

Anex

Seasonic SSR-650GD

Lab ID#: 71
Receipt Date: -
Test Date: -

Report:

Report Date: Jan 4, 2018

DUT INFORMATION	
Brand	Seasonic
Manufacturer (OEM)	Sea Sonic Electronics Co., Ltd.
Series	Prime Gold
Model Number	SSR-650GD
Serial Number	R1701TA101460009
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525M12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	2.5	0.3
	Watts	100		648	12.5	3.6
Total Max. Power (W)		650				

CABLES AND CONNECTORS			
Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (610mm)	1	1	18-22AWG
4+4 pin EPS12V (650mm)	1	1	18AWG
6+2 pin PCIe (680mm+80mm)	2	4	18AWG
SATA (450mm+120mm+120mm+120mm)	1	4	18AWG
SATA (360mm+120mm)	1	2	18AWG
4 pin Molex (460mm+130mm+130mm)	1	3	18AWG
FDD Adapter (+110mm)	1	1	22AWG

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PAGE 1/8

Anex

Seasonic SSR-650GD

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	89.647
Efficiency With 10W ($\leq 500W$) or 2% ($> 500W$) Load -115V	0.000
Average Efficiency 5VSB	79.763
Standby Power Consumption (W) -115V	0.0552163
Standby Power Consumption (W) -230V	0.0824151
Average PF	0.984
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	32.74
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard++

TEST EQUIPMENT

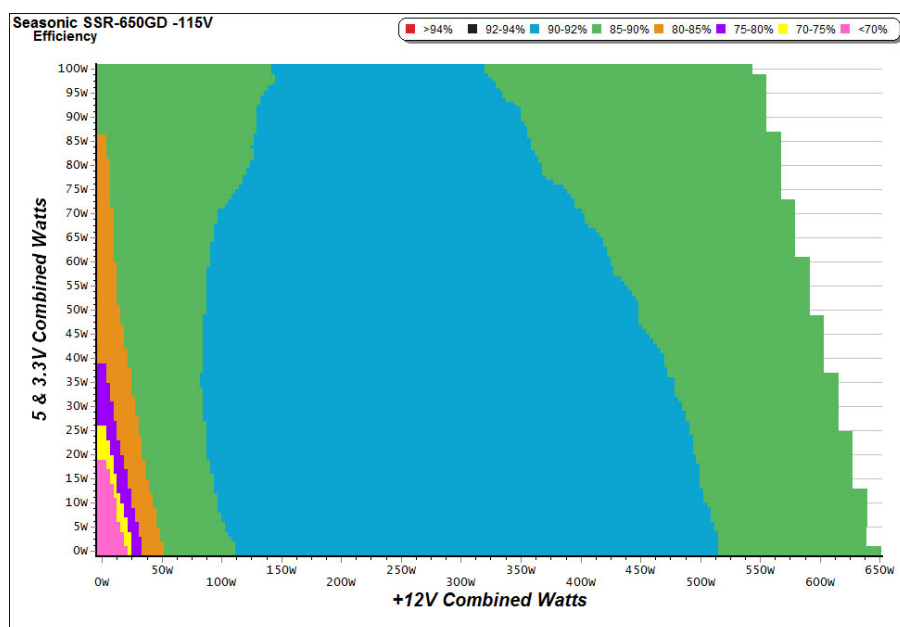
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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PAGE 2/8

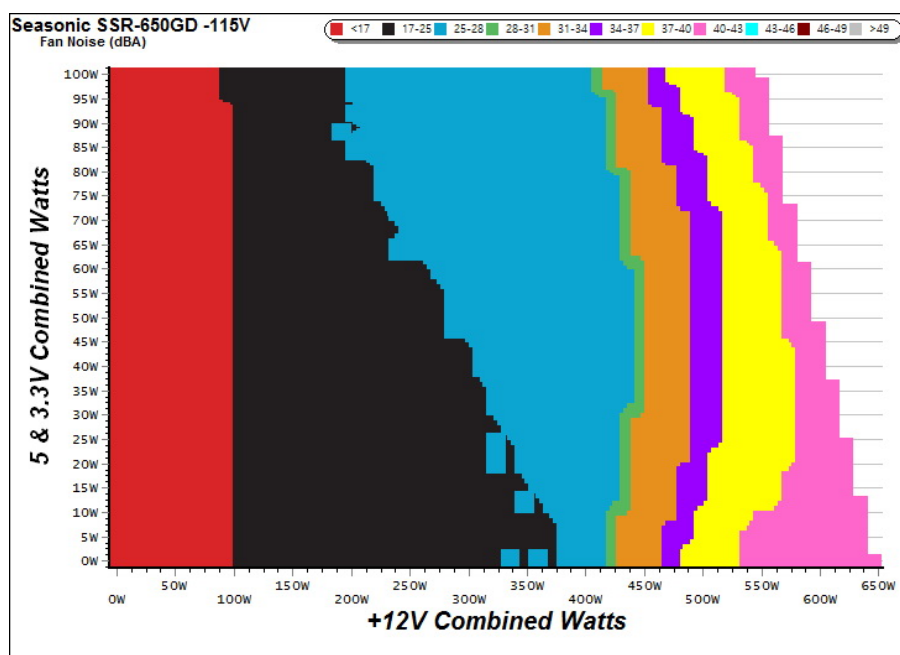
EFFICIENCY GRAPH



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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Anex

Seasonic SSR-650GD

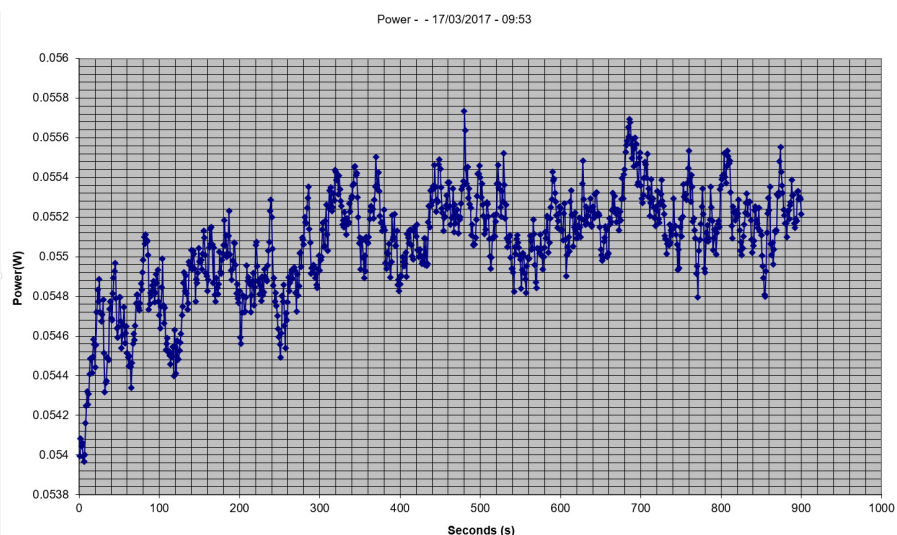
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.215	66.154%	0.037
	5.107V	0.325		115.05V
2	0.088A	0.447	73.159%	0.068
	5.106V	0.611		115.05V
3	0.533A	2.707	80.136%	0.283
	5.085V	3.378		115.06V
4	2.502A	12.500	79.547%	0.481
	4.997V	15.714		115.05V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.215	59.722%	0.012
	5.107V	0.360		230.11V
2	0.088A	0.447	68.875%	0.022
	5.105V	0.649		230.11V
3	0.532A	2.706	78.028%	0.111
	5.083V	3.468		230.13V
4	2.502A	12.471	80.122%	0.327
	4.985V	15.565		230.14V

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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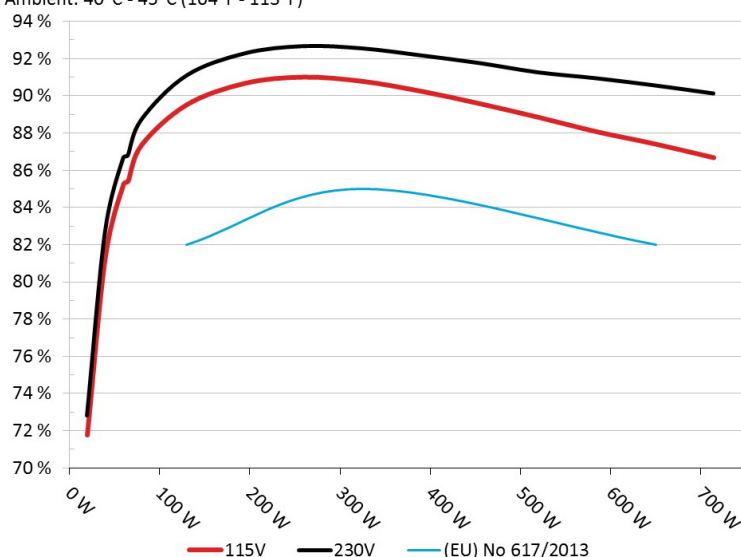
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PAGE 4/8

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Seasonic SSR-650GD

Ambient: 40°C - 45°C (104°F - 113°F)



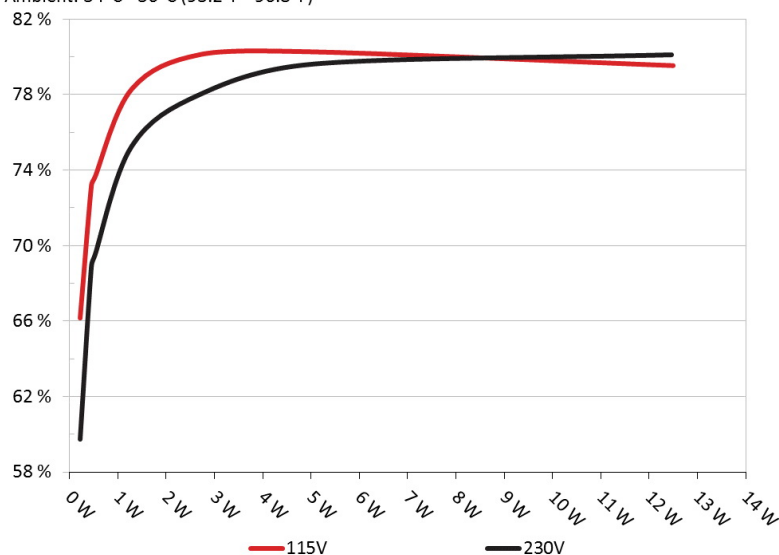
INFO

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-650GD

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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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.541A	1.985A	1.979A	0.991A	64.806	85.403%	732	24.3	38.60°C	0.951
	12.205V	5.033V	3.332V	5.049V	75.883				41.03°C	115.08V
2	8.109A	2.975A	2.970A	1.191A	129.770	89.518%	732	24.3	38.80°C	0.983
	12.198V	5.033V	3.330V	5.031V	144.966				41.68°C	115.08V
3	13.024A	3.478A	3.482A	1.396A	194.870	90.681%	750	25.1	39.65°C	0.988
	12.192V	5.031V	3.328V	5.011V	214.897				42.62°C	115.07V
4	17.940A	3.974A	3.968A	1.601A	259.783	91.010%	860	29.4	39.74°C	0.984
	12.185V	5.031V	3.326V	4.993V	285.445				43.15°C	115.07V
5	22.520A	4.970A	4.961A	1.806A	324.718	90.784%	1165	39.9	40.06°C	0.985
	12.178V	5.030V	3.323V	4.975V	357.681				43.20°C	115.06V
6	27.109A	5.964A	5.957A	2.016A	389.717	90.252%	1560	43.8	40.41°C	0.988
	12.171V	5.030V	3.321V	4.956V	431.812				43.43°C	115.06V
7	31.695A	6.959A	6.958A	2.226A	454.619	89.584%	1820	51.4	41.21°C	0.990
	12.164V	5.029V	3.319V	4.937V	507.480				44.30°C	115.06V
8	36.297A	7.952A	7.956A	2.439A	519.603	88.853%	1990	51.8	41.98°C	0.991
	12.156V	5.030V	3.317V	4.915V	584.788				45.13°C	115.06V
9	41.322A	8.456A	8.472A	2.446A	584.648	88.072%	2060	52.4	43.60°C	0.992
	12.149V	5.030V	3.316V	4.906V	663.830				47.24°C	115.07V
10	46.306A	8.955A	8.958A	2.551A	649.453	87.412%	2060	52.4	44.03°C	0.992
	12.142V	5.028V	3.315V	4.894V	742.981				47.84°C	115.06V
11	51.692A	8.958A	8.962A	2.555A	714.441	86.677%	2060	52.4	45.08°C	0.991
	12.134V	5.026V	3.314V	4.887V	824.259				49.59°C	115.06V
CL1	0.099A	12.012A	12.005A	0.005A	101.740	84.406%	1600	44.5	42.40°C	0.984
	12.210V	5.045V	3.324V	5.078V	120.536				44.99°C	115.10V
CL2	53.970A	1.003A	1.003A	1.003A	667.975	87.736%	2060	52.4	43.51°C	0.992
	12.129V	5.020V	3.323V	4.989V	761.350				47.37°C	115.07V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.195A	0.491A	0.478A	0.197A	19.660	71.749%	732	24.3	0.826
	12.209V	5.036V	3.336V	5.094V	27.401				115.08V
2	2.415A	0.991A	0.990A	0.391A	39.757	81.354%	732	24.3	0.911
	12.207V	5.034V	3.334V	5.081V	48.869				115.08V
3	3.640A	1.482A	1.500A	0.591A	59.881	85.241%	732	24.3	0.947
	12.205V	5.033V	3.333V	5.071V	70.249				115.09V
4	4.853A	1.985A	1.979A	0.792A	79.812	87.351%	732	24.3	0.973
	12.203V	5.033V	3.332V	5.058V	91.369				115.08V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.8 mV	4.9 mV	5.7 mV	6.9 mV	Pass
20% Load	10.8 mV	4.1 mV	6.3 mV	6.9 mV	Pass
30% Load	14.1 mV	4.4 mV	9.1 mV	7.9 mV	Pass
40% Load	16.3 mV	4.6 mV	8.0 mV	9.1 mV	Pass
50% Load	18.3 mV	4.9 mV	9.1 mV	9.5 mV	Pass
60% Load	18.5 mV	5.2 mV	10.0 mV	11.6 mV	Pass
70% Load	18.8 mV	5.3 mV	10.0 mV	11.5 mV	Pass
80% Load	20.3 mV	5.3 mV	10.1 mV	11.6 mV	Pass
90% Load	23.0 mV	6.1 mV	10.4 mV	11.7 mV	Pass
100% Load	26.6 mV	7.2 mV	12.1 mV	15.0 mV	Pass
110% Load	29.2 mV	7.5 mV	12.9 mV	16.1 mV	Pass
Crossload 1	10.0 mV	5.4 mV	6.9 mV	7.0 mV	Pass
Crossload 2	27.0 mV	7.1 mV	11.8 mV	11.8 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	20.42
AC Loss to PWR_OK Hold Up Time (ms)	15.76
PWR_OK Inactive to DC Loss Delay (ms)	4.66



CERTIFICATIONS



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PAGE 8/8