Anex

Bitfenix BWG550M

Lab ID#: 137
Receipt Date: -
Test Date: -

Report:
Report Date: Apr 7, 2018

DUT INFORMATION

Brand	Bitfenix
Manufacturer (OEM)	Channel Well Technology
Series	Whisper
Model Number	BWG550M
Serial Number	707Q00065
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8
Rated Frequency (Hz)	47-63
Rated Power (W)	550
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	30	2.5	0.3
	Watts	100		550			12.5	3.6
Total Max. Power (W)		550						

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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General Data	
Manufacturer (OEM)	CWT
Platform Model	GPU
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CAP004DG
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x GBU806 (600V, 8A @ 100°C)
APFC MOSFETS	2x Champion GP18S50G (500V, 28A @ 150°C, 0.19 Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8S06D (600V, 8A @ 175°C)
Hold-up Cap(s)	1x Nichicon (400V, 390uF, 2000h @ 105°C, GG)
Main Switchers	2x Silan Microelecronics SVF20N50F (500V, 12.6A @ 100°C, 0.27Ohm)
APFC Controller	Champion CM6502S & CM03X Green PFC controller
Switching Controller	Champion CM6901
Topology	Primary side: Half-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	6x Sinopower SM4021NAKP (40V, 100A @ 100°C, 1.6mΩ)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3006D FETs (30V, 57A @ 100°C, 5.5mΩ), 2x UBIQ QM3004D FETs (30V, 40A @ 100°C, 8.5mΩ) PWM Controller: ANPEC APW7159C
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, KY series, KZE series, KMG series), Nichicon (105°C) Polymers: FPCAP (Japan)
Supervisor IC	Sytronix ST9S429-PG14 (OCP [2x 12V channels, OVP, UVP, PG) & Weltrend WD7518D (OCP [2x 12V channels], SCP)
Fan Model	Martech DF1352512SEMN (135mm, 12V, 0.45A, Fluid Dynamic Bearing)
5VSB Circuit	
Standby PWM Controller	TinySwitch-LT TNY177PN (18W Peak)

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.803
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	78.294
Standby Power Consumption (W) -115V	0.0499894
Standby Power Consumption (W) -230V	0.0828786
Average PF	0.981
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	15.37
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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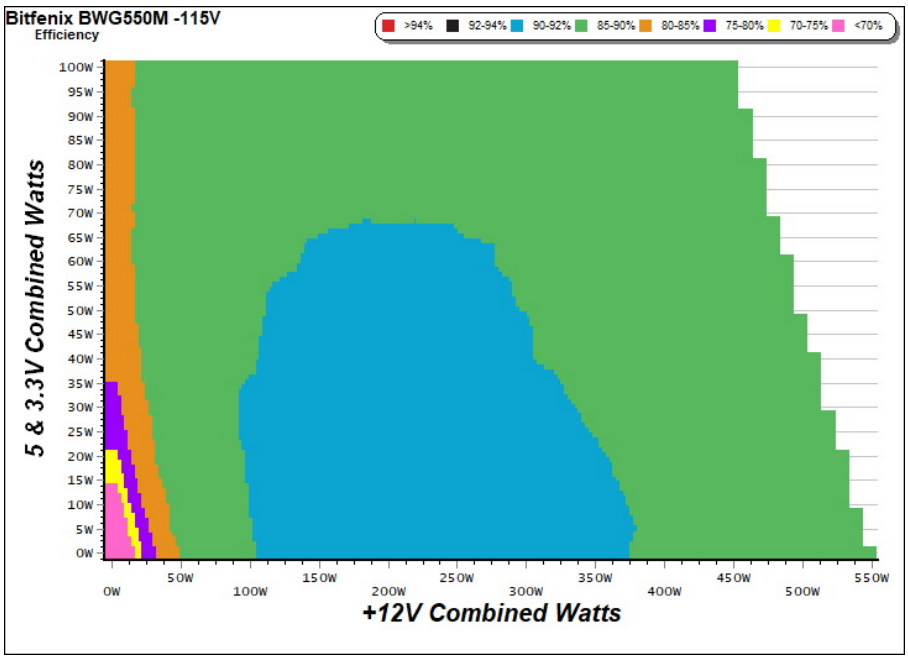
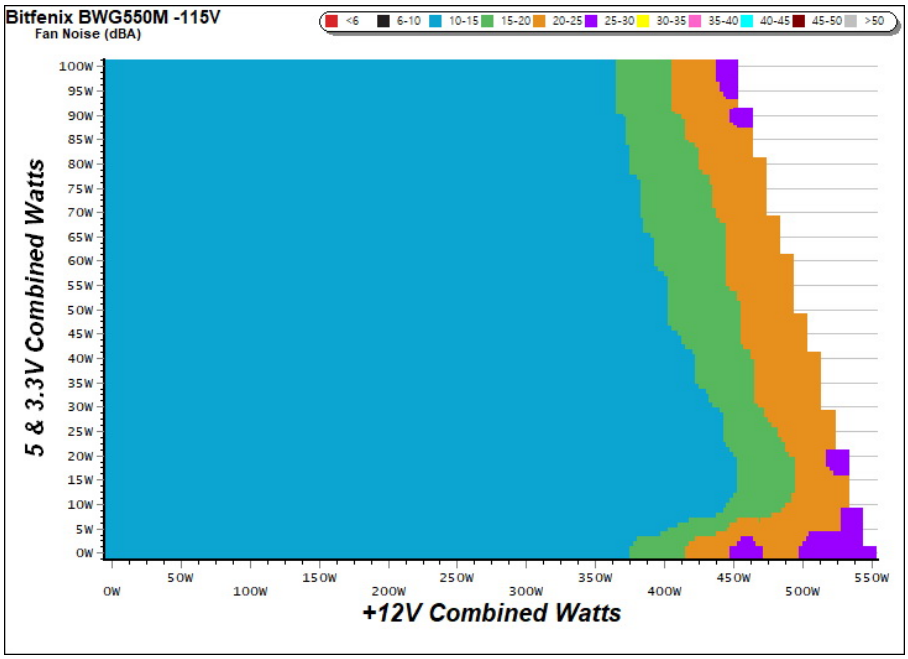
EFFICIENCY GRAPH



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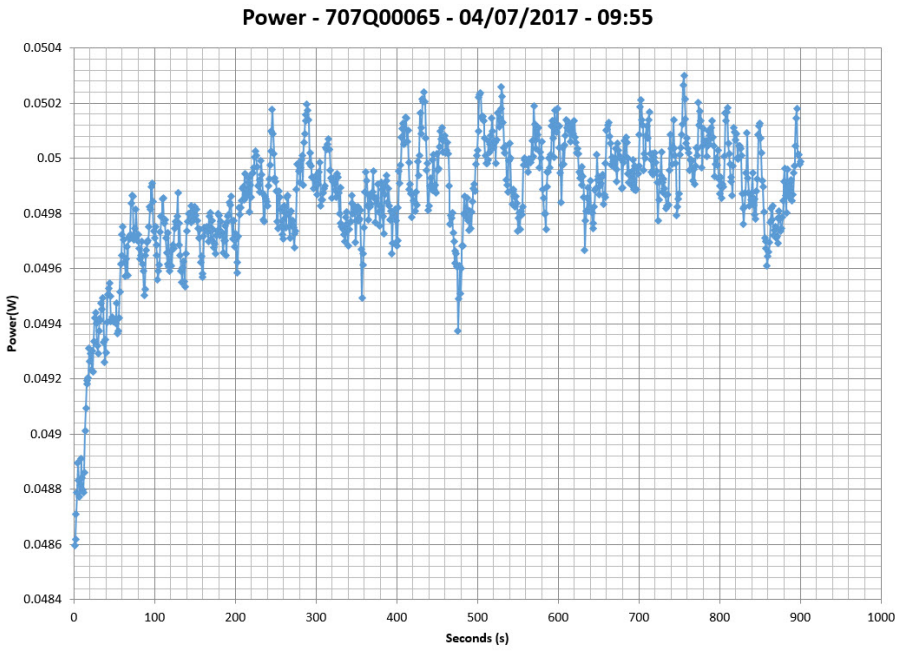
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.212	67.949%	0.032
	5.103V	0.312		115.15V
2	0.087A	0.444	75.254%	0.058
	5.101V	0.590		115.16V
3	0.542A	2.759	79.809%	0.260
	5.090V	3.457		115.13V
4	1.002A	5.090	77.936%	0.358
	5.080V	6.531		115.14V
5	1.502A	7.612	77.785%	0.410
	5.069V	9.786		115.14V
6	2.501A	12.619	75.717%	0.459
	5.045V	16.666		115.14V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.212	58.082%	0.011
	5.103V	0.365		230.37V
2	0.087A	0.443	68.682%	0.019
	5.101V	0.645		230.39V
3	0.542A	2.758	77.320%	0.101
	5.090V	3.567		230.38V
4	1.002A	5.090	78.079%	0.170
	5.080V	6.519		230.38V
5	1.502A	7.610	78.164%	0.228
	5.068V	9.736		230.38V
6	2.501A	12.620	77.887%	0.305
	5.046V	16.203		230.38V

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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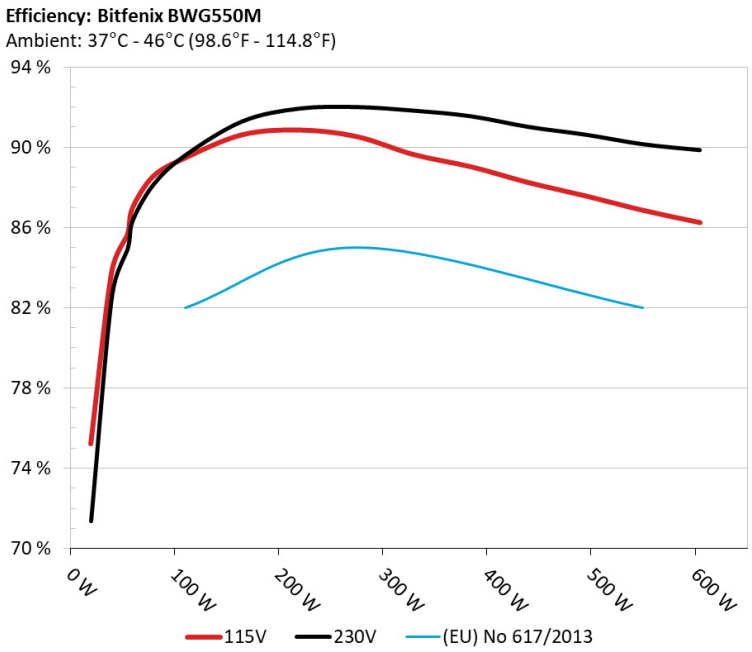
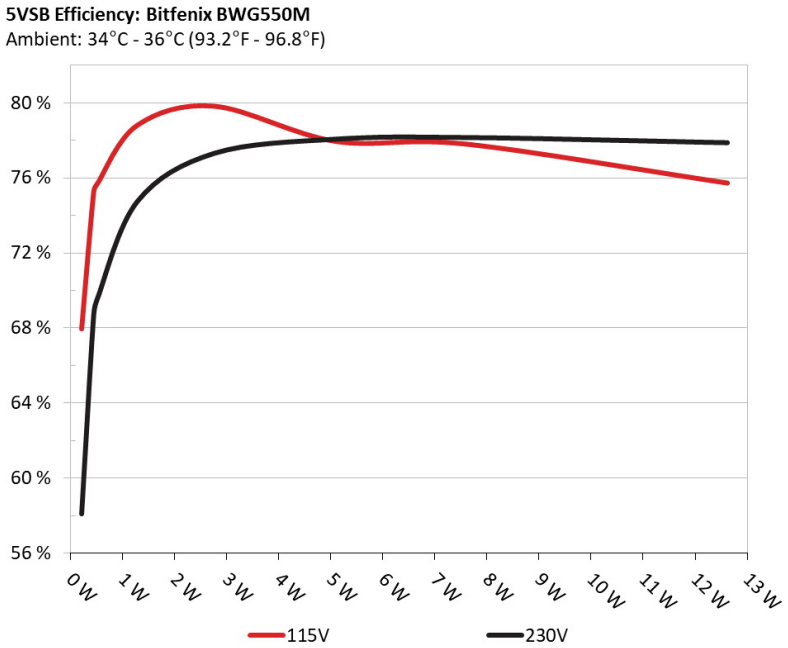
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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



INFO

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)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	2.766A	1.991A	1.984A	0.981A	54.765	85.636%	470	11.6	38.42°C	0.946
	12.014V	5.005V	3.321V	5.077V	63.951				43.24°C	115.17V
2	6.571A	3.002A	2.983A	1.181A	109.759	89.455%	455	10.5	38.55°C	0.975
	12.005V	4.996V	3.315V	5.070V	122.698				43.61°C	115.17V
3	10.734A	3.510A	3.500A	1.380A	164.857	90.622%	470	11.6	39.01°C	0.982
	11.997V	4.988V	3.310V	5.064V	181.917				44.85°C	115.17V
4	14.894A	4.016A	3.991A	1.580A	219.763	90.860%	470	11.6	39.78°C	0.985
	11.990V	4.981V	3.305V	5.057V	241.870				45.89°C	115.17V
5	18.716A	5.022A	4.999A	1.781A	274.695	90.536%	470	11.6	40.12°C	0.986
	11.981V	4.973V	3.299V	5.049V	303.410				47.16°C	115.17V
6	22.539A	6.046A	6.009A	1.980A	329.700	89.633%	470	11.6	41.16°C	0.986
	11.975V	4.965V	3.294V	5.042V	367.833				49.06°C	115.17V
7	26.371A	7.057A	7.020A	2.182A	384.643	89.026%	640	16.4	42.00°C	0.985
	11.967V	4.958V	3.289V	5.034V	432.056				50.12°C	115.17V
8	30.205A	8.086A	8.038A	2.385A	439.601	88.238%	970	27.3	42.72°C	0.985
	11.958V	4.950V	3.284V	5.026V	498.199				51.87°C	115.16V
9	34.476A	8.599A	8.569A	2.385A	494.632	87.572%	1280	35.2	43.48°C	0.985
	11.952V	4.943V	3.278V	5.023V	564.827				52.96°C	115.16V
10	38.709A	9.118A	9.067A	2.489A	549.523	86.855%	1455	39.2	44.68°C	0.986
	11.944V	4.936V	3.274V	5.018V	632.692				54.48°C	115.16V
11	43.323A	9.127A	9.078A	2.489A	604.455	86.240%	1455	39.2	45.99°C	0.988
	11.940V	4.932V	3.270V	5.014V	700.896				56.04°C	115.16V
CL1	0.096A	12.014A	12.004A	0.004A	100.507	84.697%	470	11.6	44.31°C	0.974
	11.994V	4.963V	3.308V	5.095V	118.666				55.31°C	115.18V
CL2	45.782A	1.001A	1.002A	1.001A	560.977	87.698%	1455	39.2	44.88°C	0.987
	11.962V	4.970V	3.287V	5.059V	639.671				54.19°C	115.16V

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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	1.214A	0.488A	0.479A	0.195A	19.627	75.202%	455	10.5	0.819
	12.020V	5.014V	3.328V	5.097V	26.099				115.17V
2	2.454A	0.992A	0.990A	0.391A	39.736	83.794%	470	11.6	0.918
	12.015V	5.010V	3.323V	5.093V	47.421				115.17V
3	3.697A	1.485A	1.503A	0.585A	59.815	86.988%	470	11.6	0.949
	12.013V	5.007V	3.321V	5.087V	68.762				115.18V
4	4.928A	1.996A	1.986A	0.785A	79.751	88.560%	470	11.6	0.965
	12.010V	5.003V	3.319V	5.081V	90.053				115.17V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.2 mV	8.4 mV	7.2 mV	9.0 mV	Pass
20% Load	17.8 mV	8.6 mV	9.0 mV	6.1 mV	Pass
30% Load	17.8 mV	8.3 mV	10.3 mV	7.1 mV	Pass
40% Load	16.7 mV	8.6 mV	11.4 mV	7.4 mV	Pass
50% Load	16.8 mV	8.8 mV	11.8 mV	10.0 mV	Pass
60% Load	19.2 mV	8.9 mV	12.0 mV	11.8 mV	Pass
70% Load	19.2 mV	10.4 mV	14.0 mV	19.5 mV	Pass
80% Load	18.1 mV	10.7 mV	16.9 mV	16.3 mV	Pass
90% Load	18.1 mV	19.1 mV	22.8 mV	18.0 mV	Pass
100% Load	18.6 mV	13.0 mV	21.0 mV	21.1 mV	Pass
110% Load	20.3 mV	13.4 mV	24.1 mV	24.8 mV	Pass
Crossload 1	20.5 mV	12.2 mV	9.5 mV	6.0 mV	Pass
Crossload 2	17.6 mV	11.9 mV	21.0 mV	20.5 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	13.26
AC Loss to PWR_OK Hold Up Time (ms)	12.50
PWR_OK Inactive to DC Loss Delay (ms)	0.76

Top side

Power specifications label

CERTIFICATIONS

CYBENETICS PLATINUM

CYBENETICS A+

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