EVGA 850 GQ

1603160808800964

Lab ID 93

Certification ID 2593

Test Result Report ID:

Certificate Issue Date: Apr 19, 2018

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 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 GQ
OEM/ODM	FSP
Serial Number	1603160808800964
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	14
□□□□ (Hz)	50-60

□□□□ (W)	850
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Semi Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135 mm Fluid Dynamic Bearing (MGA13512XF-O25)
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	93
Date of receipt	Apr 5, 2018
Testing Date	Apr 15, 2018
Report Issued Date	Apr 19, 2018
□□□□□	Retested on 02/06/2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□ (Non-accredited measurements)

Native Cables			
□□	□□□□	□□□□□□	Gauge
ATX □□ 20+4 pin (600mm)	1	1	18-24AWG
□□□□□			
4+4 pin EPS 12V □□ (650mm)	2	2	18AWG
6+2pin PCIe□□ (600mm+100mm)	4	8	18AWG
SATA□□ (550mm+100mm+100mm)	1	3	18AWG
□ 4pin Molex□□ (550mm+100mm+100mm)	1	3	18AWG
□ 4pin □□ (+100mm)	1	2	22AWG

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	24	24	70.8	3	0.5
	□	120		849.6	15	6
□□□□□ (W)		850				

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.715%
Average Noise Output (>1450 Load Combinations)	24.63dBA
PF□□□ (>1450 Load Combinations)	0.984
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.1069W
Non-Accredited	
12V Ripple (Full Load)	21.69mV
5V Ripple (Full Load)	19.28mV
3.3V Ripple (Full Load)	22.06mV
5VSB Ripple (Full Load)	32.69mV
12V Load Regulation	1.05%
5V Load Regulation	0.80%
3.3V Load Regulation	1.39%

5VSB Load Regulation	3.42%
Inrush Current	22.587A

230V

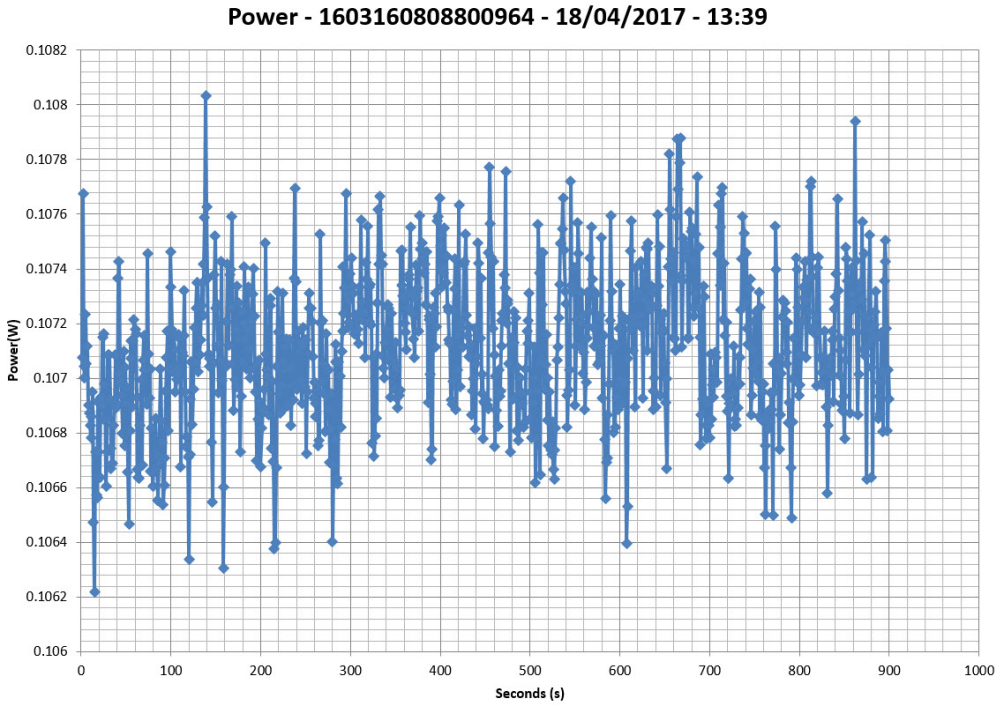
Accredited	
□□□□ (>1450 load combinations)	90.709%
Average Noise Output (>1450 Load Combinations)	30.05dBA
PF□□□ (>1450 Load Combinations)	0.964
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.1962W
Non-Accredited	
12V Ripple (Full Load)	17.44mV
5V Ripple (Full Load)	22.37mV
3.3V Ripple (Full Load)	17.25mV
5VSB Ripple (Full Load)	26.63mV
12V Load Regulation	0.52%
5V Load Regulation	0.36%
3.3V Load Regulation	0.79%
5VSB Load Regulation	2.97%
Inrush Current	47.130A
□□□□ & PG□□	28.24ms
AC Loss to PWR_OK Hold Up Time	24.06ms
PWR_OK Inactive to DC Loss Delay	4.18ms
OPP (0.00°C / 0.00°C)	- -

□□□□ & PG□□

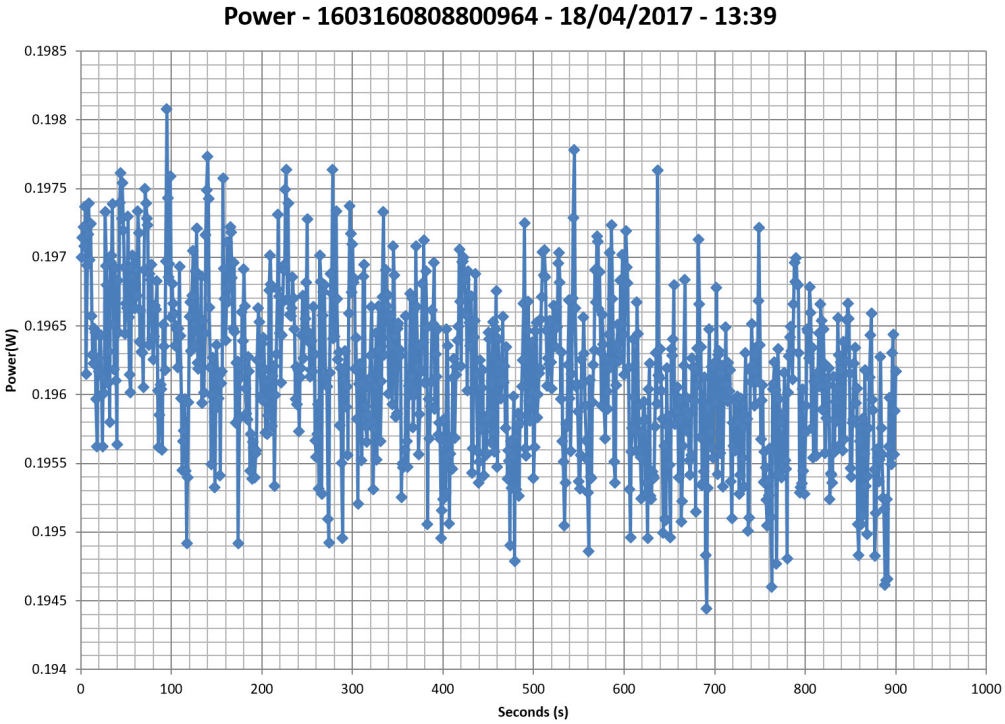
Hold-Up Time (ms)	28.24
AC Loss to PWR_OK Hold Up Time (ms)	24.06
PWR_OK Inactive to DC Loss Delay (ms)	4.18

Graphs

115V

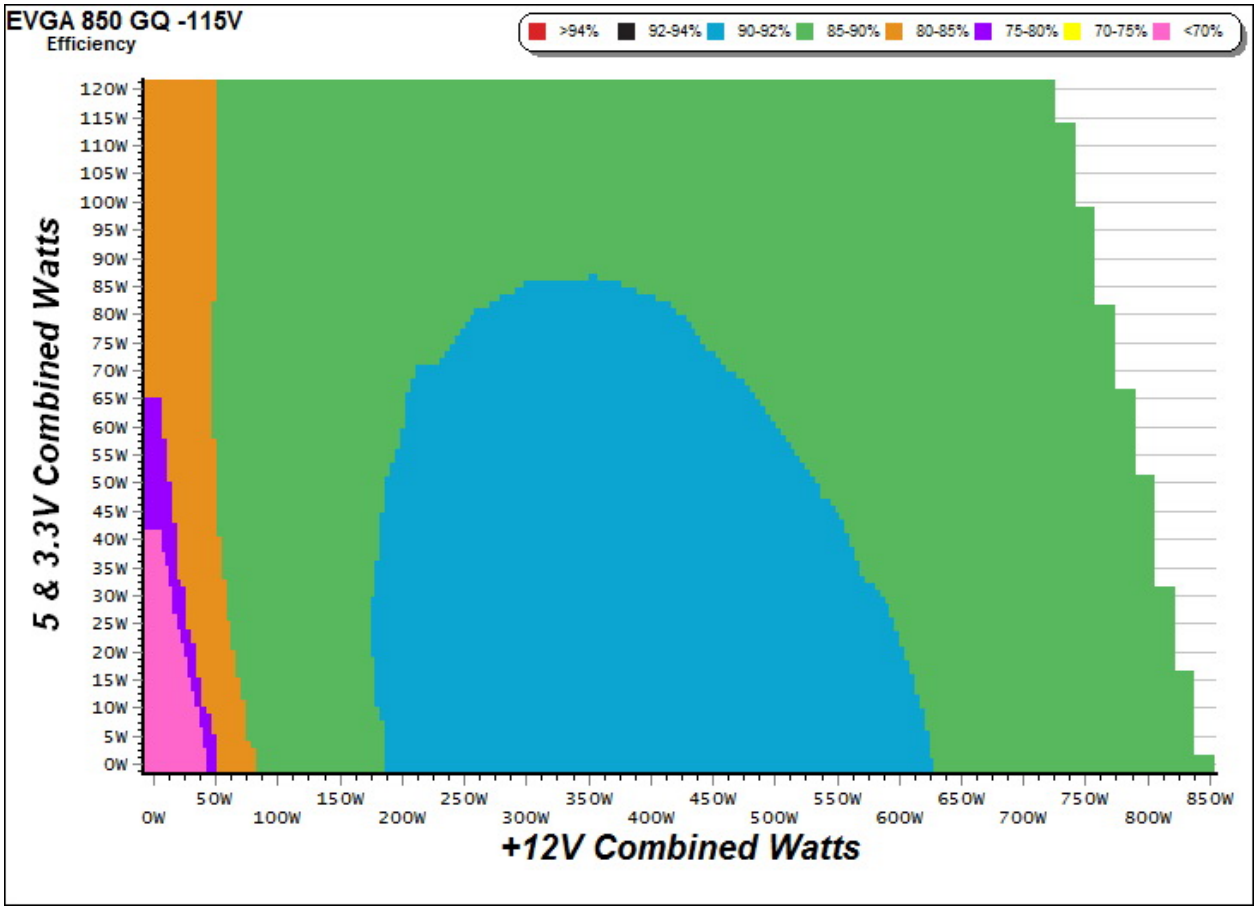


230V



□□□□□□

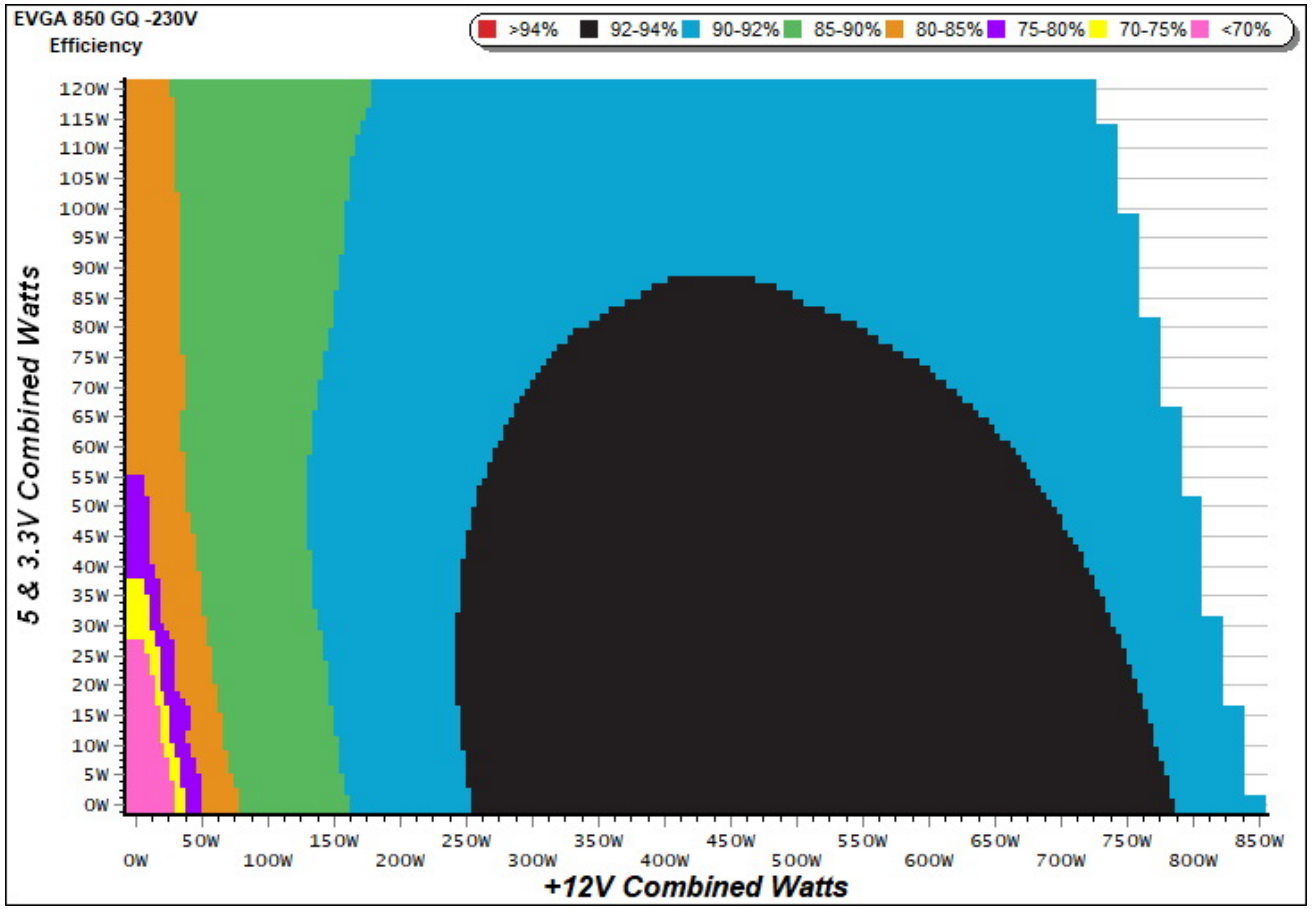
115V



□□

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.

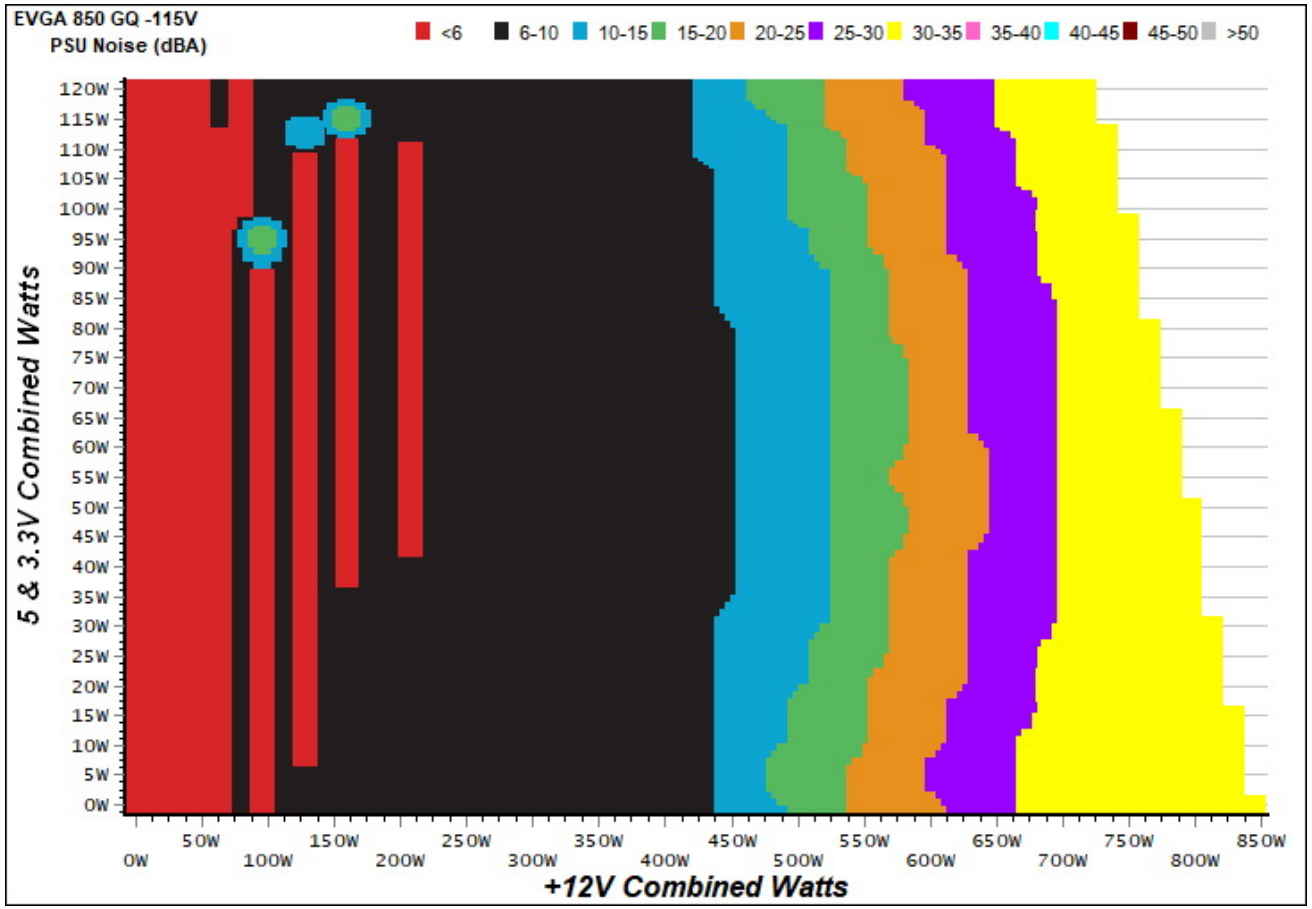
230V



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.

□□□□□

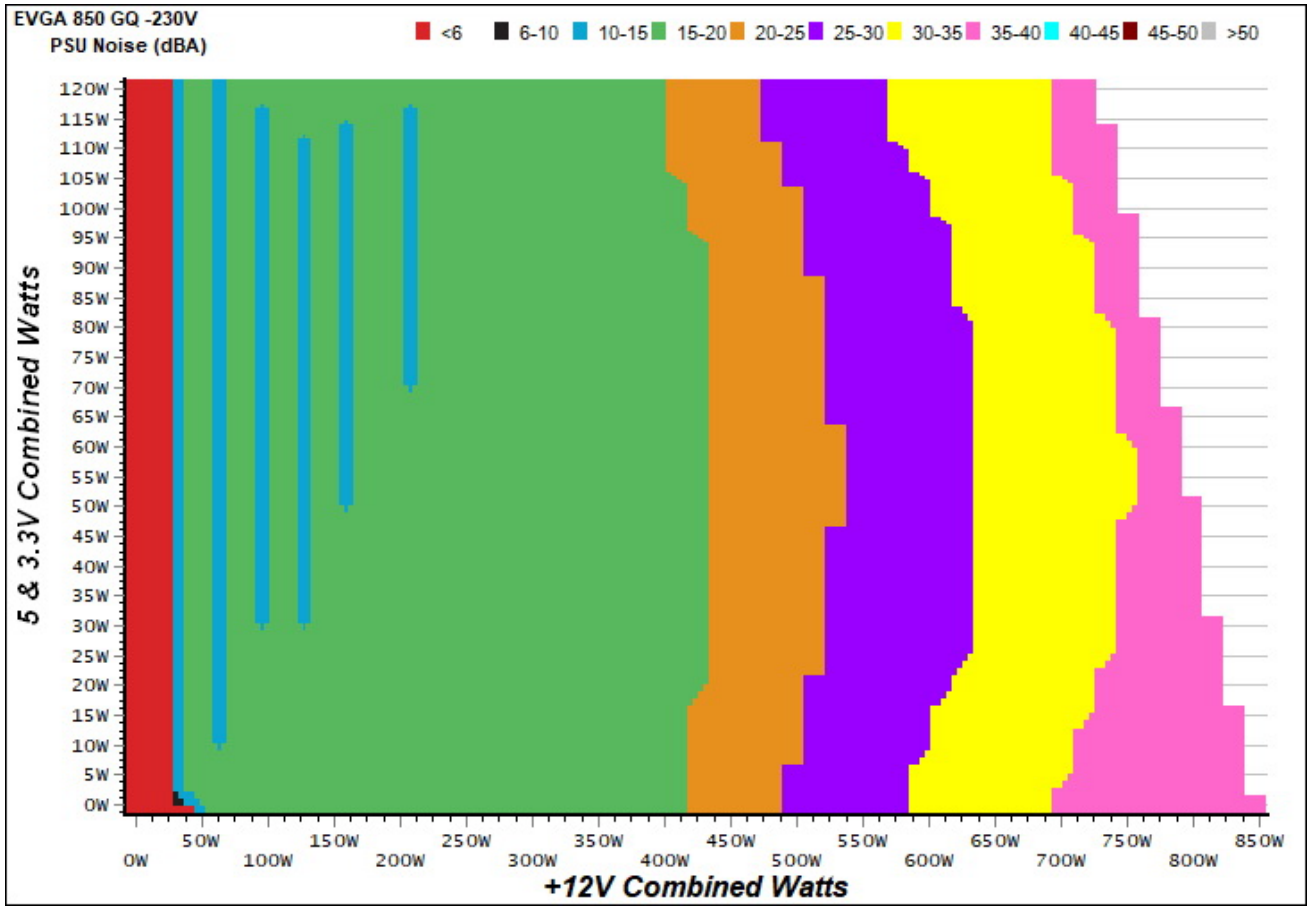
115V



□□

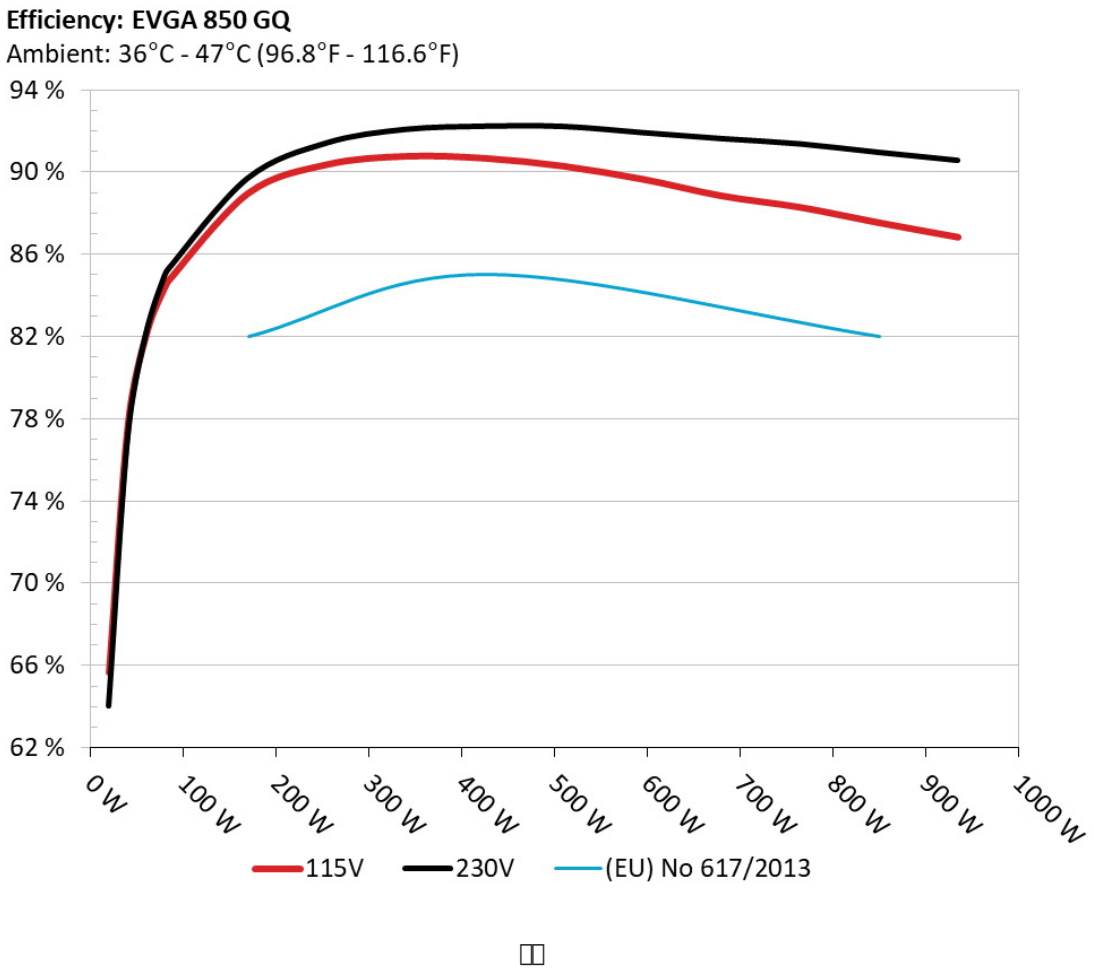
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



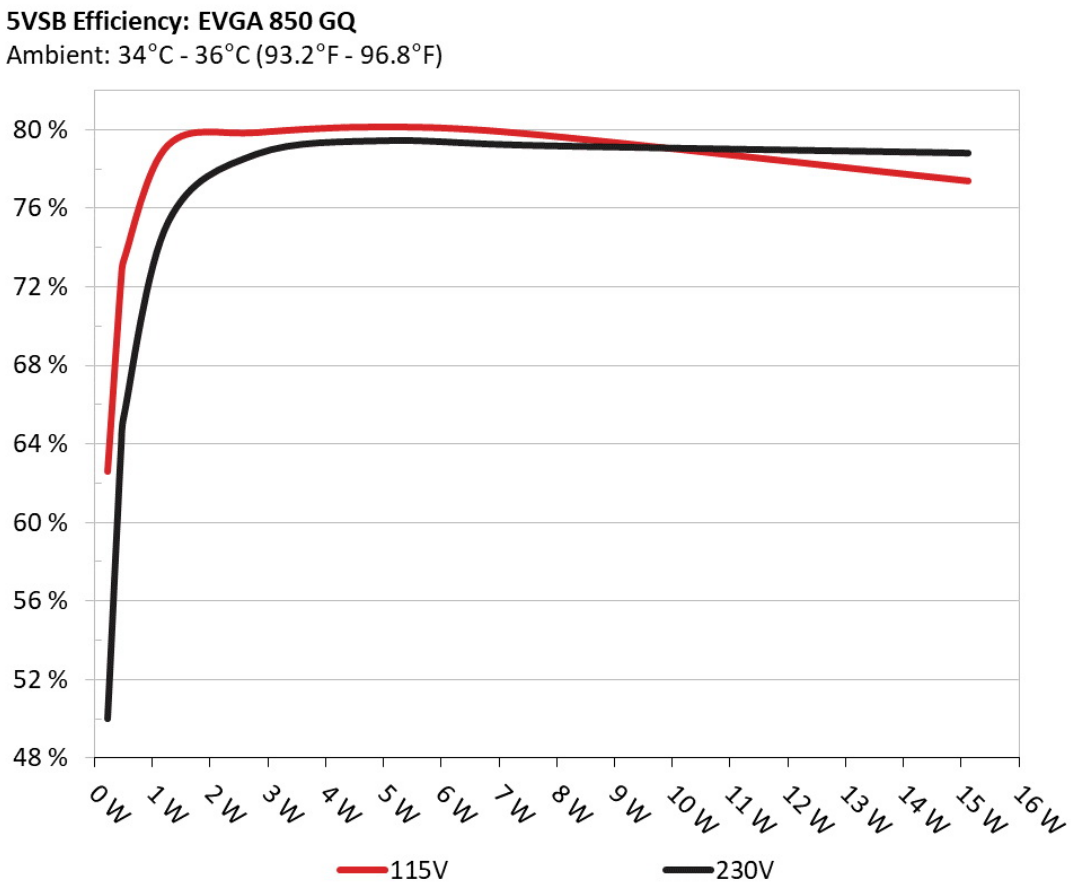
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance



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□□□□



□□

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input.

□□□□ □□ 5Vsb □□ (ErP Lot3/6 & CEC)

115V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.231	62.602%	0.031
	5.129V	0.369		115.37V
2	0.090A	0.462	72.300%	0.052
	5.127V	0.639		115.38V
3	0.550A	2.813	79.847%	0.236
	5.113V	3.523		115.37V
4	1.000A	5.100	80.138%	0.338
	5.099V	6.364		115.37V
5	1.500A	7.627	79.747%	0.401
	5.084V	9.564		115.36V
6	3.000A	15.114	77.385%	0.481
	5.038V	19.531		115.35V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.231	50.000%	0.014
	5.128V	0.462		230.92V
2	0.090A	0.462	63.724%	0.021
	5.127V	0.725		230.92V
3	0.550A	2.813	78.751%	0.099
	5.113V	3.572		230.92V
4	1.000A	5.099	79.436%	0.166
	5.098V	6.419		230.92V
5	1.500A	7.628	79.186%	0.227
	5.084V	9.633		230.92V
6	3.000A	15.116	78.799%	0.337
	5.038V	19.183		230.91V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	5.235A	1.994A	2.000A	0.981A	84.823	84.781%	520	11.8	37.77°C	0.975
	12.083V	5.005V	3.299V	5.087V	100.050				40.96°C	115.02V
2	11.518A	2.994A	3.004A	1.179A	169.695	88.983%	520	11.8	37.98°C	0.989
	12.055V	5.000V	3.294V	5.072V	190.704				41.49°C	115.02V
3	18.170A	3.507A	3.523A	1.380A	254.969	90.384%	520	11.8	38.50°C	0.991
	12.046V	4.996V	3.290V	5.059V	282.096				42.36°C	115.03V
4	24.828A	4.004A	4.014A	1.583A	339.795	90.782%	520	11.8	38.99°C	0.995
	12.028V	4.991V	3.287V	5.045V	374.299				43.79°C	115.03V
5	31.127A	5.007A	5.025A	1.787A	424.698	90.685%	725	18.5	39.73°C	0.997
	12.023V	4.988V	3.282V	5.031V	468.321				44.73°C	115.13V
6	37.461A	6.019A	6.043A	1.991A	509.688	90.296%	998	27.9	40.53°C	0.998
	12.010V	4.984V	3.276V	5.015V	564.466				45.63°C	115.05V
7	43.794A	7.025A	7.060A	2.199A	594.627	89.666%	1320	34.2	41.58°C	0.999
	12.001V	4.978V	3.271V	4.998V	663.158				46.90°C	115.04V
8	50.126A	8.045A	8.081A	2.405A	679.613	88.853%	1600	39.9	42.71°C	0.999
	11.994V	4.974V	3.267V	4.983V	764.873				48.18°C	115.08V
9	56.915A	8.547A	8.612A	2.411A	764.652	88.292%	1690	41.6	43.97°C	0.999
	11.984V	4.971V	3.263V	4.975V	866.051				50.19°C	115.06V
10	63.436A	9.063A	9.110A	3.031A	849.487	87.542%	1690	41.6	45.43°C	0.998
	11.977V	4.969V	3.259V	4.946V	970.374				52.13°C	115.04V
11	70.594A	9.064A	9.120A	3.034A	934.422	86.841%	1690	41.6	46.60°C	0.998
	11.966V	4.967V	3.255V	4.940V	1076.019				53.83°C	115.06V
CL1	0.101A	14.024A	14.003A	0.004A	117.079	81.630%	700	17.6	42.64°C	0.982
	12.071V	4.992V	3.273V	5.086V	143.426				46.79°C	115.06V

CL2	70.793A	1.002A	1.003A	1.002A	860.645	88.213%	1690	41.6	43.78°C	0.998
	11.969V	4.981V	3.280V	5.032V	975.640				50.26°C	115.06V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	5.224A	1.993A	1.994A	0.982A	84.576	85.355%	680	16.9	37.98°C	0.696
	12.060V	5.010V	3.305V	5.091V	99.087				43.21°C	230.65V
2	11.485A	2.993A	2.994A	1.182A	169.101	89.709%	680	16.9	38.48°C	0.948
	12.035V	5.008V	3.303V	5.078V	188.500				43.84°C	230.59V
3	18.129A	3.494A	3.482A	1.382A	254.188	91.424%	725	18.5	39.38°C	0.971
	12.036V	5.007V	3.300V	5.066V	278.033				45.17°C	230.63V
4	24.791A	3.994A	4.000A	1.583A	339.391	92.083%	965	27.3	40.44°C	0.981
	12.029V	5.005V	3.298V	5.053V	368.571				46.62°C	230.57V
5	31.122A	4.995A	5.006A	1.786A	424.697	92.239%	1230	32.8	41.10°C	0.986
	12.024V	5.003V	3.295V	5.040V	460.433				47.54°C	230.49V
6	37.378A	5.999A	6.013A	1.989A	509.229	92.226%	1445	39.2	41.61°C	0.990
	12.024V	5.001V	3.292V	5.028V	552.156				48.44°C	230.44V
7	43.724A	6.999A	7.023A	2.194A	594.562	91.927%	1752	43.0	42.91°C	0.993
	12.018V	4.999V	3.289V	5.014V	646.774				49.98°C	230.30V
8	50.050A	8.002A	8.031A	2.400A	679.895	91.636%	1835	44.4	44.16°C	0.994
	12.018V	4.998V	3.287V	5.001V	741.949				51.75°C	230.40V
9	56.780A	8.505A	8.524A	2.403A	764.819	91.376%	1835	44.4	44.78°C	0.995
	12.017V	4.997V	3.284V	4.994V	836.998				52.78°C	230.34V
10	63.252A	9.008A	9.046A	3.020A	849.659	90.965%	1835	44.4	45.34°C	0.995
	12.015V	4.995V	3.282V	4.968V	934.046				53.98°C	230.27V
11	70.313A	9.008A	9.052A	3.024A	934.431	90.576%	1835	44.4	46.36°C	0.996
	12.014V	4.995V	3.280V	4.962V	1031.649				55.68°C	230.30V
CL1	0.724A	14.000A	13.997A	0.000A	125.023	83.257%	1240	33.6	43.68°C	0.929
	12.047V	5.009V	3.299V	5.094V	150.166				48.51°C	230.80V

CL2	70.829A	0.999A	0.996A	1.000A	864.251	91.447%	1835	44.4	45.19°C	0.996
	12.014V	4.998V	3.287V	5.045V	945.084				52.40°C	230.37V

The results above are not used in the certification process

20-80□□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.211A	0.489A	0.480A	0.196A	19.701	65.633%	0	<6.0	0.652
	12.107V	5.009V	3.304V	5.121V	30.017				115.00V
2	2.441A	0.989A	0.997A	0.391A	39.794	77.592%	0	<6.0	0.715
	12.104V	5.009V	3.305V	5.112V	51.286				115.00V
3	3.674A	1.485A	1.515A	0.586A	59.870	82.118%	520	11.8	0.775
	12.097V	5.007V	3.301V	5.101V	72.907				115.02V
4	4.903A	1.994A	2.000A	0.785A	79.832	84.419%	520	11.8	0.972
	12.085V	5.007V	3.299V	5.093V	94.566				115.02V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.207A	0.491A	0.481A	0.196A	19.659	64.905%	680	16.9	0.433
	12.089V	5.012V	3.305V	5.120V	30.289				230.25V
2	2.444A	0.990A	0.997A	0.391A	39.769	77.248%	680	16.9	0.536
	12.085V	5.010V	3.304V	5.111V	51.482				230.26V
3	3.679A	1.486A	1.513A	0.586A	59.854	82.321%	680	16.9	0.685
	12.077V	5.009V	3.302V	5.101V	72.708				230.24V
4	4.912A	1.995A	1.999A	0.785A	79.794	85.025%	680	16.9	0.701
	12.060V	5.007V	3.299V	5.093V	93.848				230.24V

The results above are not used in the certification process

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.4 mV	10.5 mV	13.5 mV	22.6 mV	Pass
20% Load	13.9 mV	11.2 mV	14.5 mV	27.8 mV	Pass
30% Load	13.4 mV	12.2 mV	14.8 mV	18.4 mV	Pass
40% Load	14.2 mV	12.1 mV	15.7 mV	18.7 mV	Pass
50% Load	14.8 mV	13.8 mV	15.6 mV	21.8 mV	Pass
60% Load	15.4 mV	13.9 mV	15.6 mV	23.2 mV	Pass
70% Load	16.9 mV	15.5 mV	17.0 mV	27.5 mV	Pass
80% Load	18.7 mV	16.5 mV	18.7 mV	30.4 mV	Pass
90% Load	18.5 mV	17.6 mV	20.5 mV	31.0 mV	Pass
100% Load	21.7 mV	19.3 mV	22.1 mV	32.7 mV	Pass
110% Load	23.0 mV	21.9 mV	25.1 mV	35.1 mV	Pass
Crossload 1	10.3 mV	12.2 mV	14.1 mV	15.6 mV	Pass
Crossload 2	21.0 mV	18.6 mV	21.9 mV	29.7 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.0 mV	9.6 mV	9.3 mV	16.0 mV	Pass
20% Load	23.7 mV	10.5 mV	10.3 mV	17.6 mV	Pass
30% Load	26.9 mV	11.5 mV	11.1 mV	19.7 mV	Pass
40% Load	27.9 mV	13.2 mV	15.8 mV	19.7 mV	Pass
50% Load	31.0 mV	15.0 mV	17.7 mV	20.1 mV	Pass
60% Load	37.7 mV	17.3 mV	34.0 mV	21.8 mV	Pass
70% Load	36.5 mV	19.7 mV	16.9 mV	32.1 mV	Pass
80% Load	39.2 mV	21.4 mV	17.9 mV	27.9 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	41.0 mV	23.9 mV	28.2 mV	30.1 mV	Pass
100% Load	45.1 mV	29.9 mV	33.9 mV	28.4 mV	Pass
110% Load	47.2 mV	31.7 mV	39.7 mV	30.2 mV	Pass
Crossload 1	36.2 mV	17.4 mV	11.9 mV	15.1 mV	Pass
Crossload 2	37.4 mV	26.8 mV	38.9 mV	33.9 mV	Pass

The results above are not used in the certification process

EVGA 850 GQ

Top side

Power specifications label

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