Bitfenix Whisper 650W

Serial Number 709Q00001

Lab ID 136

Certification ID 25136

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

Rated Power (W)	650
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	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	

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)	1	1	18AWG
6+2 pin PCIe (650mm+150mm)	2	4	18AWG
SATA (500mm+150mm+150mm+150mm)	2	8	18AWG
4 pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG

Power Specifications

Rail		3.3V	5V	12V	12V	12V	12V	5VSB	-12V
Max. Power	Amps	20	20	25	25	30	30	2.5	0.3
	Watts	100		650				12.5	3.6
Total Max. Power (W)		650							

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)	88.637%
Average Noise Output (>1450 Load Combinations)	31.12dBA
Average PF (>1450 Load Combinations)	0.982
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	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

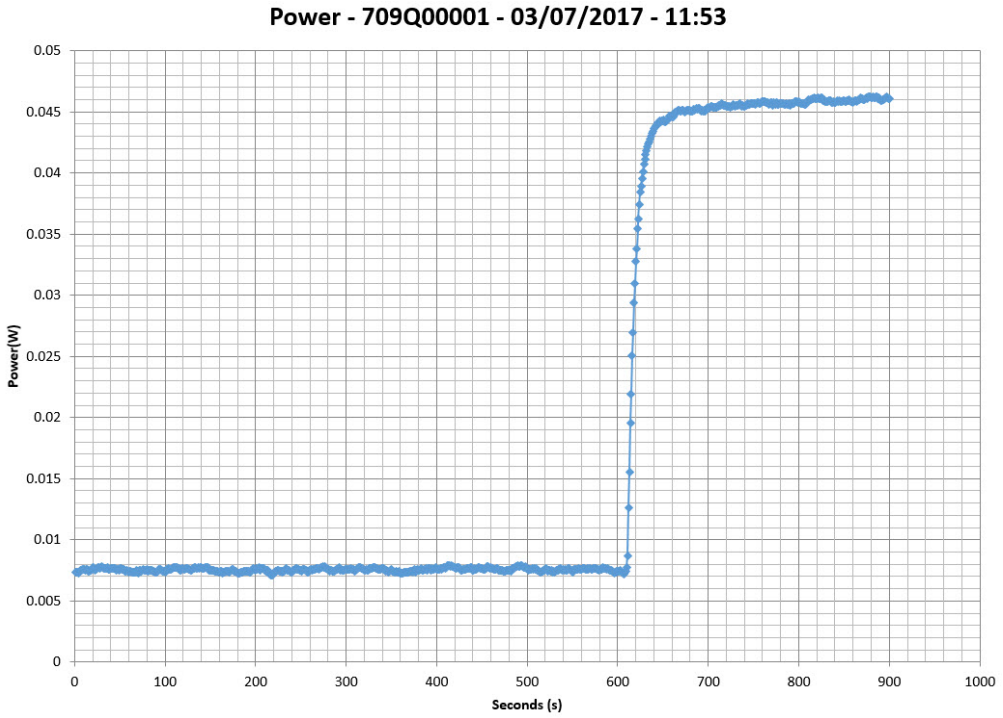
Accredited		
Average Efficiency (>1450 load combinations)		90.952%
Average Noise Output (>1450 Load Combinations)		24.91dBA
Average PF (>1450 Load Combinations)		0.933
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
Standby Power Consumption		0.0683W
Non-Accredited		
12V Ripple (Full Load)		16.91mV
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
Hold-Up Time & PWR_OK Signal		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)	-	-

Hold-Up Time & PWR_OK Signal

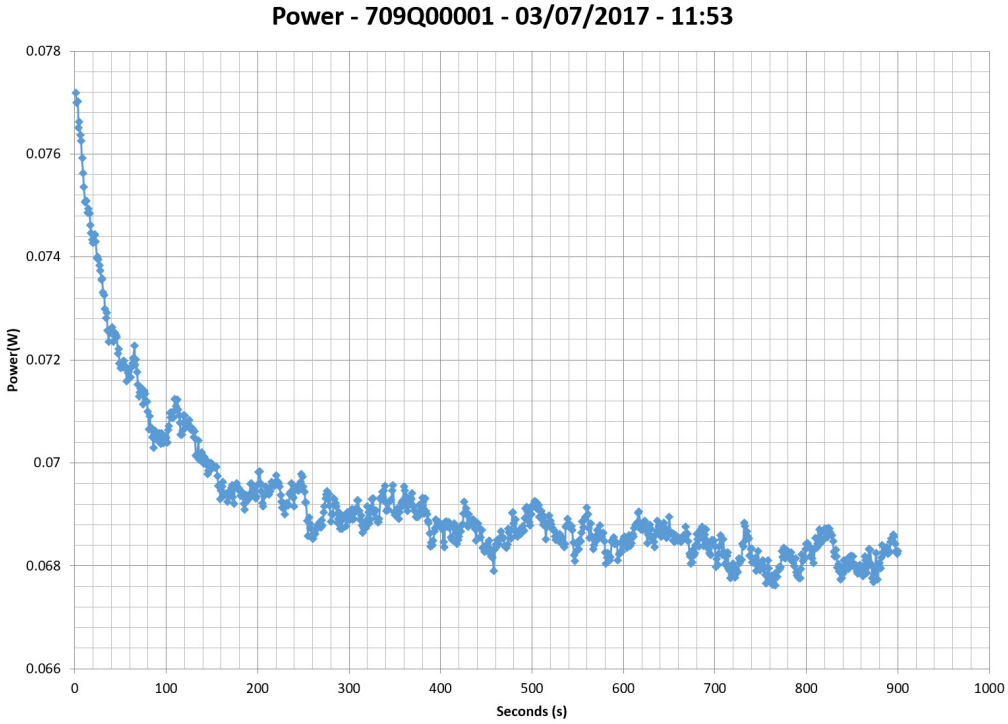
Hold-Up Time (ms)	15
AC Loss to PWR_OK Hold Up Time (ms)	13.7
PWR_OK Inactive to DC Loss Delay (ms)	1.3

Graphs

115V

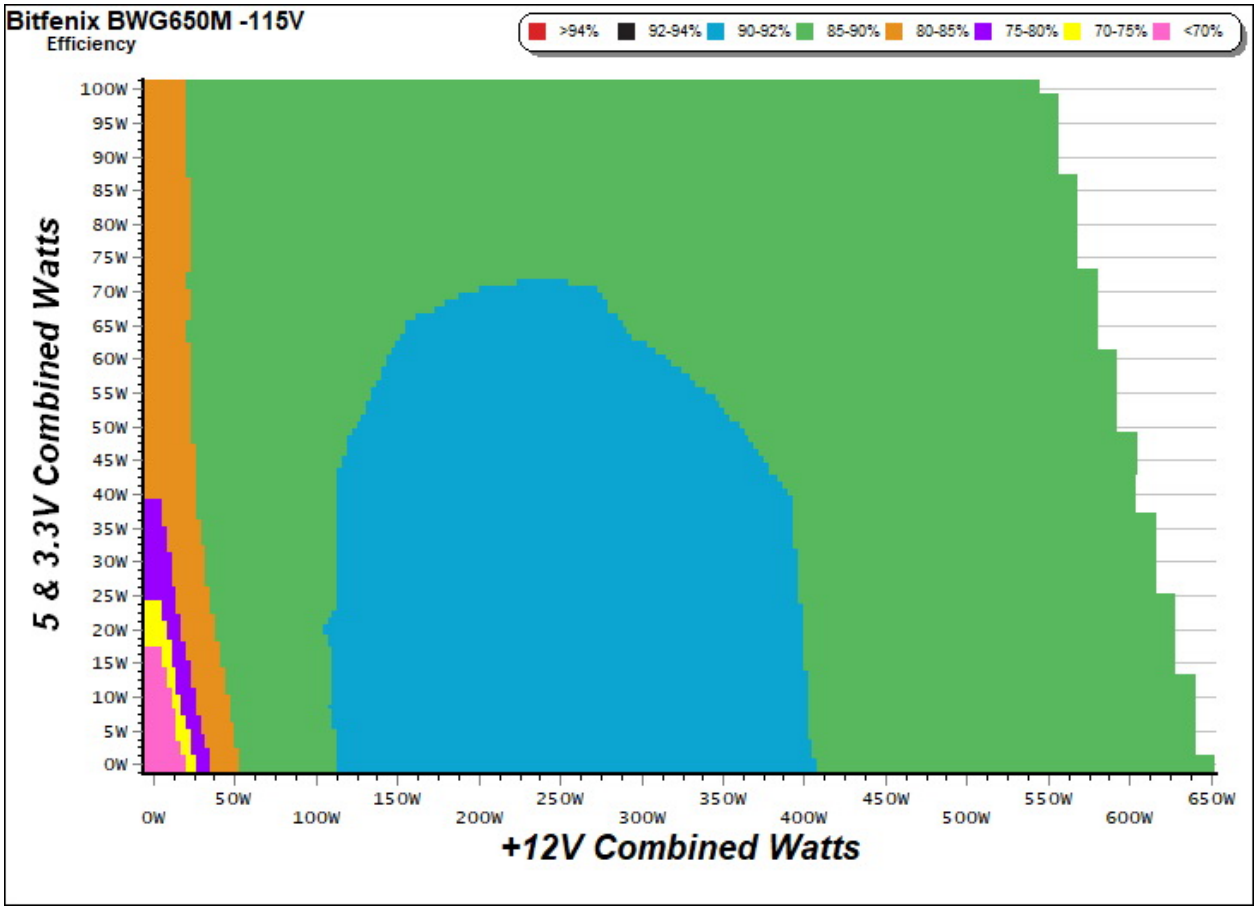


230V



Efficiency Graph

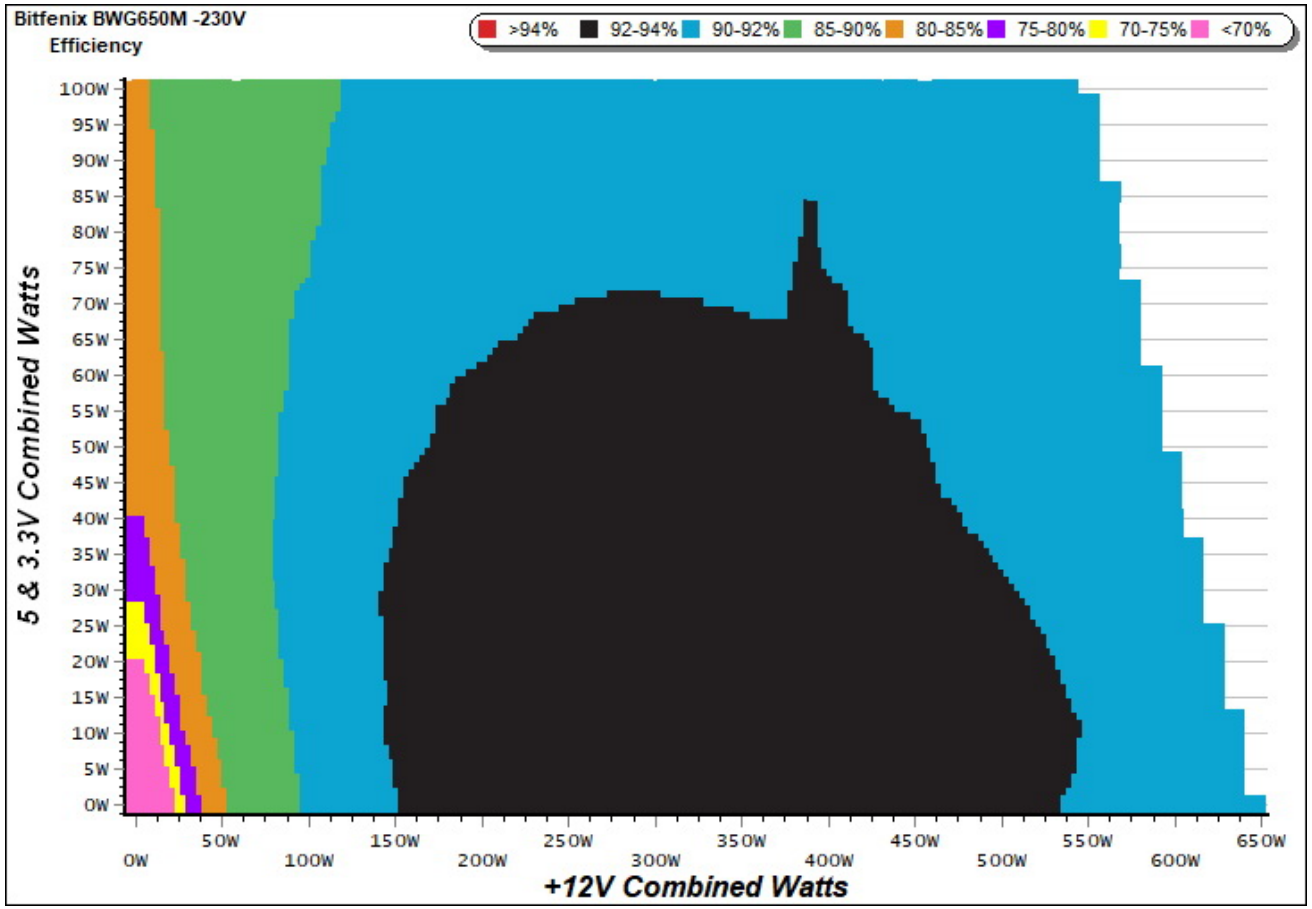
115V



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

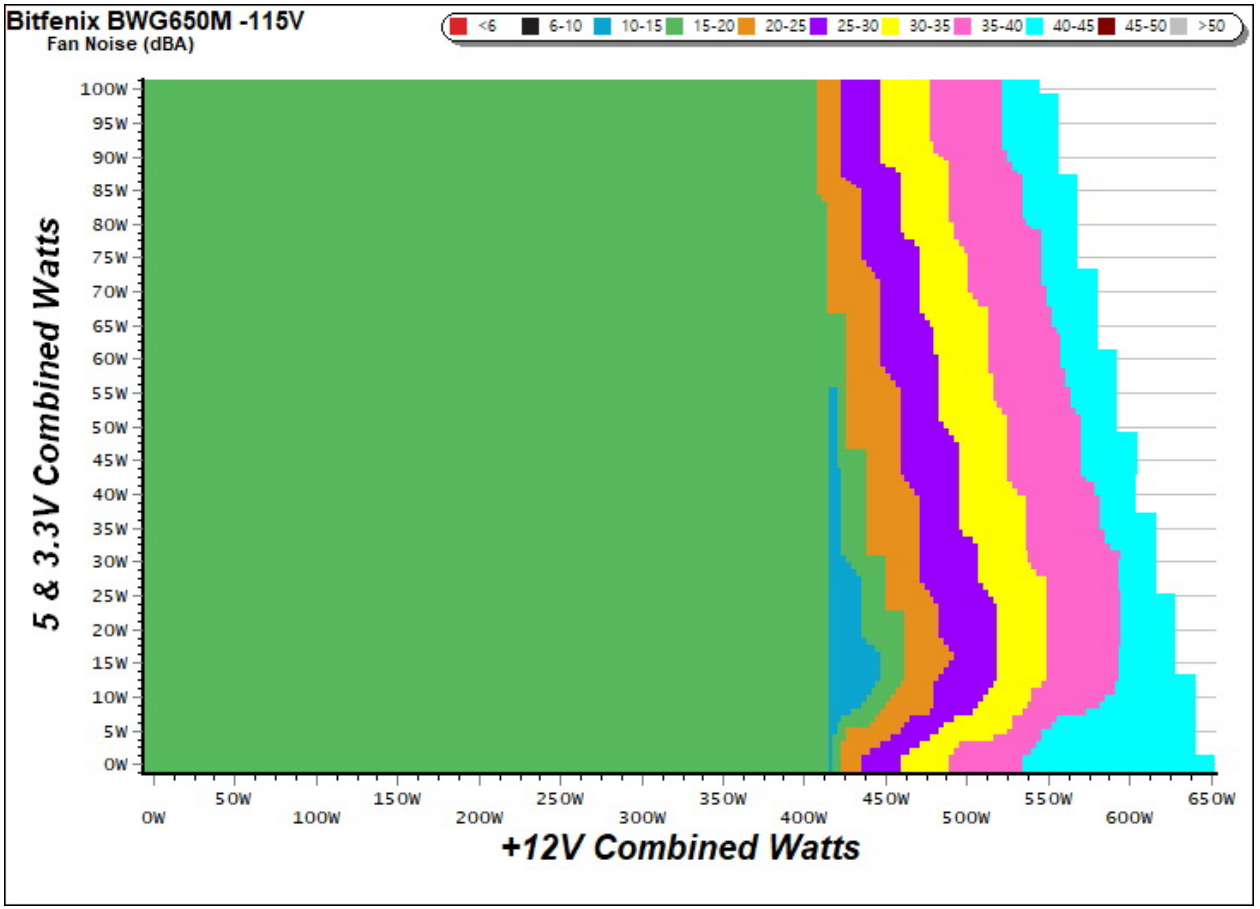


INFO

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Noise Graph

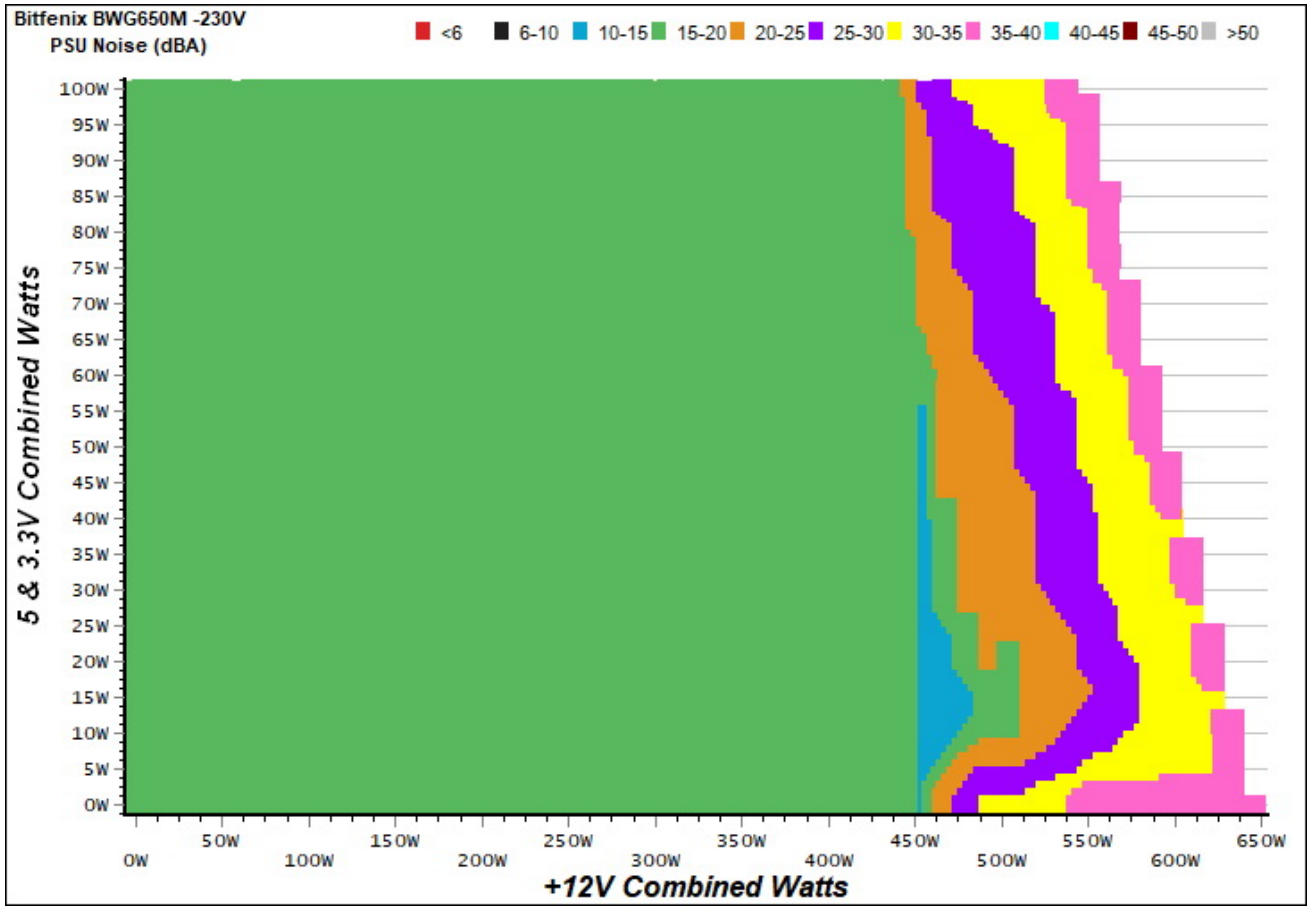
115V



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

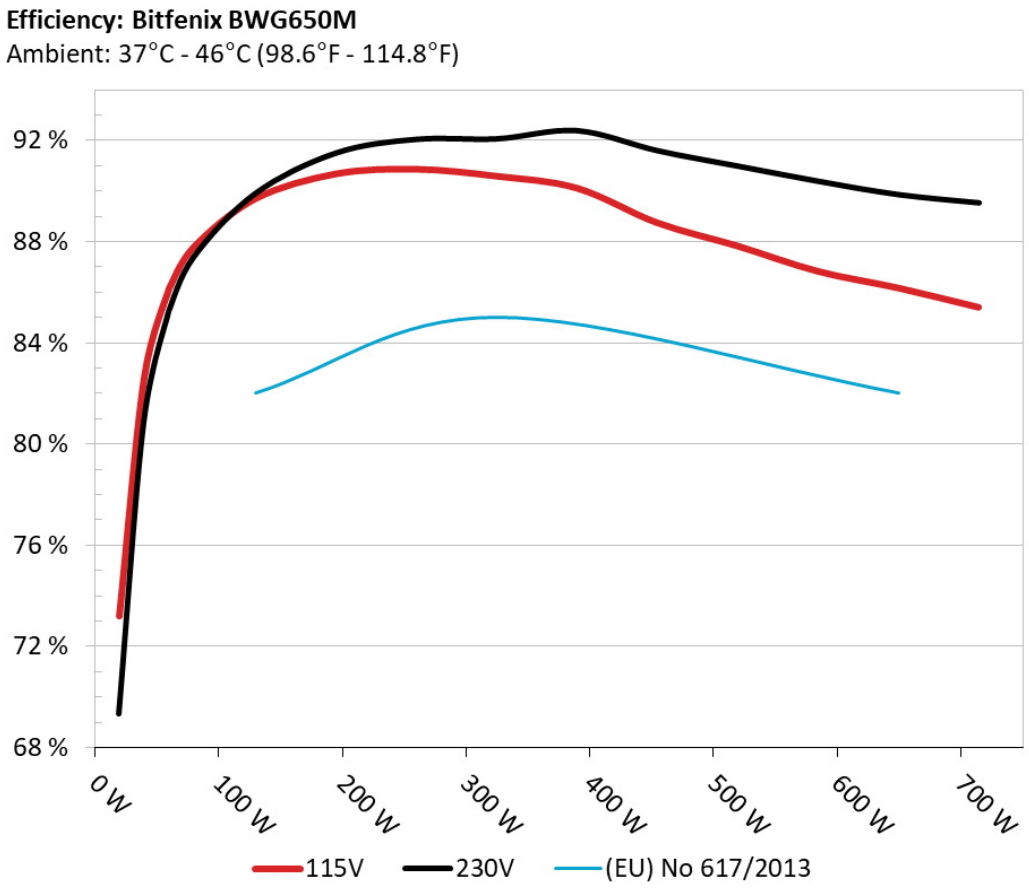


INFO

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

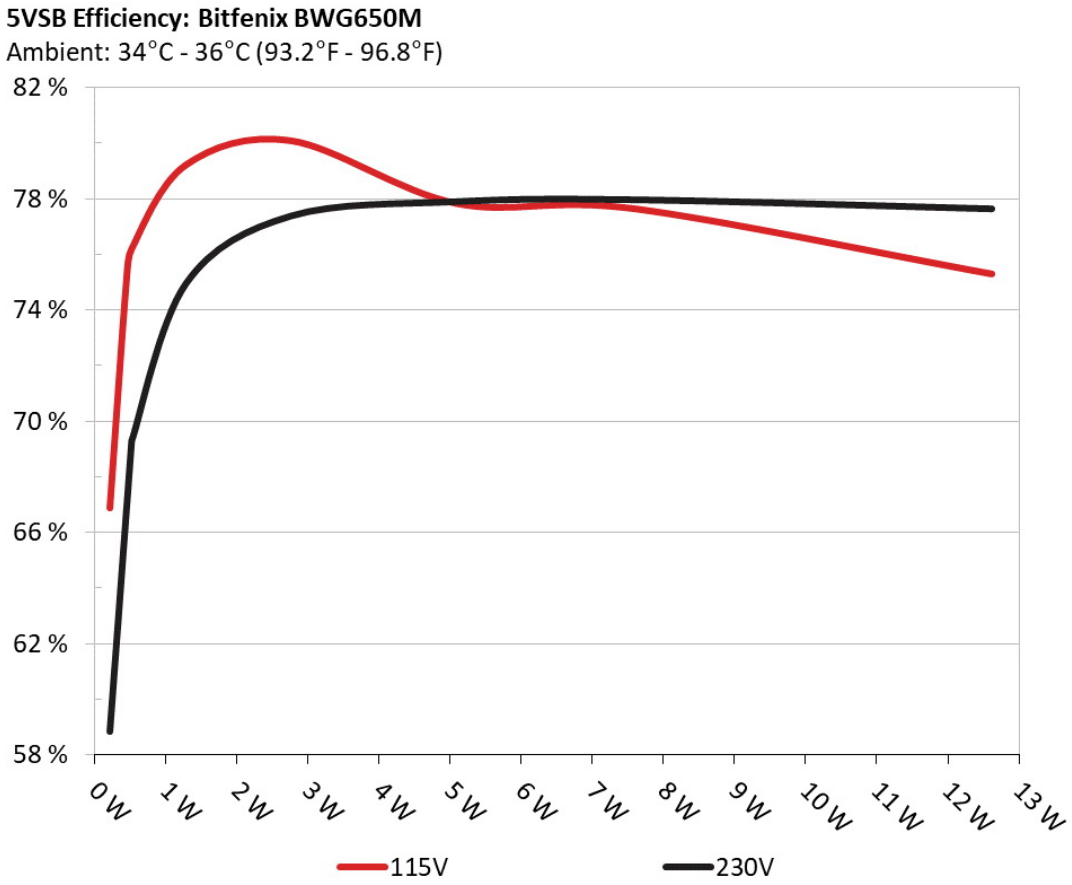
Efficiency under high ambient temperature



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	0.210	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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
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)

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	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

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
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

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	1.208A	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

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
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

Ripple Measurements

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

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

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