Bitfenix Whisper 750W

Serial Number 706Q00093

Lab ID 135

Certification ID 25135

Test Result Report ID:

Certificate Issue Date: Mar 7, 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 750W
OEM/ODM	Channel Well Technology
Serial Number	706Q00093
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	47-63

Rated Power (W)	750
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	135
Date of receipt	Feb 25, 2018
Testing Date	Mar 3, 2018
Report Issued Date	Mar 7, 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 (610mm)	1	1	18AWG
4+4 pin EPS12V (650mm)	2	2	18AWG
6+2 pin PCIe (650mm+150mm)	2	4	18AWG
6+2 pin PCIe (650mm)	2	2	18AWG
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG
4 pin Molex (500mm+150mm+150mm+150mm)	1	3	18AWG

Power Specifications

Rail		3.3V	5V	12V	12V	12V	12V	5VSB	-12V
Max. Power	Amps	22	22	25	25	35	35	2.5	0.5
	Watts	120		750				12.5	6
Total Max. Power (W)		750							

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)	88.790%
Average Noise Output (>1450 Load Combinations)	36.03dBA
Average PF (>1450 Load Combinations)	0.981
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0502W
Non-Accredited	
12V Ripple (Full Load)	18.28mV
5V Ripple (Full Load)	15.74mV
3.3V Ripple (Full Load)	9.85mV
5VSB Ripple (Full Load)	24.49mV
12V Load Regulation	0.76%
5V Load Regulation	1.39%
3.3V Load Regulation	1.43%

5VSB Load Regulation	1.32%
Inrush Current	39.305A

230V

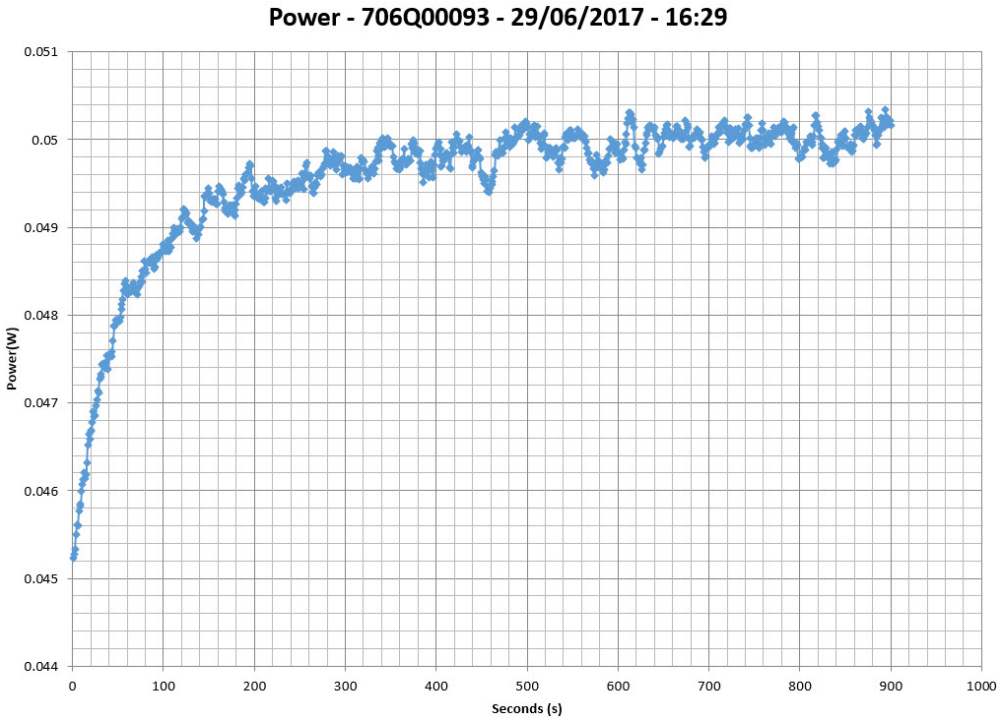
Accredited		
Average Efficiency (>1450 load combinations)	91.104%	
Average Noise Output (>1450 Load Combinations)	31.79dBA	
Average PF (>1450 Load Combinations)	0.932	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0869W	
Non-Accredited		
12V Ripple (Full Load)	19.41mV	
5V Ripple (Full Load)	11.09mV	
3.3V Ripple (Full Load)	5.70mV	
5VSB Ripple (Full Load)	27.56mV	
12V Load Regulation	0.62%	
5V Load Regulation	0.32%	
3.3V Load Regulation	0.54%	
5VSB Load Regulation	1.47%	
Inrush Current	48.197A	
Hold-Up Time & PWR_OK Signal	14.90ms	
AC Loss to PWR_OK Hold Up Time	13.20ms	
PWR_OK Inactive to DC Loss Delay	1.70ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

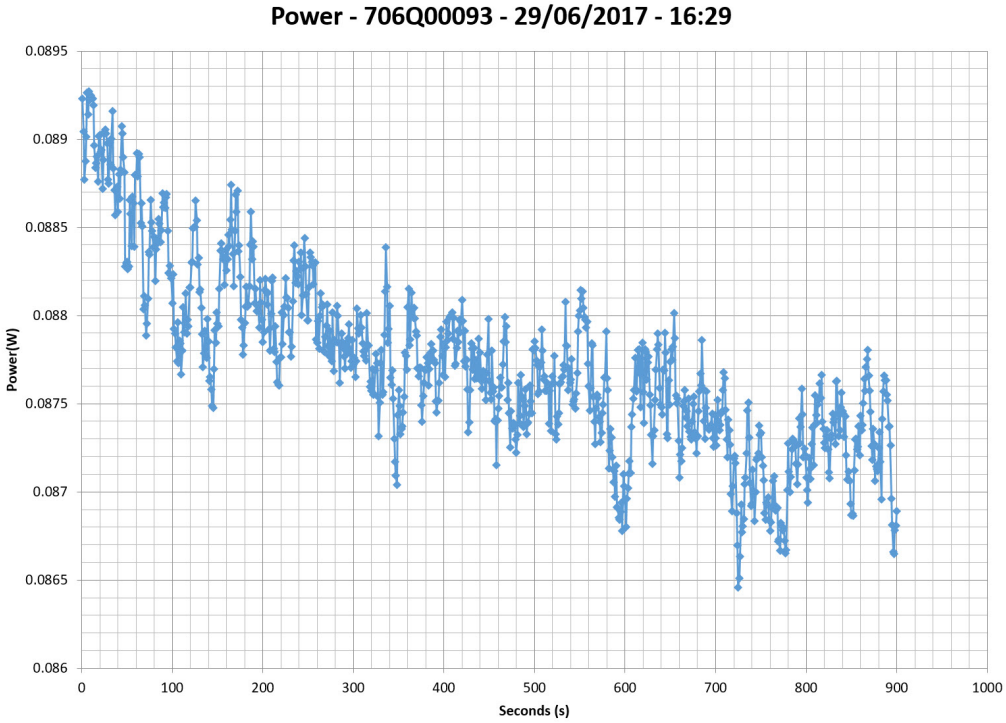
Hold-Up Time (ms)	14.9
AC Loss to PWR_OK Hold Up Time (ms)	13.2
PWR_OK Inactive to DC Loss Delay (ms)	1.7

Graphs

115V

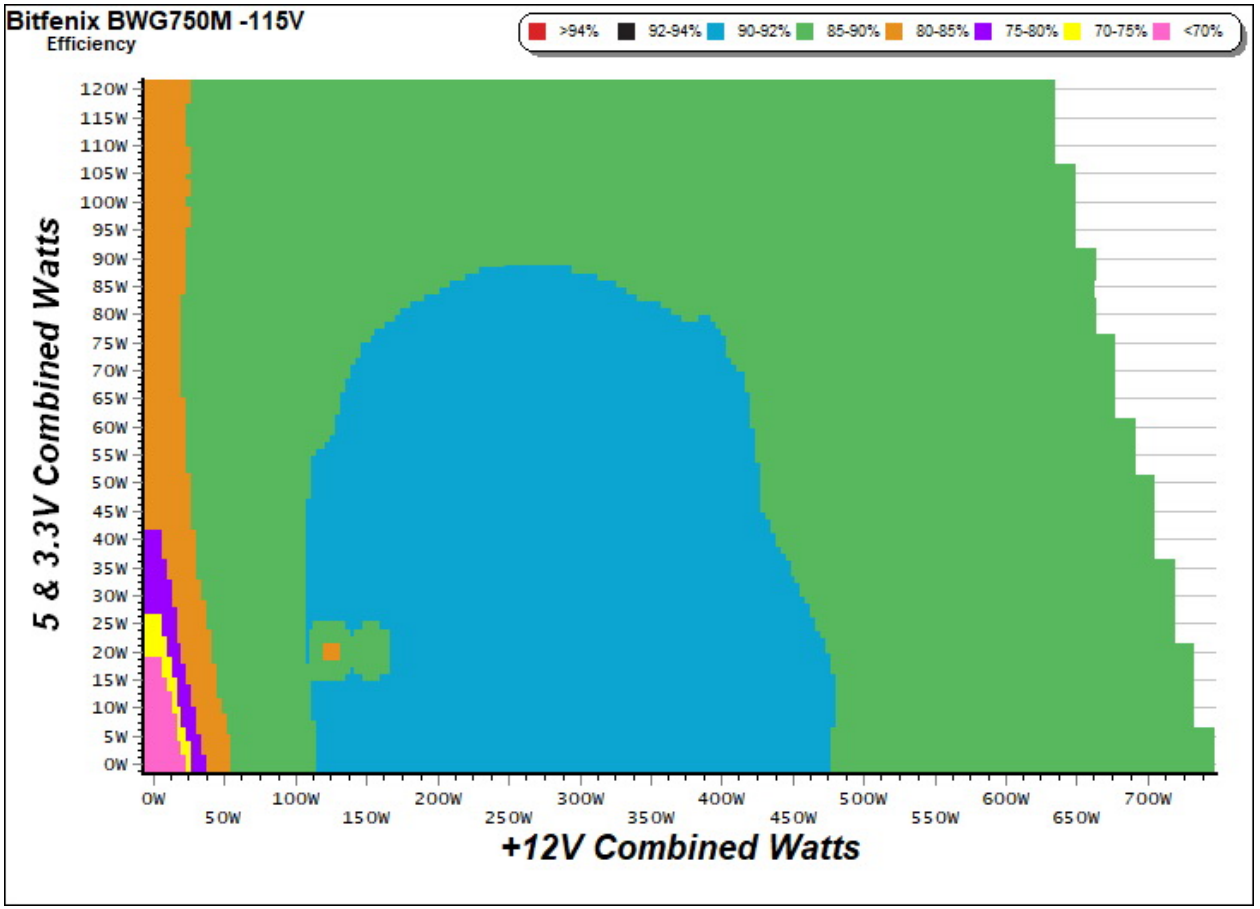


230V



Efficiency Graph

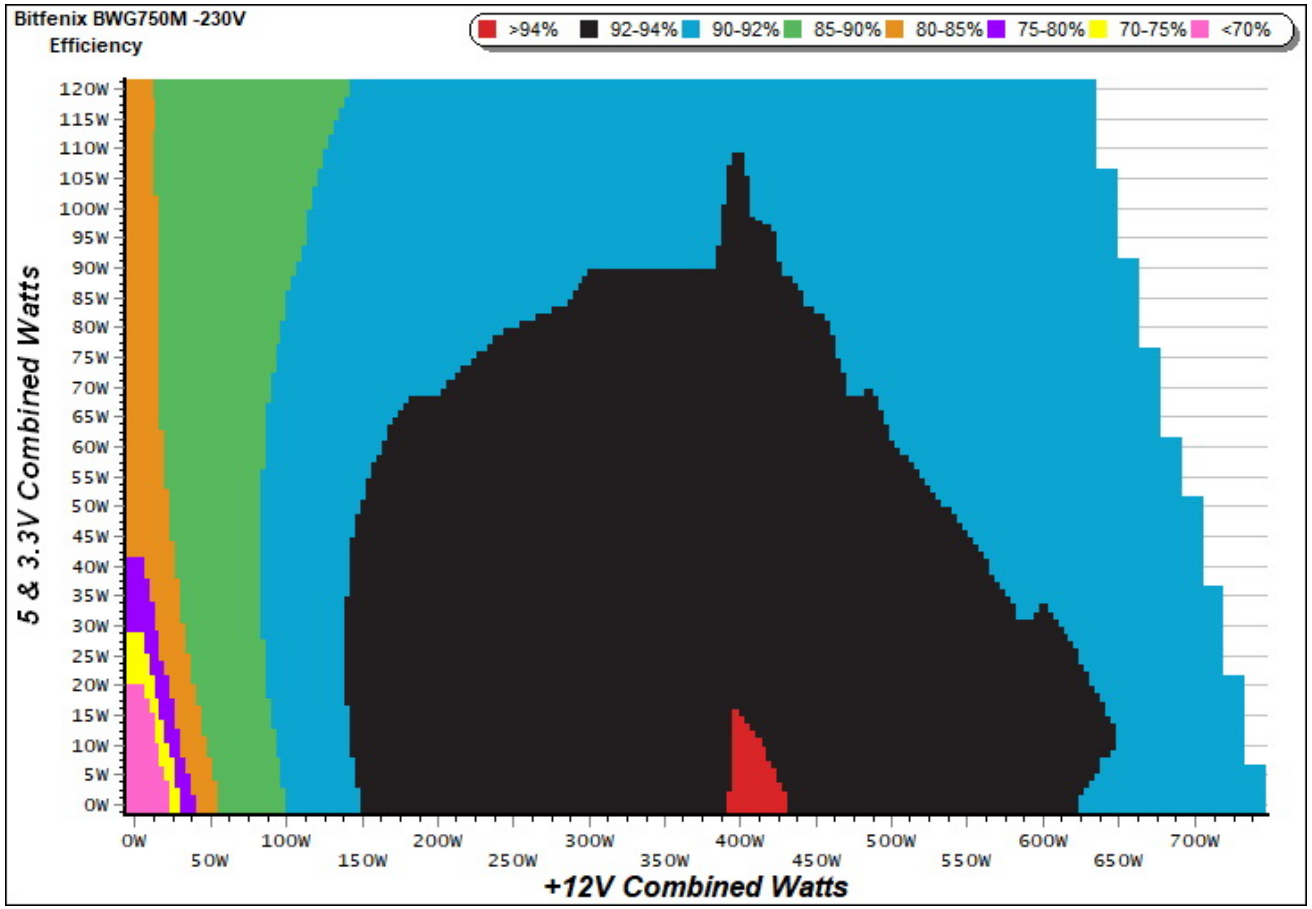
115V



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

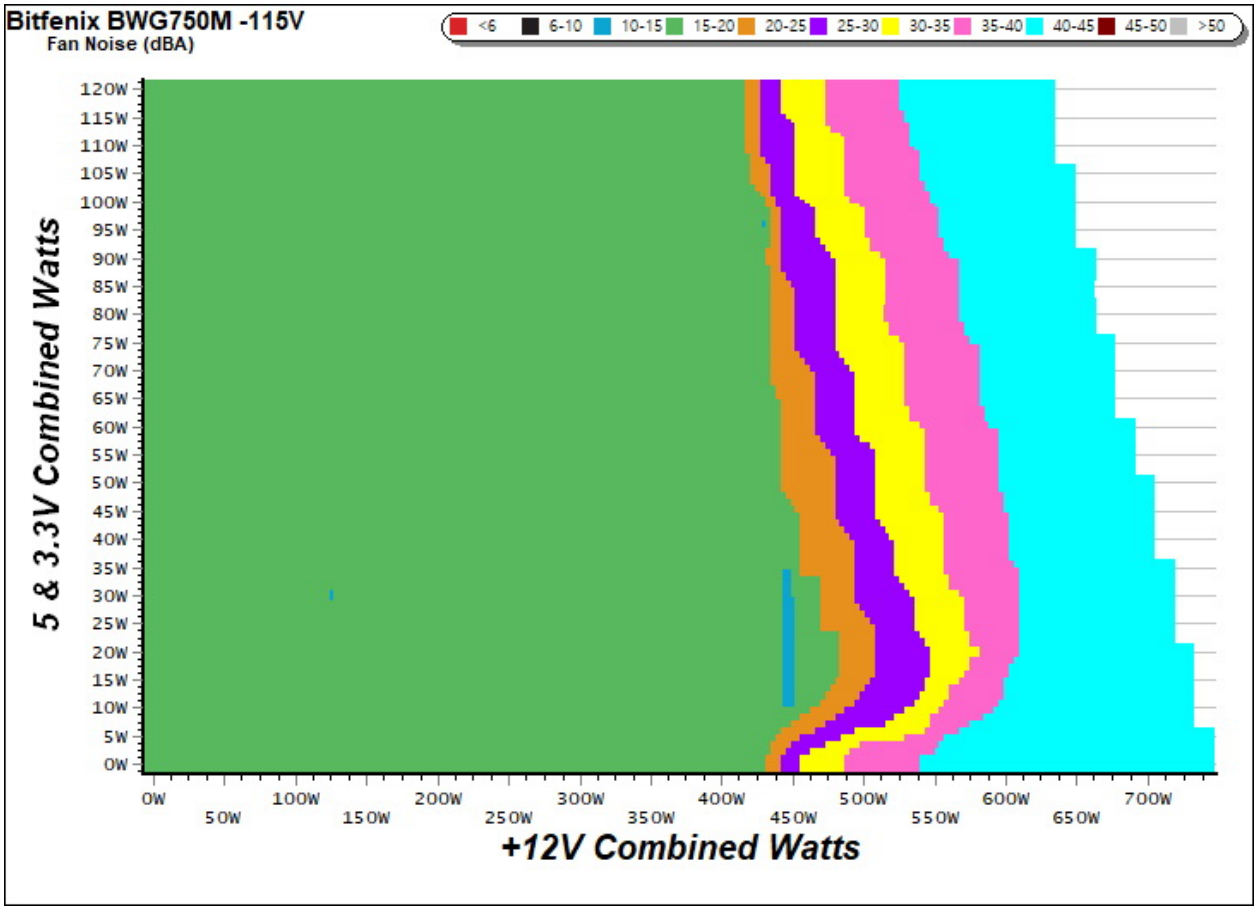


INFO

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Noise Graph

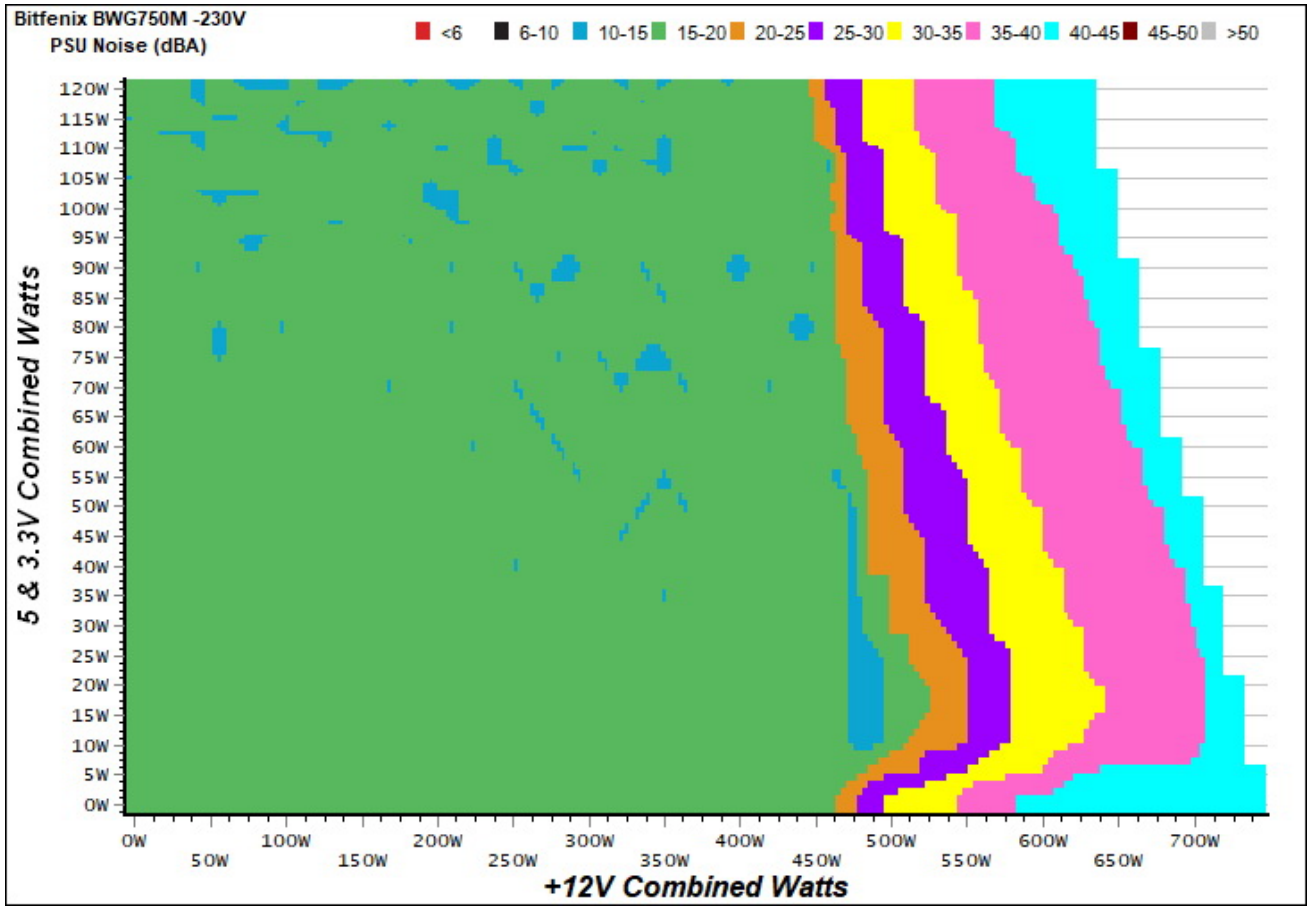
115V



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

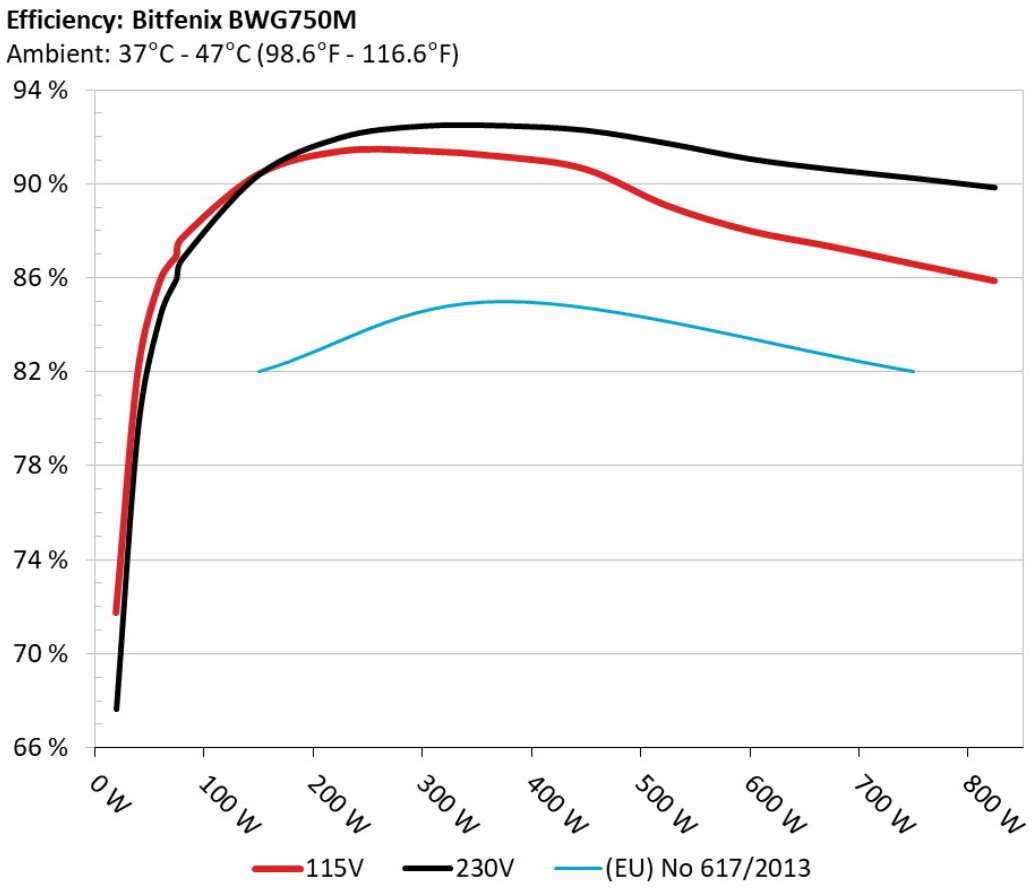


INFO

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

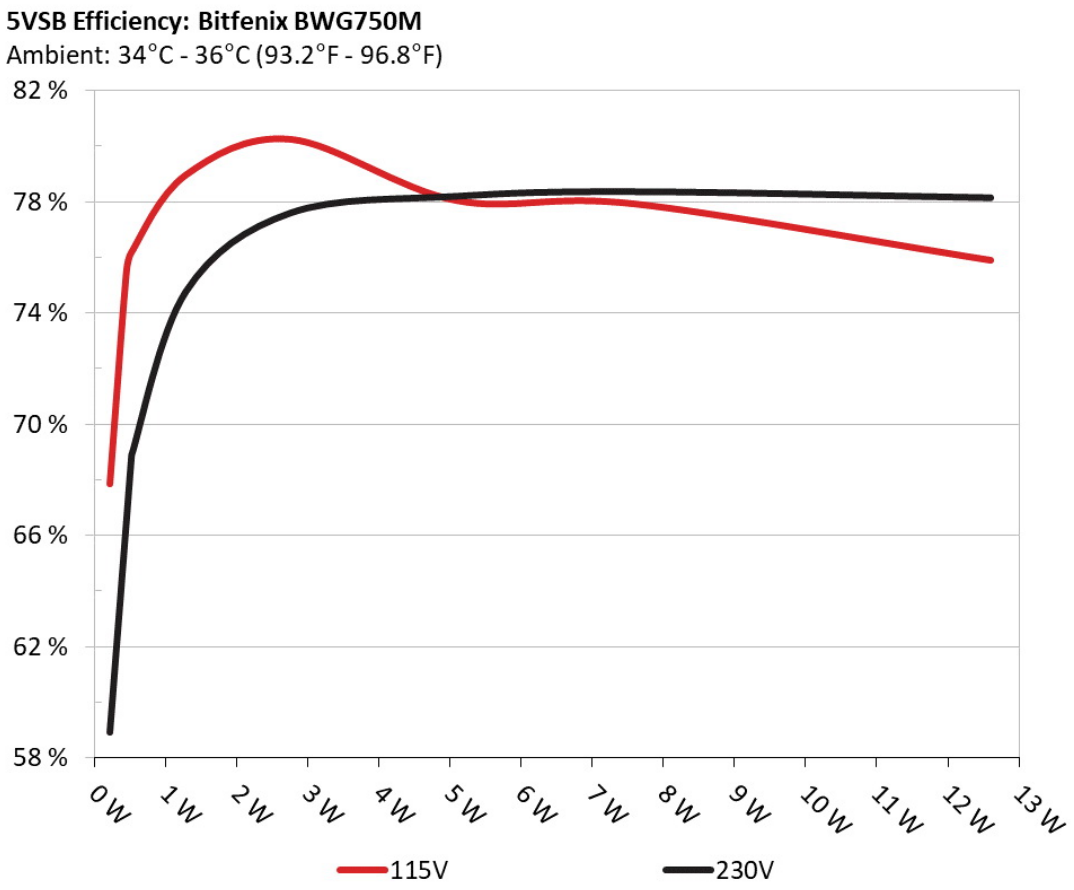
Efficiency under high ambient temperature



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	0.211	67.846%	0.031
	5.098V	0.311		115.19V
2	0.087A	0.442	75.427%	0.057
	5.097V	0.586		115.19V
3	0.542A	2.755	80.251%	0.257
	5.086V	3.433		115.19V
4	1.002A	5.084	78.047%	0.358
	5.075V	6.514		115.19V
5	1.501A	7.603	77.924%	0.411
	5.064V	9.757		115.20V
6	2.501A	12.605	75.897%	0.456
	5.040V	16.608		115.22V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.211	58.939%	0.011
	5.098V	0.358		230.47V
2	0.087A	0.443	68.896%	0.019
	5.097V	0.643		230.47V
3	0.541A	2.753	77.593%	0.100
	5.086V	3.548		230.47V
4	1.002A	5.084	78.191%	0.169
	5.075V	6.502		230.47V
5	1.501A	7.602	78.355%	0.227
	5.064V	9.702		230.47V
6	2.501A	12.606	78.138%	0.303
	5.040V	16.133		230.49V

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	4.436A	1.984A	1.972A	0.985A	74.787	86.932%	455	10.9	38.43°C	0.956
	11.992V	5.043V	3.341V	5.073V	86.029				41.24°C	115.21V
2	9.922A	2.970A	2.963A	1.181A	149.716	90.401%	470	11.5	38.86°C	0.980
	11.982V	5.035V	3.338V	5.069V	165.614				42.12°C	115.20V
3	15.765A	3.478A	3.477A	1.380A	224.811	91.384%	455	10.9	39.12°C	0.985
	11.972V	5.030V	3.334V	5.062V	246.007				43.12°C	115.21V
4	21.605A	3.984A	3.961A	1.580A	299.693	91.406%	435	9.9	39.65°C	0.986
	11.965V	5.025V	3.328V	5.056V	327.869				44.80°C	115.20V
5	27.117A	4.982A	4.960A	1.780A	374.650	91.152%	455	10.9	40.03°C	0.985
	11.955V	5.017V	3.323V	5.050V	411.016				46.31°C	115.20V
6	32.630A	5.990A	5.965A	1.980A	449.554	90.626%	455	10.9	40.74°C	0.984
	11.945V	5.010V	3.318V	5.044V	496.052				48.25°C	115.19V
7	38.147A	7.003A	6.970A	2.180A	524.547	89.071%	1225	34.4	41.96°C	0.984
	11.939V	5.003V	3.313V	5.038V	588.908				49.87°C	115.20V
8	43.688A	8.013A	7.978A	2.383A	599.508	88.010%	1795	44.4	43.01°C	0.985
	11.928V	4.994V	3.308V	5.031V	681.180				51.03°C	115.19V
9	49.677A	8.522A	8.503A	2.384A	674.533	87.335%	1795	44.4	44.38°C	0.986
	11.916V	4.988V	3.303V	5.029V	772.349				52.53°C	115.19V
10	55.615A	9.048A	9.006A	2.485A	749.403	86.599%	1795	44.4	45.10°C	0.987
	11.906V	4.980V	3.298V	5.026V	865.374				54.73°C	115.19V
11	61.965A	9.057A	9.016A	2.485A	824.297	85.877%	1795	44.4	46.76°C	0.989
	11.895V	4.974V	3.293V	5.024V	959.863				56.72°C	115.19V
CL1	0.094A	14.027A	14.004A	0.004A	117.535	84.170%	570	13.6	44.56°C	0.977
	11.974V	4.987V	3.316V	5.094V	139.640				55.07°C	115.21V

CL2	62.470A	1.003A	1.002A	1.002A	757.438	87.227%	1795	44.4	46.64°C	0.988
	11.910V	5.012V	3.313V	5.063V	868.348				55.82°C	115.19V

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	4.417A	1.982A	1.974A	0.985A	74.543	86.016%	470	11.5	40.22°C	0.769
	11.984V	5.049V	3.345V	5.075V	86.662				44.90°C	231.01V
2	9.894A	2.973A	2.962A	1.184A	149.450	90.422%	470	11.5	40.83°C	0.891
	11.981V	5.047V	3.343V	5.070V	165.280				45.69°C	230.96V
3	15.778A	3.470A	3.442A	1.382A	224.951	92.064%	470	11.5	41.25°C	0.929
	11.975V	5.046V	3.341V	5.065V	244.342				46.42°C	230.91V
4	21.607A	3.965A	3.952A	1.582A	299.755	92.558%	470	11.5	41.80°C	0.945
	11.966V	5.045V	3.340V	5.059V	323.855				47.94°C	230.85V
5	27.112A	4.958A	4.944A	1.782A	374.694	92.565%	470	11.5	42.30°C	0.955
	11.957V	5.044V	3.338V	5.053V	404.788				49.05°C	230.80V
6	32.620A	5.951A	5.935A	1.982A	449.596	92.170%	895	25.4	42.82°C	0.960
	11.949V	5.043V	3.337V	5.047V	487.791				49.95°C	230.75V
7	38.178A	6.946A	6.926A	2.183A	524.924	91.639%	1415	38.2	43.08°C	0.964
	11.939V	5.041V	3.335V	5.041V	572.820				50.38°C	230.70V
8	43.732A	7.941A	7.922A	2.384A	600.192	91.088%	1690	42.5	43.78°C	0.966
	11.931V	5.039V	3.333V	5.036V	658.915				51.68°C	230.65V
9	49.676A	8.441A	8.408A	2.385A	674.769	90.700%	1795	44.4	44.48°C	0.968
	11.922V	5.037V	3.331V	5.034V	743.953				52.66°C	230.59V
10	55.424A	8.940A	8.921A	2.990A	749.992	90.227%	1795	44.4	45.19°C	0.970
	11.913V	5.036V	3.329V	5.019V	831.231				53.55°C	230.53V
11	61.690A	8.940A	8.924A	2.989A	824.831	89.758%	1795	44.4	46.53°C	0.970
	11.916V	5.036V	3.329V	5.019V	791.112				55.48°C	230.54V
CL1	0.144A	14.005A	14.002A	0.000A	118.978	84.226%	570	13.6	44.69°C	0.872
	11.967V	5.036V	3.337V	5.096V	141.261				52.96°C	230.96V

CL2	62.523A	1.002A	1.001A	1.000A	758.789	90.936%	1795	44.4	45.73°C	0.970
	11.921V	5.042V	3.332V	5.065V	834.423				54.29°C	230.54V

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	1.215A	0.493A	0.476A	0.196A	19.664	71.769%	470	11.5	0.797
	12.001V	5.053V	3.348V	5.093V	27.399				115.21V
2	2.456A	0.985A	0.986A	0.391A	39.727	82.033%	455	10.9	0.908
	11.997V	5.050V	3.346V	5.088V	48.428				115.21V
3	3.700A	1.477A	1.495A	0.590A	59.832	85.854%	455	10.9	0.947
	11.994V	5.048V	3.344V	5.083V	69.690				115.21V
4	4.936A	1.983A	1.973A	0.786A	79.771	87.674%	435	9.9	0.960
	11.991V	5.043V	3.341V	5.078V	90.986				115.21V

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	1.210A	0.497A	0.480A	0.196A	19.629	67.442%	455	10.9	0.425
	11.993V	5.054V	3.349V	5.094V	29.105				231.03V
2	2.481A	0.991A	0.986A	0.393A	40.055	79.826%	435	16.8	0.600
	11.990V	5.052V	3.347V	5.090V	50.178				231.03V
3	3.683A	1.486A	1.464A	0.590A	59.552	84.308%	435	16.8	0.711
	11.987V	5.051V	3.346V	5.085V	70.636				231.01V
4	4.952A	1.982A	1.973A	0.788A	79.949	86.812%	415	16.9	0.784
	11.983V	5.049V	3.345V	5.080V	92.094				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	11.4 mV	9.1 mV	7.3 mV	6.6 mV	Pass
20% Load	14.7 mV	9.4 mV	6.8 mV	7.0 mV	Pass
30% Load	14.2 mV	9.5 mV	7.1 mV	6.8 mV	Pass
40% Load	14.6 mV	10.5 mV	8.1 mV	7.7 mV	Pass
50% Load	15.5 mV	11.2 mV	8.9 mV	11.2 mV	Pass
60% Load	17.0 mV	10.6 mV	10.0 mV	15.1 mV	Pass
70% Load	17.3 mV	11.6 mV	10.0 mV	17.9 mV	Pass
80% Load	18.0 mV	12.0 mV	10.2 mV	22.4 mV	Pass
90% Load	17.4 mV	12.9 mV	9.3 mV	26.5 mV	Pass
100% Load	18.3 mV	15.7 mV	9.9 mV	24.5 mV	Pass
110% Load	19.2 mV	16.6 mV	9.8 mV	22.0 mV	Pass
Crossload 1	15.8 mV	13.0 mV	8.8 mV	7.0 mV	Pass
Crossload 2	17.5 mV	15.0 mV	10.3 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	3.5 mV	7.3 mV	2.7 mV	3.6 mV	Pass
20% Load	22.3 mV	7.9 mV	3.5 mV	4.3 mV	Pass
30% Load	19.4 mV	8.1 mV	3.3 mV	5.9 mV	Pass
40% Load	16.6 mV	7.7 mV	3.7 mV	6.7 mV	Pass
50% Load	15.4 mV	8.1 mV	3.6 mV	9.1 mV	Pass
60% Load	16.9 mV	8.6 mV	4.3 mV	13.0 mV	Pass
70% Load	18.3 mV	9.2 mV	4.4 mV	18.2 mV	Pass
80% Load	18.6 mV	9.3 mV	4.6 mV	24.5 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	18.4 mV	10.2 mV	5.5 mV	28.8 mV	Pass
100% Load	19.4 mV	11.1 mV	5.7 mV	27.6 mV	Pass
110% Load	18.8 mV	11.0 mV	5.7 mV	27.7 mV	Pass
Crossload 1	14.7 mV	10.1 mV	6.3 mV	2.3 mV	Pass
Crossload 2	19.5 mV	11.1 mV	4.2 mV	19.0 mV	Pass

The results above are not used in the certification process

Bitfenix Whisper 750W



Top side



Power specifications label