Seasonic Prime Titanium Ultra 1000W (#2)

Serial Number R1711AA1A3130025

Lab ID 299

Certification ID 25299

Test Result Report ID:

Certificate Issue Date: Feb 26, 2018

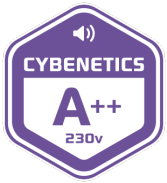
Scheme: ETA-EMI PSU

115V

230V

115V

230V



Scheme: LAMBDA PSU

Aristeidis Bitziopoulos, Certification Body General Manager

General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 Chroma 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500
Power Analyzers	Rohde & Schwarz HMC8015 & NPA701
Oscilloscopes	Picoscope 4444, 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
EMI Analyzer	TekBox TBMR-110M-EU
Isolation Transformer	4kVA
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Testing Methodology	Cybenetics PSU Test Protocol

DUT Information(Non-accredited measurements)

Product Identification Details	
Brand	Seasonic
Model	Prime Titanium Ultra 1000W (#2)
OEM/ODM	Seasonic
Serial Number	R1711AA1A3130025
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	13-6.5
Rated Frequency (Hz)	50-60

Rated Power (W)	1000
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525L12F-Z)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	299
Date of receipt	Feb 17, 2018
Testing Date	Feb 23, 2018
Report Issued Date	Feb 26, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

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	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	100	3	0.3
	Watts	125		996	15	3.6
Total Max. Power (W)		1000				

Parts Description

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, 1.3Ohm) Infineon BSC0906NS (30V, 40A @ 100°C, 4.5 mOhm)
-12V Circuit	
Buck Converter	Lite-On LSP5523 (3A max output current)

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	91.644%
Average Noise Output (>1450 Load Combinations)	13.16dBA
Average PF (>1450 Load Combinations)	0.992
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0533W
Non-Accredited	

12V Ripple (Full Load)	18.13mV
5V Ripple (Full Load)	7.22mV
3.3V Ripple (Full Load)	16.56mV
5VSB Ripple (Full Load)	11.44mV
12V Load Regulation	0.16%
5V Load Regulation	0.32%
3.3V Load Regulation	0.60%
5VSB Load Regulation	1.41%
Inrush Current	30.825A

230V

Accredited		
Average Efficiency (>1450 load combinations)	93.729%	
Average Noise Output (>1450 Load Combinations)	12.85dBA	
Average PF (>1450 Load Combinations)	0.960	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0841W	
Non-Accredited		
12V Ripple (Full Load)	17.70mV	
5V Ripple (Full Load)	5.86mV	
3.3V Ripple (Full Load)	13.24mV	
5VSB Ripple (Full Load)	9.72mV	
12V Load Regulation	0.16%	
5V Load Regulation	0.32%	
3.3V Load Regulation	0.54%	
5VSB Load Regulation	1.39%	
Inrush Current	56.990A	
Hold-Up Time & PWR_OK Signal	22.20ms	
AC Loss to PWR_OK Hold Up Time	17.60ms	
PWR_OK Inactive to DC Loss Delay	4.60ms	
OPP (0.00°C / 0.00°C)	-	-

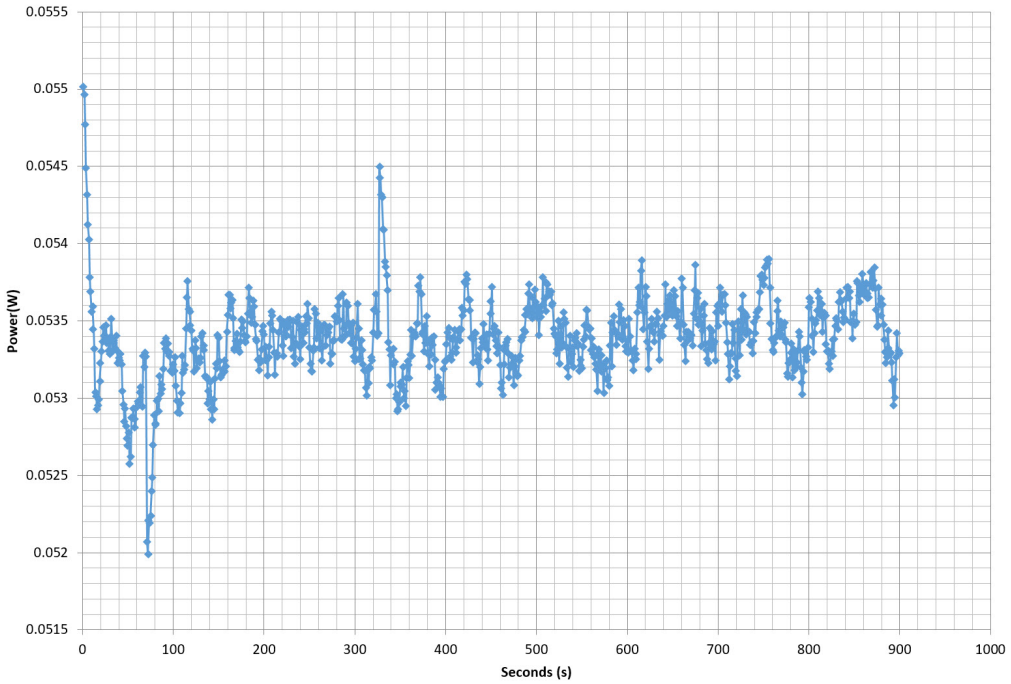
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	22.2
AC Loss to PWR_OK Hold Up Time (ms)	17.6
PWR_OK Inactive to DC Loss Delay (ms)	4.6

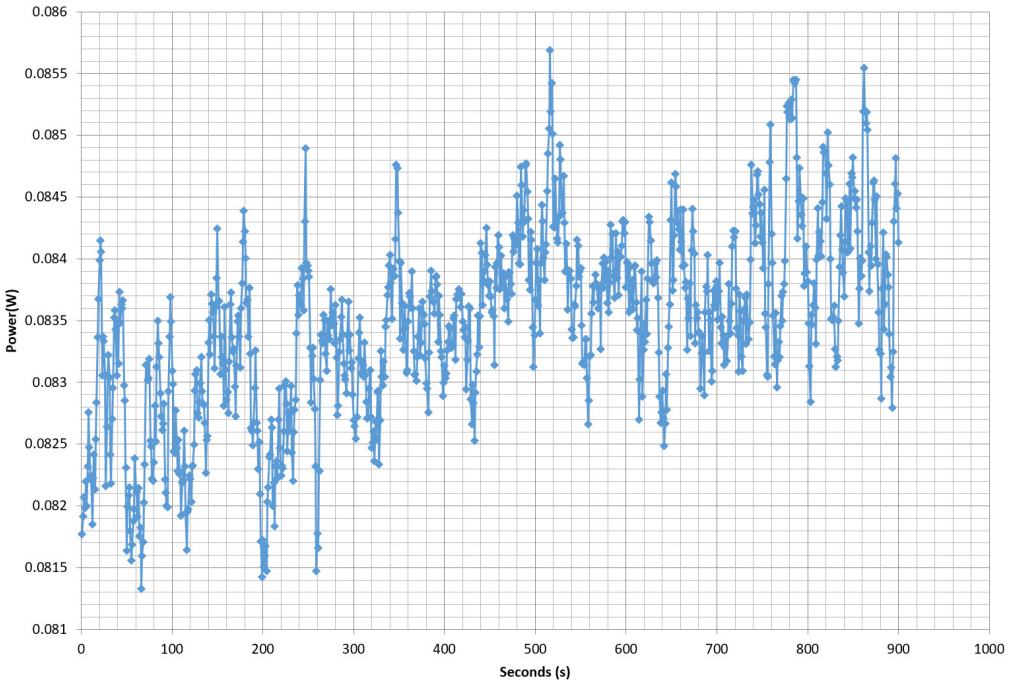
Vampire Power

Graphs

115V

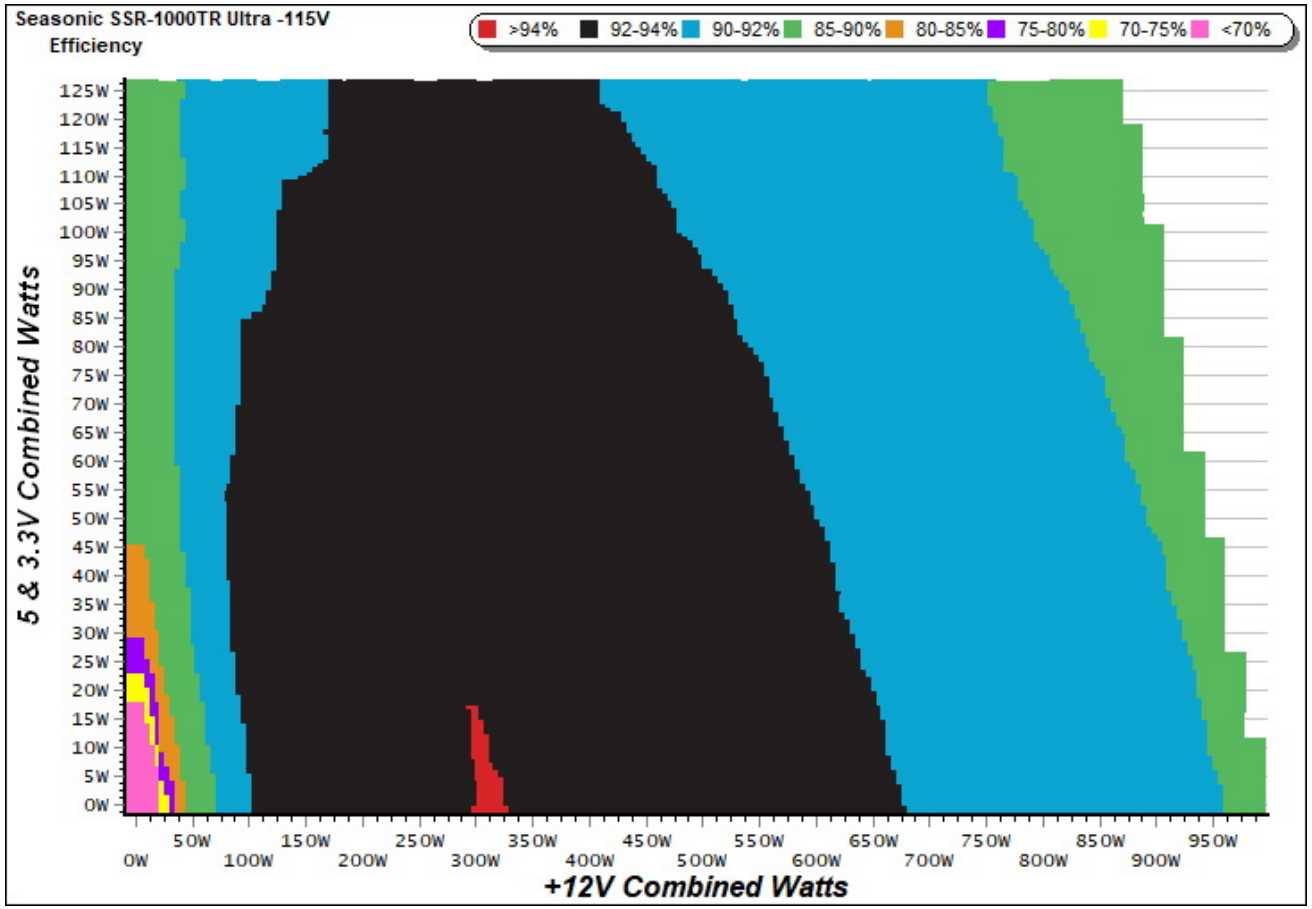


230V



Efficiency Graph

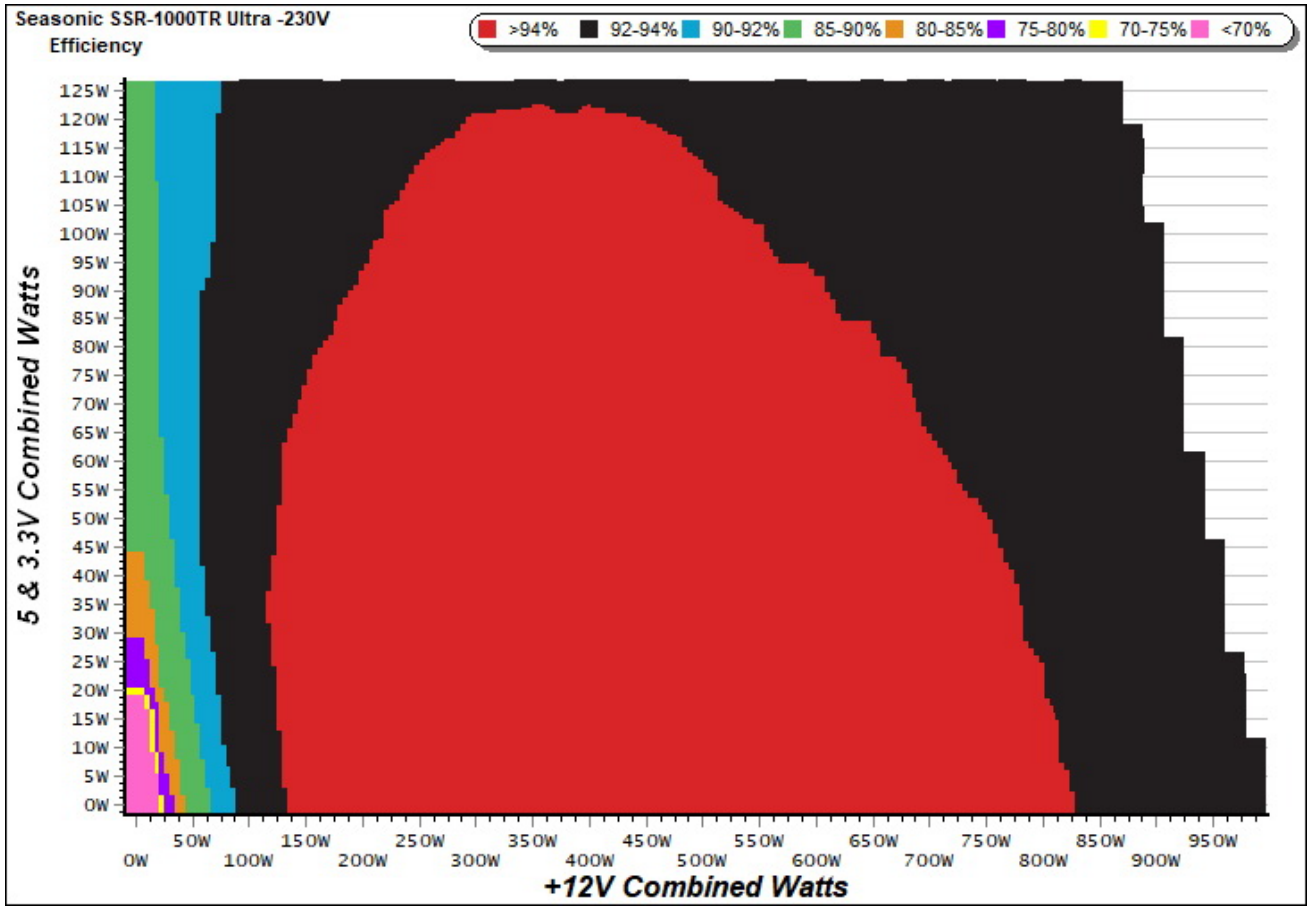
115V



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.

230V



INFO

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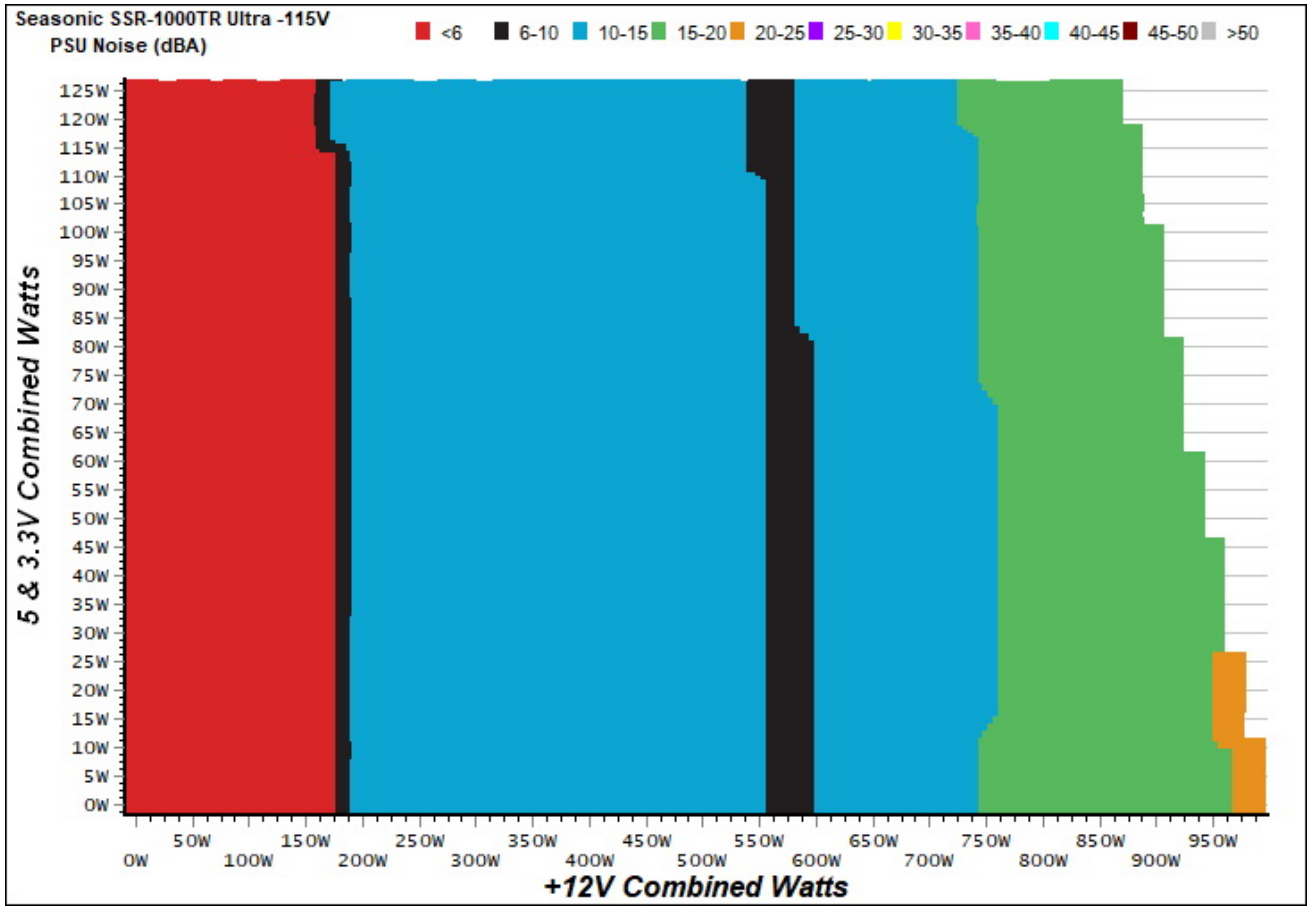
Noise Graph

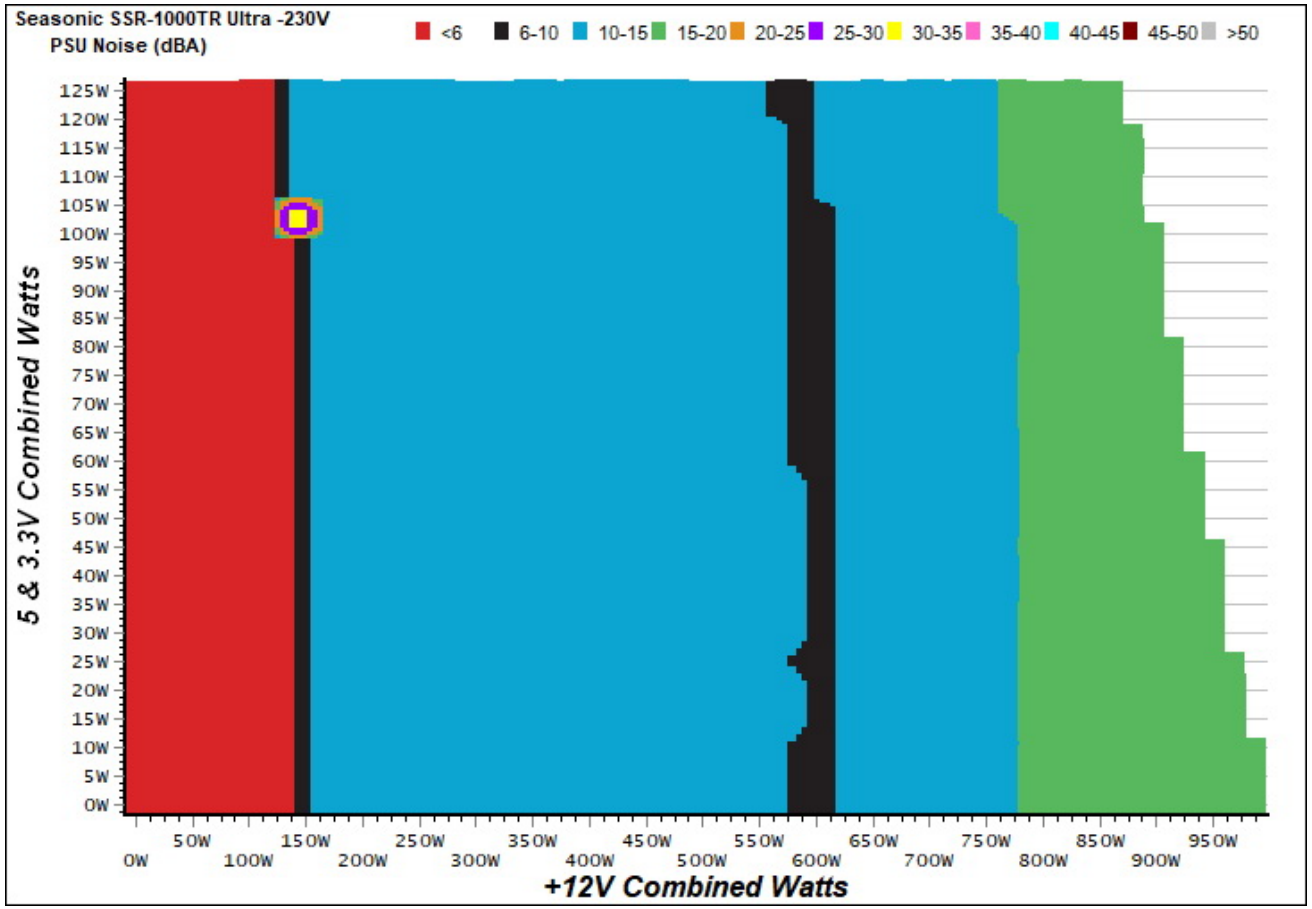
115V



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.

230V

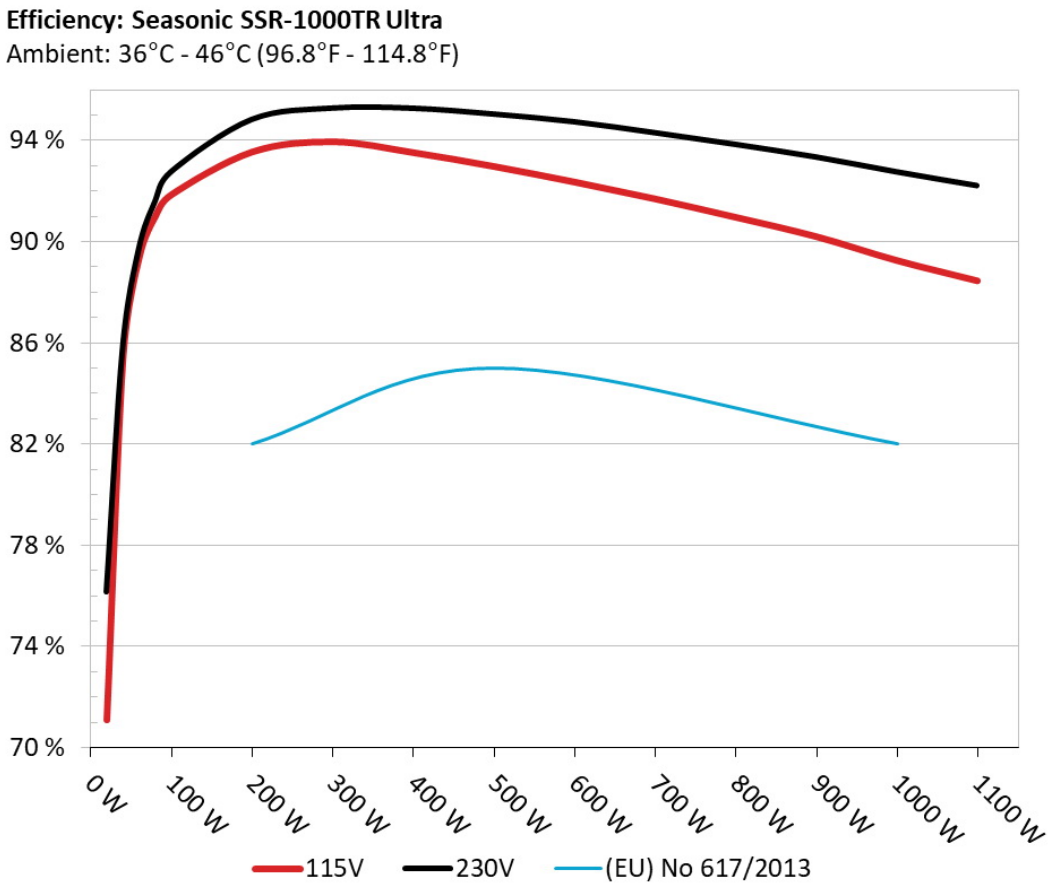


INFO

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.

Indicative Performance

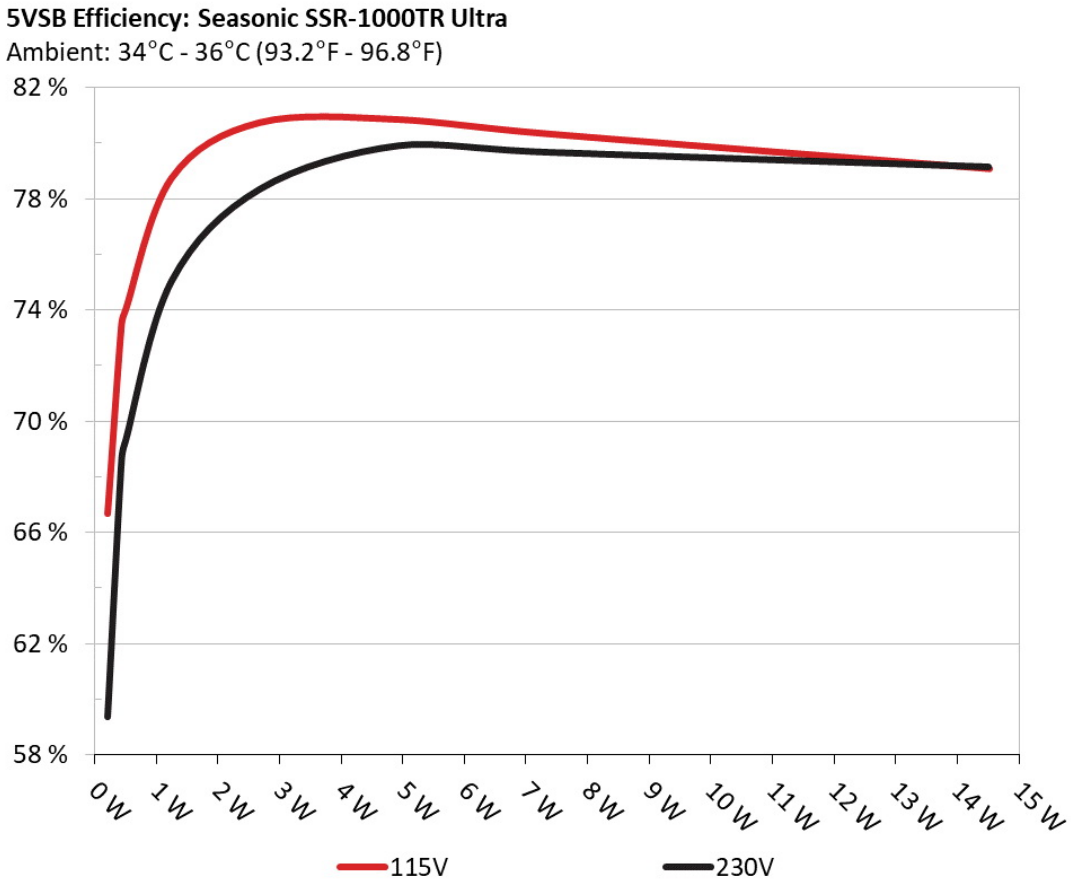
Efficiency under high ambient temperature



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.

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.210	66.667%	0.041
	4.954V	0.315		115.11V
2	0.088A	0.434	73.435%	0.075
	4.952V	0.591		115.11V
3	0.542A	2.676	80.724%	0.288
	4.934V	3.315		115.11V
4	1.002A	4.927	80.837%	0.371
	4.915V	6.095		115.10V
5	1.502A	7.351	80.321%	0.417
	4.894V	9.152		115.10V
6	3.002A	14.515	79.066%	0.475
	4.835V	18.358		115.10V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.209	59.375%	0.012
	4.954V	0.352		230.23V
2	0.088A	0.435	68.612%	0.021
	4.952V	0.634		230.24V
3	0.543A	2.677	78.344%	0.105
	4.933V	3.417		230.24V
4	1.003A	4.927	79.906%	0.174
	4.914V	6.166		230.23V
5	1.502A	7.349	79.673%	0.233
	4.893V	9.224		230.23V
6	3.002A	14.496	79.144%	0.343
	4.829V	18.316		230.22V

Supplementary Tests (For Reference)

Typical 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	6.408A	1.995A	1.980A	1.001A	99.847	91.856%	395	10.5	38.63°C	0.975
	12.210V	5.019V	3.329V	4.996V	108.699				48.04°C	115.10V
2	13.832A	2.985A	2.975A	1.201A	199.715	93.543%	395	10.5	39.27°C	0.989
	12.207V	5.017V	3.326V	4.993V	213.501				48.97°C	115.10V
3	21.615A	3.487A	3.487A	1.401A	299.899	93.945%	395	10.5	39.54°C	0.995
	12.206V	5.015V	3.324V	4.988V	319.227				49.51°C	115.07V
4	29.382A	3.991A	3.970A	1.605A	399.743	93.518%	435	10.7	39.82°C	0.995
	12.203V	5.013V	3.323V	4.982V	427.450				50.29°C	115.07V
5	36.813A	4.983A	4.964A	1.806A	499.636	92.971%	310	9.4	40.53°C	0.994
	12.202V	5.012V	3.320V	4.977V	537.410				51.29°C	115.06V
6	44.250A	5.985A	5.961A	2.010A	599.618	92.354%	430	10.8	41.83°C	0.994
	12.200V	5.010V	3.319V	4.974V	649.260				52.87°C	115.04V
7	51.682A	6.992A	6.961A	2.210A	699.566	91.687%	525	13.8	42.08°C	0.995
	12.199V	5.009V	3.317V	4.970V	762.996				53.50°C	115.05V
8	59.117A	7.991A	7.960A	2.416A	799.455	90.960%	625	19.5	43.20°C	0.996
	12.197V	5.007V	3.316V	4.966V	878.906				54.80°C	115.06V
9	66.981A	8.488A	8.479A	2.416A	899.412	90.196%	1005	32.0	44.10°C	0.997
	12.195V	5.005V	3.314V	4.966V	997.171				55.90°C	115.07V
10	74.610A	9.001A	8.968A	3.030A	999.381	89.252%	1525	42.8	45.00°C	0.997
	12.192V	5.004V	3.312V	4.948V	1119.726				57.10°C	115.10V
11	82.811A	9.005A	8.966A	3.031A	1099.178	88.448%	1650	45.8	46.15°C	0.997
	12.190V	5.002V	3.310V	4.946V	1242.741				58.65°C	115.11V
CL1	0.100A	15.021A	15.005A	0.005A	126.588	88.385%	540	15.8	43.61°C	0.982
	12.211V	5.019V	3.329V	5.054V	143.224				53.30°C	115.10V

CL2	82.929A	1.002A	1.003A	1.002A	1024.403	89.427%	1490	42.6	44.70°C	0.997
	12.192V	5.005V	3.315V	4.983V	1145.519				56.48°C	115.12V

The results above are not used in the certification process

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	6.408A	1.993A	1.980A	1.001A	99.814	92.755%	380	9.6	40.54°C	0.834
	12.206V	5.019V	3.330V	4.997V	107.610				45.70°C	230.28V
2	13.829A	2.984A	2.975A	1.201A	199.640	94.820%	395	10.5	39.74°C	0.927
	12.204V	5.018V	3.328V	4.993V	210.546				42.02°C	230.29V
3	21.614A	3.489A	3.486A	1.400A	299.827	95.273%	420	10.8	40.18°C	0.960
	12.203V	5.016V	3.324V	4.988V	314.704				42.50°C	230.29V
4	29.382A	3.989A	3.969A	1.605A	399.674	95.265%	485	12.8	40.68°C	0.974
	12.201V	5.013V	3.323V	4.983V	419.540				43.18°C	230.30V
5	36.818A	4.983A	4.965A	1.806A	499.596	95.037%	350	10.1	41.60°C	0.981
	12.199V	5.012V	3.321V	4.977V	525.688				44.95°C	230.29V
6	44.252A	5.987A	5.965A	2.010A	599.532	94.731%	440	11.6	42.35°C	0.984
	12.197V	5.010V	3.319V	4.974V	632.878				45.54°C	230.30V
7	51.687A	6.993A	6.961A	2.210A	699.480	94.299%	525	13.8	43.53°C	0.988
	12.196V	5.009V	3.318V	4.969V	741.770				46.76°C	230.32V
8	59.125A	7.991A	7.961A	2.415A	799.372	93.839%	625	19.5	44.19°C	0.989
	12.194V	5.007V	3.316V	4.966V	851.857				47.59°C	230.34V
9	66.991A	8.490A	8.476A	2.416A	899.332	93.339%	945	31.6	45.13°C	0.991
	12.192V	5.005V	3.314V	4.965V	963.514				48.35°C	230.31V
10	74.610A	9.004A	8.967A	3.030A	999.171	92.752%	1380	42.0	45.61°C	0.991
	12.189V	5.004V	3.312V	4.949V	1077.255				48.57°C	230.32V
11	82.819A	9.004A	8.970A	3.031A	1099.035	92.209%	1650	45.8	46.00°C	0.992
	12.187V	5.002V	3.310V	4.946V	1191.890				48.83°C	230.35V
CL1	0.101A	15.022A	15.005A	0.004A	126.585	89.291%	525	13.8	44.46°C	0.877
	12.208V	5.018V	3.329V	5.054V	141.767				47.97°C	230.32V

CL2	82.917A	1.002A	1.004A	1.002A	1024.092	92.966%	1355	41.6	44.67°C	0.991
	12.190V	5.004V	3.315V	4.982V	1101.576				47.51°C	230.37V

The results above are not used in the certification process

Light Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.197A	0.491A	0.478A	0.196A	19.650	71.082%	0	<6.0	0.829
	12.202V	5.023V	3.334V	5.019V	27.644				115.05V
2	2.418A	0.989A	0.988A	0.396A	39.767	85.458%	0	<6.0	0.913
	12.211V	5.020V	3.332V	5.010V	46.534				115.05V
3	3.640A	1.485A	1.500A	0.596A	59.882	89.392%	0	<6.0	0.949
	12.211V	5.020V	3.330V	5.007V	66.988				115.07V
4	4.851A	1.993A	1.982A	0.796A	79.813	91.001%	380	9.6	0.969
	12.209V	5.020V	3.330V	5.002V	87.706				115.09V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.193A	0.491A	0.480A	0.196A	19.616	76.143%	0	<6.0	0.480
	12.209V	5.024V	3.334V	5.019V	25.762				230.28V
2	2.414A	0.992A	0.989A	0.396A	39.730	85.801%	380	9.6	0.658
	12.208V	5.020V	3.332V	5.010V	46.305				230.28V
3	3.638A	1.489A	1.500A	0.596A	59.867	89.715%	380	9.6	0.732
	12.208V	5.020V	3.330V	5.007V	66.730				230.28V
4	4.849A	1.995A	1.982A	0.796A	79.788	91.576%	395	10.5	0.790
	12.207V	5.020V	3.330V	5.002V	87.128				230.28V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.9 mV	4.2 mV	13.0 mV	7.6 mV	Pass
20% Load	14.2 mV	4.0 mV	8.8 mV	5.0 mV	Pass
30% Load	11.9 mV	4.8 mV	10.5 mV	6.0 mV	Pass
40% Load	10.6 mV	5.2 mV	12.0 mV	6.2 mV	Pass
50% Load	11.8 mV	5.7 mV	13.5 mV	7.0 mV	Pass
60% Load	13.1 mV	5.6 mV	13.0 mV	7.6 mV	Pass
70% Load	15.3 mV	6.3 mV	15.3 mV	9.8 mV	Pass
80% Load	17.4 mV	6.6 mV	15.2 mV	10.7 mV	Pass
90% Load	17.4 mV	6.7 mV	16.0 mV	9.8 mV	Pass
100% Load	18.1 mV	7.2 mV	16.6 mV	11.4 mV	Pass
110% Load	21.7 mV	7.4 mV	16.9 mV	12.0 mV	Pass
Crossload 1	13.8 mV	4.9 mV	10.7 mV	5.7 mV	Pass
Crossload 2	16.5 mV	7.0 mV	15.0 mV	10.7 mV	Pass

The results above are not used in the certification process

230V

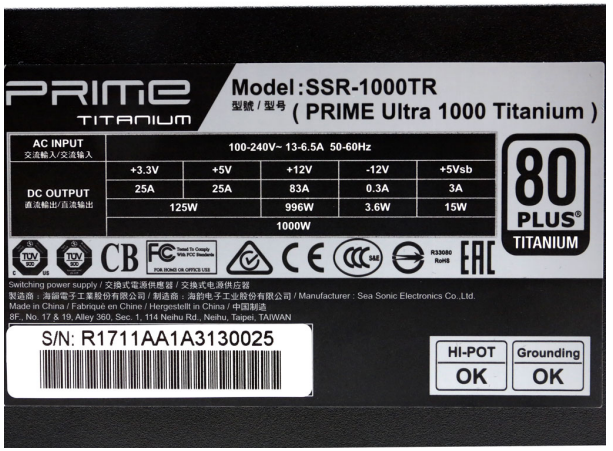
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.0 mV	3.8 mV	8.5 mV	4.1 mV	Pass
20% Load	15.2 mV	3.6 mV	8.6 mV	4.5 mV	Pass
30% Load	12.1 mV	4.6 mV	9.0 mV	4.5 mV	Pass
40% Load	10.0 mV	4.0 mV	8.7 mV	5.8 mV	Pass
50% Load	11.1 mV	4.5 mV	9.7 mV	5.1 mV	Pass
60% Load	13.0 mV	4.4 mV	9.8 mV	6.5 mV	Pass
70% Load	14.4 mV	4.7 mV	10.7 mV	7.4 mV	Pass
80% Load	15.6 mV	4.9 mV	11.6 mV	7.7 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	16.0 mV	5.3 mV	11.4 mV	7.9 mV	Pass
100% Load	17.7 mV	5.9 mV	13.2 mV	9.7 mV	Pass
110% Load	22.6 mV	6.2 mV	14.0 mV	10.4 mV	Pass
Crossload 1	15.1 mV	4.4 mV	9.7 mV	5.3 mV	Pass
Crossload 2	16.9 mV	5.8 mV	12.4 mV	8.9 mV	Pass

The results above are not used in the certification process

Seasonic Prime Titanium Ultra 1000W (#2)

Top side



Power specifications label

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

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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