

Anex

Seasonic Prime Titanium Ultra 1000W

Lab ID#: SS10001655
 Receipt Date: Dec 31, 2017
 Test Date: May 18, 2020

Report: 20PS1655A
 Report Date: Jun 17, 2020

DUT INFORMATION

Brand	Seasonic
Manufacturer (OEM)	Seasonic
Series	Prime Titanium Ultra
Model Number	SSR-1000TR Ultra
Serial Number	R1711AA1A3130025
DUT Notes	Retested on 18/05/2020

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	13-6.5
Rated Frequency (Hz)	50-60
Rated Power (W)	1000
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525L12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

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
Transformer	3kVA x2

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Seasonic Prime Titanium Ultra 1000W

RESULTS

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

115V

Average Efficiency	91.891%
Efficiency With 10W (≤500W) or 2% (>500W)	75.514
Average Efficiency 5VSB	79.630%
Standby Power Consumption (W)	0.0530492
Average PF	0.988
Avg Noise Output	19.80 dB(A)
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A+

230V

Average Efficiency	93.643%
Average Efficiency 5VSB	78.732%
Standby Power Consumption (W)	0.0841216
Average PF	0.955
Avg Noise Output	18.17 dB(A)
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A+

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	83	3	0.3
	Watts	125		996	15	3.6
Total Max. Power (W)		1000				

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

Hold-Up Time (ms)	22.2
AC Loss to PWR_OK Hold Up Time (ms)	17.8
PWR_OK Inactive to DC Loss Delay (ms)	4.4

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	18-22AWG	No
4+4 pin EPS12V (660mm)	2	2	18AWG	No
6+2 pin PCIe (670mm+80mm)	2	4	18AWG	No
6+2 pin PCIe (760mm)	4	4	18AWG	No
SATA (360mm+155mm+155mm+155mm)	1	4	18AWG	No
SATA (400mm+115mm+115mm+115mm)	2	8	18AWG	No
SATA (310mm+155mm)	1	2	18AWG	No
4 pin Molex (460mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex (350mm+120mm)	1	2	18AWG	No
4 pin Molex to SATA 3.3 Adapter (155mm+155mm)	1	2	18AWG	No
FDD Adapter (+105mm)	1	1	22AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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General Data

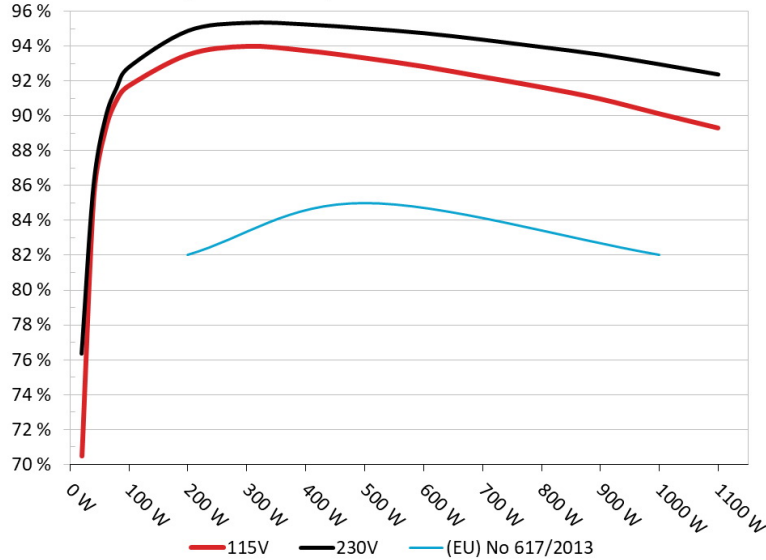
Manufacturer (OEM)	Seasonic
Platform Model	Prime Titanium
Primary Side	
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x Vishay LVB2560 (600V, 25A @ 105°C)
APFC MOSFETS	2x Infineon IPP60C7099 (650V, 14A @ 100°C, 0.099 Ohm)
APFC Boost Diode	1x STPSC10H065D (600V, 10A @ 135°C)
Hold-up Cap(s)	1x Hitachi (400V, 470uF, 2000h @ 105°C, HU) 1x Hitachi (400V, 820uF, 2000h @ 105°C, HU)
Main Switchers	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14 Ohm)
Drivers For Main Switchers	2x Silicon Labs Si8230BD
APFC Controller	ON Semiconductor NPC1654
Switching Controller	Champion CM6901
Topology	Primary side: Full-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	6x R638
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0906NS PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (1-5,000h @ 105°C, KZE), Nippon Chemi-Con (105°C, W), Nippon Chemi-Con (4,000-10,000h @ 105°C, KY), Chemi-Con (5-6,000h @ 105°C, KZH), Rubycon (3-6,000h @ 105°C, YXG) Polymers: FPCAP, Nippon Chemi-Con
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG) & AS393M
Fan Model	Hong Hua HA13525M12F-Z (135mm, 12V, 0.36A, 1800 RPM, Fluid Dynamic Bearing)
5VSB Circuit	
Buck Converter	Leadtrend LD7750R
Rectifiers	STMicroelectronics STU6N65K3 (650V, 3A @ 100°C, 1.30hm) Infineon BSC0906NS (30V, 40A @ 100°C, 4.5 mOhm)
-12V Circuit	
Buck Converter	Lite-On LSP5523 (3A max output current)

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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Seasonic SSR-1000TR Ultra
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

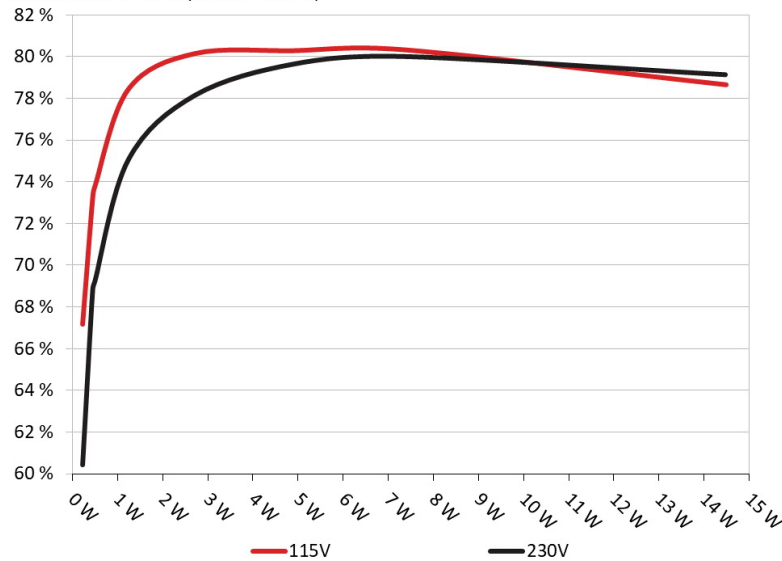


INFO

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: Seasonic SSR-1000TR Ultra
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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5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.223	67.169%	0.035
	4.954V	0.332		115.16V
2	0.090A	0.446	73.235%	0.063
	4.952V	0.609		115.15V
3	0.550A	2.712	80.142%	0.267
	4.933V	3.384		115.15V
4	1.000A	4.913	80.278%	0.363
	4.914V	6.120		115.16V
5	1.500A	7.340	80.324%	0.417
	4.894V	9.138		115.16V
6	2.999A	14.498	78.648%	0.485
	4.834V	18.434		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.223	60.434%	0.012
	4.953V	0.369		230.31V
2	0.090A	0.446	68.827%	0.021
	4.951V	0.648		230.33V
3	0.550A	2.712	78.133%	0.104
	4.931V	3.471		230.29V
4	1.000A	4.912	79.637%	0.171
	4.913V	6.168		230.30V
5	1.500A	7.337	79.993%	0.229
	4.891V	9.172		230.31V
6	3.000A	14.470	79.123%	0.335
	4.824V	18.288		230.31V

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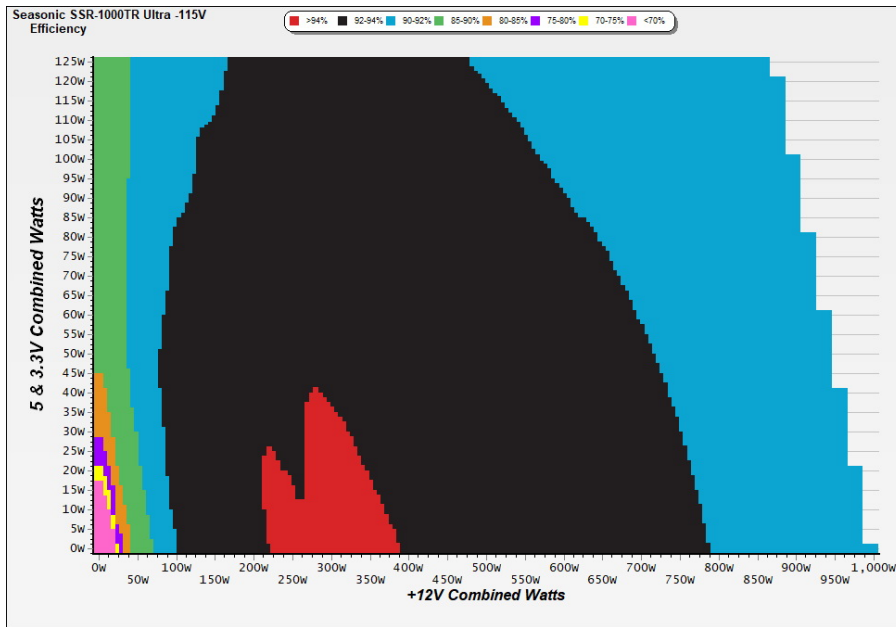
115V

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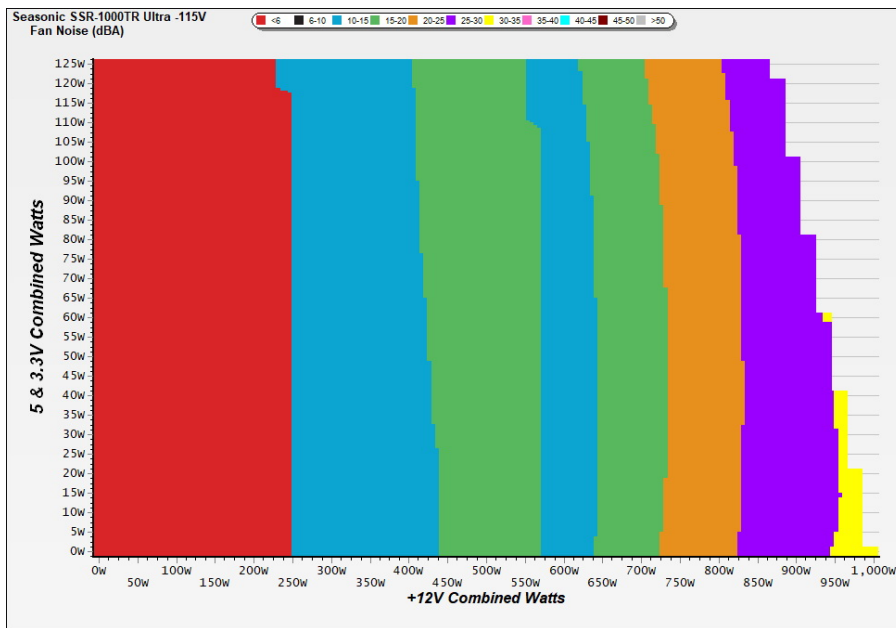
EFFICIENCY GRAPH 115V



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

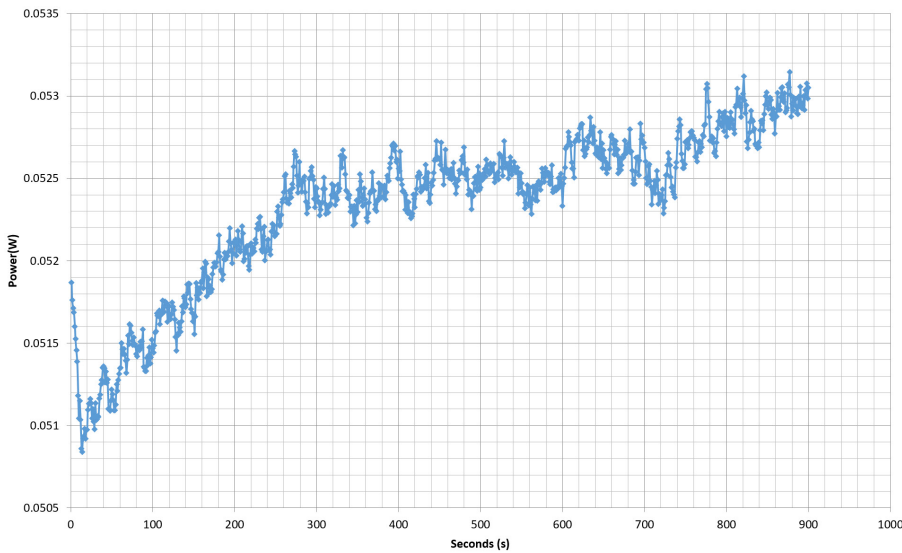
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - R1711AA1A3130025 - 13/05/2020 - 09:25



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	6.421A	1.993A	1.982A	1.000A	99.996	91.741%	468	15.3	40.81°C	0.966
	12.210V	5.018V	3.328V	4.998V	108.998				44.78°C	115.18V
2	13.853A	2.990A	2.976A	1.202A	200.014	93.515%	471	15.7	40.93°C	0.984
	12.208V	5.015V	3.326V	4.994V	213.885				45.18°C	115.17V
3	21.622A	3.490A	3.476A	1.403A	299.966	93.994%	474	16.3	41.37°C	0.992
	12.206V	5.013V	3.324V	4.988V	319.134				46.99°C	115.16V
4	29.353A	3.991A	3.975A	1.605A	399.459	93.747%	481	16.1	42.47°C	0.993
	12.205V	5.012V	3.322V	4.983V	426.104				48.56°C	115.15V
5	36.796A	4.990A	4.969A	1.808A	499.557	93.325%	547	18.7	42.65°C	0.993
	12.204V	5.010V	3.320V	4.979V	535.289				49.65°C	115.14V
6	44.241A	5.992A	5.968A	2.000A	599.633	92.836%	423	14.8	42.80°C	0.994
	12.203V	5.008V	3.318V	4.975V	645.903				50.26°C	115.13V
7	51.657A	6.991A	6.965A	2.212A	699.415	92.246%	547	18.7	43.42°C	0.995
	12.202V	5.007V	3.316V	4.971V	758.210				51.76°C	115.13V
8	59.139A	7.993A	7.965A	2.416A	799.954	91.648%	667	23.4	44.22°C	0.996
	12.201V	5.005V	3.314V	4.966V	872.858				53.18°C	115.12V
9	66.952A	8.493A	8.451A	2.416A	899.222	90.981%	905	33.6	44.88°C	0.996
	12.199V	5.003V	3.312V	4.965V	988.364				54.67°C	115.11V
10	74.606A	8.998A	8.970A	3.030A	999.655	90.126%	1480	46.9	45.52°C	0.997
	12.197V	5.001V	3.310V	4.949V	1109.174				55.96°C	115.10V
11	82.813A	9.000A	8.976A	3.031A	1099.674	89.308%	1710	48.8	46.54°C	0.997
	12.196V	5.000V	3.308V	4.947V	1231.332				57.42°C	115.10V
CL1	0.099A	15.000A	14.997A	0.000A	126.268	88.306%	589	20.4	42.03°C	0.976
	12.212V	5.017V	3.321V	5.056V	142.989				49.17°C	115.16V
CL2	82.993A	1.002A	1.000A	1.000A	1025.578	90.342%	1443	45.5	45.47°C	0.997
	12.197V	5.004V	3.316V	4.982V	1135.215				55.68°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	1.215A	0.499A	0.496A	0.199A	19.984	70.483%	0	<6.0	0.820
	12.202V	5.022V	3.333V	5.018V	28.353				115.16V
2	2.430A	0.996A	0.992A	0.399A	39.975	85.347%	0	<6.0	0.901
	12.211V	5.019V	3.330V	5.011V	46.838				115.16V
3	3.649A	1.496A	1.485A	0.599A	60.006	89.230%	0	<6.0	0.939
	12.210V	5.019V	3.329V	5.008V	67.249				115.17V
4	4.861A	1.994A	1.983A	0.799A	79.957	90.985%	0	<6.0	0.958
	12.210V	5.018V	3.329V	5.003V	87.879				115.17V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.70mV	5.30mV	8.60mV	4.80mV	Pass
20% Load	11.00mV	5.60mV	9.30mV	5.00mV	Pass
30% Load	8.30mV	6.30mV	10.60mV	5.40mV	Pass
40% Load	8.30mV	5.90mV	10.40mV	5.20mV	Pass
50% Load	8.60mV	5.90mV	10.80mV	5.60mV	Pass
60% Load	10.10mV	6.20mV	11.30mV	6.30mV	Pass
70% Load	11.10mV	7.30mV	12.10mV	6.50mV	Pass
80% Load	11.60mV	6.50mV	13.50mV	7.10mV	Pass
90% Load	12.40mV	6.80mV	12.90mV	7.20mV	Pass
100% Load	17.00mV	7.40mV	14.50mV	8.70mV	Pass
110% Load	21.80mV	7.50mV	14.90mV	8.80mV	Pass
Crossload1	15.40mV	7.70mV	14.80mV	6.50mV	Pass
Crossload2	16.80mV	5.80mV	10.00mV	7.00mV	Pass

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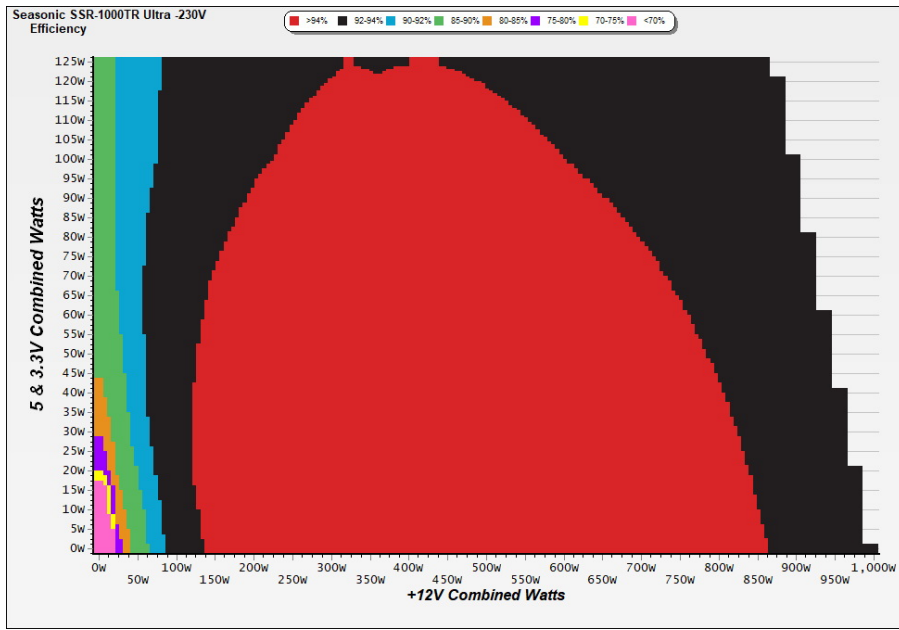
230V

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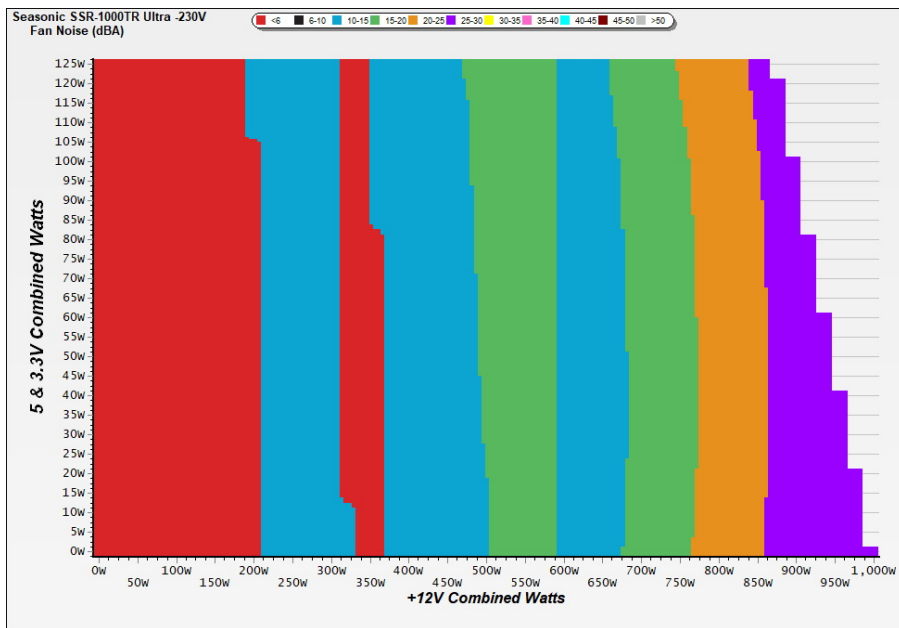
EFFICIENCY GRAPH 230V



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NOISE GRAPH 230V



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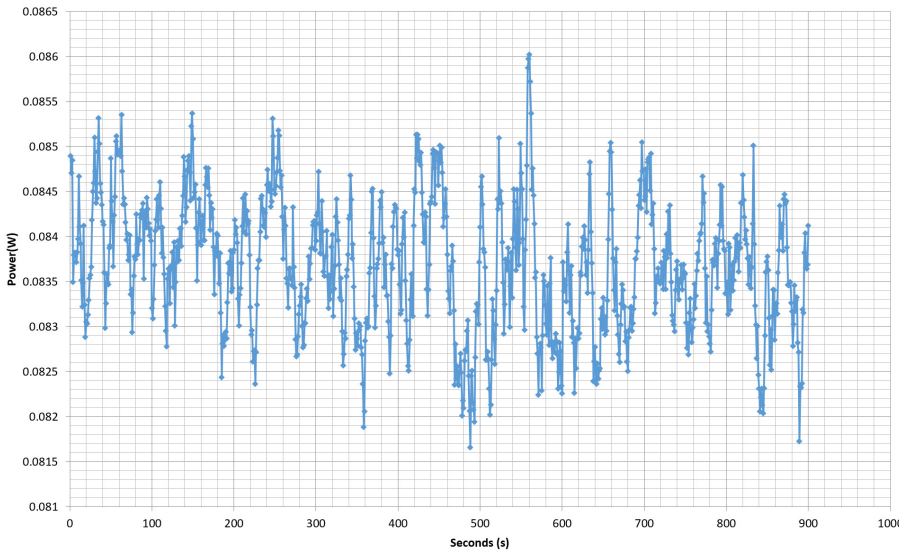
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10-110% LOAD TESTS 230V

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1	6.421A	1.991A	1.983A	1.000A	99.991	92.810%	0	<6.0	44.54°C	0.826
	12.210V	5.018V	3.329V	4.998V	107.737				41.32°C	230.32V
2	13.853A	2.990A	2.977A	1.202A	200.017	94.897%	0	<6.0	45.97°C	0.922
	12.208V	5.015V	3.326V	4.994V	210.773				41.85°C	230.32V
3	21.623A	3.491A	3.477A	1.403A	299.986	95.360%	0	<6.0	47.37°C	0.956
	12.206V	5.013V	3.324V	4.988V	314.584				42.19°C	230.31V
4	29.356A	3.993A	3.973A	1.606A	399.499	95.271%	479	16.1	41.53°C	0.971
	12.205V	5.011V	3.322V	4.982V	419.331				47.73°C	230.30V
5	36.806A	4.992A	4.970A	1.808A	499.613	95.045%	534	18.5	42.17°C	0.979
	12.202V	5.009V	3.320V	4.978V	525.658				48.97°C	230.32V
6	44.254A	5.992A	5.969A	2.000A	599.705	94.771%	411	14.5	42.52°C	0.982
	12.201V	5.008V	3.318V	4.974V	632.792				49.84°C	230.31V
7	51.670A	6.994A	6.969A	2.213A	699.492	94.395%	533	18.5	42.96°C	0.986
	12.200V	5.006V	3.316V	4.969V	741.026				50.71°C	230.31V
8	59.160A	7.994A	7.966A	2.417A	800.027	93.970%	656	23.1	44.17°C	0.988
	12.198V	5.004V	3.313V	4.965V	851.368				52.77°C	230.31V
9	66.973A	8.495A	8.454A	2.417A	899.300	93.536%	787	28.0	44.79°C	0.990
	12.196V	5.003V	3.312V	4.964V	961.448				53.89°C	230.32V
10	74.628A	9.000A	8.973A	3.031A	999.702	92.980%	1308	43.2	45.25°C	0.991
	12.194V	5.000V	3.309V	4.948V	1075.174				55.20°C	230.32V
11	82.845A	9.003A	8.980A	3.033A	1099.751	92.397%	1690	48.8	46.78°C	0.991
	12.192V	4.998V	3.308V	4.946V	1190.251				57.69°C	230.32V
CL1	0.101A	15.000A	14.997A	0.000A	126.263	89.144%	581	19.8	42.05°C	0.870
	12.210V	5.016V	3.320V	5.055V	141.639				49.05°C	230.34V
CL2	82.993A	1.000A	0.998A	1.000A	1025.395	93.190%	1339	43.8	44.93°C	0.991
	12.195V	5.004V	3.316V	4.981V	1100.325				55.13°C	230.33V

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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	1.215A	0.498A	0.493A	0.199A	19.981	76.365%	0	<6.0	0.477
	12.212V	5.023V	3.333V	5.019V	26.165				230.32V
2	2.430A	0.996A	0.991A	0.399A	39.970	85.946%	0	<6.0	0.636
	12.211V	5.019V	3.330V	5.011V	46.506				230.32V
3	3.649A	1.494A	1.485A	0.599A	60.002	89.844%	0	<6.0	0.724
	12.211V	5.019V	3.330V	5.008V	66.785				230.32V
4	4.861A	1.993A	1.983A	0.799A	79.954	91.669%	0	<6.0	0.782
	12.210V	5.018V	3.329V	5.004V	87.220				230.32V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.80mV	5.60mV	9.20mV	4.50mV	Pass
20% Load	13.10mV	5.60mV	9.90mV	5.00mV	Pass
30% Load	9.70mV	5.70mV	10.20mV	4.90mV	Pass
40% Load	8.40mV	6.00mV	10.40mV	5.20mV	Pass
50% Load	8.10mV	6.00mV	10.70mV	5.20mV	Pass
60% Load	9.00mV	6.30mV	10.70mV	5.70mV	Pass
70% Load	10.10mV	6.00mV	12.00mV	6.60mV	Pass
80% Load	11.00mV	6.30mV	13.10mV	6.70mV	Pass
90% Load	11.70mV	6.80mV	13.20mV	7.10mV	Pass
100% Load	17.70mV	7.10mV	14.30mV	8.20mV	Pass
110% Load	22.30mV	7.70mV	14.30mV	8.60mV	Pass
Crossload1	16.20mV	7.80mV	14.20mV	6.30mV	Pass
Crossload2	16.80mV	5.90mV	9.40mV	6.60mV	Pass

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

Anex

Seasonic Prime Titanium Ultra 1000W

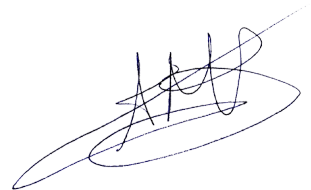


Top side



Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

CERTIFICATIONS 230V



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