Bitfenix Whisper 850W

Serial Number 640Q00002

Lab ID 122

Certification ID 25122

Test Result Report ID:

Certificate Issue Date: Sep 6, 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	Bitfenix
Model	Whisper 850W
OEM/ODM	Channel Well Technology
Serial Number	640Q00002
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12
Rated Frequency (Hz)	47-63

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	135mm Hydro Dynamic Bearing Fan (DF1352512SEHN)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	122
Date of receipt	Aug 22, 2018
Testing Date	Sep 4, 2018
Report Issued Date	Sep 6, 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	18AWG
4+4 pin EPS12V (650mm)	2	2	18AWG
6+2 pin PCIe (650mm)	2	2	18AWG
6+2 pin PCIe (650mm+150mm)	2	4	18AWG
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG
4 pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	40	3	0.5
	Watts	120		850	15	6
Total Max. Power (W)		850				

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)	89.042%
Average Noise Output (>1450 Load Combinations)	31.36dBA
Average PF (>1450 Load Combinations)	0.980
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0486W
Non-Accredited	
12V Ripple (Full Load)	17.94mV
5V Ripple (Full Load)	12.23mV
3.3V Ripple (Full Load)	17.26mV
5VSB Ripple (Full Load)	20.52mV
12V Load Regulation	1.12%
5V Load Regulation	1.43%
3.3V Load Regulation	2.38%

5VSB Load Regulation	1.57%
Inrush Current	26.855A

230V

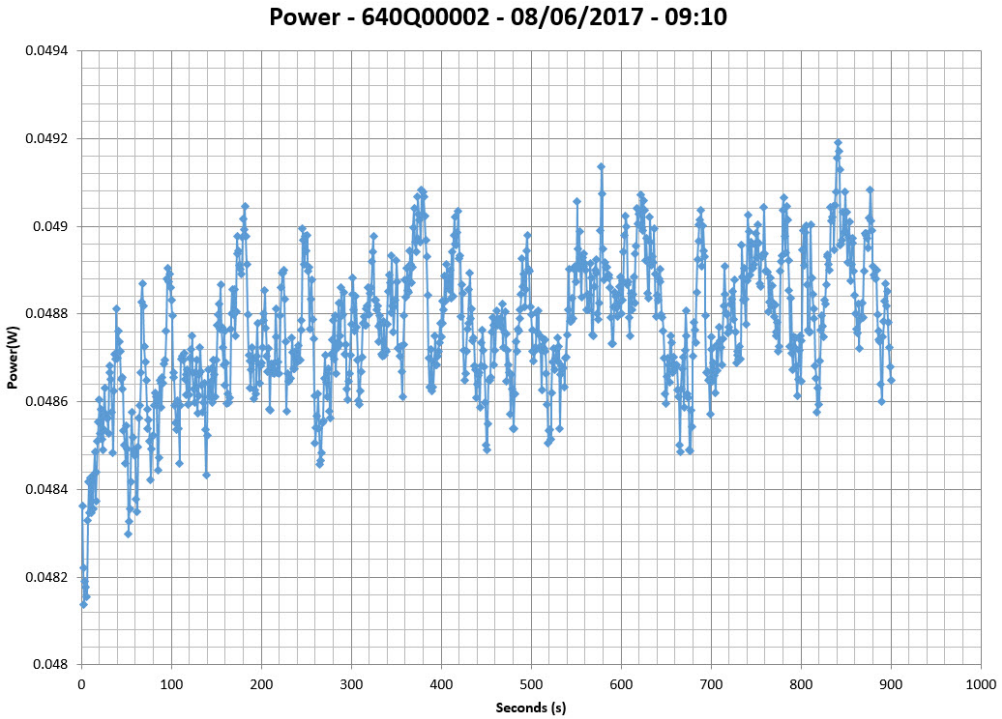
Accredited		
Average Efficiency (>1450 load combinations)	90.991%	
Average Noise Output (>1450 Load Combinations)	31.27dBA	
Average PF (>1450 Load Combinations)	0.938	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0790W	
Non-Accredited		
12V Ripple (Full Load)	16.91mV	
5V Ripple (Full Load)	9.61mV	
3.3V Ripple (Full Load)	7.45mV	
5VSB Ripple (Full Load)	22.03mV	
12V Load Regulation	1.05%	
5V Load Regulation	1.07%	
3.3V Load Regulation	1.43%	
5VSB Load Regulation	1.51%	
Inrush Current	52.288A	
Hold-Up Time & PWR_OK Signal	12.80ms	
AC Loss to PWR_OK Hold Up Time	10.70ms	
PWR_OK Inactive to DC Loss Delay	2.10ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

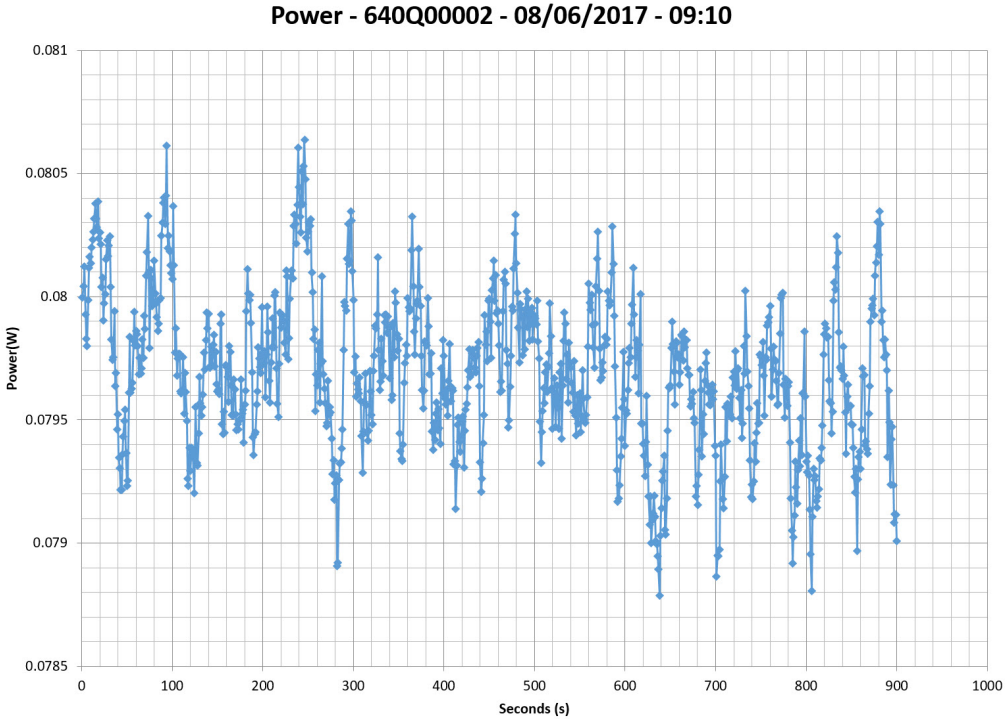
Hold-Up Time (ms)	12.8
AC Loss to PWR_OK Hold Up Time (ms)	10.7
PWR_OK Inactive to DC Loss Delay (ms)	2.1

Graphs

115V

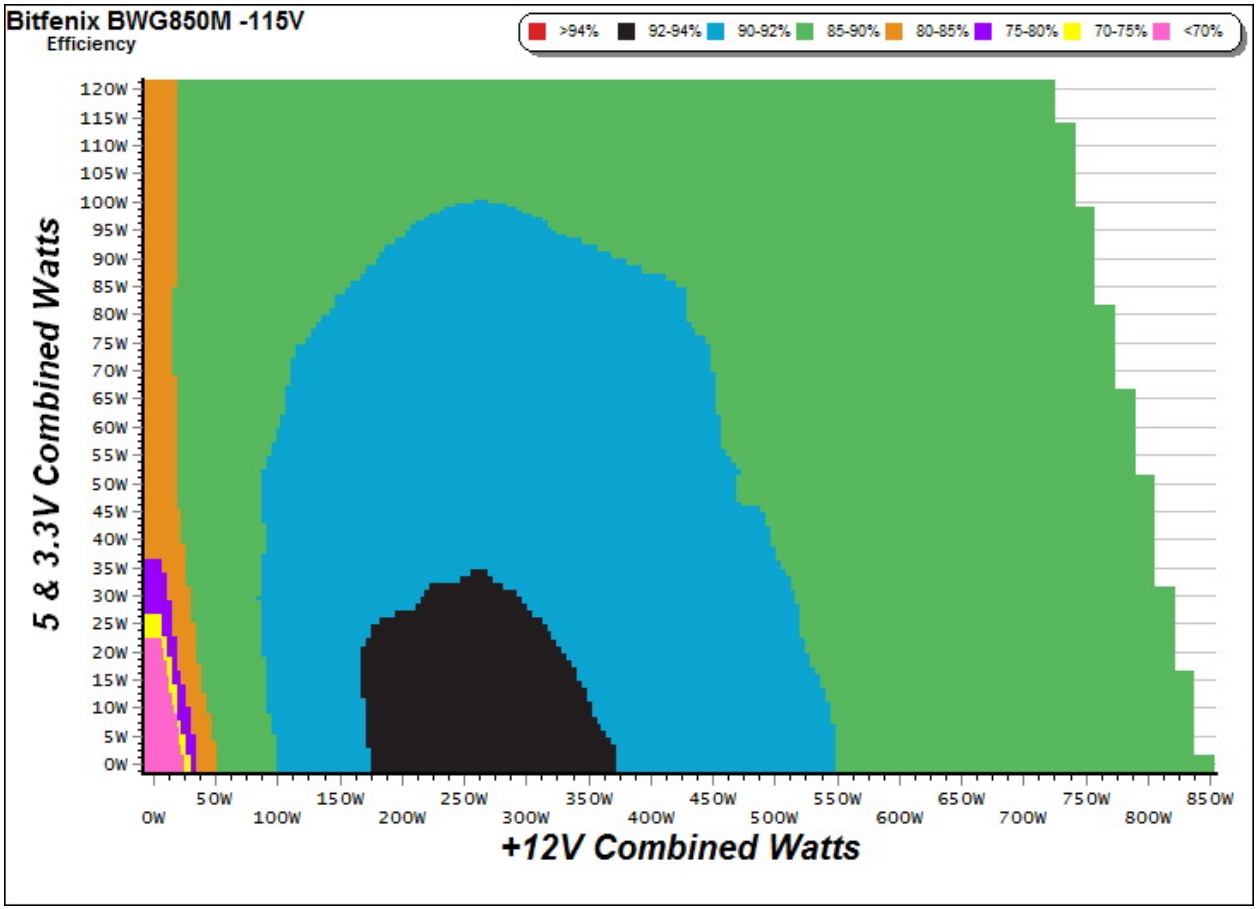


230V



Efficiency Graph

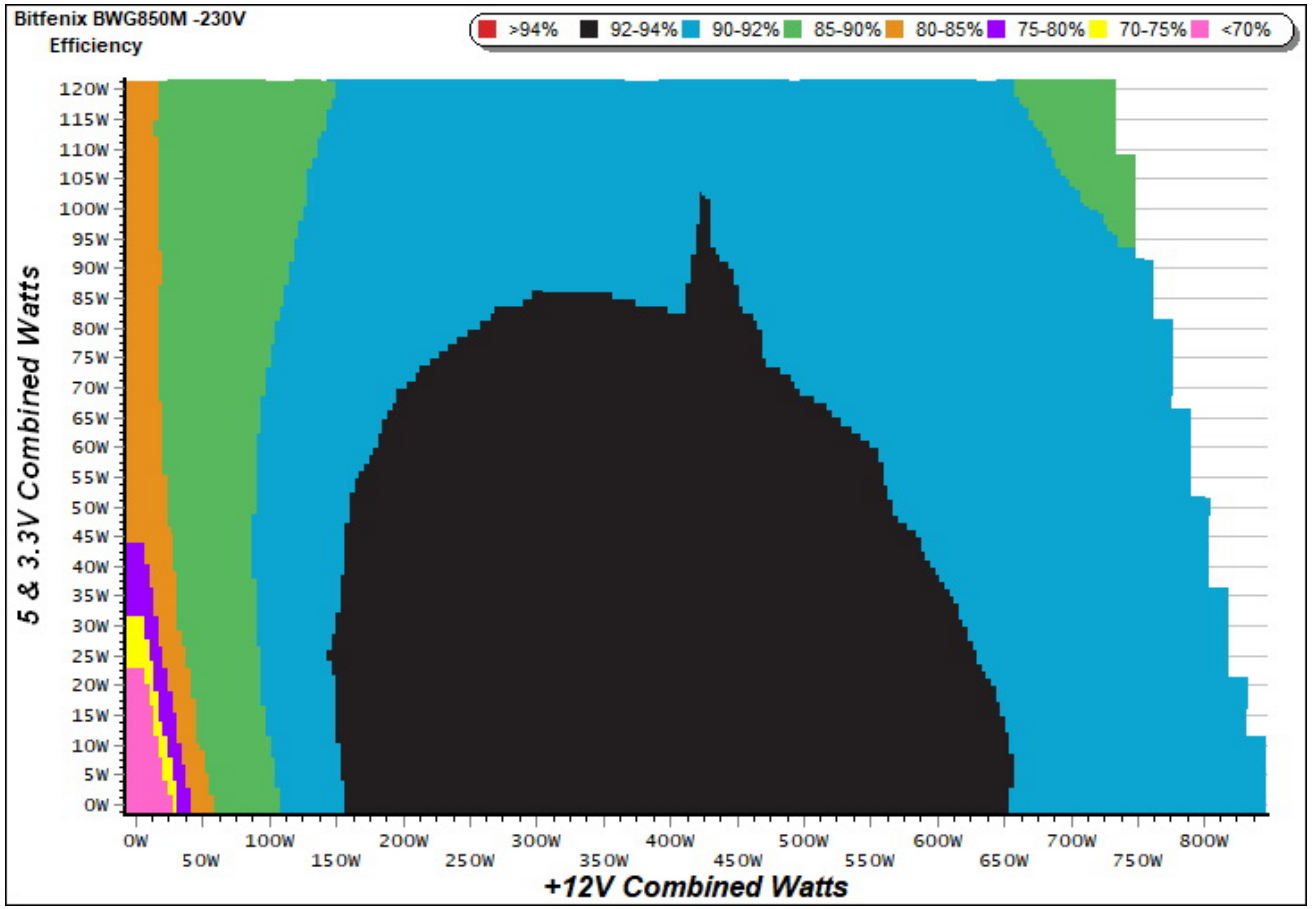
115V



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

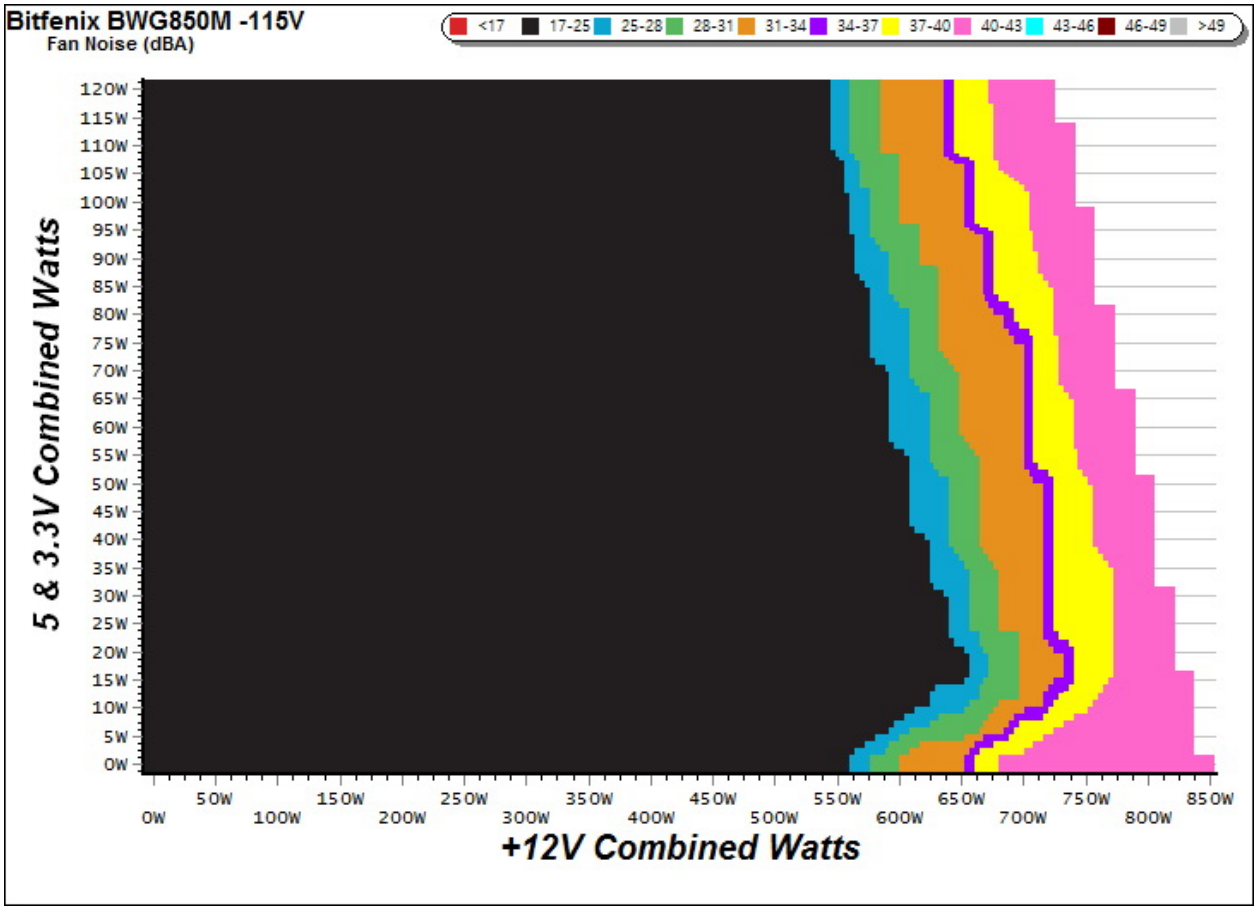


INFO

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

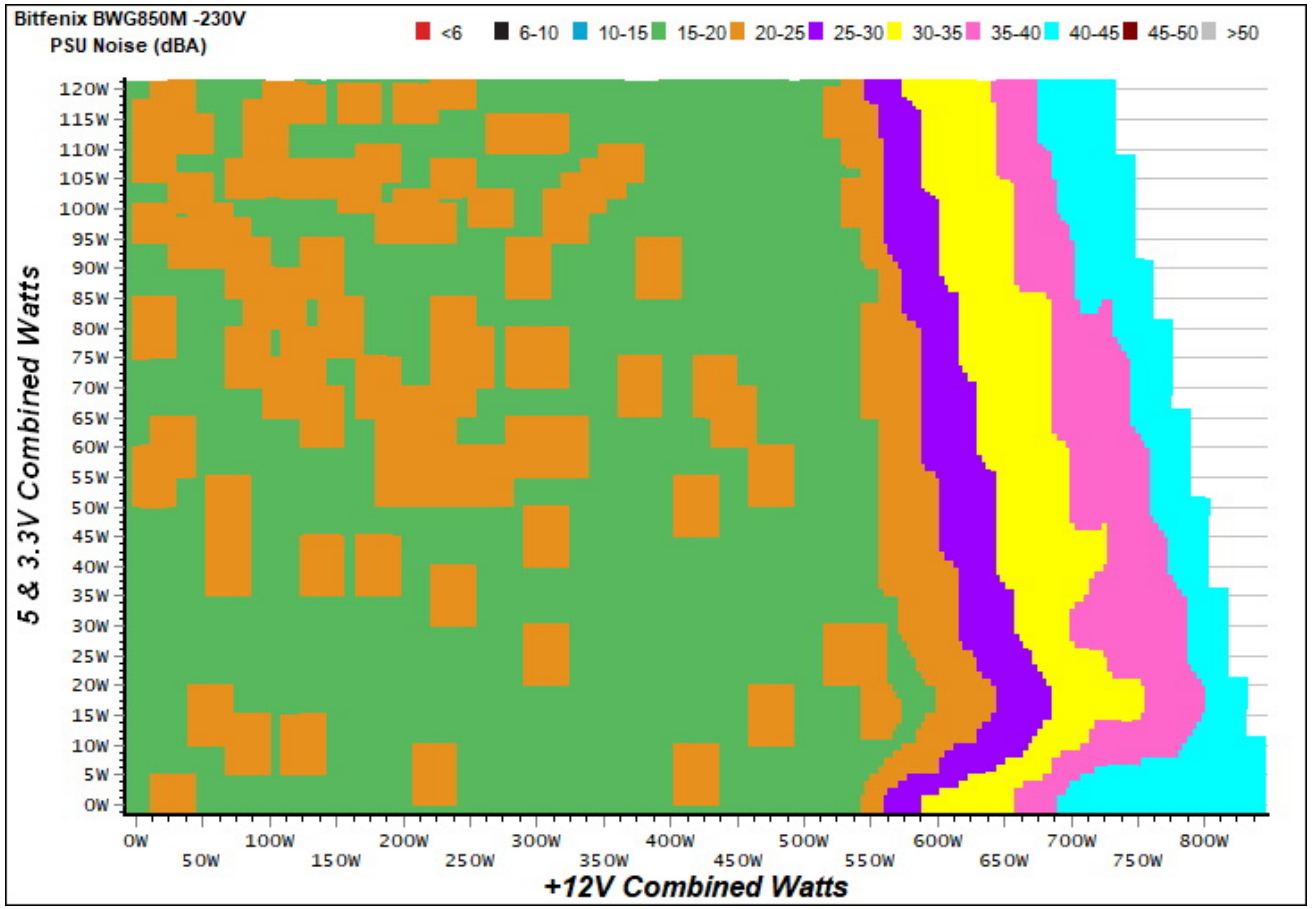
115V



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

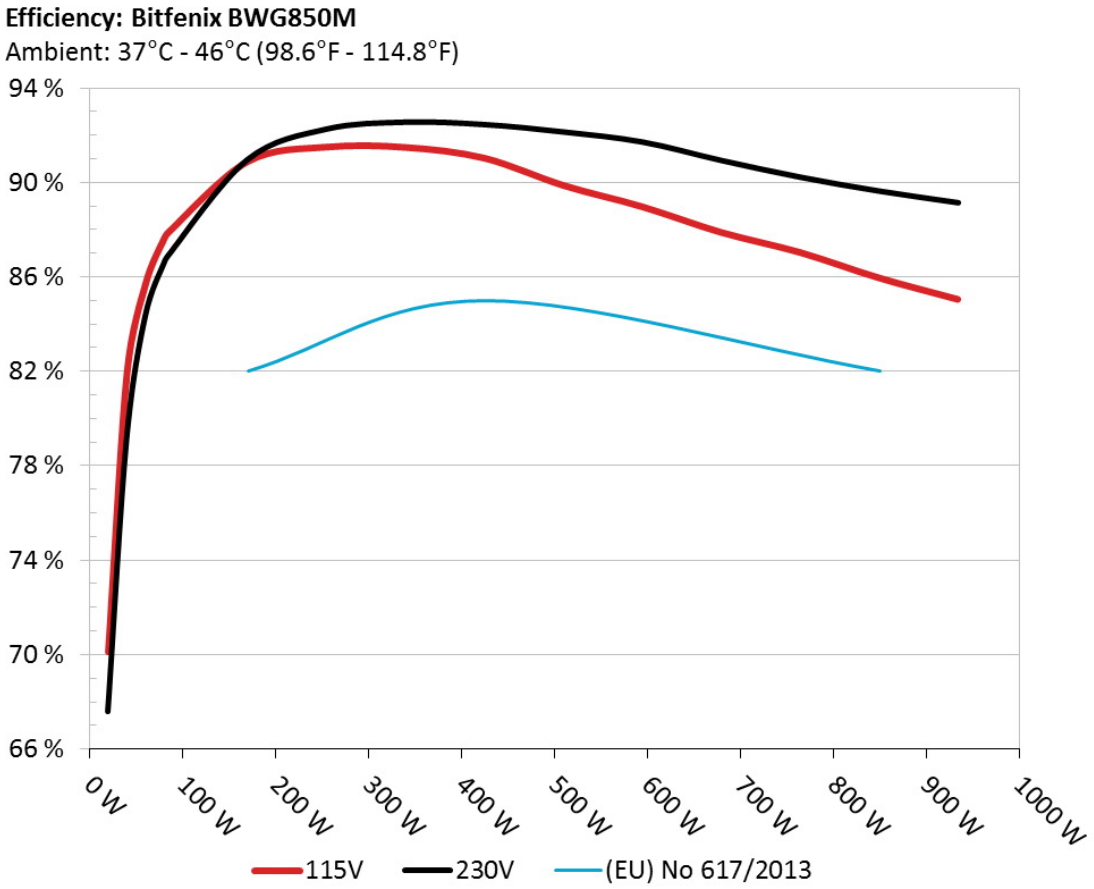


INFO

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

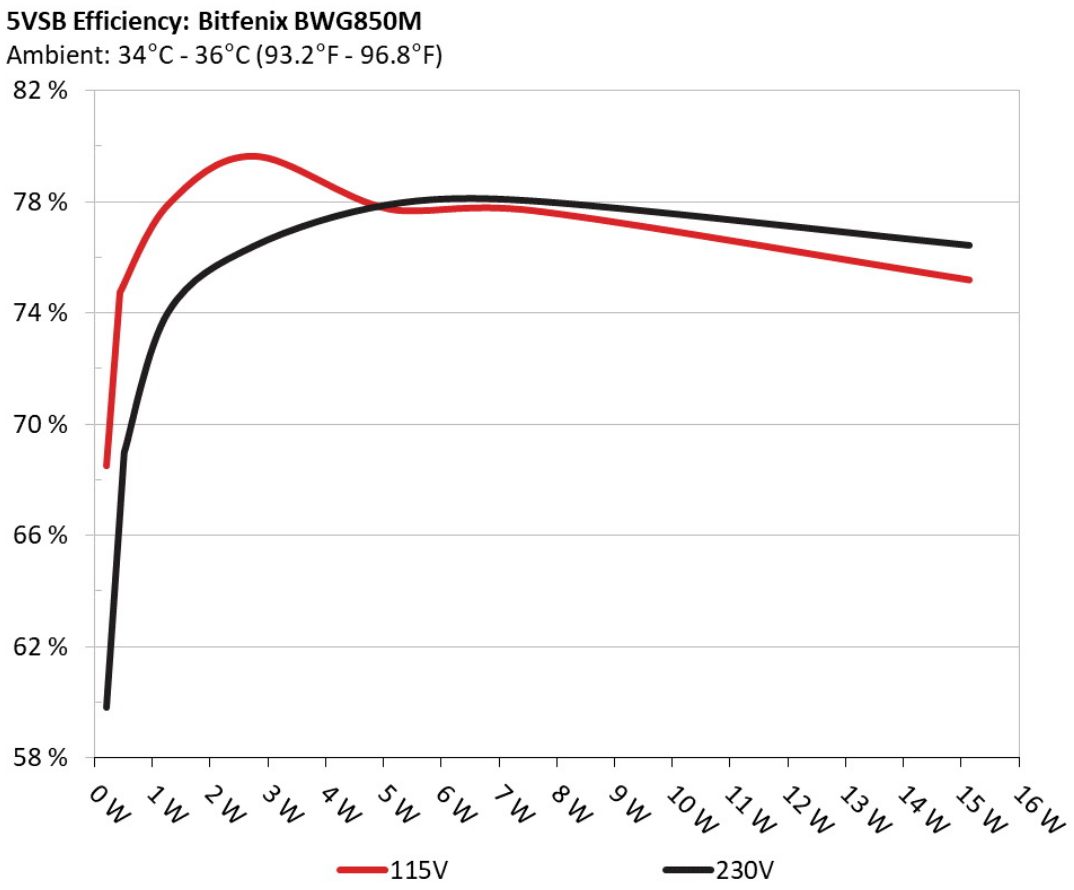
Efficiency under high ambient temperature



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	0.042A	0.213	68.489%	0.031
	5.111V	0.311		115.13V
2	0.087A	0.445	74.664%	0.057
	5.109V	0.596		115.14V
3	0.542A	2.765	79.660%	0.259
	5.099V	3.471		115.14V
4	1.002A	5.099	77.752%	0.362
	5.089V	6.558		115.14V
5	1.502A	7.625	77.687%	0.415
	5.077V	9.815		115.15V
6	3.001A	15.136	75.195%	0.478
	5.043V	20.129		115.15V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.213	59.831%	0.010
	5.111V	0.356		230.41V
2	0.087A	0.445	68.992%	0.019
	5.109V	0.645		230.40V
3	0.542A	2.764	76.417%	0.100
	5.099V	3.617		230.40V
4	1.002A	5.099	77.907%	0.167
	5.088V	6.545		230.40V
5	1.502A	7.624	78.035%	0.226
	5.077V	9.770		230.40V
6	3.001A	15.136	76.444%	0.332
	5.043V	19.800		230.40V

Supplementary Tests (For Reference)

Typical Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	5.270A	1.985A	1.969A	0.981A	84.827	87.912%	695	20.0	38.03°C	0.963
	11.998V	5.047V	3.347V	5.087V	96.491				41.68°C	115.18V
2	11.582A	2.971A	2.963A	1.180A	169.656	90.891%	720	20.5	38.59°C	0.981
	11.984V	5.039V	3.339V	5.080V	186.659				42.98°C	115.17V
3	18.274A	3.477A	3.475A	1.376A	254.826	91.508%	695	20.0	39.06°C	0.984
	11.971V	5.033V	3.334V	5.074V	278.473				44.66°C	115.17V
4	24.961A	3.977A	3.965A	1.574A	339.671	91.491%	720	20.5	39.33°C	0.981
	11.959V	5.026V	3.328V	5.069V	371.260				46.31°C	115.17V
5	31.319A	4.981A	4.970A	1.774A	424.585	91.037%	720	20.5	39.92°C	0.981
	11.945V	5.020V	3.319V	5.062V	466.388				48.54°C	115.17V
6	37.700A	5.986A	5.977A	1.975A	509.569	89.881%	720	20.5	41.15°C	0.982
	11.931V	5.012V	3.310V	5.055V	566.936				52.14°C	115.16V
7	44.095A	7.001A	6.998A	2.175A	594.552	88.979%	935	26.6	41.96°C	0.984
	11.916V	5.005V	3.300V	5.049V	668.197				53.28°C	115.17V
8	50.502A	8.009A	8.018A	2.379A	679.412	87.894%	1450	38.9	42.44°C	0.985
	11.901V	4.994V	3.292V	5.042V	772.989				53.86°C	115.16V
9	57.360A	8.522A	8.558A	2.379A	764.489	87.044%	1795	44.5	43.51°C	0.987
	11.888V	4.988V	3.283V	5.040V	878.278				55.39°C	115.16V
10	63.979A	9.045A	9.070A	2.983A	849.296	85.967%	1795	44.5	45.45°C	0.988
	11.872V	4.980V	3.275V	5.025V	987.930				57.83°C	115.16V
11	71.229A	9.051A	9.084A	2.985A	934.262	85.057%	1795	44.5	46.46°C	0.989
	11.857V	4.973V	3.269V	5.023V	1098.401				60.29°C	115.16V
CL1	0.099A	14.026A	14.006A	0.004A	117.583	84.017%	720	20.5	45.02°C	0.976
	11.971V	5.009V	3.293V	5.106V	139.951				56.58°C	115.19V

CL2	70.789A	1.003A	1.003A	1.002A	854.325	86.580%	1795	44.5	45.32°C	0.988
	11.879V	5.003V	3.310V	5.074V	986.743				57.22°C	115.16V

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	5.272A	1.975A	1.965A	0.981A	84.774	86.988%	720	20.5	38.46°C	0.814
	11.990V	5.053V	3.356V	5.085V	97.455				44.00°C	230.27V
2	11.576A	2.966A	2.949A	1.181A	169.638	91.015%	720	20.5	39.23°C	0.909
	11.988V	5.050V	3.354V	5.078V	186.385				45.23°C	230.27V
3	18.261A	3.467A	3.458A	1.379A	254.830	92.336%	720	20.5	40.24°C	0.939
	11.979V	5.048V	3.351V	5.071V	275.981				47.45°C	230.28V
4	24.941A	3.964A	3.939A	1.576A	339.686	92.646%	720	20.5	40.88°C	0.951
	11.969V	5.045V	3.348V	5.064V	366.651				48.97°C	230.29V
5	31.287A	4.960A	4.931A	1.777A	424.623	92.550%	720	20.5	41.48°C	0.957
	11.958V	5.043V	3.345V	5.057V	458.803				50.37°C	230.27V
6	37.654A	5.953A	5.922A	1.980A	509.649	92.212%	720	20.5	42.47°C	0.962
	11.947V	5.040V	3.343V	5.049V	552.692				52.83°C	230.26V
7	44.022A	6.950A	6.916A	2.180A	594.575	91.528%	1152	33.1	43.48°C	0.965
	11.937V	5.036V	3.339V	5.042V	649.608				55.39°C	230.26V
8	50.408A	7.946A	7.912A	2.380A	679.544	90.830%	1665	42.2	44.79°C	0.967
	11.926V	5.034V	3.336V	5.035V	748.152				56.84°C	230.27V
9	57.234A	8.454A	8.427A	2.382A	764.560	90.328%	1795	44.5	45.46°C	0.969
	11.915V	5.031V	3.334V	5.033V	846.422				58.18°C	230.27V
10	63.818A	8.954A	8.912A	2.990A	849.376	89.741%	1795	44.5	45.94°C	0.971
	11.904V	5.028V	3.330V	5.013V	946.472				59.42°C	230.26V
11	71.011A	8.961A	8.922A	2.991A	934.311	89.203%	1795	44.5	46.25°C	0.972
	11.894V	5.025V	3.328V	5.010V	1047.393				61.29°C	230.26V
CL1	0.099A	14.025A	14.007A	0.004A	118.829	83.894%	720	20.5	43.29°C	0.880
	11.963V	5.043V	3.348V	5.107V	141.642				54.89°C	230.27V

CL2	70.799A	1.004A	1.003A	1.002A	857.049	90.396%	1795	44.5	45.92°C	0.971
	11.915V	5.035V	3.338V	5.066V	948.106				58.68°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)	Fan Noise (dB[A])	PF/AC Volts
1	1.217A	0.493A	0.472A	0.196A	19.685	70.123%	720	20.5	0.825
	12.002V	5.055V	3.358V	5.105V	28.072				115.17V
2	2.457A	0.979A	0.982A	0.391A	39.736	81.908%	720	20.5	0.920
	12.007V	5.052V	3.355V	5.100V	48.513				115.17V
3	3.699A	1.477A	1.489A	0.586A	59.832	85.707%	720	20.5	0.949
	12.003V	5.049V	3.351V	5.095V	69.810				115.17V
4	4.934A	1.987A	1.969A	0.786A	79.824	87.629%	695	20.0	0.961
	11.999V	5.047V	3.348V	5.090V	91.093				115.17V

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	1.218A	0.491A	0.474A	0.195A	19.689	67.495%	720	20.5	0.458
	12.002V	5.057V	3.360V	5.105V	29.171				230.28V
2	2.459A	0.980A	0.980A	0.391A	39.743	79.172%	720	20.5	0.634
	11.998V	5.056V	3.359V	5.100V	50.198				230.28V
3	3.701A	1.476A	1.489A	0.585A	59.831	84.384%	695	20.0	0.737
	11.994V	5.055V	3.358V	5.094V	70.903				230.28V
4	4.938A	1.975A	1.964A	0.786A	79.783	86.709%	695	20.0	0.801
	11.991V	5.053V	3.356V	5.089V	92.012				230.28V

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	8.2 mV	5.7 mV	5.4 mV	Pass
20% Load	14.3 mV	8.3 mV	7.1 mV	9.8 mV	Pass
30% Load	14.1 mV	8.4 mV	8.2 mV	6.6 mV	Pass
40% Load	14.7 mV	8.9 mV	9.7 mV	8.5 mV	Pass
50% Load	15.8 mV	10.1 mV	10.4 mV	12.0 mV	Pass
60% Load	15.4 mV	8.9 mV	10.7 mV	15.1 mV	Pass
70% Load	15.0 mV	8.9 mV	11.9 mV	20.8 mV	Pass
80% Load	15.5 mV	10.1 mV	12.6 mV	21.4 mV	Pass
90% Load	16.6 mV	10.7 mV	13.7 mV	18.9 mV	Pass
100% Load	17.9 mV	12.2 mV	17.3 mV	20.5 mV	Pass
110% Load	22.5 mV	17.9 mV	23.2 mV	30.1 mV	Pass
Crossload 1	17.0 mV	10.7 mV	9.0 mV	7.0 mV	Pass
Crossload 2	16.8 mV	12.4 mV	17.9 mV	18.5 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	3.9 mV	7.0 mV	6.0 mV	5.7 mV	Pass
20% Load	20.8 mV	6.0 mV	5.9 mV	5.9 mV	Pass
30% Load	17.1 mV	7.9 mV	6.9 mV	7.3 mV	Pass
40% Load	14.1 mV	6.0 mV	5.3 mV	8.8 mV	Pass
50% Load	13.8 mV	6.0 mV	5.3 mV	10.6 mV	Pass
60% Load	13.4 mV	6.1 mV	5.5 mV	14.4 mV	Pass
70% Load	12.7 mV	6.8 mV	5.8 mV	21.9 mV	Pass
80% Load	13.1 mV	7.9 mV	6.9 mV	23.4 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	13.8 mV	9.3 mV	7.5 mV	20.9 mV	Pass
100% Load	14.0 mV	17.5 mV	9.2 mV	22.2 mV	Pass
110% Load	14.5 mV	8.8 mV	7.6 mV	18.2 mV	Pass
Crossload 1	4.8 mV	7.1 mV	7.4 mV	4.7 mV	Pass
Crossload 2	13.9 mV	8.2 mV	7.6 mV	18.1 mV	Pass

The results above are not used in the certification process

Bitfenix Whisper 850W



Top side



Power specifications label

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

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