Cybenetics

Anex

be quiet! E11-550

Lab ID#: 282
Receipt Date: -
Test Date: -

Report: 20PS282A
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	91.159
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	81.214
Standby Power Consumption (W) -115V	0.0343709
Standby Power Consumption (W) -230V	0.0888220
Average PF	0.967
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	13.27
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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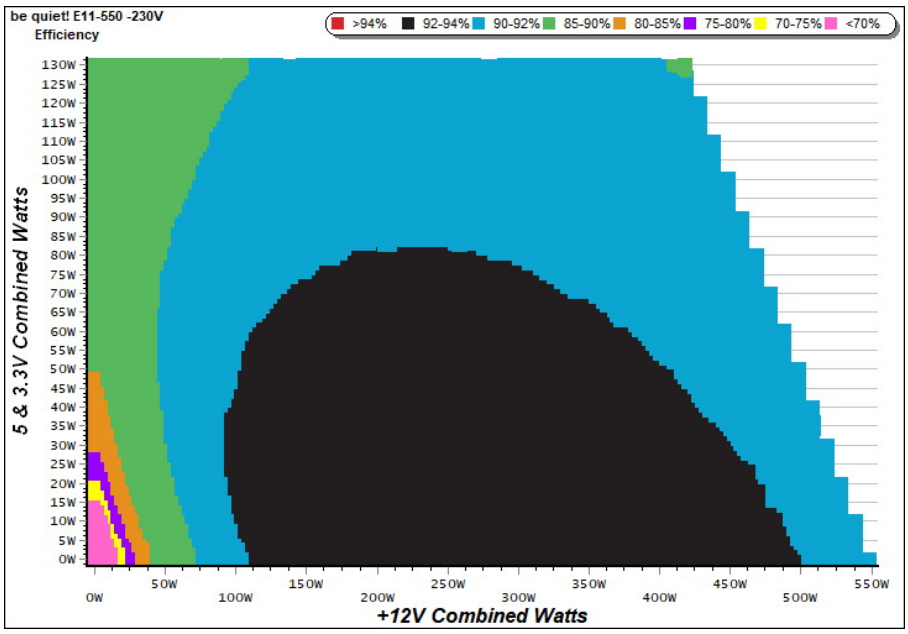
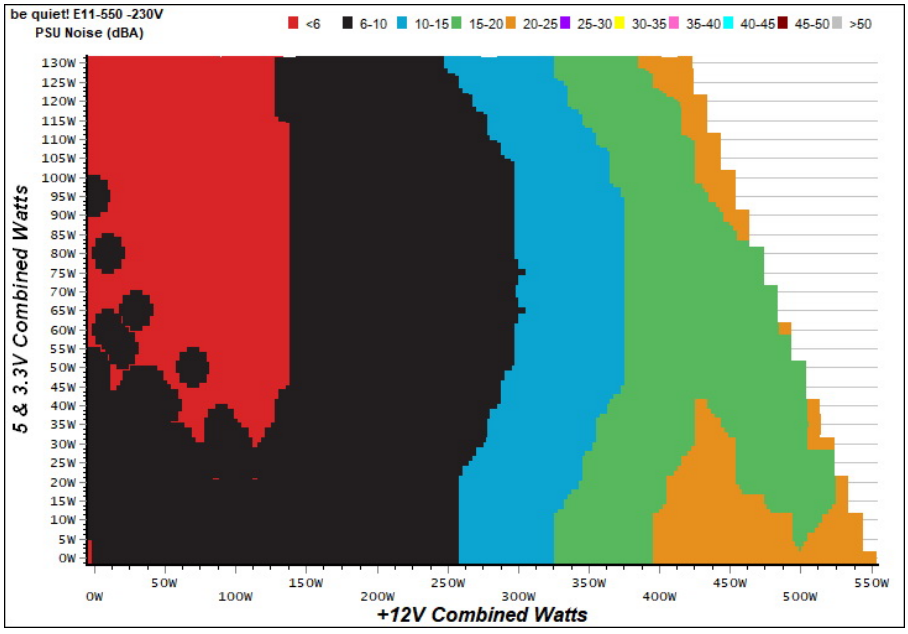
EFFICIENCY GRAPH



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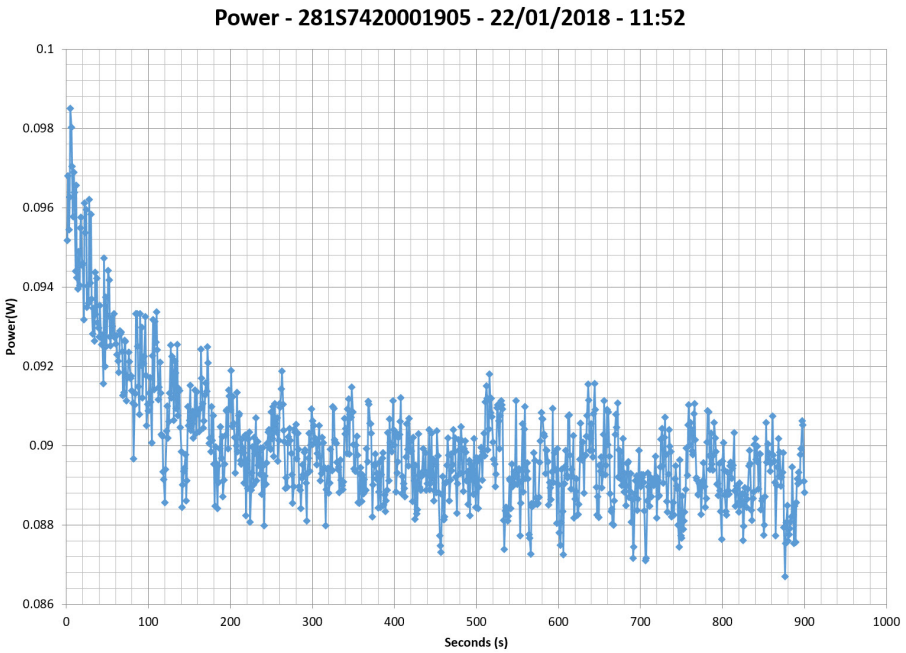
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

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 -230V



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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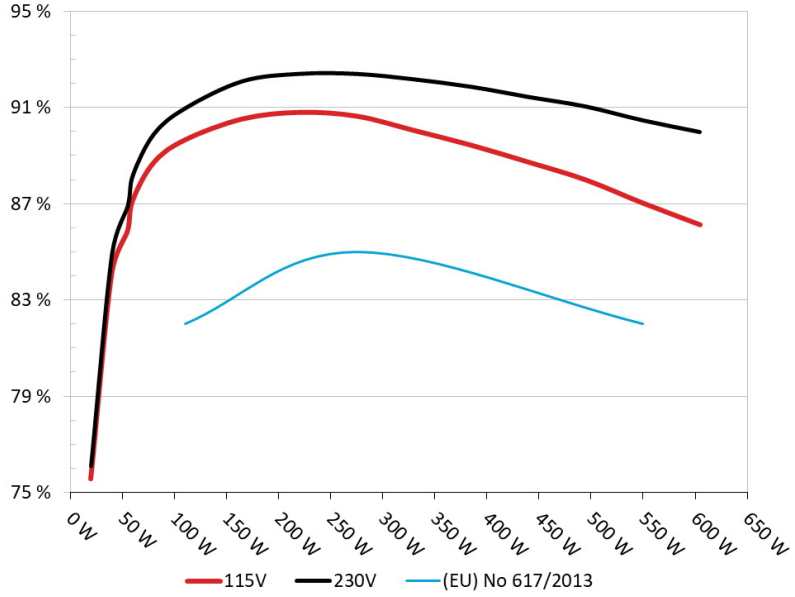
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

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

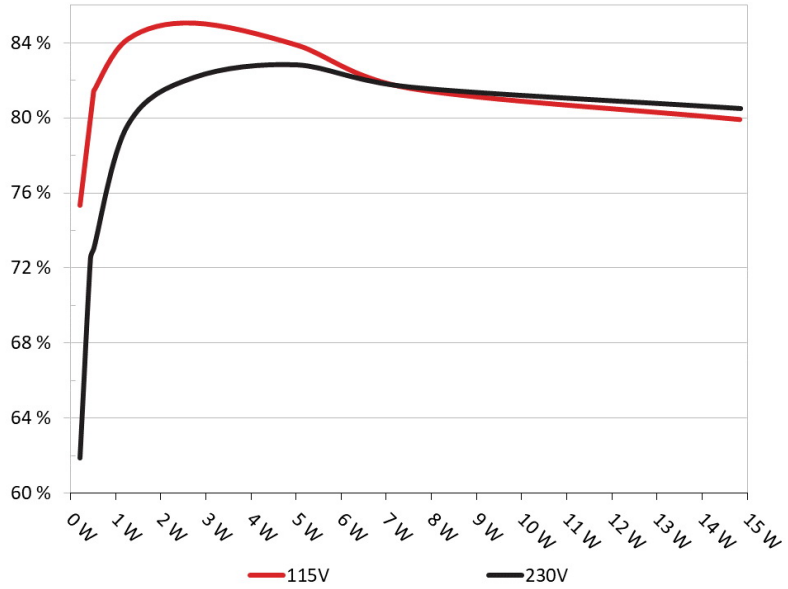


INFO

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	1.957A	0.995A	54.831	86.889%	240	6.0	38.95°C	0.819
	12.011V	5.023V	3.370V	5.023V	63.105				46.39°C	230.25V
2	6.576A	2.991A	2.945A	1.196A	109.809	90.946%	240	6.0	39.22°C	0.923
	12.003V	5.013V	3.360V	5.007V	120.741				46.87°C	230.26V
3	10.739A	3.499A	3.460A	1.401A	164.902	92.073%	290	6.5	39.60°C	0.956
	11.994V	5.004V	3.350V	4.995V	179.100				47.57°C	230.26V
4	14.903A	4.006A	3.948A	1.603A	219.785	92.382%	394	8.9	40.09°C	0.972
	11.985V	4.993V	3.339V	4.984V	237.909				48.40°C	230.26V
5	18.723A	5.014A	4.952A	1.810A	274.700	92.378%	540	10.4	40.42°C	0.983
	11.977V	4.981V	3.329V	4.969V	297.365				49.12°C	230.26V
6	22.556A	6.038A	5.967A	2.016A	329.711	92.155%	665	14.1	41.09°C	0.987
	11.967V	4.970V	3.316V	4.954V	357.777				50.12°C	230.26V
7	26.393A	7.056A	6.987A	2.225A	384.681	91.845%	850	17.4	41.40°C	0.990
	11.958V	4.959V	3.305V	4.939V	418.836				50.69°C	230.26V
8	30.227A	8.089A	8.014A	2.435A	439.612	91.424%	1012	25.4	41.72°C	0.992
	11.950V	4.948V	3.293V	4.922V	480.849				51.48°C	230.26V
9	34.507A	8.609A	8.556A	2.440A	494.683	91.026%	1194	29.5	42.72°C	0.992
	11.942V	4.938V	3.284V	4.915V	543.453				52.84°C	230.26V
10	38.534A	9.136A	9.075A	3.070A	549.542	90.452%	1349	32.3	43.56°C	0.993
	11.933V	4.928V	3.273V	4.883V	607.554				54.28°C	230.25V
11	43.158A	9.153A	9.095A	3.074A	604.413	89.968%	1400	33.5	44.75°C	0.993
	11.926V	4.919V	3.265V	4.877V	671.809				55.83°C	230.26V
CL1	0.100A	16.028A	16.004A	0.004A	133.931	86.131%	1070	25.5	42.48°C	0.949
	11.988V	4.969V	3.316V	5.040V	155.496				51.62°C	230.32V
CL2	45.785A	1.003A	1.003A	1.002A	560.033	91.218%	1361	32.4	44.09°C	0.993
	11.942V	4.953V	3.300V	4.980V	613.947				54.35°C	230.26V

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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	1.212A	0.493A	0.470A	0.196A	19.627	76.100%	240	6.0	0.551
	12.018V	5.033V	3.379V	5.058V	25.791				230.23V
2	2.456A	0.989A	0.977A	0.396A	39.775	84.919%	240	6.0	0.742
	12.014V	5.029V	3.374V	5.047V	46.839				265.12V
3	3.698A	1.489A	1.481A	0.596A	59.890	88.186%	240	6.0	0.835
	12.011V	5.024V	3.370V	5.036V	67.913				230.24V
4	4.932A	1.994A	1.960A	0.796A	79.831	89.874%	240	6.0	0.884
	12.008V	5.020V	3.367V	5.023V	88.825				230.25V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	21.6 mV	5.3 mV	9.3 mV	8.9 mV	Pass
20% Load	14.4 mV	5.1 mV	7.9 mV	10.3 mV	Pass
30% Load	14.6 mV	4.2 mV	8.8 mV	12.2 mV	Pass
40% Load	16.3 mV	4.7 mV	9.9 mV	12.8 mV	Pass
50% Load	16.2 mV	5.7 mV	10.4 mV	13.1 mV	Pass
60% Load	17.1 mV	5.7 mV	10.1 mV	16.1 mV	Pass
70% Load	18.0 mV	5.9 mV	11.0 mV	15.2 mV	Pass
80% Load	19.4 mV	7.0 mV	13.3 mV	16.0 mV	Pass
90% Load	20.4 mV	7.1 mV	12.2 mV	16.4 mV	Pass
100% Load	22.7 mV	7.2 mV	13.3 mV	18.7 mV	Pass
110% Load	24.1 mV	7.9 mV	12.8 mV	19.3 mV	Pass
Crossload 1	13.8 mV	6.5 mV	9.2 mV	7.7 mV	Pass
Crossload 2	22.2 mV	6.5 mV	11.5 mV	13.2 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 230v

CYBENETICS A++ 230v

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