Seasonic Prime Titanium Ultra 650W

R1709AA181140024

Lab ID 239

Certification ID 25239

Test Result Report ID:

Certificate Issue Date: Aug 12, 2018

Scheme: ETA-EMI PSU

115V



230V

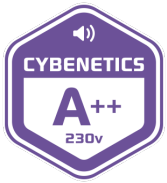


Scheme: LAMBDA PSU

115V



230V





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 650W
OEM/ODM	Seasonic
Serial Number	R1709AA181140024
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	8.5-4

□□□□ (Hz)	50-60
□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135mm Fluid Dynamic Bearing Fan (HA13525L12F-Z)
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	239
Date of receipt	Jul 28, 2018
Testing Date	Aug 8, 2018
Report Issued Date	Aug 12, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□
(Non-accredited measurements)

□□□□□				
□□	□□□□	□□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (600mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (660mm)	2	2	18AWG	□
6+2pin PCIe□□ (700mm+80mm)	2	4	18AWG	□
SATA□□ (410mm+110mm+110mm+110mm)	1	4	18AWG	□
SATA□□ (300mm+150mm)	1	2	18AWG	□

□ 4pin Molex□□ (450mm+120mm+120mm)	1	3	18AWG	□
□ 4pin Molex□□ (350mm+120mm)	1	2	18AWG	□
4-pin Molex Adapter / SATA□□ (150mm+150mm)	1	2	18AWG	□
□ 4pin □□ (+100mm)	1	1	22AWG	□
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54	3	0.3
	□	100		648	15	3.6
□□□□□ (W)		650				

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	92.425%
Average Noise Output (>1450 Load Combinations)	9.98dBA
PF□□□ (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.0550W
Non-Accredited	
12V Ripple (Full Load)	16.73mV

5V Ripple (Full Load)	5.20mV
3.3V Ripple (Full Load)	8.53mV
5VSB Ripple (Full Load)	6.65mV
12V Load Regulation	0.04%
5V Load Regulation	0.24%
3.3V Load Regulation	0.33%
5VSB Load Regulation	1.41%
Inrush Current	31.657A

230V

Accredited		
□□□□ (>1450 load combinations)		93.907%
Average Noise Output (>1450 Load Combinations)		10.29dBA
PF□□□ (>1450 Load Combinations)		0.931
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0863W
Non-Accredited		
12V Ripple (Full Load)		19.49mV
5V Ripple (Full Load)		7.99mV
3.3V Ripple (Full Load)		9.30mV
5VSB Ripple (Full Load)		5.46mV
12V Load Regulation		0.28%
5V Load Regulation		0.14%
3.3V Load Regulation		0.15%
5VSB Load Regulation		1.15%
Inrush Current		61.536A
□□□□ & PG□□		28.60ms
AC Loss to PWR_OK Hold Up Time		23.50ms
PWR_OK Inactive to DC Loss Delay		5.10ms
OPP (0.00°C / 0.00°C)	-	-

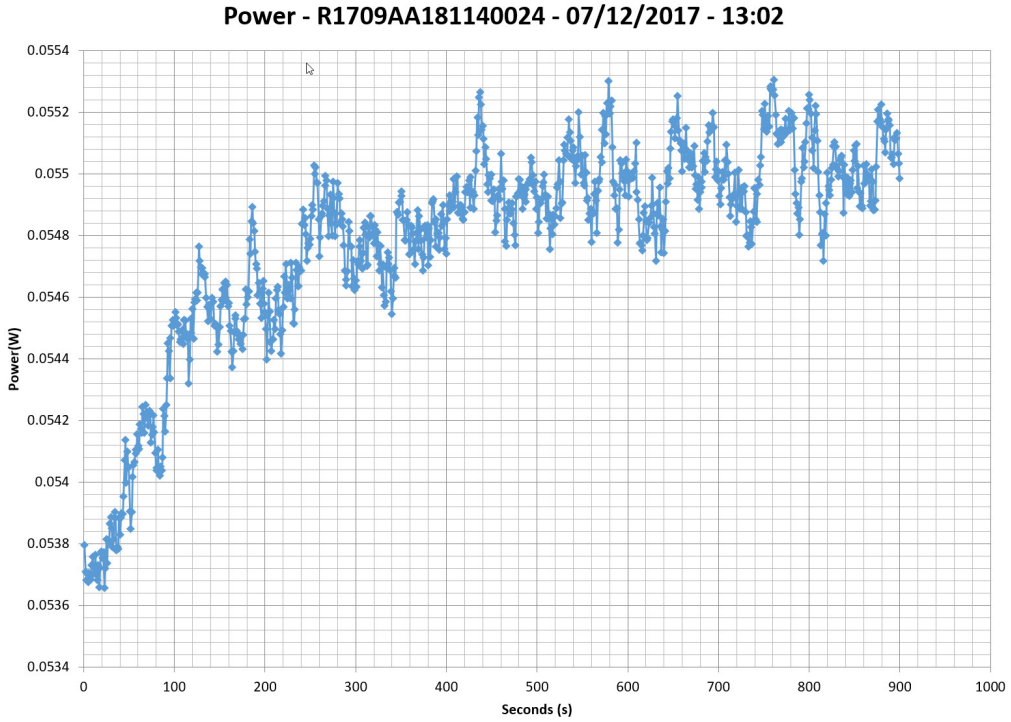
□□□□ & PG□□

Hold-Up Time (ms)	28.6
AC Loss to PWR_OK Hold Up Time (ms)	23.5
PWR_OK Inactive to DC Loss Delay (ms)	5.1

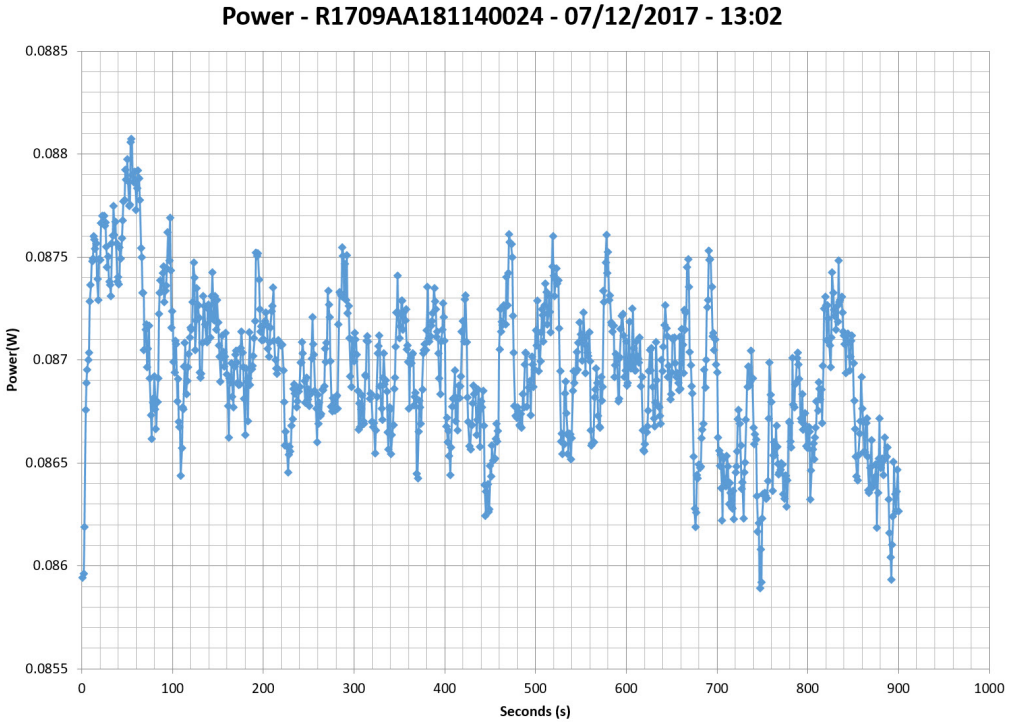
□□□□

Graphs

115V



230V



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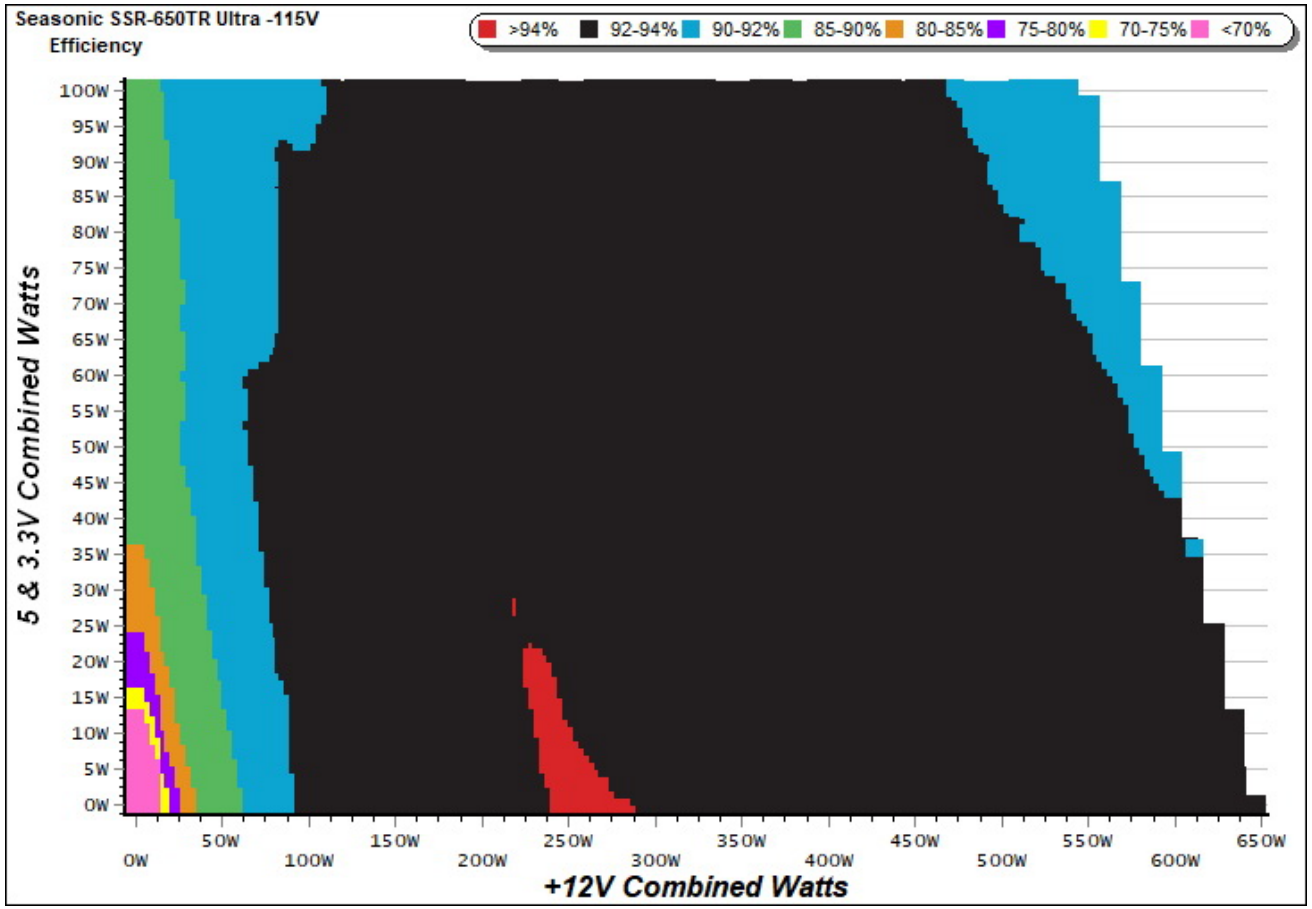
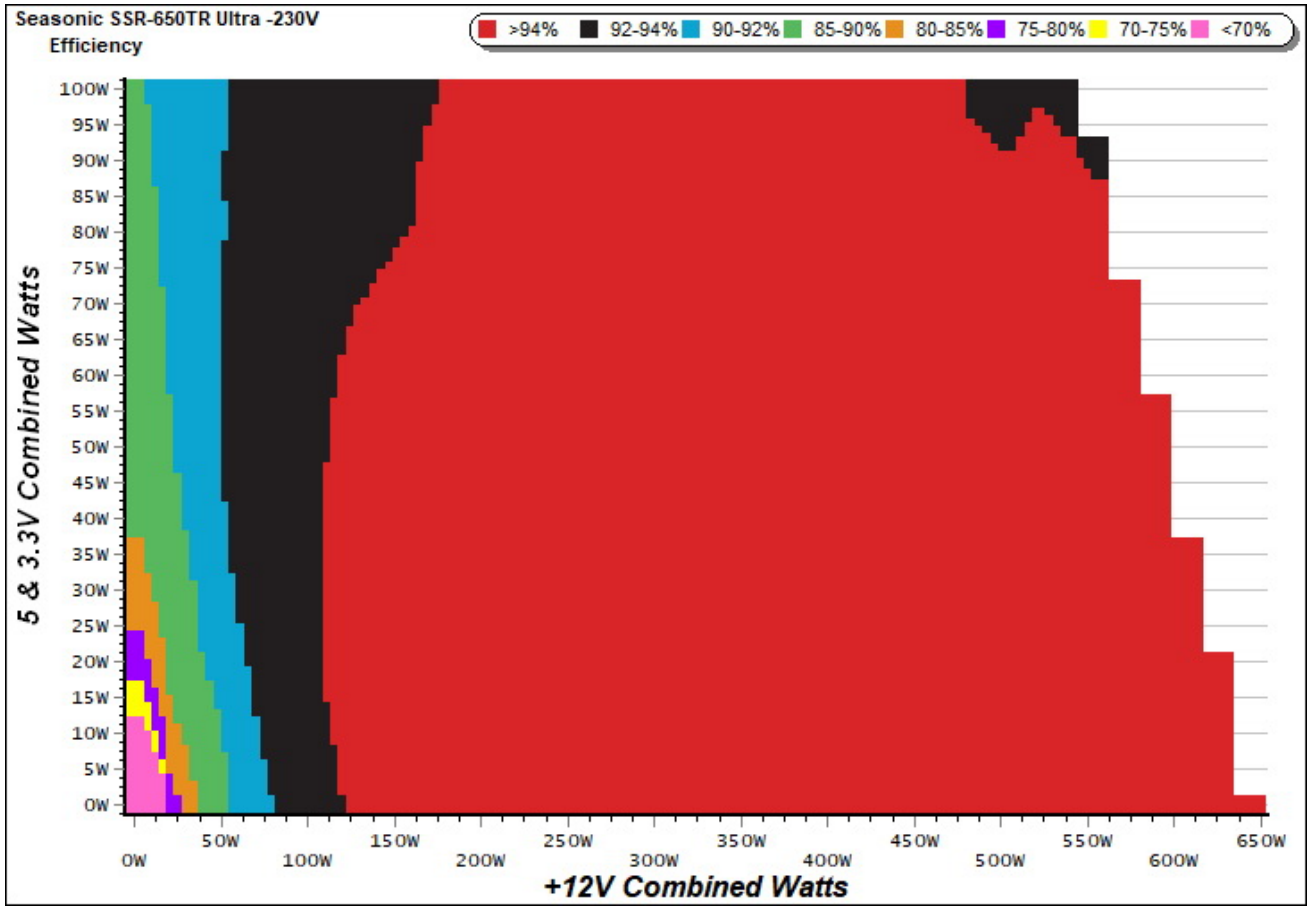
115V



□□

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



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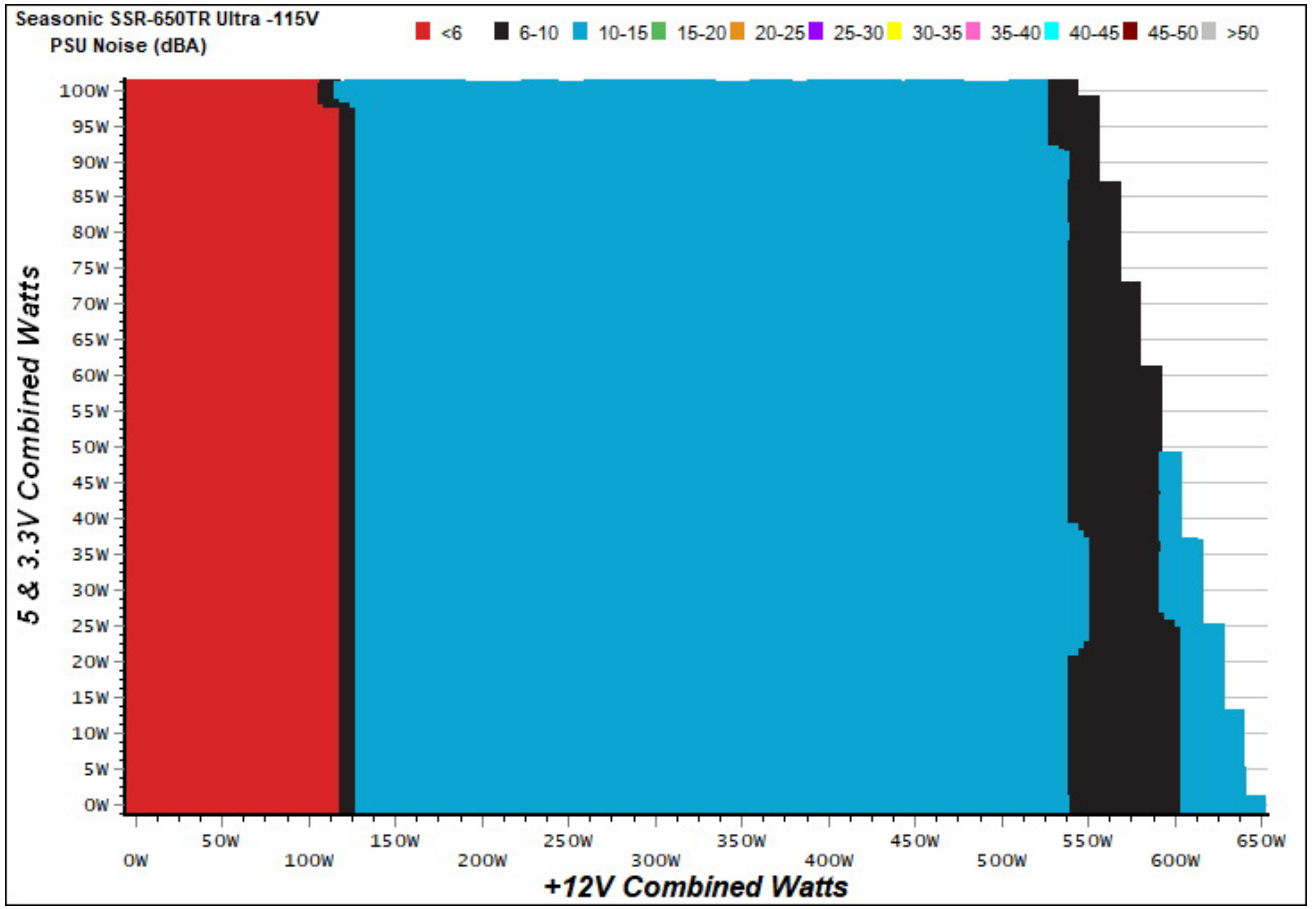
□□□□□

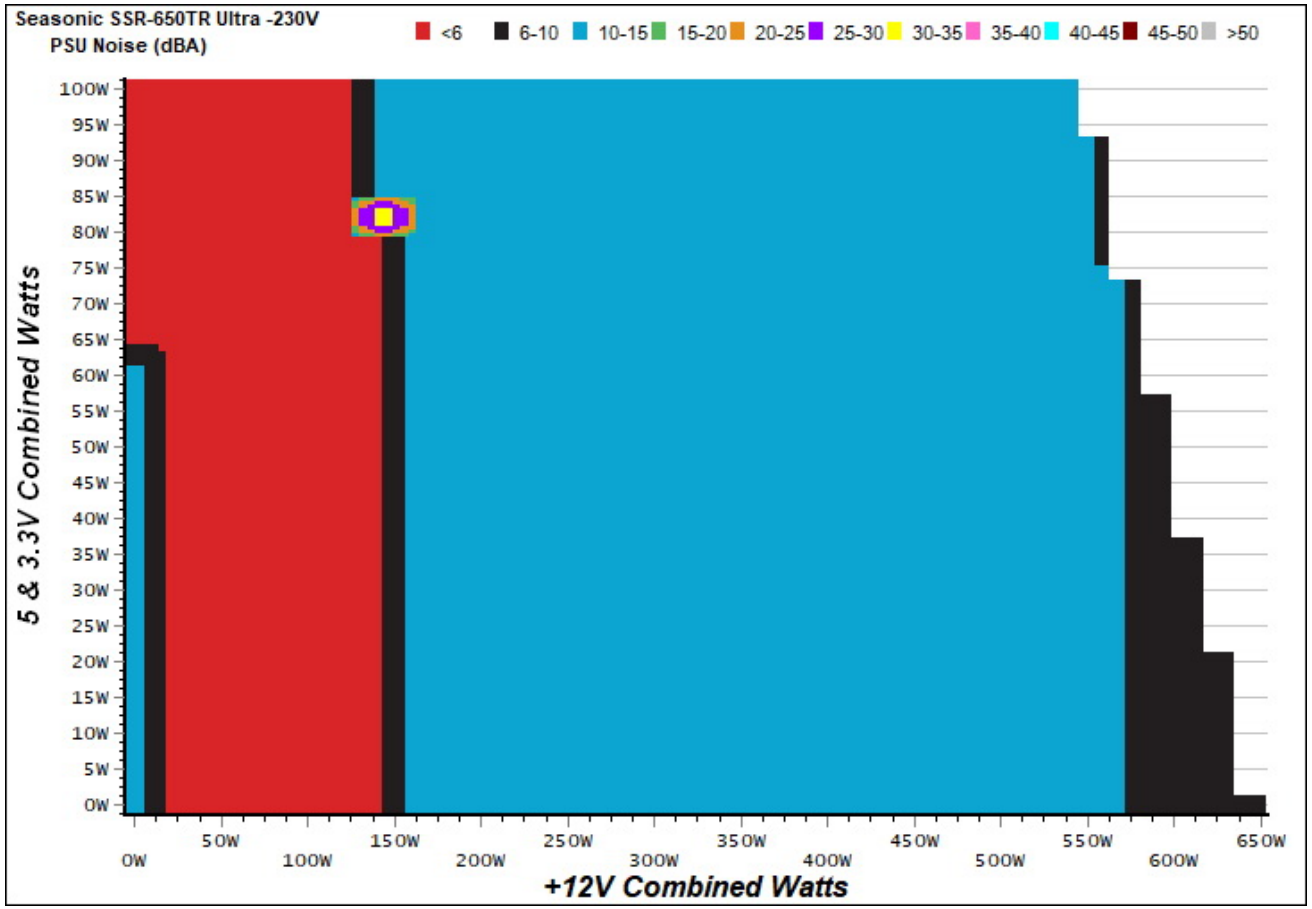
115V



□□

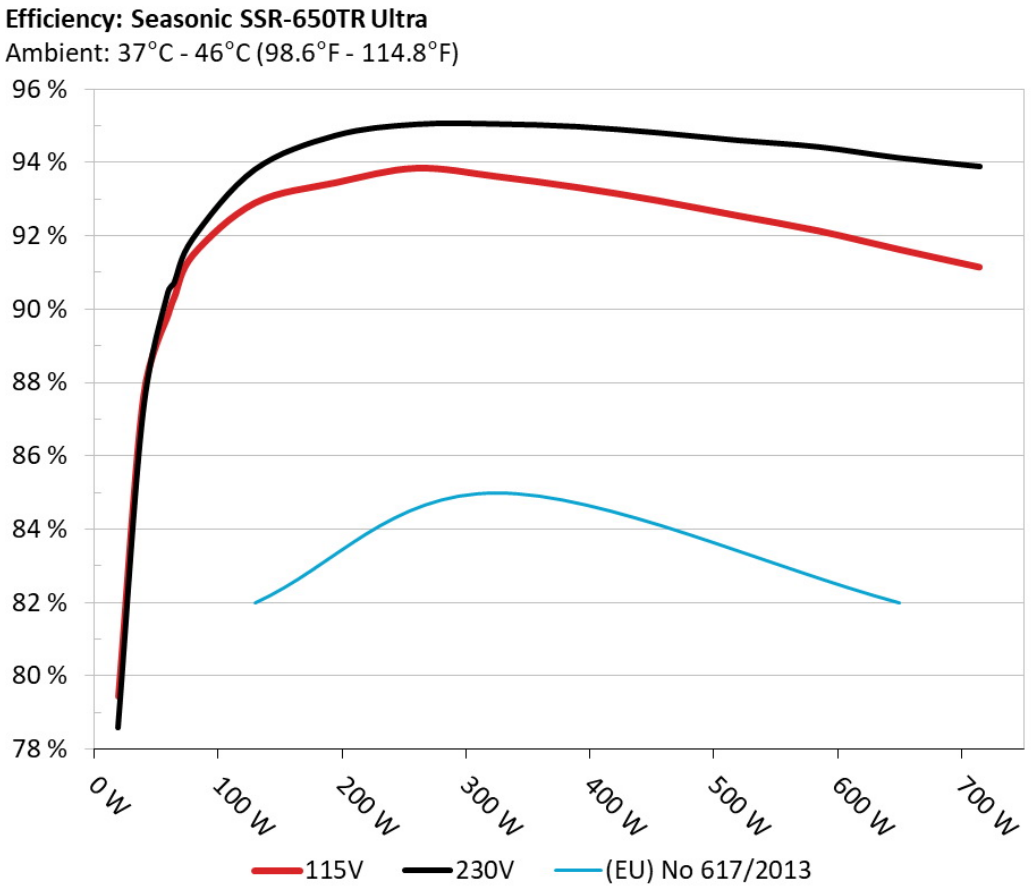
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



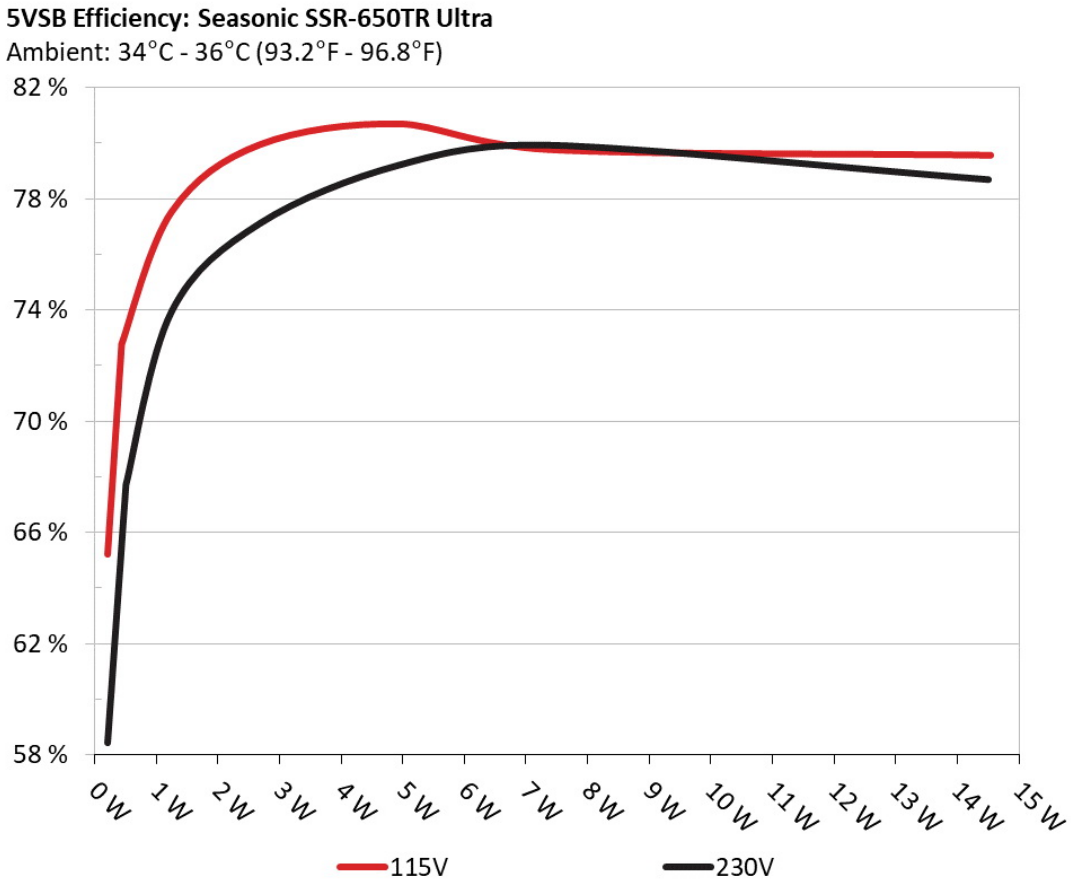
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance



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□□□□



□□

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input.

□□□□ □□ 5Vsb □□ (ErP Lot3/6 & CEC)

115V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.042A	0.208	65.204%	0.034
	4.966V	0.319		115.07V
2	0.088A	0.435	72.621%	0.063
	4.963V	0.599		115.09V
3	0.542A	2.682	79.940%	0.267
	4.944V	3.355		115.07V
4	1.002A	4.938	80.686%	0.361
	4.926V	6.120		115.07V
5	1.502A	7.365	79.760%	0.414
	4.903V	9.234		115.08V
6	3.001A	14.542	79.556%	0.479
	4.845V	18.279		115.08V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.042A	0.208	58.427%	0.011
	4.965V	0.356		230.28V
2	0.087A	0.434	67.707%	0.021
	4.963V	0.641		230.28V
3	0.542A	2.681	77.107%	0.105
	4.942V	3.477		230.25V
4	1.002A	4.935	79.201%	0.173
	4.924V	6.231		230.26V
5	1.502A	7.364	79.922%	0.231
	4.903V	9.214		230.27V
6	3.002A	14.510	78.683%	0.333
	4.834V	18.441		230.27V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.534A	1.985A	1.986A	0.997A	64.778	90.337%	395	10.5	38.04°C	0.956
	12.231V	5.026V	3.317V	5.004V	71.707				43.86°C	115.02V
2	8.089A	2.979A	2.985A	1.201A	129.809	92.894%	395	10.5	38.25°C	0.981
	12.231V	5.025V	3.316V	4.999V	139.739				44.20°C	115.03V
3	12.988A	3.485A	3.498A	1.401A	194.969	93.444%	395	10.5	38.65°C	0.988
	12.232V	5.024V	3.315V	4.993V	208.649				45.55°C	115.03V
4	17.876A	3.983A	3.980A	1.602A	259.838	93.840%	395	10.5	38.96°C	0.996
	12.232V	5.022V	3.313V	4.988V	276.896				47.01°C	115.03V
5	22.426A	4.976A	4.978A	1.805A	324.799	93.614%	420	10.8	39.27°C	0.992
	12.233V	5.020V	3.312V	4.984V	346.954				49.37°C	115.02V
6	26.979A	5.974A	5.976A	2.005A	389.787	93.318%	435	10.7	40.36°C	0.991
	12.233V	5.020V	3.310V	4.979V	417.698				50.63°C	115.03V
7	31.519A	6.979A	6.978A	2.210A	454.723	92.959%	290	9.0	41.18°C	0.992
	12.234V	5.019V	3.310V	4.975V	489.164				57.03°C	115.02V
8	36.068A	7.973A	7.979A	2.412A	519.682	92.545%	385	10.5	41.69°C	0.993
	12.235V	5.018V	3.308V	4.970V	561.544				57.89°C	115.02V
9	41.044A	8.473A	8.494A	2.412A	584.760	92.133%	460	11.9	43.46°C	0.994
	12.235V	5.017V	3.307V	4.970V	634.691				61.08°C	115.03V
10	45.759A	8.978A	8.982A	3.026A	649.638	91.627%	540	15.8	44.97°C	0.995
	12.236V	5.016V	3.307V	4.955V	709.002				63.12°C	115.03V
11	51.068A	8.981A	8.983A	3.026A	714.584	91.146%	610	18.7	46.24°C	0.995
	12.236V	5.015V	3.305V	4.953V	783.995				66.07°C	115.04V
CL1	0.102A	12.012A	12.003A	0.005A	101.471	89.060%	440	11.6	44.35°C	0.978
	12.228V	5.026V	3.318V	5.048V	113.936				59.17°C	115.06V

CL2	53.978A	1.003A	1.002A	1.002A	673.938	91.878%	580	16.4	45.08°C	0.995
	12.238V	5.018V	3.310V	4.995V	733.515				64.07°C	115.04V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.543A	1.990A	1.988A	0.999A	64.916	90.761%	0	<6.0	46.73°C	0.735
	12.224V	5.027V	3.320V	5.007V	71.524				40.00°C	231.00V
2	8.060A	2.986A	2.981A	1.199A	129.395	93.703%	395	10.5	40.83°C	0.859
	12.220V	5.026V	3.319V	5.004V	138.090				47.97°C	230.97V
3	12.973A	3.483A	3.465A	1.400A	194.477	94.652%	395	10.5	41.13°C	0.915
	12.216V	5.025V	3.318V	5.000V	205.465				48.48°C	230.76V
4	17.889A	3.981A	3.977A	1.602A	259.663	94.905%	395	10.5	41.86°C	0.944
	12.212V	5.025V	3.318V	4.995V	273.603				49.83°C	230.88V
5	22.483A	4.978A	4.973A	1.803A	324.977	94.910%	420	10.8	42.05°C	0.961
	12.208V	5.024V	3.317V	4.992V	342.405				50.46°C	230.66V
6	27.011A	5.974A	5.967A	2.005A	389.473	94.797%	468	12.1	42.80°C	0.968
	12.205V	5.023V	3.317V	4.989V	410.848				51.74°C	230.79V
7	31.607A	6.971A	6.966A	2.207A	454.795	94.616%	350	10.1	43.29°C	0.975
	12.202V	5.023V	3.317V	4.986V	480.676				52.67°C	230.74V
8	36.209A	7.968A	7.959A	2.409A	520.099	94.353%	425	10.8	43.77°C	0.979
	12.198V	5.022V	3.317V	4.984V	551.227				53.69°C	230.69V
9	41.212A	8.466A	8.444A	2.408A	585.007	94.134%	460	11.9	44.67°C	0.981
	12.193V	5.021V	3.316V	4.984V	621.465				54.88°C	230.64V
10	45.949A	8.963A	8.958A	3.019A	649.819	93.818%	525	13.8	45.21°C	0.984
	12.190V	5.021V	3.315V	4.969V	692.641				55.60°C	230.60V
11	51.286A	8.965A	8.960A	3.020A	714.633	93.609%	580	16.4	46.13°C	0.987
	12.185V	5.021V	3.314V	4.969V	763.425				56.87°C	230.39V
CL1	0.139A	12.002A	11.999A	0.000A	101.906	89.766%	385	10.5	42.66°C	0.826
	12.227V	5.025V	3.325V	5.061V	113.524				50.91°C	230.96V

CL2	54.002A	1.001A	0.999A	1.000A	671.245	94.176%	490	13.3	45.63°C	0.985
	12.183V	5.024V	3.312V	5.001V	712.754				55.71°C	230.59V

The results above are not used in the certification process

20-80□□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.197A	0.490A	0.479A	0.197A	19.675	79.453%	0	<6.0	0.797
	12.221V	5.031V	3.321V	5.026V	24.763				115.02V
2	2.414A	0.986A	0.992A	0.397A	39.770	87.607%	0	<6.0	0.908
	12.232V	5.028V	3.318V	5.019V	45.396				307.51V
3	3.636A	1.483A	1.505A	0.596A	59.912	89.881%	395	10.5	0.952
	12.232V	5.027V	3.318V	5.013V	66.657				115.02V
4	4.844A	1.986A	1.988A	0.796A	79.807	91.478%	395	10.5	0.964
	12.231V	5.026V	3.316V	5.009V	87.242				115.02V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.194A	0.498A	0.483A	0.199A	19.707	78.608%	0	<6.0	0.454
	12.225V	5.031V	3.321V	5.027V	25.070				231.02V
2	2.437A	0.995A	0.996A	0.399A	40.101	87.229%	0	<6.0	0.625
	12.224V	5.028V	3.319V	5.020V	45.972				231.02V
3	3.612A	1.492A	1.476A	0.598A	59.548	90.412%	0	<6.0	0.715
	12.223V	5.027V	3.319V	5.016V	65.863				231.01V
4	4.854A	1.990A	1.988A	0.798A	79.926	91.892%	0	<6.0	0.775
	12.222V	5.027V	3.319V	5.012V	86.978				231.00V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.2 mV	3.6 mV	6.1 mV	3.3 mV	Pass
20% Load	14.5 mV	3.6 mV	6.1 mV	4.0 mV	Pass
30% Load	16.3 mV	3.4 mV	6.1 mV	4.0 mV	Pass
40% Load	12.5 mV	4.0 mV	7.0 mV	5.1 mV	Pass
50% Load	10.6 mV	4.1 mV	7.2 mV	4.5 mV	Pass
60% Load	10.8 mV	4.4 mV	7.6 mV	5.0 mV	Pass
70% Load	13.8 mV	4.3 mV	7.5 mV	5.2 mV	Pass
80% Load	15.3 mV	4.4 mV	7.8 mV	5.6 mV	Pass
90% Load	15.7 mV	4.5 mV	7.1 mV	5.6 mV	Pass
100% Load	16.7 mV	5.2 mV	8.5 mV	6.7 mV	Pass
110% Load	18.2 mV	5.5 mV	8.8 mV	6.8 mV	Pass
Crossload 1	15.5 mV	3.9 mV	6.6 mV	3.8 mV	Pass
Crossload 2	17.2 mV	5.1 mV	7.9 mV	5.3 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.6 mV	3.7 mV	4.9 mV	2.2 mV	Pass
20% Load	16.8 mV	4.3 mV	6.0 mV	2.5 mV	Pass
30% Load	18.5 mV	4.3 mV	6.0 mV	2.7 mV	Pass
40% Load	14.7 mV	4.8 mV	6.5 mV	3.0 mV	Pass
50% Load	12.8 mV	5.7 mV	7.2 mV	3.2 mV	Pass
60% Load	13.5 mV	6.4 mV	8.2 mV	4.1 mV	Pass
70% Load	16.2 mV	6.3 mV	7.9 mV	4.3 mV	Pass
80% Load	18.0 mV	6.2 mV	9.1 mV	4.5 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	18.6 mV	6.2 mV	9.1 mV	4.7 mV	Pass
100% Load	19.5 mV	8.0 mV	9.3 mV	5.5 mV	Pass
110% Load	22.2 mV	7.5 mV	9.8 mV	5.7 mV	Pass
Crossload 1	15.0 mV	7.7 mV	9.8 mV	3.5 mV	Pass
Crossload 2	21.9 mV	4.9 mV	5.3 mV	4.7 mV	Pass

The results above are not used in the certification process

Seasonic Prime Titanium Ultra 650W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

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