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

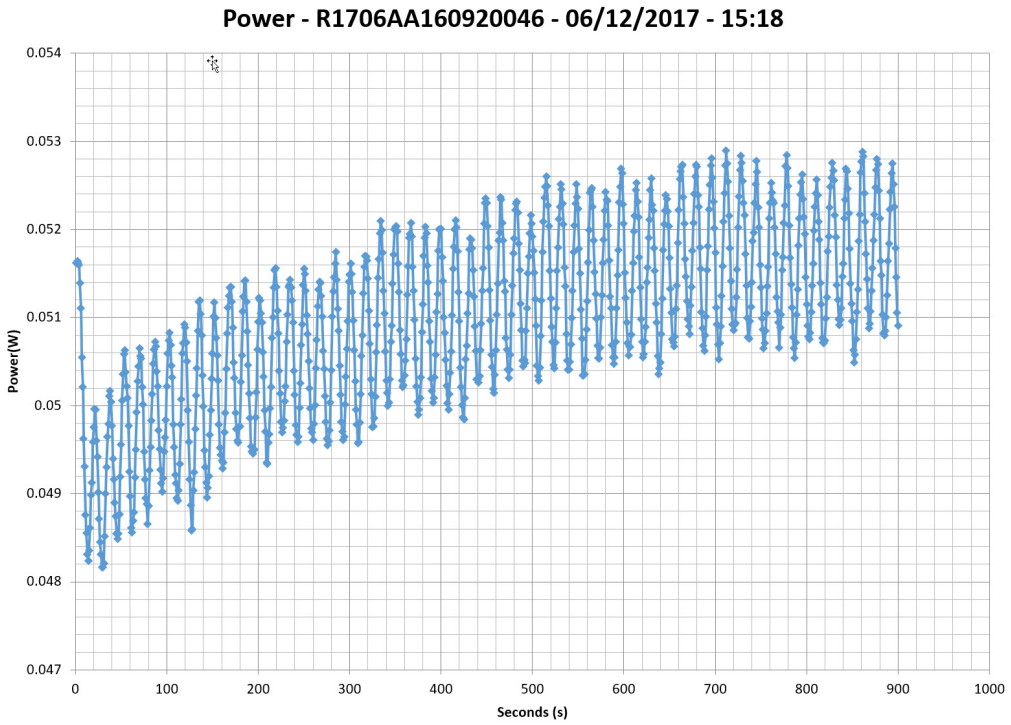
230V		
Accredited		
Average Efficiency (>1450 load combinations)	92.217%	
Average Noise Output (>1450 Load Combinations)	16.18dBA	
Average PF (>1450 Load Combinations)	0.938	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0871W	
Non-Accredited		
12V Ripple (Full Load)	17.55mV	
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

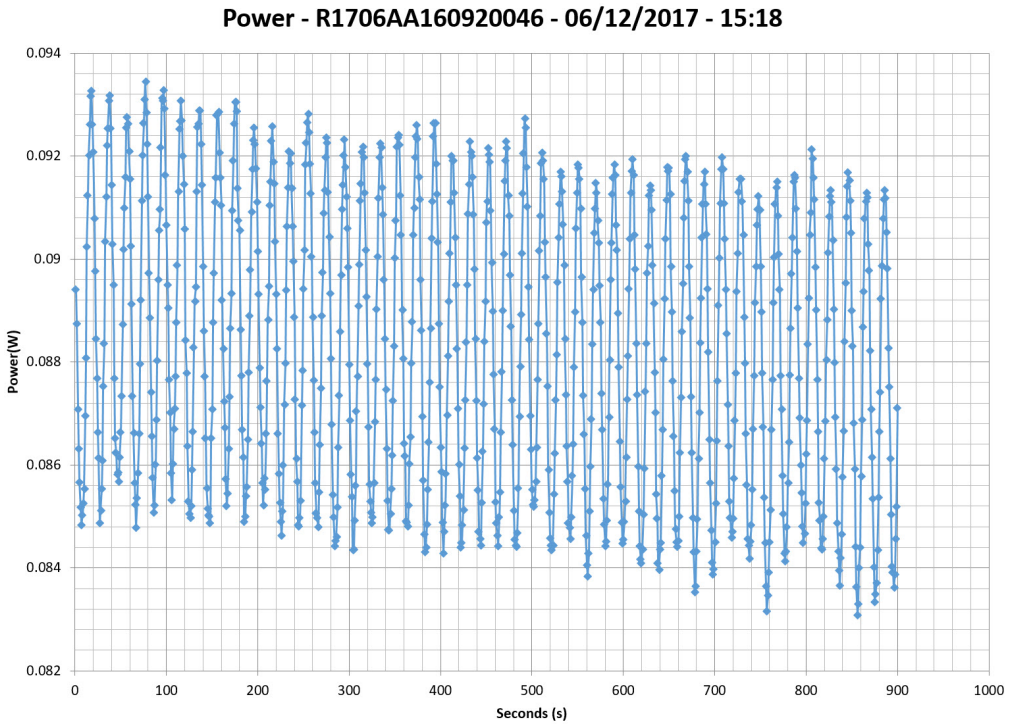
Hold-Up Time (ms)	25.2
AC Loss to PWR_OK Hold Up Time (ms)	20.7
PWR_OK Inactive to DC Loss Delay (ms)	4.5

Graphs

115V

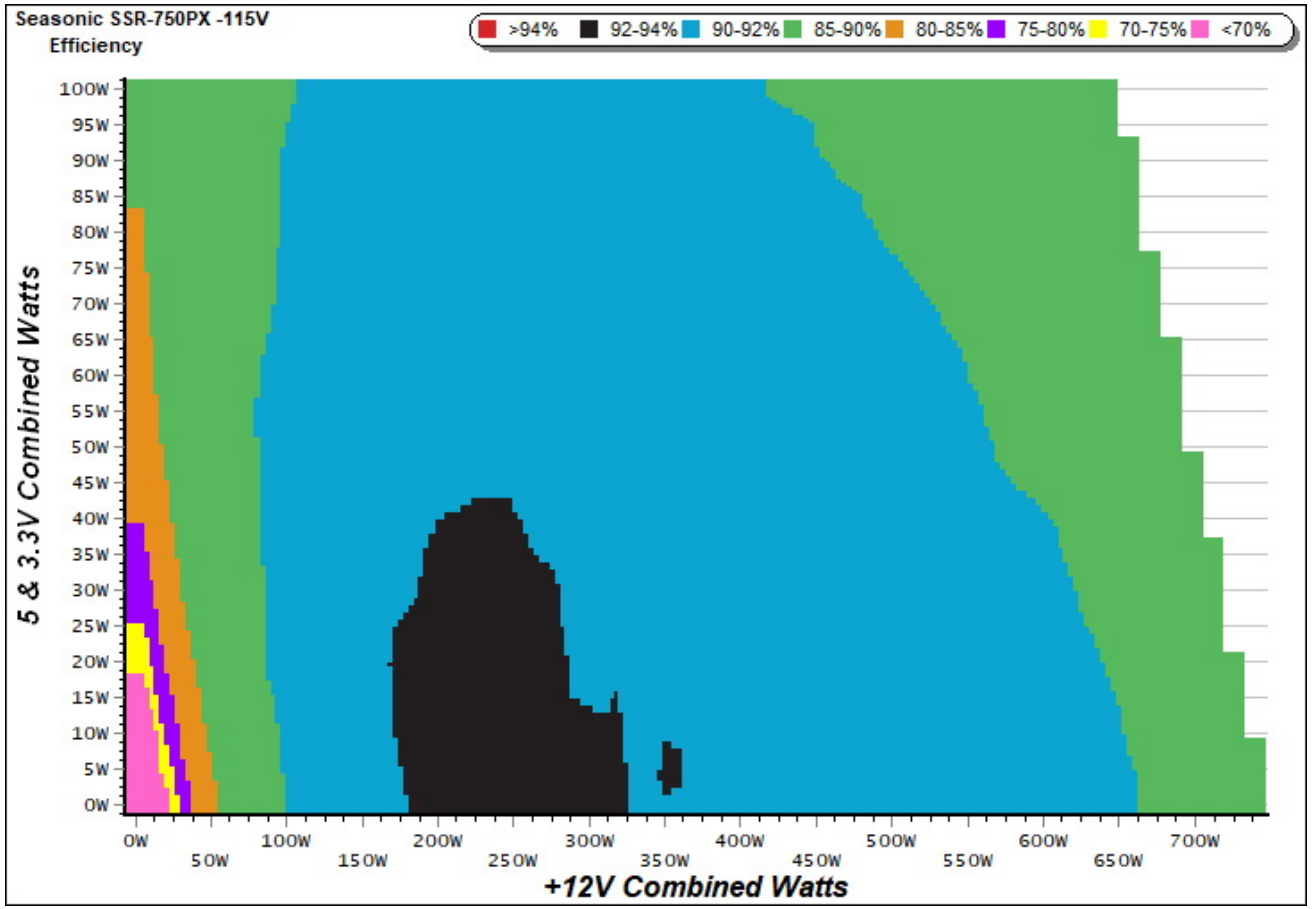


230V



Efficiency Graph

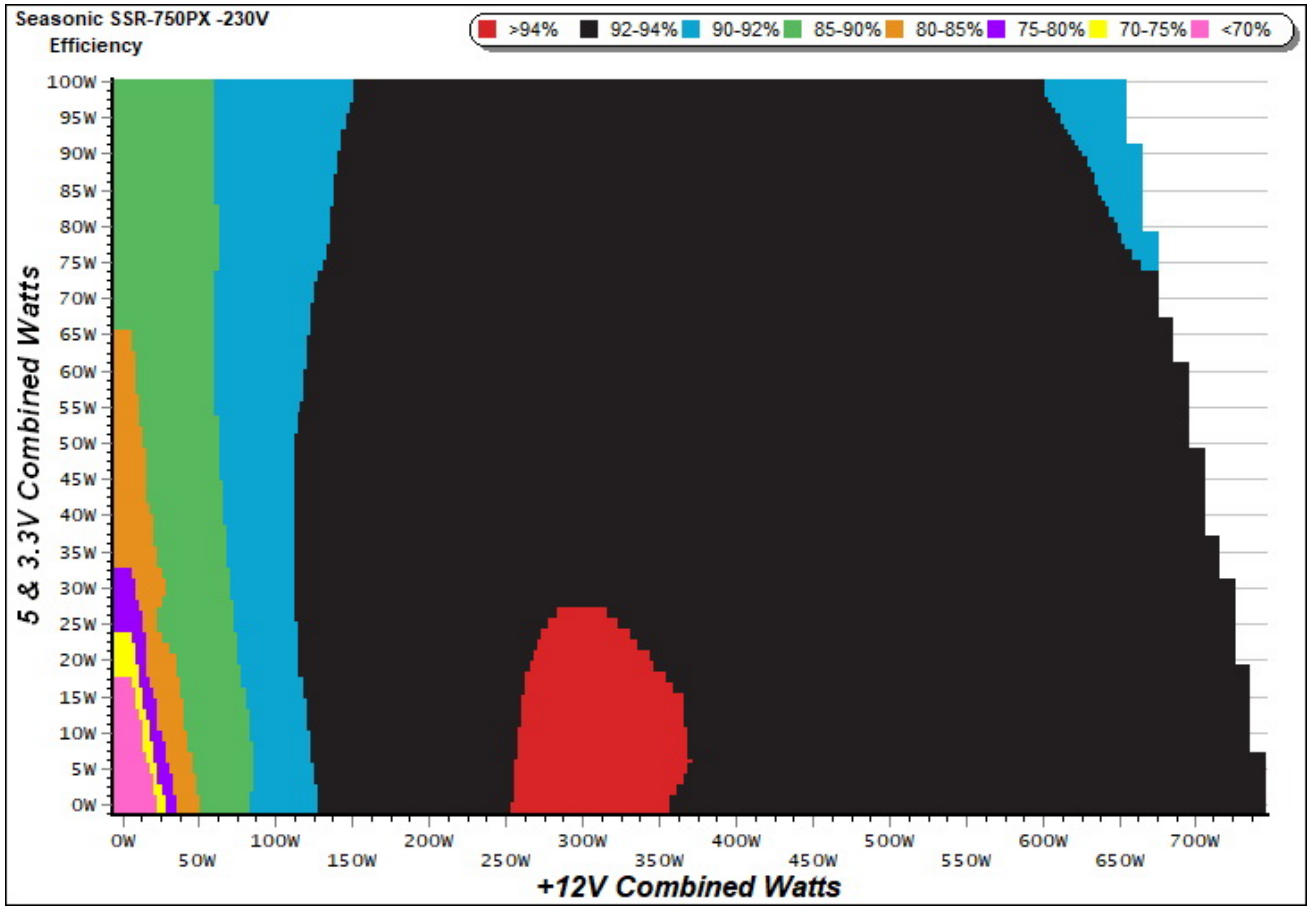
115V



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

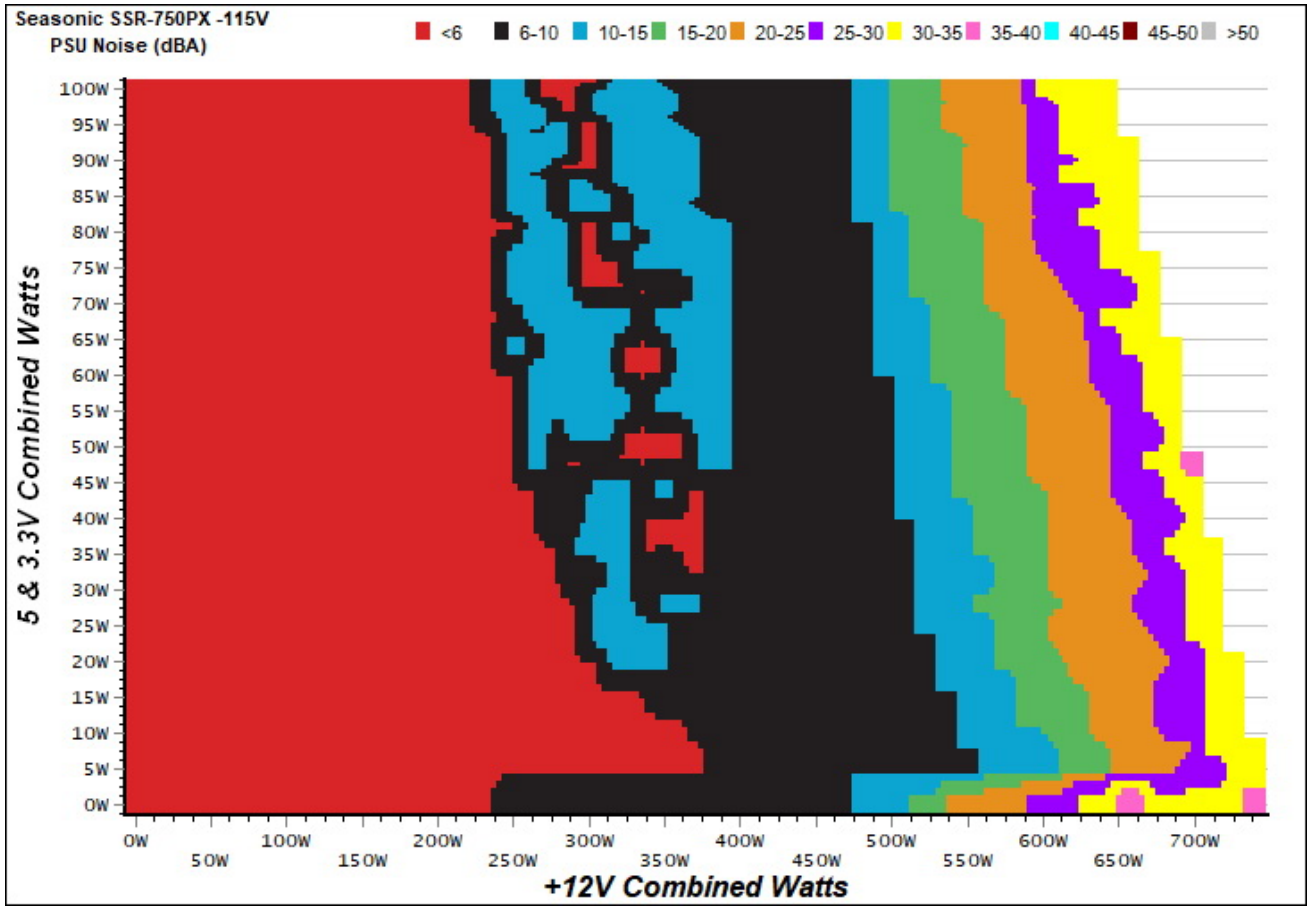


INFO

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

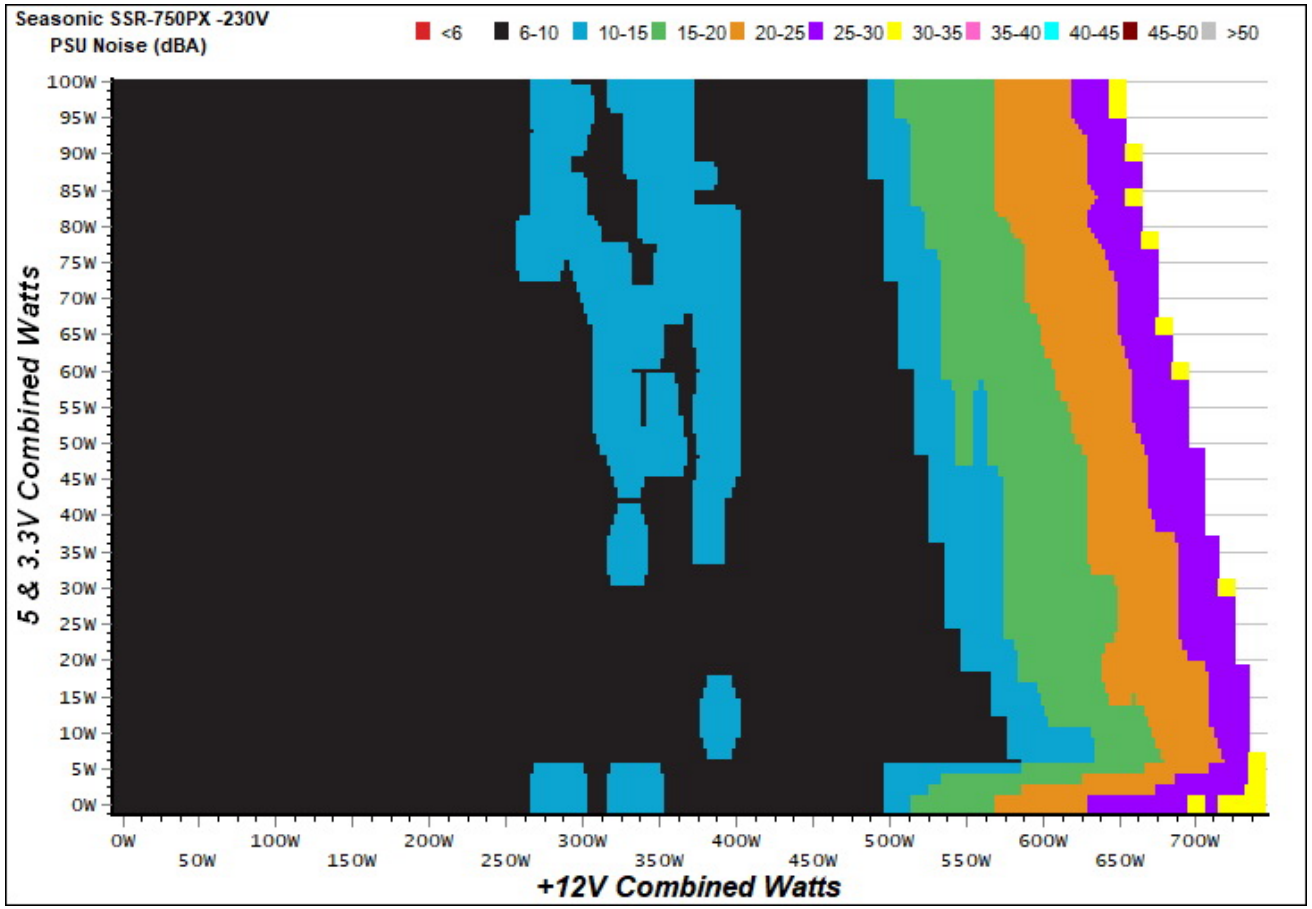
115V



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

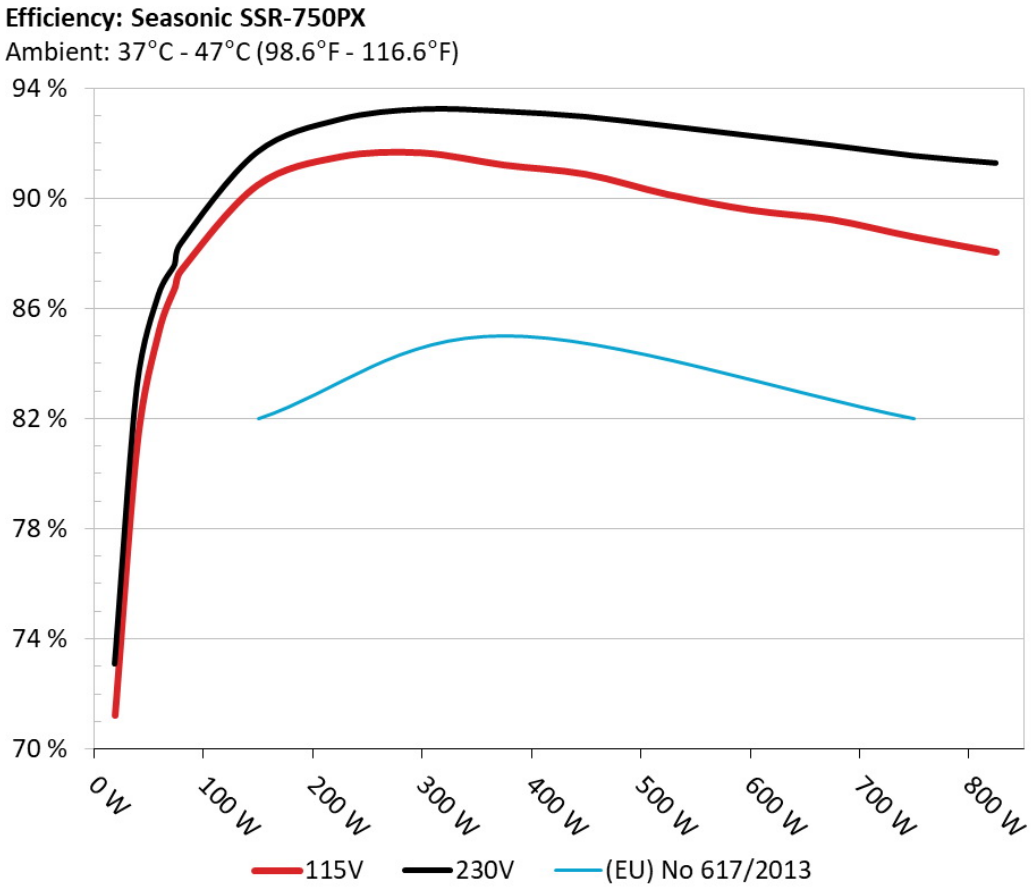


INFO

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

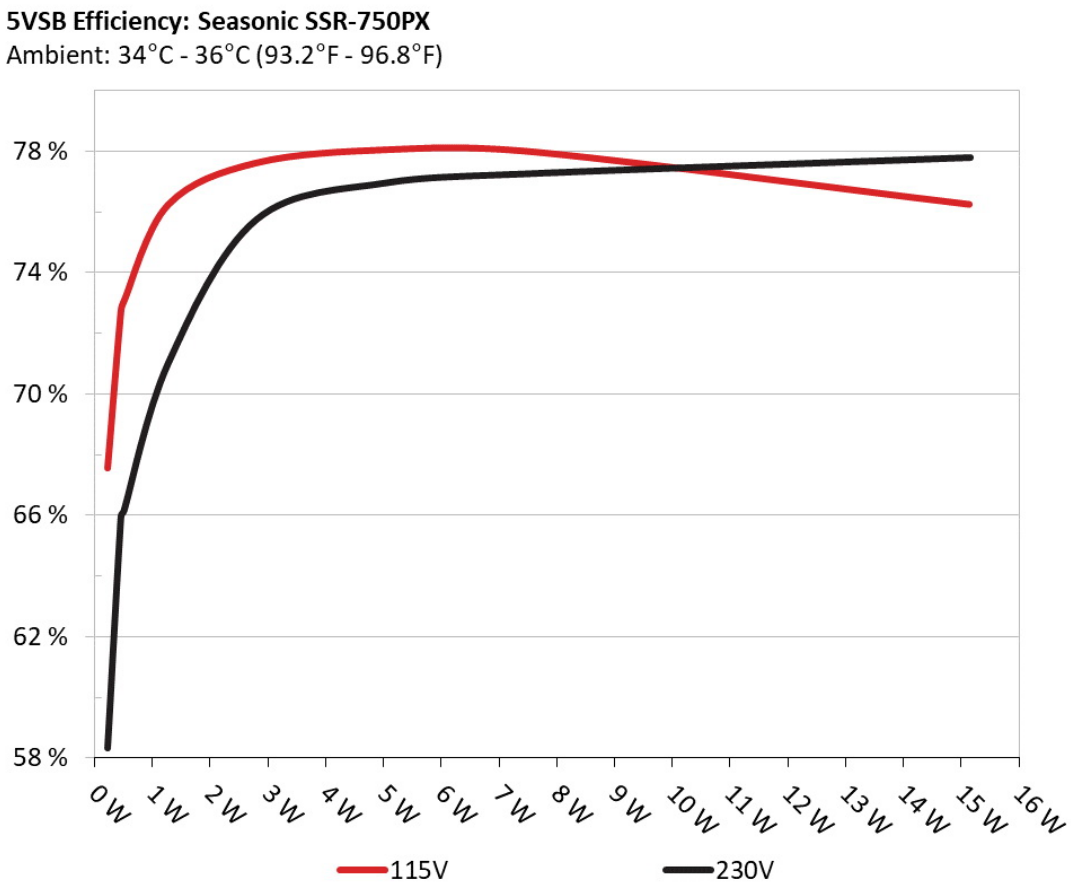
Efficiency under high ambient temperature



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

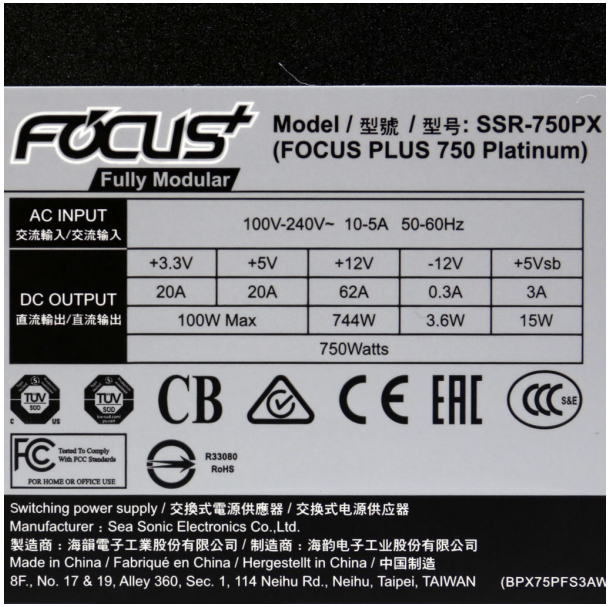
Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	15.0 mV	9.4 mV	8.6 mV	7.6 mV	Pass
100% Load	17.6 mV	10.3 mV	9.2 mV	7.8 mV	Pass
110% Load	19.4 mV	10.6 mV	9.5 mV	9.0 mV	Pass
Crossload 1	7.6 mV	9.3 mV	7.8 mV	5.0 mV	Pass
Crossload 2	17.5 mV	7.3 mV	5.3 mV	7.4 mV	Pass

The results above are not used in the certification process

Seasonic Focus Plus Platinum 750W



Top side



Power specifications label