



EVGA SuperNOVA 850 G3 (#2)

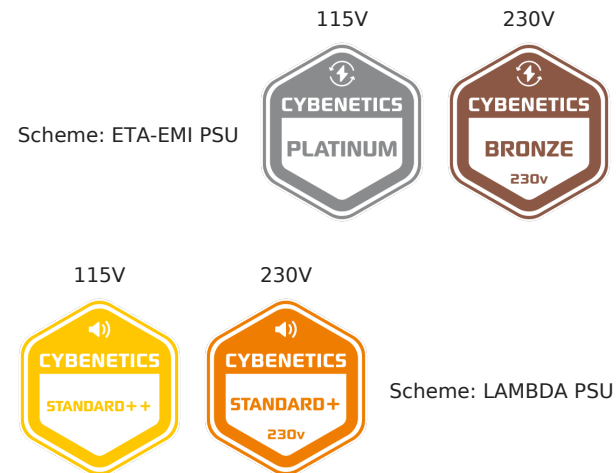
Serial Number 1703440815899001

Lab ID 212

Certification ID 25212

Test Result Report ID: 19PS212A

Certificate Issue Date: Sep 11, 2018



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	SuperNOVA 850 G3 (#2)
OEM/ODM	Super Flower
Serial Number	1703440815899001
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 Hydraulic Dynamic Bearing Fan (H1282412H)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	212
Date of receipt	Aug 27, 2018
Testing Date	Sep 7, 2018
Report Issued Date	Sep 11, 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	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (700mm)	2	2	18-22AWG	Yes
6+2 pin PCIe (700mm)	2	2	18-20AWG	Yes
6+2 pin PCIe (700mm+150mm)	2	4	18-20AWG	Yes
SATA (550mm+100mm+100mm)	3	12	18-20AWG	No
4 pin Molex (550mm+100mm+100mm+100mm)	1	4	18AWG	No
FDD Adapter (+100mm)	1	1	20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	No

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 II
Primary Side	
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	1x
APFC MOSFETS	2x Infineon IPA50R140CP (550V, 15A @ 100°C, 0.140hm)
APFC Boost Diode	1x CREE C3D08060A (600V, 8A @ 152°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 680uF, 2000h @ 105°C, KMR)
Main Switchers	2x Infineon IPA50R140CP (550V, 15A @ 100°C, 0.140hm)
APFC Controller	SF29603
PWM Controller	SF201T
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Infineon IPP023N04N G (40V, 90A @ 100°C, 2.3mOhm)
5V & 3.3V	DC-DC Converters: 8x Infineon BSC0906NS (30V, 40A @ 100°C, 4.5mOhm) PWM Controller: no info
Filtering Capacitors	Electrolytics: Chemi-Con (1-5,000 @ 105°C, KZE), Chemi-Con (4-10,000 @ 105°C, KY), Chemi-Con (105°C, W), Chemi-Con (1,000 @ 105°C, KRG) Polymers: Chemi-Con
Supervisor IC	SF201T (probably) & LM324ADG & LM339A
Fan Model	EVGA H1282412H (12V, 0.35A, 2170 RPM, Hydro Dynamic 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)	89.569%
Average Noise Output (>1450 Load Combinations)	34.01dBA
Average PF (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1368W
Non-Accredited	
12V Ripple (Full Load)	12.57mV
5V Ripple (Full Load)	9.33mV
3.3V Ripple (Full Load)	10.42mV
5VSB Ripple (Full Load)	10.75mV
12V Load Regulation	0.07%
5V Load Regulation	0.24%
3.3V Load Regulation	0.27%
5VSB Load Regulation	1.52%

Inrush Current	26.848A
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230V

Accredited		
Average Efficiency (>1450 load combinations)	91.084%	
Average Noise Output (>1450 Load Combinations)	35.50dBA	
Average PF (>1450 Load Combinations)	0.945	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.2319W	
Non-Accredited		
12V Ripple (Full Load)	11.30mV	
5V Ripple (Full Load)	9.21mV	
3.3V Ripple (Full Load)	10.88mV	
5VSB Ripple (Full Load)	12.03mV	
12V Load Regulation	0.10%	
5V Load Regulation	0.24%	
3.3V Load Regulation	0.24%	
5VSB Load Regulation	1.54%	
Inrush Current	88.005A	
Hold-Up Time & PWR_OK Signal	19.70ms	
AC Loss to PWR_OK Hold Up Time	17.20ms	
PWR_OK Inactive to DC Loss Delay	2.50ms	
OPP (0.00°C / 0.00°C)	-	

Hold-Up Time & PWR_OK Signal

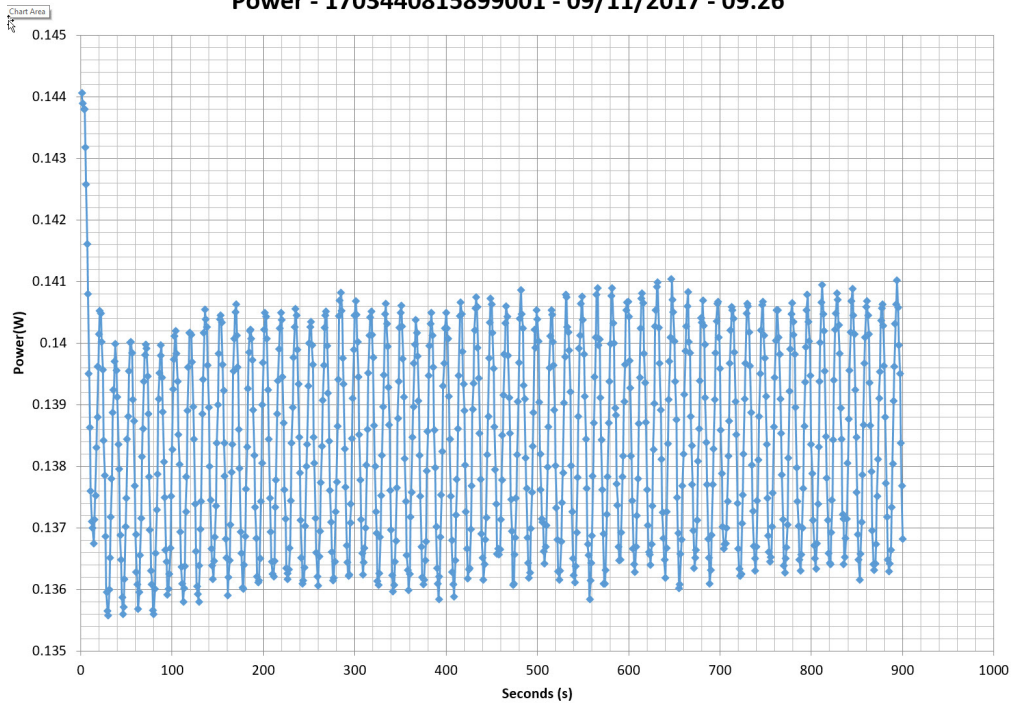
Hold-Up Time (ms)	19.7
AC Loss to PWR_OK Hold Up Time (ms)	17.2
PWR_OK Inactive to DC Loss Delay (ms)	2.5

Vampire Power

Graphs

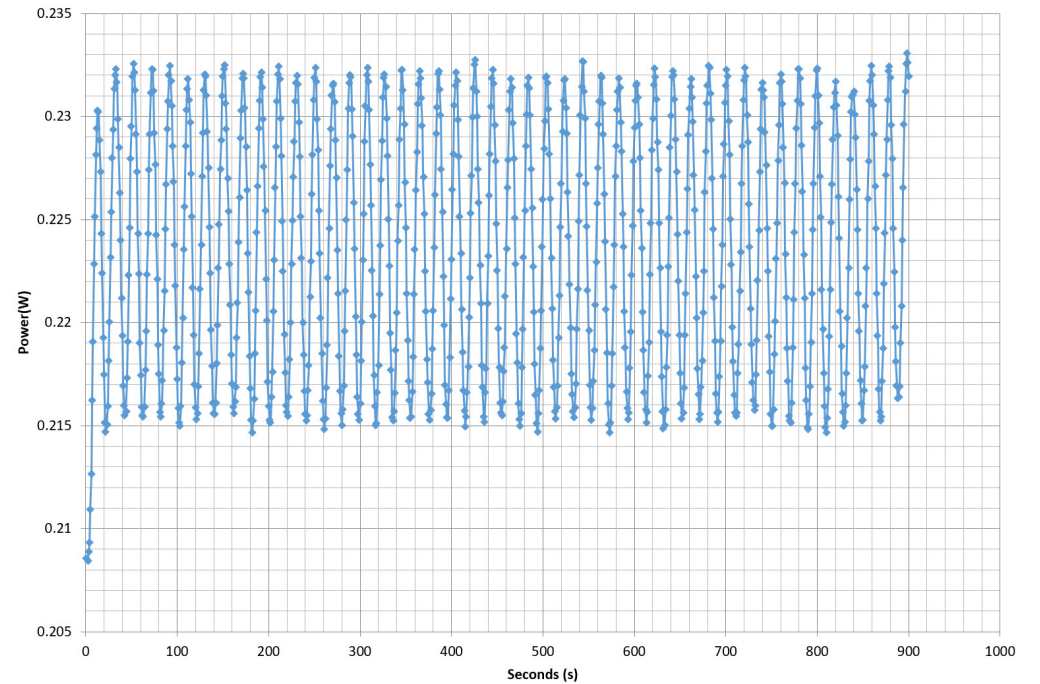
115V

Power - 1703440815899001 - 09/11/2017 - 09:26



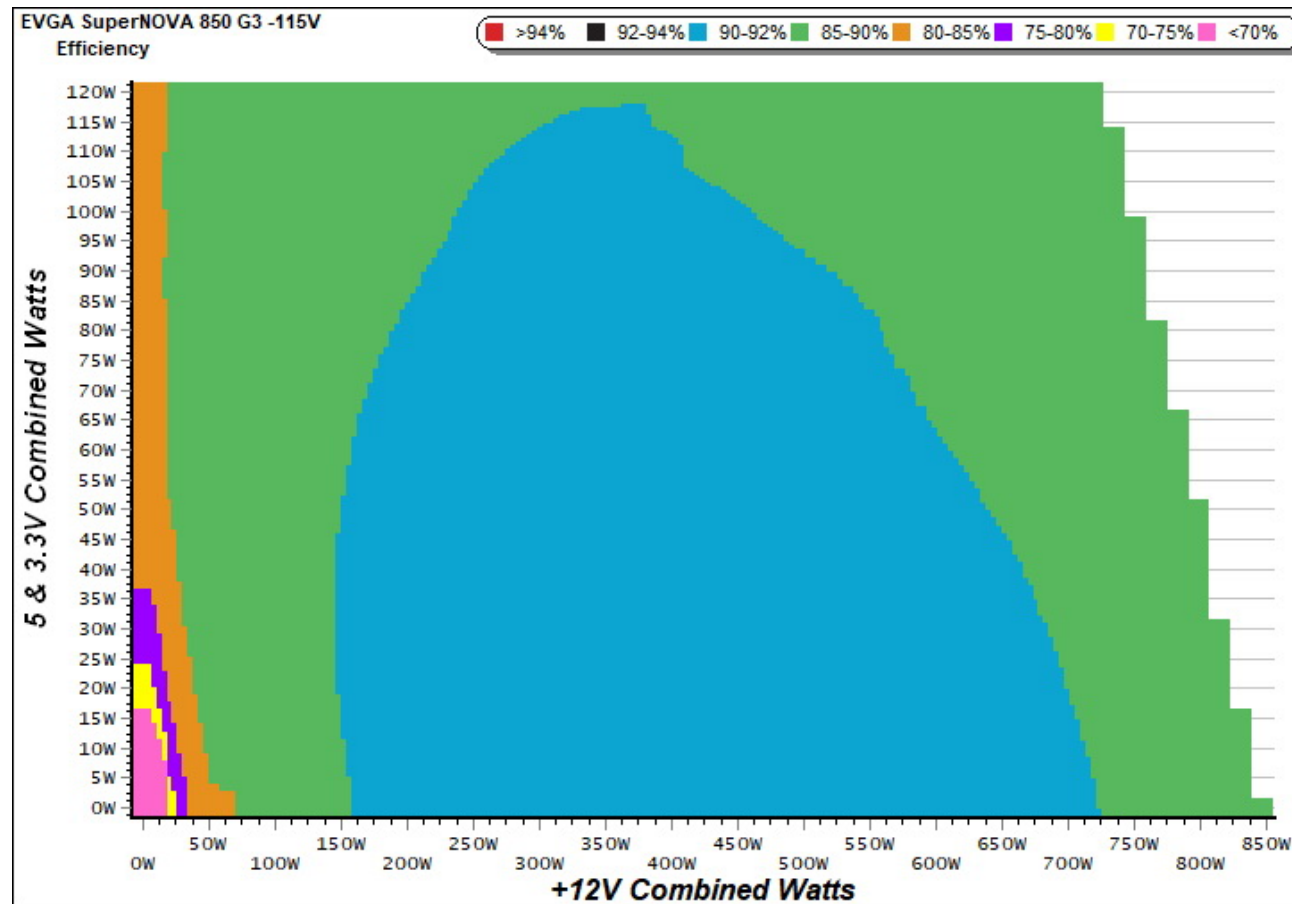
230V

Power - 1703440815899001 - 09/11/2017 - 09:26



Efficiency Graph

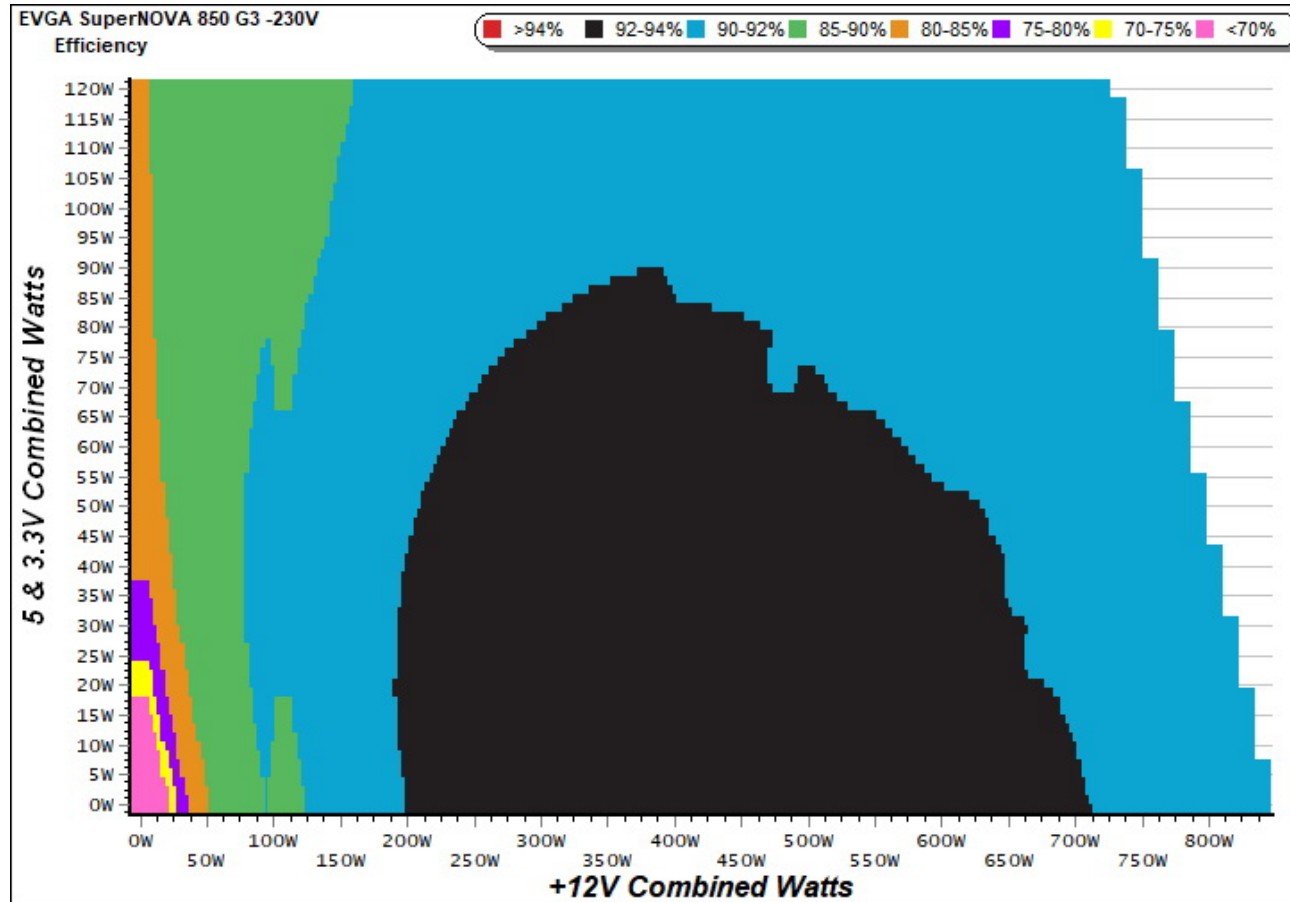
115V



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.

230V

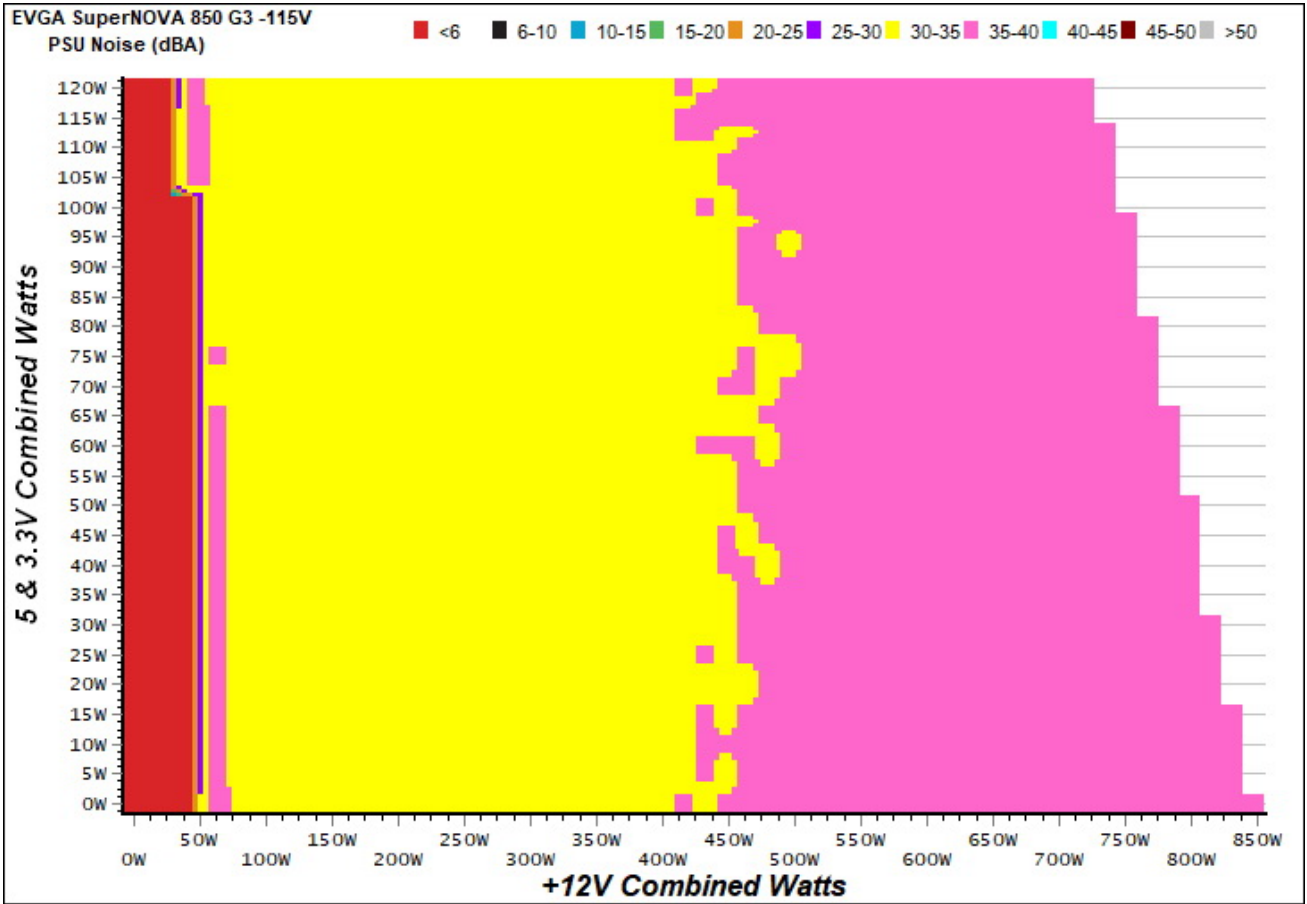


INFO

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

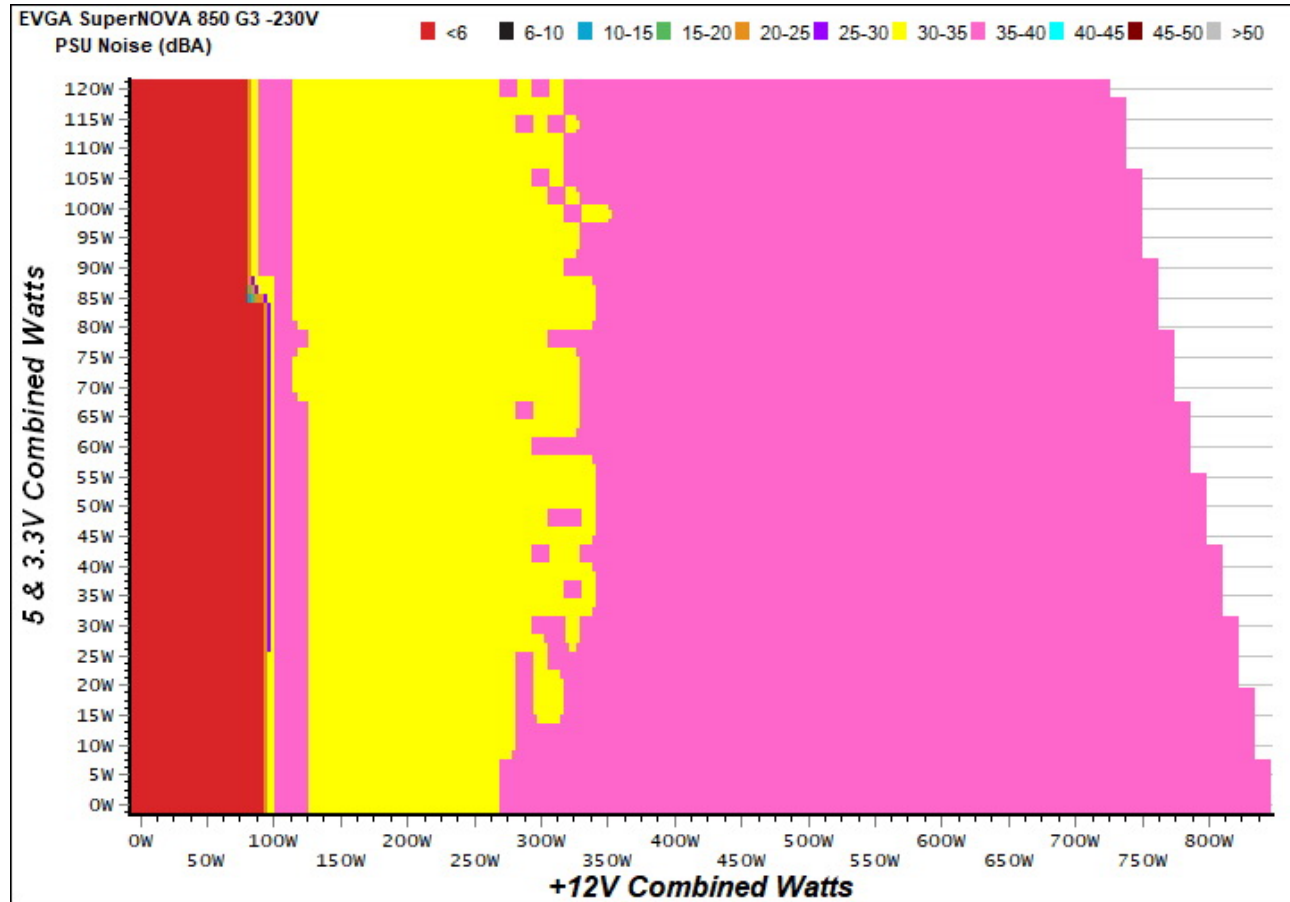
115V



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

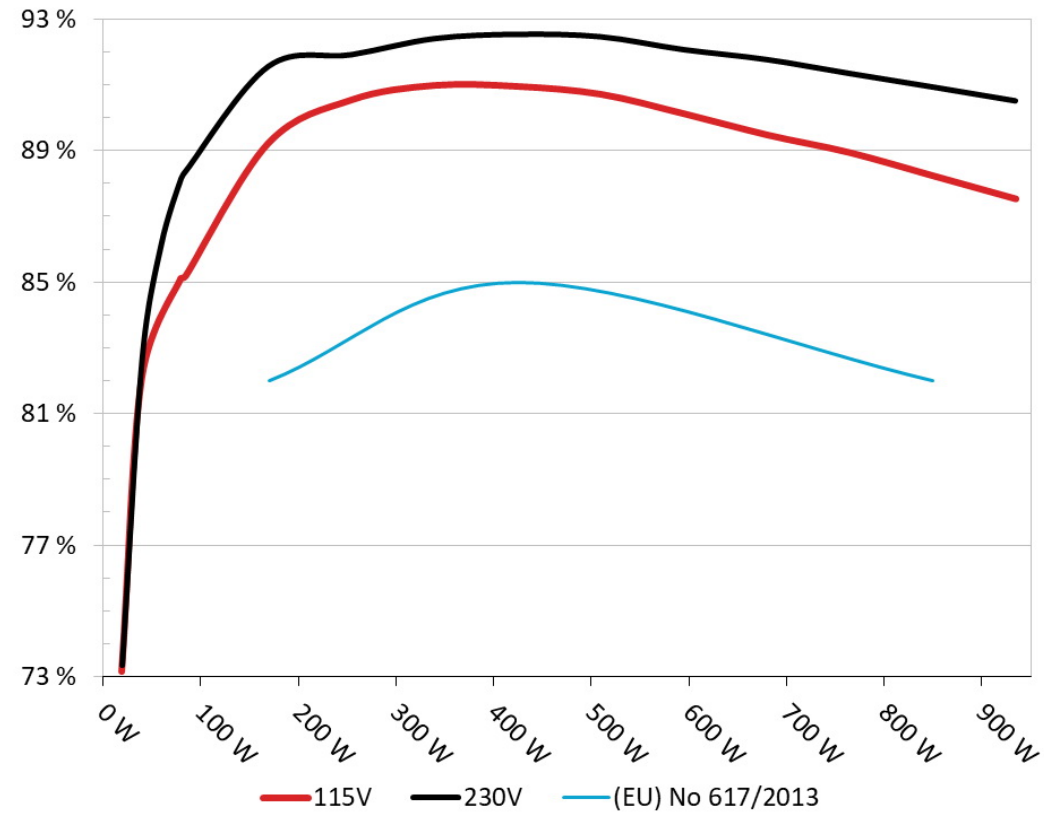
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance

Efficiency under high ambient temperature

Efficiency: EVGA SuperNOVA 850 G3

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



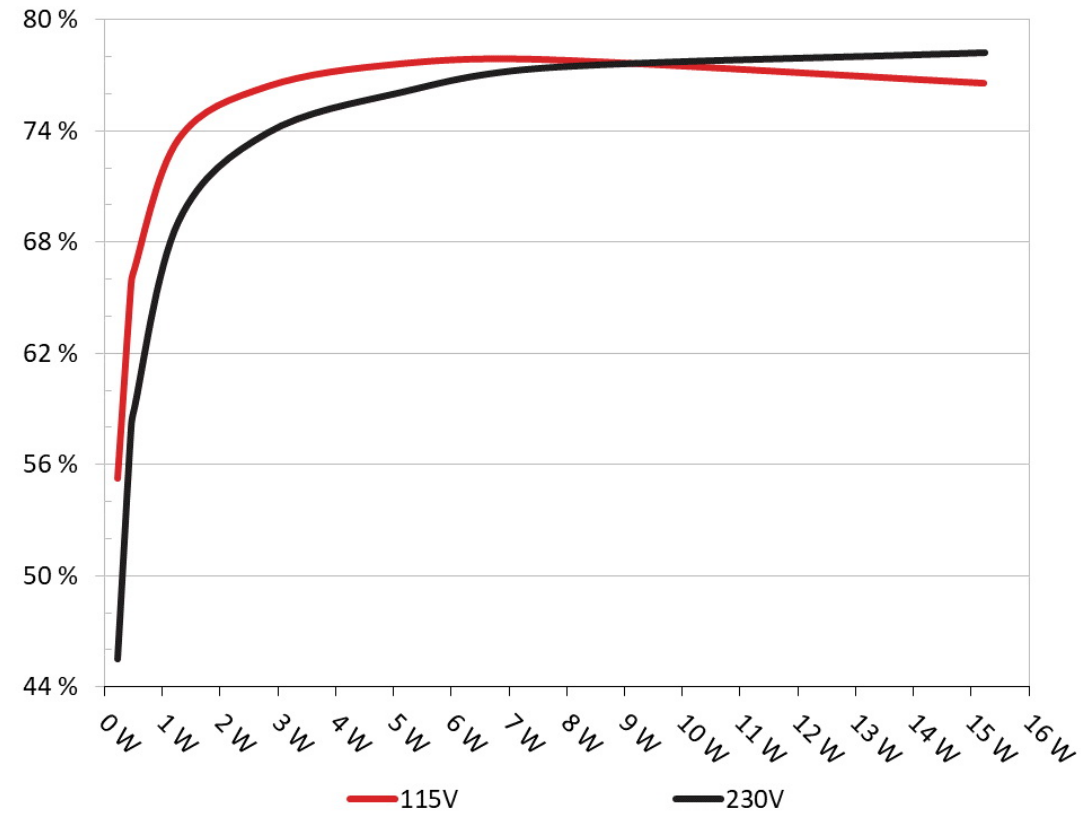
INFO

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 SuperNOVA 850 G3

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	0.232	55.238%	0.028
	5.149V	0.420		115.28V
2	0.090A	0.464	65.722%	0.048
	5.147V	0.706		115.28V
3	0.550A	2.825	76.413%	0.215
	5.137V	3.697		115.27V
4	1.000A	5.127	77.635%	0.316
	5.127V	6.604		115.27V
5	1.500A	7.674	77.853%	0.382
	5.115V	9.857		115.26V
6	3.000A	15.210	76.586%	0.470
	5.070V	19.860		115.25V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.232	45.490%	0.011
	5.149V	0.510		230.85V
2	0.090A	0.464	57.928%	0.017
	5.147V	0.801		230.85V
3	0.550A	2.826	73.882%	0.080
	5.137V	3.825		230.84V
4	1.000A	5.127	76.057%	0.135
	5.127V	6.741		230.84V
5	1.500A	7.674	77.398%	0.186
	5.115V	9.915		230.84V
6	3.000A	15.245	78.208%	0.295
	5.082V	19.493		230.84V

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	5.228A	1.998A	1.990A	0.976A	84.798	85.196%	1586	37.1	38.01°C	0.960
	12.088V	5.006V	3.315V	5.126V	99.533				42.71°C	115.27V
2	11.455A	2.995A	2.986A	1.172A	169.347	89.230%	1653	38.1	38.63°C	0.979
	12.086V	5.008V	3.316V	5.120V	189.788				43.43°C	115.16V
3	18.079A	3.494A	3.465A	1.369A	254.442	90.548%	1667	38.4	38.80°C	0.985
	12.083V	5.009V	3.316V	5.115V	281.002				43.67°C	115.15V
4	24.705A	3.994A	3.980A	1.566A	339.665	90.991%	1688	38.7	39.53°C	0.990
	12.081V	5.009V	3.316V	5.109V	373.296				44.71°C	115.02V
5	30.995A	4.990A	4.973A	1.764A	424.959	90.959%	1715	39.0	39.89°C	0.992
	12.081V	5.011V	3.318V	5.103V	467.200				45.63°C	114.90V
6	37.217A	5.987A	5.965A	1.962A	509.506	90.723%	1760	39.6	40.44°C	0.994
	12.083V	5.013V	3.319V	5.098V	561.609				46.38°C	114.87V
7	43.500A	6.982A	6.955A	2.161A	594.800	90.131%	1835	41.7	41.49°C	0.995
	12.085V	5.014V	3.320V	5.092V	659.927				47.75°C	114.75V
8	49.789A	7.976A	7.946A	2.360A	680.155	89.486%	1902	42.4	42.77°C	0.996
	12.086V	5.016V	3.322V	5.085V	760.065				49.31°C	114.71V
9	56.467A	8.474A	8.431A	2.361A	765.098	88.944%	1981	44.0	43.81°C	0.996
	12.088V	5.017V	3.322V	5.084V	860.198				50.61°C	114.59V
10	62.889A	8.972A	8.941A	2.961A	849.923	88.242%	2075	45.2	45.33°C	0.996
	12.088V	5.017V	3.322V	5.068V	963.176				53.02°C	114.45V
11	69.891A	8.974A	8.943A	2.962A	934.693	87.541%	2124	45.5	46.51°C	0.997
	12.090V	5.016V	3.320V	5.066V	1067.725				55.13°C	114.40V
CL1	0.740A	14.004A	14.001A	0.000A	126.407	83.326%	1910	42.8	43.12°C	0.979
	12.078V	5.040V	3.349V	5.147V	151.701				47.03°C	115.19V

CL2	70.847A	1.003A	1.000A	1.000A	870.033	88.690%	2019	44.6	44.45°C	0.996
	12.091V	4.995V	3.298V	5.114V	980.978				51.70°C	114.42V

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	5.233A	1.998A	1.990A	0.976A	84.855	86.456%	1668	38.3	39.68°C	0.769
	12.088V	5.006V	3.314V	5.125V	98.148				44.55°C	230.99V
2	11.460A	2.996A	2.984A	1.172A	169.382	90.408%	1738	39.2	40.40°C	0.892
	12.084V	5.008V	3.316V	5.119V	187.353				45.90°C	230.94V
3	18.084A	3.494A	3.467A	1.369A	254.464	91.748%	1775	40.2	41.16°C	0.939
	12.081V	5.008V	3.315V	5.113V	277.352				46.82°C	230.87V
4	24.716A	3.994A	3.981A	1.567A	339.675	92.279%	1832	41.7	41.82°C	0.962
	12.076V	5.009V	3.315V	5.107V	368.097				47.70°C	230.81V
5	31.009A	4.992A	4.975A	1.764A	424.975	92.370%	1869	42.1	42.11°C	0.973
	12.076V	5.011V	3.316V	5.101V	460.080				48.76°C	230.74V
6	37.236A	5.987A	5.969A	1.963A	509.506	92.283%	1915	43.5	42.93°C	0.978
	12.077V	5.012V	3.317V	5.095V	552.115				49.96°C	230.68V
7	43.528A	6.982A	6.960A	2.162A	594.797	91.841%	1953	43.8	43.29°C	0.981
	12.077V	5.014V	3.319V	5.089V	647.636				50.88°C	230.62V
8	49.812A	7.978A	7.952A	2.361A	680.141	91.548%	1982	44.0	43.97°C	0.983
	12.080V	5.015V	3.320V	5.083V	742.934				51.89°C	230.56V
9	56.493A	8.476A	8.436A	2.362A	765.073	91.052%	2047	44.6	44.54°C	0.985
	12.082V	5.016V	3.320V	5.081V	840.260				52.72°C	230.49V
10	62.914A	8.974A	8.947A	2.962A	849.901	90.512%	2117	45.7	45.96°C	0.987
	12.083V	5.016V	3.319V	5.065V	938.992				54.85°C	230.42V
11	69.929A	8.976A	8.951A	2.964A	934.672	90.093%	2121	45.7	47.38°C	0.989
	12.083V	5.015V	3.318V	5.063V	1037.452				56.86°C	230.45V
CL1	0.144A	14.003A	14.000A	0.000A	119.171	83.712%	1938	43.4	43.87°C	0.851
	12.074V	5.040V	3.347V	5.146V	142.358				51.42°C	230.94V

CL2	70.831A	1.002A	1.000A	1.000A	869.406	90.990%	2075	45.2	46.08°C	0.987
	12.085V	4.994V	3.297V	5.112V	955.500				54.67°C	230.42V

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	1.185A	0.497A	0.482A	0.194A	19.400	73.169%	0	<6.0	0.757
	12.083V	5.004V	3.312V	5.146V	26.514				115.36V
2	2.446A	0.998A	0.995A	0.389A	39.841	82.085%	0	<6.0	0.882
	12.081V	5.005V	3.313V	5.141V	48.536				115.33V
3	3.639A	1.497A	1.478A	0.584A	59.346	85.125%	0	<6.0	0.927
	12.079V	5.005V	3.314V	5.136V	69.716				115.30V
4	4.899A	1.997A	1.990A	0.780A	79.813	84.917%	1653	38.1	0.956
	12.087V	5.007V	3.315V	5.131V	93.989				115.28V

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	1.196A	0.499A	0.483A	0.194A	19.547	73.358%	0	<6.0	0.397
	12.084V	5.003V	3.312V	5.145V	26.646				231.02V
2	2.455A	0.999A	0.996A	0.389A	39.957	82.737%	0	<6.0	0.565
	12.081V	5.004V	3.313V	5.140V	48.294				231.02V
3	3.646A	1.499A	1.478A	0.584A	59.436	86.258%	0	<6.0	0.669
	12.078V	5.005V	3.314V	5.135V	68.905				231.01V
4	4.906A	2.000A	1.992A	0.780A	79.881	86.032%	1723	39.1	0.751
	12.080V	5.006V	3.315V	5.130V	92.850				231.00V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.2 mV	3.9 mV	3.6 mV	3.0 mV	Pass
20% Load	7.4 mV	4.3 mV	4.5 mV	3.3 mV	Pass
30% Load	8.4 mV	4.6 mV	4.8 mV	3.3 mV	Pass
40% Load	8.7 mV	4.8 mV	5.4 mV	4.0 mV	Pass
50% Load	9.3 mV	6.3 mV	6.4 mV	4.4 mV	Pass
60% Load	10.1 mV	6.5 mV	7.5 mV	4.3 mV	Pass
70% Load	10.9 mV	6.8 mV	7.9 mV	7.2 mV	Pass
80% Load	11.2 mV	7.9 mV	9.5 mV	7.2 mV	Pass
90% Load	11.8 mV	8.1 mV	10.3 mV	8.1 mV	Pass
100% Load	12.6 mV	9.3 mV	10.4 mV	10.8 mV	Pass
110% Load	13.1 mV	8.1 mV	10.8 mV	10.8 mV	Pass
Crossload 1	5.7 mV	7.7 mV	9.1 mV	13.5 mV	Pass
Crossload 2	11.9 mV	6.3 mV	7.4 mV	6.8 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.8 mV	4.0 mV	4.0 mV	3.3 mV	Pass
20% Load	6.3 mV	4.7 mV	4.8 mV	4.0 mV	Pass
30% Load	7.2 mV	5.1 mV	5.2 mV	4.4 mV	Pass
40% Load	7.7 mV	5.3 mV	5.8 mV	5.0 mV	Pass
50% Load	8.3 mV	6.4 mV	6.7 mV	5.3 mV	Pass
60% Load	8.9 mV	6.9 mV	7.9 mV	5.7 mV	Pass
70% Load	9.7 mV	8.2 mV	8.7 mV	8.7 mV	Pass
80% Load	10.2 mV	8.0 mV	9.6 mV	9.0 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	10.5 mV	9.0 mV	10.1 mV	9.5 mV	Pass
100% Load	11.3 mV	9.2 mV	10.9 mV	12.0 mV	Pass
110% Load	12.1 mV	8.9 mV	11.2 mV	12.8 mV	Pass
Crossload 1	5.5 mV	8.1 mV	9.3 mV	14.1 mV	Pass
Crossload 2	10.1 mV	7.8 mV	8.0 mV	8.0 mV	Pass

The results above are not used in the certification process

EVGA SuperNOVA 850 G3 (#2)



Top side

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 LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

+50°C ambient @ full load					
AC Input	100-240 VAC, 10A, 60/50 Hz				
DC Output	+5V	+3.3V	+12V	-12V	+5Vsb
Max Output, A	24A	24A	70.8A	0.5A	3A
Combined, W	120W		849.6W	6W	15W
Output Power, P _{cont}	850W @ +50°C				

Power specifications label

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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