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

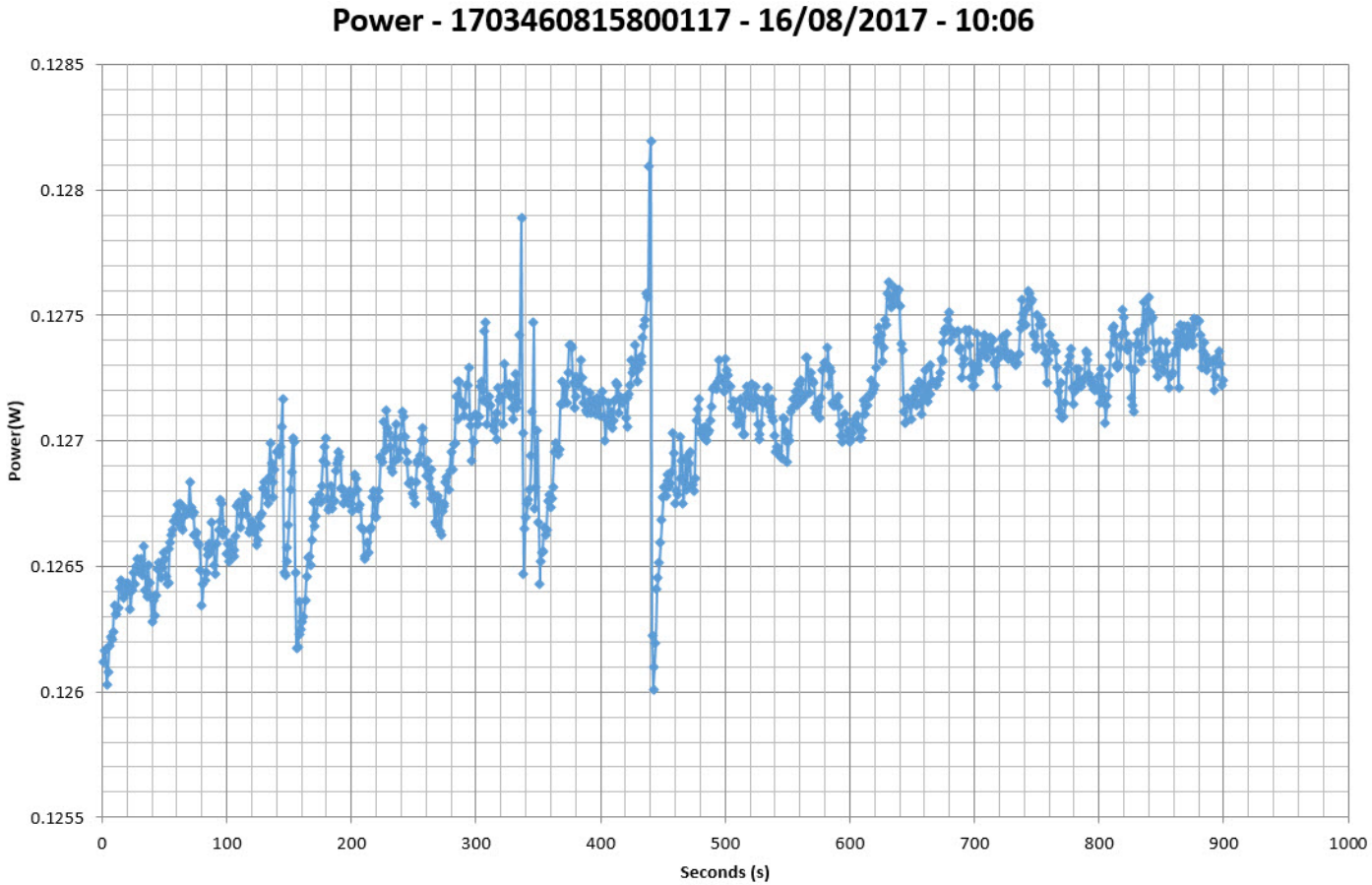
Accredited	
Average Efficiency (>1450 load combinations)	85.300%
Average Noise Output (>1450 Load Combinations)	32.81dBA
Average PF (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1272W
Non-Accredited	
12V Ripple (Full Load)	14.03mV
5V Ripple (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

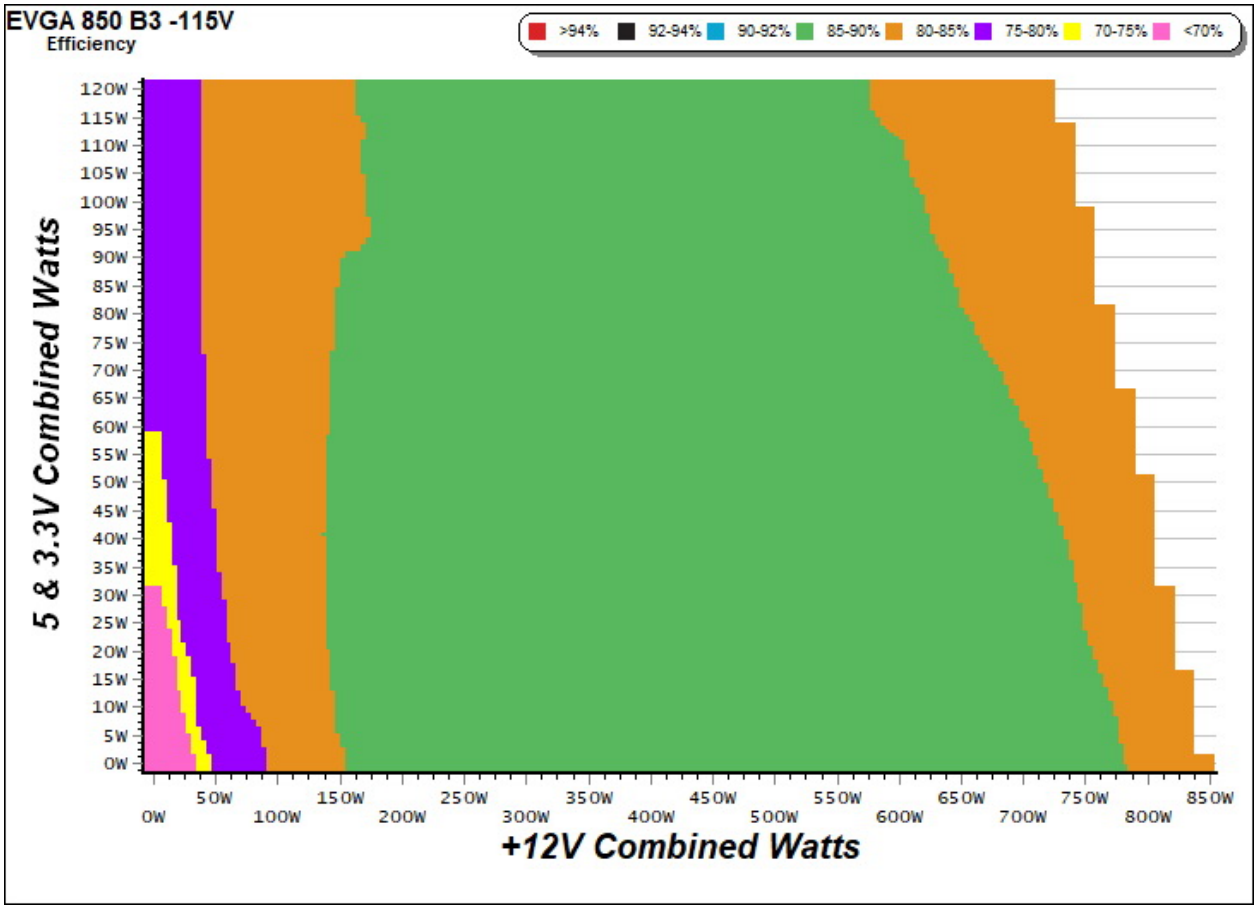
Vampire Power

Graphs 115V



Efficiency Graph

115V

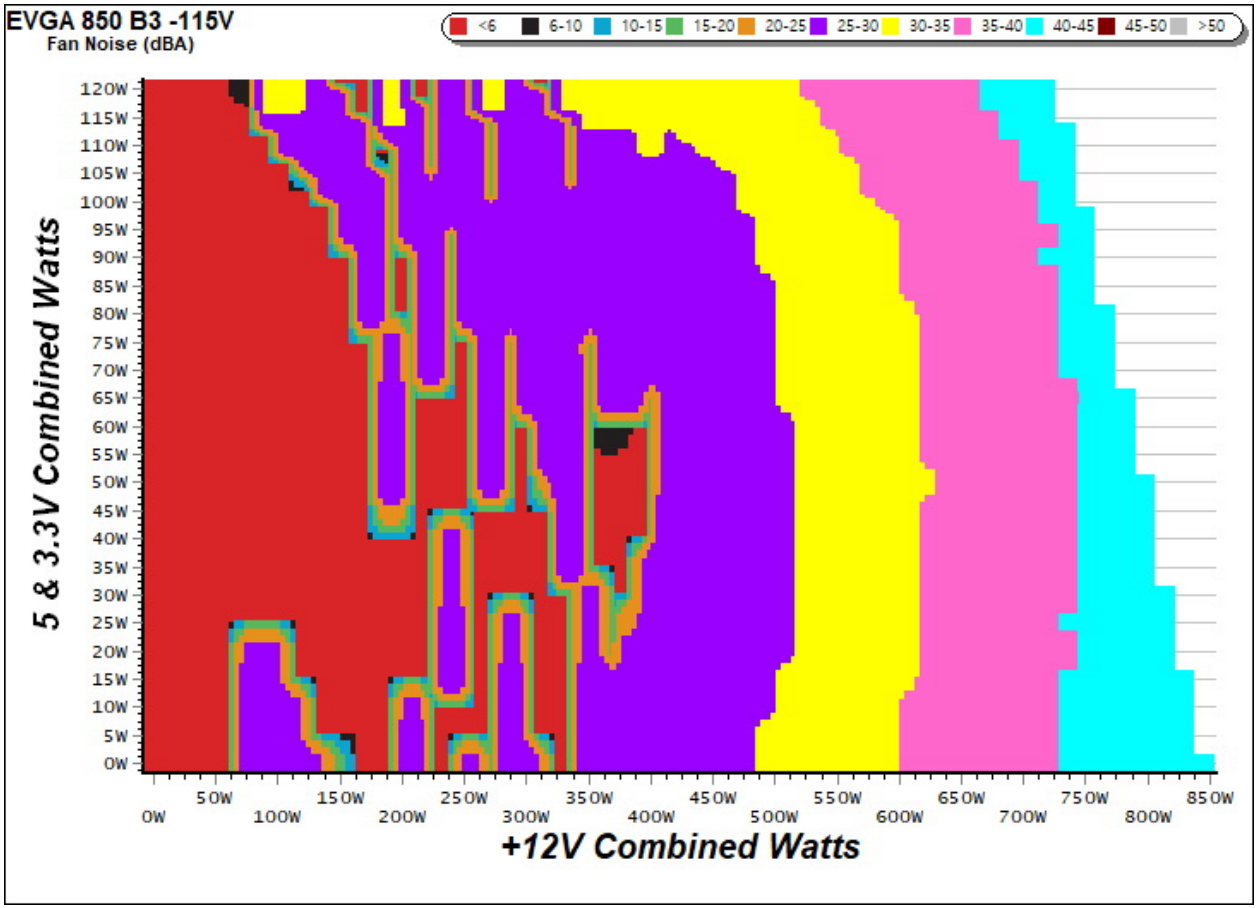


INFO

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

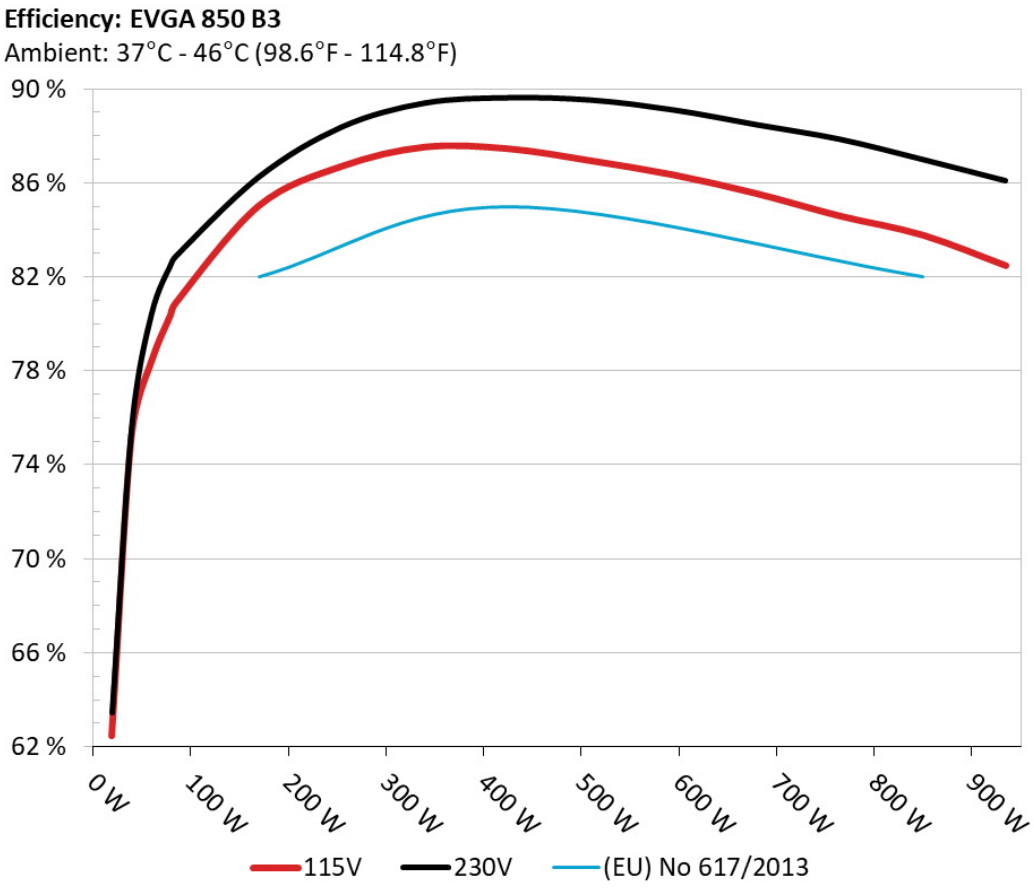


INFO

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

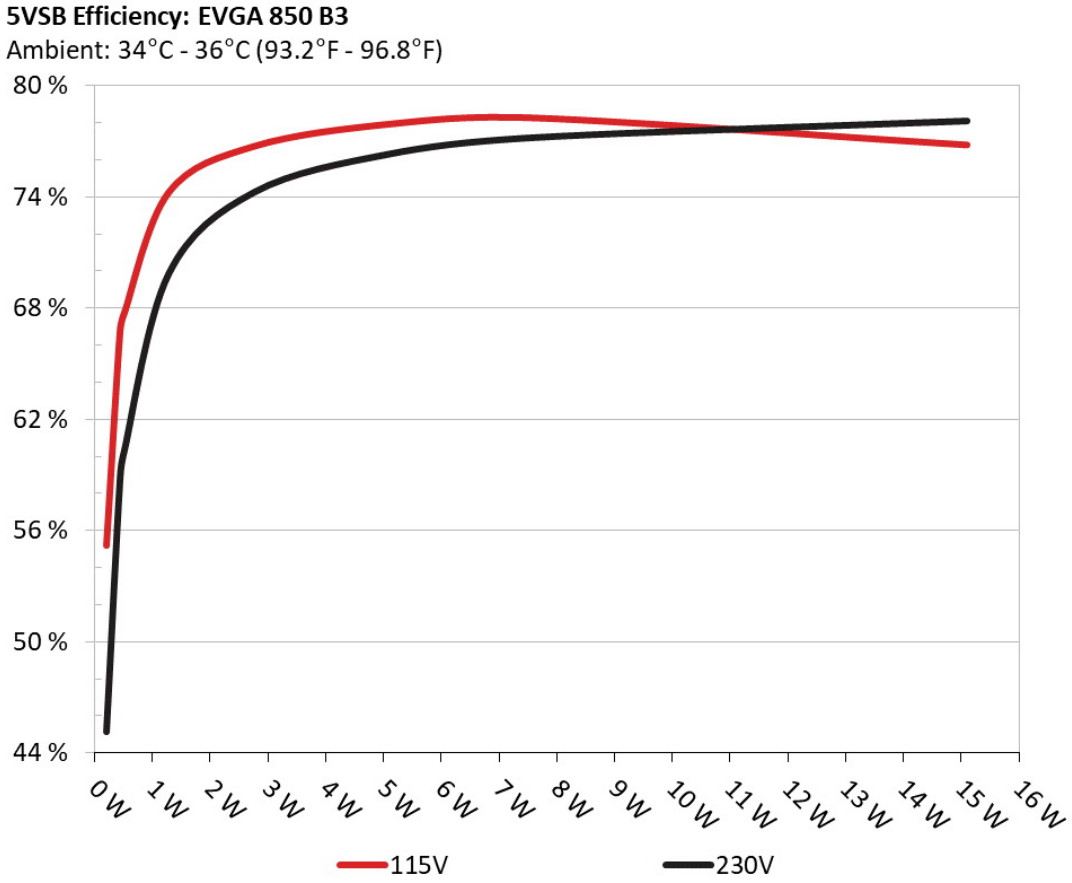
Efficiency under high ambient temperature



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

All data and graphs included in this test report can be used by any individual on the following conditions:

› It should be mentioned that the test results are provided by Cybenetics

› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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