Cybenetics

EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Be quiet! Straight Power 11 Platinum 550W

Lab ID#: BQ55001622
Receipt Date: Mar 4, 2020
Test Date: Mar 17, 2020

Report: 20PS1622A
Report Date: Mar 20, 2020

DUT INFORMATION

Brand	Be quiet!
Manufacturer (OEM)	FSP
Series	Straight Power 11 Platinum
Model Number	E11-PT-550
Serial Number	305S9491000805
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60
Rated Power (W)	550
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (BQSIW3-13525-MF)
Semi-Passive Operation	✗
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	18	3	0.3
	Watts	110		549.6	15	3.6
Total Max. Power (W)		550				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16-22AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
6+2 pin PCIe (600mm)	2	2	18AWG	No
SATA (550mm+150mm+150mm+150mm)	1	4	18AWG	No
SATA (550mm+150mm+150mm) / 4-pin Molex (+150mm)	1	3 / 1	18AWG	No
SATA (550mm+150mm) / 4-pin Molex (+150mm+150mm)	1	2 / 2	18AWG	No
FDD Adapter (150mm)	1	1	22AWG	No
AC Power Cord (1360mm) - C13 coupler	1	1	18AWG	-

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General Data	-
Manufacturer (OEM)	FSP
PCB Type	Double Sided
Primary Side	-
Transient Filter	5x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor (SCK-018)
Bridge Rectifier(s)	1x
APFC MOSFETs	2x ROHM R6020KNX (600V, 20A, 0.196Ohm)
APFC Boost Diode	1x Infineon IDH04G65C6 (650V, 4A @ 150°C)
Hold-up Cap(s)	1x Rubycon (450V, 220uF, 3,000h @ 105°C, MXK) & 1x Rubycon (450V, 180uF, 5,000h @ 105°C, VXH)
Main Switchers	4x STMicroelectronics STF18N60M2 (650V, 8A @ 100°C, 0.28Ohm)
IC Driver	2x Silicon Labs Si8233BD
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901X
Topology	Primary side: Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4mOhm)
5V & 3.3V	DC-DC Converters: 8x Advanced Power AP3R303GMT (30V, 25A @ 70°C, 3.3mOhm) PWM Controllers: 2x ANPEC APW7164
Filtering Capacitors	Electrolytic: 4x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 2x Nippon Chemi-Con (5-6,000h @ 105°C, KZH), 4x Rubycon (3-6,000h @ 105°C, YXG), 1x Rubycon (6-10,000h @ 105°C, ZLH) Polymer: 4x FPCAP, 18x United Chemi-Con
Supervisor IC	Weltrend WT7527 (OCP, OVP, UVP, SCP, PG)
Fan Model	be quite! BQ SIW3-13525-MF (135mm, 12V, 0.4A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifier	1x Silan Microelectronics SVF3N80F FET (800V, 1.9A @ 100°C, 4.8Ohm)
Standby PWM Controller	Leadtrend LD7750R

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	90.147%
Efficiency With 10W (≤500W) or 2% (>500W)	61.973
Average Efficiency 5VSB	80.508%
Standby Power Consumption (W)	0.1441950
Average PF	0.990
Avg Noise Output	9.18 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A++

230V

Average Efficiency	92.110%
Average Efficiency 5VSB	78.901%
Standby Power Consumption (W)	0.1725600
Average PF	0.966
Avg Noise Output	10.21 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A++

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2

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

Hold-Up Time (ms)	21.7
AC Loss to PWR_OK Hold Up Time (ms)	17.8
PWR_OK Inactive to DC Loss Delay (ms)	3.9

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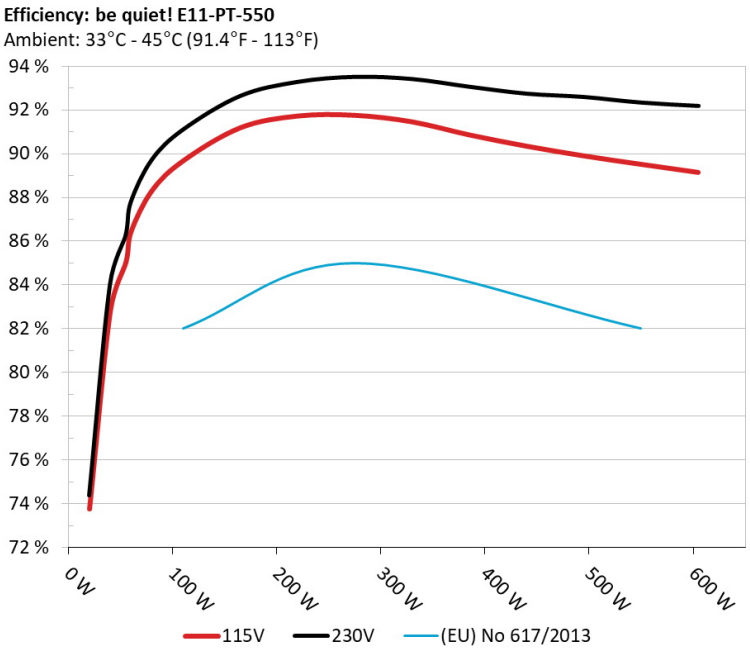
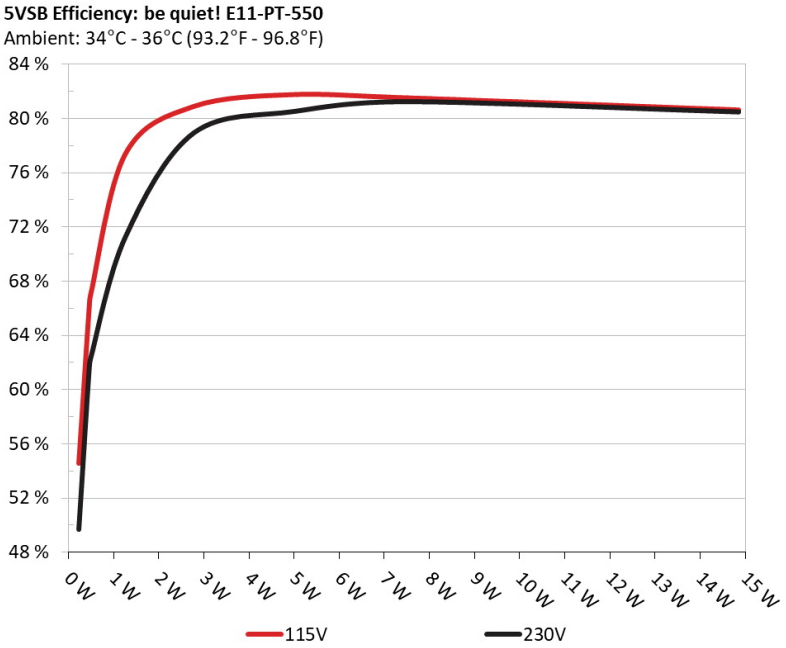
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228	54.545%	0.042
	5.057V	0.418		115.16V
2	0.090A	0.455	65.942%	0.099
	5.054V	0.690		115.16V
3	0.550A	2.771	80.905%	0.307
	5.037V	3.425		115.14V
4	1.000A	5.022	81.792%	0.374
	5.021V	6.140		115.13V
5	1.500A	7.506	81.543%	0.411
	5.003V	9.205		115.13V
6	3.000A	14.848	80.652%	0.463
	4.949V	18.410		115.11V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228	49.673%	0.021
	5.057V	0.459		230.35V
2	0.090A	0.455	61.404%	0.033
	5.054V	0.741		230.37V
3	0.550A	2.771	78.901%	0.139
	5.037V	3.512		230.37V
4	1.000A	5.022	80.507%	0.210
	5.021V	6.238		230.36V
5	1.500A	7.506	81.216%	0.262
	5.003V	9.242		230.35V
6	3.000A	14.848	80.460%	0.339
	4.949V	18.454		230.33V

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115V

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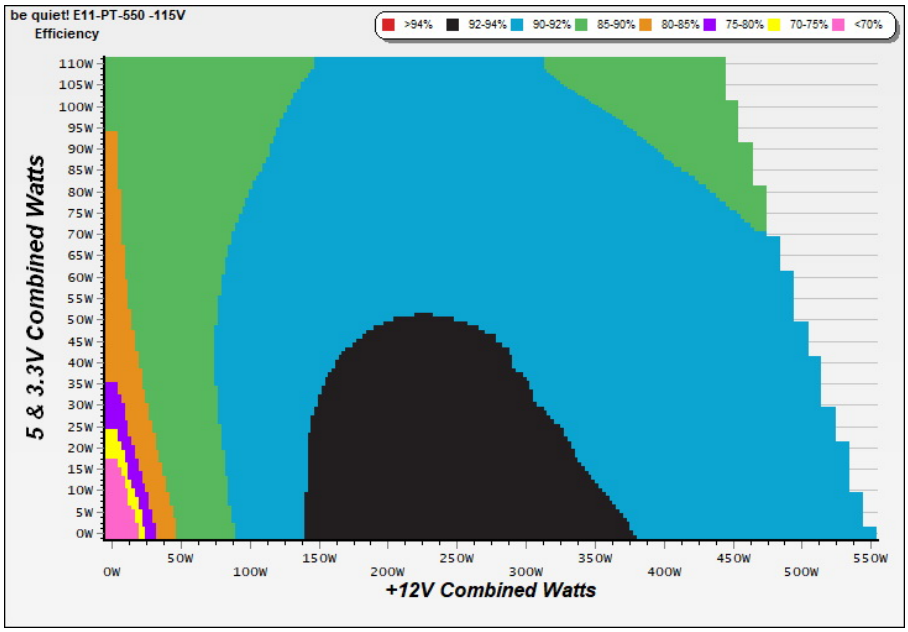
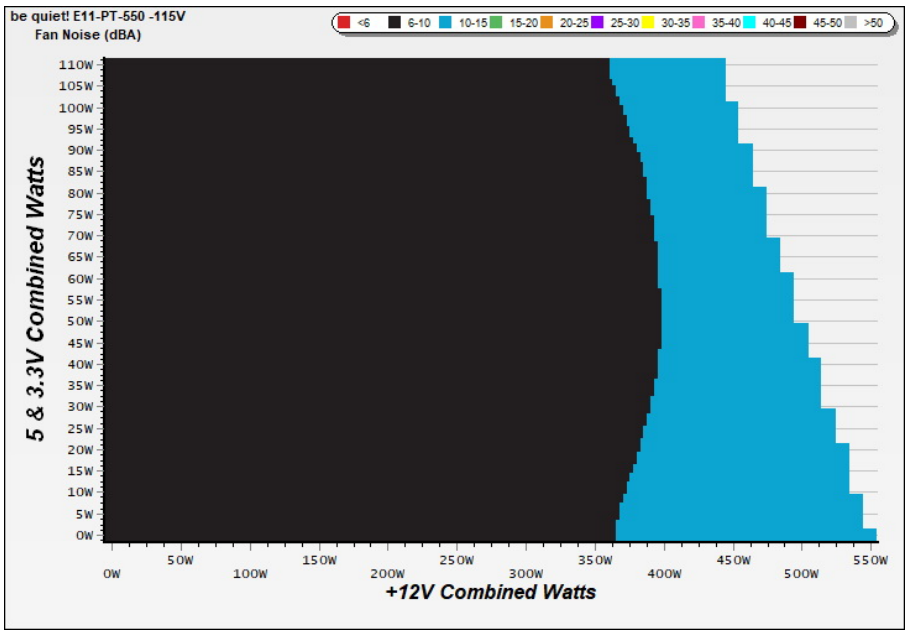
EFFICIENCY GRAPH 115V



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

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

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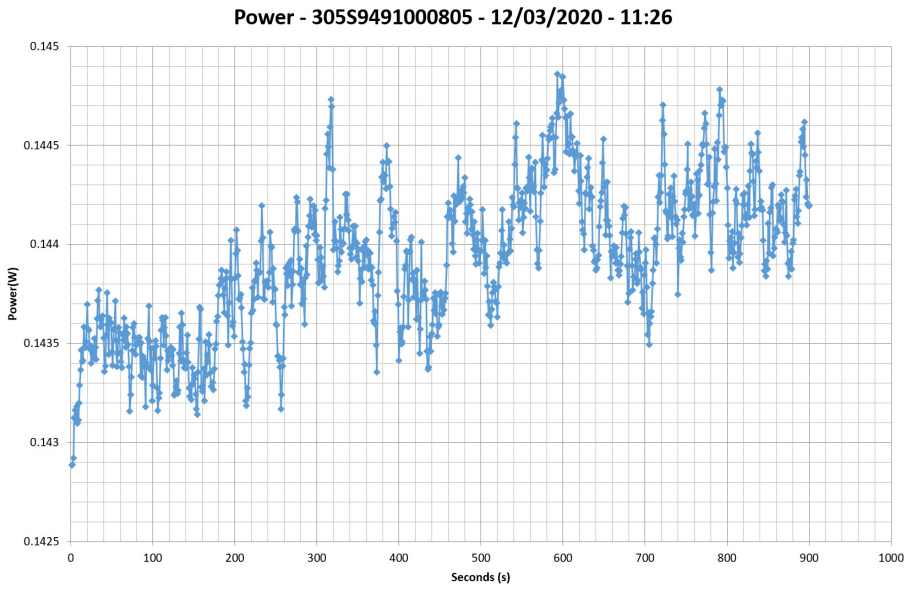
VAMPIRE POWER -115V



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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10-110% LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	2.718A	1.964A	1.988A	0.998A	54.962	85.011%	178	6.4	40.07°C	0.975
	12.272V	5.090V	3.323V	5.013V	64.653				43.27°C	115.11V
2	6.453A	2.952A	2.985A	1.201A	110.026	89.658%	180	6.5	40.91°C	0.981
	12.261V	5.083V	3.316V	4.998V	122.717				44.64°C	115.11V
3	10.529A	3.446A	3.491A	1.405A	165.023	91.170%	181	6.5	41.41°C	0.986
	12.249V	5.078V	3.309V	4.984V	181.005				45.48°C	115.11V
4	14.614A	3.944A	3.998A	1.610A	220.024	91.703%	182	6.5	41.74°C	0.990
	12.236V	5.071V	3.303V	4.970V	239.930				46.31°C	115.11V
5	18.366A	4.937A	5.007A	1.817A	275.012	91.737%	184	6.5	42.20°C	0.993
	12.224V	5.064V	3.296V	4.954V	299.784				47.86°C	115.14V
6	22.123A	5.935A	6.023A	2.000A	329.885	91.439%	199	6.9	42.98°C	0.994
	12.213V	5.057V	3.288V	4.940V	360.770				49.04°C	115.10V
7	25.899A	6.933A	7.044A	2.235A	385.082	90.841%	397	13.7	43.18°C	0.995
	12.200V	5.049V	3.280V	4.924V	423.907				49.74°C	115.14V
8	29.680A	7.937A	8.070A	2.445A	440.098	90.325%	516	15.5	43.83°C	0.996
	12.186V	5.041V	3.272V	4.909V	487.238				50.93°C	115.09V
9	33.848A	8.443A	8.574A	2.449A	494.609	89.887%	632	17.9	44.23°C	0.996
	12.175V	5.035V	3.265V	4.902V	550.258				52.06°C	115.09V
10	37.826A	8.953A	9.115A	3.079A	549.781	89.500%	632	17.9	44.51°C	0.997
	12.163V	5.027V	3.258V	4.872V	614.281				52.95°C	115.09V
11	42.411A	8.965A	9.128A	3.084A	604.961	89.128%	633	17.8	44.88°C	0.997
	12.149V	5.020V	3.254V	4.865V	678.753				53.69°C	115.10V
CL1	0.121A	12.998A	13.000A	0.000A	110.077	85.258%	198	6.9	42.23°C	0.982
	12.265V	5.064V	3.290V	5.019V	129.111				47.57°C	115.11V
CL2	45.835A	1.000A	1.000A	1.000A	570.420	90.378%	677	19.6	44.27°C	0.997
	12.155V	5.045V	3.283V	4.967V	631.146				52.94°C	115.10V

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20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.209A	0.491A	0.494A	0.198A	19.990	73.742%	174	6.3	0.939
	12.277V	5.096V	3.330V	5.049V	27.108				115.09V
2	2.418A	0.983A	0.991A	0.397A	39.980	82.790%	175	6.3	0.965
	12.273V	5.093V	3.327V	5.038V	48.291				115.09V
3	3.632A	1.472A	1.489A	0.597A	60.010	86.429%	177	6.3	0.979
	12.270V	5.091V	3.324V	5.028V	69.433				115.09V
4	4.839A	1.966A	1.988A	0.797A	79.959	88.290%	178	6.4	0.981
	12.266V	5.088V	3.321V	5.018V	90.564				115.18V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.90mV	5.80mV	13.10mV	5.20mV	Pass
20% Load	7.30mV	6.10mV	12.70mV	5.30mV	Pass
30% Load	10.70mV	6.50mV	14.50mV	5.60mV	Pass
40% Load	14.00mV	6.30mV	15.50mV	6.30mV	Pass
50% Load	16.00mV	7.00mV	16.60mV	6.40mV	Pass
60% Load	18.50mV	7.60mV	16.80mV	6.40mV	Pass
70% Load	30.40mV	11.00mV	19.40mV	6.90mV	Pass
80% Load	31.30mV	11.20mV	22.30mV	7.70mV	Pass
90% Load	31.40mV	12.00mV	23.50mV	7.90mV	Pass
100% Load	40.70mV	14.10mV	24.90mV	9.90mV	Pass
110% Load	39.40mV	14.00mV	28.60mV	10.50mV	Pass
Crossload1	14.50mV	12.20mV	34.00mV	9.60mV	Pass
Crossload2	38.30mV	12.80mV	18.10mV	7.70mV	Pass

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230V

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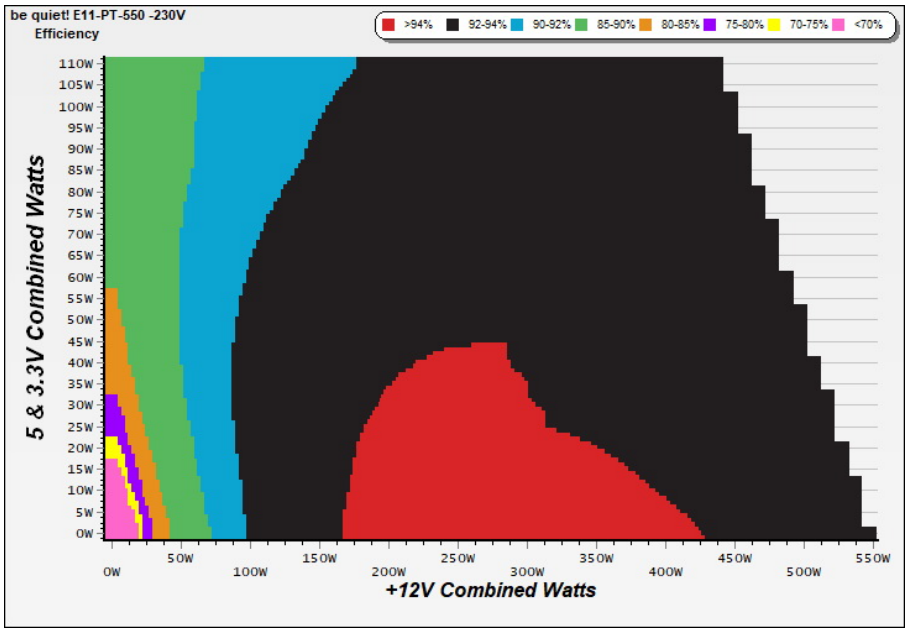
EFFICIENCY GRAPH 230V



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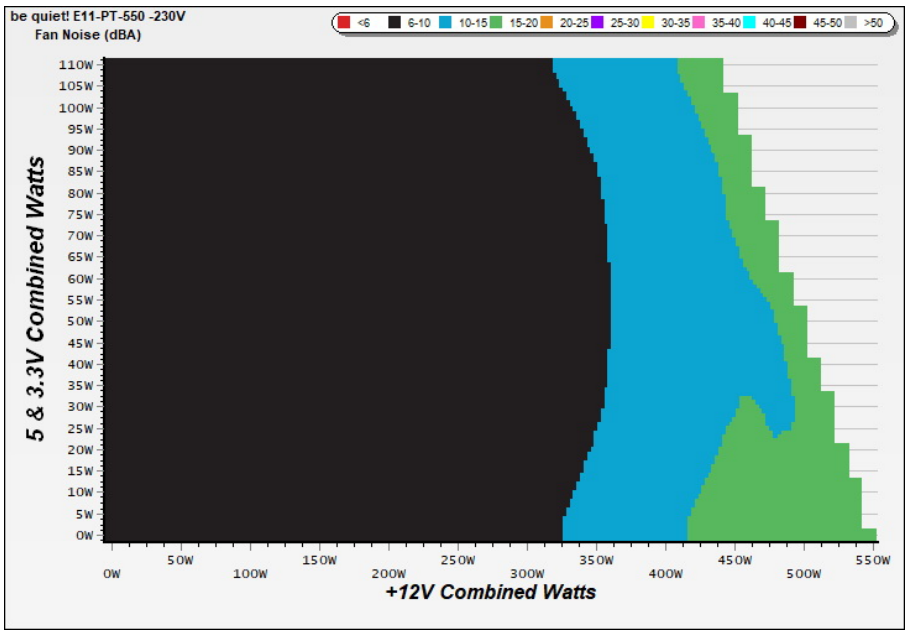
NOISE GRAPH 230V



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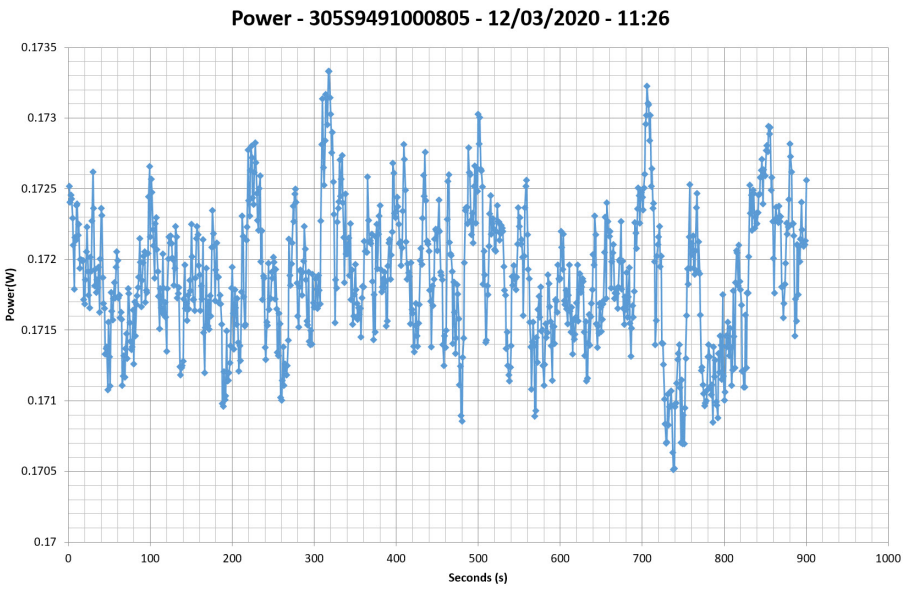
VAMPIRE POWER -230V



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10-110% LOAD TESTS 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	2.719A	1.965A	1.987A	1.001A	54.964	86.257%	176	6.3	35.30°C	0.858
	12.269V	5.089V	3.324V	4.995V	63.721				38.86°C	230.33V
2	6.457A	2.953A	2.986A	1.206A	110.038	91.087%	177	6.3	35.38°C	0.937
	12.255V	5.081V	3.316V	4.976V	120.805				39.25°C	230.34V
3	10.535A	3.450A	3.490A	1.413A	165.042	92.624%	178	6.4	36.21°C	0.962
	12.243V	5.075V	3.310V	4.955V	178.184				40.58°C	230.32V
4	14.621A	3.948A	3.998A	1.620A	220.046	93.265%	180	6.5	36.50°C	0.974
	12.231V	5.068V	3.303V	4.940V	235.937				41.27°C	230.31V
5	18.380A	4.943A	5.009A	1.824A	275.044	93.494%	180	6.5	36.64°C	0.979
	12.216V	5.059V	3.295V	4.936V	294.183				41.85°C	230.31V
6	22.144A	5.940A	6.025A	2.001A	329.886	93.396%	180	6.5	29.24°C	0.983
	12.203V	5.053V	3.287V	4.920V	353.211				38.44°C	230.31V
7	25.924A	6.938A	7.047A	2.246A	385.128	93.043%	209	7.4	29.45°C	0.987
	12.190V	5.045V	3.279V	4.900V	413.924				38.95°C	230.31V
8	29.720A	7.945A	8.072A	2.457A	440.235	92.727%	354	11.0	28.56°C	0.988
	12.174V	5.037V	3.271V	4.885V	474.766				38.32°C	230.32V
9	33.903A	8.453A	8.579A	2.461A	494.742	92.579%	463	14.0	28.74°C	0.989
	12.159V	5.029V	3.264V	4.877V	534.397				38.80°C	230.31V
10	37.903A	8.965A	9.118A	3.101A	549.970	92.323%	557	17.1	28.84°C	0.990
	12.143V	5.021V	3.257V	4.838V	595.705				39.26°C	230.30V
11	42.501A	8.978A	9.134A	3.106A	605.174	92.168%	645	18.8	29.30°C	0.991
	12.128V	5.014V	3.252V	4.830V	656.601				40.24°C	230.29V
CL1	0.117A	13.001A	12.999A	0.000A	110.012	86.667%	187	6.6	28.40°C	0.943
	12.253V	5.063V	3.289V	5.017V	126.937				34.01°C	230.33V
CL2	45.852A	1.000A	1.000A	1.000A	569.828	93.244%	582	17.5	29.20°C	0.990
	12.138V	5.039V	3.282V	4.954V	611.112				39.63°C	230.28V

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20-80W LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.209A	0.492A	0.494A	0.198A	19.992	74.400%	172	6.3	0.628
	12.274V	5.096V	3.332V	5.045V	26.871				230.33V
2	2.419A	0.982A	0.991A	0.398A	39.981	84.031%	173	6.3	0.791
	12.269V	5.092V	3.329V	5.031V	47.579				230.33V
3	3.633A	1.474A	1.489A	0.598A	60.011	87.792%	174	6.3	0.869
	12.265V	5.089V	3.325V	5.017V	68.356				230.33V
4	4.841A	1.967A	1.985A	0.800A	79.961	89.705%	175	6.3	0.905
	12.262V	5.086V	3.322V	5.003V	89.138				230.33V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.60mV	6.30mV	12.70mV	4.80mV	Pass
20% Load	8.70mV	6.20mV	13.70mV	5.00mV	Pass
30% Load	11.90mV	6.50mV	14.10mV	5.00mV	Pass
40% Load	14.40mV	6.30mV	14.30mV	5.20mV	Pass
50% Load	17.60mV	7.10mV	15.00mV	6.00mV	Pass
60% Load	19.50mV	7.50mV	16.40mV	6.00mV	Pass
70% Load	33.80mV	10.10mV	20.40mV	5.90mV	Pass
80% Load	34.80mV	10.70mV	21.30mV	8.40mV	Pass
90% Load	33.80mV	12.10mV	24.90mV	7.70mV	Pass
100% Load	43.40mV	14.10mV	26.50mV	8.90mV	Pass
110% Load	41.90mV	15.10mV	28.50mV	10.00mV	Pass
Crossload1	15.30mV	12.90mV	32.40mV	9.20mV	Pass
Crossload2	39.50mV	12.50mV	16.20mV	6.70mV	Pass

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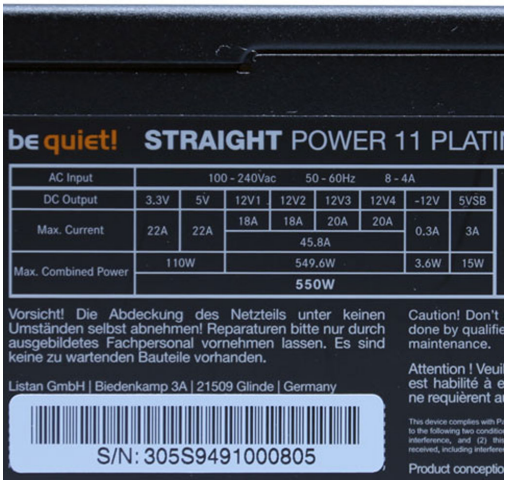
Be quiet! Straight Power 11 Platinum 550W

Top side



Power specifications label

CERTIFICATIONS 115V

CYBENETICS PLATINUM

CYBENETICS A++

CERTIFICATIONS 230V

CYBENETICS PLATINUM 230v

CYBENETICS A++ 230v