



## EVGA 500 BQ

Serial Number 1701230515800453

Lab ID 191

Certification ID 25191

Test Result Report ID:

Certificate Issue Date: Sep 10, 2018

115V

230V

Scheme: ETA-EMI PSU



115V

230V



Scheme: LAMBDA PSU

A handwritten signature in blue ink, appearing to be 'A. Bitziopoulos'.

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                             | EVGA             |
| Model                             | 500 BQ           |
| OEM/ODM                           | Andyson          |
| Serial Number                     | 1701230515800453 |
| Product Specifications            |                  |
| Manufacturer-Provided Information |                  |
| Rated Voltage (Vrms)              | 100-240          |
| Rated Current (Arms)              | 8-4              |
| Rated Frequency (Hz)              | 50-60            |

|                                                   |                                                                                     |
|---------------------------------------------------|-------------------------------------------------------------------------------------|
| Rated Power (W)                                   | 500                                                                                 |
| Operating Temperature (Continuous Full Load) (°C) |                                                                                     |
| Type                                              | ATX12V                                                                              |
| Cable Design                                      | Semi Modular                                                                        |
| Warranty                                          | -                                                                                   |
| Cybenetics Measurements                           |                                                                                     |
| Dimensions (W x H x D)                            |                                                                                     |
| Weight                                            |                                                                                     |
| Cooling                                           | 120mm Fluid Dynamic Bearing Fan<br>(S1202512L)                                      |
| Semi-Passive Operation                            | X                                                                                   |
| Cybenetics Testing Information                    |                                                                                     |
| Lab ID                                            | 191                                                                                 |
| Date of receipt                                   | Aug 30, 2018                                                                        |
| Testing Date                                      | Sep 8, 2018                                                                         |
| Report Issued Date                                | Sep 10, 2018                                                                        |
| Engineer Name                                     | -                                                                                   |
| Authorized By the Laboratory Technical Manager    | Aristeidis Bitziopoulos                                                             |
| Signature                                         |  |

### Cables and Connectors(Non-accredited measurements)

| Captive Cables                                 |             |                         |          |
|------------------------------------------------|-------------|-------------------------|----------|
| Description                                    | Cable Count | Connector Count (Total) | Gauge    |
| ATX connector 20+4 pin (610mm)                 | 1           | 1                       | 18-22AWG |
| 4+4 pin EPS12V (620mm)                         | 1           | 1                       | 18AWG    |
| Modular Cables                                 |             |                         |          |
| 6+2 pin PCIe (600mm+100mm)                     | 1           | 2                       | 18AWG    |
| SATA (460mm+120mm+120mm)                       | 2           | 6                       | 18AWG    |
| 4 pin Molex (470mm+120mm+120mm) / FDD (+120mm) | 1           | 3 / 1                   | 18AWG    |

## Power Specifications

|                      |       |      |    |       |      |      |
|----------------------|-------|------|----|-------|------|------|
| Rail                 |       | 3.3V | 5V | 12V   | 5VSB | -12V |
| Max. Power           | Amps  | 20   | 20 | 41.6  | 2.5  | 0.3  |
|                      | Watts | 110  |    | 499.2 | 12.5 | 3.6  |
| Total Max. Power (W) |       | 500  |    |       |      |      |

## Test Results

### Temperature & Compliance Info

|                             |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| Temperature Range (°C /°F)  | 28-32 / 82.4-89.6                                                              |
| ErP Lot 3/6 Ready           | ErP Lot 3/6 2010: ✓<br>ErP Lot 3/6 2013: ✓<br>ErP Lot 3/6 2014, CEC: Partially |
| (EU) No 617/2013 Compliance | ✓                                                                              |

### Performance Summary 115V

|                                                |          |
|------------------------------------------------|----------|
| Accredited                                     |          |
| Average Efficiency (>1450 load combinations)   | 86.019%  |
| Average Noise Output (>1450 Load Combinations) | 37.07dBA |
| Average PF (>1450 Load Combinations)           | 0.989    |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | -        |
| Standby Power Consumption                      | 0.0915W  |
| Non-Accredited                                 |          |
| 12V Ripple (Full Load)                         | 21.15mV  |
| 5V Ripple (Full Load)                          | 12.25mV  |
| 3.3V Ripple (Full Load)                        | 13.22mV  |
| 5VSB Ripple (Full Load)                        | 16.61mV  |
| 12V Load Regulation                            | 0.26%    |
| 5V Load Regulation                             | 0.06%    |
| 3.3V Load Regulation                           | 0.47%    |

|                      |         |
|----------------------|---------|
| 5VSB Load Regulation | 2.72%   |
| Inrush Current       | 98.637A |

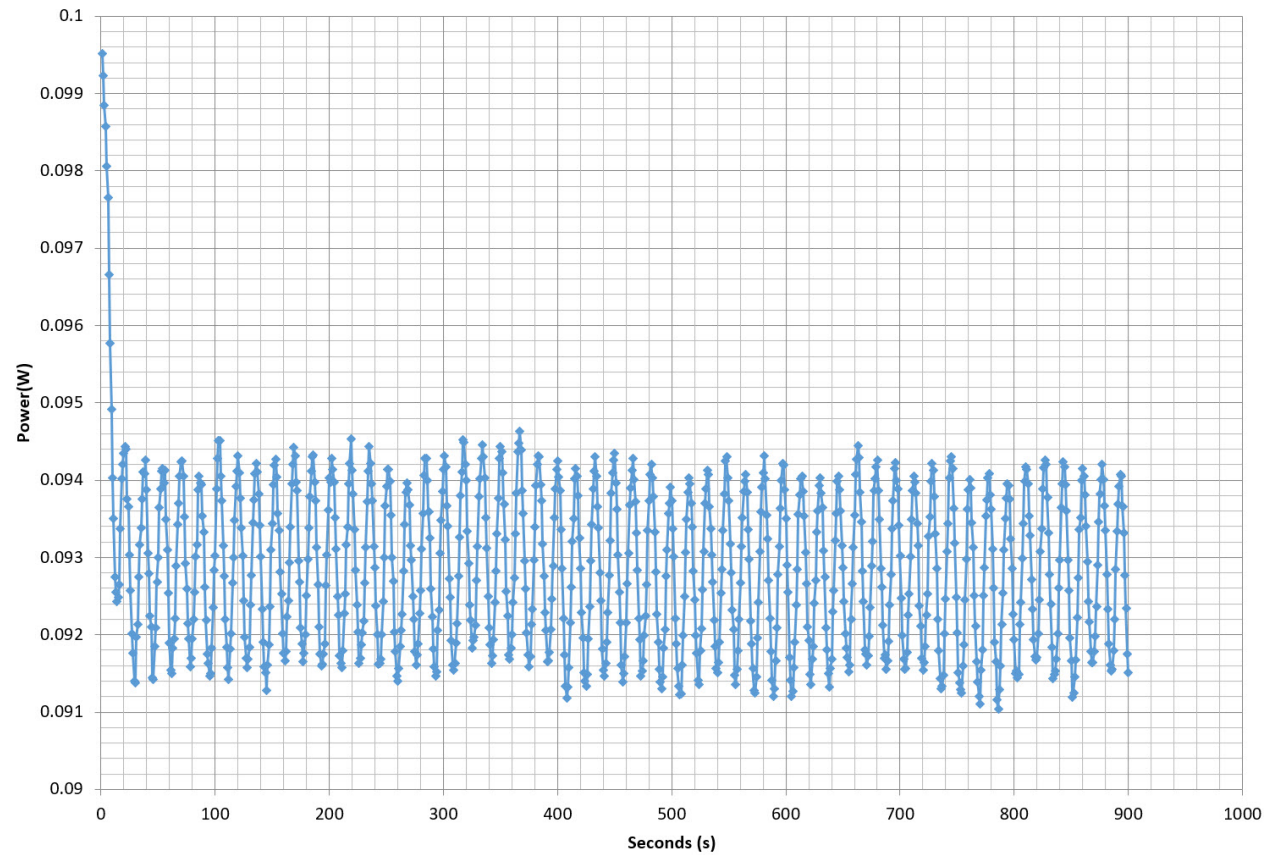
### Hold-Up Time & PWR\_OK Signal

|                                       |      |
|---------------------------------------|------|
| Hold-Up Time (ms)                     | 15   |
| AC Loss to PWR_OK Hold Up Time (ms)   | 12.4 |
| PWR_OK Inactive to DC Loss Delay (ms) | 2.6  |

## Stromverbrauch im Ruhezustand

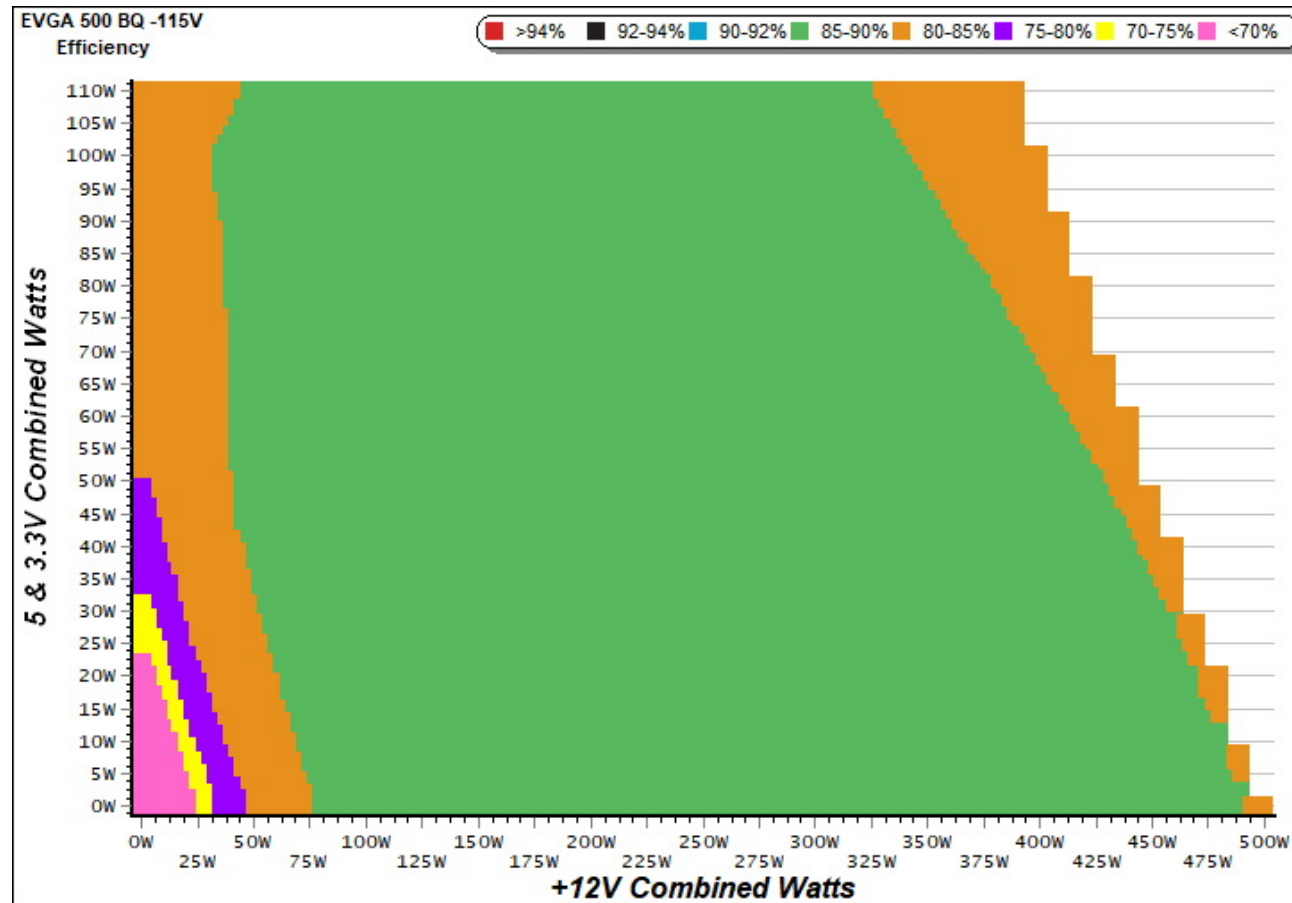
Graphs 115V

Power - 1701230515800453 - 07/10/2017 - 09:26



## Efficiency Graph

115V

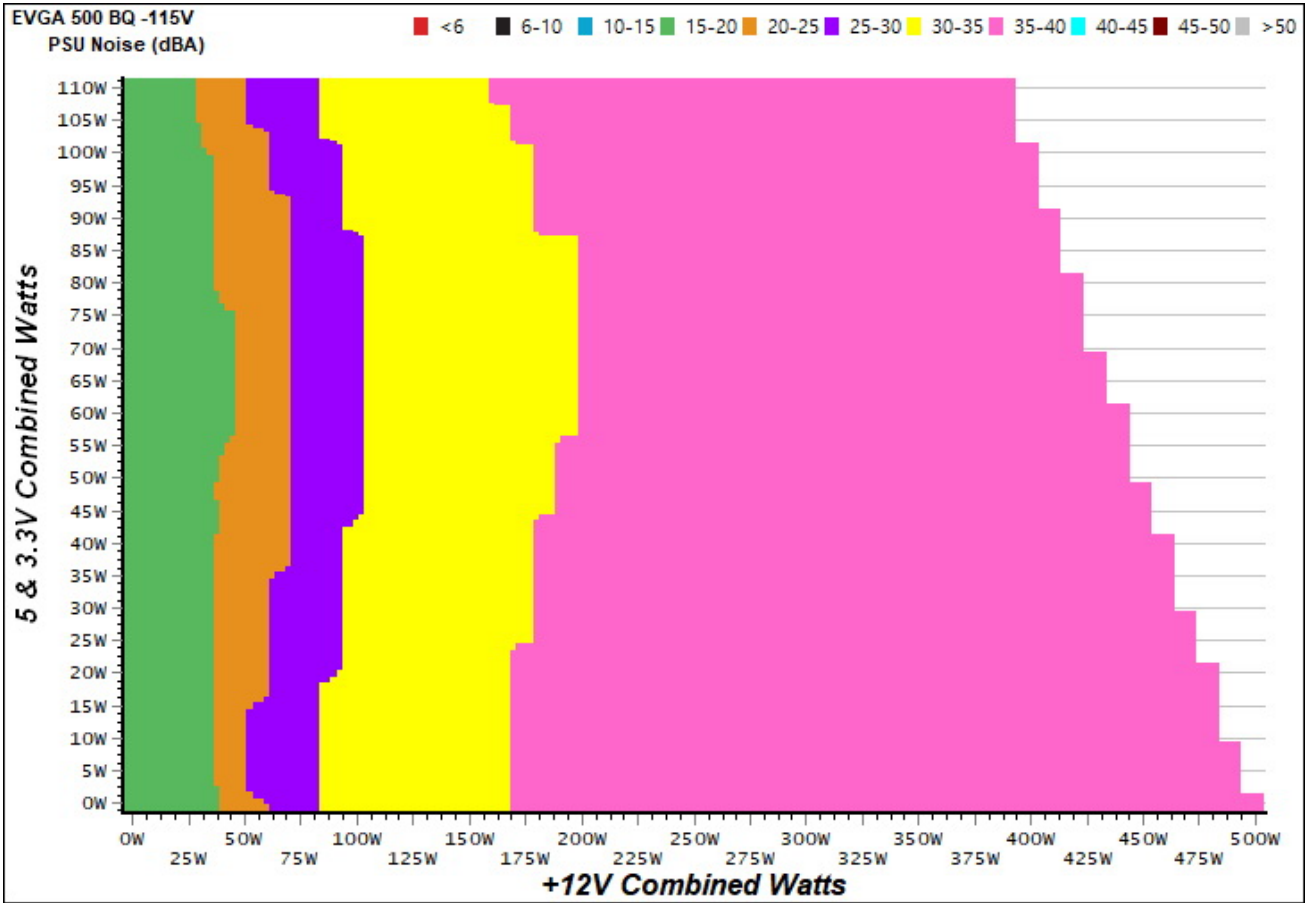


### INFO

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

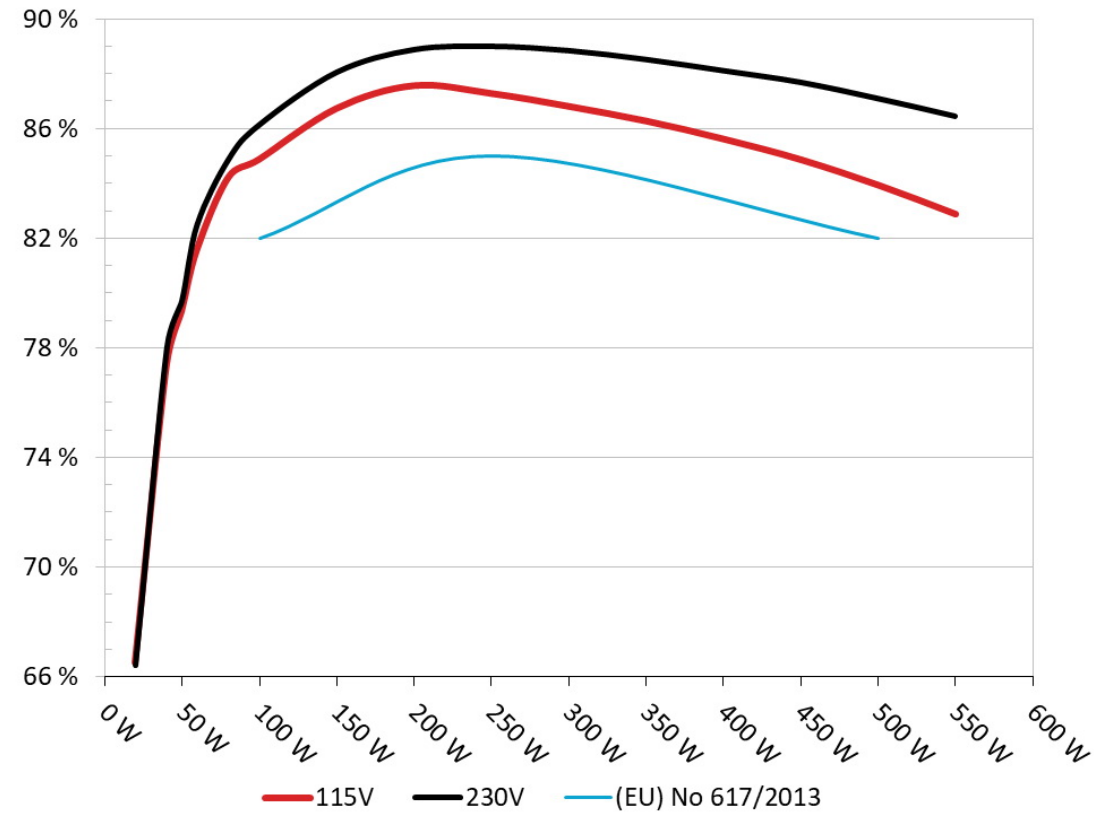
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

## Indicative Performance

### Efficiency under high ambient temperature

Efficiency: EVGA 500 BQ

Ambient: 37°C - 46°C (98.6°F - 114.8°F)

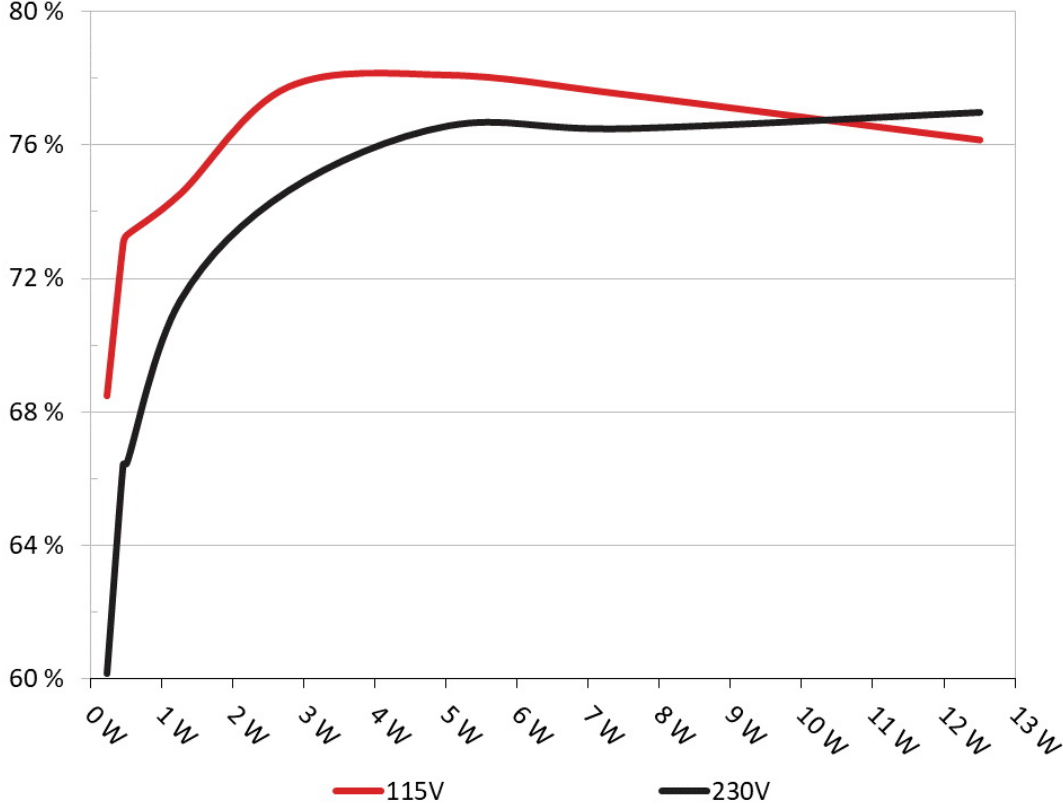


### INFO

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: EVGA 500 BQ  
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.

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

| Test # | 5VSB   | DC/AC (Watts) | Efficiency | PF/AC Volts |
|--------|--------|---------------|------------|-------------|
| 1      | 0.045A | 0.228         | 68.468%    | 0.029       |
|        | 5.052V | 0.333         |            | 115.39V     |

|   |        |        |         |         |
|---|--------|--------|---------|---------|
| 2 | 0.090A | 0.455  | 73.034% | 0.053   |
|   | 5.051V | 0.623  |         | 115.39V |
| 3 | 0.550A | 2.774  | 77.747% | 0.236   |
|   | 5.042V | 3.568  |         | 115.38V |
| 4 | 1.000A | 5.034  | 78.107% | 0.320   |
|   | 5.034V | 6.445  |         | 115.37V |
| 5 | 1.500A | 7.537  | 77.517% | 0.367   |
|   | 5.024V | 9.723  |         | 115.38V |
| 6 | 2.500A | 12.511 | 76.157% | 0.413   |
|   | 5.004V | 16.428 |         | 115.36V |

## 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      | 2.336A  | 1.982A | 1.959A | 0.996A | 49.688        | 79.360%    | 1353            | 32.6              | 38.04°C        | 0.957       |
|        | 12.017V | 5.051V | 3.371V | 5.022V | 62.611        |            |                 |                   | 41.17°C        | 115.31V     |
| 2      | 5.733A  | 2.970A | 2.941A | 1.198A | 99.796        | 84.876%    | 1509            | 38.1              | 38.90°C        | 0.984       |
|        | 12.015V | 5.052V | 3.369V | 5.009V | 117.579       |            |                 |                   | 42.08°C        | 115.24V     |
| 3      | 9.466A  | 3.466A | 3.415A | 1.401A | 149.721       | 86.727%    | 1579            | 37.7              | 39.05°C        | 0.991       |
|        | 12.013V | 5.051V | 3.367V | 4.997V | 172.635       |            |                 |                   | 42.49°C        | 115.17V     |
| 4      | 13.199A | 3.961A | 3.924A | 1.605A | 199.744       | 87.560%    | 1737            | 39.3              | 39.48°C        | 0.995       |
|        | 12.011V | 5.051V | 3.365V | 4.985V | 228.122       |            |                 |                   | 43.09°C        | 115.20V     |
| 5      | 16.601A | 4.953A | 4.906A | 1.811A | 249.861       | 87.273%    | 1770            | 39.9              | 39.82°C        | 0.992       |
|        | 12.008V | 5.050V | 3.363V | 4.972V | 286.299       |            |                 |                   | 44.24°C        | 115.12V     |
| 6      | 20.002A | 5.942A | 5.891A | 2.017A | 299.952       | 86.804%    | 1770            | 39.9              | 40.26°C        | 0.991       |
|        | 12.006V | 5.050V | 3.361V | 4.959V | 345.549       |            |                 |                   | 45.97°C        | 115.05V     |
| 7      | 23.410A | 6.933A | 6.876A | 2.225A | 350.084       | 86.268%    | 1776            | 39.9              | 41.18°C        | 0.992       |
|        | 12.002V | 5.050V | 3.360V | 4.945V | 405.811       |            |                 |                   | 48.31°C        | 114.97V     |
| 8      | 26.821A | 7.923A | 7.862A | 2.435A | 400.190       | 85.610%    | 1776            | 39.9              | 42.52°C        | 0.993       |
|        | 11.997V | 5.050V | 3.358V | 4.931V | 467.455       |            |                 |                   | 50.75°C        | 114.99V     |

|     |         |         |         |        |         |         |      |      |         |         |
|-----|---------|---------|---------|--------|---------|---------|------|------|---------|---------|
| 9   | 30.637A | 8.418A  | 8.343A  | 2.439A | 449.916 | 84.860% | 1776 | 39.9 | 44.16°C | 0.993   |
|     | 11.992V | 5.051V  | 3.356V  | 4.920V | 530.186 |         |      |      | 53.50°C | 114.92V |
| 10  | 34.455A | 8.912A  | 8.856A  | 2.547A | 500.238 | 83.925% | 1776 | 39.9 | 45.64°C | 0.994   |
|     | 11.987V | 5.051V  | 3.355V  | 4.908V | 596.056 |         |      |      | 56.59°C | 114.83V |
| 11  | 38.607A | 8.911A  | 8.858A  | 2.552A | 549.861 | 82.875% | 1776 | 39.9 | 46.42°C | 0.994   |
|     | 11.983V | 5.052V  | 3.354V  | 4.900V | 663.482 |         |      |      | 60.89°C | 114.74V |
| CL1 | 0.742A  | 13.002A | 13.002A | 0.000A | 118.436 | 83.118% | 1770 | 39.9 | 44.69°C | 0.987   |
|     | 12.004V | 5.055V  | 3.369V  | 4.998V | 142.491 |         |      |      | 51.92°C | 115.21V |
| CL2 | 41.682A | 1.002A  | 1.000A  | 1.000A | 513.017 | 84.242% | 1776 | 39.9 | 46.27°C | 0.994   |
|     | 11.987V | 5.050V  | 3.356V  | 4.959V | 608.979 |         |      |      | 57.18°C | 114.82V |

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      | 1.201A  | 0.495A | 0.476A | 0.198A | 19.535        | 66.527%    | 1015            | 25.3              | 0.860       |
|        | 12.019V | 5.047V | 3.369V | 5.045V | 29.364        |            |                 |                   | 115.35V     |
| 2      | 2.464A  | 0.991A | 0.980A | 0.397A | 39.918        | 77.399%    | 1133            | 28.3              | 0.939       |
|        | 12.018V | 5.049V | 3.370V | 5.037V | 51.574        |            |                 |                   | 115.33V     |
| 3      | 3.666A  | 1.485A | 1.454A | 0.597A | 59.461        | 81.581%    | 1275            | 32.0              | 0.966       |
|        | 12.018V | 5.051V | 3.370V | 5.030V | 72.886        |            |                 |                   | 115.30V     |
| 4      | 4.931A  | 1.980A | 1.958A | 0.797A | 79.850        | 84.219%    | 1393            | 34.9              | 0.976       |
|        | 12.016V | 5.051V | 3.369V | 5.022V | 94.812        |            |                 |                   | 115.27V     |

The results above are not used in the certification process

### Ripple Measurements 115V

| Test     | 12V    | 5V     | 3.3V   | 5VSB   | Pass/Fail |
|----------|--------|--------|--------|--------|-----------|
| 10% Load | 4.8 mV | 7.3 mV | 6.9 mV | 7.1 mV | Pass      |
| 20% Load | 6.4 mV | 7.4 mV | 7.7 mV | 7.7 mV | Pass      |
| 30% Load | 8.5 mV | 8.2 mV | 8.2 mV | 8.9 mV | Pass      |
| 40% Load | 9.8 mV | 8.8 mV | 8.9 mV | 9.8 mV | Pass      |

| Test        | 12V     | 5V      | 3.3V    | 5VSB    | Pass/Fail |
|-------------|---------|---------|---------|---------|-----------|
| 50% Load    | 11.3 mV | 10.2 mV | 9.4 mV  | 10.9 mV | Pass      |
| 60% Load    | 12.4 mV | 10.7 mV | 10.2 mV | 11.9 mV | Pass      |
| 70% Load    | 14.8 mV | 11.4 mV | 11.0 mV | 13.2 mV | Pass      |
| 80% Load    | 18.4 mV | 11.5 mV | 12.5 mV | 14.1 mV | Pass      |
| 90% Load    | 21.2 mV | 10.8 mV | 11.7 mV | 14.4 mV | Pass      |
| 100% Load   | 21.2 mV | 12.3 mV | 13.2 mV | 16.6 mV | Pass      |
| 110% Load   | 22.5 mV | 13.4 mV | 14.1 mV | 17.1 mV | Pass      |
| Crossload 1 | 8.5 mV  | 9.6 mV  | 11.0 mV | 17.6 mV | Pass      |
| Crossload 2 | 22.3 mV | 12.1 mV | 11.1 mV | 13.0 mV | Pass      |

The results above are not used in the certification process

## EVGA 500 BQ



Top side

|                                 |                            |       |        |      |       |
|---------------------------------|----------------------------|-------|--------|------|-------|
| <div> </div>                    |                            |       |        |      |       |
| +40° C ambient @ full load      |                            |       |        |      |       |
| AC Input                        | 100-240 VAC, 8-4A, 50-60Hz |       |        |      |       |
| DC Output                       | +5V                        | +3.3V | +12V   | -12V | +5Vsb |
| Max Output, A                   | 20A                        | 20A   | 41.6A  | 0.3A | 2.5A  |
| Combined, W                     | 110W                       |       | 499.2W | 3.6W | 12.5W |
| Output Power, P <sub>cont</sub> | 500W @ +40°C               |       |        |      |       |

Power specifications label

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CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

[www.cybenetics.com](http://www.cybenetics.com) - [info@cybenetics.com](mailto:info@cybenetics.com)