Anex

Seasonic Vertex GX-850

Lab ID#: SS85002116
Receipt Date: Dec 12, 2022
Test Date: Jan 20, 2023

Report: 23PS2116A
Report Date: Jan 20, 2023

DUT INFORMATION

Brand	Seasonic
Manufacturer (OEM)	Seasonic
Series	Vertex GX
Model Number	12851GXAFS
Serial Number	
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5.5
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P
Power Analyzers	RS HMC8015, N4L PPA1530, N4L PPA5530
Oscilloscopes	Picoscope 4444, Rigol DS7014, Siglent SDS2104X PLUS
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Tachometer	UNI-T UT372
Multimeters	Keysight 34465A, Keithley 2015 - THD
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Isolation Transformer	4kVA

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX 3.0 Ready	✓

115V

Average Efficiency	89.407%
Efficiency With 10W (≤500W) or 2% (>500W)	73.042
Average Efficiency 5VSB	80.387%
Standby Power Consumption (W)	0.0659000
Average PF	0.984
Avg Noise Output	24.54 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A

230V

Average Efficiency	91.460%
Average Efficiency 5VSB	79.321%
Standby Power Consumption (W)	0.1398000
Average PF	0.947
Avg Noise Output	24.51 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70	3	0.3
	Watts	100		840	15	3.6
Total Max. Power (W)		850				

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

Hold-Up Time (ms)	25.9
AC Loss to PWR_OK Hold Up Time (ms)	21.3
PWR_OK Inactive to DC Loss Delay (ms)	4.6

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (620mm)	1	1	16-18AWG	No
4+4 pin EPS12V (710mm)	2	2	16AWG	No
6+2 pin PCIe (760mm)	3	3	16AWG	No
12+4 pin PCIe (760mm) (600W)	1	1	16-28AWG	No
SATA 3.3 (410mm+150mm)	1	2	18AWG	No
SATA (510mm+150mm+150mm+150mm)	4	16	18AWG	No
4-pin Molex (460mm+130mm+130mm)	1	3	18AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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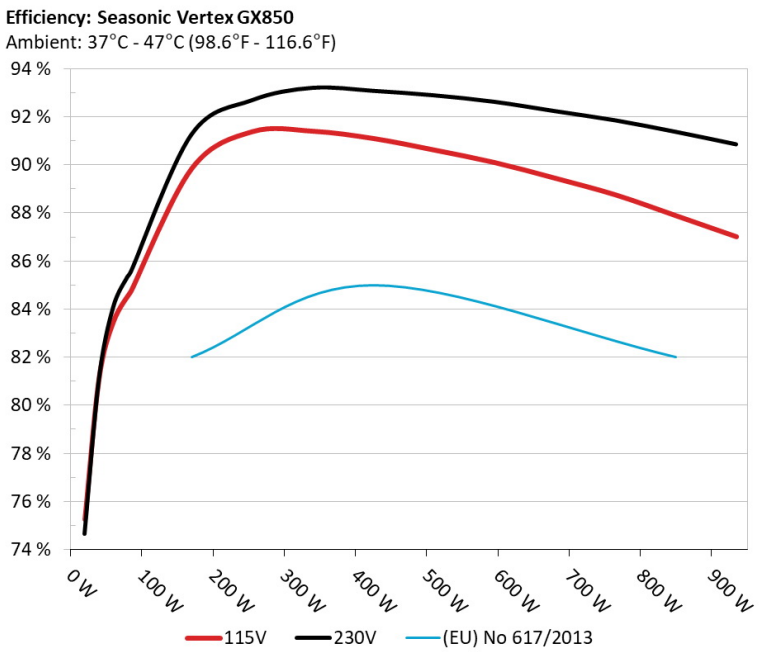
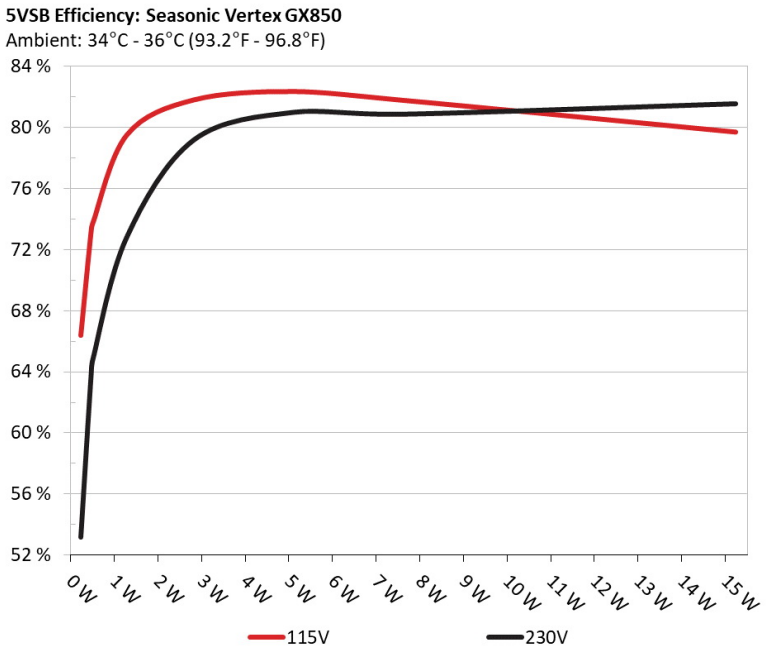
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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	0.231W	65.88%	0.035
	5.141V	0.351W		115.15V
2	0.09A	0.463W	72.616%	0.063
	5.14V	0.638W		115.15V
3	0.55A	2.823W	81.327%	0.269
	5.13V	3.471W		115.16V
4	1A	5.123W	81.874%	0.372
	5.121V	6.257W		115.15V
5	1.5A	7.668W	81.284%	0.428
	5.11V	9.433W		115.15V
6	3A	15.234W	79.215%	0.502
	5.077V	19.231W		115.15V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231W	52.673%	0.013
	5.14V	0.439W		230.38V
2	0.09A	0.463W	63.155%	0.022
	5.14V	0.733W		230.38V
3	0.55A	2.822W	78.671%	0.103
	5.13V	3.588W		230.38V
4	1A	5.122W	80.481%	0.17
	5.121V	6.363W		230.37V
5	1.5A	7.668W	80.357%	0.231
	5.111V	9.543W		230.37V
6	3A	15.239W	81.034%	0.338
	5.079V	18.805W		230.37V

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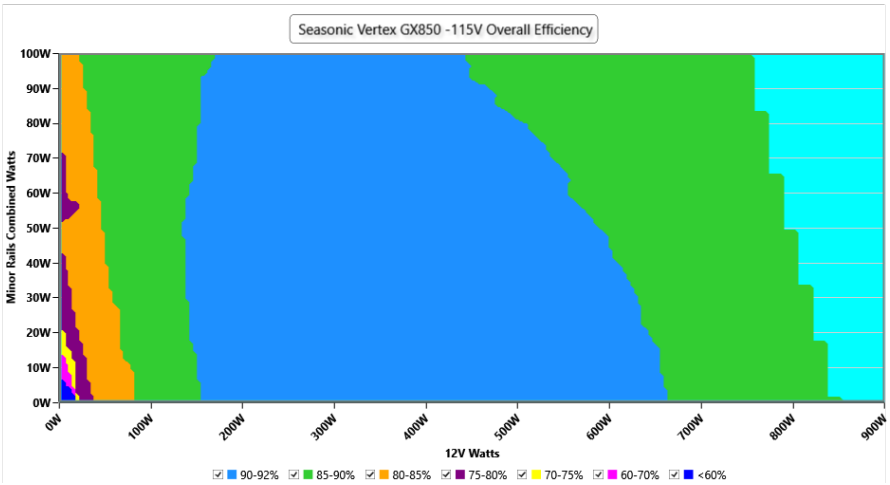
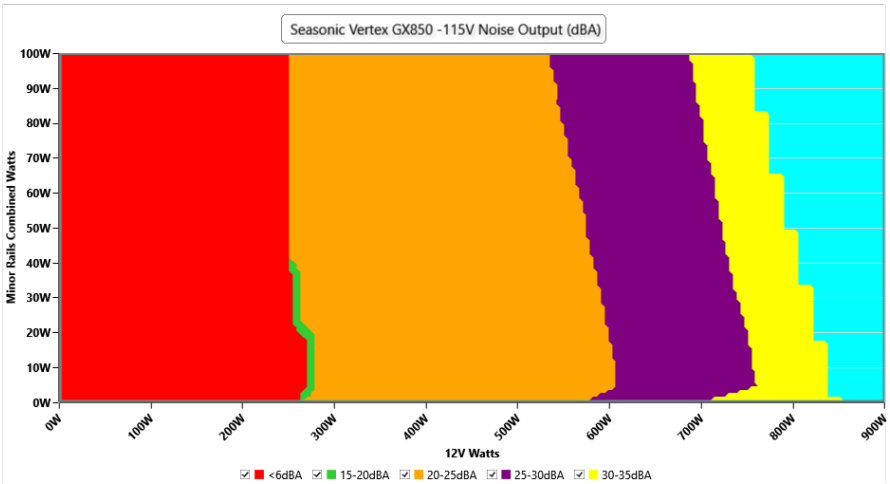
EFFICIENCY GRAPH 115V



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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Seasonic Vertex GX-850

VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.15 V	115.14 V	113.85 V	115.17 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.94 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.11 %	N/A	0.15 %	2.00 %	PASS
Real Power:	0.066 W	0.061 W	N/A	0.071 W	N/A	N/A
Apparent Power:	9.983 W	9.979 W	N/A	9.986 W	N/A	N/A
Power Factor:	0.007	N/A	N/A	N/A	N/A	N/A

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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Seasonic Vertex GX-850

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
10%	5.180A	1.989A	1.987A	0.978A	84.998	84.819%	0	<6.0	44.58°C	0.968
	12.240V	5.028V	3.322V	5.112V	100.213				40.24°C	115.13V
20%	11.378A	2.986A	2.982A	1.176A	169.957	89.851%	0	<6.0	45.51°C	0.98
	12.220V	5.025V	3.32V	5.101V	189.151				40.69°C	115.11V
30%	17.920A	3.485A	3.48A	1.375A	254.966	91.385%	0	<6.0	46.23°C	0.986
	12.216V	5.022V	3.319V	5.092V	278.997				41.05°C	115.09V
40%	24.466A	3.986A	3.979A	1.574A	340.058	91.404%	0	<6.0	47.18°C	0.989
	12.215V	5.019V	3.318V	5.082V	372.035				41.51°C	115.06V
50%	30.663A	4.986A	4.976A	1.775A	424.958	91.101%	757	20.4	42.24°C	0.989
	12.212V	5.015V	3.316V	5.073V	466.473				48.25°C	115.04V
60%	36.834A	5.987A	5.974A	1.976A	509.496	90.628%	754	20.3	42.56°C	0.989
	12.208V	5.012V	3.315V	5.063V	562.188				49.27°C	115.01V
70%	43.058A	6.99A	6.972A	2.177A	594.836	90.103%	832	23.5	43.27°C	0.989
	12.209V	5.009V	3.314V	5.052V	660.17				50.33°C	114.98V
80%	49.282A	7.994A	7.97A	2.28A	679.672	89.452%	918	26.6	43.58°C	0.99
	12.211V	5.005V	3.312V	5.044V	759.819				51.63°C	114.95V
90%	55.897A	8.497A	8.456A	2.383A	765.098	88.753%	1003	29.1	44.16°C	0.991
	12.212V	5.002V	3.311V	5.036V	862.059				53.21°C	114.93V
100%	62.244A	9.002A	8.973A	2.99A	849.933	87.887%	1196	34.4	45.13°C	0.992
	12.214V	4.999V	3.31V	5.018V	967.074				55.14°C	114.91V
110%	68.457A	10.008A	10.064A	2.994A	934.507	87.015%	1335	38.7	46.84°C	0.993
	12.216V	4.996V	3.308V	5.011V	1073.957				57.78°C	114.88V
CL1	0.114A	11.987A	11.977A	0A	101.291	82.617%	654	6.1	40.31°C	0.973
	12.247V	5.022V	3.314V	5.118V	122.605				45.82°C	115.13V
CL2	0.114A	19.89A	0A	0A	101.391	81.578%	803	22.1	41.94°C	0.973
	12.254V	5.027V	3.313V	5.128V	124.286				48.95°C	115.13V
CL3	0.114A	0A	19.868A	0A	67.397	73.981%	806	22.2	42.87°C	0.96
	12.249V	5.025V	3.322V	5.113V	91.098				52.01°C	115.14V
CL4	69.567A	0A	0A	0A	849.827	88.351%	1264	36.4	45.32°C	0.992
	12.216V	5.007V	3.318V	5.09V	961.882				56.3°C	114.9V

Anex

Seasonic Vertex GX-850

20-80W 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
20W	1.227A	0.497A	0.496A	0.195A	20	75.256%	0	<6.0	39.65°C	0.833
	12.103V	5.033V	3.325V	5.134V	26.574				36.55°C	115.15V
40W	2.700A	0.696A	0.695A	0.292A	39.997	81.163%	0	<6.0	40.42°C	0.917
	12.108V	5.031V	3.324V	5.13V	49.281				37.07°C	115.15V
60W	4.172A	0.895A	0.894A	0.39A	59.996	83.484%	0	<6.0	41.89°C	0.952
	12.109V	5.031V	3.323V	5.127V	71.865				38.17°C	115.14V
80W	5.582A	1.094A	1.092A	0.488A	79.956	84.766%	0	<6.0	43.13°C	0.962
	12.239V	5.03V	3.323V	5.123V	94.319				39.18°C	115.13V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.27mV	5.83mV	8.29mV	13.25mV	Pass
20% Load	23.43mV	5.52mV	7.83mV	10.50mV	Pass
30% Load	16.79mV	4.91mV	7.63mV	10.40mV	Pass
40% Load	13.98mV	5.37mV	7.88mV	11.52mV	Pass
50% Load	13.52mV	8.59mV	8.39mV	23.15mV	Pass
60% Load	13.88mV	8.80mV	9.16mV	23.81mV	Pass
70% Load	14.49mV	9.20mV	9.62mV	24.63mV	Pass
80% Load	14.13mV	9.72mV	13.66mV	25.54mV	Pass
90% Load	14.71mV	10.69mV	14.02mV	25.85mV	Pass
100% Load	23.35mV	12.10mV	16.01mV	27.81mV	Pass
110% Load	23.22mV	12.55mV	16.72mV	28.22mV	Pass
Crossload1	9.38mV	9.81mV	15.18mV	25.13mV	Pass
Crossload2	7.82mV	11.30mV	8.91mV	23.71mV	Pass
Crossload3	10.27mV	10.48mV	17.09mV	23.65mV	Pass
Crossload4	11.78mV	11.94mV	11.78mV	29.07mV	Pass

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230V

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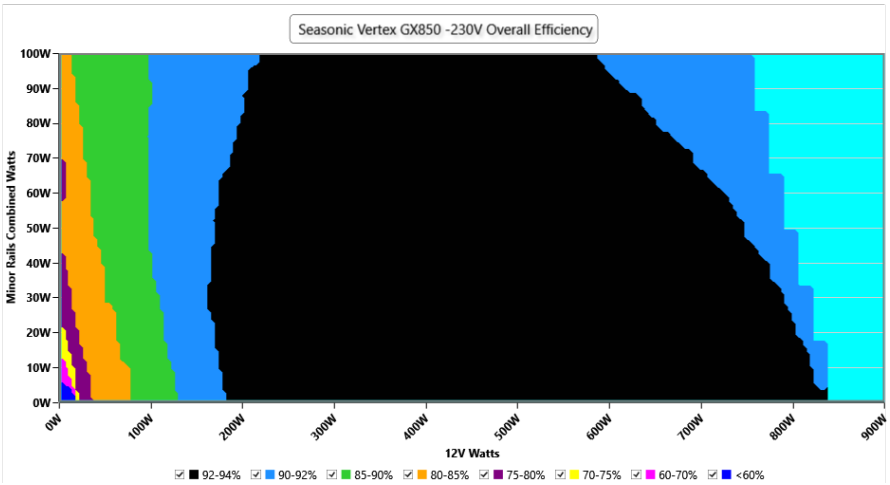
EFFICIENCY GRAPH 230V



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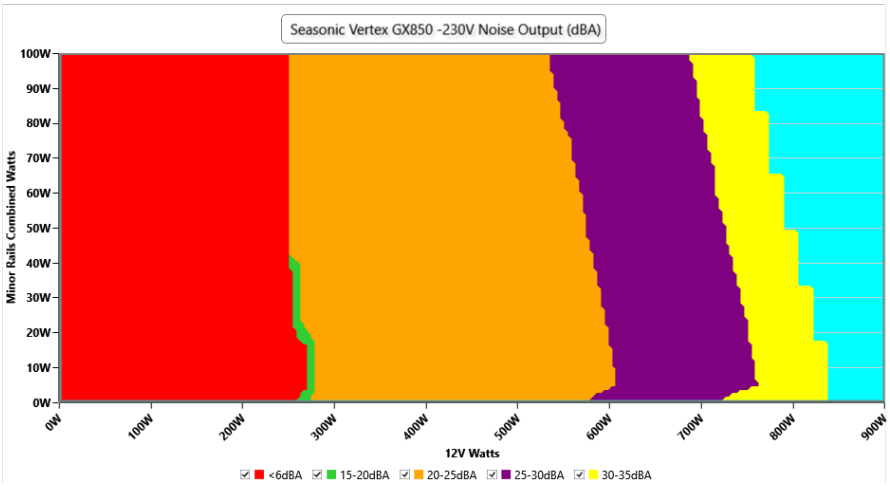
NOISE GRAPH 230V



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Seasonic Vertex GX-850

VAMPIRE POWER -230V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.37 V	230.35 V	227.70 V	230.39 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	50.00 Hz	49.50 Hz	50.00 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.15 %	0.13 %	N/A	0.16 %	2.00 %	PASS
Real Power:	0.140 W	0.125 W	N/A	0.153 W	N/A	N/A
Apparent Power:	33.395 W	33.387 W	N/A	33.404 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

INFO

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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
10%	5.180A	1.989A	1.987A	0.978A	84.994	85.547%	0	<6.0	44.44°C	0.826
	12.237V	5.028V	3.322V	5.113V	99.354				40.05°C	230.34V
20%	11.380A	2.986A	2.982A	1.176A	169.941	91.242%	0	<6.0	45.23°C	0.916
	12.217V	5.025V	3.32V	5.103V	186.254				40.55°C	230.33V
30%	17.924A	3.485A	3.48A	1.375A	254.948	92.673%	0	<6.0	46.31°C	0.945
	12.212V	5.022V	3.319V	5.093V	275.108				41.03°C	230.33V
40%	24.472A	3.986A	3.978A	1.574A	340.044	93.189%	0	<6.0	47.28°C	0.962
	12.212V	5.019V	3.318V	5.083V	364.896				41.57°C	230.32V
50%	30.666A	4.986A	4.976A	1.774A	424.922	93.063%	757	20.4	42.09°C	0.969
	12.209V	5.015V	3.316V	5.074V	456.593				48.21°C	230.32V
60%	36.834A	5.987A	5.974A	1.975A	509.463	92.879%	754	20.3	42.47°C	0.974
	12.208V	5.012V	3.315V	5.064V	548.526				49.12°C	230.31V
70%	43.058A	6.99A	6.973A	2.177A	594.809	92.609%	832	23.5	43.02°C	0.977
	12.209V	5.009V	3.313V	5.053V	642.279				50.08°C	230.3V
80%	49.283A	7.994A	7.97A	2.28A	679.661	92.222%	919	26.6	43.46°C	0.98
	12.210V	5.005V	3.312V	5.045V	736.981				51.49°C	230.29V
90%	55.899A	8.496A	8.455A	2.383A	765.094	91.836%	1006	29.2	44.04°C	0.982
	12.211V	5.002V	3.311V	5.037V	833.109				53.14°C	230.28V
100%	62.248A	9.002A	8.972A	2.99A	849.936	91.358%	1174	33.8	45.19°C	0.984
	12.213V	4.999V	3.31V	5.018V	930.337				55.27°C	230.27V
110%	68.460A	10.008A	10.065A	2.994A	934.532	90.842%	1336	38.8	47.02°C	0.985
	12.215V	4.996V	3.308V	5.011V	1028.755				57.93°C	230.26V
CL1	0.114A	11.987A	11.977A	0A	101.294	83.796%	653	<6.0	40.56°C	0.861
	12.247V	5.022V	3.314V	5.117V	120.881				46.01°C	230.37V
CL2	0.114A	19.889A	0A	0A	101.392	82.749%	805	22.2	41.76°C	0.863
	12.252V	5.028V	3.313V	5.128V	122.531				49.01°C	230.37V
CL3	0.114A	0A	19.868A	0A	67.397	74.494%	804	22.1	42.85°C	0.806
	12.248V	5.025V	3.322V	5.113V	90.475				51.89°C	230.37V
CL4	69.581A	0A	0A	0A	849.792	91.893%	1218	34.9	45.05°C	0.983
	12.213V	5.007V	3.318V	5.09V	924.769				55.88°C	230.27V

Anex

Seasonic Vertex GX-850

20-80W 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
20W	1.226A	0.497A	0.496A	0.195A	19.99	74.648%	0	<6.0	39.59°C	0.486
	12.098V	5.033V	3.324V	5.135V	26.773				36.54°C	230.33V
40W	2.700A	0.696A	0.695A	0.292A	39.99	81.042%	0	<6.0	40.36°C	0.639
	12.104V	5.031V	3.323V	5.132V	49.345				37.05°C	230.33V
60W	4.174A	0.895A	0.893A	0.39A	59.989	84.058%	0	<6.0	41.73°C	0.744
	12.105V	5.031V	3.323V	5.128V	71.363				38.17°C	230.33V
80W	5.584A	1.093A	1.092A	0.488A	79.936	85.324%	0	<6.0	42.88°C	0.818
	12.234V	5.03V	3.323V	5.125V	93.687				39.06°C	230.33V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.22mV	5.78mV	8.39mV	13.97mV	Pass
20% Load	26.39mV	5.52mV	7.62mV	9.99mV	Pass
30% Load	18.63mV	5.27mV	7.42mV	10.71mV	Pass
40% Load	15.31mV	5.42mV	8.08mV	11.52mV	Pass
50% Load	14.80mV	8.95mV	8.39mV	24.16mV	Pass
60% Load	15.20mV	9.16mV	9.01mV	24.47mV	Pass
70% Load	16.33mV	9.36mV	9.52mV	25.70mV	Pass
80% Load	15.82mV	9.97mV	13.25mV	26.41mV	Pass
90% Load	15.26mV	10.07mV	14.02mV	25.85mV	Pass
100% Load	23.82mV	11.85mV	15.39mV	27.09mV	Pass
110% Load	24.77mV	12.62mV	17.26mV	28.09mV	Pass
Crossload1	8.94mV	7.06mV	14.16mV	13.62mV	Pass
Crossload2	7.81mV	11.10mV	8.34mV	23.71mV	Pass
Crossload3	10.06mV	10.64mV	16.94mV	23.91mV	Pass
Crossload4	24.23mV	12.24mV	11.28mV	28.16mV	Pass

Anex

Seasonic Vertex GX-850

Top side

Power specifications label

CERTIFICATIONS 115V

CERTIFICATIONS 230V

Aristeidis Bitziopoulos
Lab Director