Anex

be quiet! E11-550

Lab ID#: 281
Receipt Date: -
Test Date: -

Report: 20PS281A
Report Date: Jan 25, 2000

DUT INFORMATION

Brand	be quiet!
Manufacturer (OEM)	FSP
Series	Straight Power 11
Model Number	E11-550
Serial Number	281S7420001905
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 (SIW3-13525-HF-26)
Semi-Passive Operation	✗
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V1	12V2	12V3	12V4	5VSB	-12V
Max. Power	Amps	24	24	18	18	20	20	3	0.3
				45.8					
	Watts	130		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	18-22AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
6+2 pin PCIe (600mm)	2	2	18AWG	No
SATA (550mm+150mm+150mm)	1	3	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 (1380mm) - C13 coupler	1	1	18AWG	-

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.981
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	82.051
Standby Power Consumption (W) -115V	0.0343709
Standby Power Consumption (W) -230V	0.0888220
Average PF	0.993
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	13.54
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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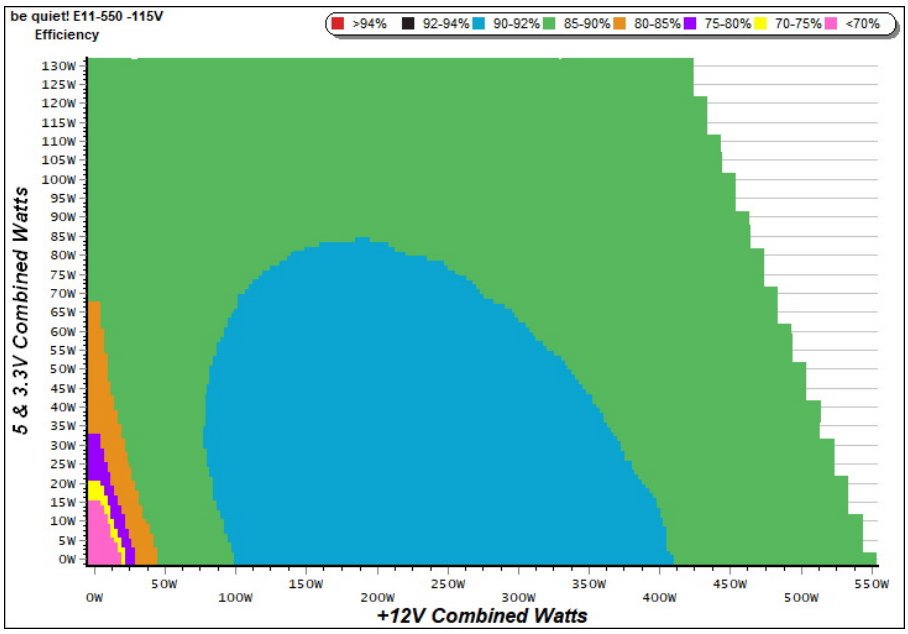
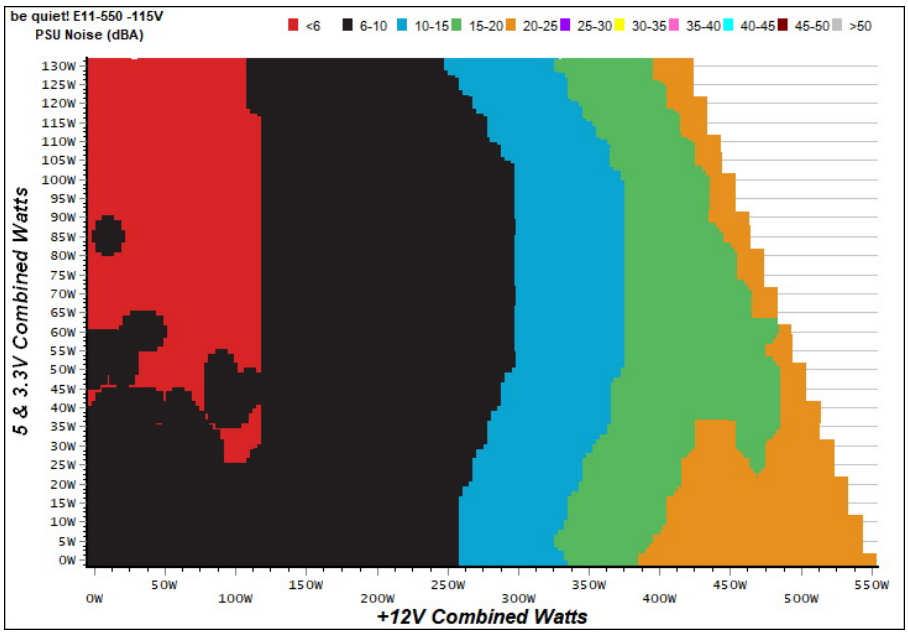
EFFICIENCY GRAPH



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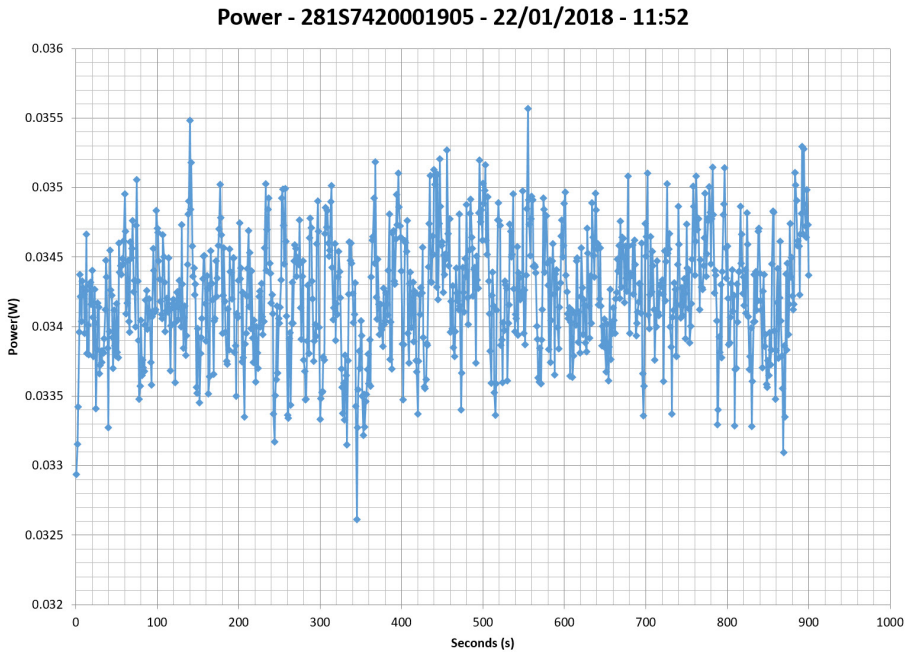
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.211	75.357%	0.040
	5.069V	0.280		115.04V
2	0.087A	0.443	81.434%	0.075
	5.068V	0.544		115.05V
3	0.542A	2.736	85.048%	0.295
	5.045V	3.217		115.04V
4	1.002A	5.039	83.858%	0.378
	5.028V	6.009		115.04V
5	1.502A	7.524	81.579%	0.423
	5.010V	9.223		115.04V
6	3.002A	14.836	79.918%	0.480
	4.942V	18.564		115.04V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.211	61.877%	0.015
	5.070V	0.341		230.17V
2	0.087A	0.443	72.504%	0.026
	5.069V	0.611		230.17V
3	0.542A	2.736	82.137%	0.129
	5.047V	3.331		230.16V
4	1.002A	5.033	82.807%	0.206
	5.023V	6.078		230.17V
5	1.502A	7.529	81.624%	0.266
	5.013V	9.224		230.17V
6	3.002A	14.847	80.485%	0.355
	4.946V	18.447		230.17V

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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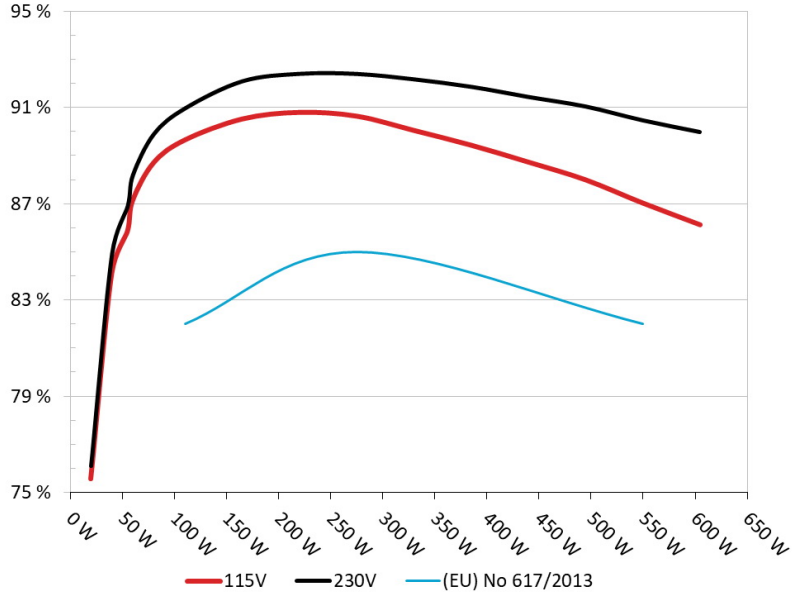
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: be quiet! E11-550
Ambient: 36°C - 44°C (96.8°F - 111.2°F)

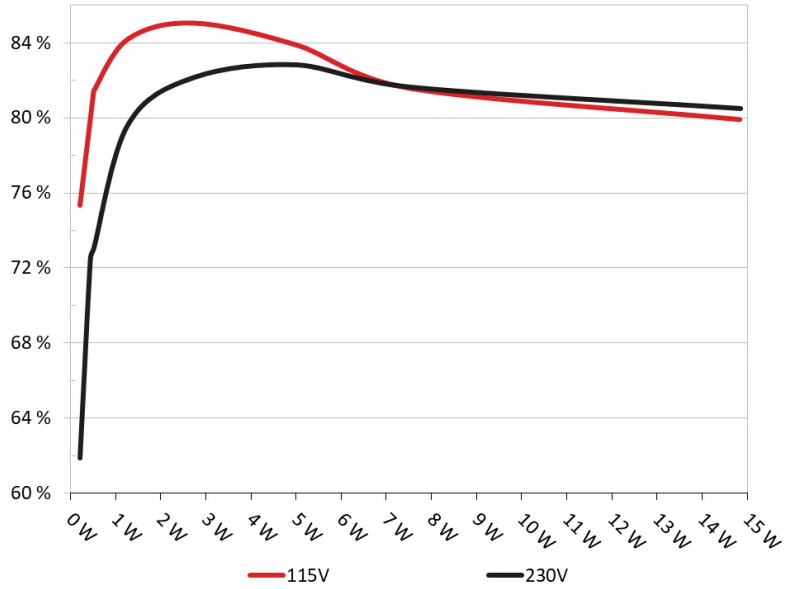


INFO

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: be quiet! E11-550
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	2.766A	1.994A	1.956A	0.996A	54.835	85.847%	240	6.0	37.91°C	0.969
	12.013V	5.023V	3.369V	5.021V	63.875				45.92°C	115.06V
2	6.576A	2.990A	2.945A	1.196A	109.806	89.636%	240	6.0	38.12°C	0.990
	12.004V	5.013V	3.359V	5.005V	122.502				46.34°C	115.03V
3	10.741A	3.497A	3.463A	1.401A	164.945	90.510%	240	6.0	39.03°C	0.993
	11.996V	5.004V	3.349V	4.996V	182.239				47.56°C	115.02V
4	14.900A	4.005A	3.950A	1.605A	219.806	90.786%	350	7.7	39.96°C	0.995
	11.988V	4.993V	3.339V	4.983V	242.114				48.90°C	115.02V
5	18.727A	5.014A	4.954A	1.810A	274.789	90.630%	490	11.6	40.19°C	0.996
	11.979V	4.981V	3.329V	4.968V	303.199				49.42°C	115.03V
6	22.556A	6.036A	5.967A	2.016A	329.718	90.037%	632	13.3	40.91°C	0.997
	11.968V	4.969V	3.316V	4.954V	366.203				50.41°C	115.03V
7	26.389A	7.054A	6.985A	2.226A	384.671	89.424%	800	18.1	41.53°C	0.997
	11.960V	4.959V	3.305V	4.938V	430.164				51.33°C	115.02V
8	30.235A	8.089A	8.014A	2.435A	439.679	88.720%	968	23.3	42.44°C	0.997
	11.949V	4.948V	3.293V	4.922V	495.582				52.99°C	115.06V
9	34.512A	8.608A	8.558A	2.440A	494.746	87.982%	1133	27.7	43.19°C	0.997
	11.942V	4.938V	3.284V	4.915V	562.328				54.15°C	115.05V
10	38.531A	9.135A	9.074A	3.071A	549.579	87.019%	1295	32.3	43.72°C	0.997
	11.935V	4.928V	3.273V	4.883V	631.562				55.56°C	115.04V
11	43.170A	9.152A	9.094A	3.074A	604.508	86.120%	1400	33.5	44.20°C	0.997
	11.925V	4.919V	3.265V	4.878V	701.935				56.42°C	115.04V
CL1	0.103A	16.028A	16.005A	0.005A	133.976	84.665%	1012	25.4	42.18°C	0.992
	11.989V	4.969V	3.316V	5.040V	158.242				51.46°C	115.03V
CL2	45.802A	1.001A	1.004A	1.002A	560.138	87.744%	1295	32.3	43.21°C	0.997
	11.940V	4.953V	3.300V	4.981V	638.379				54.15°C	115.04V

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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	1.216A	0.491A	0.471A	0.196A	19.668	75.571%	240	6.0	0.892
	12.019V	5.032V	3.378V	5.056V	26.026				115.08V
2	2.456A	0.990A	0.978A	0.396A	39.784	84.097%	240	6.0	0.953
	12.015V	5.028V	3.374V	5.046V	47.307				115.07V
3	3.699A	1.485A	1.481A	0.596A	59.882	87.128%	240	6.0	0.971
	12.012V	5.023V	3.369V	5.035V	68.729				115.07V
4	4.934A	1.994A	1.961A	0.796A	79.859	88.691%	240	6.0	0.981
	12.009V	5.019V	3.365V	5.024V	90.042				115.05V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	21.5 mV	5.1 mV	9.4 mV	9.3 mV	Pass
20% Load	16.6 mV	4.3 mV	9.1 mV	10.5 mV	Pass
30% Load	16.2 mV	4.4 mV	9.3 mV	12.4 mV	Pass
40% Load	17.8 mV	5.2 mV	10.8 mV	12.8 mV	Pass
50% Load	16.7 mV	5.3 mV	11.5 mV	13.8 mV	Pass
60% Load	17.9 mV	5.6 mV	11.2 mV	16.0 mV	Pass
70% Load	18.9 mV	6.2 mV	11.7 mV	16.2 mV	Pass
80% Load	19.9 mV	6.3 mV	13.3 mV	15.7 mV	Pass
90% Load	21.0 mV	6.6 mV	13.7 mV	16.6 mV	Pass
100% Load	22.2 mV	8.1 mV	14.9 mV	19.0 mV	Pass
110% Load	23.9 mV	8.1 mV	14.7 mV	18.7 mV	Pass
Crossload 1	16.9 mV	6.4 mV	10.7 mV	7.8 mV	Pass
Crossload 2	22.2 mV	6.8 mV	14.1 mV	13.5 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	16.20
AC Loss to PWR_OK Hold Up Time (ms)	14.60
PWR_OK Inactive to DC Loss Delay (ms)	1.60

Top side

Power specifications label

CERTIFICATIONS

CYBENETICS PLATINUM

CYBENETICS A++