EVGA 850 B3

Serial Number 1703460815800117

Lab ID 160

Certification ID 25160

Test Result Report ID:

Certificate Issue Date: Aug 16, 2018

115V 230V

Scheme: ETA-EMI PSU

115V 230V

Scheme: LAMBDA PSU

Aristeidis Bitziopoulos, Certification Body General Manager

General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 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	850 B3
OEM/ODM	Super Flower
Serial Number	1703460815800117
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
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	130mm Sleeve Bearing Fan (S1282412H)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	160
Date of receipt	Aug 9, 2018
Testing Date	Aug 13, 2018
Report Issued Date	Aug 16, 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 (600mm)	1	1	18-22AWG
4+4 pin EPS12V (600mm)	1	1	18-22AWG
6+2 pin PCIe (550mm+150mm)	3	6	18-22AWG
SATA (500mm+100mm+100mm)	3	9	18-20AWG
4 pin Molex (500mm+100mm+100mm)	1	3	18AWG
FDD Adapter (+105mm)	1	1	20AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	24	24	70.8	3	0.5
	Watts	120		849.6	15	6
Total Max. Power (W)		850				

Parts Description

General Data	
Manufacturer (OEM)	Super Flower
Platform Model	Leadex Bronze
Primary Side	
Transient Filter	5x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	1x GBU1506 (600V, 15A @ 100°C)
APFC MOSFETS	2x A&O AOTF29S50 (500V, 18A @ 100°C, 0.15Ohm)
APFC Boost Diode	1x CREE C3D06065A (650V, 6A @ 150°C)
Hold-up Cap(s)	2x Nippon Chemi-Con (400V, 270uF each or 540uF combined, 95°C, CE)
Main Switchers	2x Infineon IPA50R199CP (550V, 11A @ 100°C, 0.199Ohm)
APFC Controller	SF29603 & S9602 & ICE3PCS02G
Resonant Controller	SF29605
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	6x A&O AOT240L (40V, 82A @ 100°C, 4.7mOhm @ 125°C)
5V & 3.3V	DC-DC Converters: 8x A&O AON6516 (30V, 25A @ 100°C, 8mOhm) PWM Controller: 2x On Semiconductor NCP1587A
Filtering Capacitors	Electrolytics: Chemi-Con 7x W, 3x KZE, 3x KY, 2x KMG, 7x KRG (modular board) Polymers: 8x Chemi-Con
Supervisor IC	SF29605 & LM339A
Fan Model	S1282412H (120mm, 12V, 0.35A, Sleeve Bearing)
5VSB Circuit	

Rectifier	Mospec S10C60C
Standby PWM Controller	29604

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: ✓ ErP Lot 3/6 2013: ✓ ErP Lot 3/6 2014, CEC: Partially
(EU) No 617/2013 Compliance	✓

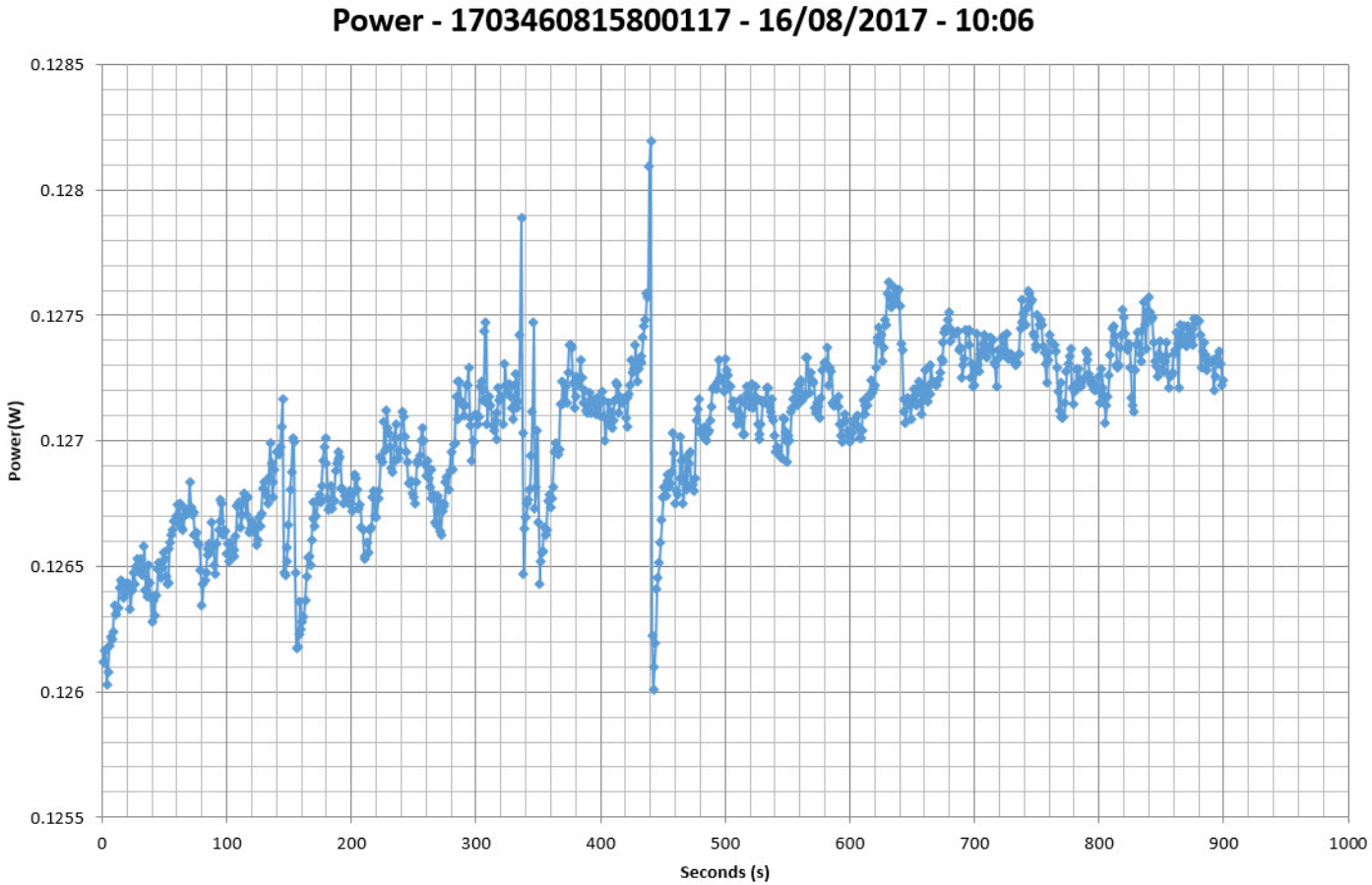
Performance Summary 115V

Accredited	
Average Efficiency (>1450 load combinations)	85.300%
Average Noise Output (>1450 Load Combinations)	32.81dBA
Average PF (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1272W
Non-Accredited	
12V Ripple (Full Load)	14.03mV
5V Ripple (Full Load)	18.88mV
3.3V Ripple (Full Load)	19.89mV
5VSB Ripple (Full Load)	24.24mV
12V Load Regulation	0.70%
5V Load Regulation	0.95%
3.3V Load Regulation	1.39%
5VSB Load Regulation	3.80%
Inrush Current	45.351A

Hold-Up Time & PWR_OK Signal

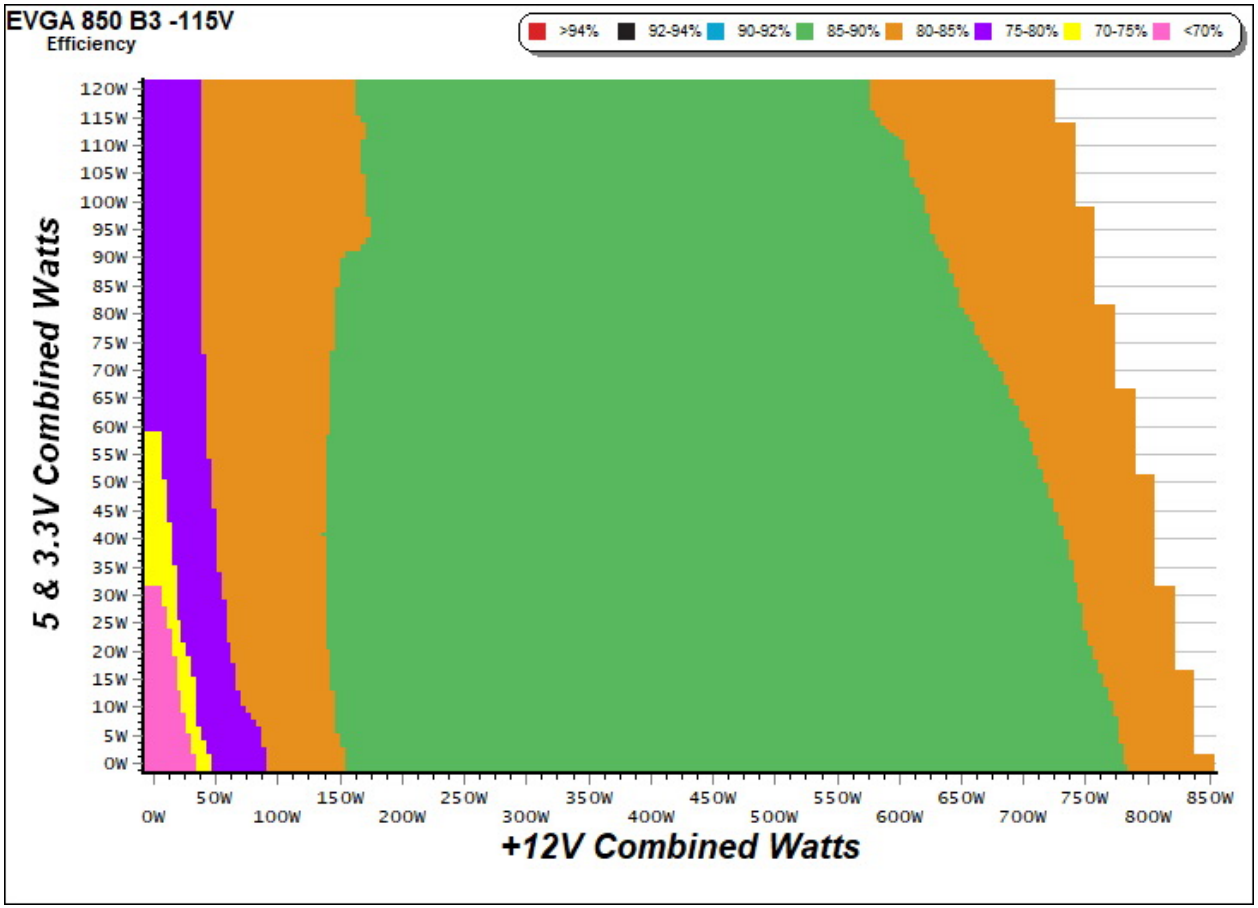
Hold-Up Time (ms)	20.28
AC Loss to PWR_OK Hold Up Time (ms)	17.08
PWR_OK Inactive to DC Loss Delay (ms)	3.20

Graphs 115V



Efficiency Graph

115V

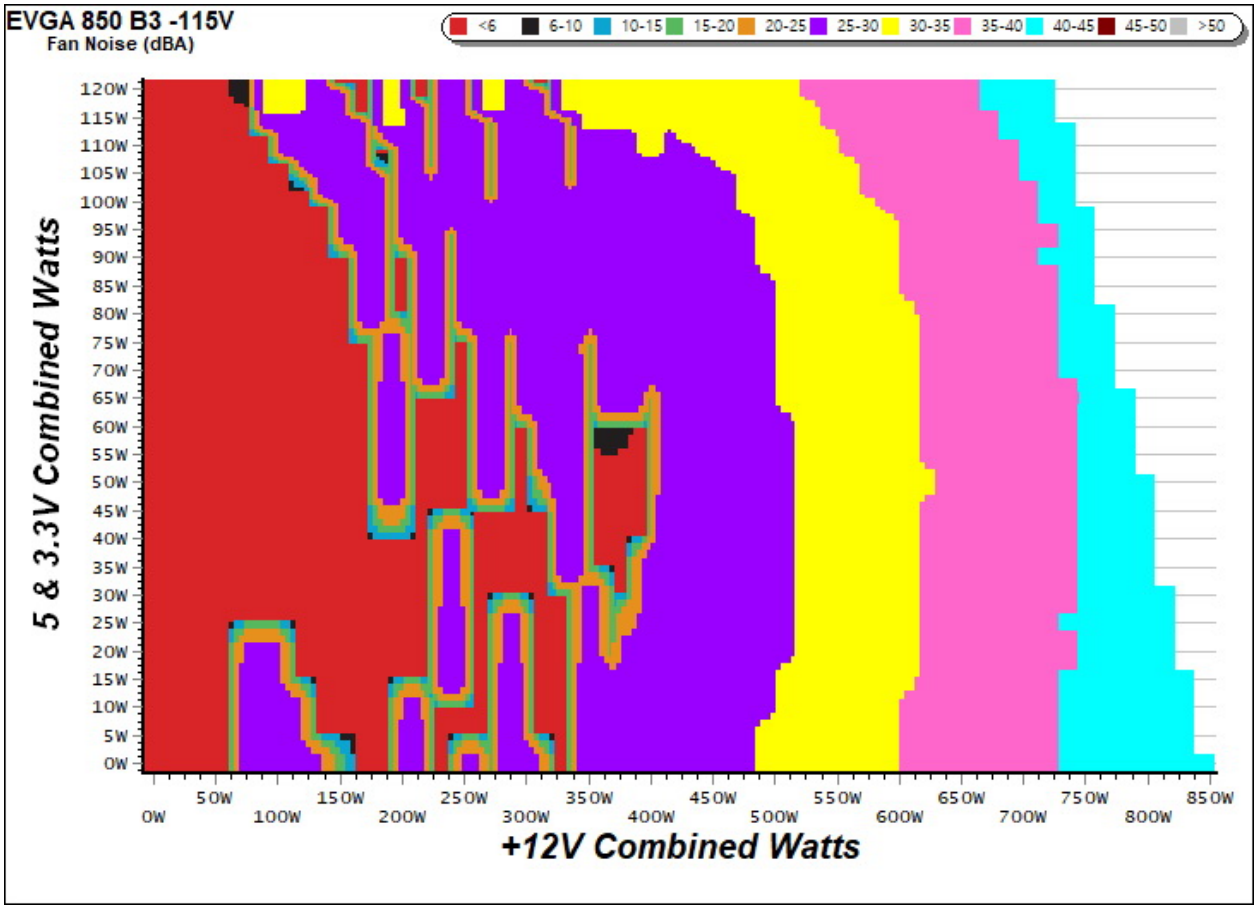


INFO

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

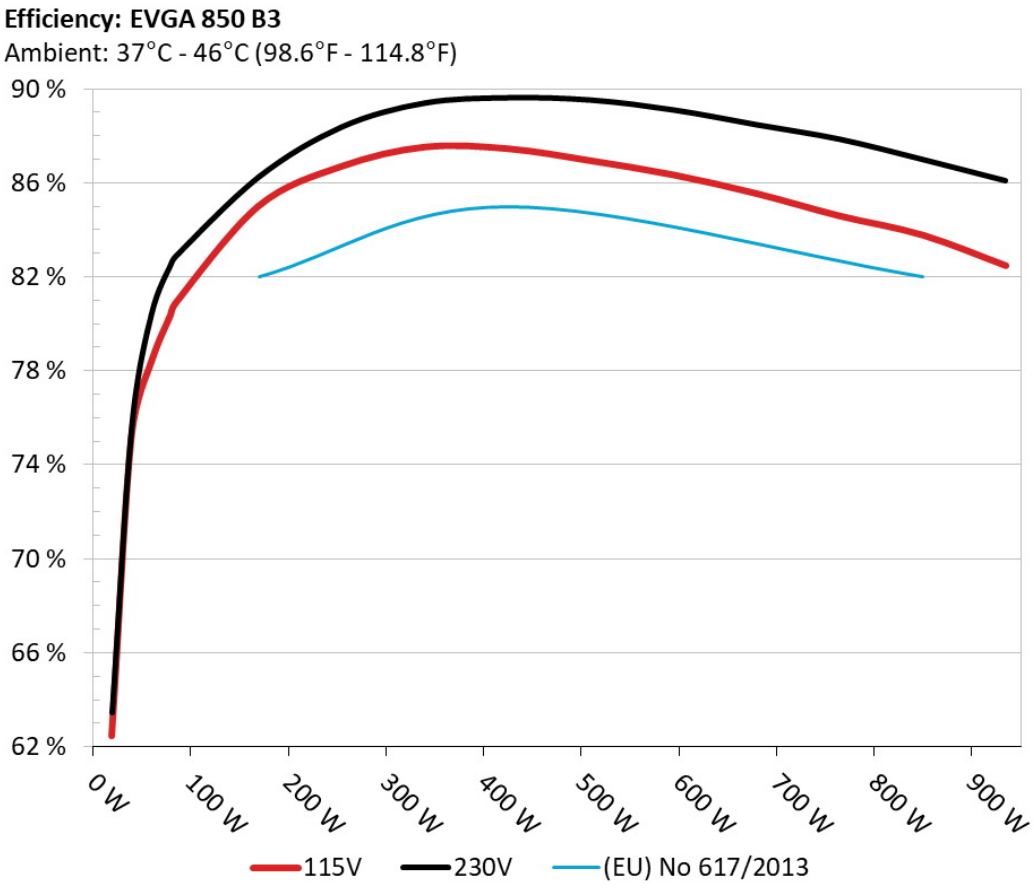


INFO

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.

Indicative Performance

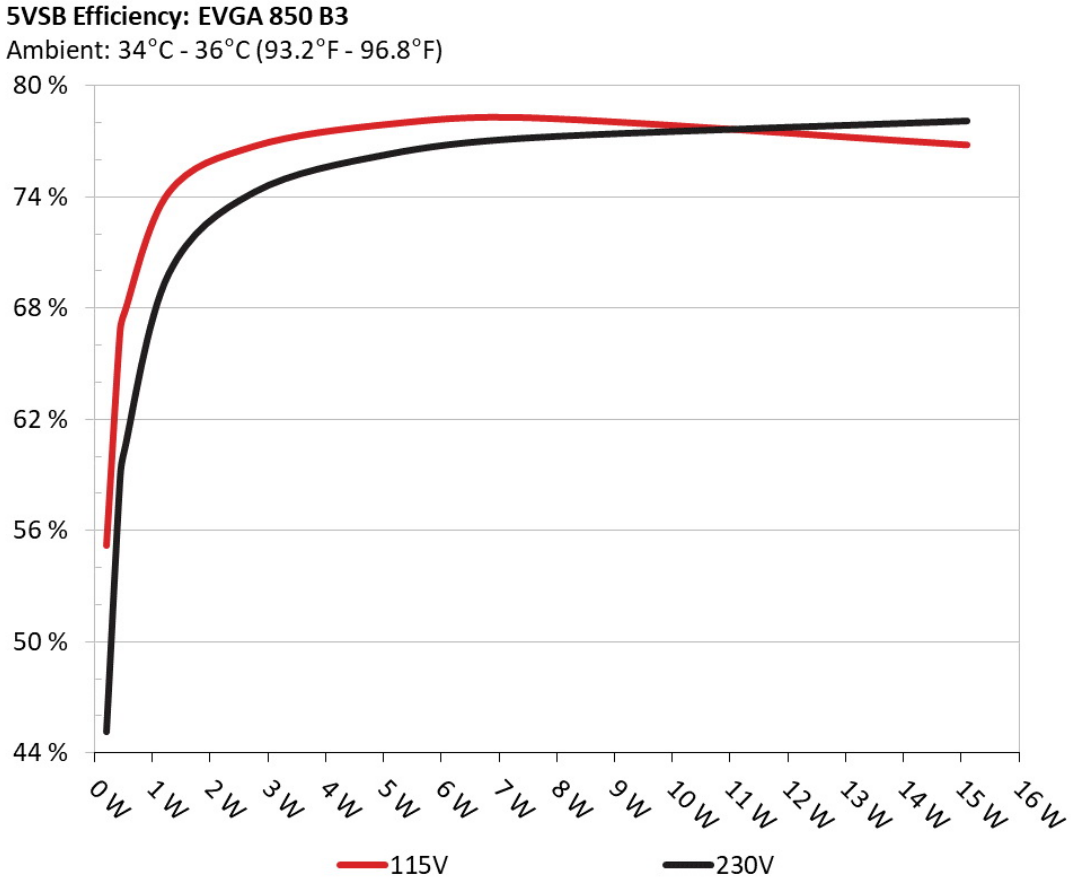
Efficiency under high ambient temperature



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	0.213	55.181%	0.030
	5.141V	0.386		115.16V

2	0.087A	0.447	66.716%	0.051
	5.139V	0.670		115.16V
3	0.542A	2.776	76.727%	0.227
	5.123V	3.618		115.16V
4	1.002A	5.116	77.917%	0.326
	5.107V	6.566		115.16V
5	1.502A	7.643	78.245%	0.385
	5.090V	9.768		115.16V
6	3.001A	15.097	76.790%	0.465
	5.031V	19.660		115.16V

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	5.210A	1.985A	1.991A	0.980A	84.785	80.878%	0	<6.0	45.75°C	0.954
	12.128V	5.047V	3.310V	5.092V	104.831				38.55°C	115.18V
2	11.444A	2.971A	2.992A	1.181A	169.620	85.014%	0	<6.0	43.19°C	0.982
	12.125V	5.041V	3.305V	5.076V	199.521				40.50°C	115.18V
3	18.052A	3.478A	3.510A	1.380A	254.853	86.712%	1218	27.3	41.24°C	0.989
	12.119V	5.036V	3.300V	5.060V	293.906				47.13°C	115.19V
4	24.648A	3.977A	4.001A	1.584A	339.727	87.533%	1276	29.0	41.29°C	0.992
	12.112V	5.032V	3.296V	5.045V	388.113				47.08°C	115.20V
5	30.912A	4.974A	5.009A	1.785A	424.624	87.466%	1338	30.7	41.63°C	0.994
	12.104V	5.026V	3.292V	5.029V	485.473				48.15°C	115.22V
6	37.193A	5.977A	6.022A	1.994A	509.607	86.950%	1462	34.3	42.72°C	0.995
	12.094V	5.021V	3.287V	5.010V	586.089				49.76°C	115.19V
7	43.502A	6.981A	7.038A	2.199A	594.560	86.345%	1600	36.1	43.47°C	0.996
	12.079V	5.017V	3.282V	4.992V	688.583				51.70°C	115.20V
8	49.797A	7.987A	8.058A	2.410A	679.494	85.549%	1743	40.0	44.14°C	0.996
	12.071V	5.010V	3.275V	4.975V	794.273				53.88°C	115.18V

9	56.545A	8.488A	8.583A	2.414A	764.493	84.596%	1885	42.2	44.62°C	0.996
	12.060V	5.007V	3.271V	4.965V	903.702				54.68°C	115.18V
10	63.031A	9.005A	9.088A	3.036A	849.365	83.782%	1885	42.2	45.71°C	0.997
	12.052V	5.002V	3.267V	4.935V	1013.785				56.43°C	115.18V
11	70.143A	9.016A	9.099A	3.042A	934.308	82.482%	2014	43.1	46.20°C	0.997
	12.041V	4.997V	3.262V	4.925V	1132.742				56.85°C	115.18V
CL1	0.098A	14.023A	14.004A	0.004A	117.803	77.549%	1432	32.6	44.59°C	0.974
	12.123V	5.027V	3.292V	5.107V	151.908				51.67°C	115.20V
CL2	70.778A	1.004A	1.003A	1.002A	865.942	83.783%	2003	43.0	47.16°C	0.996
	12.046V	5.011V	3.278V	5.022V	1033.550				56.62°C	115.18V

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	1.200A	0.493A	0.478A	0.192A	19.629	62.453%	0	<6.0	0.834
	12.141V	5.052V	3.315V	5.130V	31.430				115.18V
2	2.428A	0.987A	0.994A	0.391A	39.749	75.220%	0	<6.0	0.933
	12.137V	5.050V	3.313V	5.121V	52.844				115.18V
3	3.662A	1.477A	1.508A	0.585A	59.870	78.364%	0	<6.0	0.937
	12.133V	5.048V	3.312V	5.110V	76.400				115.18V
4	4.881A	1.985A	1.990A	0.781A	79.789	80.384%	0	<6.0	0.951
	12.129V	5.047V	3.310V	5.099V	99.260				115.18V

The results above are not used in the certification process

Ripple Measurements 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.9 mV	9.0 mV	9.0 mV	12.5 mV	Pass
20% Load	7.6 mV	9.4 mV	9.7 mV	13.4 mV	Pass
30% Load	8.9 mV	11.2 mV	11.2 mV	13.7 mV	Pass
40% Load	8.8 mV	11.3 mV	13.1 mV	13.6 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	10.0 mV	11.1 mV	13.7 mV	14.3 mV	Pass
60% Load	10.9 mV	11.7 mV	15.0 mV	15.7 mV	Pass
70% Load	10.7 mV	13.5 mV	14.7 mV	16.9 mV	Pass
80% Load	11.9 mV	14.7 mV	17.2 mV	20.0 mV	Pass
90% Load	11.8 mV	17.8 mV	19.5 mV	18.7 mV	Pass
100% Load	14.0 mV	18.9 mV	19.9 mV	24.2 mV	Pass
110% Load	14.2 mV	20.2 mV	20.6 mV	25.8 mV	Pass
Crossload 1	7.8 mV	10.7 mV	11.1 mV	14.6 mV	Pass
Crossload 2	12.9 mV	17.1 mV	19.6 mV	21.3 mV	Pass

The results above are not used in the certification process

EVGA 850 B3

Top side

Power specifications label

Cybenetics □□□□□□□□□□□□□□□□□□ ETA□□□□ LAMBDA□□□□ SAFE□□□□□□□□□□□□□□□□□ DELTA□□□□□□□ PHI□□□□□□□□□

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