EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Bitfenix BF450G

Lab ID#: 159
Receipt Date: -
Test Date: -

Report:
Report Date: Aug 14, 2018

DUT INFORMATION

Brand	Bitfenix
Manufacturer (OEM)	Channel Well Technology
Series	Formula Gold Series
Model Number	BF450G
Serial Number	
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	120mm Rifle Bearing Fan (DF1202512SELN)
Semi-Passive Operation	✗
Cable Design	Fixed cables

POWER SPECIFICATIONS

Rail		3.3V	5V	12V1	12V2	12V3	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

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (660mm)	1	1	18-22AWG
4+4 pin EPS12V (670mm)	1	1	18AWG
6+2 pin PCIe (560mm+150mm)	1	2	18AWG
SATA (460mm+150mm+150mm)+4 pin Molex (+150mm)	2	6 / 2	18AWG

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General Data	
Manufacturer (OEM)	CWT
Platform Model	GPS (Modified)
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 GBU606 (600V, 6A @ 100°C)
APFC MOSFETS	2x Champion GP18S50G (500V, 28A @ 150°C, 0.19O)
APFC Boost Diode	1x STMicroelectronics STTH8R06FP (600V, 8A @ 130°C)
Hold-up Cap(s)	1x Nipon Chemi-Con (400V, 390uF, 2000h @ 105°C, KMR series)
Main Switchers	2x F-Cell SVF13N50F (500V, 10A @ 100°C, 0.52O)
APFC Controller	Champion CM6502S & CM03X Green PFC controller
LLC Resonant Controller	Champion CM6901
Topology	Primary side: Half-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Inte ational Rectifier IRFH7004TRPBF (40 V, 164 A @ 100°C, 1.4Ohm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3006D FETs (30 V, 57 A @ 100°C, 5.5Ohm) 2x UBIQ QM3004D FETs (30 V, 40 A @ 100°C, 8.5Ohm) PWM Controller: ANPEC APW7159C
Filtering Capacitors	Electrolytics: Chemi-Con (105°C, KY series, KZE series) Polymers: FPCAP (Japan)
Supervisor IC	Sytronix ST9S429-PG14 (OCP [2x 12V channels, OVP, UVP, PG), Weltrend WD7518D (OCP [2x 12V channels], SCP) & UTC LM393G
Fan Model	Martech DF1202512SEMN (120mm, 12V, 0.16A, 1630 RPM, Rifle 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	88.770
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	77.739
Standby Power Consumption (W) -115V	0.0421894
Standby Power Consumption (W) -230V	0.0579340
Average PF	0.985
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	10.30
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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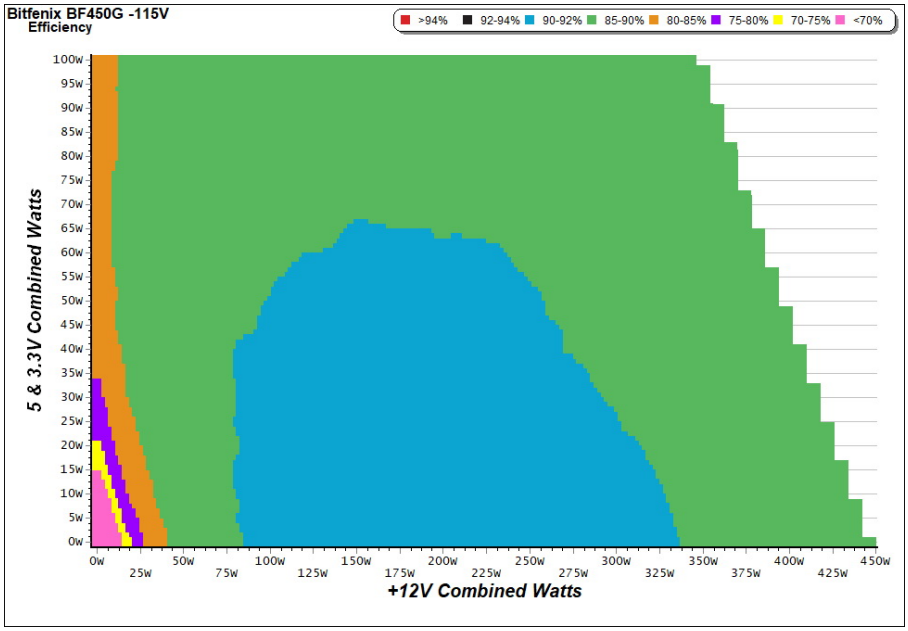
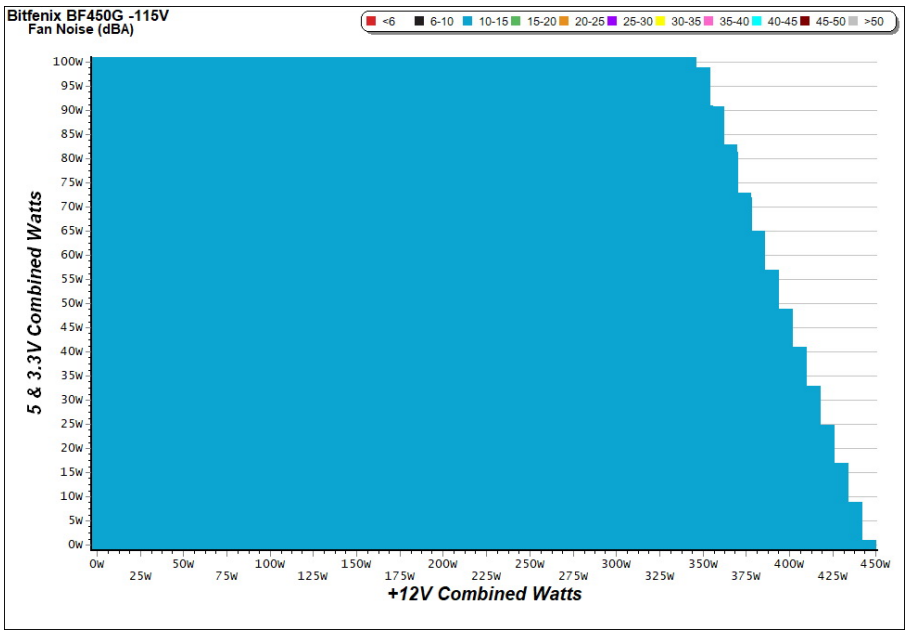
EFFICIENCY GRAPH



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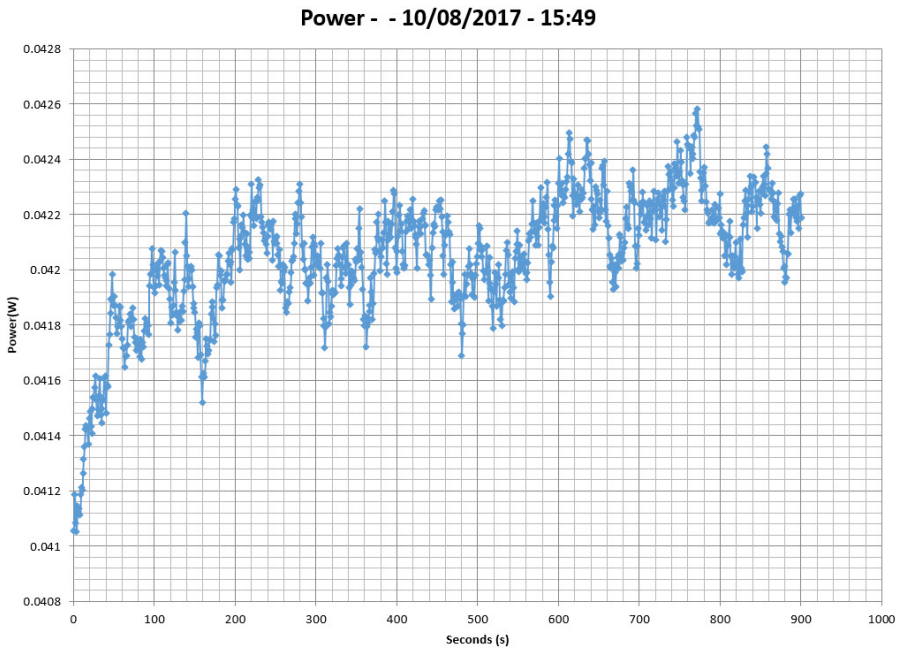
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.211	69.637%	0.030
	5.095V	0.303		115.20V
2	0.087A	0.443	75.726%	0.058
	5.094V	0.585		115.20V
3	0.542A	2.754	79.526%	0.266
	5.083V	3.463		115.18V
4	1.002A	5.081	77.727%	0.374
	5.071V	6.537		115.18V
5	1.501A	7.595	77.524%	0.430
	5.059V	9.797		115.19V
6	2.501A	12.587	75.196%	0.484
	5.033V	16.739		115.18V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.211	63.174%	0.010
	5.095V	0.334		230.48V
2	0.087A	0.443	71.222%	0.019
	5.094V	0.622		230.48V
3	0.542A	2.754	76.288%	0.103
	5.083V	3.610		230.47V
4	1.002A	5.080	78.034%	0.172
	5.071V	6.510		230.47V
5	1.502A	7.595	78.025%	0.232
	5.058V	9.734		230.47V
6	2.501A	12.586	77.807%	0.313
	5.032V	16.176		230.47V

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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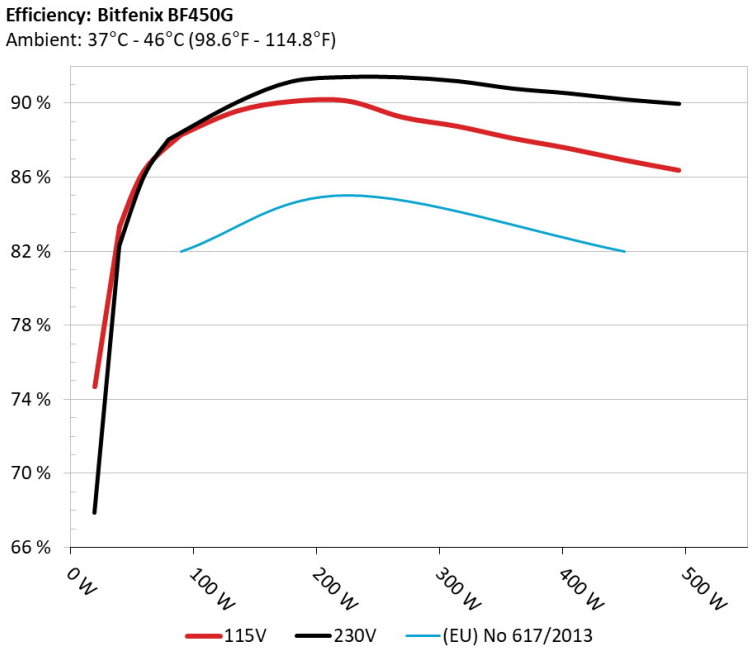
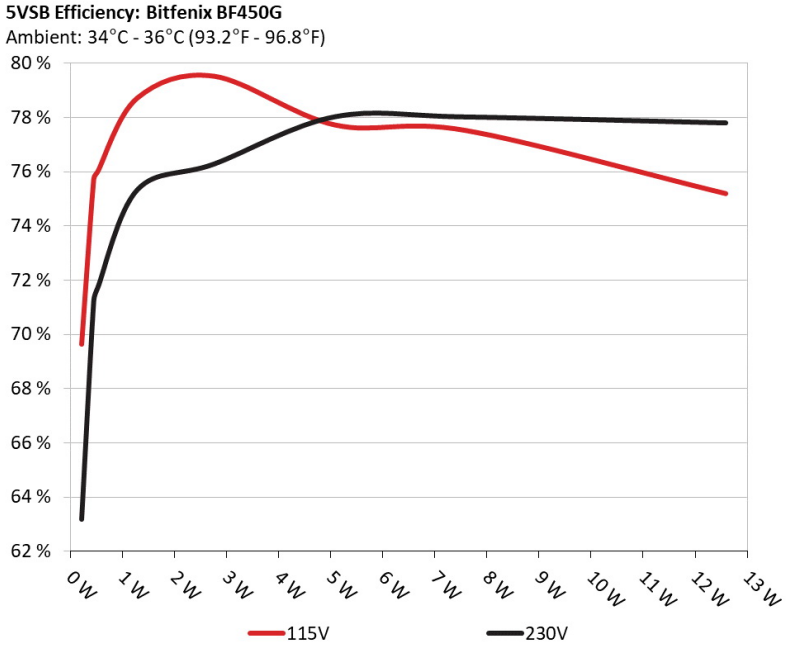
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	1.922A	1.986A	1.973A	0.985A	44.785	83.350%	537	10.3	38.34°C	0.944
	12.064V	5.047V	3.341V	5.060V	53.731				42.89°C	115.22V
2	4.883A	2.972A	2.963A	1.186A	89.731	88.092%	537	10.3	38.70°C	0.977
	12.056V	5.042V	3.338V	5.047V	101.860				43.84°C	115.22V
3	8.201A	3.478A	3.474A	1.388A	134.910	89.587%	537	10.3	39.02°C	0.985
	12.048V	5.039V	3.336V	5.035V	150.591				45.04°C	115.22V
4	11.508A	3.974A	3.960A	1.590A	179.765	90.115%	537	10.3	39.60°C	0.988
	12.041V	5.036V	3.333V	5.023V	199.484				46.94°C	115.21V
5	14.481A	4.973A	4.949A	1.794A	224.742	90.142%	545	10.9	39.87°C	0.990
	12.033V	5.033V	3.330V	5.007V	249.319				48.09°C	115.21V
6	17.456A	5.967A	5.947A	2.000A	269.716	89.261%	537	10.3	40.67°C	0.991
	12.026V	5.030V	3.328V	4.993V	302.167				50.37°C	115.21V
7	20.435A	6.971A	6.947A	2.208A	314.693	88.765%	612	12.7	41.84°C	0.992
	12.018V	5.025V	3.323V	4.978V	354.524				52.35°C	115.21V
8	23.422A	7.964A	7.947A	2.415A	359.646	88.116%	810	20.5	42.76°C	0.991
	12.009V	5.022V	3.320V	4.965V	408.152				53.43°C	115.20V
9	26.844A	8.474A	8.469A	2.419A	404.748	87.575%	1019	26.5	43.75°C	0.991
	12.000V	5.019V	3.318V	4.956V	462.175				55.01°C	115.21V
10	30.216A	8.975A	8.955A	2.525A	449.552	86.948%	1252	32.4	44.94°C	0.991
	11.992V	5.017V	3.315V	4.946V	517.035				56.45°C	115.21V
11	33.987A	8.983A	8.960A	2.527A	494.561	86.391%	1479	36.9	45.98°C	0.992
	11.985V	5.015V	3.314V	4.940V	572.471				57.82°C	115.20V
CL1	0.096A	12.014A	12.004A	0.004A	101.473	83.803%	537	10.3	43.51°C	0.981
	12.041V	5.025V	3.326V	5.051V	121.085				54.29°C	115.22V
CL2	37.471A	1.005A	1.001A	1.001A	463.306	88.068%	1226	31.4	44.70°C	0.992
	12.007V	5.027V	3.327V	5.005V	526.079				55.63°C	115.21V

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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	0.493A	0.476A	0.196A	19.637	74.680%	537	10.3	0.838
	12.071V	5.049V	3.344V	5.087V	26.295				115.23V
2	2.445A	0.990A	0.985A	0.391A	39.775	83.279%	537	10.3	0.932
	12.066V	5.048V	3.341V	5.078V	47.761				115.22V
3	3.680A	1.477A	1.494A	0.590A	59.824	86.393%	537	10.3	0.962
	12.062V	5.047V	3.340V	5.070V	69.246				115.22V
4	4.908A	1.986A	1.974A	0.790A	79.792	88.310%	537	10.3	0.973
	12.059V	5.044V	3.339V	5.060V	90.354				115.22V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	16.6 mV	11.9 mV	6.7 mV	10.4 mV	Pass
20% Load	24.4 mV	13.0 mV	6.3 mV	8.9 mV	Pass
30% Load	28.9 mV	13.2 mV	6.6 mV	10.1 mV	Pass
40% Load	28.2 mV	14.7 mV	6.9 mV	11.6 mV	Pass
50% Load	27.7 mV	15.8 mV	8.2 mV	11.2 mV	Pass
60% Load	32.9 mV	17.7 mV	8.3 mV	12.0 mV	Pass
70% Load	33.2 mV	18.0 mV	10.0 mV	12.6 mV	Pass
80% Load	42.2 mV	93.0 mV	52.8 mV	23.8 mV	Fail
90% Load	35.2 mV	20.2 mV	8.8 mV	24.6 mV	Pass
100% Load	36.6 mV	22.0 mV	9.6 mV	19.8 mV	Pass
110% Load	37.4 mV	24.0 mV	15.9 mV	20.8 mV	Pass
Crossload 1	35.5 mV	18.4 mV	7.6 mV	9.2 mV	Pass
Crossload 2	29.9 mV	20.2 mV	9.3 mV	13.4 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	17.30
AC Loss to PWR_OK Hold Up Time (ms)	16.58
PWR_OK Inactive to DC Loss Delay (ms)	0.72

Top side

Power specifications label

CERTIFICATIONS

CYBENETICS PLATINUM

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