Seasonic Focus Plus Platinum 750W

Serial Number R1706AA160920046

Lab ID 238

Certification ID 25238

Test Result Report ID:

Certificate Issue Date: Aug 12, 2018

Scheme: ETA-EMI PSU

115V



230V



115V



230V



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 Platinum 750W
OEM/ODM	Seasonic
Serial Number	R1706AA160920046
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 (HA1225M12F-Z)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	238
Date of receipt	Jul 29, 2018
Testing Date	Aug 10, 2018
Report Issued Date	Aug 12, 2018
DUT Notes	Retested on 04/10/2018
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	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (650mm)	2	2	18AWG	Yes
6+2 pin PCIe (680mm+80mm)	2	4	18AWG	Yes
SATA (450mm+110mm+110mm+110mm)	2	8	18AWG	No
4 pin Molex (450mm+120mm+120mm)	1	3	18AWG	No
FDD Adapter (+105mm)	1	1	22AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	No

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	PX
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV , 1x CM02X
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	2x GBU1506 (600V, 15A @ 100°C)
APFC MOSFETS	2x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14Ohm)
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 Infineon IPP50R250CP (550V, 9A @ 100°C, 0.25Ohm)
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 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), W Polymers: Chemi-Con
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Hong Hua HA1225M12F-Z (120mm, 12V, 0.45A, 2050 RPM, Fluid Dynamic Bearing)
5VSB Circuit	

Standby PWM Controller	Excelliance EM8569
Rectifier	P10V45SP SBR (45V, 10A @ 50% Duty Cycle)

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)	90.132%
Average Noise Output (>1450 Load Combinations)	19.40dBA
Average PF (>1450 Load Combinations)	0.985
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0509W
Non-Accredited	
12V Ripple (Full Load)	16.26mV
5V Ripple (Full Load)	11.35mV
3.3V Ripple (Full Load)	9.64mV
5VSB Ripple (Full Load)	11.50mV
12V Load Regulation	0.05%
5V Load Regulation	0.16%
3.3V Load Regulation	0.30%
5VSB Load Regulation	2.35%
Inrush Current	27.965A

230V		
Accredited		
Average Efficiency (>1450 load combinations)	92.217%	
Average Noise Output (>1450 Load Combinations)	16.18dBA	
Average PF (>1450 Load Combinations)	0.938	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0871W	
Non-Accredited		
12V Ripple (Full Load)	17.55mV	
5V Ripple (Full Load)	10.30mV	
3.3V Ripple (Full Load)	9.24mV	
5VSB Ripple (Full Load)	7.78mV	
12V Load Regulation	0.02%	
5V Load Regulation	0.18%	
3.3V Load Regulation	0.33%	
5VSB Load Regulation	2.74%	
Inrush Current	60.174A	
Hold-Up Time & PWR_OK Signal	25.20ms	
AC Loss to PWR_OK Hold Up Time	20.70ms	
PWR_OK Inactive to DC Loss Delay	4.50ms	
OPP (0.00°C / 0.00°C)	-	-

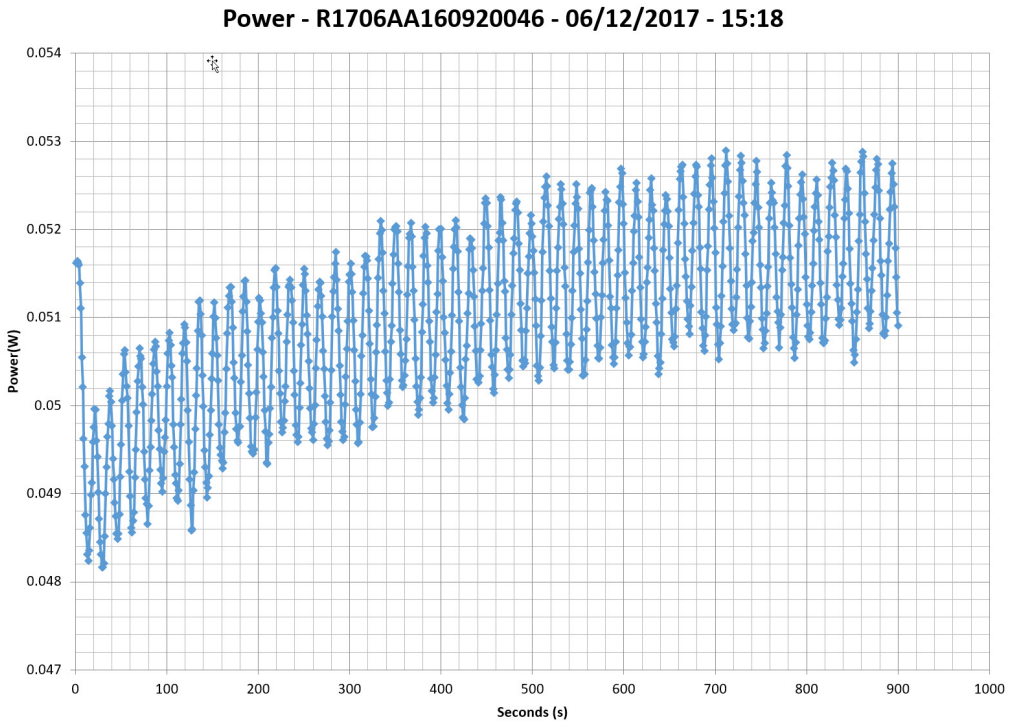
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	25.2
AC Loss to PWR_OK Hold Up Time (ms)	20.7
PWR_OK Inactive to DC Loss Delay (ms)	4.5

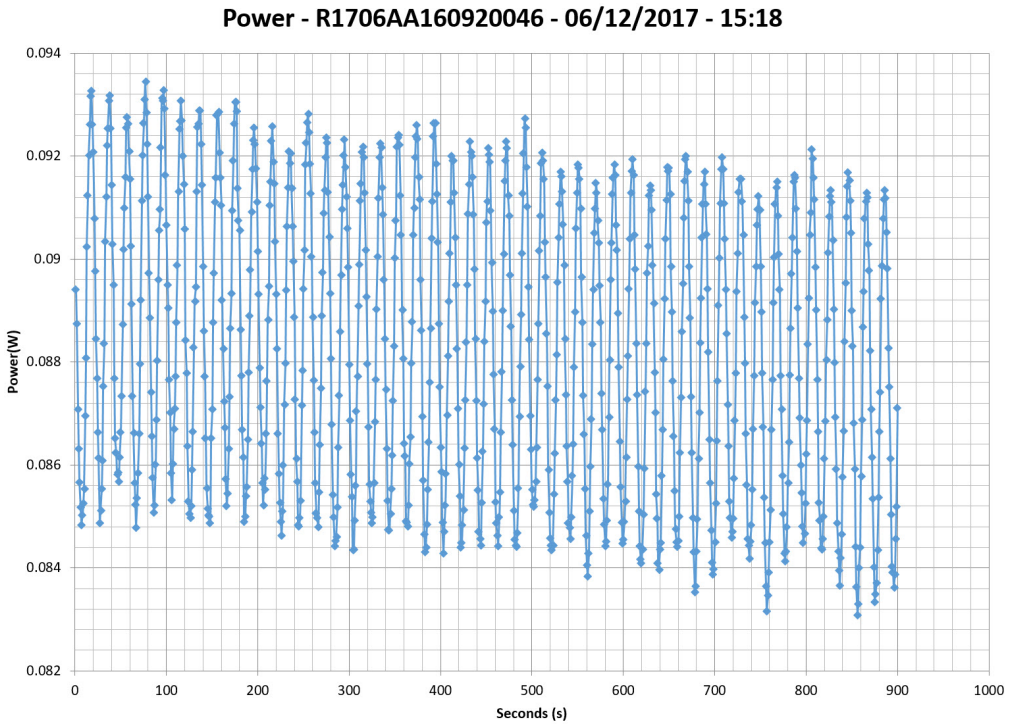
Vampire Power

Graphs

115V

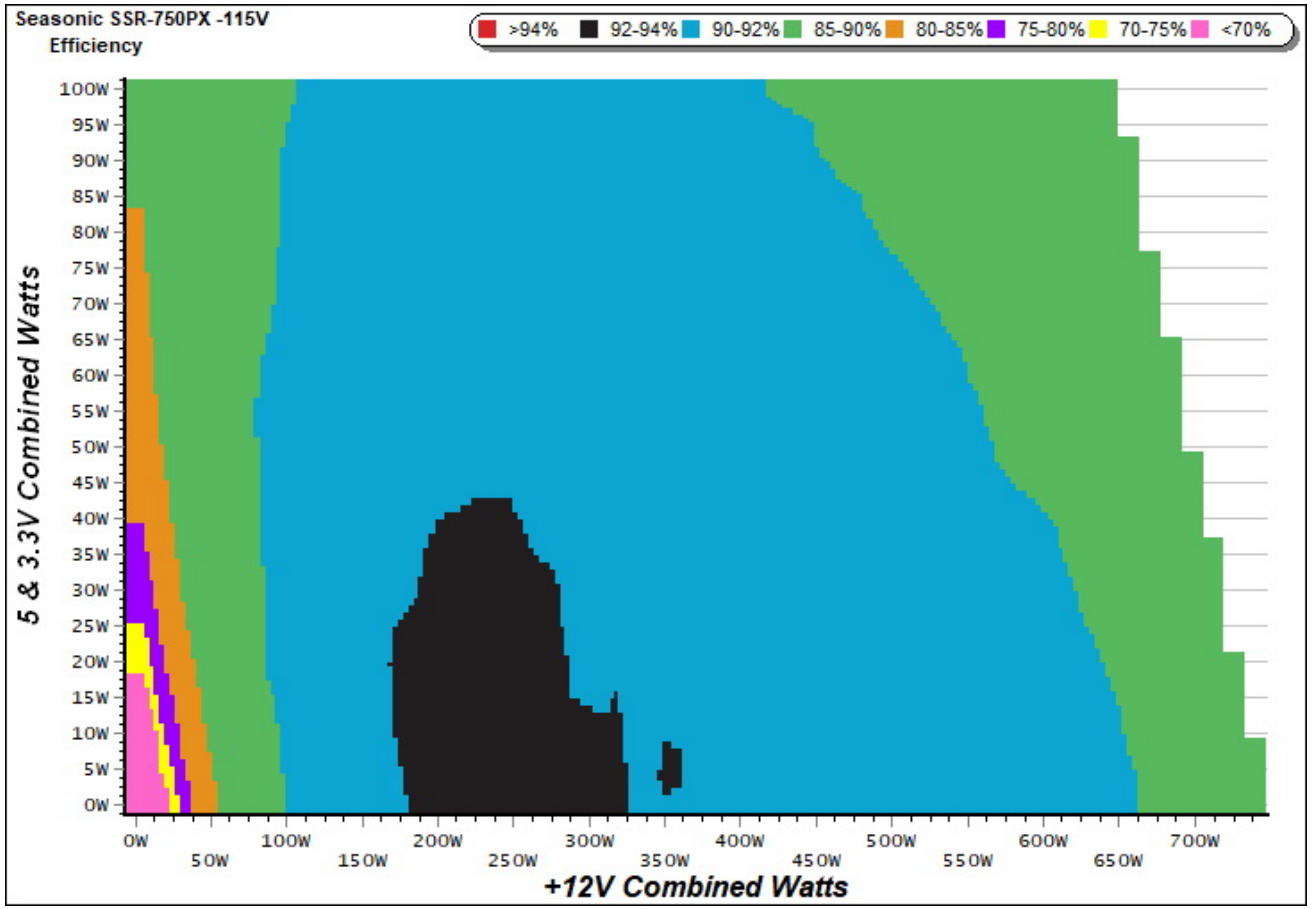


230V



Efficiency Graph

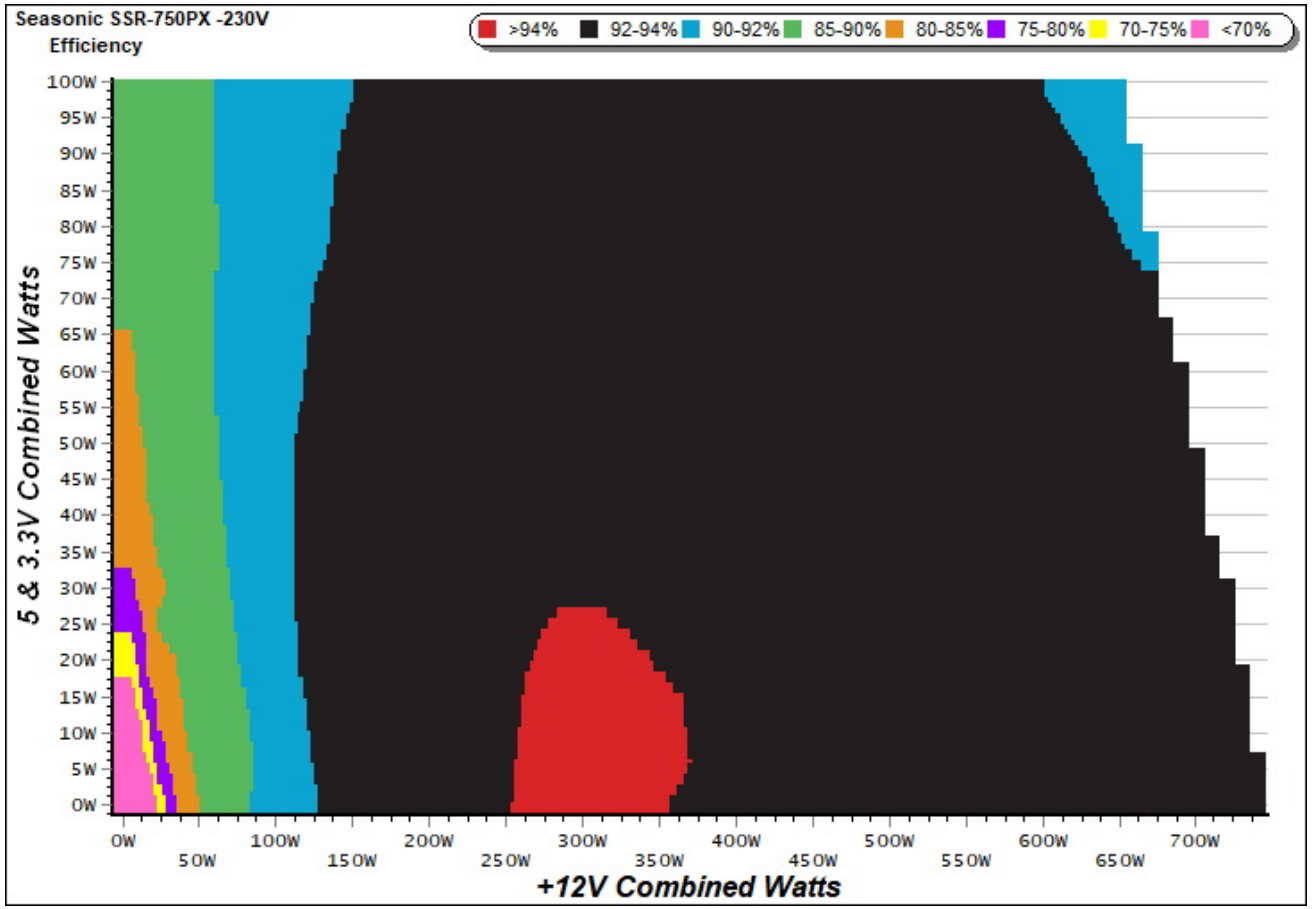
115V



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.

230V

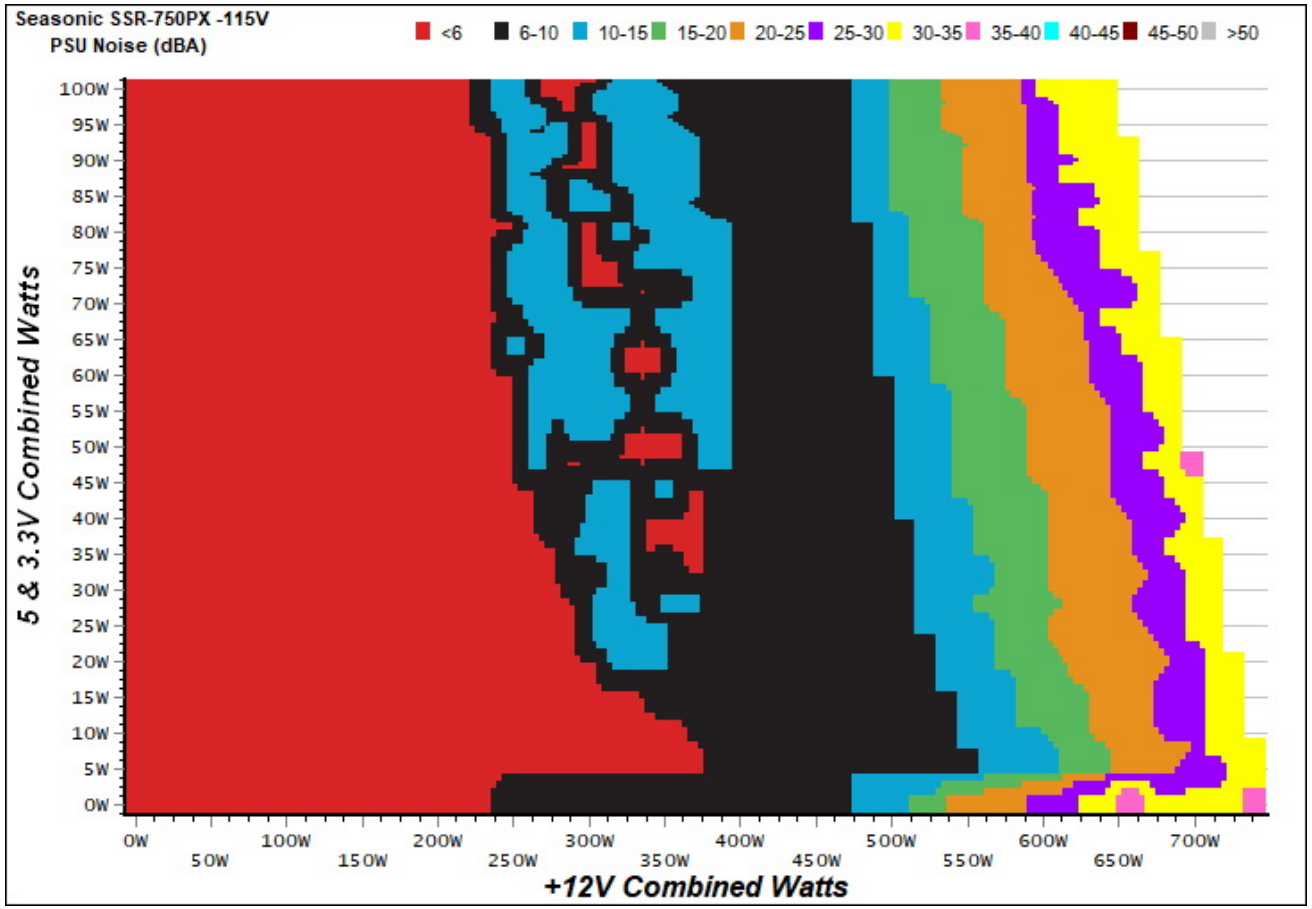


INFO

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

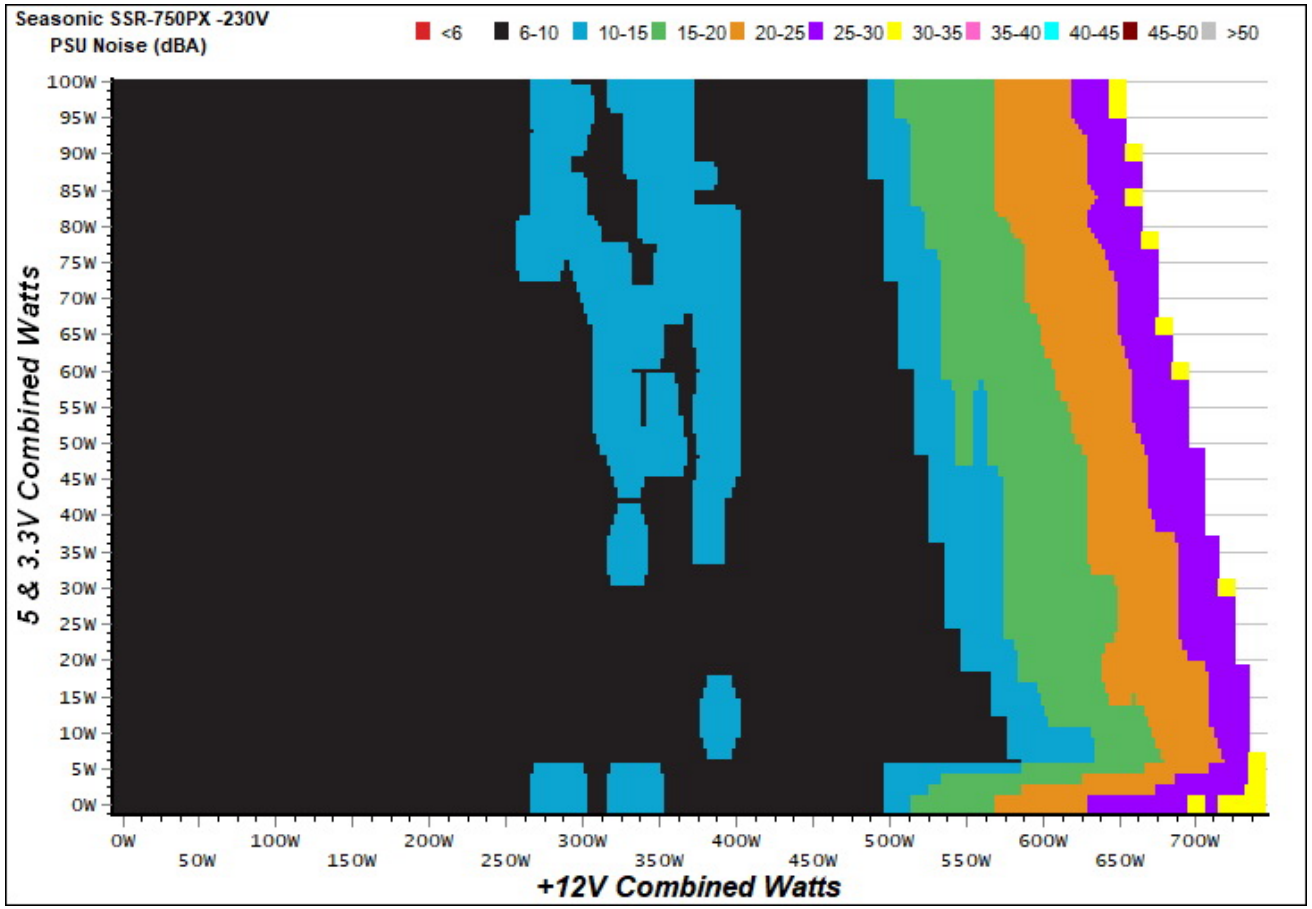
115V



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.

230V

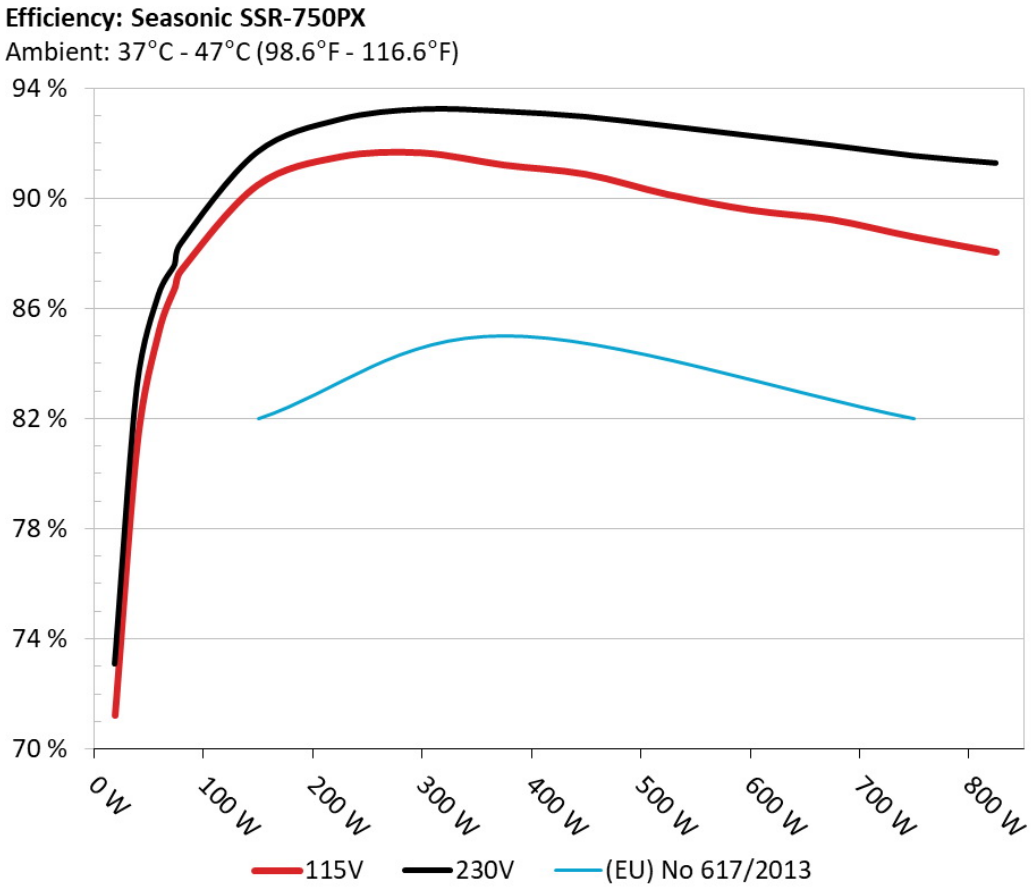


INFO

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

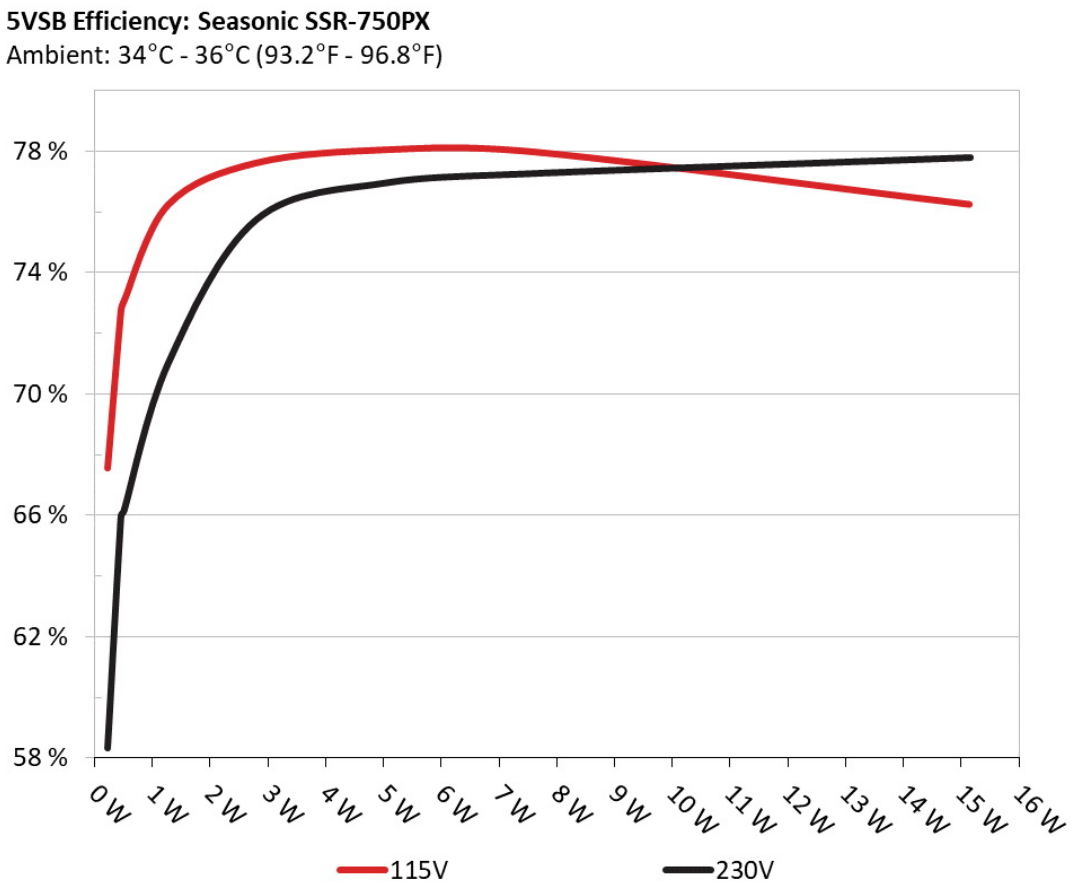
Efficiency under high ambient temperature



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	0.045A	0.231	67.544%	0.031
	5.120V	0.342		115.38V
2	0.090A	0.461	72.713%	0.057
	5.118V	0.634		115.38V
3	0.550A	2.810	77.603%	0.255
	5.108V	3.621		115.37V
4	1.000A	5.099	78.038%	0.349
	5.098V	6.534		115.37V
5	1.500A	7.632	77.957%	0.404
	5.087V	9.790		115.36V
6	3.000A	15.131	76.234%	0.470
	5.043V	19.848		115.35V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	58.333%	0.013
	5.120V	0.396		230.93V
2	0.090A	0.461	65.951%	0.022
	5.118V	0.699		230.94V
3	0.550A	2.810	75.762%	0.110
	5.107V	3.709		230.88V
4	1.000A	5.099	76.978%	0.179
	5.098V	6.624		230.93V
5	1.500A	7.631	77.276%	0.239
	5.086V	9.875		230.93V
6	3.001A	15.159	77.798%	0.339
	5.052V	19.485		230.93V

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	4.354A	1.987A	1.986A	0.982A	74.416	86.788%	0	<6.0	45.15°C	0.940
	12.134V	5.027V	3.321V	5.092V	85.745				38.29°C	115.28V
2	9.761A	2.984A	2.982A	1.181A	149.342	90.468%	0	<6.0	45.58°C	0.984
	12.134V	5.027V	3.320V	5.082V	165.078				38.41°C	115.18V
3	15.563A	3.481A	3.463A	1.380A	224.853	91.505%	0	<6.0	46.44°C	0.992
	12.135V	5.027V	3.320V	5.072V	245.728				38.79°C	115.13V
4	21.296A	3.980A	3.977A	1.581A	299.637	91.651%	0	<6.0	47.71°C	0.995
	12.135V	5.027V	3.319V	5.062V	326.931				39.39°C	115.07V
5	26.703A	4.976A	4.971A	1.782A	374.572	91.213%	445	9.6	39.69°C	0.993
	12.136V	5.026V	3.318V	5.051V	410.657				50.85°C	114.96V
6	32.106A	5.973A	5.970A	1.984A	449.483	90.876%	445	9.6	40.18°C	0.993
	12.137V	5.024V	3.317V	5.041V	494.614				51.59°C	114.95V
7	37.543A	6.967A	6.967A	2.188A	524.798	90.141%	590	15.2	41.44°C	0.994
	12.138V	5.024V	3.315V	5.029V	582.196				53.11°C	114.84V
8	42.984A	7.965A	7.968A	2.392A	600.108	89.578%	1130	29.9	42.81°C	0.994
	12.137V	5.022V	3.314V	5.019V	669.925				54.83°C	114.73V
9	48.788A	8.467A	8.451A	2.394A	674.652	89.227%	1655	37.0	44.76°C	0.995
	12.137V	5.021V	3.313V	5.013V	756.111				57.40°C	114.72V
10	54.401A	8.967A	8.971A	3.005A	749.870	88.598%	2005	41.1	45.51°C	0.995
	12.135V	5.019V	3.311V	4.994V	846.370				58.68°C	114.60V
11	60.595A	8.968A	8.974A	3.008A	825.100	88.041%	2025	41.2	46.73°C	0.995
	12.136V	5.019V	3.310V	4.988V	937.176				60.09°C	114.49V
CL1	0.740A	12.001A	11.999A	0.000A	109.173	86.549%	485	9.3	46.91°C	0.973
	12.139V	5.026V	3.323V	5.102V	126.140				49.95°C	115.22V

CL2	62.013A	1.001A	1.000A	1.000A	765.974	89.018%	2025	41.2	45.82°C	0.995
	12.136V	5.022V	3.312V	5.046V	860.471				54.78°C	114.59V

The results above are not used in the certification process

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	4.353A	1.989A	1.986A	0.983A	74.434	87.809%	0	<6.0	46.59°C	0.713
	12.138V	5.028V	3.322V	5.086V	84.768				39.20°C	230.90V
2	9.759A	2.986A	2.981A	1.183A	149.358	91.686%	0	<6.0	47.59°C	0.883
	12.137V	5.027V	3.321V	5.074V	162.902				39.63°C	230.84V
3	15.559A	3.483A	3.463A	1.383A	224.867	92.850%	0	<6.0	48.91°C	0.939
	12.138V	5.027V	3.321V	5.063V	242.182				40.31°C	230.78V
4	21.292A	3.978A	3.976A	1.584A	299.641	93.162%	425	9.0	41.24°C	0.962
	12.138V	5.027V	3.320V	5.051V	321.633				50.40°C	230.73V
5	26.694A	4.976A	4.971A	1.787A	374.575	93.024%	445	9.6	41.70°C	0.973
	12.140V	5.026V	3.319V	5.038V	402.664				51.52°C	230.67V
6	32.099A	5.972A	5.966A	1.990A	449.490	92.912%	445	9.6	42.49°C	0.979
	12.140V	5.025V	3.318V	5.027V	483.780				52.65°C	230.62V
7	37.537A	6.969A	6.964A	2.195A	524.815	92.622%	590	15.2	43.23°C	0.983
	12.140V	5.024V	3.317V	5.013V	566.622				53.83°C	230.66V
8	42.974A	7.966A	7.963A	2.400A	600.077	92.346%	1005	23.9	43.86°C	0.986
	12.139V	5.023V	3.315V	5.002V	649.816				55.00°C	230.61V
9	48.778A	8.467A	8.451A	2.402A	674.637	92.055%	1580	36.9	44.16°C	0.987
	12.139V	5.021V	3.314V	4.996V	732.866				55.84°C	230.55V
10	54.392A	8.969A	8.968A	3.018A	749.879	91.596%	1835	40.2	45.89°C	0.988
	12.137V	5.019V	3.312V	4.972V	818.682				57.86°C	230.49V
11	60.588A	8.969A	8.972A	3.021A	825.071	91.247%	2035	41.3	46.12°C	0.989
	12.137V	5.018V	3.311V	4.966V	904.215				58.73°C	230.43V
CL1	0.142A	12.002A	11.999A	0.000A	101.920	87.081%	0	<6.0	50.31°C	0.807
	12.140V	5.026V	3.323V	5.100V	117.041				41.63°C	230.96V

CL2	62.011A	1.003A	1.000A	1.000A	766.016	92.056%	1970	41.1	44.46°C	0.988
	12.137V	5.022V	3.314V	5.037V	832.120				55.84°C	230.49V

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	1.187A	0.496A	0.481A	0.196A	19.496	71.234%	0	<6.0	0.662
	12.131V	5.030V	3.324V	5.114V	27.369				115.35V
2	2.439A	0.994A	0.994A	0.392A	39.886	81.142%	0	<6.0	0.830
	12.132V	5.024V	3.320V	5.108V	49.156				115.33V
3	3.628A	1.490A	1.475A	0.588A	59.404	85.146%	0	<6.0	0.908
	12.133V	5.025V	3.321V	5.102V	69.767				115.30V
4	4.881A	1.989A	1.986A	0.785A	79.813	87.384%	0	<6.0	0.946
	12.133V	5.026V	3.321V	5.096V	91.336				115.27V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.191A	0.497A	0.482A	0.196A	19.558	73.573%	0	<6.0	0.374
	12.135V	5.032V	3.325V	5.113V	26.583				230.80V
2	2.443A	0.995A	0.993A	0.392A	39.948	83.334%	0	<6.0	0.671
	12.136V	5.026V	3.321V	5.106V	47.937				230.87V
3	3.629A	1.492A	1.472A	0.589A	59.439	86.634%	0	<6.0	0.662
	12.137V	5.027V	3.322V	5.099V	68.609				230.90V
4	4.883A	1.989A	1.987A	0.786A	79.866	88.443%	0	<6.0	0.724
	12.137V	5.027V	3.322V	5.091V	90.302				230.89V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.8 mV	4.2 mV	3.4 mV	4.7 mV	Pass
20% Load	10.0 mV	5.0 mV	4.1 mV	5.2 mV	Pass
30% Load	12.8 mV	5.5 mV	4.5 mV	5.7 mV	Pass
40% Load	15.4 mV	6.1 mV	5.5 mV	6.4 mV	Pass
50% Load	16.2 mV	7.7 mV	6.2 mV	6.7 mV	Pass
60% Load	15.3 mV	8.5 mV	7.1 mV	8.7 mV	Pass
70% Load	13.2 mV	9.0 mV	7.5 mV	8.9 mV	Pass
80% Load	13.5 mV	8.8 mV	8.5 mV	9.9 mV	Pass
90% Load	15.3 mV	10.1 mV	9.2 mV	11.0 mV	Pass
100% Load	16.3 mV	11.4 mV	9.6 mV	11.5 mV	Pass
110% Load	17.7 mV	10.8 mV	9.8 mV	11.4 mV	Pass
Crossload 1	8.6 mV	9.4 mV	8.2 mV	4.8 mV	Pass
Crossload 2	17.2 mV	7.3 mV	5.5 mV	9.7 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.1 mV	4.4 mV	3.3 mV	4.6 mV	Pass
20% Load	9.4 mV	5.0 mV	4.2 mV	4.5 mV	Pass
30% Load	11.9 mV	5.2 mV	4.4 mV	4.8 mV	Pass
40% Load	14.0 mV	6.0 mV	5.1 mV	5.2 mV	Pass
50% Load	15.5 mV	7.2 mV	6.1 mV	5.1 mV	Pass
60% Load	14.6 mV	8.6 mV	6.8 mV	5.3 mV	Pass
70% Load	13.9 mV	8.8 mV	7.2 mV	6.2 mV	Pass
80% Load	14.3 mV	9.0 mV	8.6 mV	6.9 mV	Pass

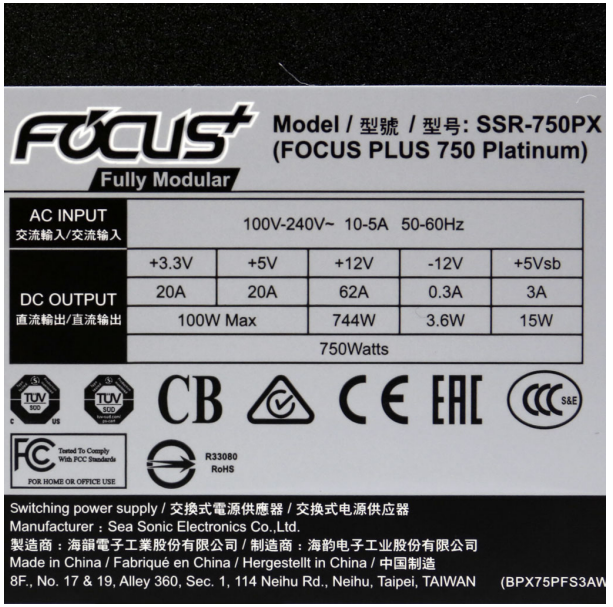
Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	15.0 mV	9.4 mV	8.6 mV	7.6 mV	Pass
100% Load	17.6 mV	10.3 mV	9.2 mV	7.8 mV	Pass
110% Load	19.4 mV	10.6 mV	9.5 mV	9.0 mV	Pass
Crossload 1	7.6 mV	9.3 mV	7.8 mV	5.0 mV	Pass
Crossload 2	17.5 mV	7.3 mV	5.3 mV	7.4 mV	Pass

The results above are not used in the certification process

Seasonic Focus Plus Platinum 750W



Top side



Power specifications label

All data and graphs included in this test report can be used by any individual on the following conditions:
› It should be mentioned that the test results are provided by Cybenetics
› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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