PHANTEKS

Phanteks AMP 750W

Serial Number R1906AA252140124

Lab ID PH19750098

Certification ID 25801

Test Result Report ID: 19PS801A

Certificate Issue Date: Aug 29, 2019

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
OEM/ODM	Seasonic
Serial Number	R1906AA252140124
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	PH19750098
Date of receipt	Aug 26, 2019
Testing Date	Aug 29, 2019
Report Issued Date	Aug 29, 2019
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	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.518%
Average Noise Output (>1450 Load Combinations)	33.08dBA
Average PF (>1450 Load Combinations)	0.975
Efficiency With 10W (≤500W) or 2% (>500W) Load	62.931%
Standby Power Consumption	0.0459W
Non-Accredited	
12V Ripple (Full Load)	29.38mV
5V Ripple (Full Load)	18.25mV
3.3V Ripple (Full Load)	16.65mV
5VSB Ripple (Full Load)	8.34mV
12V Load Regulation	0.07%
5V Load Regulation	0.32%
3.3V Load Regulation	0.54%
5VSB Load Regulation	2.57%
Inrush Current	44.193A

230V		
Accredited		
Average Efficiency (>1450 load combinations)		90.741%
Average Noise Output (>1450 Load Combinations)		32.72dBA
Average PF (>1450 Load Combinations)		0.934
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
Standby Power Consumption		0.0720W
Non-Accredited		
12V Ripple (Full Load)		30.27mV
5V Ripple (Full Load)		18.88mV
3.3V Ripple (Full Load)		16.16mV
5VSB Ripple (Full Load)		7.24mV
12V Load Regulation		0.12%
5V Load Regulation		0.32%
3.3V Load Regulation		0.51%
5VSB Load Regulation		3.18%
Inrush Current		70.631A
Hold-Up Time & PWR_OK Signal		19.90ms
AC Loss to PWR_OK Hold Up Time		16.20ms
PWR_OK Inactive to DC Loss Delay		3.70ms
PSU Timings: T1 (20% / 100%)	80.0ms	80.0ms
PSU Timings: T3 (20% / 100%)	314.0ms	314.0ms
OPP (0.00°C / 0.00°C)	137.65%	-

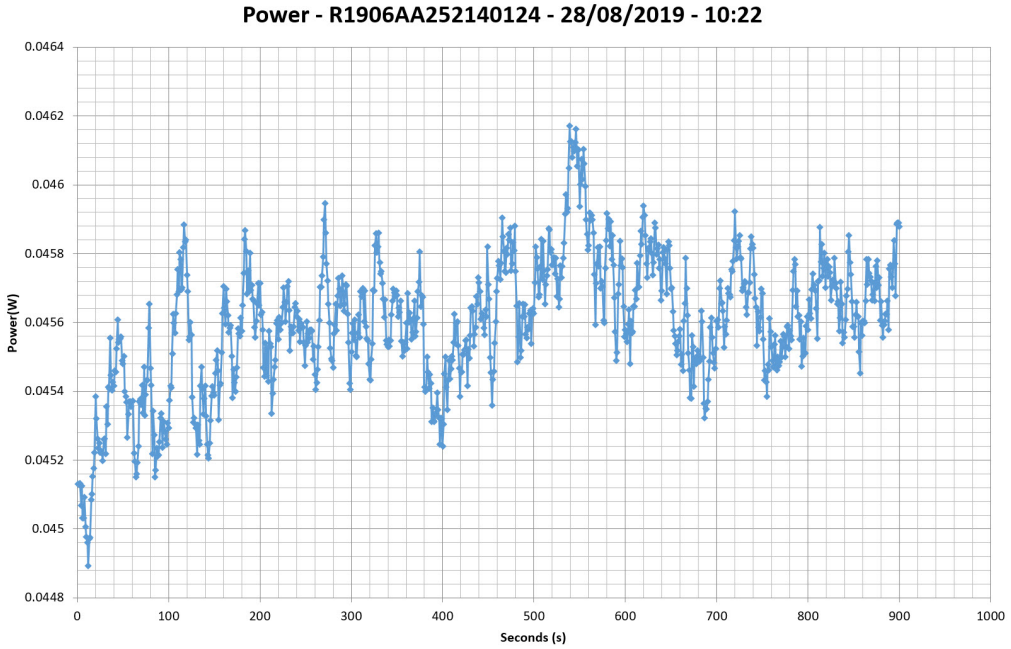
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	19.9
AC Loss to PWR_OK Hold Up Time (ms)	16.2
PWR_OK Inactive to DC Loss Delay (ms)	3.7

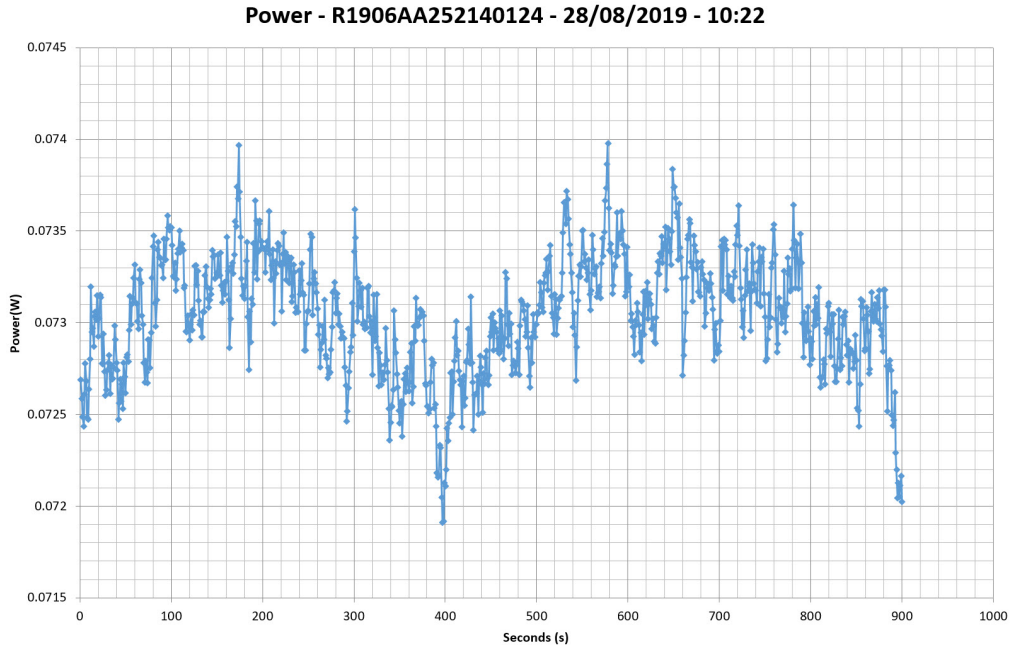
Stromverbrauch im Ruhezustand

Graphs

115V

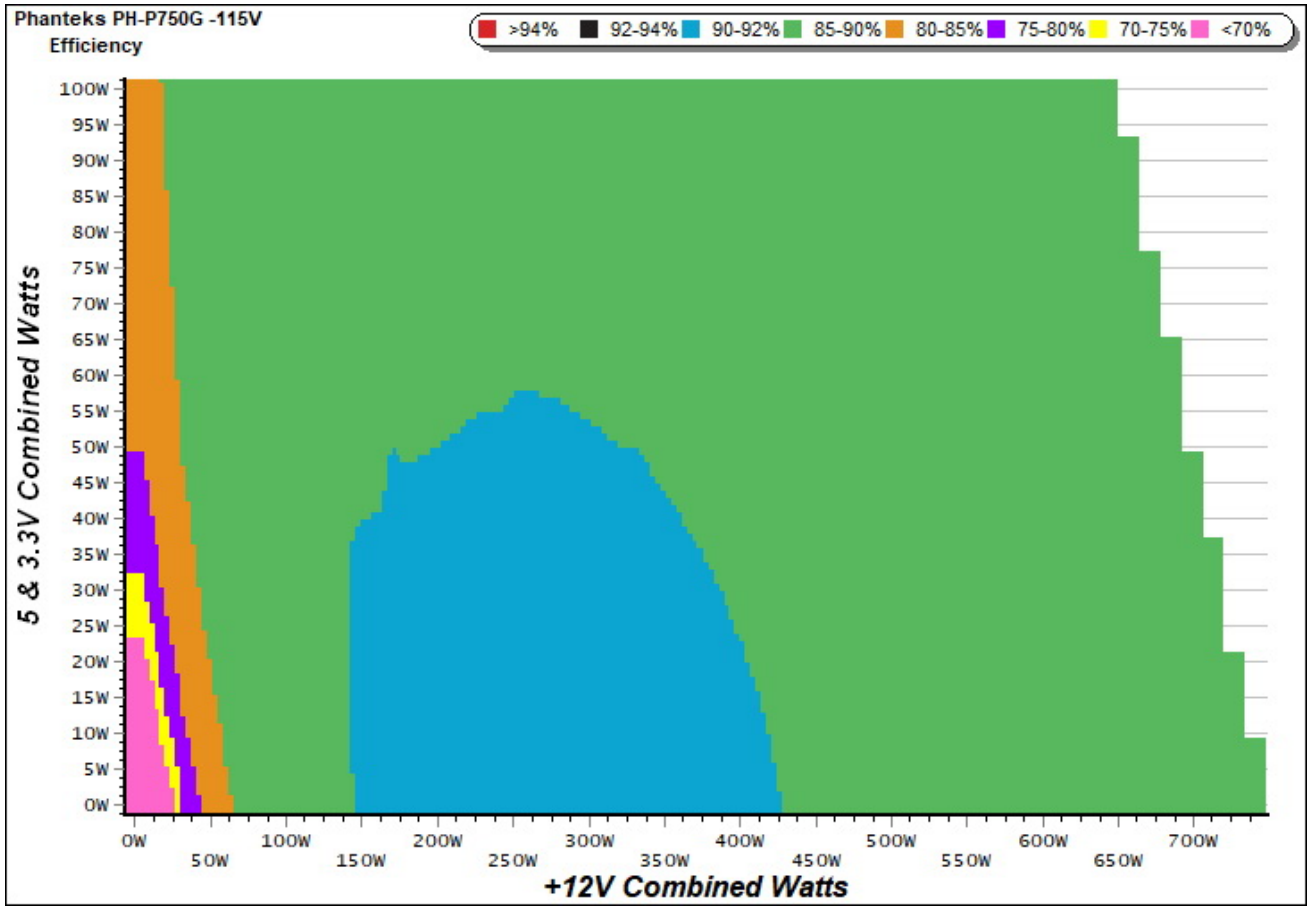


230V



Efficiency Graph

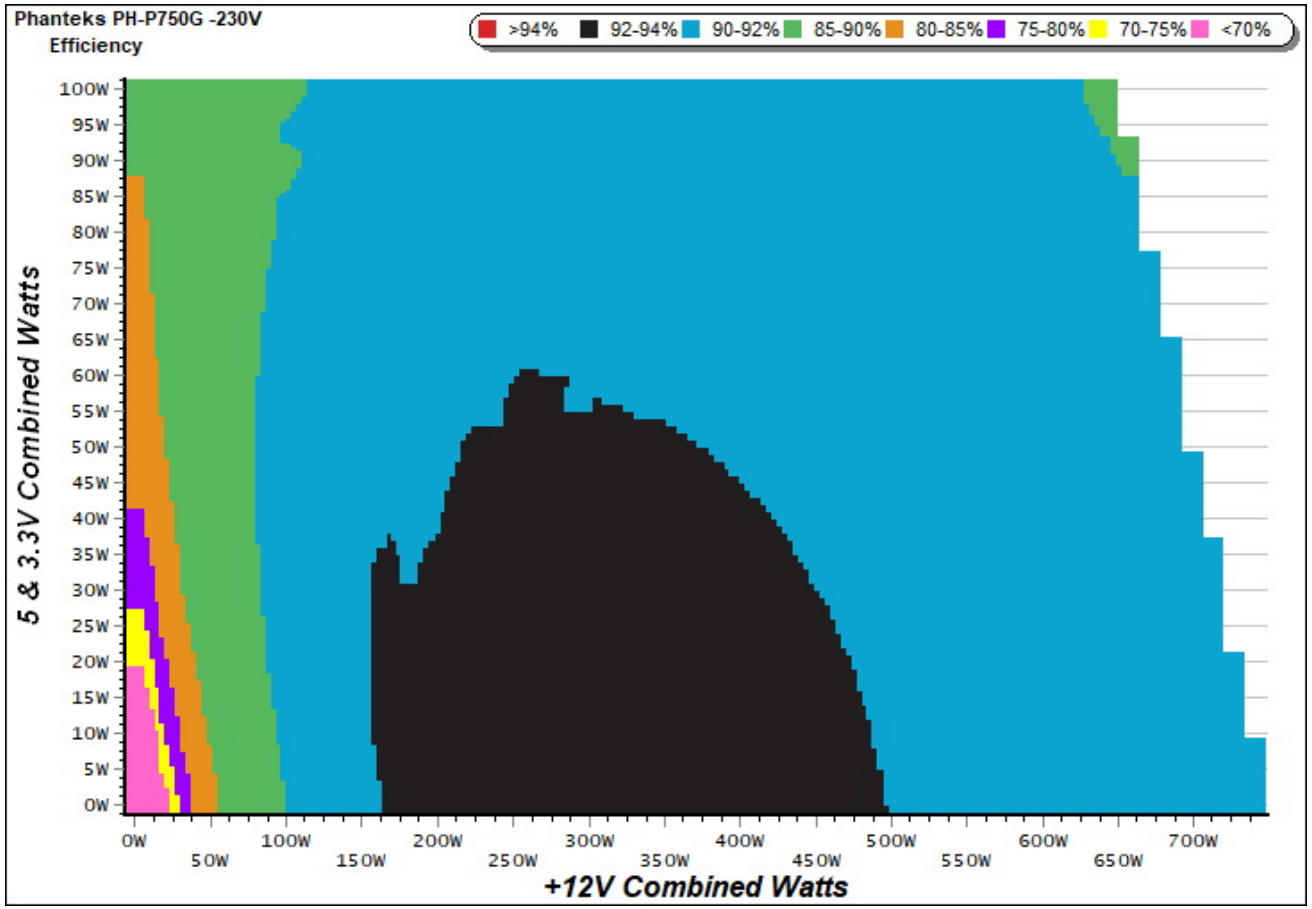
115V



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

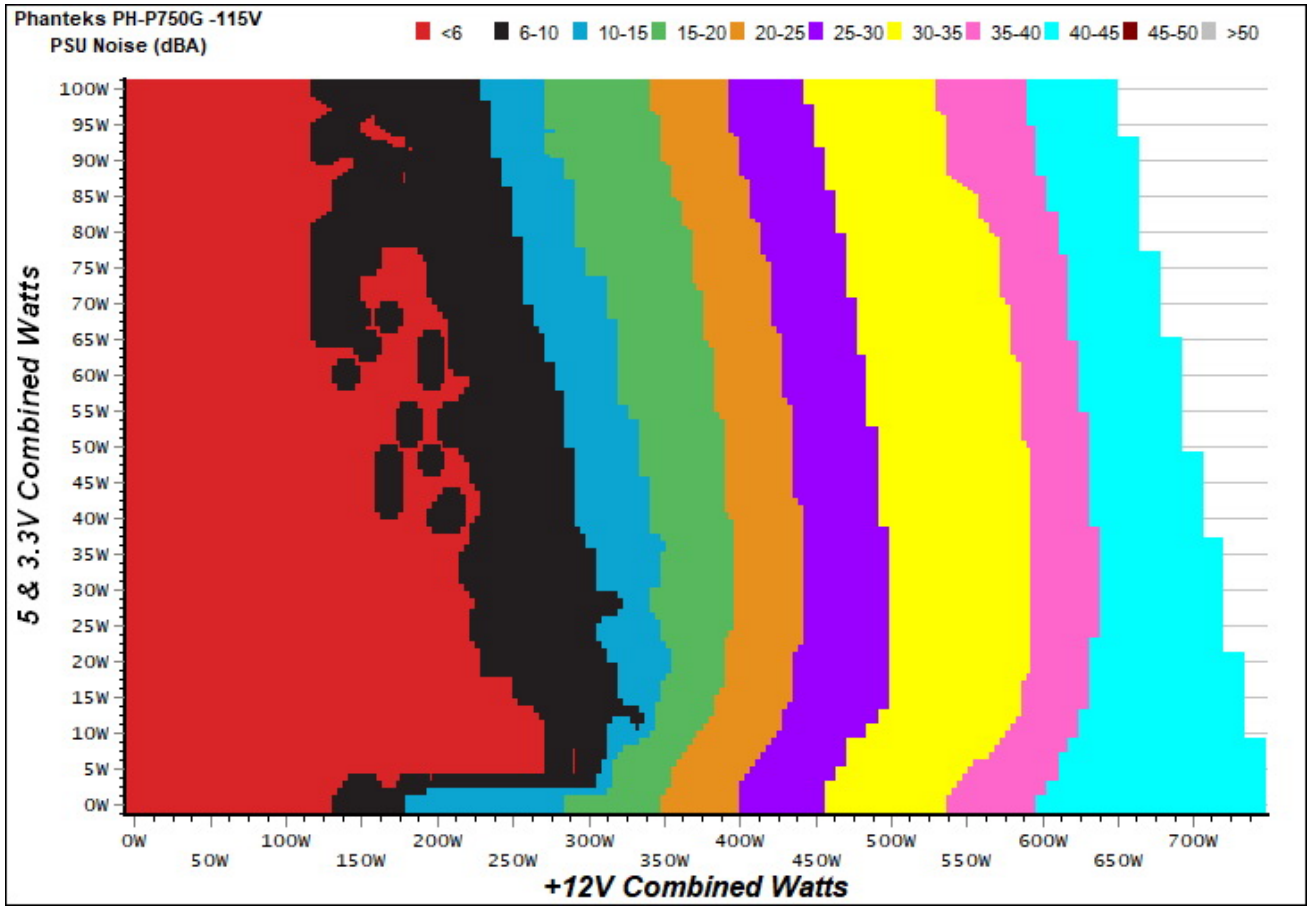


INFO

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

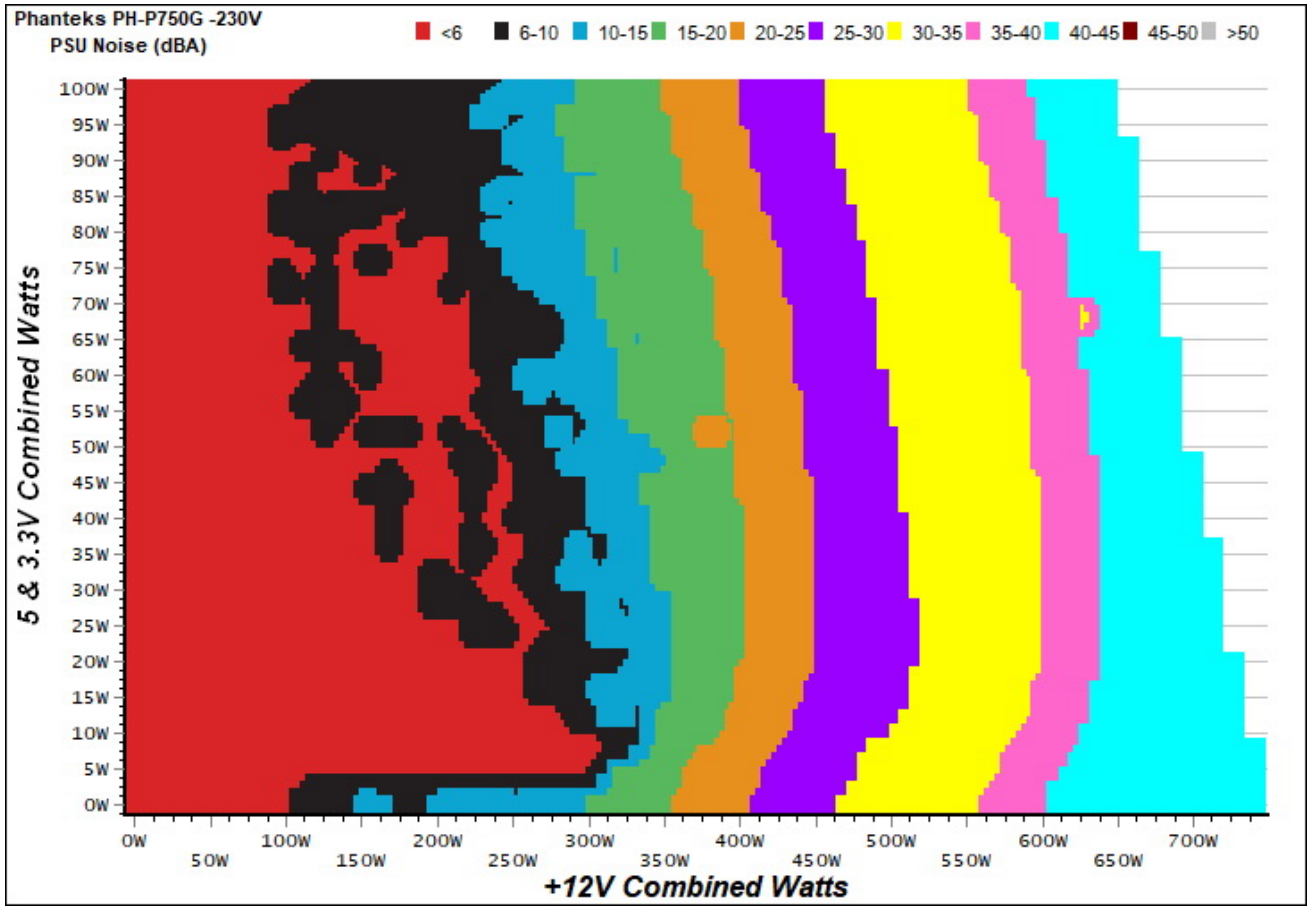
115V



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

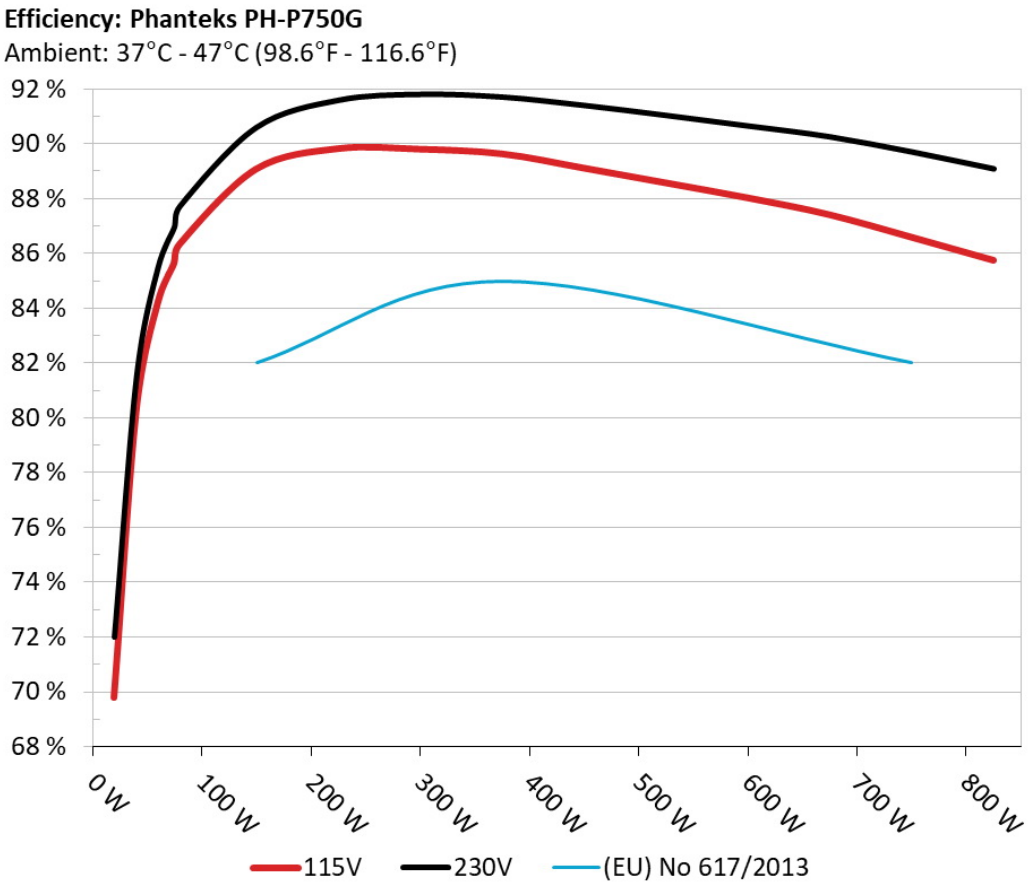


INFO

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

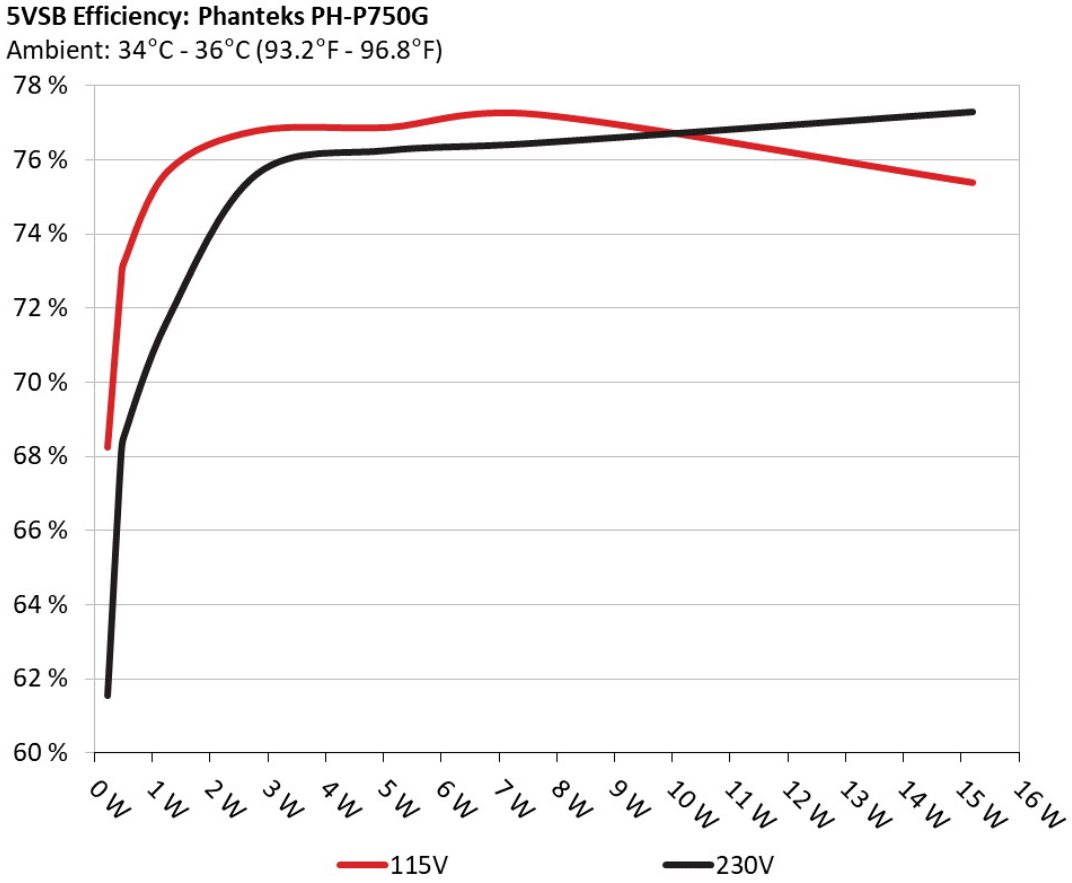
Efficiency under high ambient temperature



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	0.232	68.235%	0.057
	5.136V	0.340		115.13V
2	0.090A	0.463	72.684%	0.103
	5.135V	0.637		115.13V
3	0.550A	2.819	76.770%	0.337
	5.124V	3.672		115.13V
4	1.000A	5.115	76.860%	0.403
	5.114V	6.655		115.13V
5	1.500A	7.656	77.209%	0.436
	5.103V	9.916		115.13V
6	3.001A	15.195	75.372%	0.479
	5.064V	20.160		115.13V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.232	61.538%	0.019
	5.136V	0.377		230.27V
2	0.090A	0.463	67.988%	0.034
	5.135V	0.681		230.27V
3	0.550A	2.819	75.617%	0.164
	5.124V	3.728		230.27V
4	1.000A	5.115	76.252%	0.244
	5.114V	6.708		230.27V
5	1.500A	7.654	76.448%	0.297
	5.102V	10.012		230.26V
6	3.001A	15.207	77.287%	0.369
	5.068V	19.676		230.27V

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	4.385A	2.003A	1.994A	0.979A	74.624	85.625%	0	<6.0	45.13°C	0.929
	12.089V	4.998V	3.312V	5.106V	87.152				39.80°C	115.14V
2	9.810A	3.005A	2.990A	1.178A	149.511	89.052%	0	<6.0	46.88°C	0.960
	12.090V	4.995V	3.310V	5.095V	167.892				41.19°C	115.13V
3	15.634A	3.505A	3.478A	1.377A	225.025	89.806%	631	9.3	41.64°C	0.974
	12.090V	4.994V	3.308V	5.084V	250.569				48.00°C	115.13V
4	21.392A	4.008A	3.992A	1.577A	299.796	89.786%	1021	21.3	41.94°C	0.980
	12.088V	4.993V	3.306V	5.073V	333.900				49.20°C	115.13V
5	26.825A	5.011A	4.995A	1.778A	374.721	89.617%	1231	27.6	42.15°C	0.983
	12.086V	4.991V	3.304V	5.062V	418.134				50.19°C	115.13V
6	32.257A	6.017A	5.997A	1.981A	449.650	89.100%	1697	33.1	42.96°C	0.985
	12.085V	4.989V	3.302V	5.050V	504.657				51.35°C	115.13V
7	37.726A	7.020A	7.001A	2.184A	524.958	88.559%	1951	40.2	43.14°C	0.986
	12.083V	4.987V	3.300V	5.038V	592.780				52.06°C	115.13V
8	43.192A	8.027A	8.005A	2.388A	600.262	88.013%	2102	41.1	44.38°C	0.988
	12.082V	4.985V	3.298V	5.026V	682.013				53.75°C	115.12V
9	49.020A	8.532A	8.493A	2.392A	674.789	87.399%	2113	41.9	44.51°C	0.989
	12.082V	4.984V	3.297V	5.019V	772.076				54.28°C	115.12V
10	54.651A	9.037A	9.012A	3.002A	750.014	86.579%	2120	42.3	46.14°C	0.990
	12.082V	4.982V	3.295V	4.998V	866.281				56.33°C	115.12V
11	60.871A	9.038A	9.016A	3.006A	825.234	85.740%	2126	42.4	46.60°C	0.991
	12.083V	4.982V	3.294V	4.991V	962.480				57.45°C	115.12V
CL1	0.154A	12.002A	12.000A	0.000A	101.366	84.074%	1110	24.0	42.14°C	0.948
	12.101V	4.987V	3.304V	5.114V	120.567				50.44°C	115.14V

CL2	62.026A	1.003A	1.002A	1.000A	762.515	87.030%	2122	42.4	45.93°C	0.990
	12.078V	4.990V	3.301V	5.053V	876.156				55.85°C	115.12V

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	4.384A	2.003A	1.995A	0.981A	74.638	86.943%	0	<6.0	44.39°C	0.771
	12.094V	4.997V	3.312V	5.098V	85.847				39.28°C	230.28V
2	9.809A	3.004A	2.994A	1.180A	149.521	90.572%	0	<6.0	46.42°C	0.889
	12.092V	4.995V	3.309V	5.084V	165.085				40.70°C	230.28V
3	15.634A	3.506A	3.478A	1.381A	225.032	91.571%	694	11.3	41.34°C	0.928
	12.090V	4.994V	3.308V	5.071V	245.747				47.29°C	230.28V
4	21.392A	4.007A	3.994A	1.582A	299.796	91.784%	989	20.5	41.65°C	0.948
	12.088V	4.992V	3.306V	5.058V	326.632				48.35°C	230.28V
5	26.825A	5.013A	4.994A	1.784A	374.723	91.687%	1282	28.4	42.14°C	0.958
	12.086V	4.990V	3.304V	5.045V	408.696				49.46°C	230.28V
6	32.260A	6.015A	5.998A	1.989A	449.649	91.381%	1685	33.1	42.99°C	0.965
	12.084V	4.989V	3.302V	5.030V	492.059				50.63°C	230.28V
7	37.728A	7.023A	7.003A	2.194A	524.962	91.017%	1976	40.7	43.25°C	0.970
	12.082V	4.986V	3.300V	5.016V	576.776				51.48°C	230.28V
8	43.196A	8.029A	8.004A	2.401A	600.272	90.631%	2108	41.5	43.82°C	0.974
	12.081V	4.984V	3.298V	5.001V	662.326				52.69°C	230.28V
9	49.028A	8.534A	8.495A	2.405A	674.799	90.235%	2119	42.2	44.73°C	0.976
	12.080V	4.983V	3.297V	4.993V	747.820				54.23°C	230.28V
10	54.654A	9.037A	9.016A	3.023A	750.011	89.685%	2127	42.4	45.13°C	0.979
	12.081V	4.982V	3.295V	4.964V	836.269				55.19°C	230.28V
11	60.881A	9.040A	9.017A	3.029A	825.242	89.067%	2136	42.5	46.54°C	0.980
	12.081V	4.981V	3.294V	4.955V	926.539				57.13°C	230.28V
CL1	0.153A	12.003A	12.002A	0.000A	101.353	85.179%	1102	24.3	42.67°C	0.840
	12.100V	4.986V	3.304V	5.111V	118.988				48.97°C	230.28V

CL2	62.031A	1.003A	1.002A	1.000A	762.500	90.164%	2128	42.4	45.26°C	0.979
	12.077V	4.991V	3.301V	5.038V	845.682				55.07°C	230.28V

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	1.207A	0.501A	0.483A	0.195A	19.692	69.817%	0	<6.0	0.768
	12.082V	5.004V	3.317V	5.130V	28.205				115.14V
2	2.466A	1.002A	0.999A	0.391A	40.117	80.293%	0	<6.0	0.880
	12.083V	4.998V	3.313V	5.123V	49.963				115.14V
3	3.658A	1.500A	1.480A	0.586A	59.606	84.176%	0	<6.0	0.916
	12.085V	4.998V	3.313V	5.117V	70.811				115.13V
4	4.916A	2.001A	1.994A	0.783A	80.027	86.339%	0	<6.0	0.934
	12.087V	4.998V	3.312V	5.111V	92.689				115.13V

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	1.206A	0.502A	0.483A	0.195A	19.696	71.983%	0	<6.0	0.476
	12.092V	5.004V	3.317V	5.128V	27.362				230.27V
2	2.466A	1.002A	0.996A	0.391A	40.128	81.539%	0	<6.0	0.616
	12.092V	4.998V	3.313V	5.120V	49.213				230.28V
3	3.656A	1.502A	1.479A	0.587A	59.615	85.463%	0	<6.0	0.719
	12.092V	4.998V	3.313V	5.112V	69.755				230.28V
4	4.913A	2.003A	1.994A	0.784A	80.023	87.720%	0	<6.0	0.786
	12.092V	4.997V	3.312V	5.104V	91.226				230.27V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	15.1 mV	10.9 mV	8.9 mV	5.1 mV	Pass
20% Load	20.3 mV	12.7 mV	12.1 mV	6.1 mV	Pass
30% Load	23.2 mV	13.2 mV	12.5 mV	6.0 mV	Pass
40% Load	25.9 mV	13.6 mV	13.2 mV	6.3 mV	Pass
50% Load	24.8 mV	15.7 mV	14.3 mV	6.2 mV	Pass
60% Load	24.0 mV	17.2 mV	14.8 mV	6.6 mV	Pass
70% Load	23.6 mV	17.5 mV	14.8 mV	6.6 mV	Pass
80% Load	24.7 mV	18.2 mV	16.4 mV	8.0 mV	Pass
90% Load	26.1 mV	18.0 mV	16.2 mV	8.6 mV	Pass
100% Load	29.4 mV	18.3 mV	16.7 mV	8.3 mV	Pass
110% Load	33.3 mV	18.2 mV	16.9 mV	8.8 mV	Pass
Crossload 1	17.4 mV	19.3 mV	13.0 mV	6.2 mV	Pass
Crossload 2	29.8 mV	13.9 mV	13.6 mV	7.4 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.30mV	10.20mV	6.30mV	4.80mV	Pass
20% Load	14.20mV	11.30mV	8.70mV	5.10mV	Pass
30% Load	17.20mV	11.90mV	9.70mV	5.40mV	Pass
40% Load	19.30mV	12.70mV	11.20mV	5.50mV	Pass
50% Load	18.70mV	14.90mV	12.60mV	5.70mV	Pass
60% Load	16.90mV	16.40mV	13.20mV	6.00mV	Pass
70% Load	16.20mV	16.70mV	14.30mV	5.80mV	Pass
80% Load	17.70mV	17.60mV	15.80mV	6.20mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	19.50mV	17.70mV	15.80mV	6.40mV	Pass
100% Load	30.30mV	18.90mV	16.20mV	7.20mV	Pass
110% Load	33.70mV	19.00mV	16.00mV	7.00mV	Pass
Crossload1	16.20mV	18.00mV	10.40mV	6.30mV	Pass
Crossload2	30.30mV	14.10mV	12.80mV	6.20mV	Pass

The results above are not used in the certification process

Phanteks AMP 750W

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

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com