PHANTEKS

Phanteks AMP 750W (#2)

Serial Number R1906AA252140121

Lab ID PH19750145

Certification ID 251596

Test Result Report ID: 20PS1596A

Certificate Issue Date: Feb 14, 2020

Scheme: ETA-EMI PSU

115V

230V

Scheme: LAMBDA PSU

115V

230V

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	Phanteks
Model	AMP 750W (#2)
OEM/ODM	Seasonic
Serial Number	R1906AA252140121
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	PH19750145
Date of receipt	Aug 26, 2019
Testing Date	Feb 11, 2020
Report Issued Date	Feb 14, 2020
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 (610mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (650mm)	2	2	18AWG	No
6+2 pin PCIe (680mm+80mm)	2	4	18AWG	No
SATA (420mm+150mm+150mm+150mm)	2	8	18AWG	No
SATA (300mm+150mm)	1	2	18AWG	No
4 pin Molex (450mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex to SATA 3.3V Adapter (150mm+150mm)	1	2	18AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

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
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x Discharge IC
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU1508 (800V, 15A @ 100°C)
APFC MOSFETS	2x Infineon IPA50R190CE (550V, 15.7A @ 100°C, 0.19Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8S06 (600V, 8A)
Hold-up Cap(s)	1x Rubycon (400V, 560uF, 2,000h @ 105°C, MXH)
Main Switchers	4x Champion GPT10N50AD (500V, 9.7A, 0.7Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controllers	Champion CM6901T6
Topology	Primary side: Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nexperia PSMN2R6-40YS (40V, 100A @ 100°C, 5.3mOhm @ 175°C)
5V & 3.3V	DC-DC Converters
Filtering Capacitors	Electrolytics: 6x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 3x Nippon Chemi-Con (1-5,000h @ 105°C, KZE), 2x Nichicon (2-5,000h @ 105°C, HD), 3x Nichicon (4-10,000h @ 105°C, HE) Polymers: 9x FPCAP, 2x NIC, 6x United Chemi-Con
Supervisor IC	Weltrend WT7527V (OCP, OVP, UVP, SCP, PG)
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, Fluid Dynamic Bearing Fan)
5VSB Circuit	
Rectifier	1xPFC P10V45SP SBR (45V, 10A)

Standby PWM Controller	Excelliance MOS EM8569

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓ ErP Lot 6 2013: ✓ ErP Lot 3 2014 & CEC: Partially
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.622%
Average Noise Output (>1450 Load Combinations)	33.13dBA
Average PF (>1450 Load Combinations)	0.976
Efficiency With 10W (≤500W) or 2% (>500W) Load	59.918%
Standby Power Consumption	0.0450W
Non-Accredited	
12V Ripple (Full Load)	29.64mV
5V Ripple (Full Load)	22.17mV
3.3V Ripple (Full Load)	17.70mV
5VSB Ripple (Full Load)	8.10mV
12V Load Regulation	0.12%
5V Load Regulation	0.30%
3.3V Load Regulation	0.51%
5VSB Load Regulation	2.71%
Inrush Current	44.018A

230V		
Accredited		
Average Efficiency (>1450 load combinations)		90.413%
Average Noise Output (>1450 Load Combinations)		33.10dBA
Average PF (>1450 Load Combinations)		0.935
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
Standby Power Consumption		0.0741W
Non-Accredited		
12V Ripple (Full Load)		30.31mV
5V Ripple (Full Load)		21.12mV
3.3V Ripple (Full Load)		17.17mV
5VSB Ripple (Full Load)		7.25mV
12V Load Regulation		0.09%
5V Load Regulation		0.32%
3.3V Load Regulation		0.54%
5VSB Load Regulation		2.67%
Inrush Current		78.725A
Hold-Up Time & PWR_OK Signal		21.00ms
AC Loss to PWR_OK Hold Up Time		17.50ms
PWR_OK Inactive to DC Loss Delay		3.50ms
PSU Timings: T1 (20% / 100%)	78.0ms	78.0ms
PSU Timings: T3 (20% / 100%)	312.0ms	312.0ms
OPP (0.00°C / 0.00°C)	-	-

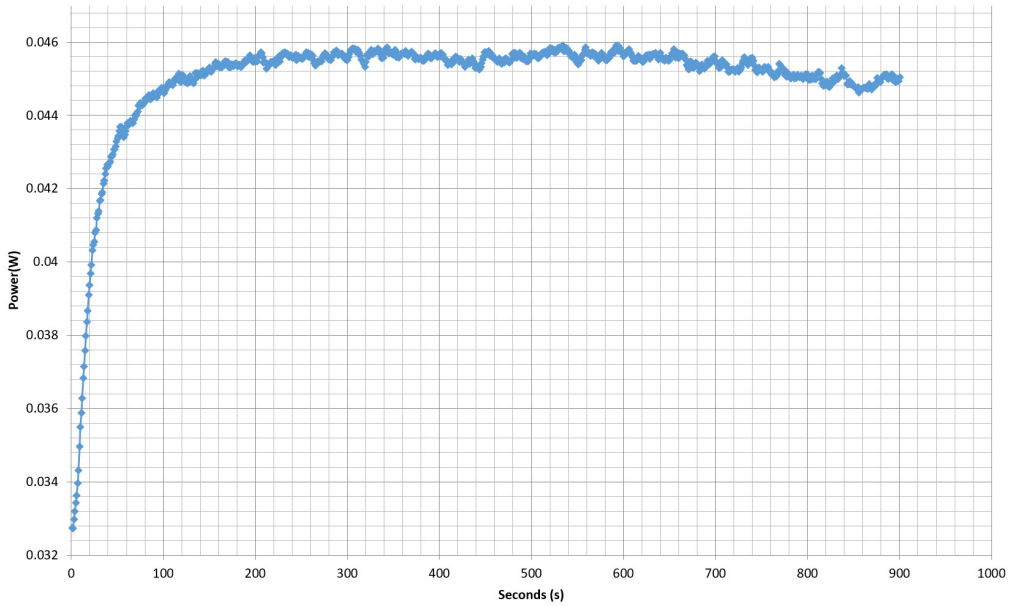
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	21
AC Loss to PWR_OK Hold Up Time (ms)	17.5
PWR_OK Inactive to DC Loss Delay (ms)	3.5

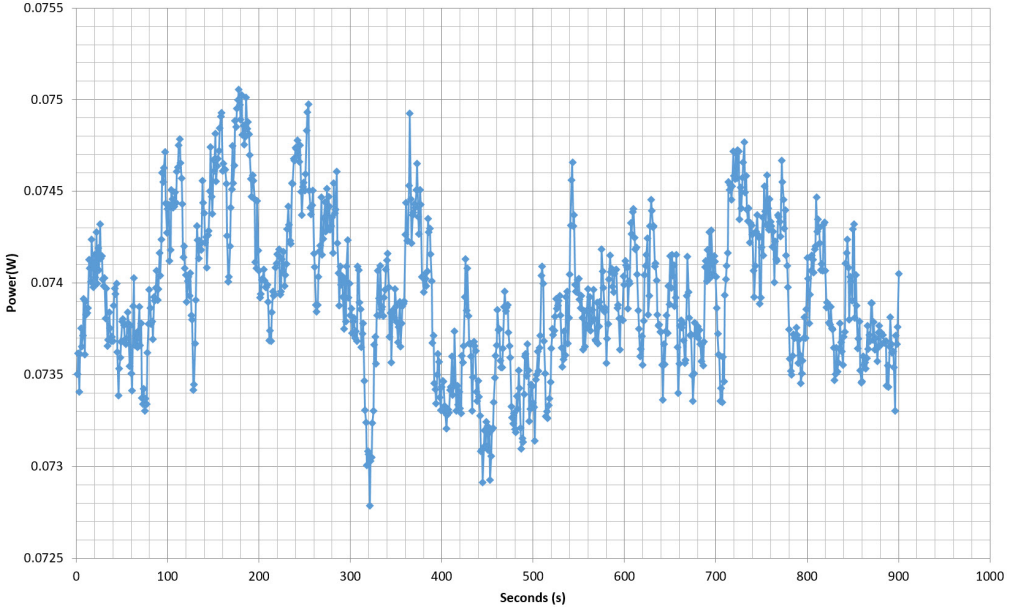
Vampire Power

Graphs

115V

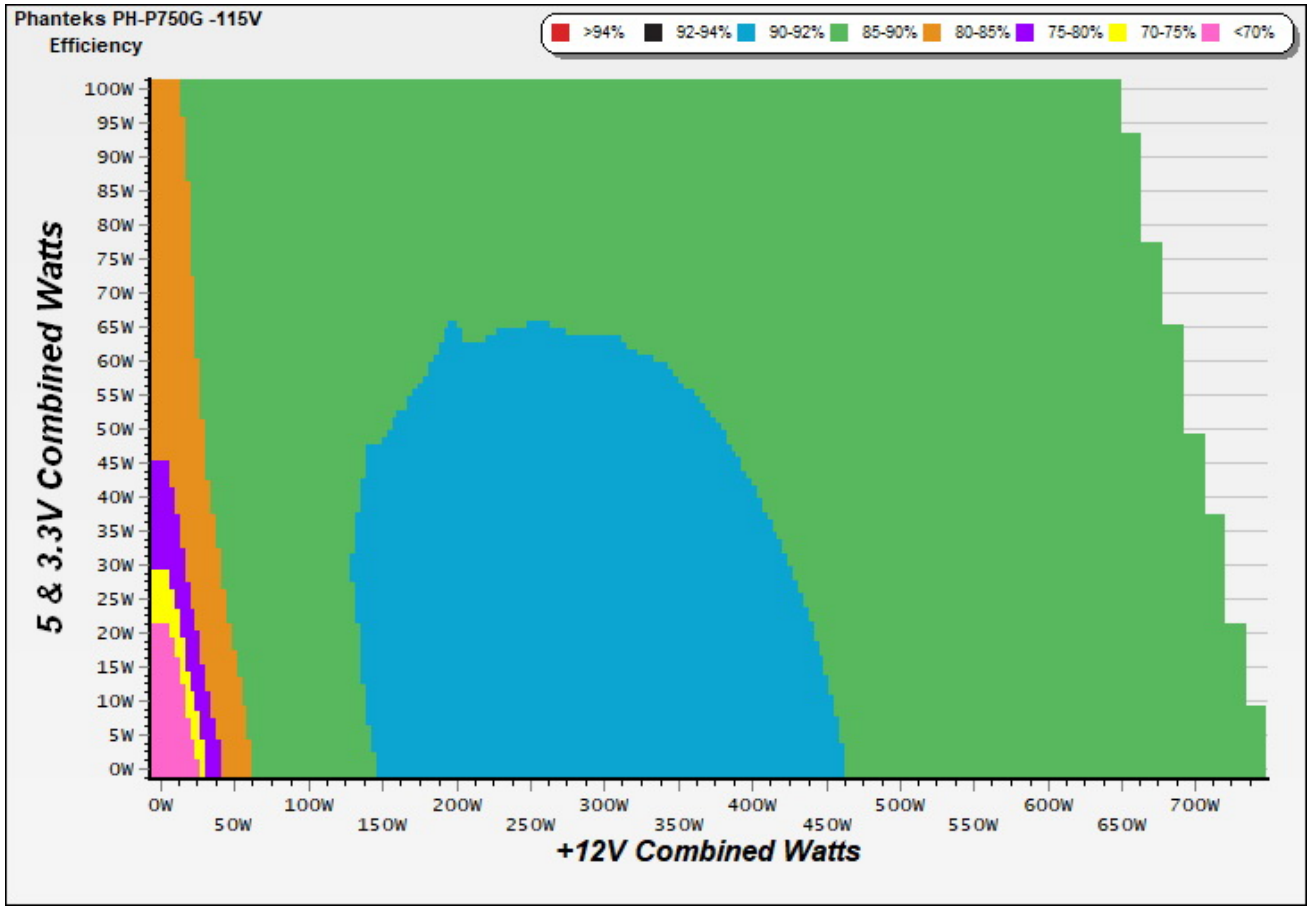


230V



Efficiency Graph

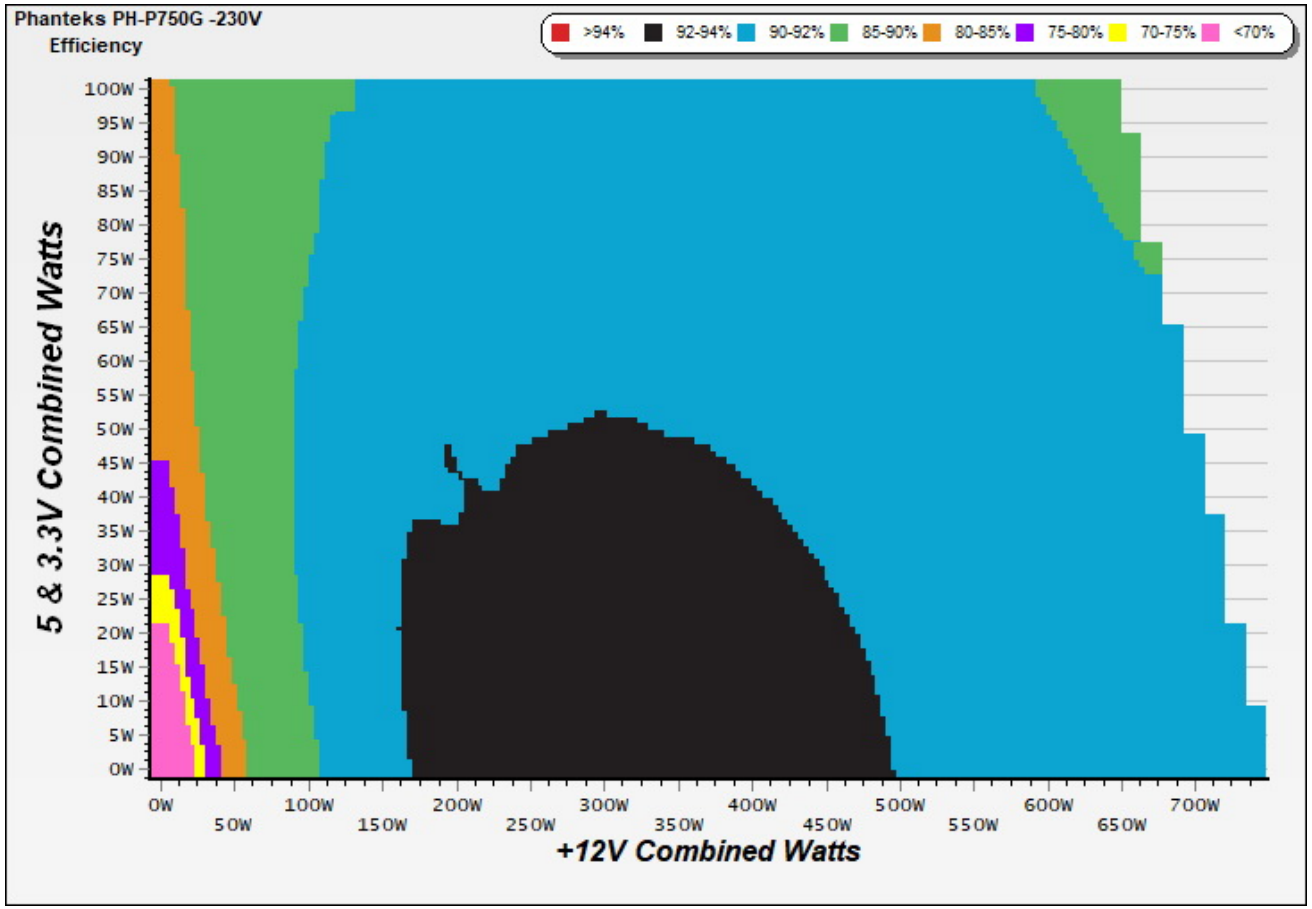
115V



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

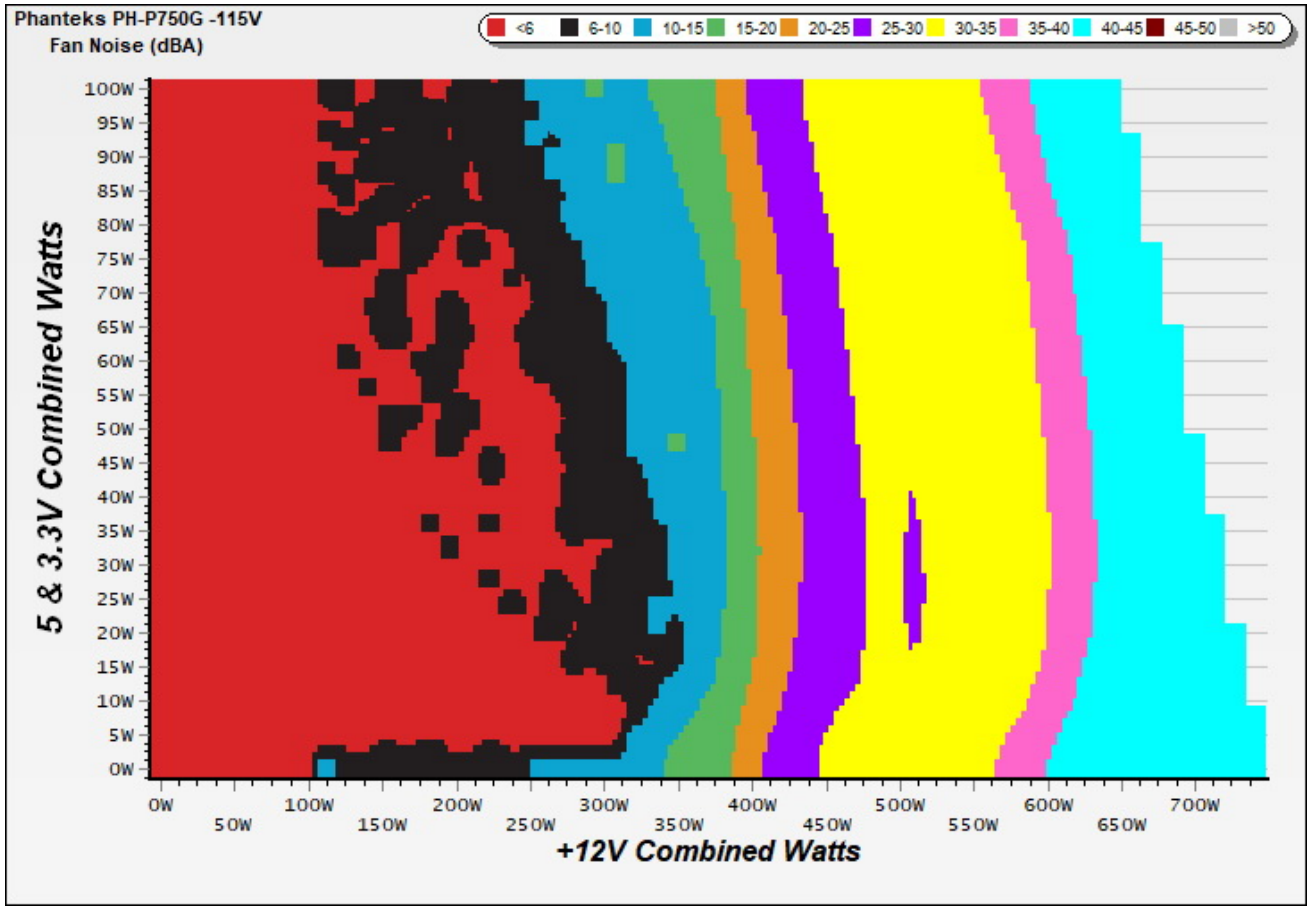


INFO

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

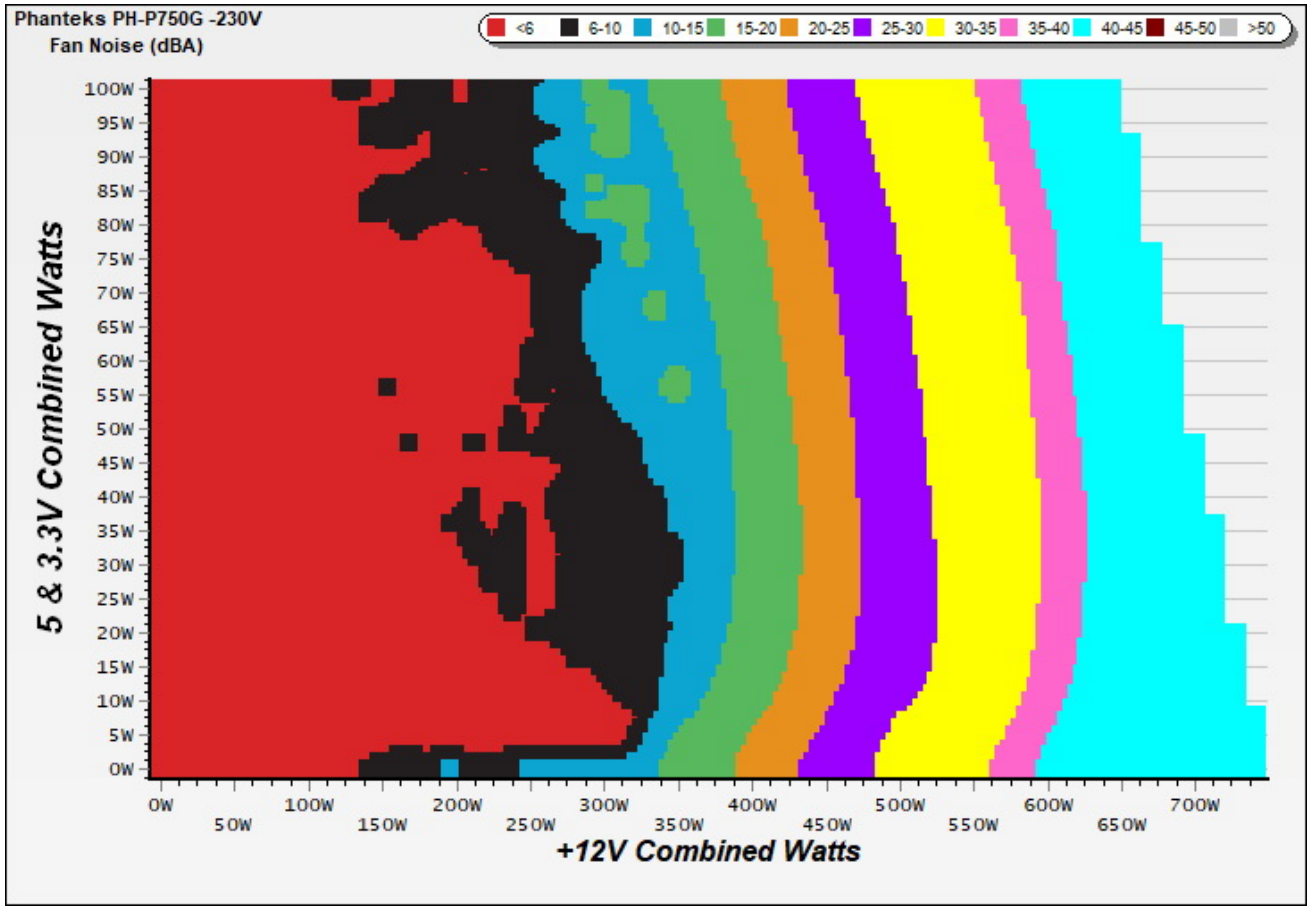
115V



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

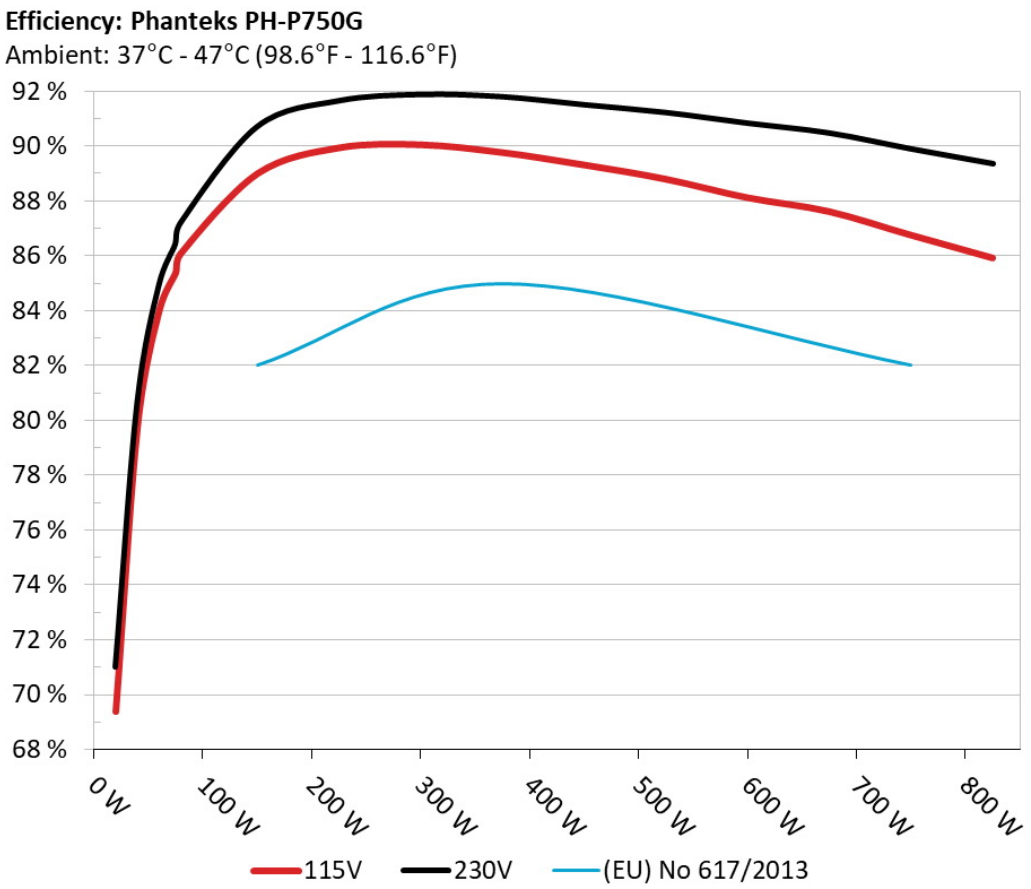


INFO

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

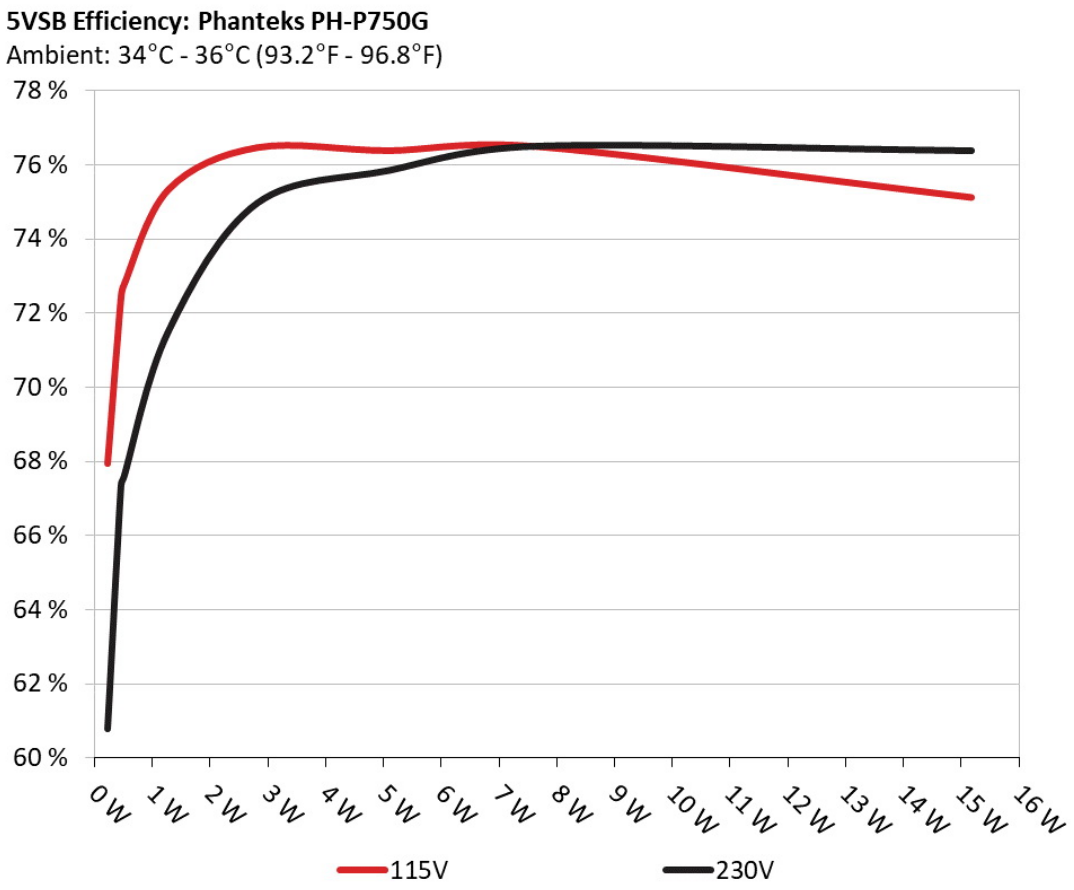
Efficiency under high ambient temperature



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	67.941%	0.057
	5.135V	0.340		115.12V
2	0.090A	0.462	72.414%	0.103
	5.133V	0.638		115.12V
3	0.550A	2.818	76.472%	0.341
	5.122V	3.685		115.12V
4	1.000A	5.112	76.390%	0.409
	5.111V	6.692		115.12V
5	1.500A	7.650	76.500%	0.443
	5.099V	10.000		115.12V
6	3.000A	15.175	75.127%	0.487
	5.058V	20.199		115.12V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	60.789%	0.020
	5.135V	0.380		230.23V
2	0.090A	0.462	67.347%	0.035
	5.133V	0.686		230.24V
3	0.550A	2.818	74.967%	0.166
	5.122V	3.759		230.24V
4	1.000A	5.112	75.857%	0.247
	5.111V	6.739		230.23V
5	1.500A	7.650	76.508%	0.301
	5.099V	9.999		230.24V
6	3.000A	15.187	76.386%	0.375
	5.062V	19.882		230.24V

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	2.001A	1.986A	0.980A	74.947	85.385%	0	<6.0	43.87°C	0.935
	12.182V	4.996V	3.319V	5.103V	87.775				40.45°C	115.08V
2	9.776A	3.003A	2.985A	1.179A	149.995	88.996%	497	7.3	40.84°C	0.963
	12.182V	4.995V	3.317V	5.091V	168.541				44.54°C	115.08V
3	15.514A	3.504A	3.483A	1.378A	224.995	89.940%	577	8.6	41.48°C	0.976
	12.179V	4.994V	3.316V	5.080V	250.160				45.85°C	115.08V
4	21.255A	4.005A	3.984A	1.578A	300.000	90.050%	887	17.4	41.73°C	0.981
	12.176V	4.993V	3.314V	5.069V	333.148				46.69°C	115.08V
5	26.609A	5.010A	4.980A	1.780A	374.438	89.769%	1327	29.3	42.46°C	0.985
	12.174V	4.991V	3.312V	5.057V	417.115				47.77°C	115.08V
6	32.004A	6.014A	5.982A	1.983A	449.366	89.318%	1646	33.1	42.57°C	0.986
	12.172V	4.989V	3.311V	5.044V	503.109				48.61°C	115.08V
7	37.439A	7.019A	6.982A	2.186A	524.709	88.799%	1934	39.8	43.03°C	0.987
	12.169V	4.988V	3.309V	5.032V	590.896				49.70°C	115.08V
8	42.863A	8.002A	7.981A	2.392A	599.896	88.120%	2084	41.3	43.46°C	0.989
	12.169V	4.986V	3.307V	5.019V	680.772				51.15°C	115.08V
9	48.659A	8.526A	8.470A	2.395A	674.533	87.620%	2104	41.5	44.10°C	0.990
	12.167V	4.985V	3.305V	5.012V	769.841				52.19°C	115.08V
10	54.250A	9.032A	8.989A	3.007A	749.767	86.758%	2113	41.9	45.56°C	0.991
	12.167V	4.983V	3.304V	4.989V	864.203				54.30°C	115.08V
11	60.422A	9.036A	8.992A	3.011A	824.988	85.924%	2118	42.2	46.81°C	0.991
	12.169V	4.982V	3.302V	4.983V	960.139				56.63°C	115.08V
CL1	0.100A	12.001A	11.999A	0.000A	100.796	84.225%	592	8.7	42.15°C	0.951
	12.188V	4.987V	3.311V	5.112V	119.675				47.57°C	115.10V

CL2	62.007A	1.000A	1.000A	1.000A	767.602	87.196%	2109	41.7	45.00°C	0.991
	12.164V	4.991V	3.310V	5.048V	880.314				54.66°C	115.08V

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	4.382A	2.001A	1.988A	0.980A	74.960	86.438%	0	<6.0	43.52°C	0.772
	12.178V	4.996V	3.319V	5.103V	86.721				40.26°C	230.23V
2	9.782A	3.004A	2.985A	1.179A	150.030	90.722%	0	<6.0	44.65°C	0.893
	12.178V	4.994V	3.317V	5.091V	165.374				40.85°C	230.23V
3	15.521A	3.506A	3.485A	1.378A	225.040	91.666%	636	9.4	41.01°C	0.932
	12.176V	4.993V	3.315V	5.079V	245.501				45.16°C	230.23V
4	21.262A	4.004A	3.983A	1.579A	300.055	91.894%	1145	25.0	41.59°C	0.951
	12.175V	4.992V	3.314V	5.068V	326.523				46.51°C	230.23V
5	26.617A	5.010A	4.982A	1.780A	374.535	91.813%	1409	30.9	42.03°C	0.962
	12.174V	4.990V	3.312V	5.056V	407.932				47.62°C	230.24V
6	32.012A	6.014A	5.983A	1.983A	449.458	91.522%	1769	35.2	42.36°C	0.968
	12.172V	4.989V	3.310V	5.043V	491.095				48.64°C	230.24V
7	37.448A	7.021A	6.984A	2.187A	524.788	91.238%	2042	41.5	43.17°C	0.973
	12.168V	4.987V	3.308V	5.032V	575.187				50.07°C	230.24V
8	42.876A	8.005A	7.985A	2.392A	599.978	90.848%	2096	41.1	43.43°C	0.976
	12.167V	4.985V	3.306V	5.018V	660.422				51.00°C	230.23V
9	48.667A	8.529A	8.470A	2.395A	674.634	90.491%	2107	41.5	44.68°C	0.979
	12.167V	4.984V	3.305V	5.011V	745.528				53.22°C	230.24V
10	54.254A	9.033A	8.991A	3.007A	749.864	89.911%	2113	41.9	45.21°C	0.981
	12.168V	4.982V	3.303V	4.989V	834.007				54.37°C	230.24V
11	60.429A	9.035A	8.996A	3.011A	825.069	89.373%	2121	42.3	46.63°C	0.982
	12.169V	4.981V	3.302V	4.982V	923.179				56.40°C	230.24V
CL1	0.100A	12.002A	11.998A	0.000A	100.799	85.143%	1139	25.1	41.92°C	0.843
	12.190V	4.987V	3.311V	5.111V	118.388				47.57°C	230.25V

CL2	62.007A	1.000A	1.001A	1.000A	767.605	90.416%	2114	42.0	45.43°C	0.981
	12.164V	4.990V	3.310V	5.048V	848.975				54.04°C	230.24V

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	1.219A	0.499A	0.495A	0.195A	19.978	69.390%	0	<6.0	0.767
	12.170V	5.003V	3.325V	5.128V	28.791				115.08V
2	2.438A	0.999A	0.992A	0.391A	39.965	79.815%	0	<6.0	0.880
	12.172V	4.998V	3.321V	5.122V	50.072				115.08V
3	3.659A	1.500A	1.490A	0.587A	59.996	84.029%	0	<6.0	0.918
	12.176V	4.997V	3.320V	5.115V	71.399				115.08V
4	4.874A	2.000A	1.987A	0.783A	79.946	86.102%	0	<6.0	0.937
	12.179V	4.996V	3.319V	5.108V	92.850				115.08V

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	1.219A	0.500A	0.495A	0.195A	19.987	71.022%	0	<6.0	0.494
	12.175V	5.002V	3.324V	5.128V	28.142				230.22V
2	2.438A	1.000A	0.993A	0.391A	39.977	80.649%	0	<6.0	0.608
	12.174V	4.997V	3.321V	5.121V	49.569				230.22V
3	3.660A	1.500A	1.491A	0.587A	60.008	84.960%	0	<6.0	0.717
	12.175V	4.997V	3.320V	5.114V	70.631				230.23V
4	4.876A	2.000A	1.988A	0.783A	79.959	87.232%	0	<6.0	0.785
	12.176V	4.996V	3.319V	5.107V	91.662				230.23V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.40mV	13.10mV	12.10mV	5.70mV	Pass
20% Load	11.60mV	14.30mV	15.30mV	6.10mV	Pass
30% Load	14.20mV	15.20mV	15.20mV	6.40mV	Pass
40% Load	16.00mV	15.40mV	14.60mV	6.50mV	Pass
50% Load	18.60mV	16.70mV	16.80mV	6.70mV	Pass
60% Load	16.20mV	17.50mV	16.50mV	6.90mV	Pass
70% Load	16.40mV	18.00mV	16.30mV	7.00mV	Pass
80% Load	17.60mV	18.60mV	16.60mV	7.70mV	Pass
90% Load	18.90mV	19.60mV	17.40mV	7.90mV	Pass
100% Load	29.60mV	22.20mV	17.70mV	8.10mV	Pass
110% Load	32.90mV	21.40mV	18.10mV	8.20mV	Pass
Crossload1	14.50mV	20.00mV	14.00mV	6.80mV	Pass
Crossload2	30.40mV	16.20mV	16.00mV	7.50mV	Pass

The results above are not used in the certification process

230V

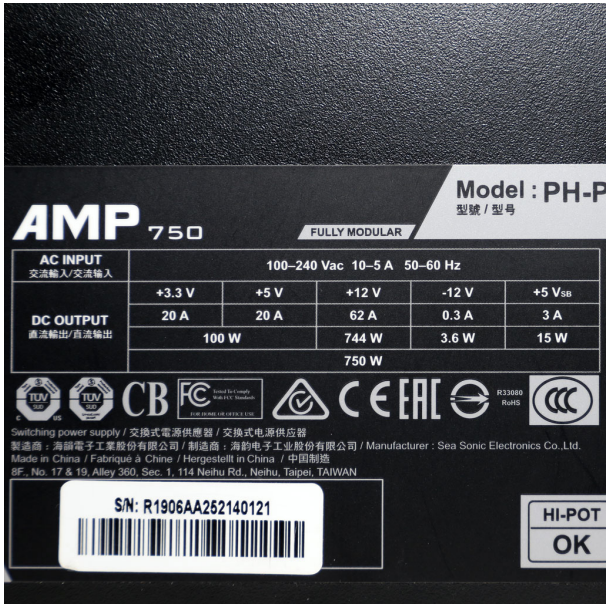
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.9 mV	11.6 mV	10.4 mV	5.0 mV	Pass
20% Load	11.7 mV	12.8 mV	10.9 mV	6.1 mV	Pass
30% Load	13.7 mV	14.3 mV	11.5 mV	6.0 mV	Pass
40% Load	16.6 mV	15.5 mV	12.3 mV	6.2 mV	Pass
50% Load	17.2 mV	16.8 mV	13.0 mV	6.4 mV	Pass
60% Load	16.9 mV	16.7 mV	14.2 mV	6.3 mV	Pass
70% Load	16.6 mV	17.0 mV	14.1 mV	6.3 mV	Pass
80% Load	17.5 mV	18.1 mV	15.7 mV	6.9 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	19.9 mV	19.4 mV	16.6 mV	6.9 mV	Pass
100% Load	30.3 mV	21.1 mV	17.2 mV	7.3 mV	Pass
110% Load	33.0 mV	21.1 mV	18.2 mV	7.0 mV	Pass
Crossload 1	13.7 mV	19.6 mV	13.0 mV	6.0 mV	Pass
Crossload 2	30.4 mV	16.1 mV	16.3 mV	7.0 mV	Pass

The results above are not used in the certification process

Phanteks AMP 750W (#2)

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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