Bitfenix Whisper 650W

709Q00001

Lab ID 136

Certification ID 25136

Test Result Report ID:

Certificate Issue Date: Mar 7, 2018

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



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 650W
OEM/ODM	Channel Well Technology
Serial Number	709Q00001
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	10
□□□□ (Hz)	47-63

□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135mm Hydro Dynamic Bearing Fan (DF1352512SEHN)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	136
Date of receipt	Feb 23, 2018
Testing Date	Mar 4, 2018
Report Issued Date	Mar 7, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□ (Non-accredited measurements)

□□□□□			
□□	□□□□	□□□□□□	Gauge
ATX □□ 20+4 pin (610mm)	1	1	18AWG
4+4 pin EPS 12V □□ (650mm)	1	1	18AWG
6+2pin PCIe□□ (650mm+150mm)	2	4	18AWG
SATA□□ (500mm+150mm+150mm+150mm)	2	8	18AWG
□ 4pin Molex□□ (500mm+150mm+150mm+150mm)	1	4	18AWG

□□□□

□		3.3V	5V	12V	12V	12V	12V	5VSB	-12V
□□□□	□□	20	20	25	25	30	30	2.5	0.3
	□	100		650				12.5	3.6
□□□□□ (W)		650							

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)	88.637%
Average Noise Output (>1450 Load Combinations)	31.12dBA
PF□□□ (>1450 Load Combinations)	0.982
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.0461W
Non-Accredited	
12V Ripple (Full Load)	18.99mV
5V Ripple (Full Load)	13.41mV
3.3V Ripple (Full Load)	27.33mV
5VSB Ripple (Full Load)	19.66mV
12V Load Regulation	0.70%
5V Load Regulation	1.24%
3.3V Load Regulation	1.54%

5VSB Load Regulation	1.43%
Inrush Current	48.019A

230V

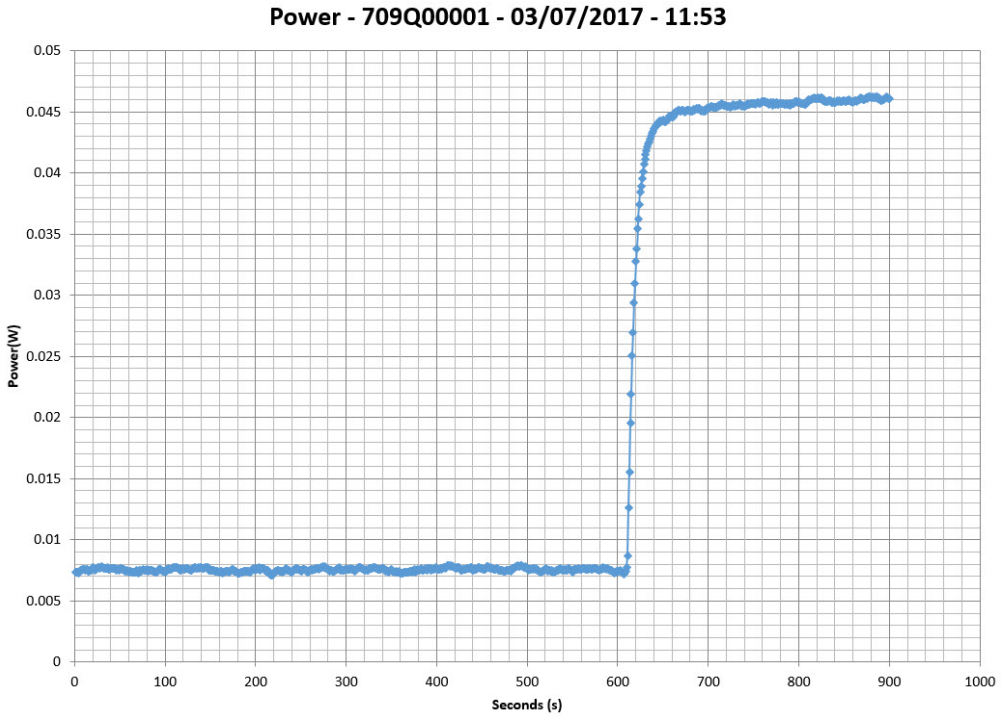
Accredited	
□□□□ (>1450 load combinations)	90.952%
Average Noise Output (>1450 Load Combinations)	24.91dBA
PF□□□ (>1450 Load Combinations)	0.933
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.0683W
Non-Accredited	
12V Ripple (Full Load)	16.91mV
5V Ripple (Full Load)	8.78mV
3.3V Ripple (Full Load)	9.24mV
5VSB Ripple (Full Load)	21.60mV
12V Load Regulation	0.46%
5V Load Regulation	0.42%
3.3V Load Regulation	0.63%
5VSB Load Regulation	1.43%
Inrush Current	47.663A
□□□□ & PG□□	15.00ms
AC Loss to PWR_OK Hold Up Time	13.70ms
PWR_OK Inactive to DC Loss Delay	1.30ms
OPP (0.00°C / 0.00°C)	- -

□□□□ & PG□□

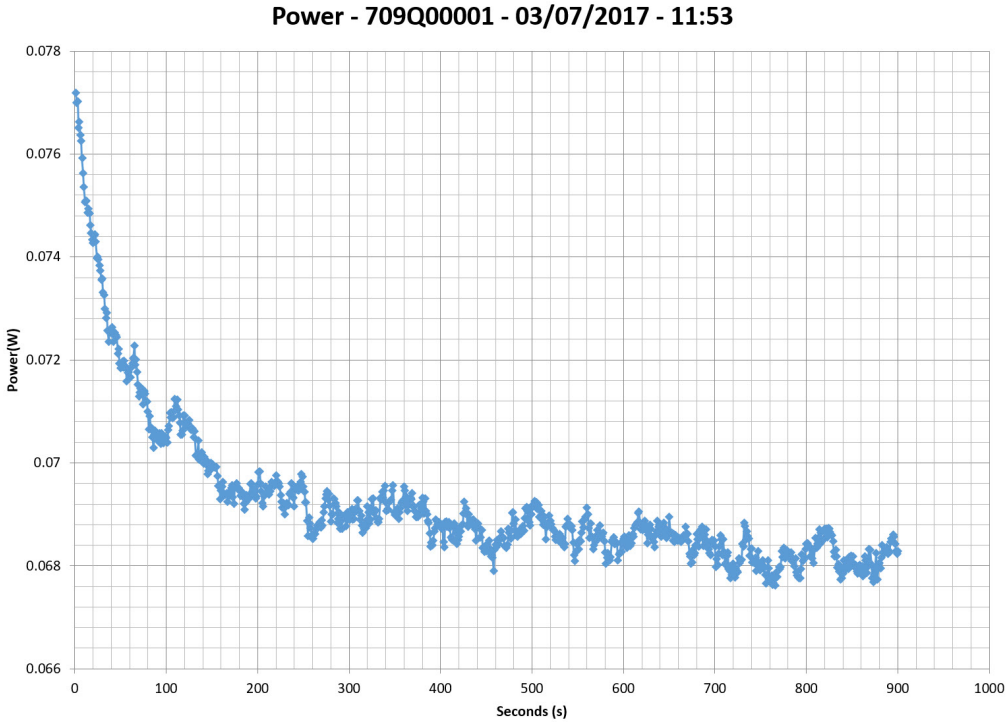
Hold-Up Time (ms)	15
AC Loss to PWR_OK Hold Up Time (ms)	13.7
PWR_OK Inactive to DC Loss Delay (ms)	1.3

Graphs

115V

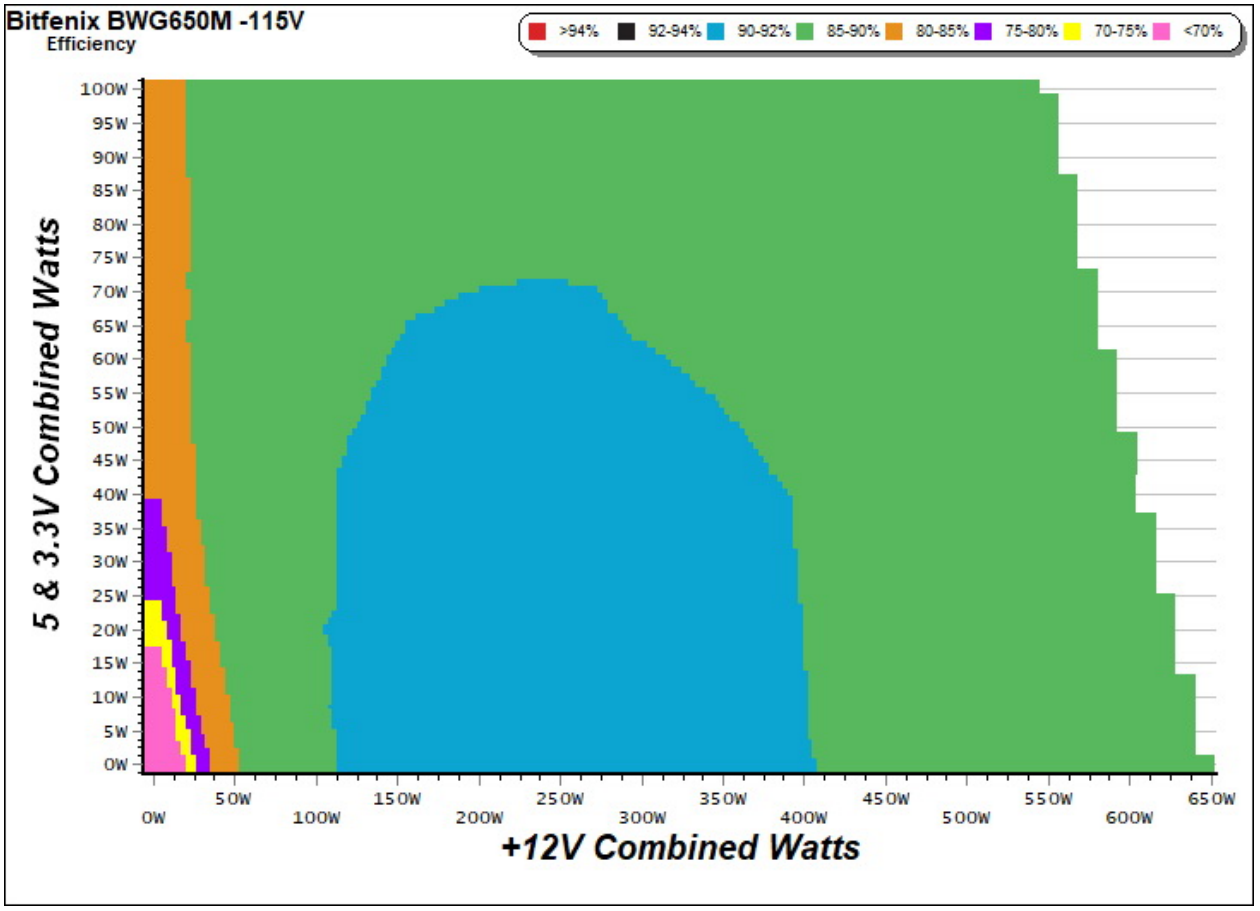


230V



□□□□□□

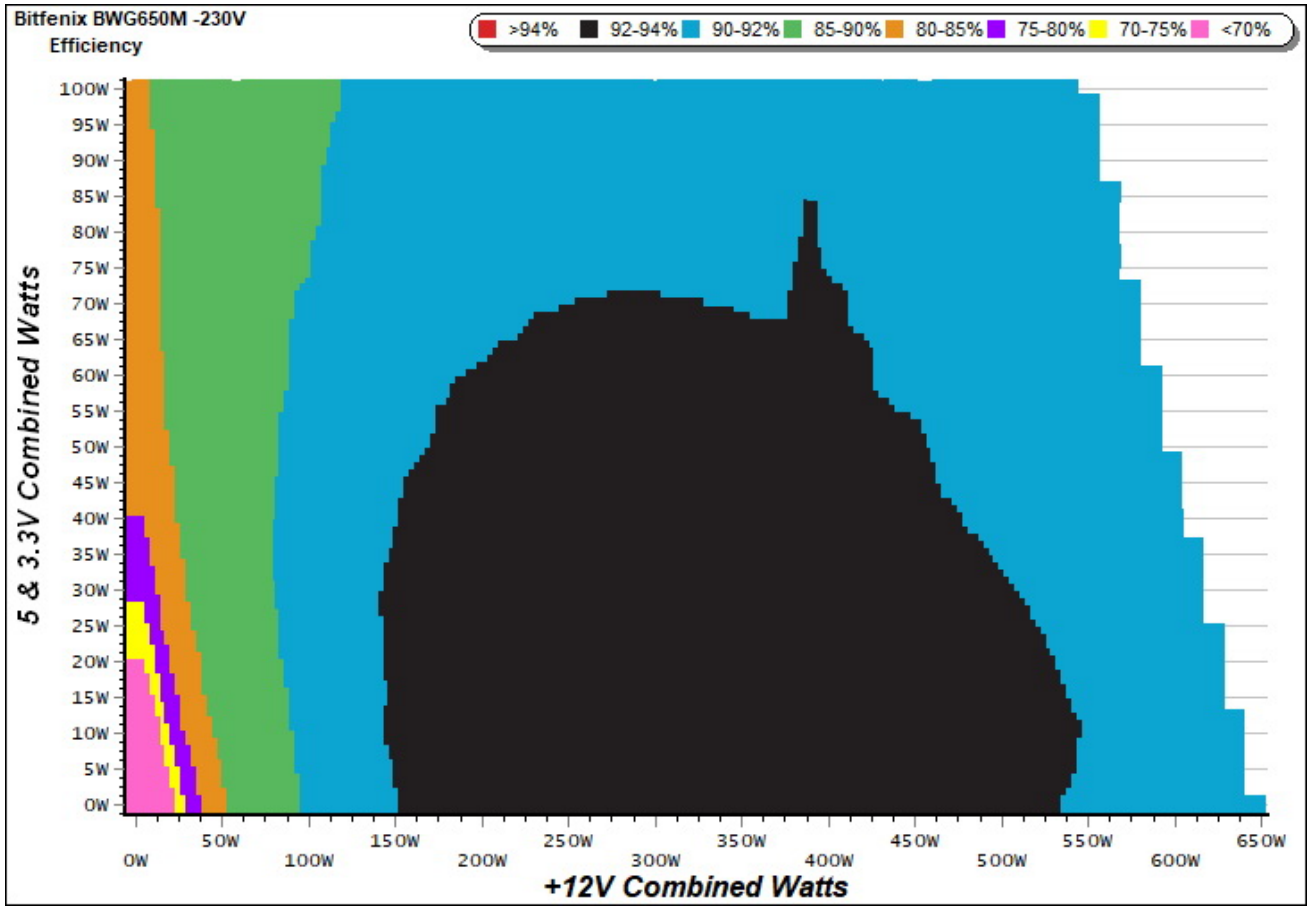
115V



□□

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



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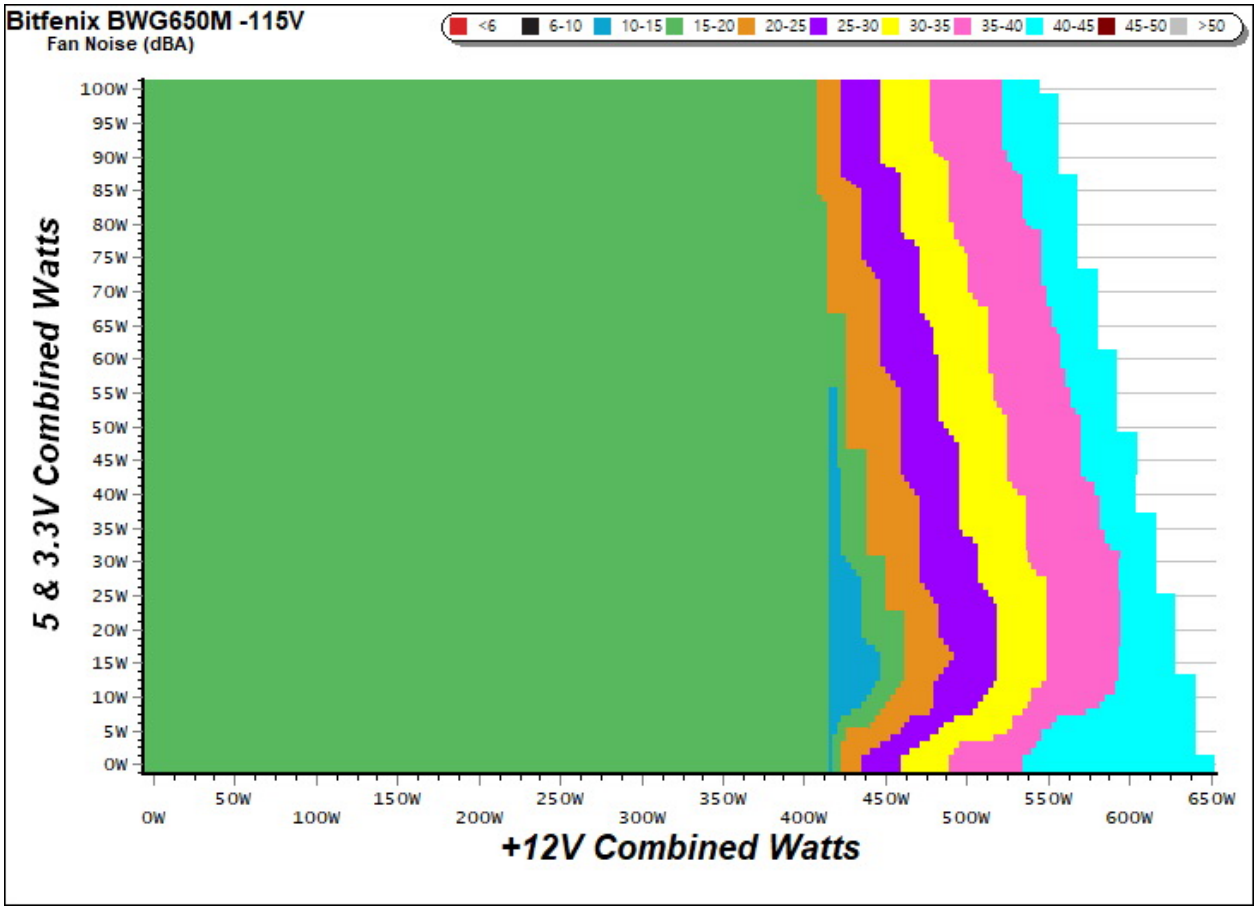
□□□□□

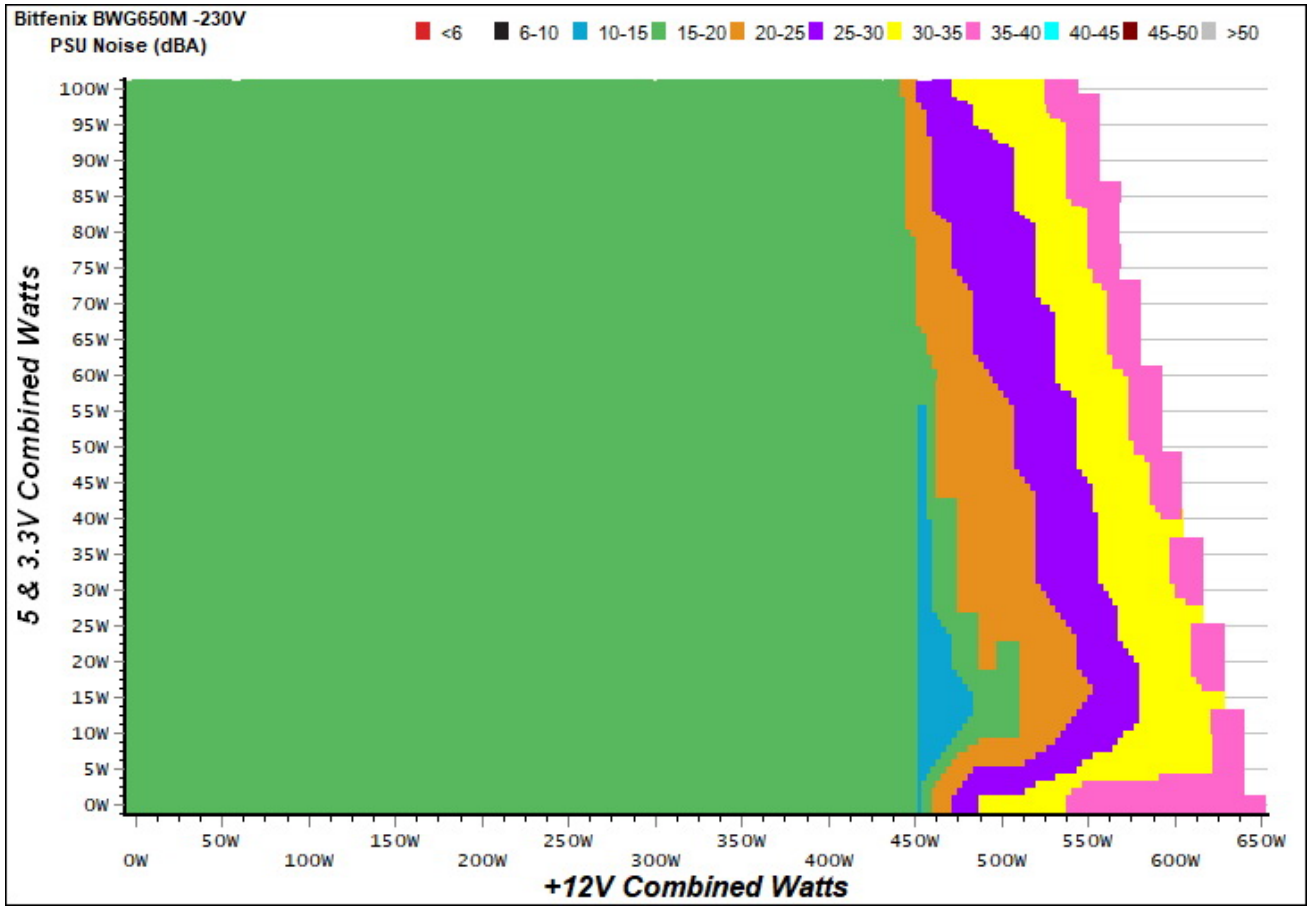
115V



□□

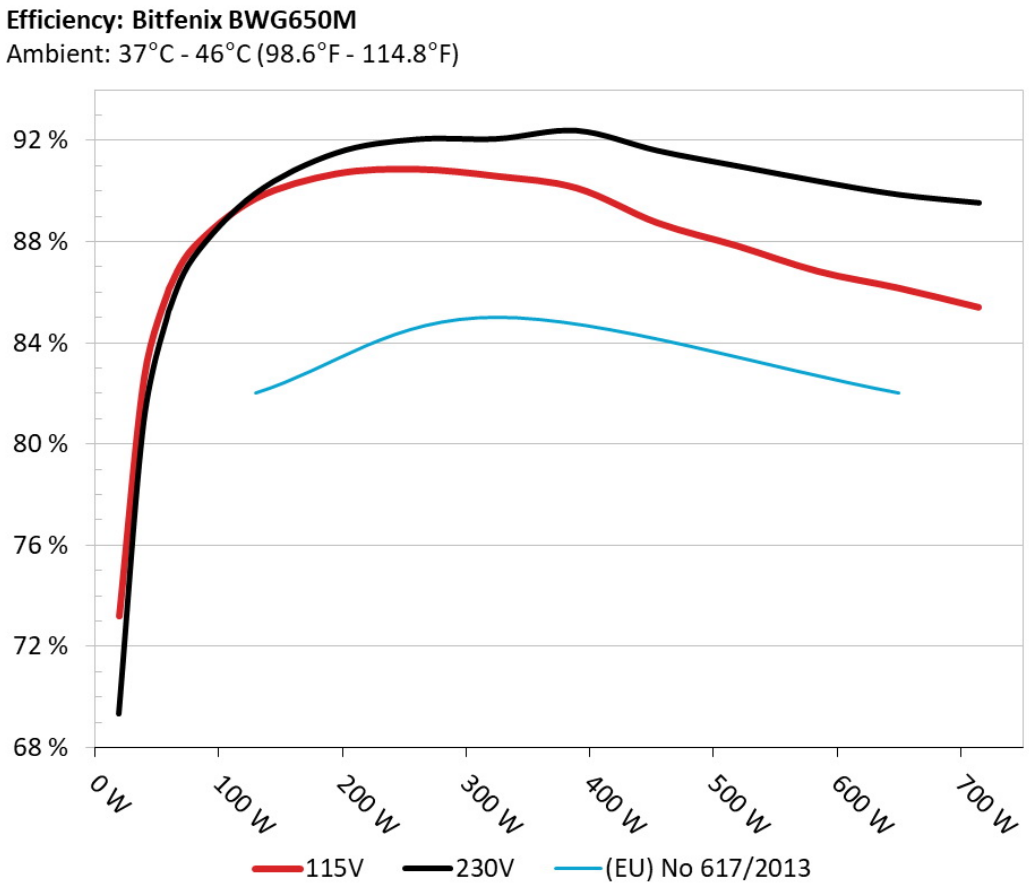
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



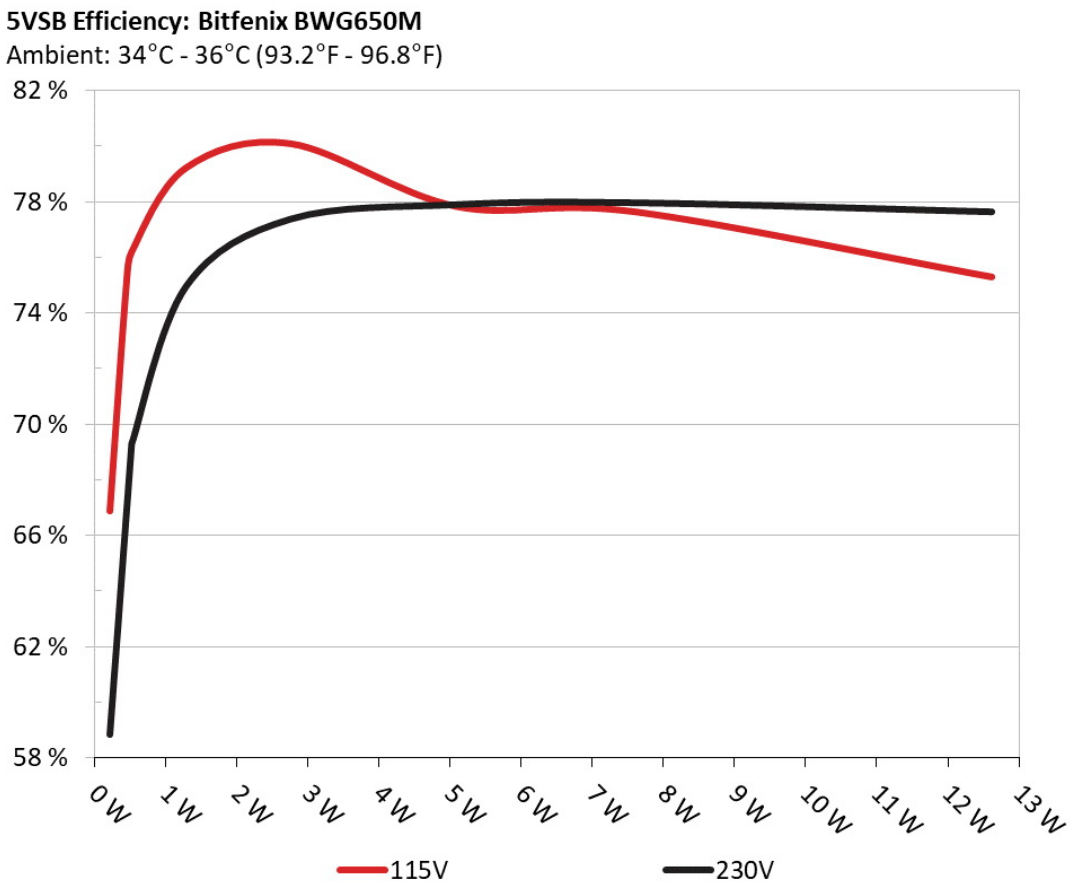
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

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	0.041A	0.210	66.879%	0.031
	5.101V	0.314		115.23V
2	0.087A	0.442	75.042%	0.058
	5.101V	0.589		115.23V
3	0.542A	2.757	80.076%	0.258
	5.090V	3.443		115.22V
4	1.002A	5.087	77.819%	0.357
	5.079V	6.537		115.22V
5	1.501A	7.608	77.625%	0.407
	5.068V	9.801		115.22V
6	2.501A	12.613	75.288%	0.458
	5.044V	16.753		115.22V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.041A	0.210	58.824%	0.011
	5.101V	0.357		230.51V
2	0.087A	0.442	69.279%	0.019
	5.101V	0.638		230.51V
3	0.541A	2.756	77.372%	0.101
	5.090V	3.562		230.51V
4	1.002A	5.087	77.890%	0.170
	5.079V	6.531		230.51V
5	1.501A	7.606	77.954%	0.228
	5.067V	9.757		230.51V
6	2.501A	12.615	77.631%	0.305
	5.044V	16.250		230.51V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.582A	1.997A	1.987A	0.980A	64.750	86.146%	455	10.9	38.53°C	0.958
	12.055V	5.009V	3.317V	5.077V	75.163				42.03°C	115.23V
2	8.209A	2.993A	2.986A	1.180A	129.721	89.701%	455	10.9	38.84°C	0.978
	12.045V	5.002V	3.312V	5.070V	144.615				43.20°C	115.23V
3	13.186A	3.511A	3.503A	1.380A	194.835	90.682%	435	9.9	39.16°C	0.984
	12.037V	4.996V	3.307V	5.065V	214.856				44.09°C	115.22V
4	18.167A	4.010A	3.992A	1.580A	259.692	90.865%	455	10.9	39.69°C	0.986
	12.028V	4.989V	3.302V	5.058V	285.800				45.30°C	115.22V
5	22.815A	5.012A	5.002A	1.780A	324.643	90.590%	435	9.9	40.27°C	0.987
	12.018V	4.983V	3.296V	5.051V	358.364				45.92°C	115.22V
6	27.459A	6.034A	6.012A	1.980A	389.602	90.116%	435	9.9	40.86°C	0.986
	12.011V	4.975V	3.291V	5.044V	432.334				47.51°C	115.22V
7	32.111A	7.043A	7.027A	2.180A	454.496	88.747%	895	25.4	41.96°C	0.985
	12.003V	4.969V	3.286V	5.037V	512.124				49.24°C	115.21V
8	36.789A	8.069A	8.048A	2.384A	519.526	87.828%	1415	38.2	42.92°C	0.986
	11.990V	4.962V	3.280V	5.029V	591.528				50.98°C	115.22V
9	41.881A	8.578A	8.579A	2.385A	584.544	86.827%	1795	44.4	43.59°C	0.987
	11.985V	4.956V	3.275V	5.028V	673.228				53.09°C	115.22V
10	46.957A	9.092A	9.082A	2.485A	649.363	86.168%	1795	44.4	44.61°C	0.988
	11.972V	4.951V	3.270V	5.023V	753.603				54.78°C	115.21V
11	52.391A	9.097A	9.087A	2.487A	714.295	85.406%	1795	44.4	46.12°C	0.989
	11.970V	4.947V	3.267V	5.020V	836.353				57.61°C	115.22V
CL1	0.095A	12.014A	12.005A	0.004A	100.466	84.532%	555	13.1	44.96°C	0.975
	12.042V	4.973V	3.295V	5.096V	118.849				57.68°C	115.23V

CL2	54.094A	1.005A	1.003A	1.001A	662.011	86.828%	1800	44.4	45.29°C	0.988
	11.991V	4.978V	3.290V	5.062V	762.439				55.83°C	115.21V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.589A	1.994A	1.983A	0.984A	64.826	85.427%	455	10.9	40.15°C	0.774
	12.050V	5.015V	3.321V	5.075V	75.885				43.39°C	265.12V
2	8.217A	2.991A	2.979A	1.181A	129.824	90.062%	435	9.9	40.77°C	0.891
	12.043V	5.013V	3.319V	5.069V	144.149				44.35°C	230.26V
3	13.181A	3.498A	3.492A	1.380A	194.894	91.680%	435	9.9	41.20°C	0.928
	12.047V	5.012V	3.317V	5.063V	212.580				45.59°C	230.26V
4	18.157A	3.995A	3.979A	1.581A	259.786	92.244%	455	10.9	41.61°C	0.946
	12.039V	5.009V	3.315V	5.056V	281.629				46.70°C	230.26V
5	22.793A	4.990A	4.975A	1.781A	324.704	92.262%	455	10.9	42.13°C	0.955
	12.032V	5.007V	3.313V	5.049V	351.935				47.43°C	230.29V
6	27.437A	5.994A	5.976A	1.980A	389.700	92.086%	435	9.9	42.57°C	0.961
	12.025V	5.005V	3.311V	5.042V	423.193				48.39°C	230.32V
7	32.082A	7.001A	6.978A	2.181A	454.627	91.520%	1005	28.4	43.14°C	0.965
	12.017V	5.004V	3.308V	5.035V	496.750				49.40°C	230.36V
8	36.742A	8.003A	7.983A	2.385A	519.607	90.934%	1425	38.6	43.78°C	0.968
	12.008V	5.000V	3.307V	5.029V	571.409				50.52°C	230.34V
9	41.835A	8.505A	8.505A	2.385A	584.657	90.408%	1800	44.4	44.74°C	0.970
	12.001V	4.998V	3.304V	5.026V	646.690				51.83°C	230.30V
10	46.876A	9.014A	8.994A	2.486A	649.492	90.043%	1800	44.4	45.18°C	0.972
	11.995V	4.996V	3.302V	5.021V	721.311				52.61°C	000.00V
11	52.325A	9.017A	9.002A	2.488A	714.497	89.708%	1800	44.4	46.32°C	0.973
	11.988V	4.994V	3.300V	5.019V	796.474				54.00°C	230.41V
CL1	0.100A	12.013A	12.006A	0.004A	101.245	84.694%	555	13.1	42.88°C	0.866
	12.037V	5.010V	3.318V	5.096V	119.542				49.70°C	230.27V

CL2	54.122A	1.002A	1.001A	1.002A	663.183	90.797%	1800	44.4	45.06°C	0.972
	12.006V	5.002V	3.309V	5.059V	730.399				52.41°C	230.29V

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	1.208A	0.494A	0.479A	0.195A	19.633	73.200%	435	9.9	0.825
	12.061V	5.017V	3.323V	5.096V	26.821				115.23V
2	2.445A	0.991A	0.990A	0.390A	39.721	82.620%	435	9.9	0.922
	12.057V	5.013V	3.321V	5.092V	48.077				115.23V
3	3.681A	1.489A	1.504A	0.585A	59.803	86.123%	455	10.9	0.951
	12.055V	5.010V	3.319V	5.087V	69.439				115.23V
4	4.909A	1.995A	1.987A	0.785A	79.736	87.778%	435	9.9	0.965
	12.053V	5.008V	3.316V	5.081V	90.838				115.23V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.214A	0.490A	0.479A	0.196A	19.686	69.545%	455	10.9	0.477
	12.056V	5.018V	3.324V	5.095V	28.307				230.25V
2	2.450A	0.990A	0.990A	0.391A	39.777	80.981%	455	10.9	0.652
	12.053V	5.017V	3.323V	5.090V	49.119				230.25V
3	3.689A	1.486A	1.503A	0.586A	59.881	85.302%	435	9.9	0.754
	12.050V	5.016V	3.323V	5.085V	70.199				230.25V
4	4.919A	1.996A	1.984A	0.785A	79.796	87.441%	435	9.9	0.814
	12.038V	5.013V	3.320V	5.080V	91.257				230.53V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.7 mV	7.9 mV	12.7 mV	9.6 mV	Pass
20% Load	17.9 mV	8.1 mV	17.1 mV	6.8 mV	Pass
30% Load	16.3 mV	8.4 mV	13.5 mV	6.1 mV	Pass
40% Load	16.1 mV	9.0 mV	15.6 mV	7.4 mV	Pass
50% Load	16.7 mV	9.2 mV	17.5 mV	8.2 mV	Pass
60% Load	18.0 mV	11.1 mV	18.1 mV	13.9 mV	Pass
70% Load	17.7 mV	10.1 mV	21.9 mV	17.3 mV	Pass
80% Load	18.9 mV	12.0 mV	23.4 mV	18.8 mV	Pass
90% Load	19.5 mV	11.7 mV	27.2 mV	23.0 mV	Pass
100% Load	19.0 mV	13.4 mV	27.3 mV	19.7 mV	Pass
110% Load	19.7 mV	13.6 mV	31.8 mV	22.0 mV	Pass
Crossload 1	18.1 mV	11.6 mV	10.8 mV	6.5 mV	Pass
Crossload 2	17.9 mV	13.0 mV	27.9 mV	17.3 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.3 mV	6.1 mV	7.7 mV	6.2 mV	Pass
20% Load	6.3 mV	6.6 mV	7.3 mV	6.1 mV	Pass
30% Load	24.3 mV	7.1 mV	7.1 mV	7.0 mV	Pass
40% Load	18.6 mV	6.7 mV	8.2 mV	7.3 mV	Pass
50% Load	17.1 mV	7.0 mV	7.5 mV	9.6 mV	Pass
60% Load	16.9 mV	7.5 mV	8.5 mV	10.3 mV	Pass
70% Load	16.6 mV	7.4 mV	7.8 mV	17.8 mV	Pass
80% Load	16.6 mV	8.5 mV	8.0 mV	20.0 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	16.8 mV	8.6 mV	8.2 mV	22.2 mV	Pass
100% Load	16.9 mV	8.8 mV	9.2 mV	21.6 mV	Pass
110% Load	17.2 mV	9.2 mV	9.6 mV	19.2 mV	Pass
Crossload 1	5.1 mV	6.8 mV	9.1 mV	4.7 mV	Pass
Crossload 2	16.4 mV	8.3 mV	9.5 mV	14.6 mV	Pass

The results above are not used in the certification process

Bitfenix Whisper 650W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
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CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com