Cybenetics

Anex

Seasonic SSR-650TR Ultra

Lab ID#: 239
Receipt Date: -
Test Date: -

Report:
Report Date: Aug 12, 2018

DUT INFORMATION

Brand	Seasonic
Manufacturer (OEM)	Seasonic
Series	Prime Titanium Ultra
Model Number	SSR-650TR Ultra
Serial Number	R1709AA181140024
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8.5-4
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525L12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	3	0.3
	Watts	100		648	15	3.6
Total Max. Power (W)		650				

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 (660mm)	2	2	18AWG	No
6+2 pin PCIe (700mm+80mm)	2	4	18AWG	No
SATA (410mm+110mm+110mm+110mm)	1	4	18AWG	No
SATA (300mm+150mm)	1	2	18AWG	No
4 pin Molex (450mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex (350mm+120mm)	1	2	18AWG	No
4-pin Molex Adapter / SATA (150mm+150mm)	1	2	18AWG	No
FDD Adapter (+100mm)	1	1	22AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	92.425
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	79.426
Standby Power Consumption (W) -115V	0.0549842
Standby Power Consumption (W) -230V	0.0862653
Average PF	0.987
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	9.98
Efficiency Rating (ETA)	TITANIUM
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	

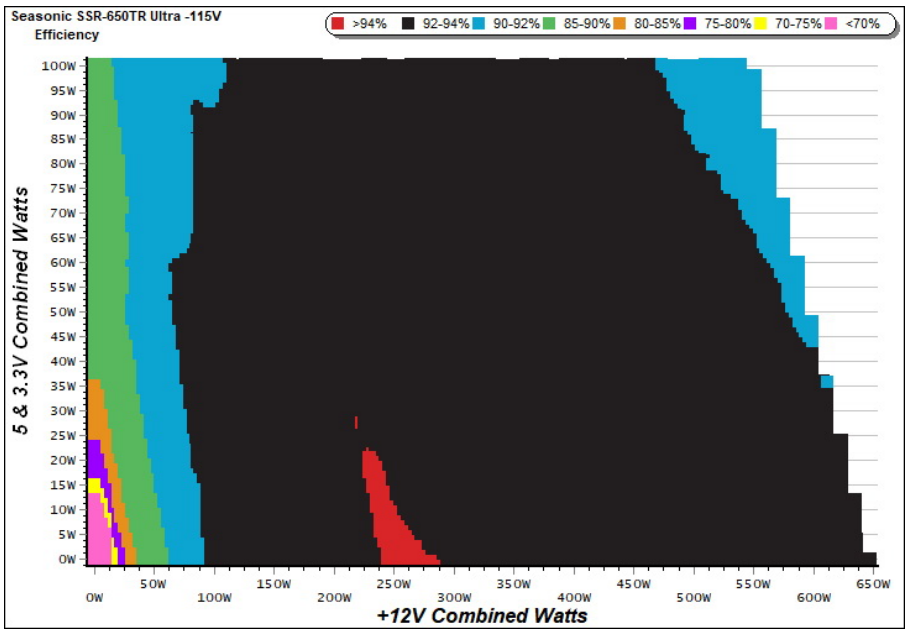
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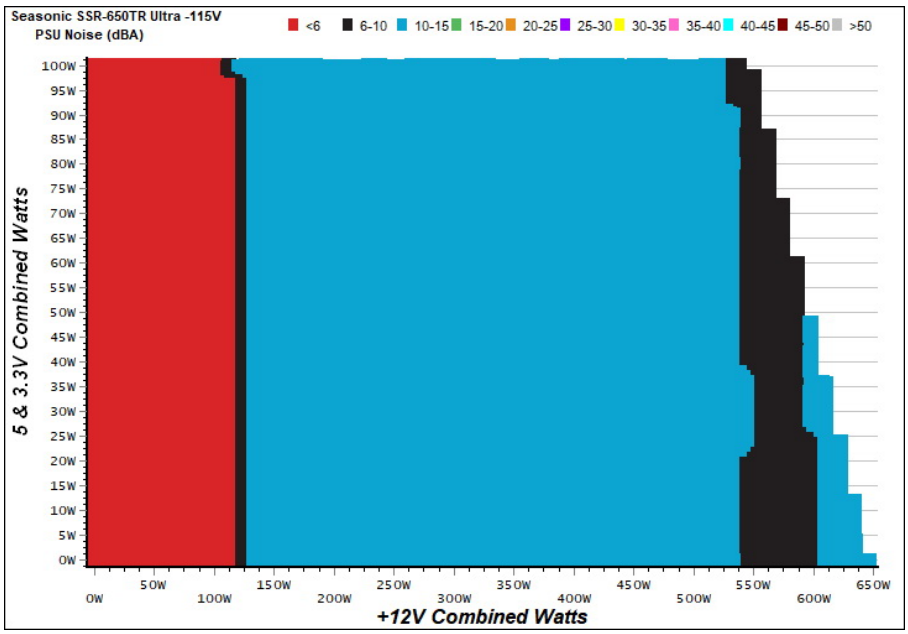
EFFICIENCY GRAPH



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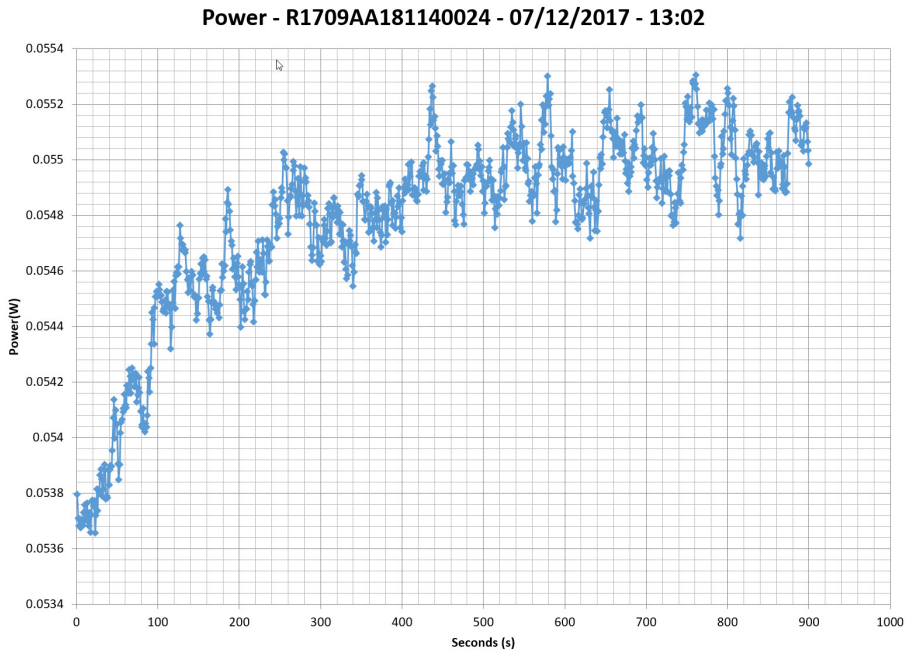
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.208	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

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
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

VAMPIRE POWER -115V



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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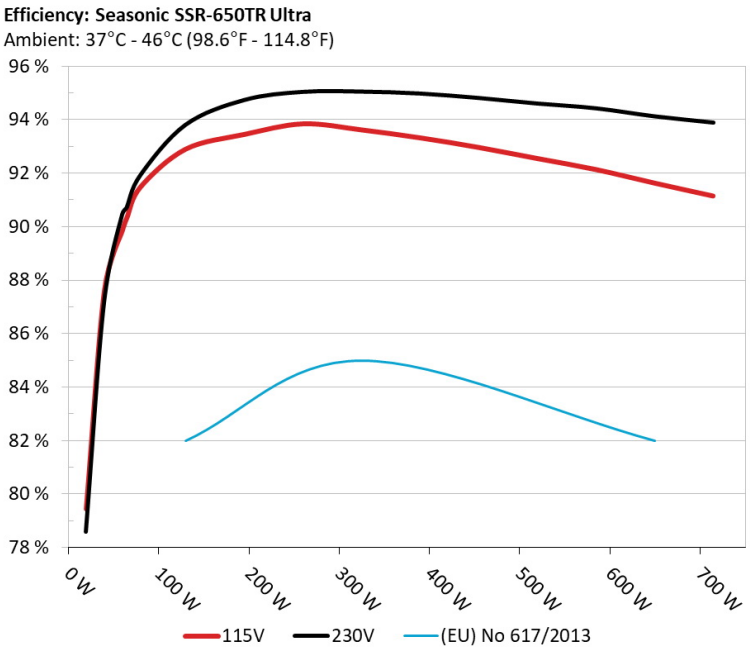
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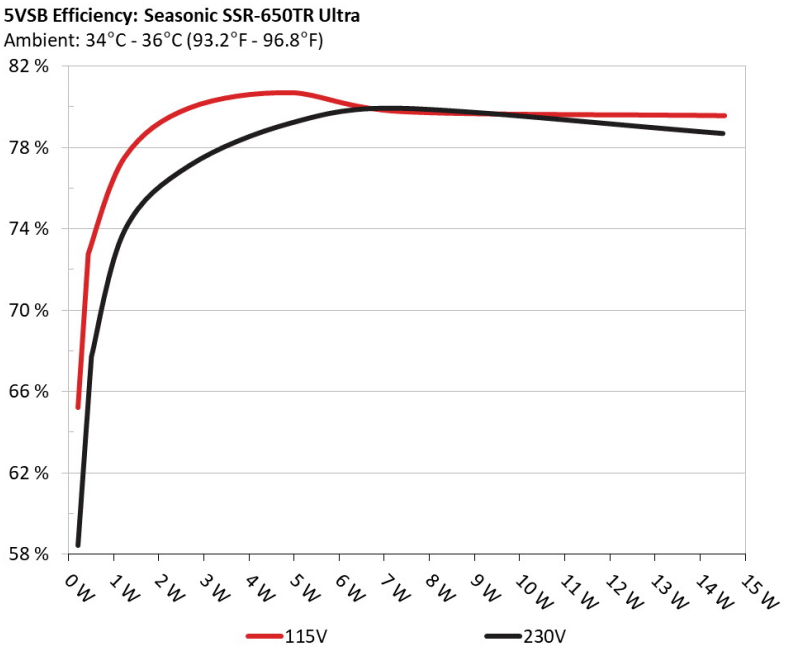
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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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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	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

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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	1.197A	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

RIPPLE MEASUREMENTS

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

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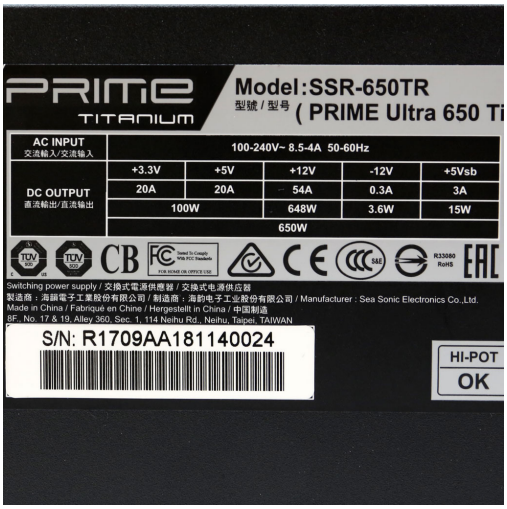
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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	28.64
AC Loss to PWR_OK Hold Up Time (ms)	23.54
PWR_OK Inactive to DC Loss Delay (ms)	5.10



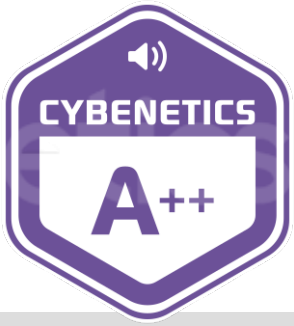
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Power specifications label

CERTIFICATIONS





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