



EVGA 450B

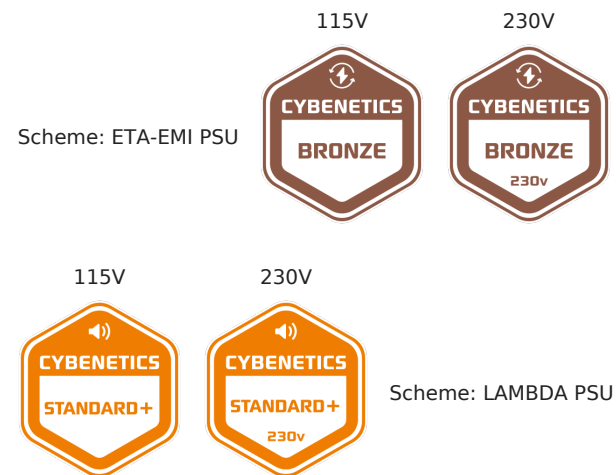
Serial Number 1603530425800472

Lab ID 162

Certification ID 25162

Test Result Report ID:

Certificate Issue Date: Aug 18, 2018



A handwritten signature in blue ink, appearing to read 'A. Bitziopoulos', enclosed within a circular scribble.

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	450B
OEM/ODM	HEC
Serial Number	1603530425800472
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60

Rated Power (W)	450
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Sleeve Bearing Fan (EFS-12E12H)
Semi-Passive Operation	X
Cybenetics Testing Information	
Lab ID	162
Date of receipt	Aug 1, 2018
Testing Date	Aug 14, 2018
Report Issued Date	Aug 18, 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 (560mm)	1	1	18-20AWG
4+4 pin EPS12V (620mm)	1	1	18AWG
6+2 pin PCIe (560mm)	1	1	20AWG
SATA (460mm+115mm)	2	4	20AWG
4 pin Molex (460mm+120mm+120mm)+FDD (+120mm)	1	3 / 1	20-22AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	35	3	0.3
	Watts	120		420	15	3.6
Total Max. Power (W)		450				

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	83.117%
Average Noise Output (>1450 Load Combinations)	37.49dBA
Average PF (>1450 Load Combinations)	0.966
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0557W
Non-Accredited	
12V Ripple (Full Load)	29.80mV
5V Ripple (Full Load)	27.45mV
3.3V Ripple (Full Load)	16.02mV
5VSB Ripple (Full Load)	23.54mV
12V Load Regulation	1.73%
5V Load Regulation	1.97%
3.3V Load Regulation	2.72%

5VSB Load Regulation	3.92%
Inrush Current	81.810A

230V

Accredited		
Average Efficiency (>1450 load combinations)	85.145%	
Average Noise Output (>1450 Load Combinations)	35.96dBA	
Average PF (>1450 Load Combinations)	0.929	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1277W	
Non-Accredited		
12V Ripple (Full Load)	31.73mV	
5V Ripple (Full Load)	22.01mV	
3.3V Ripple (Full Load)	24.77mV	
5VSB Ripple (Full Load)	26.32mV	
12V Load Regulation	1.70%	
5V Load Regulation	2.00%	
3.3V Load Regulation	2.81%	
5VSB Load Regulation	3.62%	
Inrush Current	63.314A	
Hold-Up Time & PWR_OK Signal	17.70ms	
AC Loss to PWR_OK Hold Up Time	11.80ms	
PWR_OK Inactive to DC Loss Delay	5.90ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

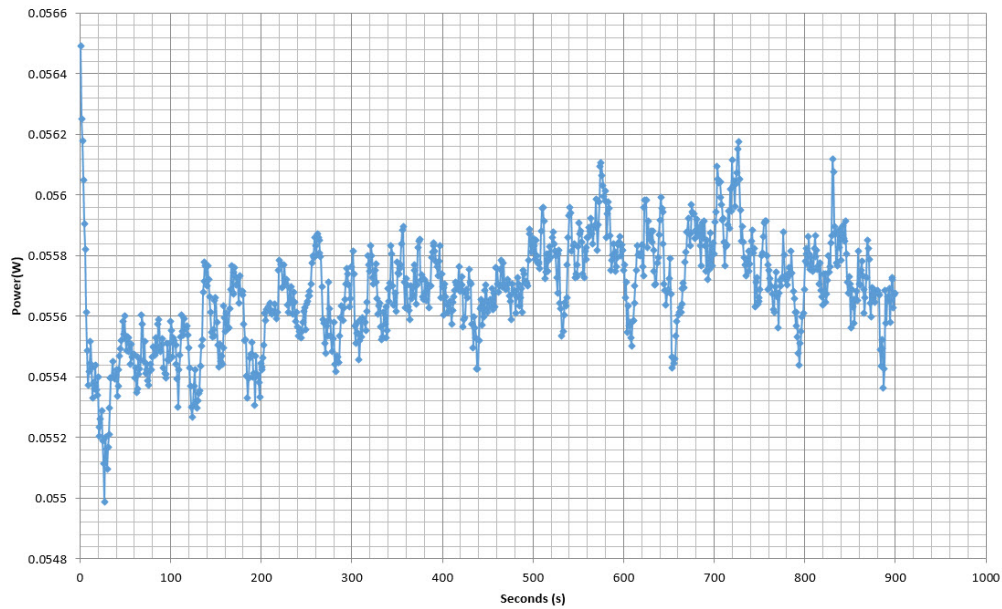
Hold-Up Time (ms)	17.7
AC Loss to PWR_OK Hold Up Time (ms)	11.8
PWR_OK Inactive to DC Loss Delay (ms)	5.9

Vampire Power

Graphs

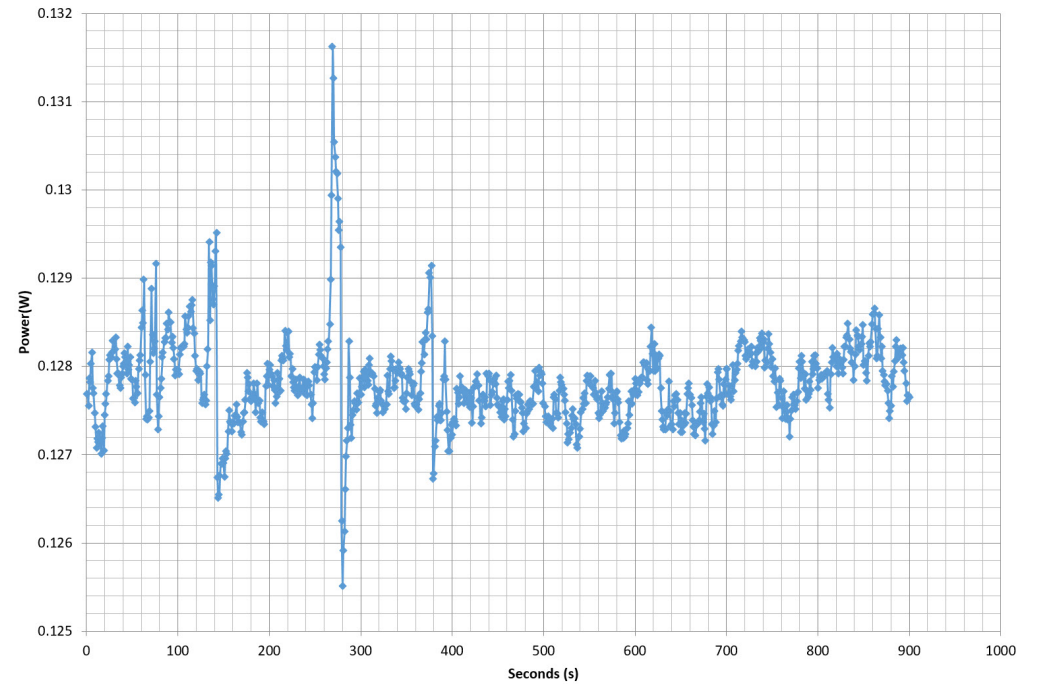
115V

Power - 1603530425800472 - 18/08/2017 - 10:22



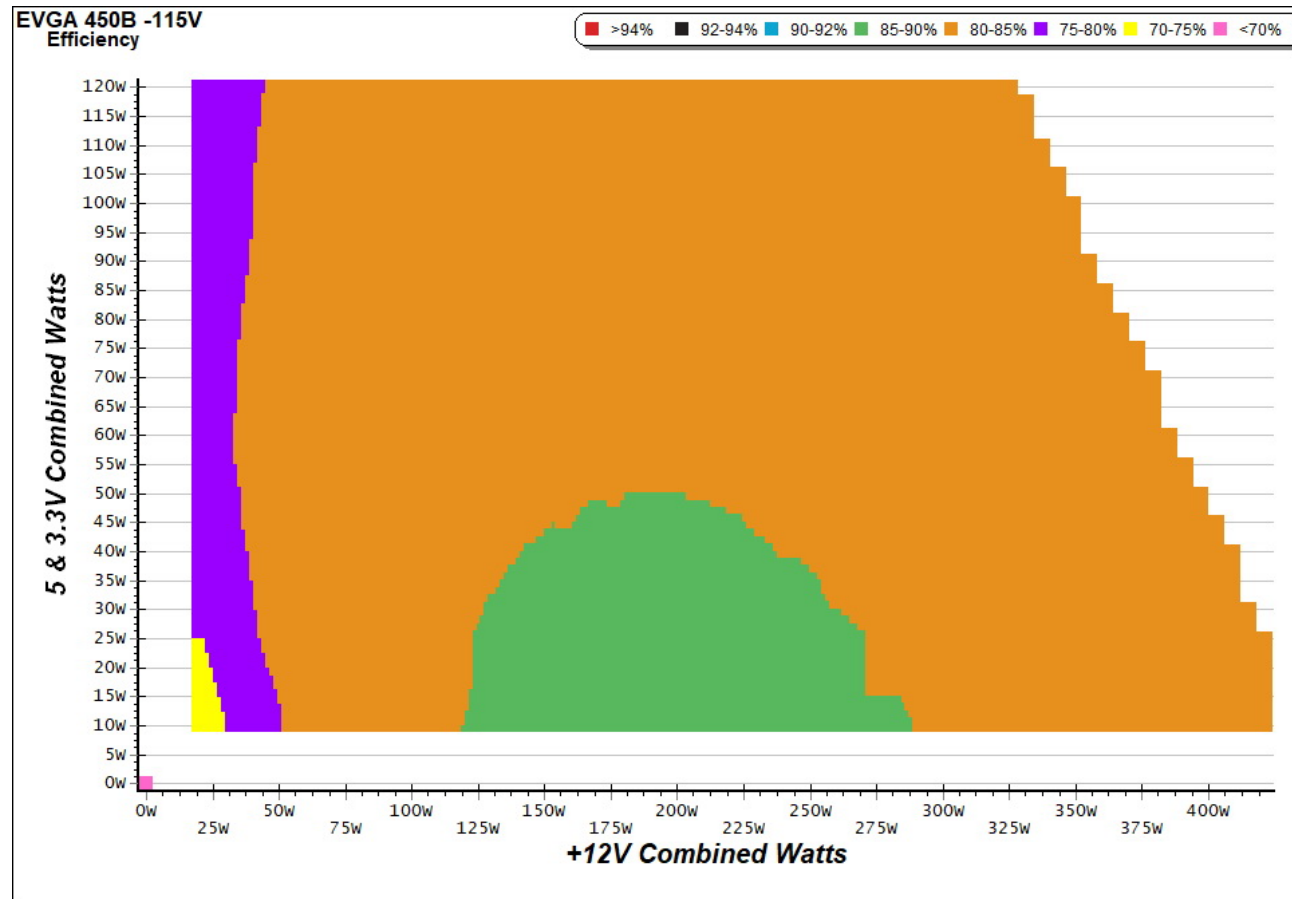
230V

Power - 1603530425800472 - 18/08/2017 - 10:22



Efficiency Graph

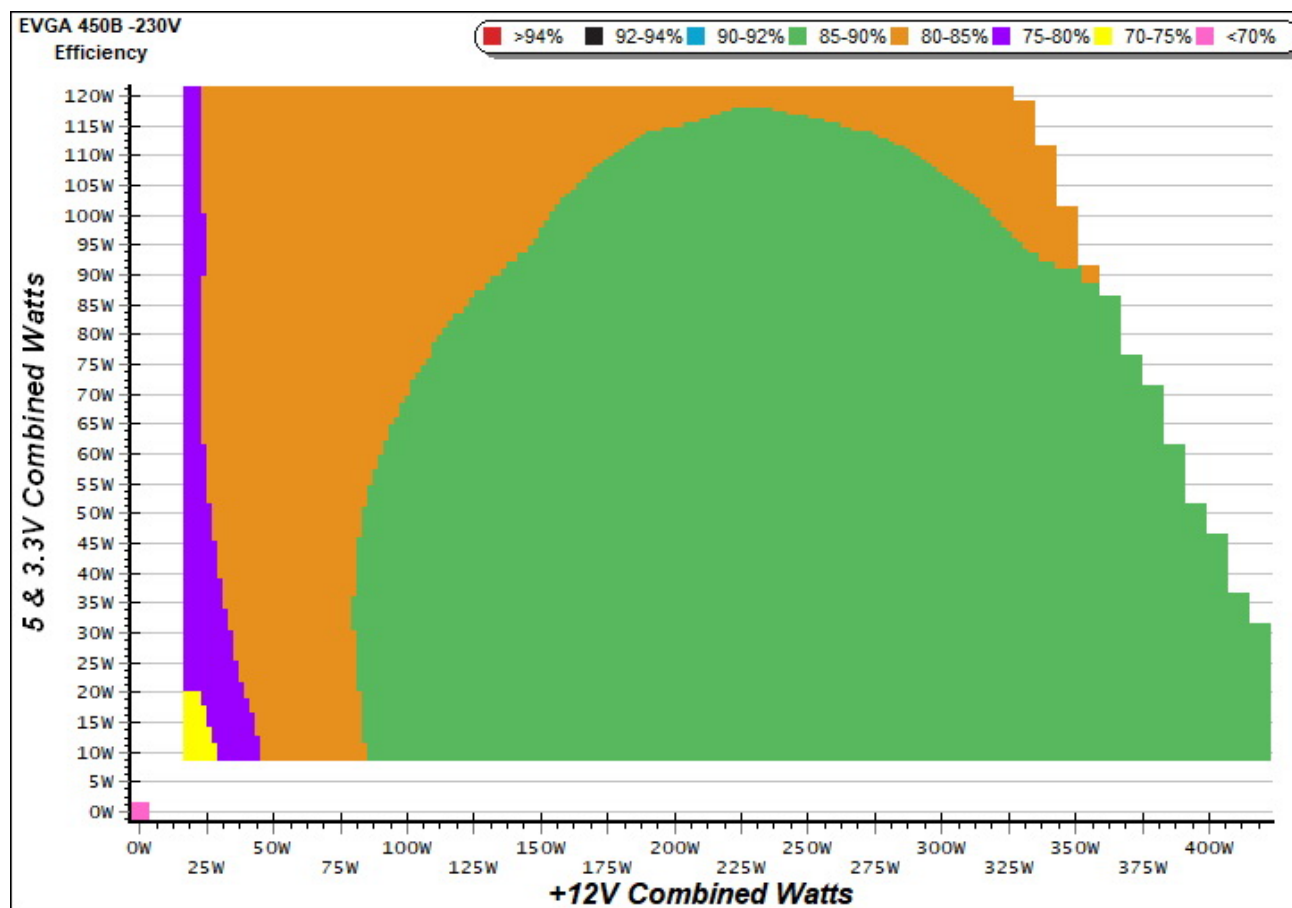
115V



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

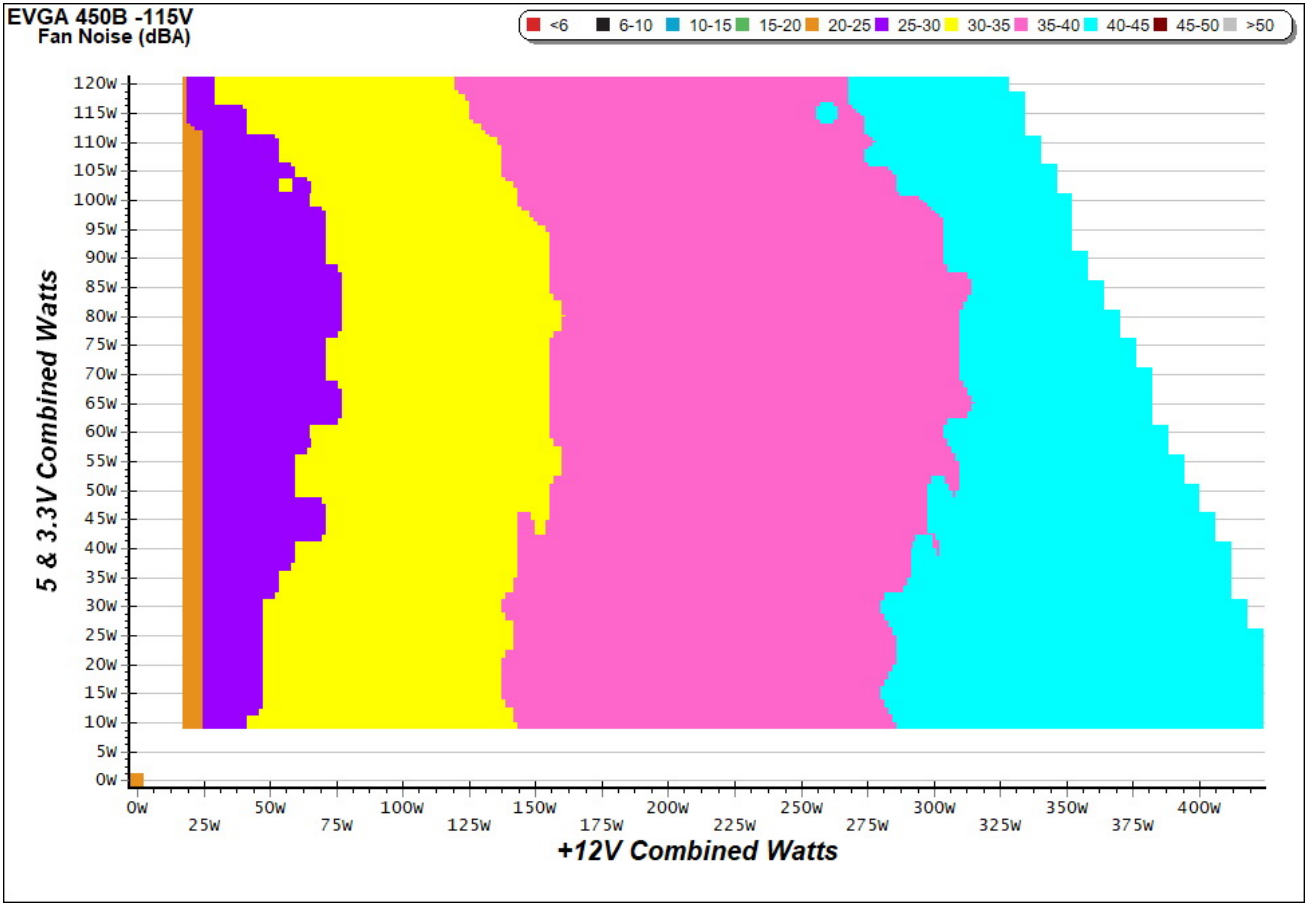


INFO

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Noise Graph

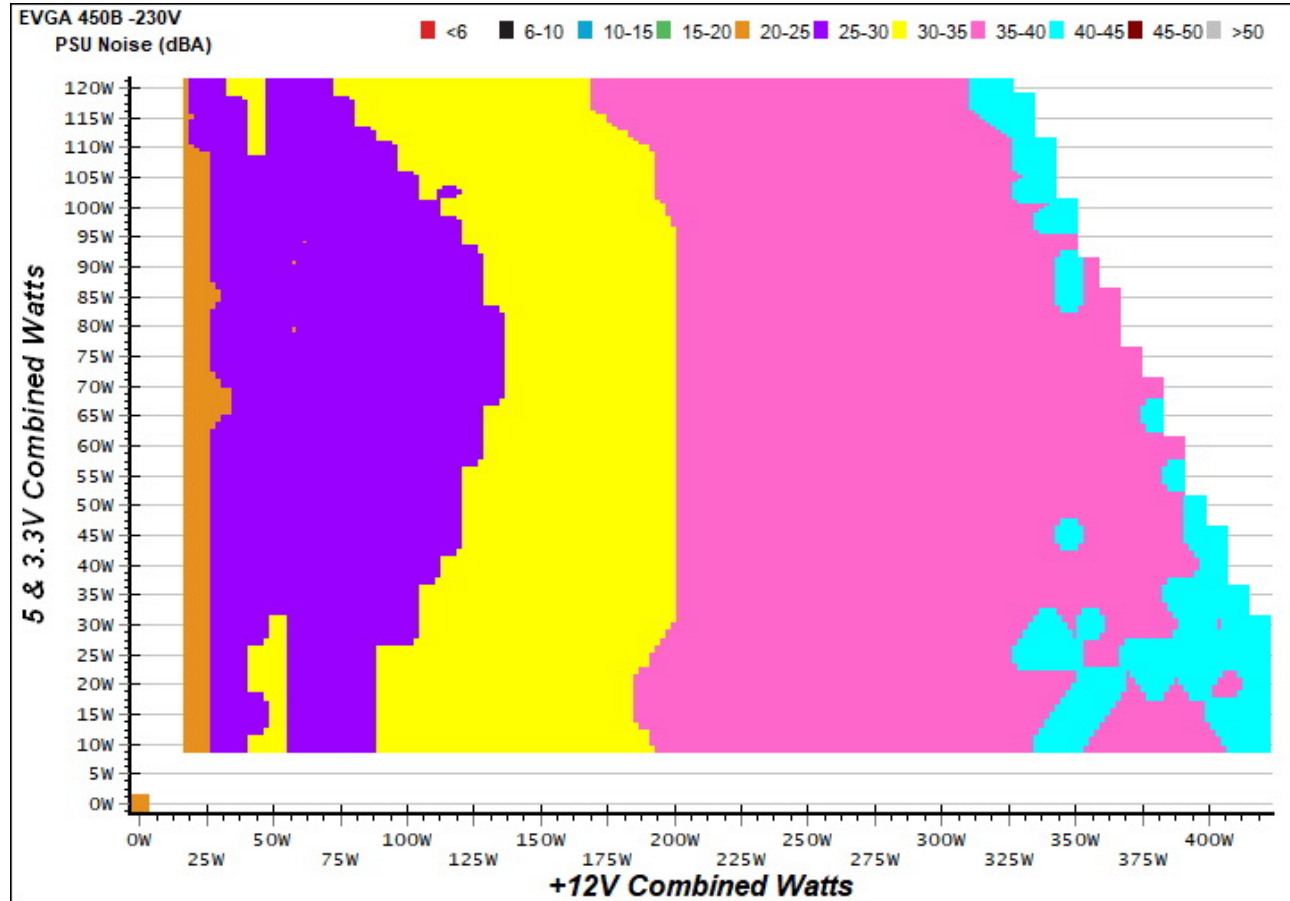
115V



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

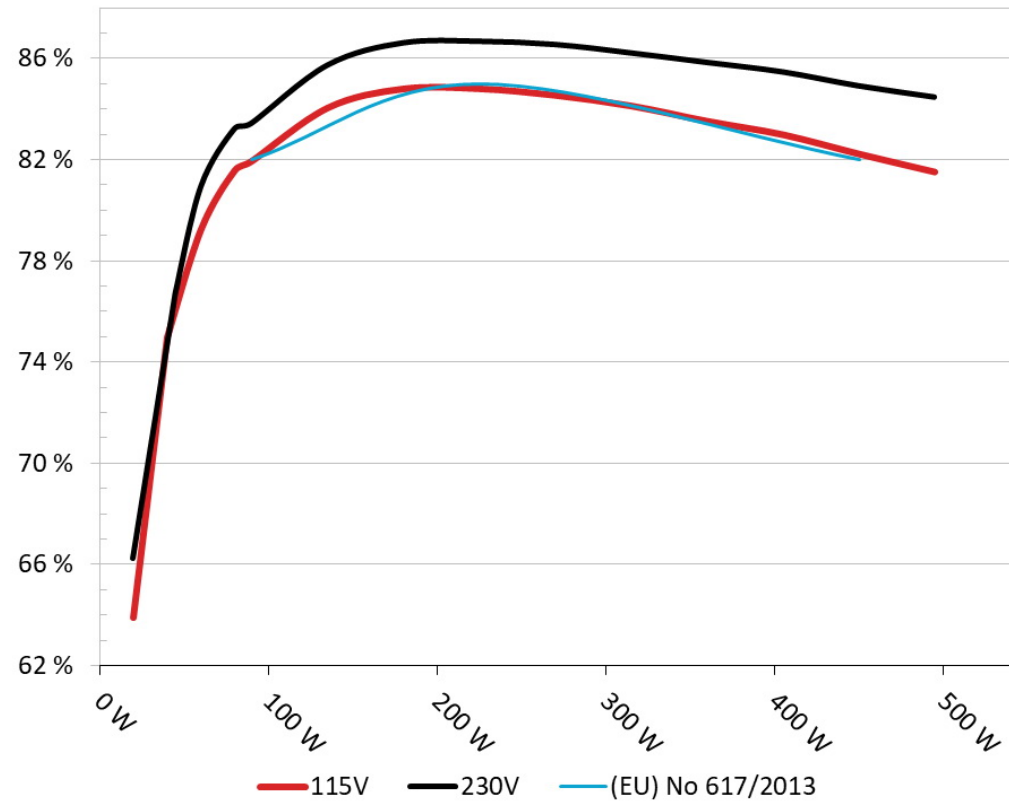
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance

Efficiency under high ambient temperature

Efficiency: EVGA 450B

Ambient: 30°C - 40°C (86°F - 104°F)



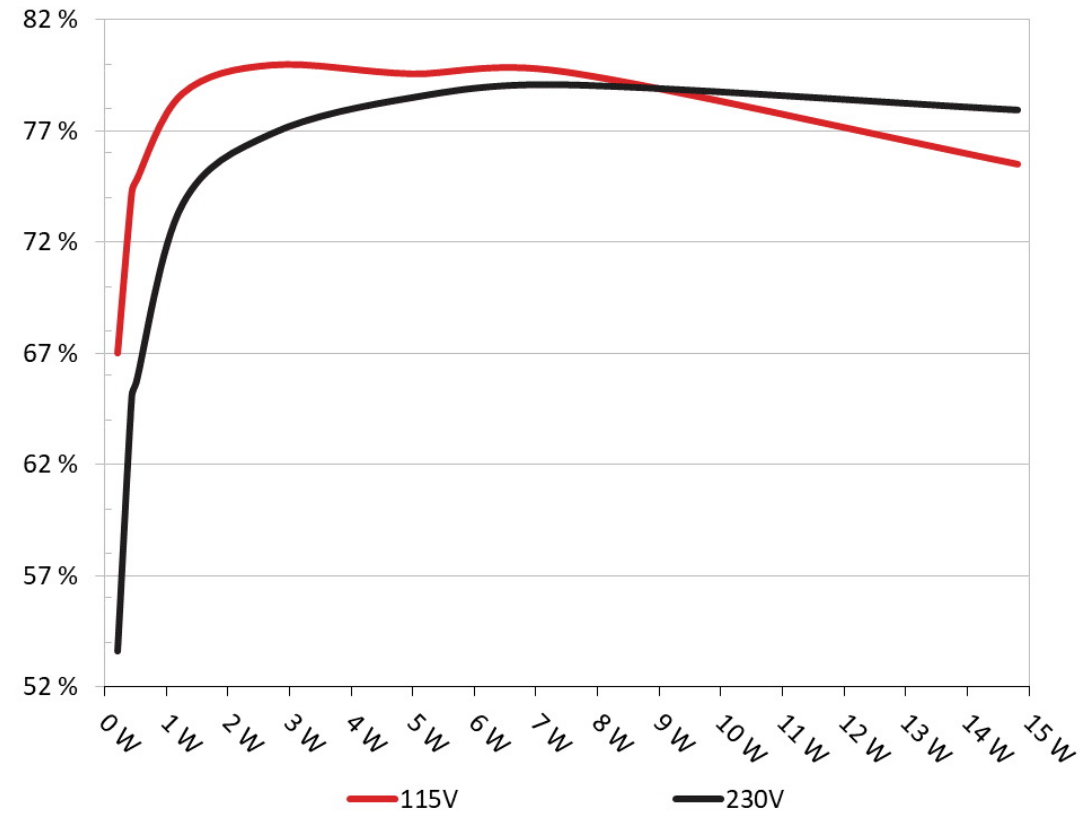
INFO

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 450B

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	0.042A	0.209	66.987%	0.057
	5.016V	0.312		115.17V
2	0.087A	0.437	74.194%	0.103
	5.015V	0.589		115.17V
3	0.542A	2.712	79.953%	0.305
	5.004V	3.392		115.16V
4	1.002A	5.000	79.554%	0.357
	4.991V	6.285		115.16V
5	1.502A	7.473	79.644%	0.385
	4.977V	9.383		115.16V
6	3.001A	14.815	75.490%	0.431
	4.936V	19.625		115.16V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.209	53.590%	0.023
	5.016V	0.390		230.41V
2	0.087A	0.437	65.030%	0.038
	5.015V	0.672		230.41V
3	0.542A	2.712	76.893%	0.168
	5.003V	3.527		230.40V
4	1.002A	4.999	78.514%	0.240
	4.989V	6.367		230.40V
5	1.502A	7.473	79.088%	0.282
	4.977V	9.449		230.40V
6	3.001A	14.812	77.954%	0.342
	4.935V	19.001		230.41V

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	1.900A	1.975A	1.950A	1.005A	44.750	74.995%	587	23.4	31.72°C	0.892
	12.196V	5.057V	3.380V	4.974V	59.671				37.26°C	115.19V
2	4.837A	2.971A	2.934A	1.209A	89.776	81.957%	612	24.5	32.03°C	0.928
	12.177V	5.045V	3.372V	4.958V	109.540				38.09°C	115.19V
3	8.135A	3.466A	3.447A	1.416A	134.892	84.067%	691	26.7	32.55°C	0.952
	12.148V	5.045V	3.361V	4.941V	160.457				39.61°C	115.20V
4	11.435A	3.963A	3.935A	1.621A	179.779	84.818%	837	30.6	33.26°C	0.960
	12.122V	5.043V	3.353V	4.926V	211.959				41.15°C	115.20V
5	14.398A	4.972A	4.932A	1.831A	224.739	84.824%	987	35.6	33.94°C	0.965
	12.103V	5.030V	3.343V	4.906V	264.947				42.47°C	115.20V
6	17.375A	5.979A	5.936A	2.042A	269.729	84.562%	1168	37.3	34.96°C	0.970
	12.084V	5.017V	3.334V	4.889V	318.972				44.18°C	115.20V
7	20.363A	6.999A	6.950A	2.256A	314.773	84.143%	1319	39.7	35.76°C	0.975
	12.064V	5.005V	3.323V	4.871V	374.091				45.76°C	115.24V
8	23.355A	8.015A	7.970A	2.470A	359.693	83.538%	1470	41.6	36.97°C	0.978
	12.045V	4.991V	3.312V	4.851V	430.574				47.20°C	115.20V
9	26.822A	8.514A	8.506A	2.475A	404.816	83.002%	1581	43.1	37.76°C	0.980
	12.014V	4.991V	3.304V	4.840V	487.719				48.85°C	115.25V
10	30.031A	9.030A	9.017A	3.116A	449.640	82.243%	1710	44.7	39.01°C	0.982
	11.985V	4.989V	3.292V	4.809V	546.718				50.68°C	115.24V
11	33.887A	9.010A	9.040A	3.125A	494.624	81.532%	1776	45.6	40.00°C	0.983
	11.948V	5.000V	3.285V	4.799V	606.665				52.38°C	115.24V
CL1	0.099A	14.027A	14.004A	0.004A	112.647	76.131%	1443	41.2	38.87°C	0.949
	12.572V	4.595V	3.351V	4.938V	147.964				47.89°C	115.20V

CL2	34.958A	1.005A	1.002A	1.002A	426.573	82.830%	1667	43.8	39.77°C	0.981
	11.817V	5.214V	3.314V	4.904V	514.996				50.98°C	115.24V

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	1.906A	1.978A	1.952A	1.004A	44.840	76.151%	733	27.8	40.05°C	0.801
	12.195V	5.058V	3.378V	4.978V	58.883				43.58°C	230.32V
2	4.799A	2.972A	2.939A	1.210A	89.341	83.242%	837	30.6	40.70°C	0.869
	12.177V	5.048V	3.368V	4.961V	107.327				44.65°C	230.31V
3	8.103A	3.467A	3.423A	1.415A	134.431	85.584%	970	35.0	41.12°C	0.898
	12.148V	5.048V	3.358V	4.947V	157.075				45.85°C	230.30V
4	11.424A	3.962A	3.940A	1.622A	179.664	86.465%	1120	36.8	41.86°C	0.919
	12.121V	5.048V	3.349V	4.931V	207.788				46.95°C	230.30V
5	14.414A	4.965A	4.942A	1.832A	224.937	86.568%	1275	39.0	42.17°C	0.930
	12.102V	5.035V	3.338V	4.914V	259.838				47.77°C	230.29V
6	17.347A	5.974A	5.950A	2.042A	269.466	86.469%	1400	40.7	42.78°C	0.939
	12.086V	5.023V	3.328V	4.898V	311.633				48.67°C	230.29V
7	20.357A	6.986A	6.965A	2.255A	314.755	86.220%	1530	42.4	43.17°C	0.947
	12.067V	5.011V	3.316V	4.880V	365.059				49.50°C	230.29V
8	23.383A	8.001A	7.987A	2.469A	360.075	85.830%	1667	43.8	44.02°C	0.952
	12.046V	5.000V	3.305V	4.861V	419.521				50.87°C	230.28V
9	26.837A	8.499A	8.495A	2.475A	404.980	85.458%	1735	45.1	44.23°C	0.956
	12.016V	5.001V	3.296V	4.850V	473.895				51.47°C	230.29V
10	30.037A	9.004A	9.040A	3.112A	449.797	84.942%	1830	45.7	45.23°C	0.961
	11.988V	4.999V	3.285V	4.822V	529.534				52.89°C	230.29V
11	33.867A	8.986A	9.061A	3.117A	494.488	84.567%	1830	45.7	45.77°C	0.965
	11.952V	5.008V	3.278V	4.814V	584.732				53.89°C	230.26V
CL1	0.129A	14.000A	13.999A	0.000A	112.832	77.629%	1360	40.2	43.31°C	0.893
	12.559V	4.616V	3.328V	4.939V	145.348				49.10°C	230.25V

CL2	34.994A	1.001A	0.999A	1.000A	427.115	85.705%	1620	43.4	45.57°C	0.958
	11.821V	5.217V	3.320V	4.912V	498.352				52.84°C	230.26V

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	0.491A	0.469A	0.196A	19.680	63.911%	556	22.5	0.855
	12.171V	5.101V	3.388V	5.005V	30.793				115.18V
2	2.421A	0.980A	0.973A	0.401A	39.746	74.992%	556	22.5	0.889
	12.170V	5.089V	3.384V	4.994V	53.000				115.18V
3	3.653A	1.468A	1.477A	0.601A	59.883	79.270%	556	22.5	0.908
	12.166V	5.079V	3.379V	4.983V	75.543				115.18V
4	4.866A	1.976A	1.953A	0.801A	79.773	81.590%	587	23.4	0.924
	12.162V	5.069V	3.375V	4.974V	97.773				115.18V

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	1.202A	0.492A	0.471A	0.200A	19.735	65.755%	587	23.4	0.702
	12.168V	5.106V	3.388V	5.007V	30.013				230.34V
2	2.446A	0.985A	0.977A	0.400A	40.084	76.563%	632	25.1	0.786
	12.168V	5.092V	3.383V	4.998V	52.354				230.34V
3	3.624A	1.478A	1.450A	0.602A	59.497	80.735%	632	25.1	0.827
	12.165V	5.082V	3.378V	4.987V	73.694				230.34V
4	4.874A	1.969A	1.956A	0.804A	79.847	82.916%	691	26.7	0.859
	12.155V	5.082V	3.373V	4.975V	96.299				230.25V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.1 mV	24.3 mV	17.9 mV	10.4 mV	Pass
20% Load	13.4 mV	28.8 mV	20.5 mV	10.9 mV	Pass
30% Load	14.2 mV	28.3 mV	21.2 mV	11.2 mV	Pass
40% Load	16.0 mV	26.7 mV	21.3 mV	13.1 mV	Pass
50% Load	16.9 mV	29.3 mV	23.1 mV	16.0 mV	Pass
60% Load	18.4 mV	30.3 mV	22.9 mV	16.8 mV	Pass
70% Load	19.7 mV	29.0 mV	20.5 mV	15.1 mV	Pass
80% Load	21.0 mV	28.4 mV	18.7 mV	16.3 mV	Pass
90% Load	25.6 mV	27.7 mV	17.5 mV	16.8 mV	Pass
100% Load	29.8 mV	27.5 mV	16.0 mV	23.5 mV	Pass
110% Load	34.8 mV	30.5 mV	15.7 mV	23.4 mV	Pass
Crossload 1	26.3 mV	49.4 mV	24.3 mV	16.0 mV	Pass
Crossload 2	37.2 mV	20.9 mV	13.4 mV	18.2 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.9 mV	10.1 mV	14.2 mV	7.8 mV	Pass
20% Load	11.7 mV	11.1 mV	15.2 mV	8.8 mV	Pass
30% Load	12.6 mV	13.6 mV	15.5 mV	9.1 mV	Pass
40% Load	14.8 mV	14.8 mV	16.1 mV	11.0 mV	Pass
50% Load	16.5 mV	16.2 mV	16.0 mV	13.4 mV	Pass
60% Load	18.9 mV	17.9 mV	17.3 mV	16.8 mV	Pass
70% Load	20.6 mV	16.7 mV	18.4 mV	15.9 mV	Pass
80% Load	23.7 mV	20.5 mV	20.8 mV	16.4 mV	Pass

