

Anex

Bitfenix BF450G (Sample #2)

Lab ID#: 204

Receipt Date: -

Test Date: -

Report:

Report Date: Oct 27, 2018

DUT INFORMATION

Brand	Bitfenix
Manufacturer (OEM)	Channel Well Technology
Series	Formula Gold Series
Model Number	BF450G (Sample #2)
Serial Number	735Q00355
DUT Notes	Edited on 05/18/2018

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	X
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, 0.190)
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, 0.520)
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 International Rectifier IRFH7004TRPBF (40 V, 164 A @ 100°C, 1.40hm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3006D FETs (30 V, 57 A @ 100°C, 5.50hm) 2x UBIQ QM3004D FETs (30 V, 40 A @ 100°C, 8.50hm) 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	89.130
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	77.848
Standby Power Consumption (W) -115V	0.0455600
Standby Power Consumption (W) -230V	0.0704738
Average PF	0.982
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	10.32
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A++

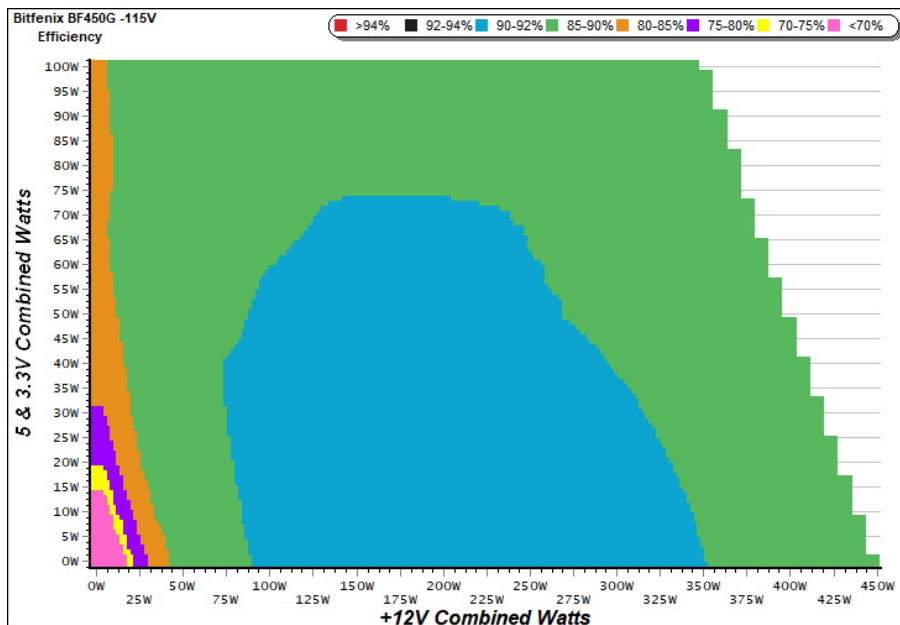
TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 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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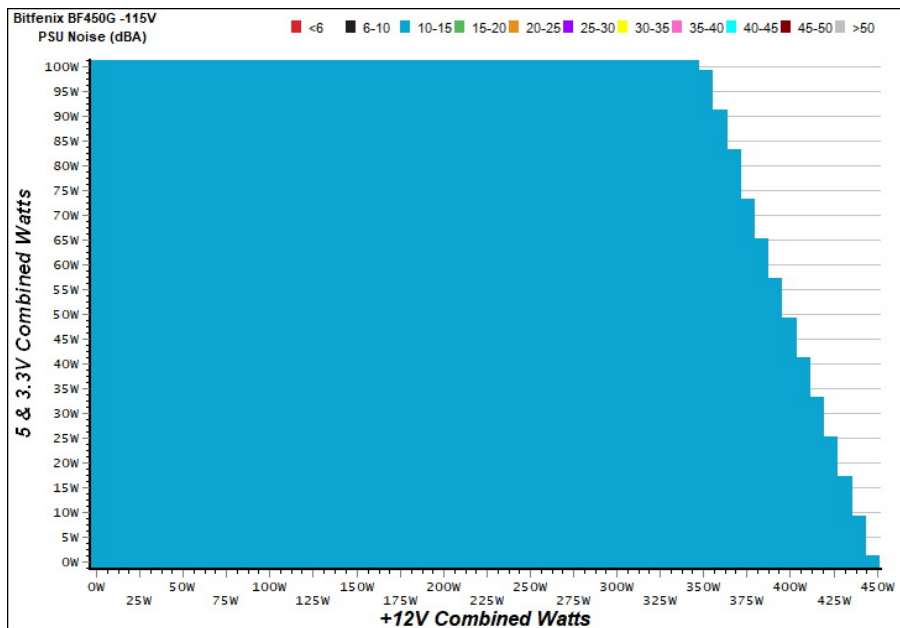
EFFICIENCY GRAPH



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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Bitfenix BF450G (Sample #2)

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

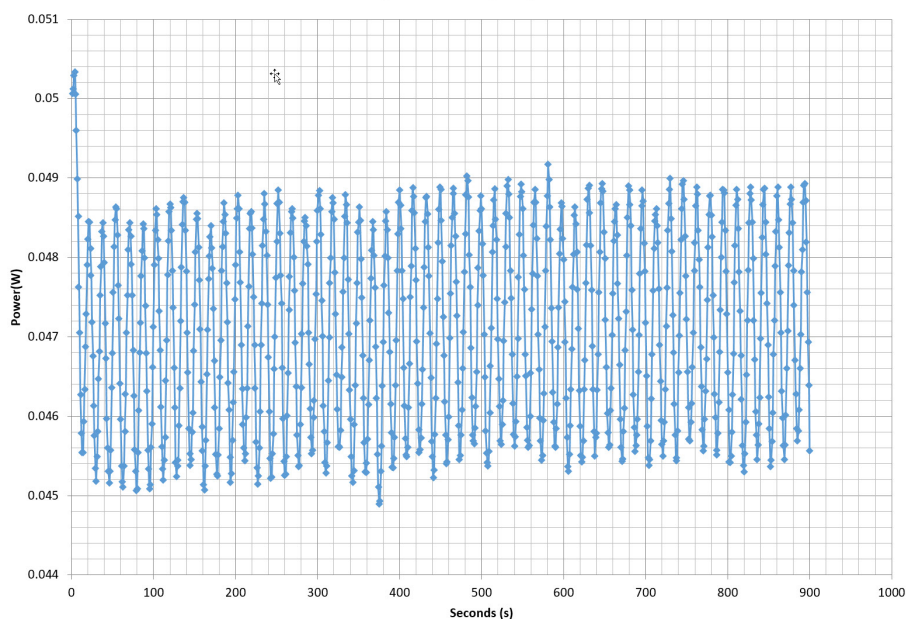
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	69.789%	0.025
	5.112V	0.331		115.39V
2	0.090A	0.461	75.081%	0.045
	5.112V	0.614		115.38V
3	0.550A	2.807	79.609%	0.224
	5.102V	3.526		115.37V
4	1.000A	5.091	77.571%	0.336
	5.090V	6.563		115.38V
5	1.500A	7.615	77.459%	0.404
	5.076V	9.831		115.37V
6	2.500A	12.625	75.140%	0.473
	5.050V	16.802		115.36V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	62.772%	0.009
	5.112V	0.368		230.96V
2	0.090A	0.461	70.706%	0.017
	5.111V	0.652		230.96V
3	0.550A	2.806	77.450%	0.088
	5.100V	3.623		230.96V
4	1.000A	5.090	78.139%	0.151
	5.089V	6.514		230.95V
5	1.500A	7.614	78.189%	0.209
	5.076V	9.738		230.95V
6	2.500A	12.624	77.964%	0.293
	5.049V	16.192		230.94V

VAMPIRE POWER -115V

Power - 735Q00355 - 26/10/2017 - 14:13



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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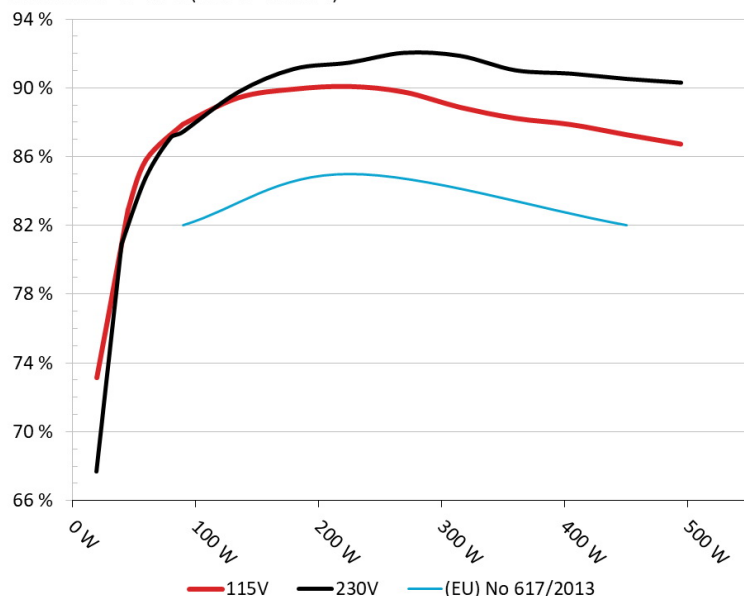
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Bitfenix BF450G

Ambient: 37°C - 46°C (98.6°F - 114.8°F)



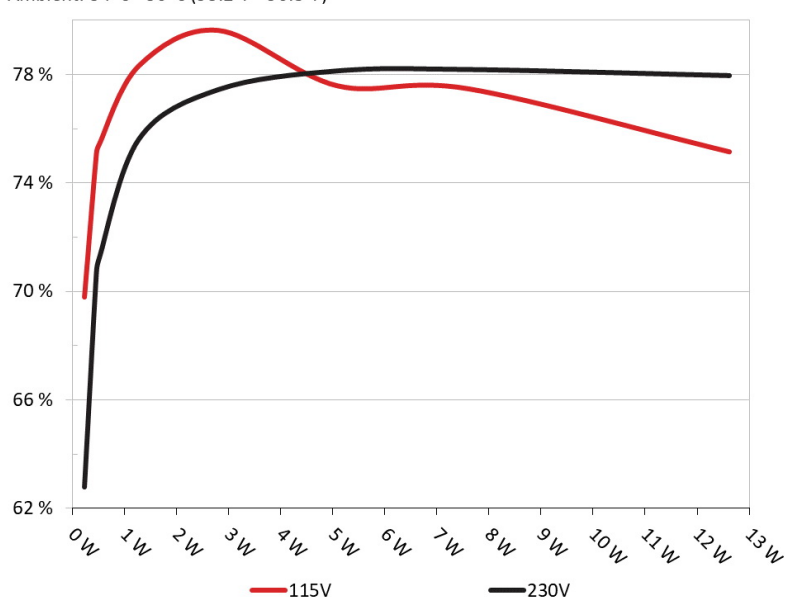
INFO

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

5VSB Efficiency: Bitfenix BF450G

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



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)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	1.944A	1.983A	1.981A	0.985A	44.893	82.577%	537	10.3	38.21°C	0.936
	11.978V	5.043V	3.334V	5.079V	54.365				44.74°C	115.32V
2	4.885A	2.976A	2.971A	1.184A	89.393	87.655%	537	10.3	38.67°C	0.972
	11.973V	5.041V	3.333V	5.068V	101.983				45.89°C	115.26V
3	8.229A	3.473A	3.454A	1.384A	134.497	89.423%	537	10.3	38.93°C	0.982
	11.968V	5.040V	3.332V	5.058V	150.406				47.48°C	115.20V
4	11.576A	3.970A	3.964A	1.585A	179.698	89.925%	537	10.3	39.55°C	0.986
	11.963V	5.040V	3.331V	5.048V	199.831				49.23°C	115.13V
5	14.595A	4.963A	4.955A	1.787A	225.029	90.080%	537	10.3	40.18°C	0.989
	11.957V	5.039V	3.331V	5.038V	249.811				51.38°C	115.16V
6	17.546A	5.957A	5.946A	1.990A	269.524	89.756%	537	10.3	40.50°C	0.990
	11.952V	5.038V	3.330V	5.027V	300.284				54.09°C	115.09V
7	20.566A	6.952A	6.937A	2.194A	314.836	88.872%	678	15.3	41.83°C	0.990
	11.948V	5.036V	3.330V	5.015V	354.258				56.42°C	115.02V
8	23.591A	7.947A	7.932A	2.399A	360.148	88.233%	854	21.2	42.67°C	0.990
	11.942V	5.035V	3.329V	5.004V	408.177				57.83°C	114.95V
9	27.018A	8.446A	8.414A	2.401A	405.035	87.870%	1182	31.1	43.34°C	0.990
	11.937V	5.034V	3.328V	4.999V	460.950				58.67°C	114.99V
10	30.384A	8.945A	8.930A	2.505A	449.768	87.287%	1346	34.3	45.21°C	0.990
	11.932V	5.032V	3.327V	4.992V	515.274				60.92°C	114.92V
11	34.153A	8.948A	8.931A	2.507A	494.579	86.736%	1630	39.4	46.29°C	0.991
	11.927V	5.032V	3.326V	4.988V	570.212				62.27°C	114.85V
CL1	0.738A	12.001A	12.000A	0.000A	109.284	84.933%	545	10.9	43.59°C	0.978
	11.960V	5.035V	3.336V	5.082V	128.671				55.49°C	115.22V
CL2	37.514A	1.001A	1.000A	1.000A	461.365	88.330%	1346	34.3	45.13°C	0.991
	11.941V	5.037V	3.328V	5.041V	522.320				58.13°C	114.92V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.204A	0.496A	0.478A	0.196A	19.521	73.167%	537	10.3	0.828
	11.981V	5.045V	3.335V	5.104V	26.680				115.35V
2	2.475A	0.992A	0.990A	0.393A	39.958	82.931%	537	10.3	0.923
	11.980V	5.044V	3.334V	5.097V	48.182				115.33V
3	3.679A	1.487A	1.470A	0.590A	59.468	85.816%	537	10.3	0.953
	11.978V	5.043V	3.334V	5.089V	69.297				115.30V
4	4.950A	1.982A	1.980A	0.787A	79.870	87.881%	537	10.3	0.968
	11.975V	5.043V	3.333V	5.082V	90.884				115.27V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.5 mV	7.0 mV	6.2 mV	9.2 mV	Pass
20% Load	22.4 mV	6.1 mV	5.9 mV	9.1 mV	Pass
30% Load	24.7 mV	6.6 mV	6.3 mV	10.5 mV	Pass
40% Load	22.5 mV	6.7 mV	7.0 mV	10.7 mV	Pass
50% Load	21.9 mV	7.8 mV	7.4 mV	11.0 mV	Pass
60% Load	24.3 mV	8.8 mV	8.3 mV	11.6 mV	Pass
70% Load	26.3 mV	10.5 mV	10.3 mV	12.1 mV	Pass
80% Load	25.7 mV	14.3 mV	15.3 mV	18.5 mV	Pass
90% Load	26.3 mV	16.8 mV	18.8 mV	19.5 mV	Pass
100% Load	29.0 mV	13.9 mV	15.2 mV	21.7 mV	Pass
110% Load	27.7 mV	13.9 mV	14.3 mV	25.1 mV	Pass
Crossload 1	28.0 mV	12.6 mV	11.5 mV	6.4 mV	Pass
Crossload 2	24.5 mV	10.3 mV	13.5 mV	11.5 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	18.0
AC Loss to PWR_OK Hold Up Time (ms)	15.7
PWR_OK Inactive to DC Loss Delay (ms)	2.3

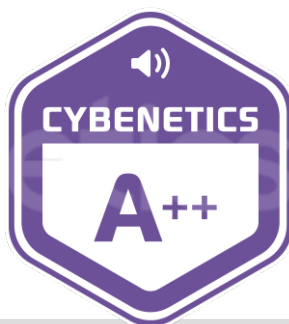


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Power specifications label

CERTIFICATIONS



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