

Lab ID#: SS65001679
Receipt Date: Jul 7, 2020
Test Date: Jul 10, 2020

Report: 20PS1679A

Report Date: Jul 17, 2020

DUT INFORMATION

Brand	SeaSonic
Manufacturer (OEM)	Seasonic
Series	GB3
Model Number	S12III-650
Serial Number	R2002RA1C5251091
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	110-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	120mm Rifle Bearing Fan (DF1202512SEHN)
Semi-Passive Operation	X
Cable Design	Fixed cables

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

Native Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Caps
ATX connector 20+4 pin (550mm)	1	1	18-24AWG	No
4+4 pin EPS12V (610mm)	1	1	18AWG	No
6+2 pin PCIe (550mm+150mm)	2	4	18-22AWG	No
SATA (580mm+125mm+125mm)	1	3	20AWG	No
SATA (450mm+125mm+125mm)	1	3	20AWG	No
4-pin Molex (450mm+120mm+120mm) / FDD(+120mm)	1	3 / 1	20AWG	No

Modular Cables

AC Power Cord (1100mm) - C13 coupler	1	1	18AWG	-
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General Data	-
Manufacturer (OEM)	Seasonic
PCB Type	Single Sided
Primary Side	-
Transient Filter	4x Y caps, 5x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor 5D-11 & Relay
Bridge Rectifier(s)	1x HY GBU1506 (600V, 15A @ 100°C)
APFC MOSFETs	2x Oriental Semiconductor OSG55R140F (550V, 14.5A @ 100°C, Rds(on): 0.140hm)
APFC Boost Diode	1x WeEn BYC15-600P (600V, 15A @ 121°C)
Bulk Cap(s)	1x Teapo (400V, 470uF, 2,000h @ 85°C, LH)
Main Switchers	2x Si23N50F
APFC Controller	Infineon ICE2PCS01G
Resonant Controller	MPS HR1000A
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Group Regulation & Passive Rectification
Secondary Side	-
+12V & 5V SBRs	2x MHCHXM EBR60L45PT (45V, 60A)
3.3V SBRs	2x MHCHXM EBR3EL45
Filtering Capacitors	Electrolytic: 14x Teapo (1-3,000h @ 105°C, SC) Polymer: -
Supervisor IC	Greenergy GR8313 (OVP, UVP, PG)
Fan Model	DF1202512SEHN (120mm, 12V, 0.23A, Rifle Bearing Fan)
5VSB Circuit	-
Rectifier	1x JX MBR1060CT SBR (60V, 10A)
Standby PWM Controller	Excelliance MOS EM8564A
-12V	-
Rectifier	1x STMicroelectronics L7912CV (-12V, 1.5A)

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	83.683%
Efficiency With 10W (≤500W) or 2% (>500W)	59.867
Average Efficiency 5VSB	76.565%
Standby Power Consumption (W)	0.0381524
Average PF	0.993
Avg Noise Output	38.63 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	S+

230V

Average Efficiency	86.091%
Average Efficiency 5VSB	75.550%
Standby Power Consumption (W)	0.0785918
Average PF	0.949
Avg Noise Output	38.28 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	S+

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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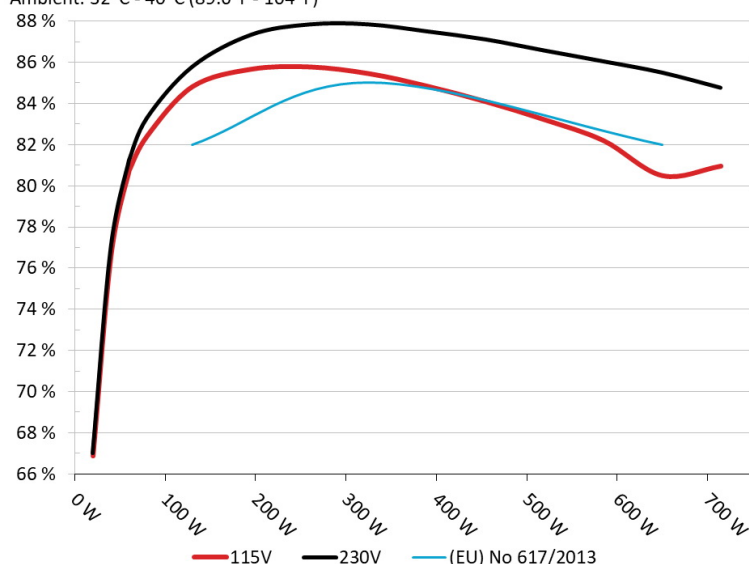
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Seasonic SSR-650GB3

Ambient: 32°C - 40°C (89.6°F - 104°F)



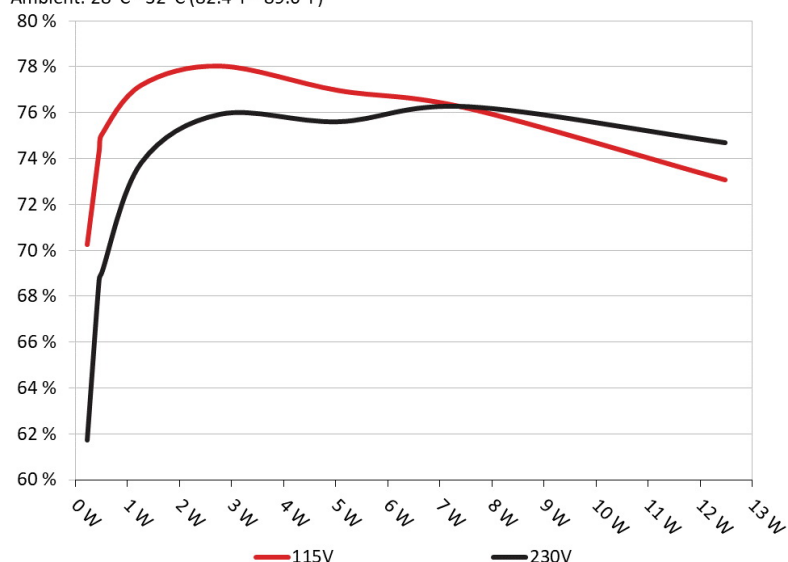
INFO

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-650GB3

Ambient: 28°C - 32°C (82.4°F - 89.6°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	0.229	70.245%	0.015
	5.083V	0.326		115.17V
2	0.090A	0.457	74.309%	0.028
	5.082V	0.615		115.16V
3	0.550A	2.786	78.017%	0.151
	5.066V	3.571		115.16V
4	1.000A	5.049	76.955%	0.248
	5.050V	6.561		115.17V
5	1.500A	7.548	76.173%	0.324
	5.032V	9.909		115.16V
6	2.499A	12.474	73.063%	0.416
	4.991V	17.073		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229	61.725%	0.005
	5.082V	0.371		230.30V
2	0.090A	0.457	68.722%	0.009
	5.081V	0.665		230.30V
3	0.550A	2.786	75.933%	0.049
	5.066V	3.669		230.30V
4	1.000A	5.049	75.606%	0.087
	5.050V	6.678		230.30V
5	1.500A	7.547	76.263%	0.126
	5.032V	9.896		230.30V
6	2.499A	12.485	74.693%	0.197
	4.995V	16.715		230.30V

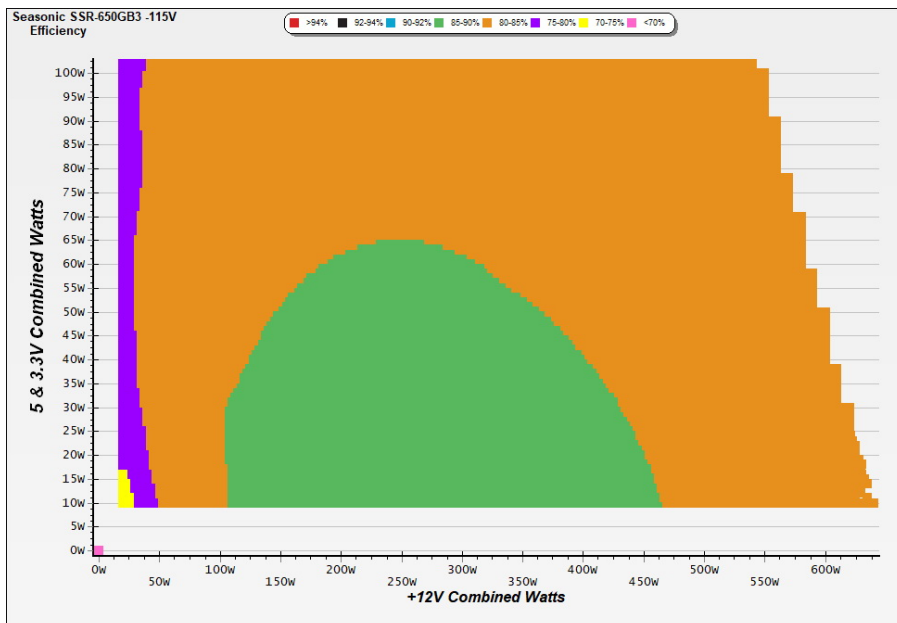
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115V

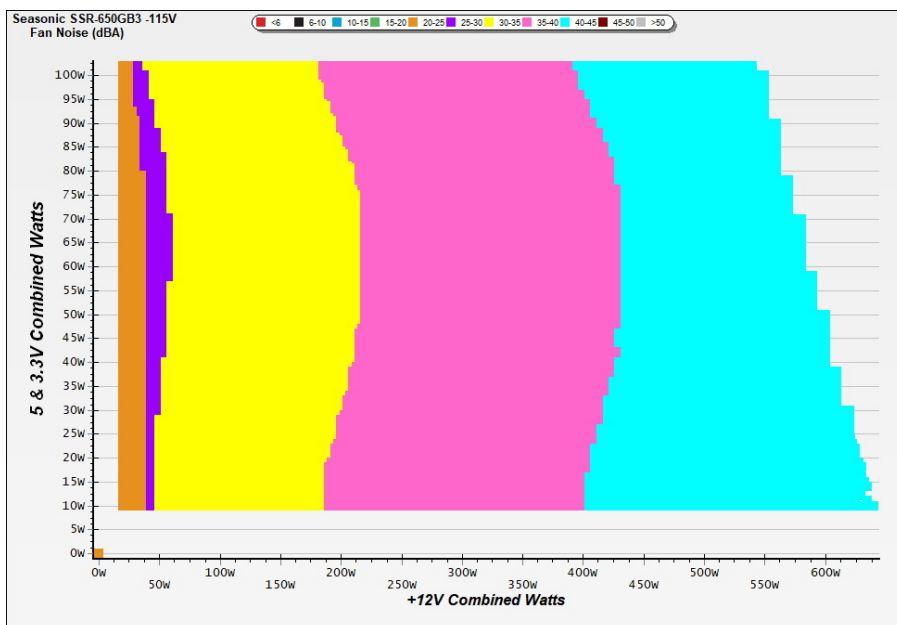
EFFICIENCY GRAPH 115V



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

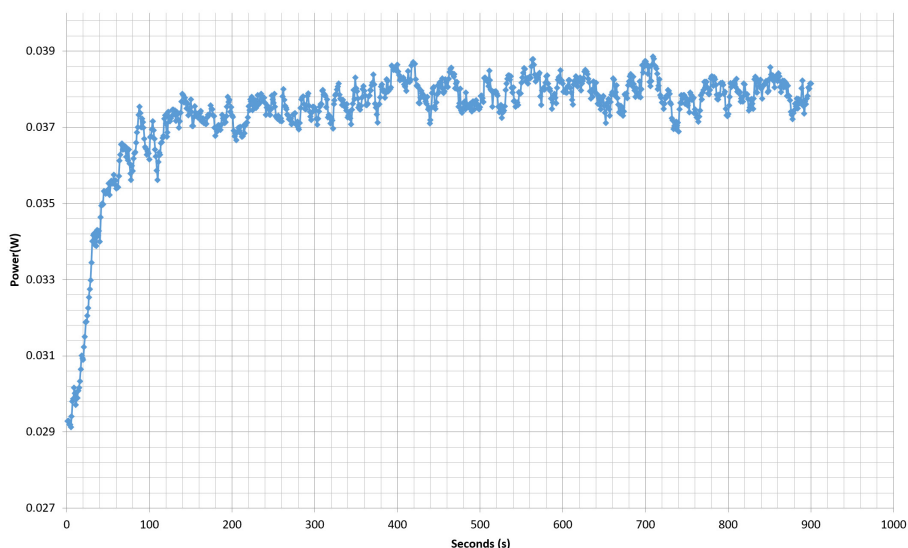
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - R2002RA1C5251086 - 08/07/2020 - 09:40



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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COMMISSION REGULATION (EU) NO 617/2013 TESTING 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	3.589A	1.949A	1.982A	0.991A	64.954	80.767%	1064	27.2	34.28°C	0.945
	12.081V	5.130V	3.328V	5.046V	80.421				37.43°C	115.16V
2	8.205A	2.924A	2.975A	1.192A	130.008	84.822%	1247	32.2	34.84°C	0.984
	12.080V	5.129V	3.325V	5.035V	153.271				38.32°C	115.16V
5	22.755A	4.879A	4.970A	1.799A	325.041	85.451%	1630	38.7	36.02°C	0.996
	12.065V	5.125V	3.319V	5.004V	380.385				42.01°C	115.16V
10	46.678A	8.790A	8.981A	2.521A	649.601	80.496%	2029	43.5	38.99°C	0.999
	12.049V	5.118V	3.306V	4.958V	807.000				49.83°C	115.13V

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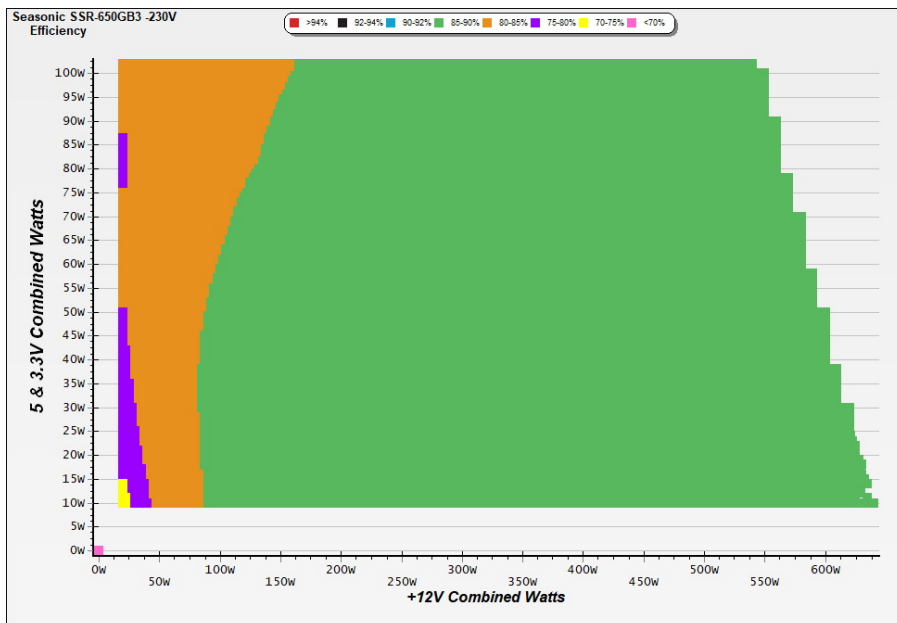
230V

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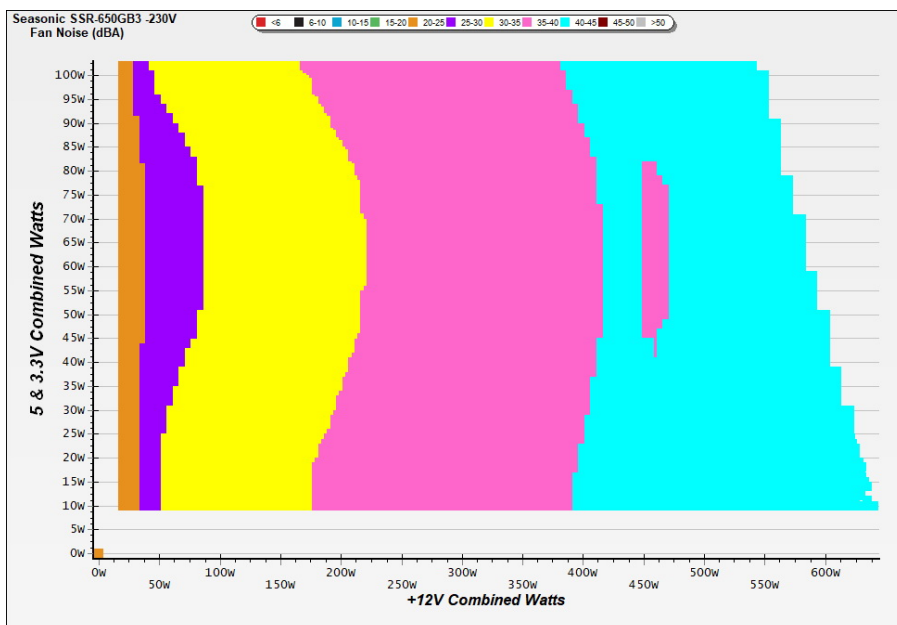
EFFICIENCY GRAPH 230V



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 230V



INFO

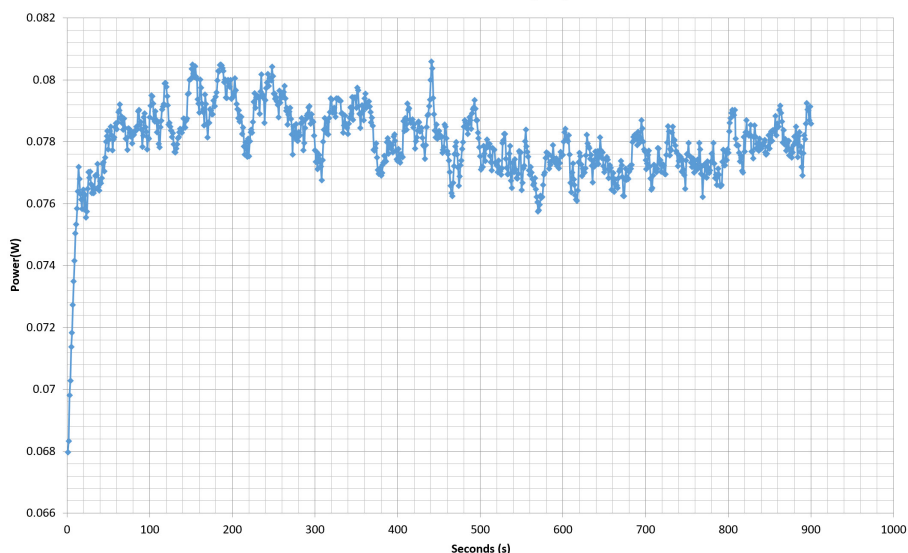
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -230V

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COMMISSION REGULATION (EU) NO 617/2013 TESTING 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	3.545A	1.948A	1.982A	0.985A	64.955	81.213%	925	23.7	34.44°C	0.689
	12.229V	5.132V	3.332V	5.078V	79.981				37.62°C	230.33V
2	8.106A	2.924A	2.973A	1.184A	130.012	85.768%	1033	27.3	34.73°C	0.865
	12.227V	5.130V	3.329V	5.069V	151.586				38.51°C	230.34V
5	22.490A	4.878A	4.966A	1.787A	325.040	87.828%	1481	36.3	35.55°C	0.971
	12.207V	5.125V	3.323V	5.038V	370.085				41.29°C	230.33V
10	46.152A	8.794A	8.959A	2.503A	649.552	85.488%	1922	42.8	38.12°C	0.991
	12.185V	5.117V	3.314V	4.994V	759.814				48.83°C	230.31V

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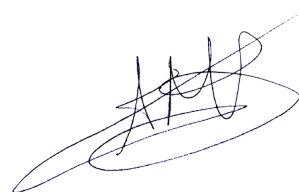


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Model / 型號 / 型号: SSR-650GB ³ (S12III-650)					
AC INPUT 交流輸入/交流輸入		110-240 Vac 10-5 A 50-60 Hz			
DC OUTPUT 直流輸出/直流輸出	+3.3 V	+5 V	+12 V	-12 V	+5 V _{SB}
	20 A	20 A	54 A	0.3 A	2.5 A
	100 W		648 W	3.6 W	12.5 W
	650 W				
 100% Efficiency Total Harmonic Distortion Regulation Load Regulation  CB  Trans Tech Company Wuxi PCC Transformers FOR HOME OR OFFICE USE  					
Switching power supply / 交換式電源供應器 / 交換式電源供應器 Manufacturer : Sea Sonic Electronics Co., Ltd. 製造商：海韻電子工業股份有限公司 / 制造商：海韵电子工业股份有限公司 Made in China / Fabriqué en Chine / Hergestellt in China / 中国制造 8F., No. 17 & 19, Alley 360, Sec. 1, 114 NeiHu Rd., NeiHu, Taipei, TAIWAN					

Power specifications label

CERTIFICATIONS 115V

Aris Mpitsiopoulos
Lab Director

CERTIFICATIONS 230V



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