EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Bitfenix BWG450M

Lab ID#: 138
Receipt Date: -
Test Date: -

Report:
Report Date: Jun 7, 2018

DUT INFORMATION

Brand	Bitfenix
Manufacturer (OEM)	Channel Well Technology
Series	Whisper
Model Number	BWG450M
Serial Number	711Q00002
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	7
Rated Frequency (Hz)	47-63
Rated Power (W)	450
Type	ATX12V
Cooling	135mm Hydro Dynamic Bearing Fan (DF1352512SEMN)
Semi-Passive Operation	✗
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	12V	12V	5VSB	-12V
Max. Power	Amps	20	20	25	25	25	2.5	0.3
	Watts	100		450			12.5	3.6
Total Max. Power (W)		450						

CABLES AND CONNECTORS

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

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.669
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	78.014
Standby Power Consumption (W) -115V	0.0464233
Standby Power Consumption (W) -230V	0.0712531
Average PF	0.979
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	11.63
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A++

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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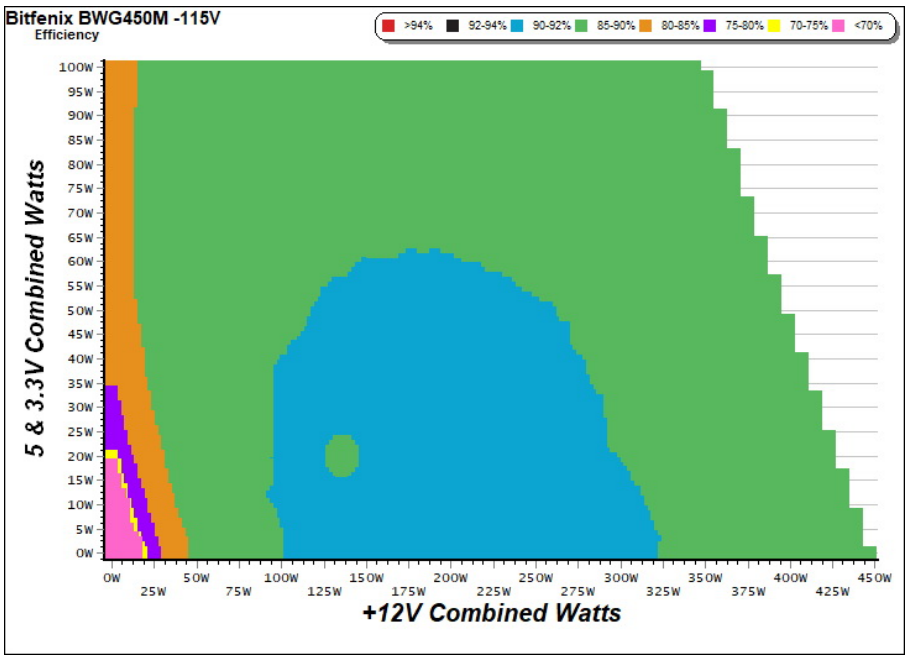
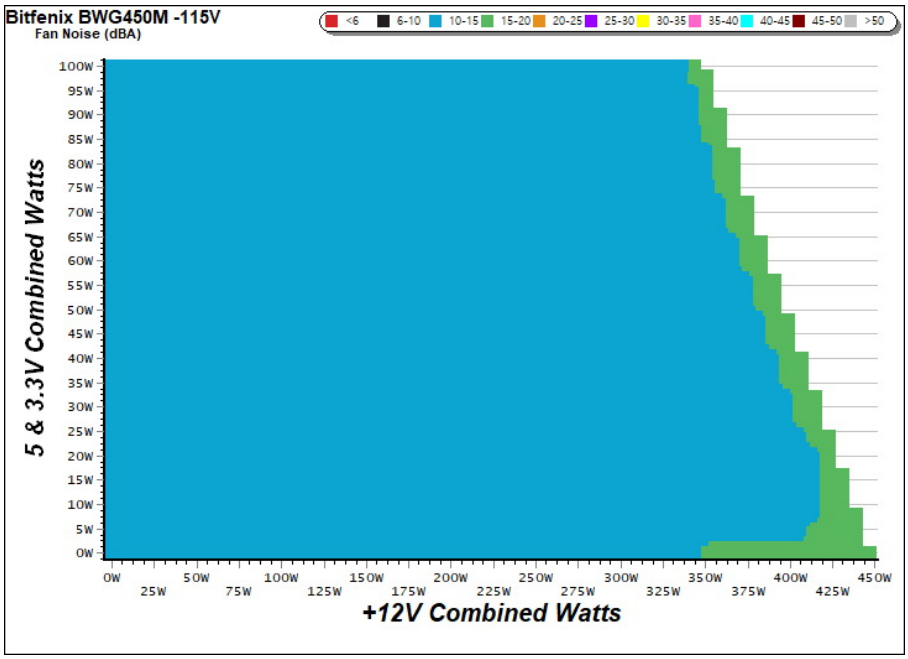
EFFICIENCY GRAPH



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



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

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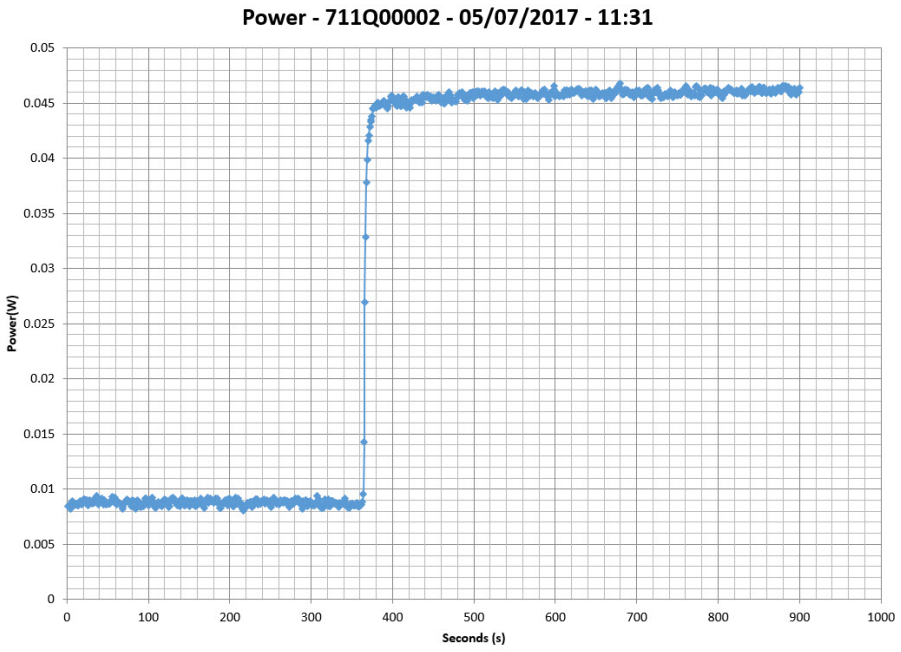
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.212	67.949%	0.031
	5.085V	0.312		115.16V
2	0.087A	0.443	75.212%	0.058
	5.084V	0.589		115.16V
3	0.542A	2.750	79.895%	0.260
	5.073V	3.442		115.14V
4	1.002A	5.073	77.926%	0.360
	5.063V	6.510		115.14V
5	1.502A	7.585	77.787%	0.412
	5.051V	9.751		115.14V
6	2.501A	12.576	75.541%	0.462
	5.028V	16.648		115.14V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.212	58.242%	0.011
	5.086V	0.364		230.39V
2	0.087A	0.443	69.327%	0.019
	5.085V	0.639		230.39V
3	0.542A	2.750	77.052%	0.101
	5.074V	3.569		230.38V
4	1.002A	5.074	78.134%	0.169
	5.063V	6.494		230.38V
5	1.502A	7.585	78.204%	0.227
	5.051V	9.699		230.39V
6	2.501A	12.577	77.867%	0.304
	5.028V	16.152		230.39V

VAMPIRE POWER -115V



INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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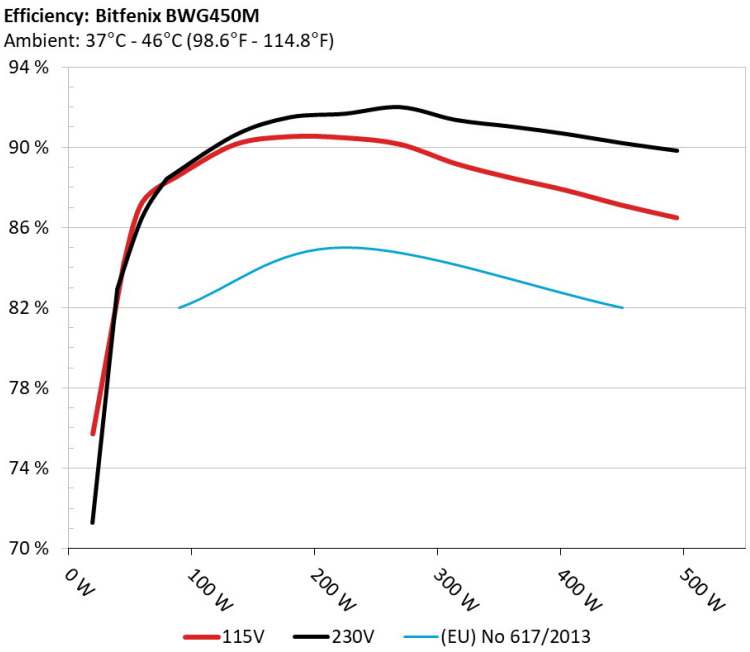
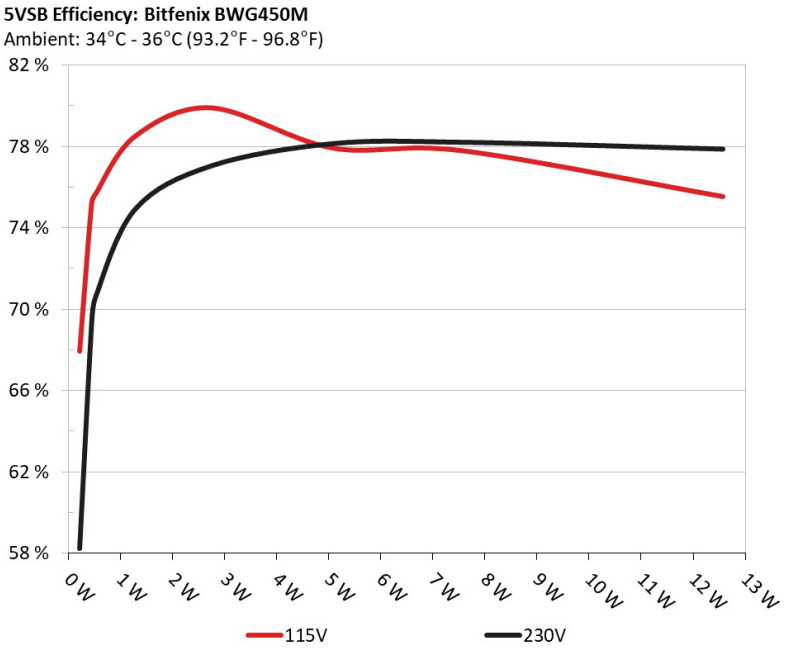
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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



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This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input

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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	1.920A	1.994A	1.969A	0.986A	44.770	84.034%	470	11.6	38.39°C	0.932
	12.077V	5.019V	3.345V	5.059V	53.276				43.41°C	115.18V
2	4.880A	2.988A	2.961A	1.186A	89.755	88.589%	470	11.6	38.54°C	0.967
	12.069V	5.012V	3.340V	5.053V	101.316				43.97°C	115.17V
3	8.191A	3.499A	3.474A	1.385A	134.896	90.116%	470	11.6	38.83°C	0.976
	12.062V	5.006V	3.336V	5.047V	149.692				44.56°C	115.16V
4	11.496A	4.005A	3.958A	1.585A	179.786	90.512%	470	11.6	39.07°C	0.982
	12.055V	5.000V	3.332V	5.040V	198.632				45.39°C	115.16V
5	14.469A	5.000A	4.955A	1.786A	224.723	90.453%	470	11.6	39.64°C	0.984
	12.046V	4.990V	3.328V	5.033V	248.441				46.63°C	115.16V
6	17.440A	6.018A	5.955A	1.987A	269.711	90.127%	470	11.6	40.46°C	0.985
	12.038V	4.984V	3.323V	5.026V	299.255				47.93°C	115.16V
7	20.419A	7.031A	6.960A	2.190A	314.675	89.167%	470	11.6	41.30°C	0.984
	12.028V	4.977V	3.318V	5.018V	352.906				49.20°C	115.16V
8	23.403A	8.057A	7.964A	2.394A	359.704	88.456%	800	22.4	42.44°C	0.985
	12.019V	4.969V	3.314V	5.010V	406.646				50.79°C	115.16V
9	26.822A	8.566A	8.488A	2.394A	404.755	87.832%	1150	32.3	43.73°C	0.984
	12.011V	4.963V	3.310V	5.007V	460.829				52.53°C	115.16V
10	30.192A	9.078A	8.983A	2.495A	449.563	87.099%	1455	39.2	44.87°C	0.984
	12.003V	4.956V	3.306V	5.002V	516.150				53.87°C	115.16V
11	33.959A	9.082A	8.992A	2.497A	494.540	86.468%	1455	39.2	46.08°C	0.985
	11.996V	4.954V	3.302V	5.000V	571.932				55.13°C	115.16V
CL1	0.100A	12.012A	12.004A	0.004A	101.042	84.670%	470	11.6	44.18°C	0.972
	12.043V	4.978V	3.334V	5.075V	119.336				52.88°C	115.17V
CL2	37.476A	1.003A	1.003A	1.002A	463.923	87.994%	1460	39.3	44.44°C	0.984
	12.022V	4.991V	3.316V	5.045V	527.220				53.34°C	115.17V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.206A	0.492A	0.474A	0.196A	19.633	75.695%	470	11.6	0.821
	12.086V	5.029V	3.350V	5.080V	25.937				115.17V
2	2.441A	0.991A	0.984A	0.391A	39.749	84.193%	470	11.6	0.919
	12.082V	5.024V	3.347V	5.074V	47.212				115.17V
3	3.677A	1.487A	1.494A	0.591A	59.865	87.246%	470	11.6	0.949
	12.077V	5.020V	3.345V	5.069V	68.616				115.17V
4	4.903A	1.994A	1.972A	0.786A	79.771	88.595%	470	11.6	0.962
	12.073V	5.017V	3.343V	5.064V	90.030				115.17V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.7 mV	8.4 mV	8.1 mV	5.3 mV	Pass
20% Load	20.5 mV	8.1 mV	8.4 mV	5.9 mV	Pass
30% Load	21.3 mV	8.1 mV	9.0 mV	5.8 mV	Pass
40% Load	20.9 mV	8.6 mV	9.2 mV	7.1 mV	Pass
50% Load	20.7 mV	8.8 mV	9.3 mV	7.3 mV	Pass
60% Load	21.0 mV	8.9 mV	11.4 mV	10.4 mV	Pass
70% Load	22.0 mV	9.7 mV	14.8 mV	10.4 mV	Pass
80% Load	23.5 mV	16.0 mV	17.8 mV	19.8 mV	Pass
90% Load	24.6 mV	10.9 mV	19.0 mV	21.4 mV	Pass
100% Load	26.3 mV	12.2 mV	21.2 mV	18.7 mV	Pass
110% Load	26.2 mV	12.2 mV	20.8 mV	20.7 mV	Pass
Crossload 1	23.8 mV	12.4 mV	10.1 mV	5.6 mV	Pass
Crossload 2	25.0 mV	11.7 mV	18.7 mV	13.9 mV	Pass

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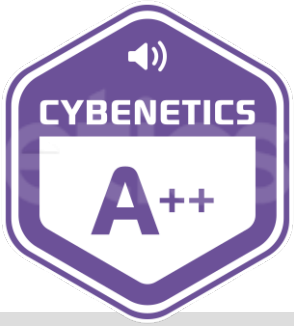
HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	13.96
AC Loss to PWR_OK Hold Up Time (ms)	13.68
PWR_OK Inactive to DC Loss Delay (ms)	0.28

Top side

Power specifications label

CERTIFICATIONS



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