 | <6.0 | 0.965 |
| | 12.027V | 5.041V | 3.324V | 5.101V | 90.919 | | | | 115.14V |

上述结果不用于认证过程

## 230V

| 测试 # | 12V | 5V | 3.3V | 5VSB | DC/AC (瓦 ) | 效率 | 风扇转速 (RPM) | PSU 噪音 (dB[A]) | PF/AC 电压 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.233A | 0.495A | 0.495A | 0.195A | 19.974 | 76.590% | 0 | <6.0 | 0.448 |
| | 12.028V | 5.047V | 3.330V | 5.117V | 26.079 | | | | 230.28V |
| 2 | 2.466A | 0.991A | 0.991A | 0.391A | 39.963 | 84.118% | 0 | <6.0 | 0.599 |
| | 12.028V | 5.046V | 3.328V | 5.112V | 47.508 | | | | 230.29V |
| 3 | 3.704A | 1.487A | 1.488A | 0.587A | 59.995 | 87.385% | 0 | <6.0 | 0.710 |
| | 12.028V | 5.042V | 3.325V | 5.106V | 68.656 | | | | 230.28V |
| 4 | 4.934A | 1.984A | 1.986A | 0.784A | 79.947 | 89.122% | 0 | <6.0 | 0.788 |
| | 12.028V | 5.041V | 3.323V | 5.101V | 89.705 | | | | 230.27V |

上述结果不用于认证过程

□□□□

**115V**

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 10.10mV | 8.11mV | 7.19mV | 10.83mV | Pass |
| 20% Load | 5.52mV | 7.18mV | 6.23mV | 7.55mV | Pass |
| 30% Load | 13.72mV | 9.25mV | 9.13mV | 11.49mV | Pass |
| 40% Load | 14.27mV | 9.48mV | 9.81mV | 12.55mV | Pass |
| 50% Load | 15.84mV | 10.60mV | 10.56mV | 13.18mV | Pass |
| 60% Load | 15.94mV | 11.00mV | 11.67mV | 13.63mV | Pass |
| 70% Load | 17.54mV | 11.66mV | 12.68mV | 13.05mV | Pass |
| 80% Load | 18.90mV | 12.25mV | 14.37mV | 14.64mV | Pass |
| 90% Load | 20.27mV | 12.37mV | 14.75mV | 14.82mV | Pass |
| 100% Load | 30.28mV | 14.36mV | 15.78mV | 17.76mV | Pass |
| 110% Load | 31.25mV | 14.45mV | 16.64mV | 18.20mV | Pass |
| Crossload1 | 19.99mV | 11.10mV | 15.82mV | 11.66mV | Pass |
| Crossload2 | 29.03mV | 12.29mV | 11.17mV | 17.08mV | Pass |

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**230V**

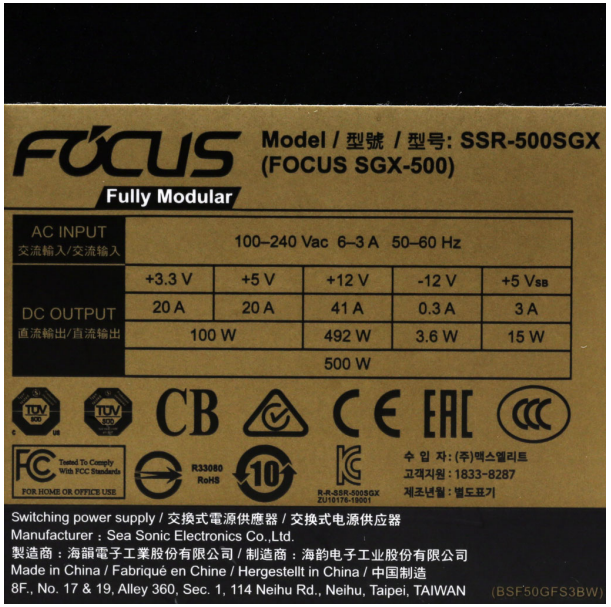
| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 14.74mV | 8.20mV | 7.43mV | 11.28mV | Pass |
| 20% Load | 18.54mV | 8.65mV | 8.62mV | 11.87mV | Pass |
| 30% Load | 19.19mV | 9.10mV | 9.28mV | 11.99mV | Pass |
| 40% Load | 20.22mV | 9.79mV | 9.81mV | 12.72mV | Pass |
| 50% Load | 21.80mV | 10.95mV | 10.82mV | 12.96mV | Pass |
| 60% Load | 23.77mV | 11.49mV | 12.01mV | 13.59mV | Pass |
| 70% Load | 25.47mV | 12.30mV | 12.84mV | 14.38mV | Pass |
| 80% Load | 27.23mV | 12.97mV | 15.45mV | 14.70mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 90% Load | 28.90mV | 13.18mV | 15.82mV | 14.73mV | Pass |
| 100% Load | 32.14mV | 14.83mV | 17.40mV | 17.63mV | Pass |
| 110% Load | 32.42mV | 15.41mV | 17.49mV | 17.06mV | Pass |
| Crossload1 | 19.99mV | 11.07mV | 16.97mV | 12.55mV | Pass |
| Crossload2 | 30.40mV | 12.98mV | 11.97mV | 15.80mV | Pass |

## Seasonic Focus SGX-500W (#2)



Top side




Power specifications label

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