Seasonic Focus Plus Gold 750W (#2)

Serial Number R1705AA135880160

Lab ID 165

Certification ID 25165

Test Result Report ID:

Certificate Issue Date: Aug 25, 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 750W (#2)
OEM/ODM	Seasonic
Serial Number	R1705AA135880160
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60

Rated Power (W)	750
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	165
Date of receipt	Aug 12, 2018
Testing Date	Aug 21, 2018
Report Issued Date	Aug 25, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (610mm)	1	1	18-22AWG
4+4 pin EPS12V (655mm)	2	2	18AWG
6+2 pin PCIe (680mm+80mm)	2	4	18AWG
SATA (455mm+115mm+115mm+115mm)	2	8	18AWG
4 pin Molex (460mm+125mm+125mm)	1	3	18AWG
FDD Adapter (+110mm)	1	1	22AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	62	3	0.3
	Watts	100		744	15	3.6
Total Max. Power (W)		750				

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 GBU1506 (600V, 15A @ 100°C)
APFC MOSFETS	2x UTC GPT18N50DG (500V, 18A @ 100°C, 0.265Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8S06D (600V, 8A @ 125°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 560uF, 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	4x Nexperia PSMN2R6-40YS (40V, 100A @ 25°C, 2.8mOhm)
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), W Polymers: Chemi-Con
Supervisor IC	WeltrendWT7527V (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	ExcellianceEM8569

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary 115V

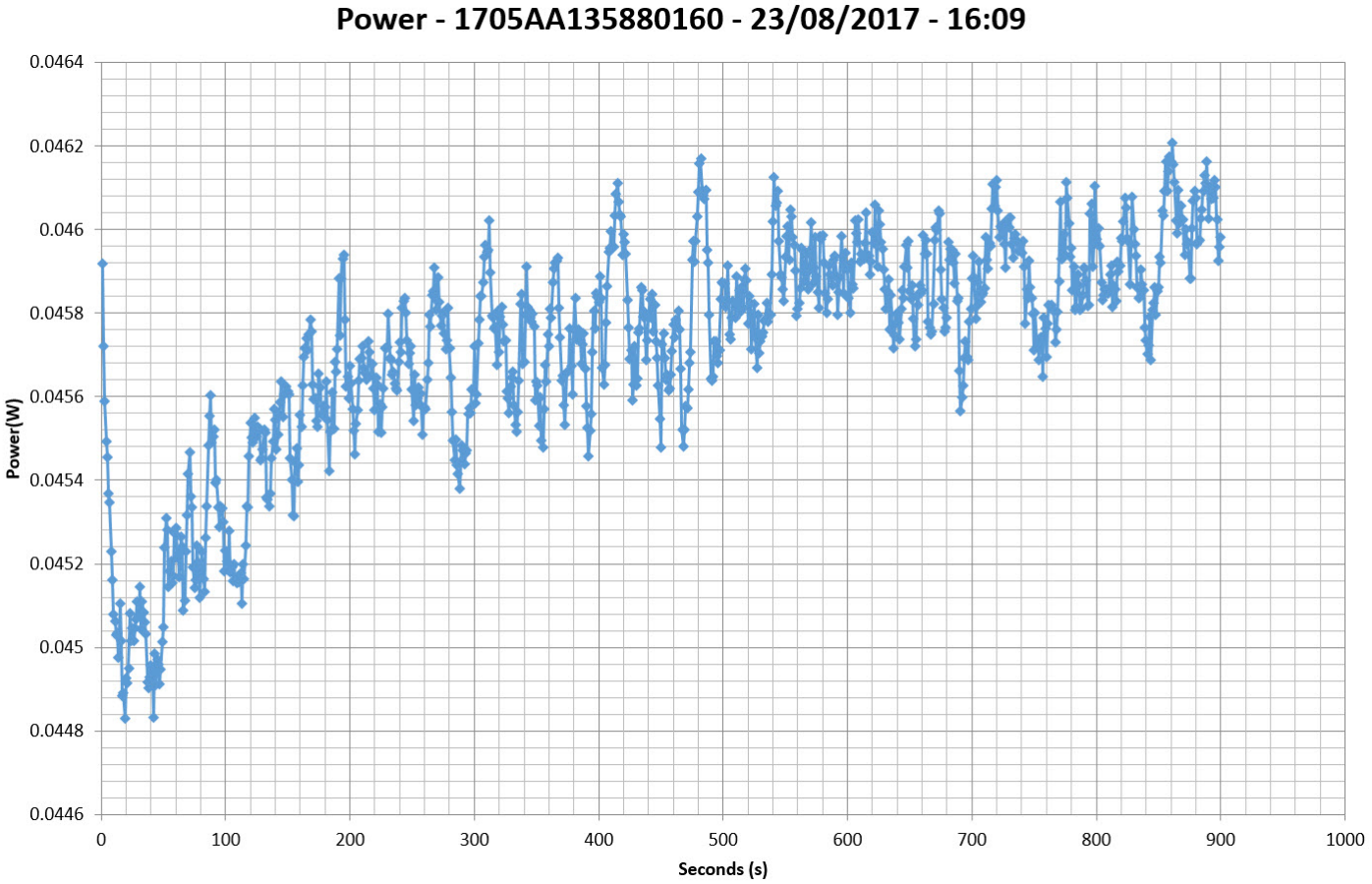
Accredited	
Average Efficiency (>1450 load combinations)	88.261%
Average Noise Output (>1450 Load Combinations)	34.75dBA
Average PF (>1450 Load Combinations)	0.986
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0460W
Non-Accredited	
12V Ripple (Full Load)	27.90mV
5V Ripple (Full Load)	13.22mV
3.3V Ripple (Full Load)	14.56mV
5VSB Ripple (Full Load)	11.64mV
12V Load Regulation	0.12%
5V Load Regulation	0.84%
3.3V Load Regulation	1.12%
5VSB Load Regulation	2.81%
Inrush Current	40.372A

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	23.4
AC Loss to PWR_OK Hold Up Time (ms)	20
PWR_OK Inactive to DC Loss Delay (ms)	3.4

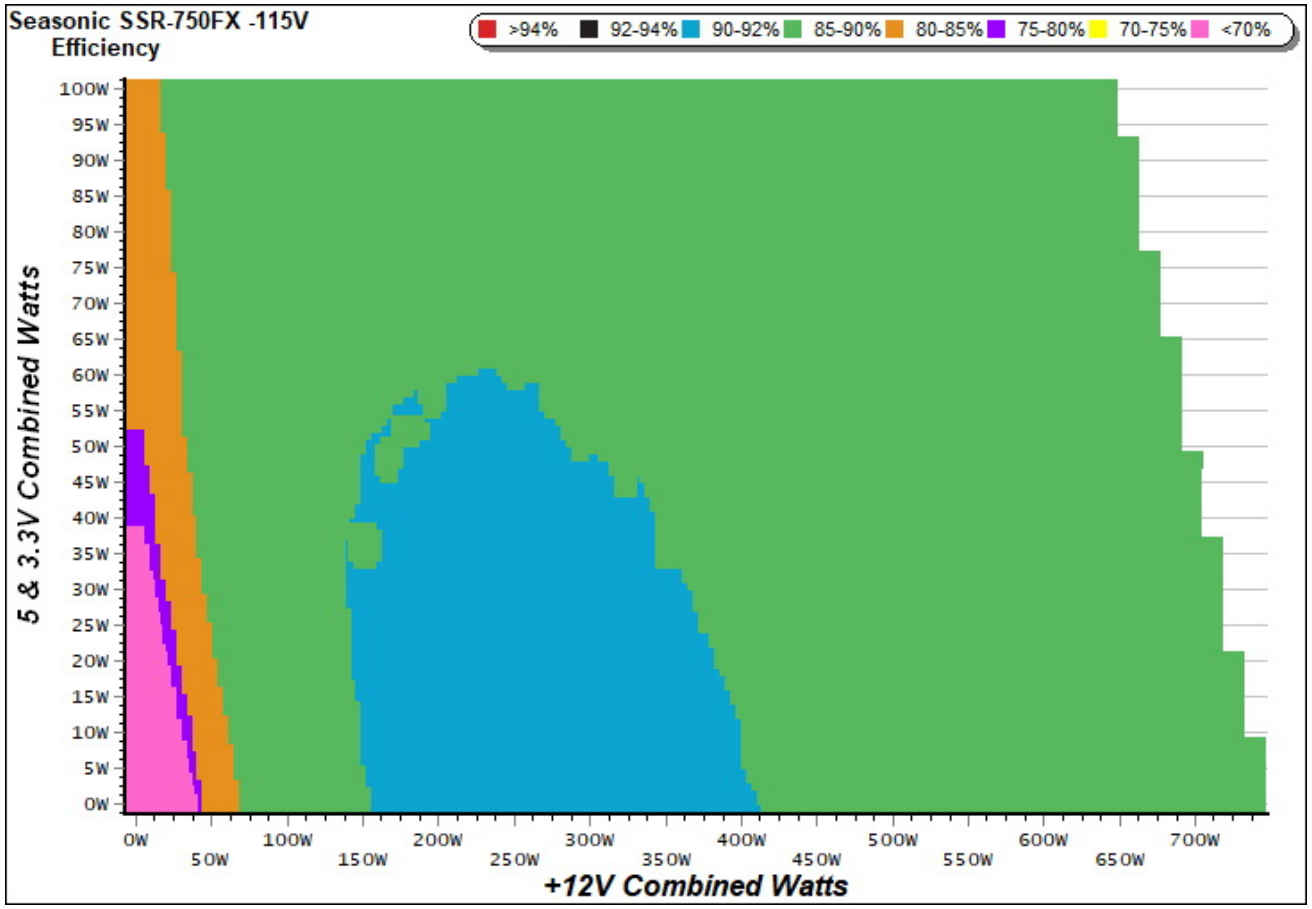
Stromverbrauch im Ruhezustand

Graphs 115V



Efficiency Graph

115V

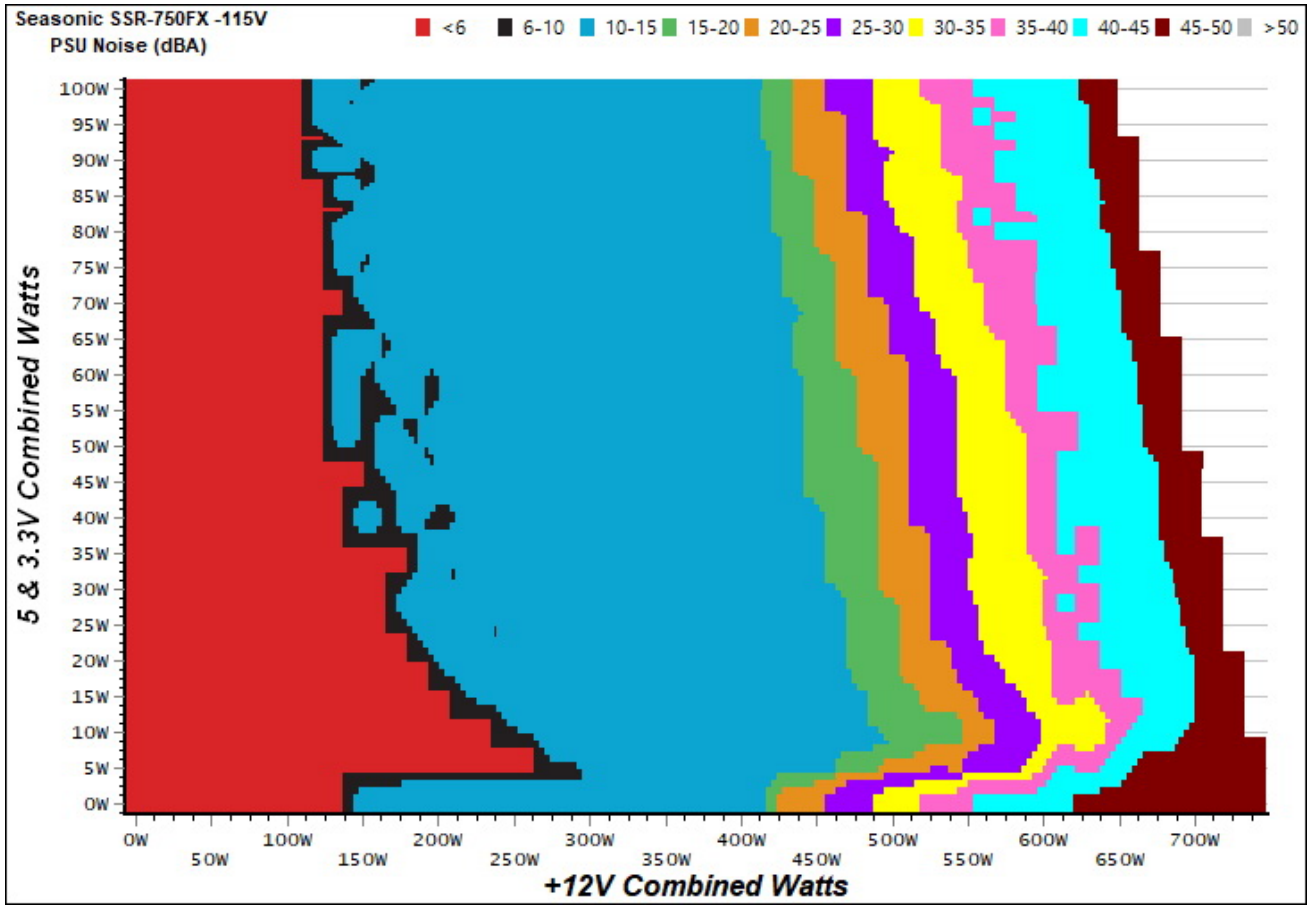


INFO

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

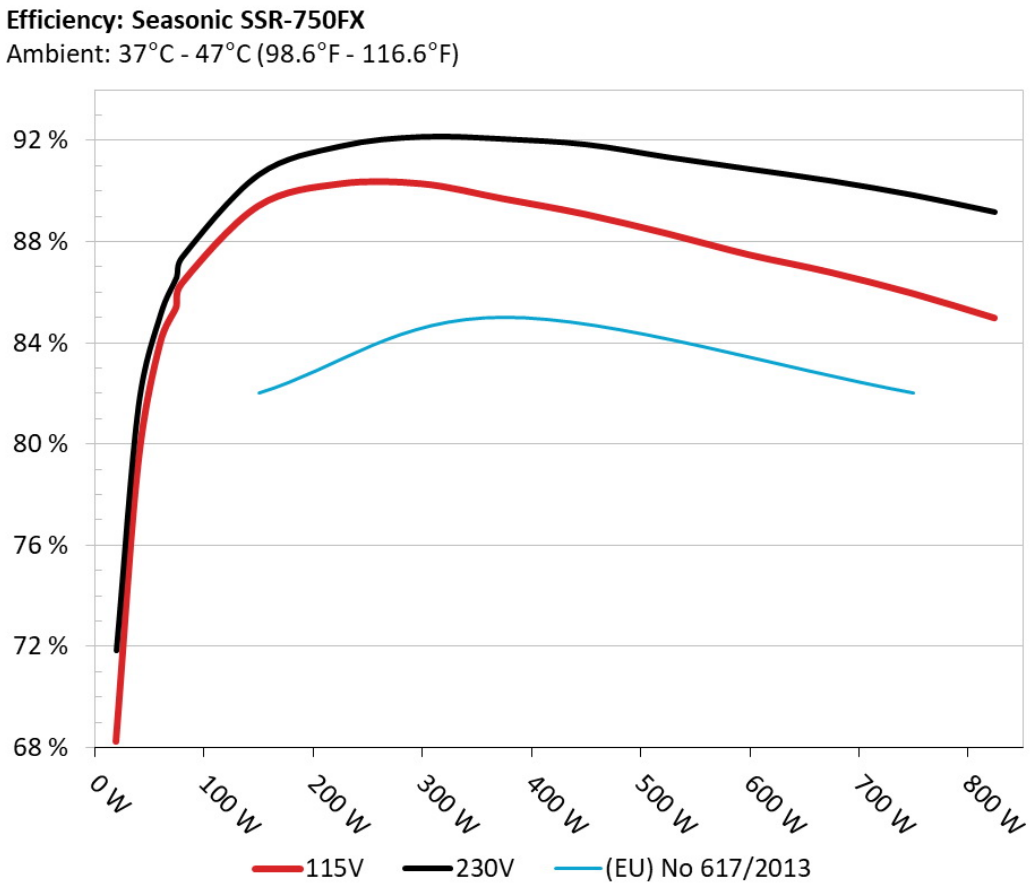


INFO

The PSU`s noise in its entire operational range and under 30-32 °C 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

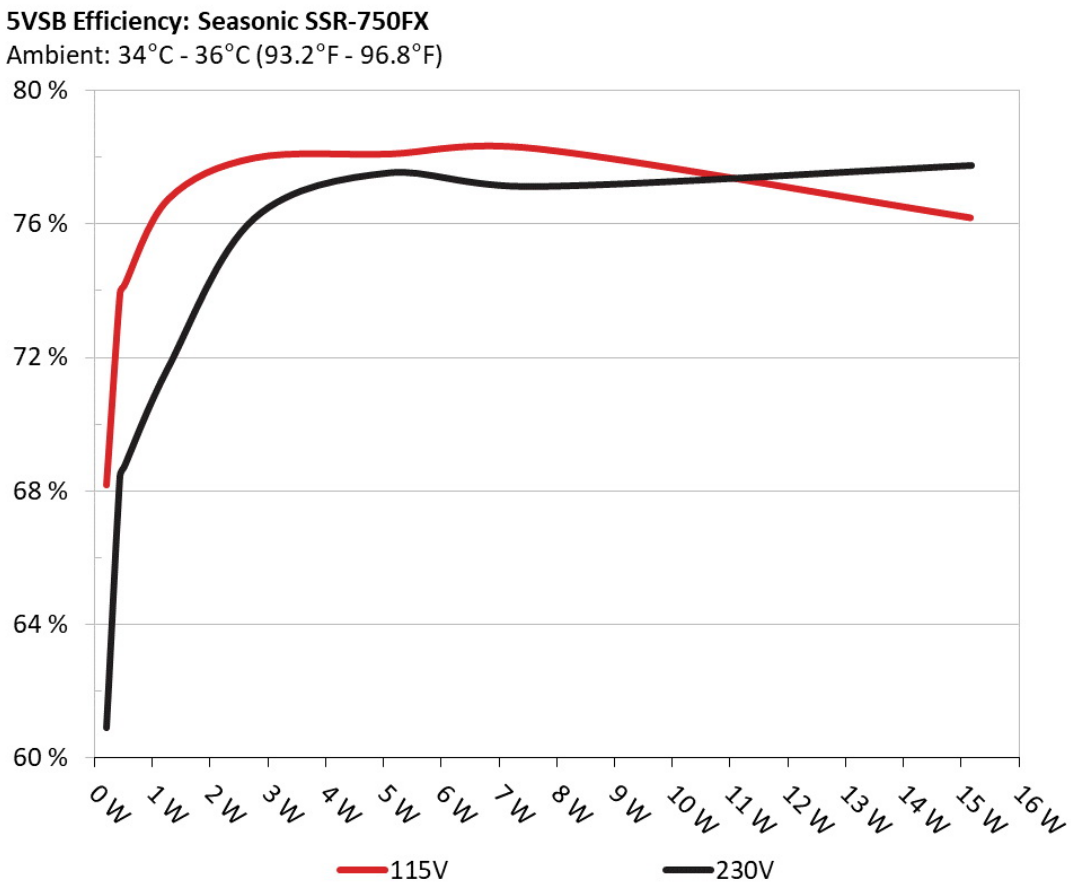
Efficiency under high ambient temperature



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.

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.212	68.167%	0.050
	5.128V	0.311		115.21V

2	0.087A	0.445	73.920%	0.095
	5.126V	0.602		115.21V
3	0.542A	2.771	77.968%	0.329
	5.116V	3.554		115.38V
4	1.002A	5.113	78.085%	0.400
	5.105V	6.548		115.34V
5	1.501A	7.647	78.246%	0.436
	5.094V	9.773		115.34V
6	3.001A	15.153	76.176%	0.485
	5.049V	19.892		115.33V

Supplementary Tests (For Reference)

Typical Load Tests 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	4.380A	1.996A	1.994A	0.981A	74.721	85.411%	0	|6	42.05°C	0.955
	12.131V	5.012V	3.303V	5.095V	87.484				38.38°C	115.20V
2	9.797A	2.992A	2.999A	1.180A	149.732	89.414%	0	|6	42.62°C	0.983
	12.132V	5.008V	3.299V	5.083V	167.459				38.80°C	115.20V
3	15.560A	3.498A	3.517A	1.379A	224.860	90.296%	700	14.6	38.85°C	0.989
	12.132V	5.004V	3.295V	5.071V	249.026				52.18°C	115.19V
4	21.307A	4.004A	4.008A	1.580A	299.705	90.300%	550	10.4	39.00°C	0.991
	12.132V	5.000V	3.292V	5.059V	331.900				53.36°C	115.19V
5	26.716A	5.002A	5.014A	1.780A	374.628	89.703%	560	10.5	40.37°C	0.990
	12.134V	4.996V	3.288V	5.045V	417.633				55.25°C	115.27V
6	32.118A	6.016A	6.026A	1.985A	449.554	89.092%	735	15.4	40.60°C	0.991
	12.135V	4.990V	3.284V	5.034V	504.597				55.86°C	115.17V
7	37.534A	7.018A	7.042A	2.190A	524.474	88.327%	1325	31.4	42.34°C	0.991
	12.133V	4.986V	3.279V	5.019V	593.787				57.82°C	115.17V
8	42.959A	8.034A	8.062A	2.395A	599.416	87.492%	1960	41.4	43.07°C	0.992
	12.128V	4.981V	3.275V	5.006V	685.112				59.02°C	115.16V

9	48.809A	8.539A	8.586A	2.400A	674.436	86.791%	2310	45.1	44.06°C	0.992
	12.126V	4.977V	3.271V	4.998V	777.079				60.62°C	115.16V
10	54.388A	9.058A	9.085A	3.011A	749.284	85.960%	2320	45.2	45.87°C	0.993
	12.127V	4.973V	3.268V	4.977V	871.661				62.87°C	115.15V
11	60.564A	9.067A	9.093A	3.015A	824.135	84.992%	2320	45.2	47.30°C	0.993
	12.126V	4.970V	3.265V	4.970V	969.658				65.69°C	115.15V
CL1	0.099A	12.013A	12.004A	0.004A	100.757	84.378%	560	10.5	43.09°C	0.973
	12.145V	4.998V	3.290V	5.101V	119.412				55.37°C	115.21V
CL2	61.936A	1.005A	1.002A	1.001A	764.309	86.243%	2320	45.2	46.36°C	0.993
	12.125V	4.982V	3.279V	5.037V	886.231				62.78°C	115.16V

The results above are not used in the certification process

Light Load Tests 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.205A	0.493A	0.482A	0.195A	19.665	68.239%	0	<6.0	0.750
	12.115V	5.017V	3.308V	5.121V	28.818				115.20V
2	2.433A	0.991A	0.997A	0.391A	39.753	79.148%	0	<6.0	0.884
	12.120V	5.015V	3.305V	5.114V	50.226				115.20V
3	3.665A	1.487A	1.509A	0.585A	59.862	83.966%	0	<6.0	0.938
	12.124V	5.013V	3.304V	5.106V	71.293				115.20V
4	4.880A	1.996A	1.995A	0.780A	79.756	86.353%	0	<6.0	0.959
	12.128V	5.012V	3.303V	5.099V	92.360				115.21V

The results above are not used in the certification process

Ripple Measurements 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.9 mV	6.0 mV	8.2 mV	5.7 mV	Pass
20% Load	12.7 mV	6.1 mV	8.5 mV	5.9 mV	Pass
30% Load	15.2 mV	6.3 mV	8.5 mV	6.1 mV	Pass
40% Load	17.1 mV	7.8 mV	10.4 mV	6.5 mV	Pass

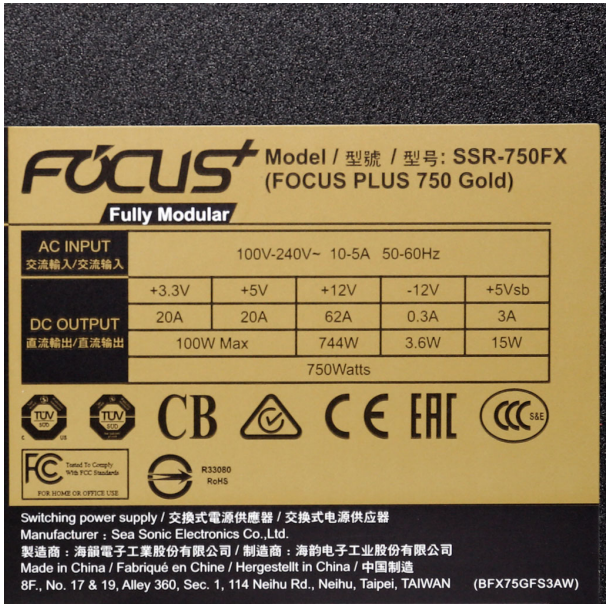
Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	18.3 mV	7.8 mV	9.1 mV	6.5 mV	Pass
60% Load	20.2 mV	10.4 mV	10.6 mV	7.2 mV	Pass
70% Load	21.9 mV	11.4 mV	11.6 mV	8.4 mV	Pass
80% Load	23.0 mV	11.6 mV	11.8 mV	9.4 mV	Pass
90% Load	26.2 mV	13.1 mV	13.1 mV	9.8 mV	Pass
100% Load	27.9 mV	13.2 mV	14.6 mV	11.6 mV	Pass
110% Load	28.6 mV	15.4 mV	15.9 mV	12.2 mV	Pass
Crossload 1	12.3 mV	11.3 mV	9.4 mV	8.2 mV	Pass
Crossload 2	27.2 mV	10.6 mV	12.8 mV	9.2 mV	Pass

The results above are not used in the certification process

Seasonic Focus Plus Gold 750W (#2)



Top side



Power specifications label

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern