# Antec Signature Titanium 1000W

Serial Number ST1000GSN200200207

Lab ID AN10001615

Certification ID 251615

Test Result Report ID: 20PS1615A

Certificate Issue Date: Mar 4, 2020

Scheme: ETA-EMI PSU

115V 230V

Scheme: LAMBDA PSU

115V 230V

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 | Antec |
| Model | Signature Titanium 1000W |
| OEM/ODM | Seasonic |
| Serial Number | ST1000GSN200200207 |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 13-6.5 |
| Rated Frequency (Hz) | 50-60 |

| | |
|---|---|
| Rated Power (W) | 1000 |
| 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 | AN10001615 |
| Date of receipt | Feb 26, 2020 |
| Testing Date | Mar 3, 2020 |
| Report Issued Date | Mar 4, 2020 |
| 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 | In Cable Capacitors |
| ATX connector 20+4 pin (610mm) | 1 | 1 | 18-22AWG | No |
| 4+4 pin EPS12V (650mm) | 2 | 2 | 18AWG | No |
| 6+2 pin PCIe (750mm) | 4 | 4 | 18AWG | No |
| 6+2 pin PCIe (680mm+70mm) | 2 | 4 | 18AWG | No |
| SATA (400mm+115mm+115mm+115mm) | 2 | 8 | 18AWG | No |
| SATA (350mm+150mm+150mm+150mm) | 1 | 4 | 18AWG | No |
| SATA (300mm+150mm) | 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 (105mm) | 1 | 1 | 22AWG | No |
| 4 pin Molex to SATA 3.3V Adapter (150mm+150mm) | 1 | 2 | 18AWG | No |
| OC Link Cable (460mm) | 1 | 1 | 24AWG | No |
| AC Power Cord (1400mm) - C13 coupler | 1 | 1 | 16AWG | - |

### Power Specifications

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 25 | 25 | 83 | 3 | 0.3 |
| | Watts | 125 | | 996 | 15 | 3.6 |
| Total Max. Power (W) | | 1000 | | | | |

## 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) | 92.057% |
| Average Noise Output (>1450 Load Combinations) | 23.28dBA |
| Average PF (>1450 Load Combinations) | 0.990 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 77.492% |
| Standby Power Consumption | 0.0566W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 18.02mV |

| | |
|---|---|
| 5V Ripple (Full Load) | 8.51mV |
| 3.3V Ripple (Full Load) | 17.20mV |
| 5VSB Ripple (Full Load) | 8.95mV |
| 12V Load Regulation | 0.05% |
| 5V Load Regulation | 0.51% |
| 3.3V Load Regulation | 0.68% |
| 5VSB Load Regulation | 3.04% |
| Inrush Current | 26.180A |

## 230V

| | | |
|---|---|---|
| Accredited | | |
| Average Efficiency (>1450 load combinations) | | 93.873% |
| Average Noise Output (>1450 Load Combinations) | | 22.83dBA |
| Average PF (>1450 Load Combinations) | | 0.960 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | | - |
| Standby Power Consumption | | 0.0936W |
| Non-Accredited | | |
| 12V Ripple (Full Load) | | 17.13mV |
| 5V Ripple (Full Load) | | 9.00mV |
| 3.3V Ripple (Full Load) | | 17.45mV |
| 5VSB Ripple (Full Load) | | 8.42mV |
| 12V Load Regulation | | 0.06% |
| 5V Load Regulation | | 0.51% |
| 3.3V Load Regulation | | 0.68% |
| 5VSB Load Regulation | | 3.00% |
| Inrush Current | | 82.460A |
| Hold-Up Time & PWR_OK Signal | | 24.80ms |
| AC Loss to PWR_OK Hold Up Time | | 21.00ms |
| PWR_OK Inactive to DC Loss Delay | | 3.80ms |
| PSU Timings: T1 (20% / 100%) | 132.0ms | 144.0ms |
| PSU Timings: T3 (20% / 100%) | 322.0ms | 324.0ms |
| OPP (0.00°C / 0.00°C) | 137.43% | - |

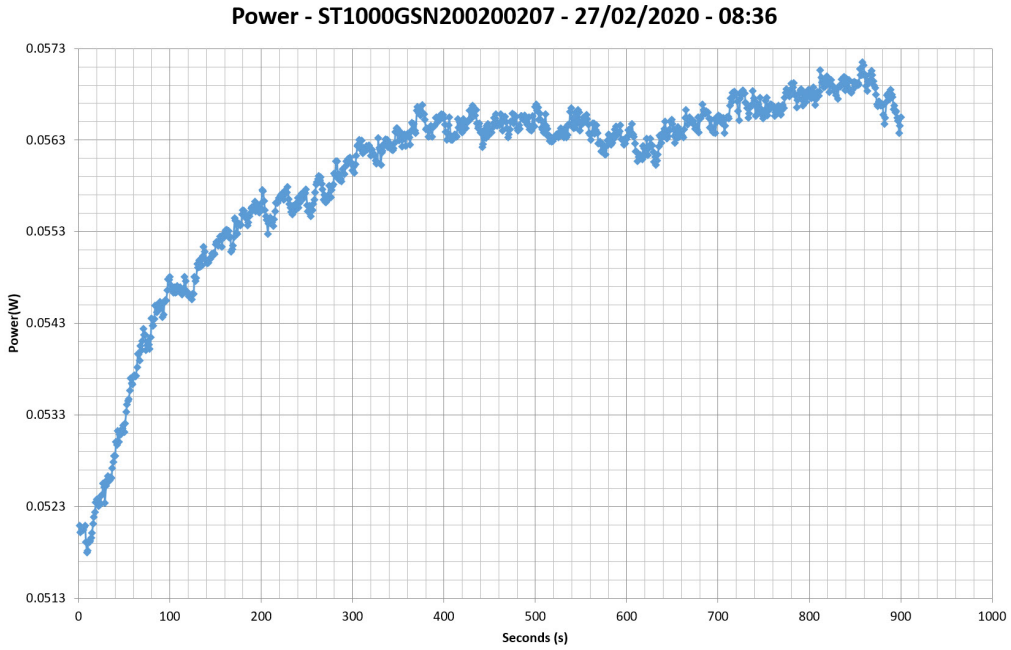
## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 24.8 |
| AC Loss to PWR_OK Hold Up Time (ms) | 21 |
| PWR_OK Inactive to DC Loss Delay (ms) | 3.8 |

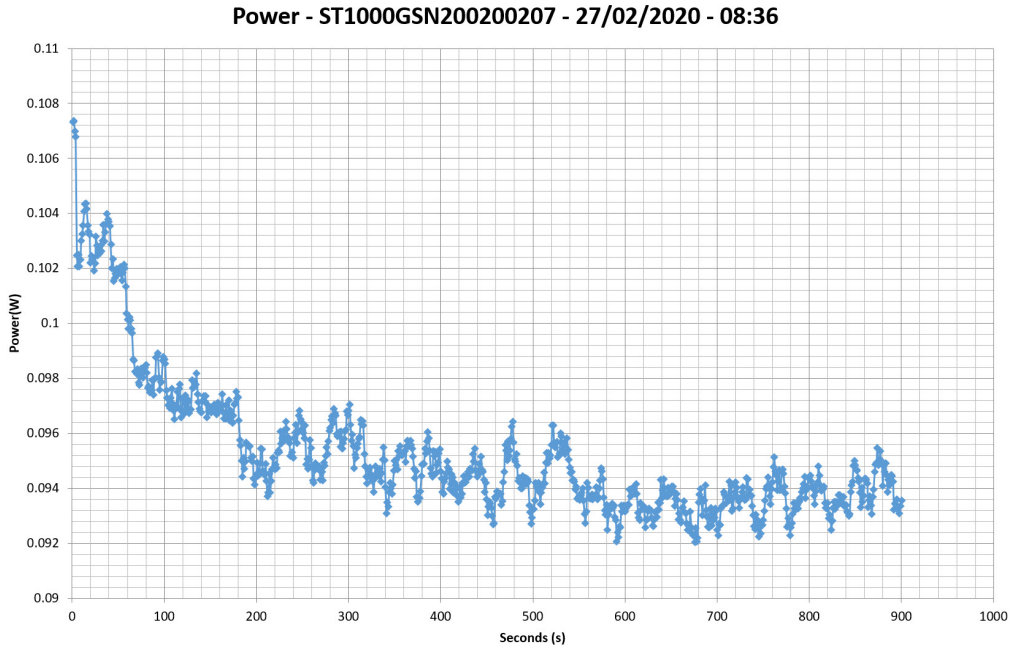
## Stromverbrauch im Ruhezustand

### Graphs

**115V**

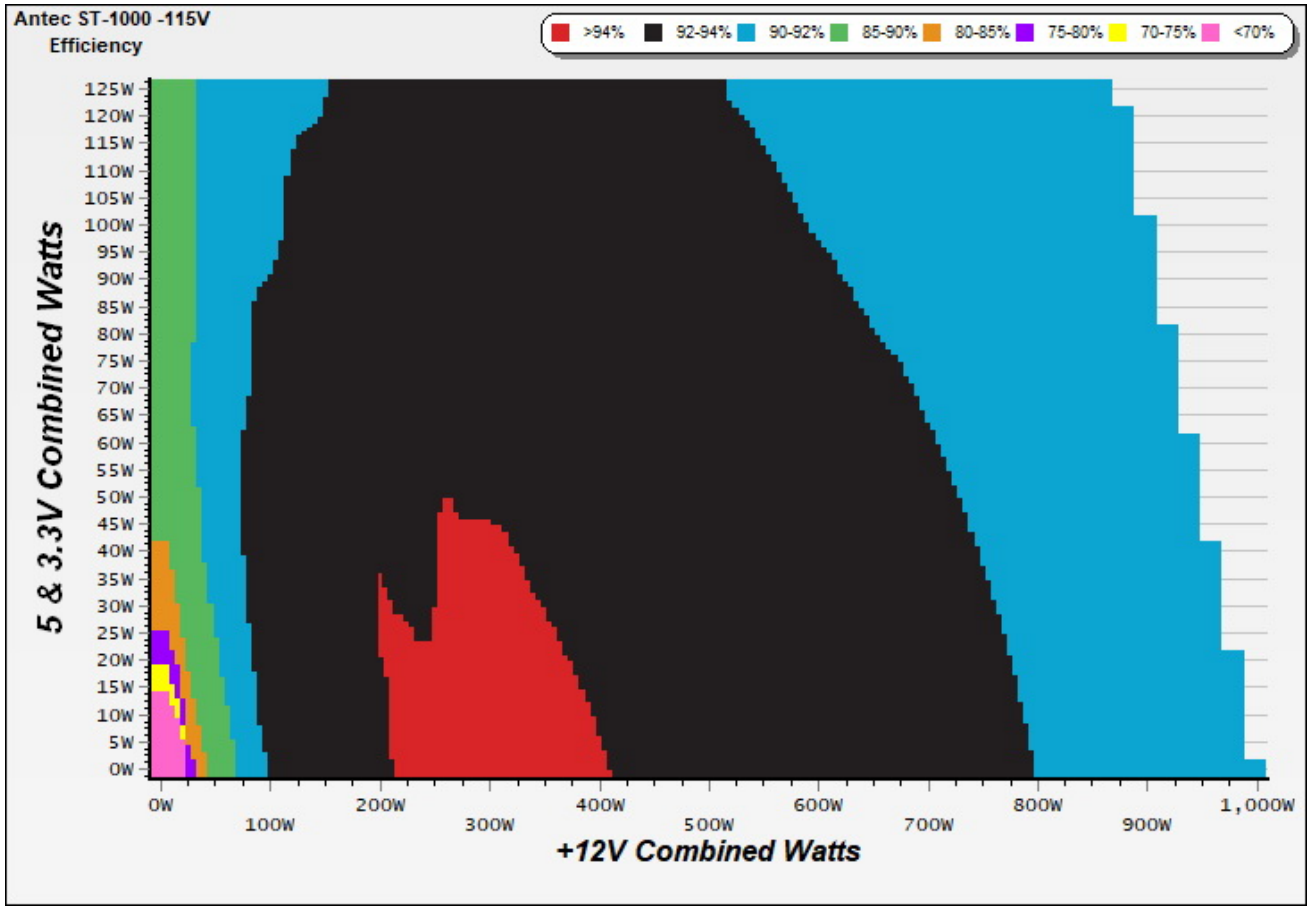



**230V**



## Efficiency Graph

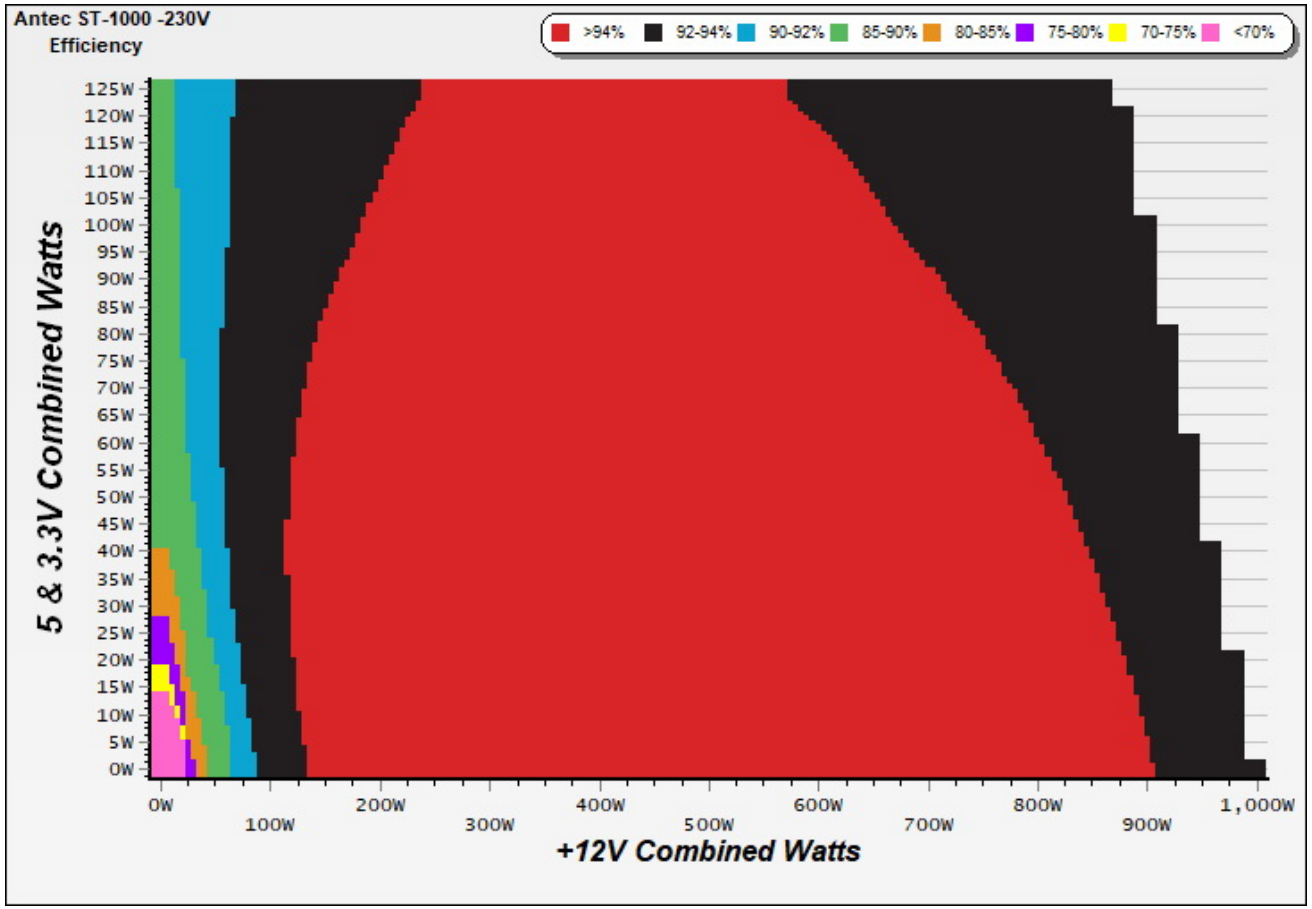
**115V**




**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

## 230V

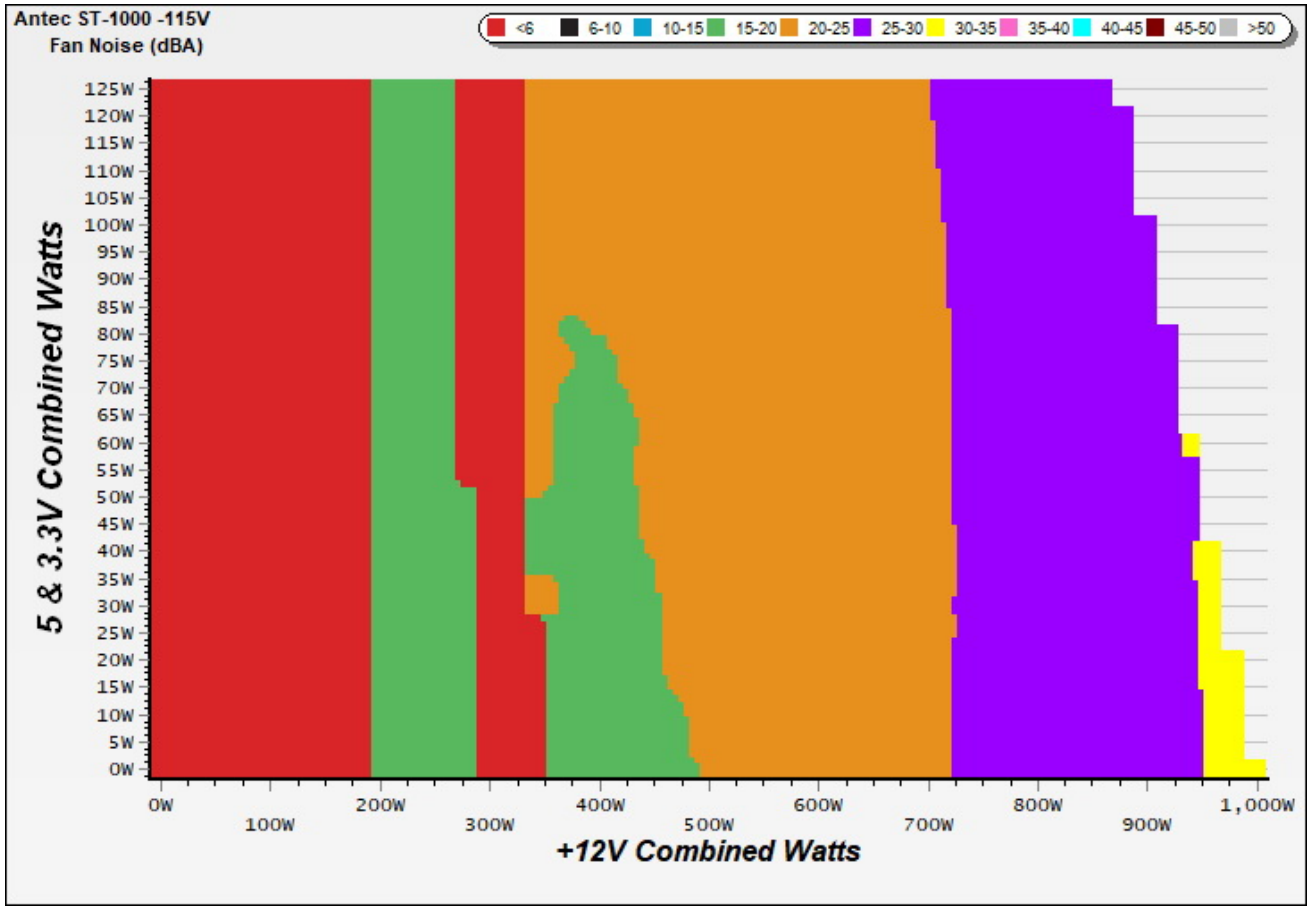



### INFO

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

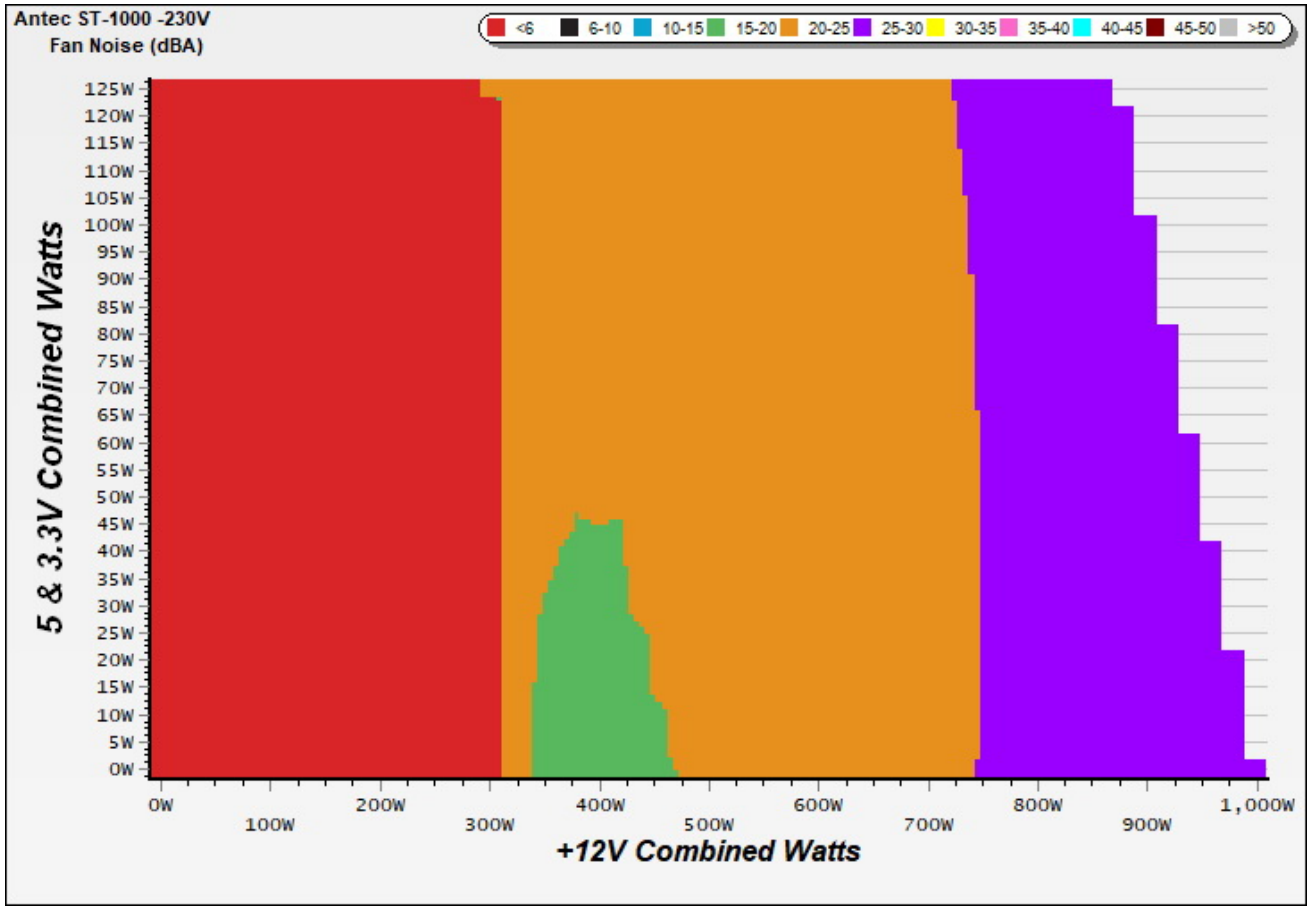
**115V**




**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

## 230V

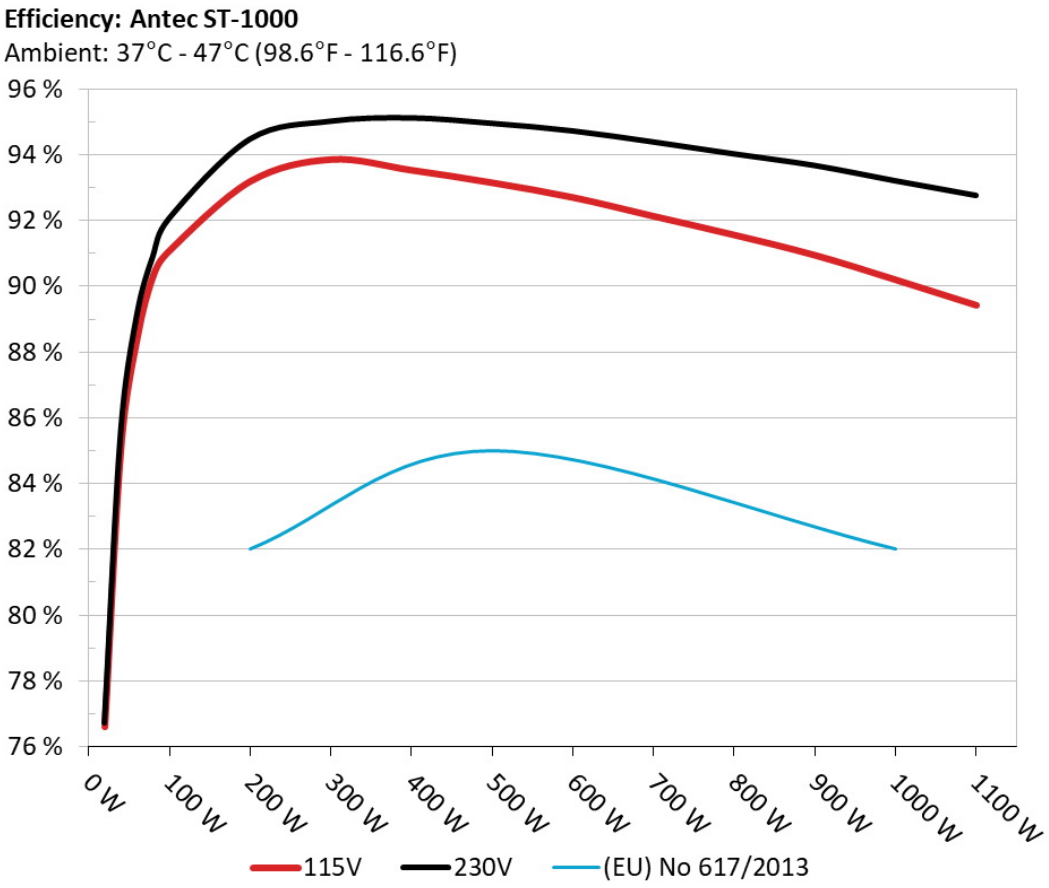



### INFO

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

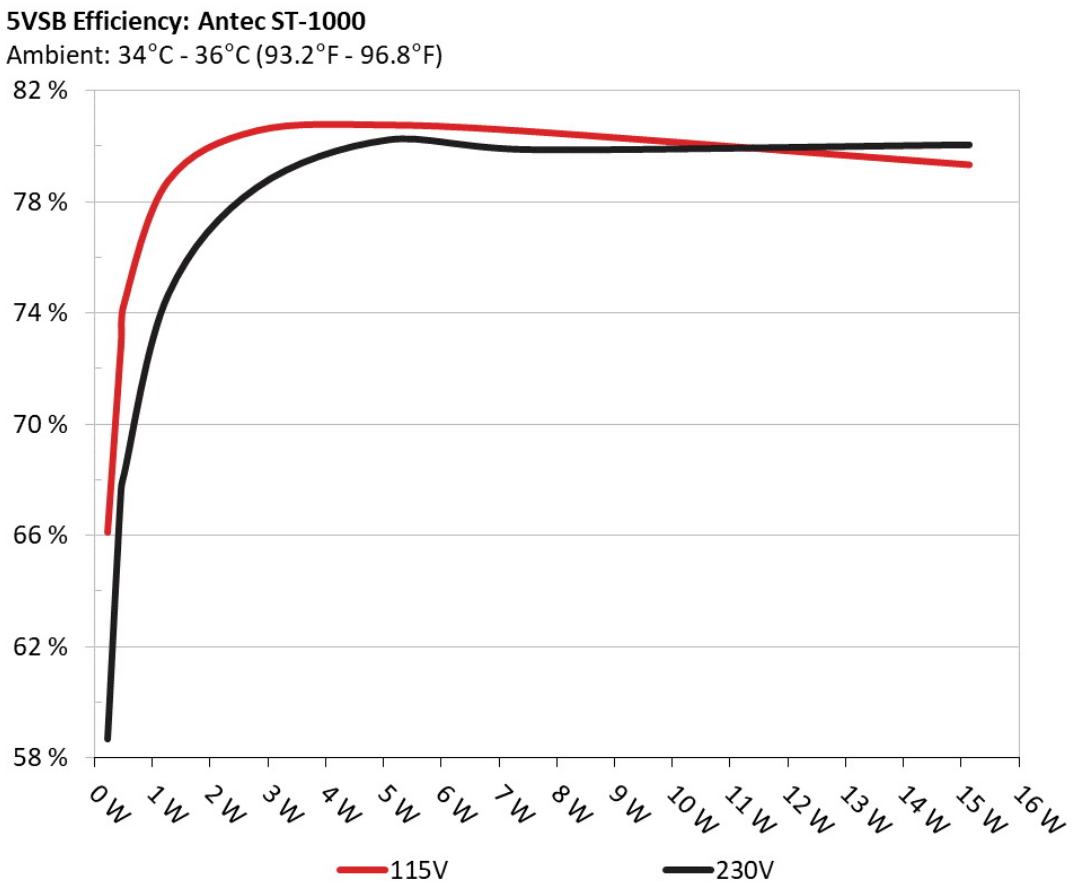
### Efficiency under high ambient temperature




**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 | 0.045A | 0.230 | 66.092% | 0.036 |
| | 5.120V | 0.348 | | 115.10V |
| 2 | 0.090A | 0.461 | 72.828% | 0.065 |
| | 5.119V | 0.633 | | 115.11V |
| 3 | 0.550A | 2.809 | 80.556% | 0.272 |
| | 5.107V | 3.487 | | 115.11V |
| 4 | 1.000A | 5.096 | 80.761% | 0.367 |
| | 5.096V | 6.310 | | 115.11V |
| 5 | 1.500A | 7.625 | 80.517% | 0.420 |
| | 5.083V | 9.470 | | 115.11V |
| 6 | 3.000A | 15.138 | 79.331% | 0.493 |
| | 5.046V | 19.082 | | 115.11V |

### 230V

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.045A | 0.230 | 58.673% | 0.012 |
| | 5.120V | 0.392 | | 230.25V |
| 2 | 0.090A | 0.461 | 67.595% | 0.021 |
| | 5.119V | 0.682 | | 230.24V |
| 3 | 0.550A | 2.809 | 78.508% | 0.106 |
| | 5.107V | 3.578 | | 230.23V |
| 4 | 1.000A | 5.096 | 80.227% | 0.174 |
| | 5.096V | 6.352 | | 230.22V |
| 5 | 1.500A | 7.626 | 79.870% | 0.234 |
| | 5.083V | 9.548 | | 230.22V |
| 6 | 3.001A | 15.138 | 80.044% | 0.337 |
| | 5.045V | 18.912 | | 230.22V |

# Supplementary Tests (For Reference)

## Typical Load Tests

### 115V

| Test # | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.370A | 1.962A | 1.959A | 1.006A | 100.006 | 91.091% | 0 | <6.0 | 43.26°C | 0.972 |
| | 12.309V | 5.097V | 3.368V | 4.969V | 109.787 | | | | 40.64°C | 115.11V |
| 2 | 13.741A | 2.945A | 2.942A | 1.211A | 200.040 | 93.201% | 0 | <6.0 | 44.78°C | 0.988 |
| | 12.309V | 5.094V | 3.365V | 4.956V | 214.633 | | | | 41.12°C | 115.10V |
| 3 | 21.443A | 3.436A | 3.436A | 1.416A | 300.014 | 93.867% | 0 | <6.0 | 45.53°C | 0.995 |
| | 12.310V | 5.092V | 3.363V | 4.943V | 319.617 | | | | 41.52°C | 115.10V |
| 4 | 29.127A | 3.930A | 3.928A | 1.623A | 399.672 | 93.542% | 636 | 20.1 | 41.76°C | 0.995 |
| | 12.307V | 5.090V | 3.361V | 4.930V | 427.263 | | | | 47.20°C | 115.10V |
| 5 | 36.516A | 4.914A | 4.915A | 1.831A | 499.807 | 93.161% | 652 | 20.9 | 42.21°C | 0.994 |
| | 12.304V | 5.088V | 3.359V | 4.917V | 536.496 | | | | 48.27°C | 115.10V |
| 6 | 43.889A | 5.902A | 5.901A | 2.000A | 599.724 | 92.713% | 707 | 23.7 | 43.29°C | 0.995 |
| | 12.306V | 5.085V | 3.356V | 4.905V | 646.860 | | | | 49.85°C | 115.09V |
| 7 | 51.234A | 6.889A | 6.890A | 2.250A | 699.658 | 92.142% | 781 | 27.0 | 43.42°C | 0.996 |
| | 12.307V | 5.082V | 3.354V | 4.890V | 759.326 | | | | 50.39°C | 115.09V |
| 8 | 58.643A | 7.878A | 7.876A | 2.461A | 800.183 | 91.569% | 857 | 29.8 | 44.96°C | 0.997 |
| | 12.308V | 5.079V | 3.351V | 4.876V | 873.859 | | | | 52.72°C | 115.09V |
| 9 | 66.370A | 8.371A | 8.359A | 2.465A | 899.455 | 90.958% | 939 | 32.1 | 45.24°C | 0.997 |
| | 12.309V | 5.077V | 3.350V | 4.870V | 988.866 | | | | 53.48°C | 115.08V |
| 10 | 73.938A | 8.868A | 8.873A | 3.096A | 999.880 | 90.208% | 1012 | 35.2 | 45.40°C | 0.998 |
| | 12.310V | 5.075V | 3.347V | 4.845V | 1108.417 | | | | 54.53°C | 115.08V |
| 11 | 82.056A | 8.872A | 8.878A | 3.100A | 1099.896 | 89.433% | 1443 | 43.8 | 46.53°C | 0.998 |
| | 12.311V | 5.073V | 3.345V | 4.839V | 1229.849 | | | | 56.42°C | 115.08V |
| CL1 | 0.101A | 15.002A | 14.997A | 0.000A | 127.741 | 88.643% | 839 | 29.2 | 42.75°C | 0.980 |
| | 12.339V | 5.077V | 3.356V | 5.010V | 144.108 | | | | 48.69°C | 115.11V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CL2 | 83.008A | 1.000A | 1.000A | 1.000A | 1034.919 | 90.329% | 1010 | 35.2 | 45.65°C | 0.998 |
| | 12.307V | 5.084V | 3.352V | 4.905V | 1145.728 | | | | 54.22°C | 115.08V |

The results above are not used in the certification process

## 230V

| Test # | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.368A | 1.962A | 1.962A | 1.006A | 100.007 | 92.043% | 0 | <6.0 | 42.80°C | 0.822 |
| | 12.312V | 5.097V | 3.367V | 4.969V | 108.652 | | | | 39.84°C | 230.24V |
| 2 | 13.739A | 2.944A | 2.942A | 1.211A | 200.038 | 94.459% | 0 | <6.0 | 44.47°C | 0.921 |
| | 12.311V | 5.094V | 3.365V | 4.955V | 211.772 | | | | 40.77°C | 230.24V |
| 3 | 21.448A | 3.437A | 3.434A | 1.416A | 300.012 | 95.006% | 632 | 20.1 | 41.46°C | 0.953 |
| | 12.307V | 5.093V | 3.363V | 4.943V | 315.781 | | | | 45.76°C | 230.24V |
| 4 | 29.133A | 3.927A | 3.926A | 1.623A | 399.670 | 95.106% | 636 | 20.1 | 41.62°C | 0.967 |
| | 12.305V | 5.091V | 3.361V | 4.930V | 420.237 | | | | 46.55°C | 230.24V |
| 5 | 36.511A | 4.913A | 4.913A | 1.831A | 499.802 | 94.942% | 670 | 23.1 | 42.09°C | 0.975 |
| | 12.306V | 5.088V | 3.358V | 4.917V | 526.427 | | | | 47.87°C | 230.23V |
| 6 | 43.894A | 5.901A | 5.904A | 2.000A | 599.739 | 94.712% | 724 | 24.5 | 42.57°C | 0.981 |
| | 12.305V | 5.085V | 3.355V | 4.905V | 633.225 | | | | 48.85°C | 230.23V |
| 7 | 51.238A | 6.888A | 6.891A | 2.250A | 699.654 | 94.378% | 783 | 27.0 | 43.42°C | 0.984 |
| | 12.306V | 5.083V | 3.353V | 4.890V | 741.333 | | | | 50.29°C | 230.23V |
| 8 | 58.646A | 7.878A | 7.878A | 2.461A | 800.179 | 94.012% | 853 | 29.8 | 43.65°C | 0.987 |
| | 12.307V | 5.080V | 3.351V | 4.877V | 851.149 | | | | 51.11°C | 230.24V |
| 9 | 66.379A | 8.372A | 8.360A | 2.465A | 899.442 | 93.662% | 925 | 32.2 | 44.22°C | 0.989 |
| | 12.307V | 5.078V | 3.349V | 4.870V | 960.302 | | | | 52.50°C | 230.23V |
| 10 | 73.943A | 8.869A | 8.872A | 3.096A | 999.873 | 93.194% | 1005 | 34.2 | 45.25°C | 0.990 |
| | 12.309V | 5.075V | 3.347V | 4.846V | 1072.891 | | | | 54.31°C | 230.24V |
| 11 | 82.062A | 8.869A | 8.879A | 3.100A | 1099.889 | 92.750% | 1316 | 41.6 | 46.55°C | 0.991 |
| | 12.310V | 5.074V | 3.345V | 4.840V | 1185.863 | | | | 56.34°C | 230.23V |
| CL1 | 0.101A | 15.000A | 14.998A | 0.000A | 127.749 | 89.546% | 814 | 28.4 | 42.16°C | 0.873 |
| | 12.335V | 5.077V | 3.357V | 5.009V | 142.663 | | | | 47.51°C | 230.25V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CL2 | 83.018A | 1.000A | 1.001A | 1.000A | 1035.050 | 93.422% | 1008 | 35.2 | 45.61°C | 0.990 |
| | 12.307V | 5.085V | 3.352V | 4.906V | 1107.930 | | | | 54.81°C | 230.24V |

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) | PSU Noise (dB[A]) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.207A | 0.489A | 0.488A | 0.200A | 19.991 | 76.606% | 0 | <6.0 | 0.810 |
| | 12.303V | 5.106V | 3.373V | 4.997V | 26.096 | | | | 115.11V |
| 2 | 2.412A | 0.981A | 0.979A | 0.401A | 39.981 | 85.104% | 0 | <6.0 | 0.911 |
| | 12.304V | 5.101V | 3.370V | 4.990V | 46.979 | | | | 115.11V |
| 3 | 3.622A | 1.471A | 1.467A | 0.602A | 60.012 | 88.426% | 0 | <6.0 | 0.946 |
| | 12.305V | 5.099V | 3.369V | 4.983V | 67.867 | | | | 115.11V |
| 4 | 4.823A | 1.962A | 1.959A | 0.804A | 79.963 | 90.332% | 0 | <6.0 | 0.964 |
| | 12.308V | 5.098V | 3.368V | 4.976V | 88.521 | | | | 115.11V |

The results above are not used in the certification process

### 230V

| Test # | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.206A | 0.490A | 0.489A | 0.200A | 19.994 | 76.708% | 0 | <6.0 | 0.463 |
| | 12.308V | 5.105V | 3.373V | 4.997V | 26.065 | | | | 230.25V |
| 2 | 2.412A | 0.979A | 0.980A | 0.401A | 39.985 | 85.518% | 0 | <6.0 | 0.629 |
| | 12.309V | 5.100V | 3.369V | 4.990V | 46.756 | | | | 230.25V |
| 3 | 3.620A | 1.472A | 1.469A | 0.602A | 60.014 | 89.090% | 0 | <6.0 | 0.718 |
| | 12.310V | 5.098V | 3.368V | 4.983V | 67.363 | | | | 230.25V |
| 4 | 4.822A | 1.962A | 1.961A | 0.804A | 79.964 | 90.896% | 0 | <6.0 | 0.784 |
| | 12.310V | 5.097V | 3.368V | 4.976V | 87.973 | | | | 230.25V |

The results above are not used in the certification process

## Ripple Measurements

### 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 9.20mV | 6.40mV | 12.20mV | 3.60mV | Pass |
| 20% Load | 11.60mV | 6.50mV | 12.80mV | 4.10mV | Pass |
| 30% Load | 11.00mV | 7.00mV | 14.20mV | 4.50mV | Pass |
| 40% Load | 8.60mV | 7.40mV | 13.90mV | 5.20mV | Pass |
| 50% Load | 8.50mV | 8.00mV | 15.50mV | 5.40mV | Pass |
| 60% Load | 8.90mV | 7.40mV | 14.90mV | 5.90mV | Pass |
| 70% Load | 9.70mV | 7.50mV | 15.70mV | 6.50mV | Pass |
| 80% Load | 10.60mV | 8.70mV | 16.40mV | 6.60mV | Pass |
| 90% Load | 11.30mV | 8.20mV | 16.30mV | 7.20mV | Pass |
| 100% Load | 18.00mV | 8.50mV | 17.20mV | 9.00mV | Pass |
| 110% Load | 18.90mV | 8.90mV | 17.10mV | 9.30mV | Pass |
| Crossload1 | 13.50mV | 9.00mV | 18.80mV | 4.30mV | Pass |
| Crossload2 | 18.30mV | 7.80mV | 13.80mV | 8.80mV | Pass |

The results above are not used in the certification process

### 230V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 9.30mV | 6.40mV | 13.30mV | 3.50mV | Pass |
| 20% Load | 11.50mV | 6.90mV | 12.90mV | 4.20mV | Pass |
| 30% Load | 10.60mV | 6.80mV | 15.00mV | 4.20mV | Pass |
| 40% Load | 7.90mV | 8.00mV | 14.70mV | 4.70mV | Pass |
| 50% Load | 8.10mV | 8.00mV | 15.20mV | 5.60mV | Pass |
| 60% Load | 9.10mV | 7.70mV | 15.40mV | 6.10mV | Pass |
| 70% Load | 9.40mV | 7.40mV | 15.50mV | 6.40mV | Pass |
| 80% Load | 10.40mV | 7.80mV | 16.00mV | 6.50mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 90% Load | 11.00mV | 8.10mV | 16.60mV | 7.00mV | Pass |
| 100% Load | 17.10mV | 9.00mV | 17.50mV | 8.40mV | Pass |
| 110% Load | 18.50mV | 8.90mV | 17.60mV | 9.10mV | Pass |
| Crossload1 | 13.90mV | 8.90mV | 16.30mV | 4.20mV | Pass |
| Crossload2 | 17.70mV | 7.70mV | 13.90mV | 8.30mV | Pass |

The results above are not used in the certification process

## Antec Signature Titanium 1000W

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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