Seasonic Focus Plus Gold 650W

R1705AA135760494

Lab ID 132

Certification ID 25132

Test Result Report ID:

Certificate Issue Date: Jun 27, 2018

115V

Scheme: ETA-EMI PSU



115V



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	Focus Plus Gold 650W
OEM/ODM	Seasonic
Serial Number	R1705AA135760494
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	9-4.5
□□□□ (Hz)	50-60

□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	132
Date of receipt	Jun 13, 2018
Testing Date	Jun 25, 2018
Report Issued Date	Jun 27, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□			
□□	□□□	□□□□□	Gauge
ATX □□ 20+4 pin (610mm)	1	1	18-22AWG
4+4 pin EPS 12V □□ (655mm)	1	1	18AWG
6+2pin PCIe□□ (680mm+80mm)	2	4	18AWG
SATA□□ (455mm+115mm+115mm+115mm)	2	8	18AWG
□ 4pin Molex□□ (460mm+125mm+125mm)	1	3	18AWG
□ 4pin □□ (+110mm)	1	1	22AWG

□□□□

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

Parts Description

General Data	
Manufacturer (OEM)	Seasonic
Platform Model	FX
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	2x GBU1006 (600V, 10A @ 100°C)
APFC MOSFETS	2x UTC GPT18N50DG (500V, 18A @ 100°C, 0.265Ohm)
APFC Boost Diode	1x BYC8-600 (600V, 8A @ 109°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 450uF, 2000h @ 105°C, CE)
Main Switchers	4x UTC GBT10N50ADG (500V, 10A @ 25°C, 0.61Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901T6X
Topology	Primary side: Full-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	2x Nexperia PSMN1R8-40YLC (40V, 100A @ 25°C, 1.8mOhm)
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0906NS (30V, 40A @ 100°C, 4.5mOhm) PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Chemi-Con (1-5,000 @ 105°C, KZE), Chemi-Con (4-10,000 @ 105°C, KY), Chemi-Con (105°C, W) Polymers: Chemi-Con
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, 2200 RPM, Fluid Dynamic Bearing)
5VSB Circuit	

Standby PWM Controller	Excelliance EM8569

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)	87.957%
Average Noise Output (>1450 Load Combinations)	26.34dBA
PF□□□ (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.0456W
Non-Accredited	
12V Ripple (Full Load)	30.01mV
5V Ripple (Full Load)	11.67mV
3.3V Ripple (Full Load)	11.50mV
5VSB Ripple (Full Load)	11.18mV
12V Load Regulation	0.11%
5V Load Regulation	0.44%
3.3V Load Regulation	0.60%
5VSB Load Regulation	3.06%
Inrush Current	38.237A

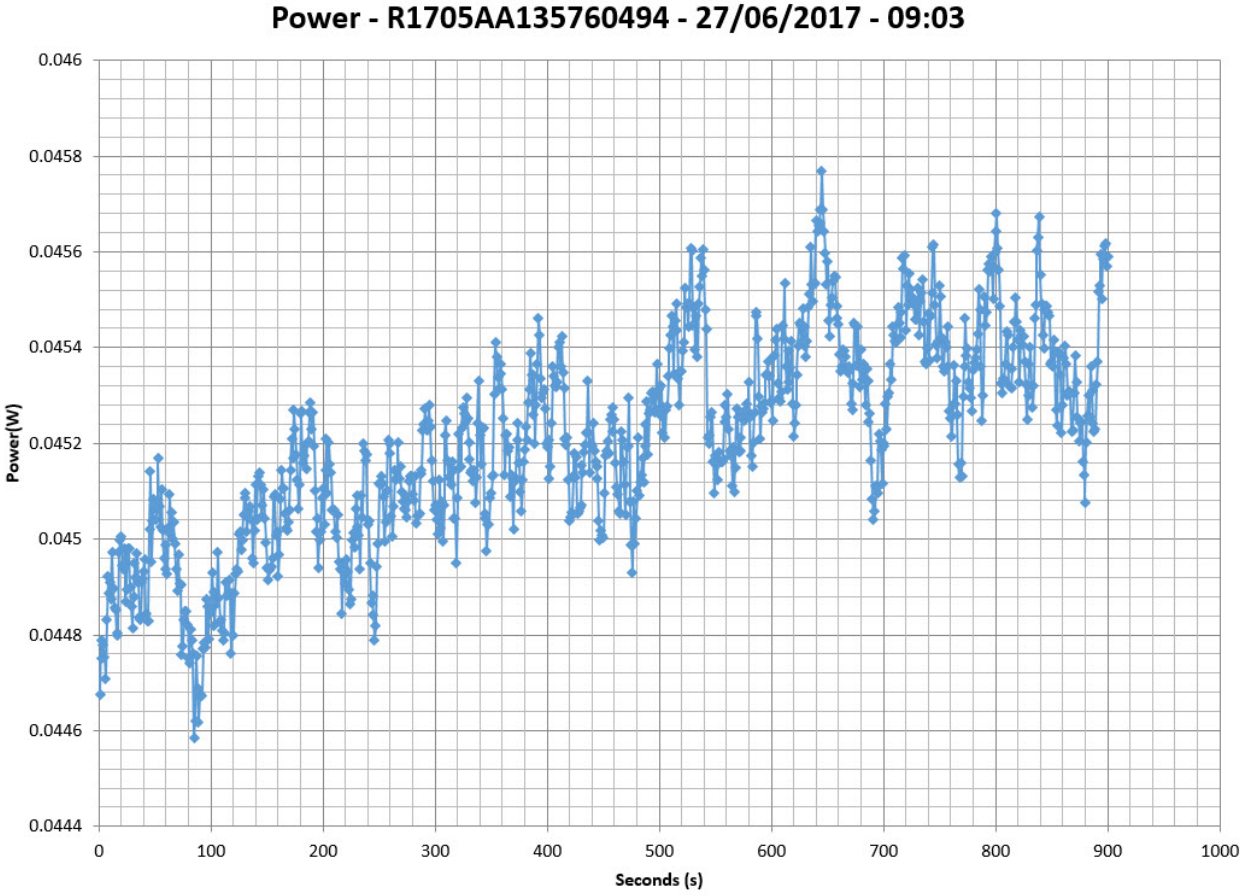
□□□□ & PG□□

Hold-Up Time (ms)	21.5
AC Loss to PWR_OK Hold Up Time (ms)	20.7

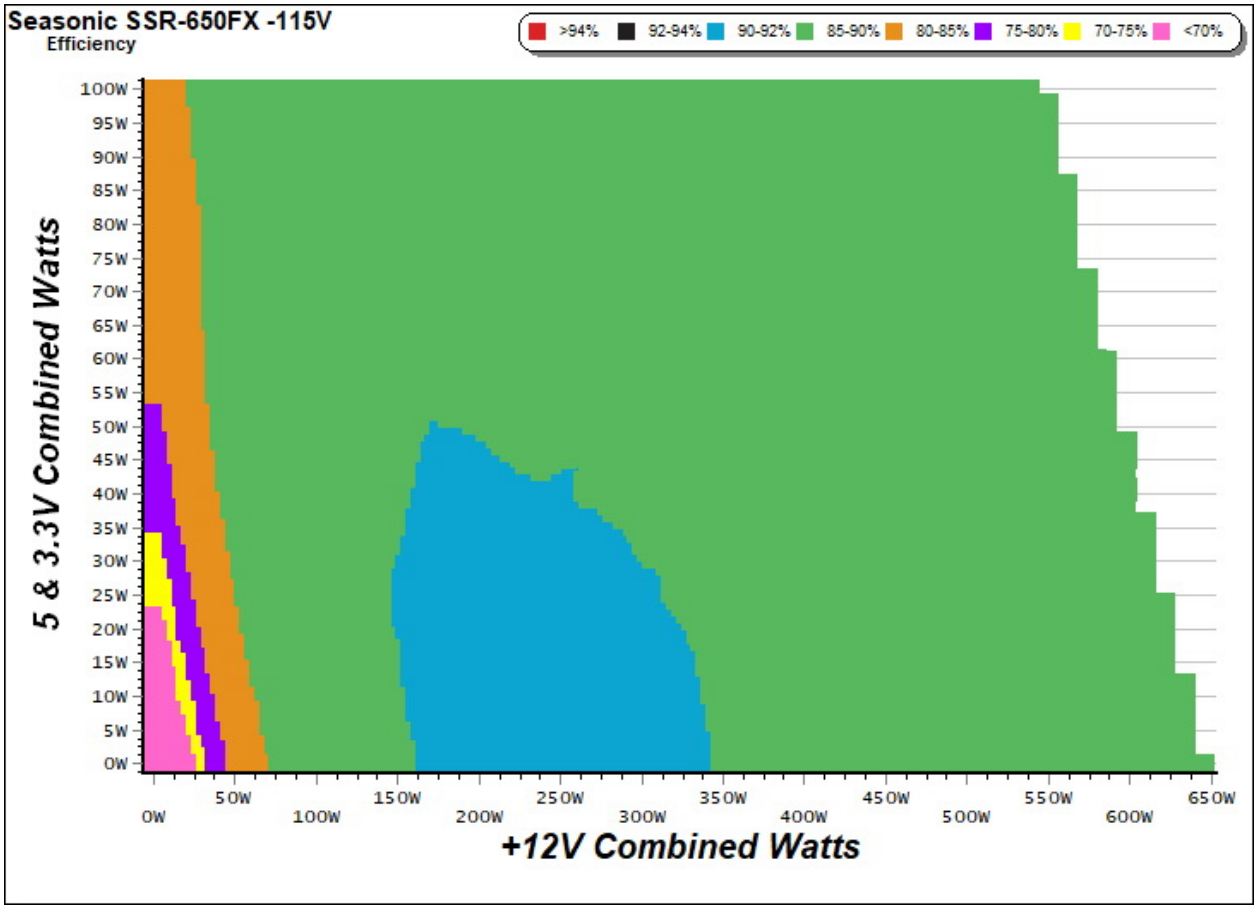
PWR_OK Inactive to DC Loss Delay (ms)	0.8

□□□□

Graphs 115V



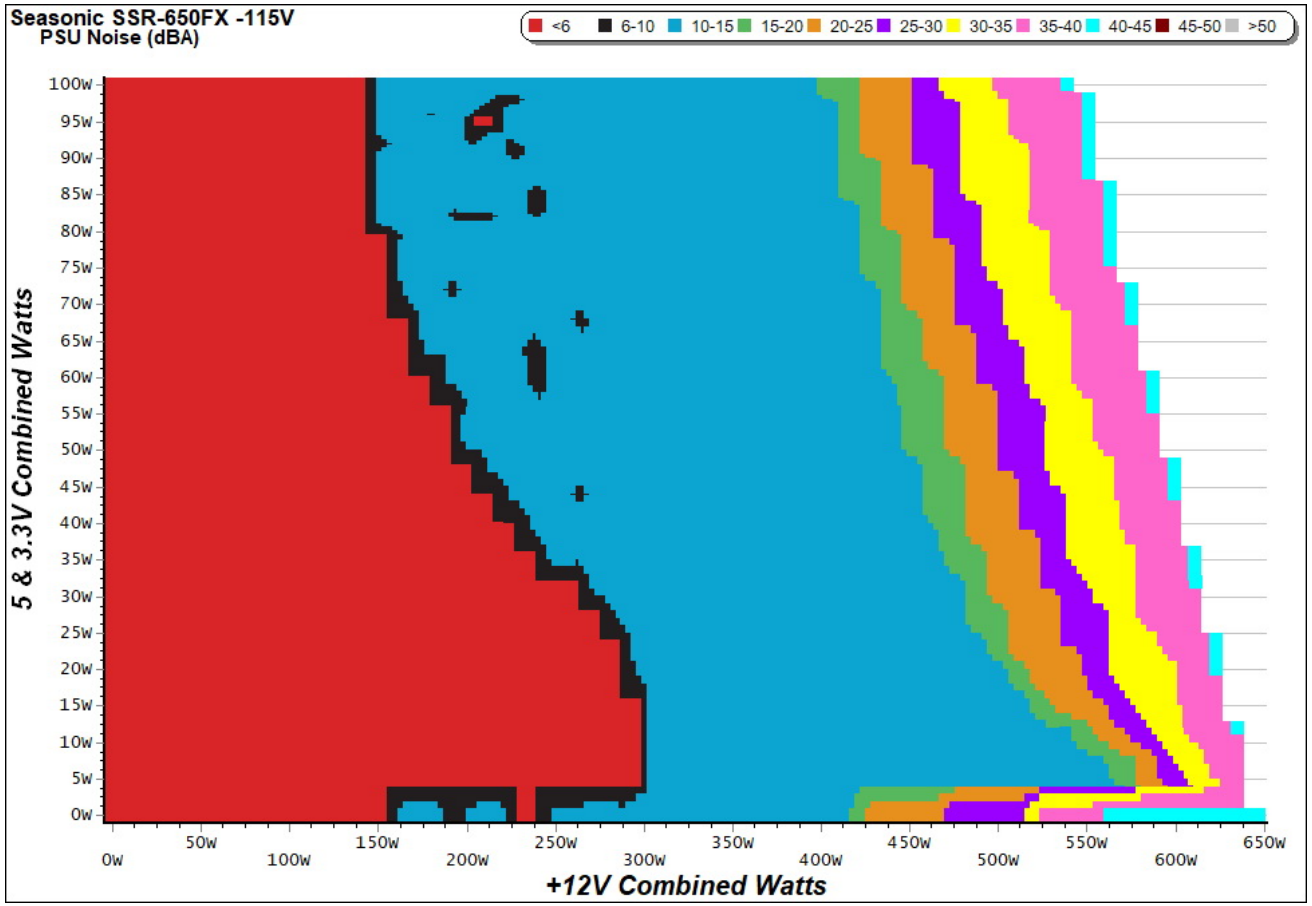
115V



□□

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.

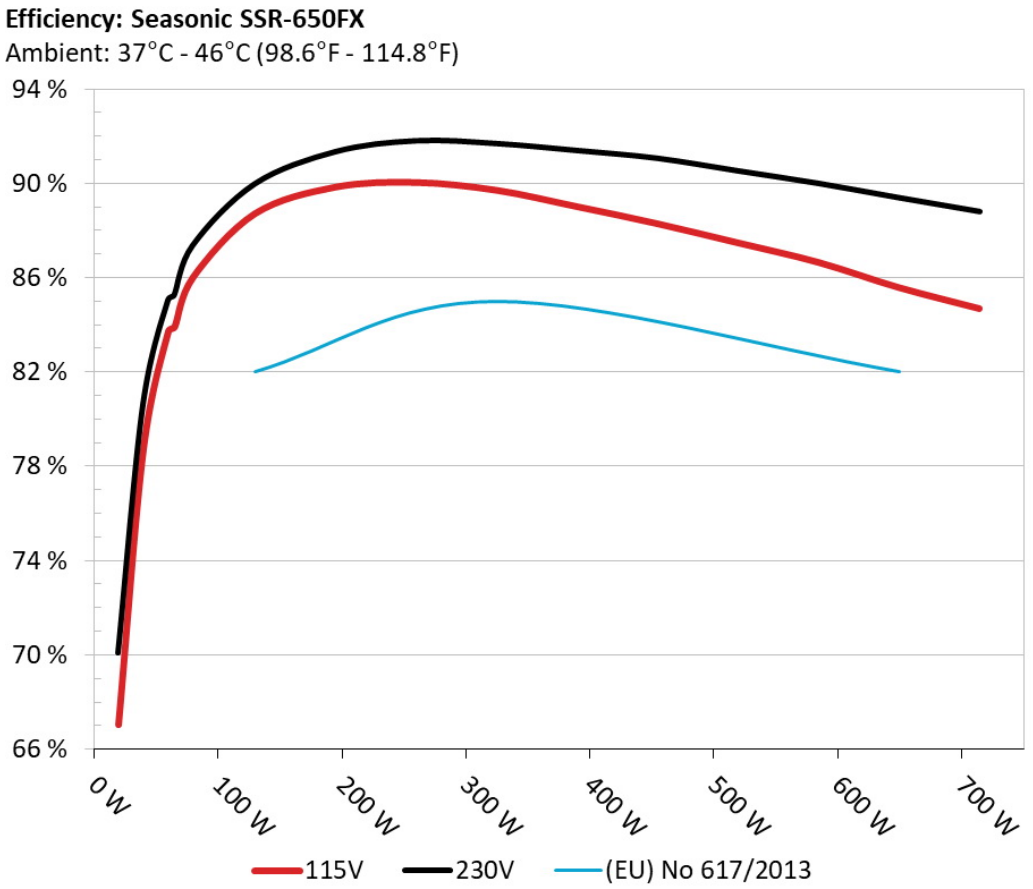
115V



□□

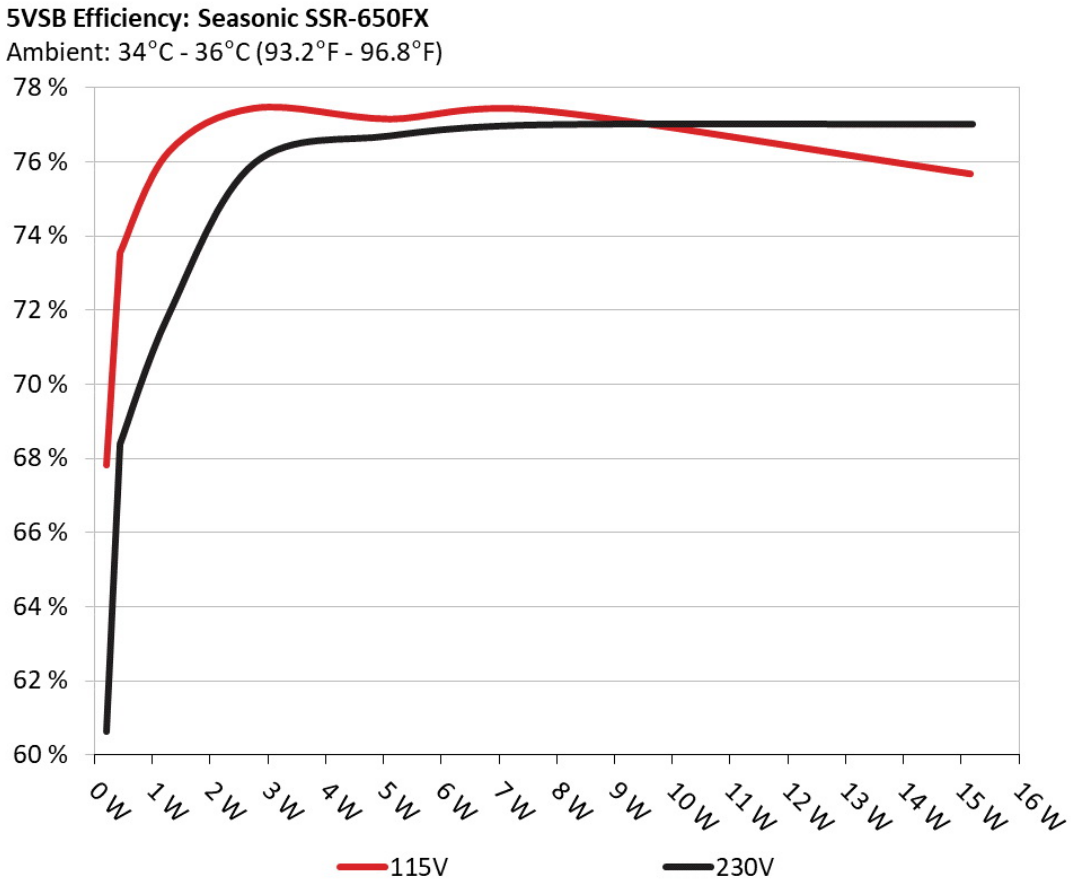
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

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	0.041A	0.213	67.834%	0.052
	5.135V	0.314		115.11V

2	0.087A	0.447	73.520%	0.098
	5.133V	0.608		115.13V
3	0.542A	2.775	77.449%	0.334
	5.122V	3.583		115.13V
4	1.002A	5.120	77.155%	0.405
	5.111V	6.636		115.13V
5	1.502A	7.657	77.398%	0.439
	5.099V	9.893		115.14V
6	3.001A	15.163	75.679%	0.484
	5.052V	20.036		115.14V

Supplementary Tests (For Reference)

10-110%□□□□ 115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.524A	1.985A	1.978A	0.981A	64.785	83.886%	0	| 6.0	44.17°C	0.957
	12.260V	5.031V	3.332V	5.100V	77.230				41.62°C	115.17V
2	8.066A	2.980A	2.968A	1.176A	129.741	88.711%	0	| 6.0	44.71°C	0.980
	12.260V	5.029V	3.330V	5.087V	146.252				41.88°C	115.17V
3	12.953A	3.488A	3.480A	1.375A	194.878	89.839%	0	| 6.0	45.38°C	0.987
	12.259V	5.026V	3.328V	5.073V	216.920				42.06°C	115.16V
4	17.830A	3.982A	3.964A	1.580A	259.745	90.035%	0	| 6.0	45.79°C	0.990
	12.258V	5.024V	3.326V	5.060V	288.493				42.23°C	115.16V
5	22.371A	4.976A	4.960A	1.781A	324.680	89.702%	550	10.4	40.25°C	0.991
	12.258V	5.022V	3.323V	5.045V	361.956				48.56°C	115.16V
6	26.912A	5.976A	5.957A	1.985A	389.646	89.008%	560	10.5	41.08°C	0.991
	12.258V	5.019V	3.321V	5.029V	437.766				50.62°C	115.15V
7	31.449A	6.981A	6.959A	2.190A	454.567	88.286%	735	15.4	41.65°C	0.992
	12.257V	5.017V	3.318V	5.015V	514.881				51.38°C	115.16V
8	36.000A	7.975A	7.960A	2.400A	519.523	87.474%	1300	32.4	43.03°C	0.993
	12.254V	5.014V	3.316V	4.999V	593.917				53.07°C	115.15V

9	40.979A	8.481A	8.473A	2.401A	584.571	86.643%	1960	41.4	43.89°C	0.993
	12.250V	5.012V	3.315V	4.991V	674.691				53.87°C	115.15V
10	45.700A	8.989A	8.963A	3.015A	649.398	85.575%	2320	45.2	44.70°C	0.994
	12.247V	5.010V	3.313V	4.969V	758.863				54.76°C	115.14V
11	51.006A	8.990A	8.966A	3.020A	714.331	84.685%	2330	45.4	46.12°C	0.994
	12.246V	5.009V	3.312V	4.962V	843.518				56.50°C	115.14V
CL1	0.100A	12.012A	12.005A	0.004A	101.428	83.993%	560	10.5	43.48°C	0.975
	12.265V	5.020V	3.322V	5.101V	120.757				56.63°C	115.19V
CL2	54.121A	1.004A	1.003A	1.002A	676.286	85.925%	2330	45.4	45.60°C	0.994
	12.248V	5.017V	3.322V	5.033V	787.070				55.33°C	115.14V

The results above are not used in the certification process

20-80□□□□□ 115V

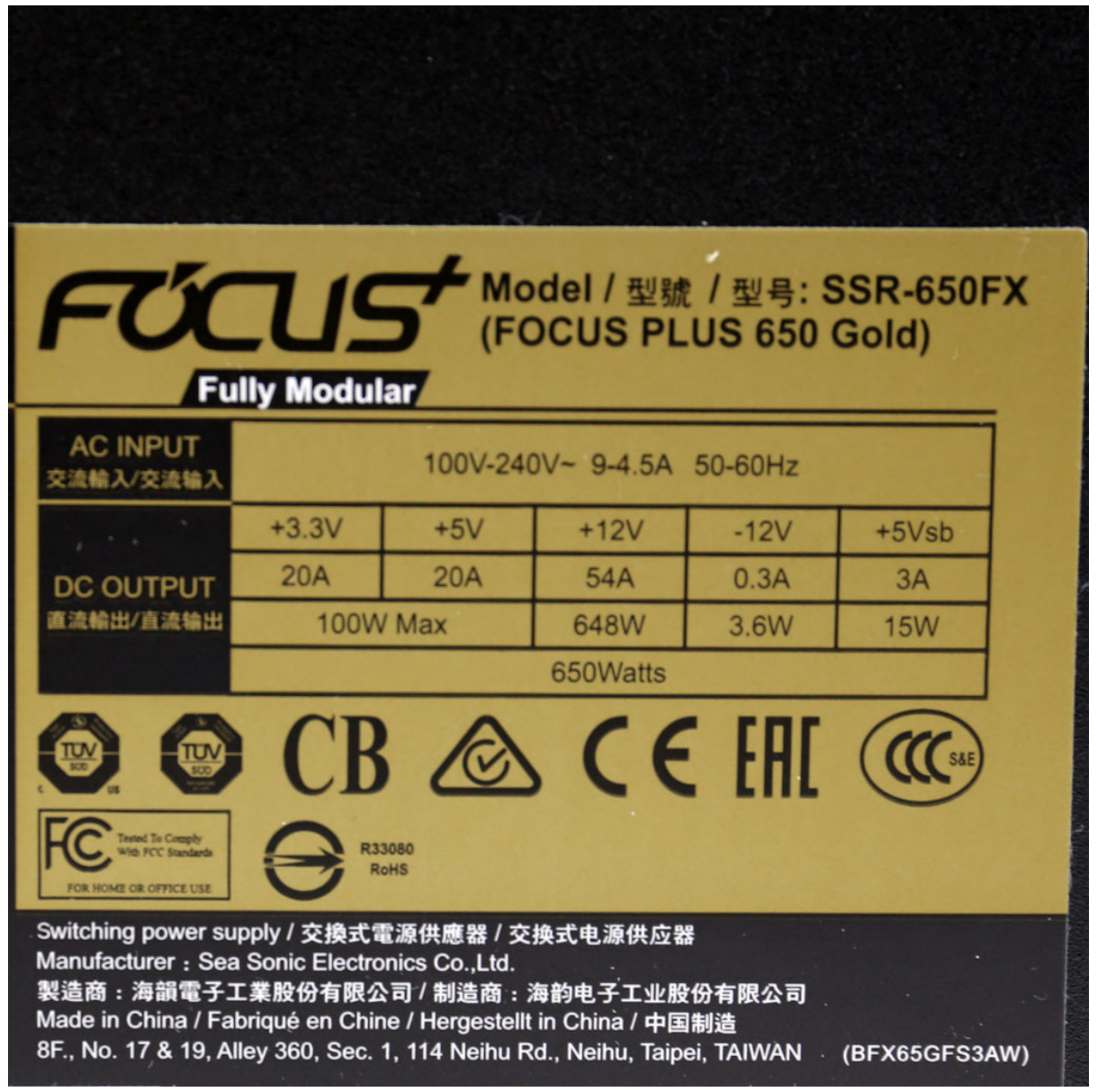
□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□ (dB[A])	PF/AC □□
1	1.189A	0.493A	0.476A	0.196A	19.647	67.023%	0	| 6.0	0.809
	12.254V	5.040V	3.338V	5.126V	29.314				115.16V
2	2.405A	0.990A	0.989A	0.390A	39.749	78.730%	0	| 6.0	0.916
	12.255V	5.032V	3.333V	5.120V	50.488				115.16V
3	3.620A	1.486A	1.500A	0.586A	59.843	83.708%	0	| 6.0	0.952
	12.257V	5.032V	3.333V	5.112V	71.490				115.16V
4	4.829A	1.985A	1.978A	0.781A	79.755	86.006%	0	| 6.0	0.965
	12.258V	5.031V	3.332V	5.102V	92.732				115.16V

The results above are not used in the certification process

□□□□ 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.6 mV	5.9 mV	6.1 mV	5.7 mV	Pass
20% Load	12.4 mV	5.3 mV	5.6 mV	5.4 mV	Pass
30% Load	15.6 mV	6.5 mV	6.2 mV	5.2 mV	Pass
40% Load	17.6 mV	6.9 mV	6.3 mV	5.9 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	19.9 mV	7.4 mV	8.3 mV	5.9 mV	Pass
60% Load	22.0 mV	8.3 mV	8.7 mV	7.5 mV	Pass
70% Load	24.0 mV	9.4 mV	8.2 mV	7.3 mV	Pass
80% Load	25.8 mV	9.6 mV	10.1 mV	10.2 mV	Pass
90% Load	27.4 mV	10.8 mV	9.6 mV	10.6 mV	Pass
100% Load	30.0 mV	11.7 mV	11.5 mV	11.2 mV	Pass
110% Load	31.9 mV	12.1 mV	12.1 mV	11.3 mV	Pass
Crossload 1	14.1 mV	10.3 mV	8.3 mV	9.0 mV	Pass
Crossload 2	28.9 mV	10.6 mV	10.5 mV	10.7 mV	Pass

The results above are not used in the certification process

Seasonic Focus Plus Gold 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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