



Antec HCG1000 Extreme

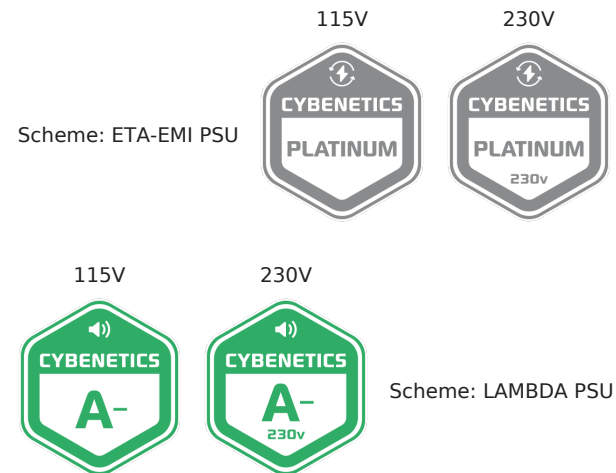
☐ HCG1000XSN181500031

Lab ID 429

Certification ID 25429

Test Result Report ID:

Certificate Issue Date: Jul 16, 2018



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	Antec
Model	HCG1000 Extreme
OEM/ODM	Seasonic
Serial Number	HCG1000XSN181500031
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	13-6.5
□□□□ (Hz)	50-60

□□□□ (W)	1000
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135mm Fluid Dynamic Bearing Fan (HA13525H12F-Z)
□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	429
Date of receipt	Jul 4, 2018
Testing Date	Jul 13, 2018
Report Issued Date	Jul 16, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ **(Non-accredited measurements)**

□□□□				
□□	□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (550mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (650mm)	2	2	16AWG	□
6+2pin PCIe□□ (550mm)	4	4	18AWG	□
6+2pin PCIe□□ (550mm+100mm)	2	4	18AWG	□
SATA□□ (400mm+90mm+90mm+90mm)	2	8	18AWG	□
□ 4pin Molex□□ (500mm+100mm+100mm+100mm)	1	4	18AWG	□
SATA□□ (400mm+90mm+90mm+90mm) / □ 4pin Molex□□ (+100mm+100mm)	1	4 / 2	18AWG	□
□ 4pin □□ (+105mm)	1	1	22AWG	□

AC Power Cord (1400mm) - C13 coupler	1	1	16AWG	-
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□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	25	25	83	3	0.3
	□	125		996	15	3.6
□□□□ (W)		1000				

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V	
Accredited	
□□□□ (>1450 load combinations)	89.701%
Average Noise Output (>1450 Load Combinations)	28.31dBA
PF□□□ (>1450 Load Combinations)	0.986
Efficiency With 10W (≤500W) or 2% (>500W) Load	68.040%
□□□□□□	0.0467W
Non-Accredited	
12V Ripple (Full Load)	17.09mV
5V Ripple (Full Load)	10.89mV
3.3V Ripple (Full Load)	10.14mV
5VSB Ripple (Full Load)	11.96mV
12V Load Regulation	0.17%

5V Load Regulation	0.08%
3.3V Load Regulation	0.24%
5VSB Load Regulation	2.46%
Inrush Current	45.923A

230V

Accredited		
THD (%) (>1450 load combinations)	91.479%	
Average Noise Output (>1450 Load Combinations)	28.25dBA	
PF (%) (>1450 Load Combinations)	0.953	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
THD (%)	0.0770W	
Non-Accredited		
12V Ripple (Full Load)	20.08mV	
5V Ripple (Full Load)	11.29mV	
3.3V Ripple (Full Load)	10.33mV	
5VSB Ripple (Full Load)	10.27mV	
12V Load Regulation	0.12%	
5V Load Regulation	0.08%	
3.3V Load Regulation	0.24%	
5VSB Load Regulation	2.40%	
Inrush Current	60.933A	
THD (%) & PG (%)	18.00ms	
AC Loss to PWR_OK Hold Up Time	15.50ms	
PWR_OK Inactive to DC Loss Delay	2.50ms	
OPP (0.00°C / 0.00°C)	-	-

□□□□ & PG□□

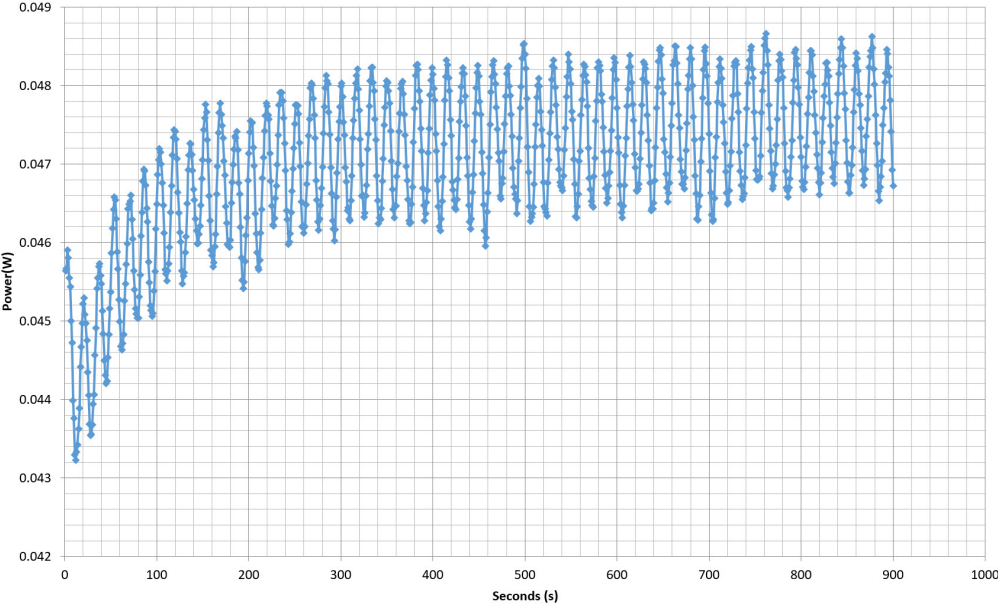
Hold-Up Time (ms)	18
AC Loss to PWR_OK Hold Up Time (ms)	15.5



Graphs

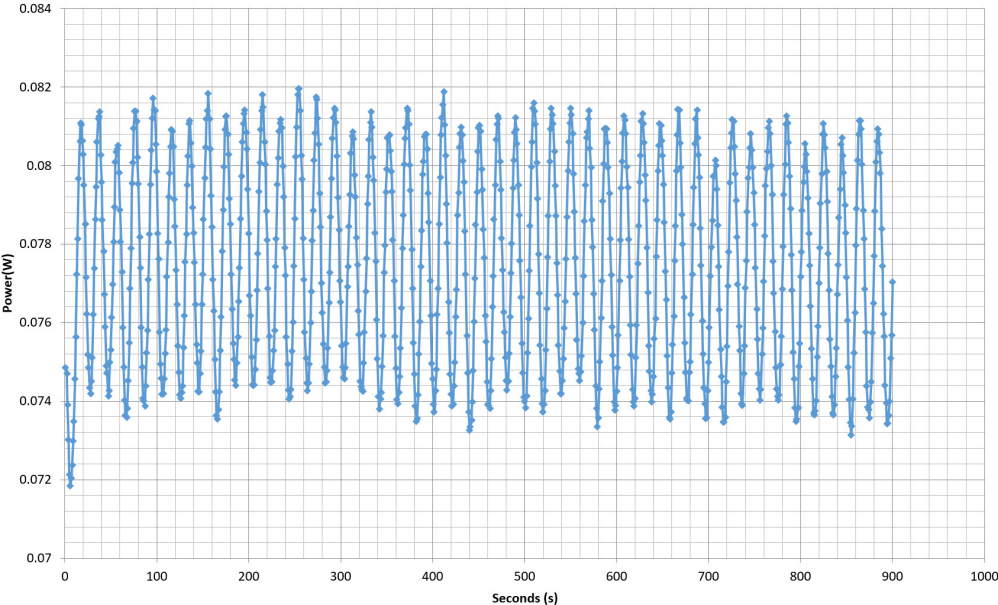
115V

Power - HCG1000XSN181500031 - 11/07/2018 - 21:55



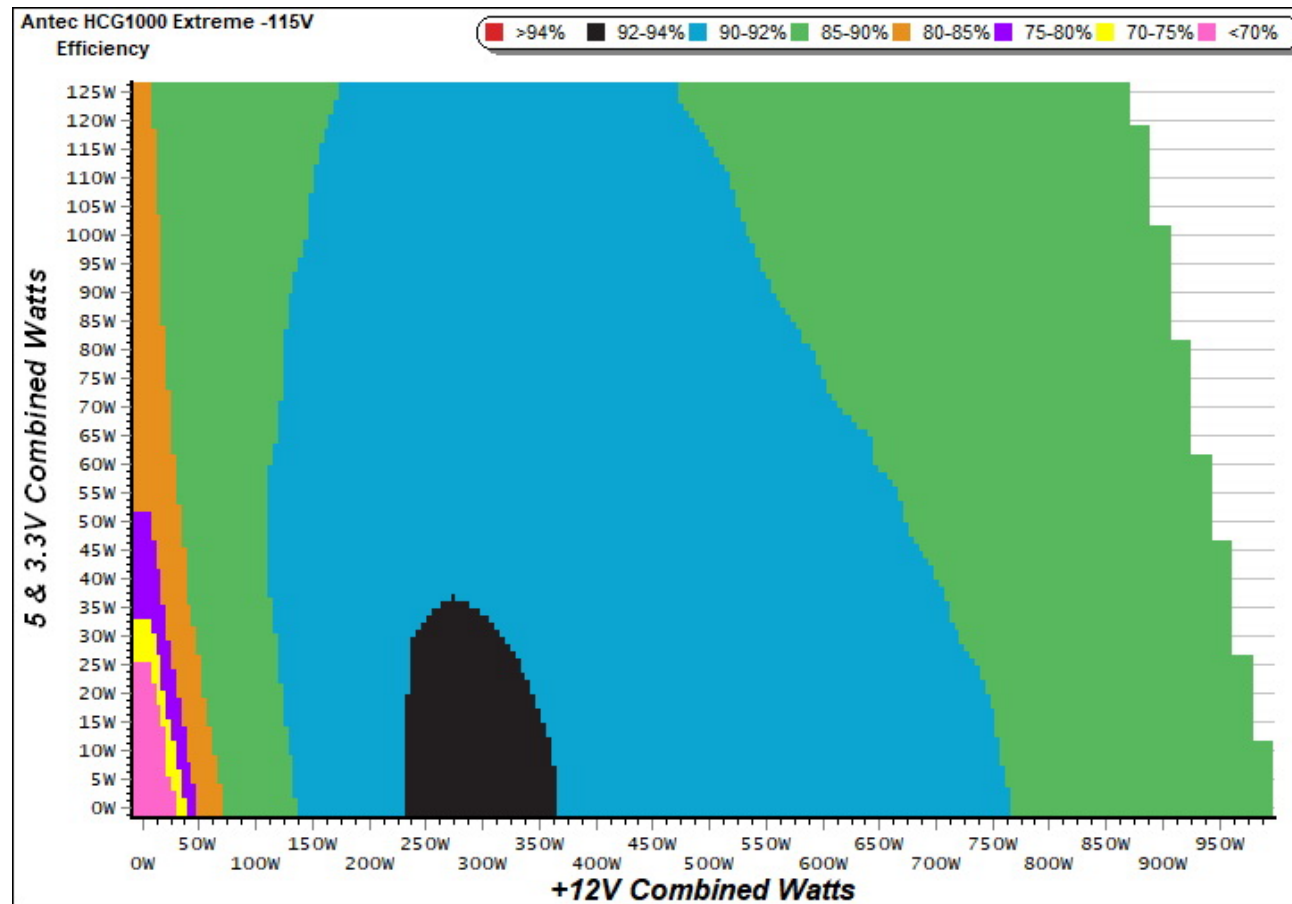
230V

Power - HCG1000XSN181500031 - 11/07/2018 - 21:55



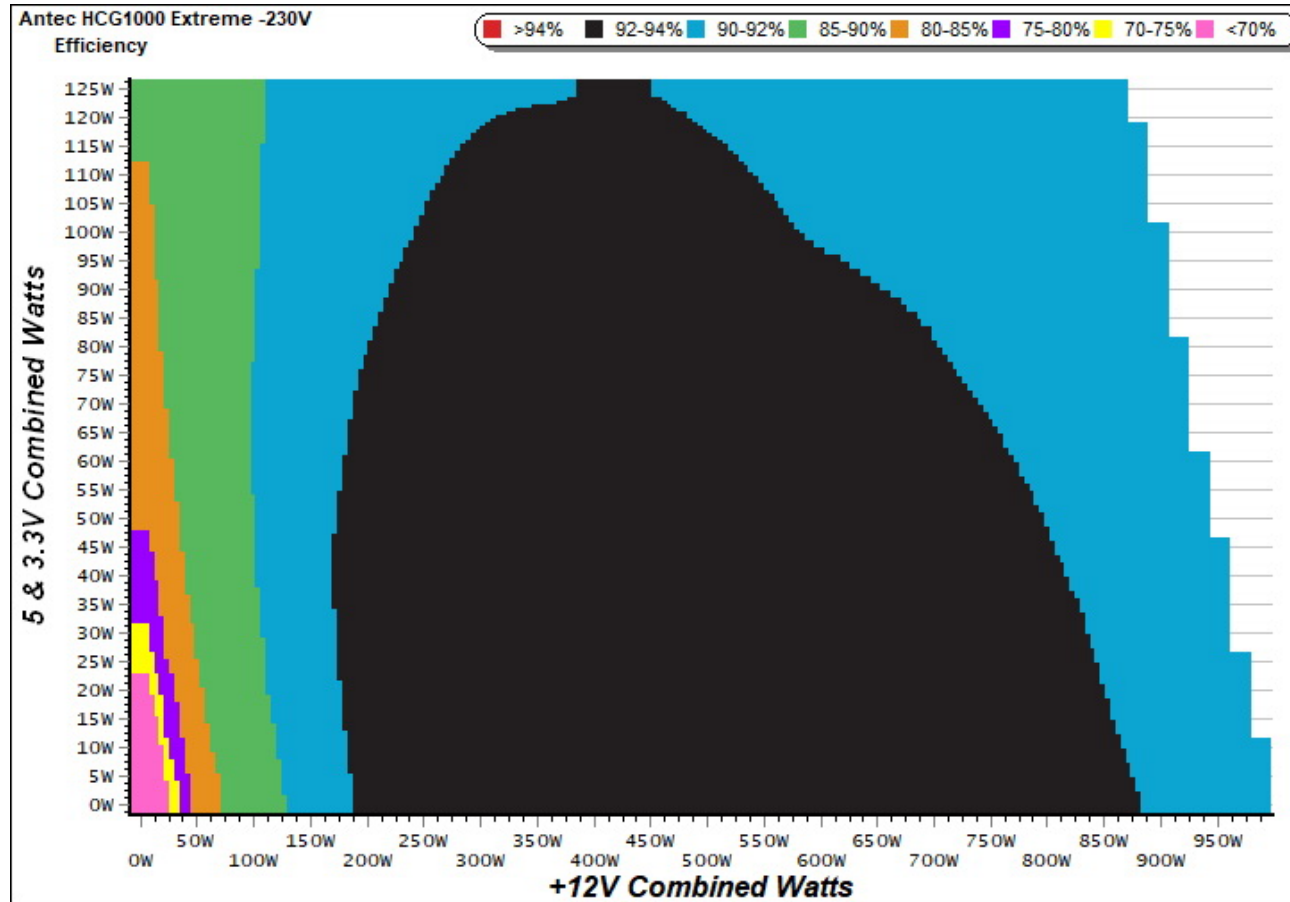


115V



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.

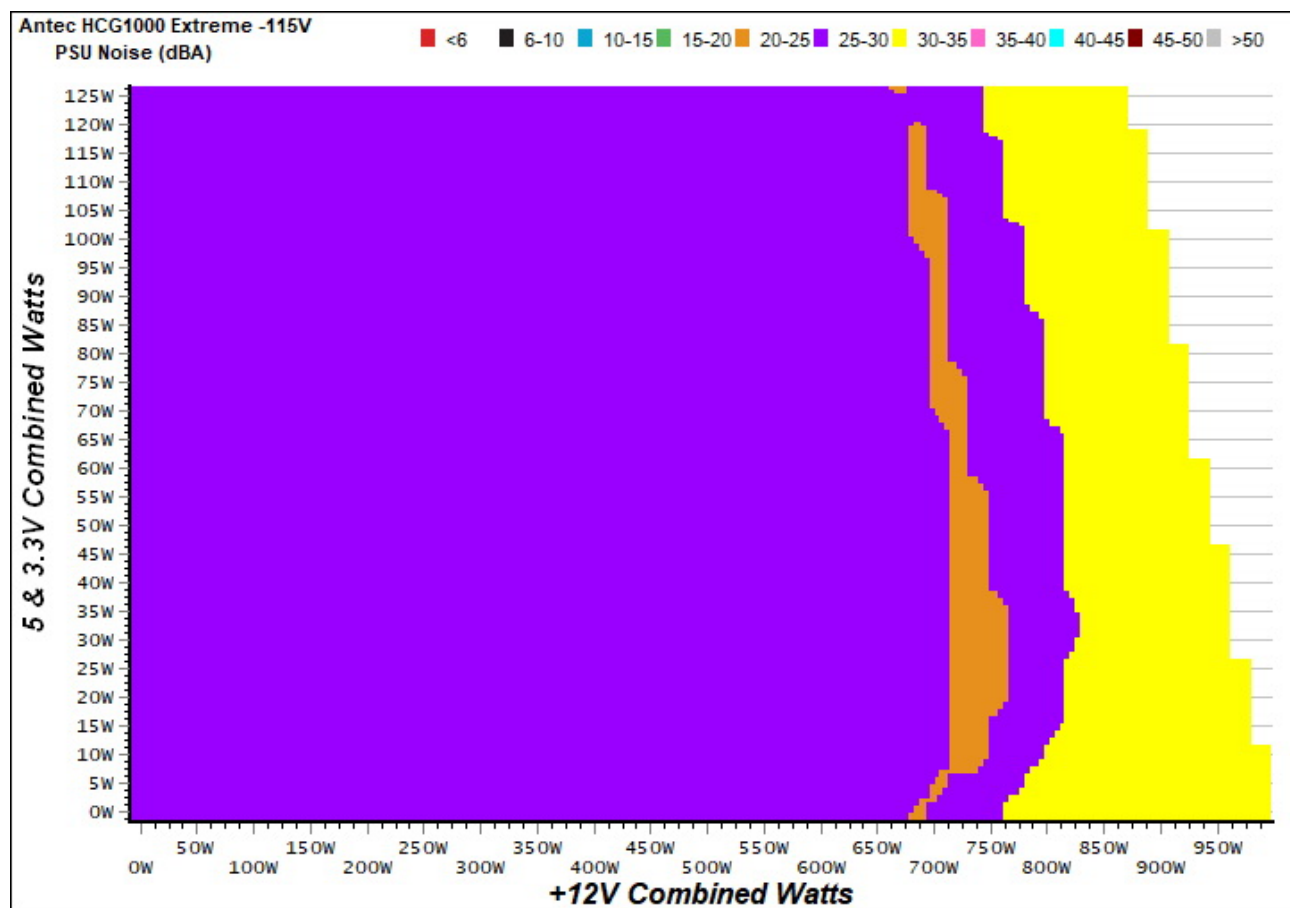
230V



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.

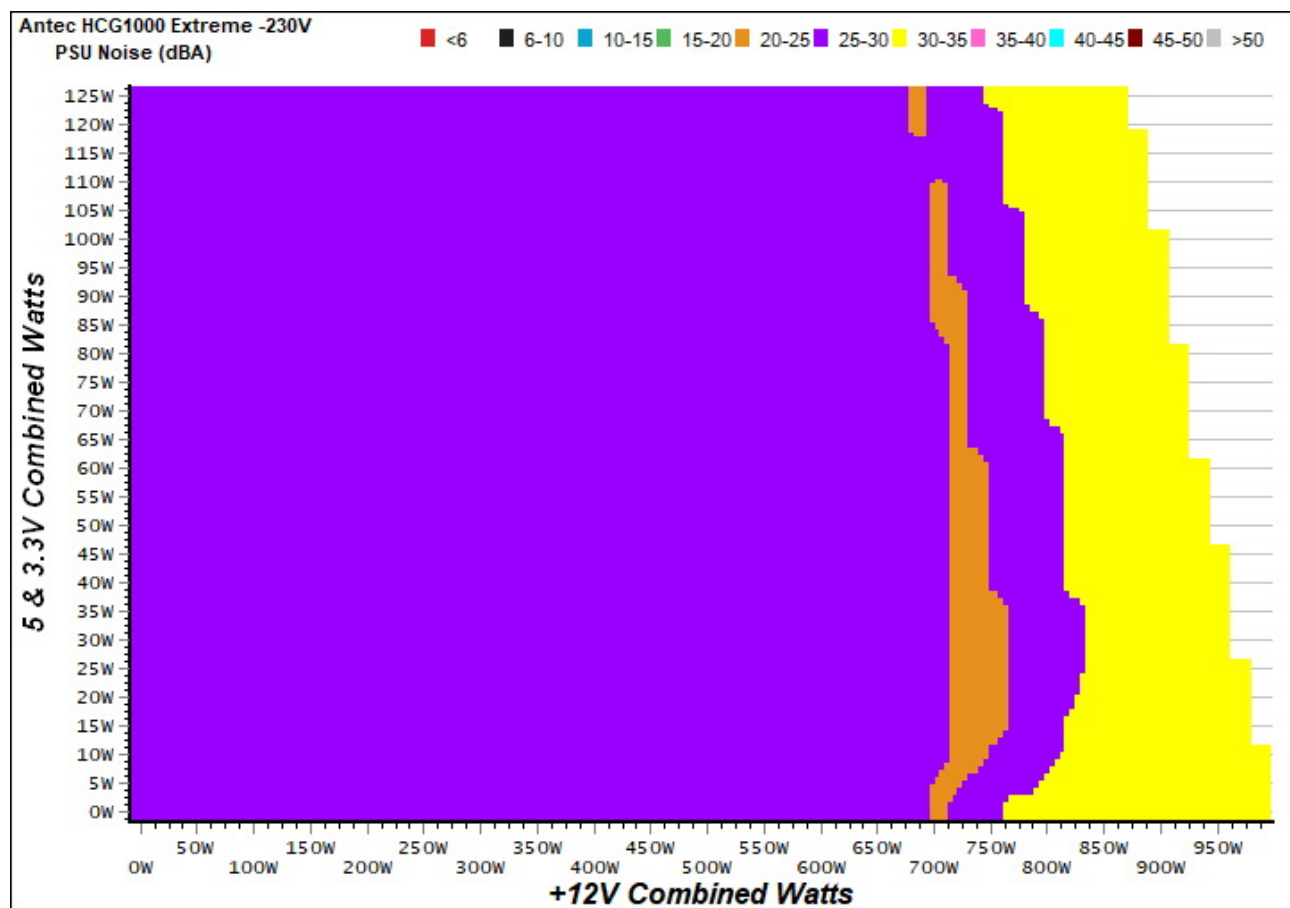


115V



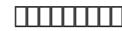
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



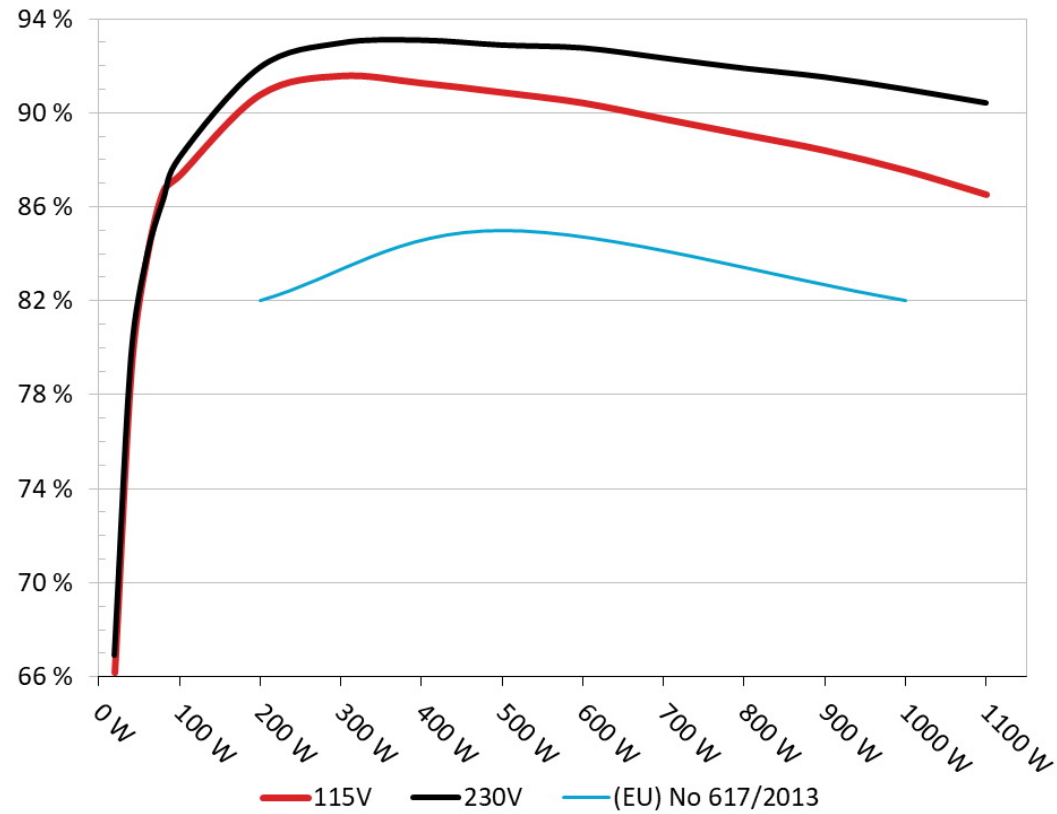
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance



Efficiency: Antec HCG1000 Extreme

Ambient: 37°C - 47°C (98.6°F - 116.6°F)

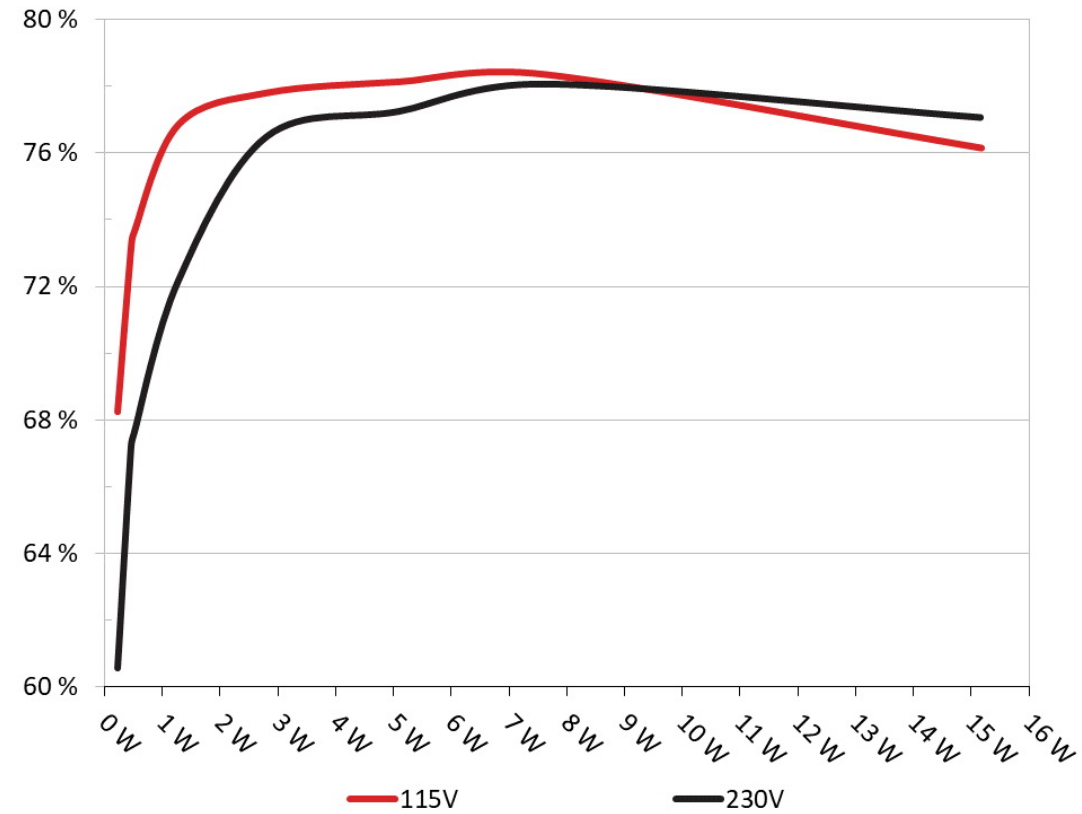


The PSU's efficiency under high ambient temperatures with 115V and 230V input. For this graph the results of the 10-110% load regulation table are used.

5Vsb

5VSB Efficiency: Antec HCG1000 Extreme

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input.

5Vsb (ErP Lot3/6 & CEC)

115V

#	5VSB	DC/AC (%)		PF/AC
1	0.045A	0.232	68.235%	0.034
	5.126V	0.340		115.37V
2	0.090A	0.462	73.101%	0.062
	5.125V	0.632		115.37V
3	0.550A	2.815	77.805%	0.269
	5.115V	3.618		115.36V
4	1.000A	5.107	78.136%	0.359
	5.106V	6.536		115.36V
5	1.501A	7.644	78.352%	0.409
	5.094V	9.756		115.35V
6	3.001A	15.171	76.148%	0.471
	5.056V	19.923		115.34V

230V

#	5VSB	DC/AC (%)		PF/AC
1	0.045A	0.232	60.574%	0.013
	5.126V	0.383		231.02V
2	0.090A	0.462	67.151%	0.023
	5.125V	0.688		231.02V
3	0.550A	2.815	76.495%	0.117
	5.115V	3.680		230.91V
4	1.000A	5.107	77.250%	0.191
	5.105V	6.611		230.96V
5	1.500A	7.643	78.069%	0.249
	5.094V	9.790		231.00V
6	3.001A	15.169	77.067%	0.348
	5.055V	19.683		231.00V

Supplementary Tests (For Reference)

10-110%□□□

115V

□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□	□□□ (RPM)	□□□□□ (dB[A])	□ (□□ /□□)	PF/AC □
1	6.501A	1.996A	1.986A	0.981A	100.176	87.319%	570	25.5	39.43°C	0.963
	12.085V	5.014V	3.325V	5.098V	114.724				44.74°C	115.24V
2	13.982A	2.994A	2.978A	1.180A	199.912	90.746%	570	25.5	40.19°C	0.988
	12.087V	5.013V	3.324V	5.087V	220.299				45.98°C	115.21V
3	21.789A	3.493A	3.462A	1.379A	299.423	91.545%	573	26.4	40.87°C	0.991
	12.089V	5.013V	3.323V	5.077V	327.079				47.39°C	115.07V
4	29.659A	3.991A	3.975A	1.579A	399.851	91.247%	580	26.6	41.49°C	0.989
	12.092V	5.013V	3.322V	5.068V	438.208				48.61°C	115.04V
5	37.160A	4.992A	4.971A	1.781A	499.982	90.846%	586	26.7	41.93°C	0.990
	12.095V	5.012V	3.321V	5.055V	550.365				50.18°C	114.90V
6	44.660A	5.990A	5.963A	1.982A	600.123	90.399%	600	26.9	42.44°C	0.992
	12.098V	5.012V	3.321V	5.046V	663.859				51.57°C	114.75V
7	52.109A	6.988A	6.960A	2.186A	699.856	89.722%	630	27.3	43.24°C	0.993
	12.104V	5.011V	3.320V	5.034V	780.028				53.17°C	114.70V
8	59.637A	7.987A	7.956A	2.390A	800.398	89.048%	1030	31.1	44.65°C	0.993
	12.106V	5.011V	3.319V	5.023V	898.835				55.91°C	114.54V
9	67.513A	8.487A	8.442A	2.393A	899.714	88.380%	1143	33.1	45.45°C	0.994
	12.104V	5.010V	3.318V	5.017V	1018.001				57.75°C	114.48V
10	75.207A	8.988A	8.955A	3.005A	1000.121	87.529%	1140	33.1	46.39°C	0.994
	12.105V	5.010V	3.317V	4.994V	1142.620				59.97°C	114.31V
11	83.455A	8.988A	8.959A	3.009A	1100.132	86.502%	1140	33.1	46.88°C	0.994
	12.107V	5.010V	3.316V	4.987V	1271.796				61.60°C	114.26V
CL1	0.143A	15.004A	15.002A	0.000A	126.917	85.101%	589	26.8	42.87°C	0.978
	12.106V	5.015V	3.329V	5.106V	149.137				52.09°C	115.20V

CL2	83.040A	1.003A	1.001A	1.000A	1017.848	87.960%	1136	33.0	46.38°C	0.994
	12.096V	5.012V	3.316V	5.050V	1157.169				59.57°C	114.32V

The results above are not used in the certification process

230V

#	12V	5V	3.3V	5VSB	DC/AC ()		(RPM)	(dB[A])	(/)	PF/AC
1	6.489A	1.995A	1.985A	0.981A	100.043	88.087%	580	26.6	38.82°C	0.779
	12.088V	5.014V	3.325V	5.098V	113.573				44.00°C	230.78V
2	13.969A	2.991A	2.977A	1.180A	199.749	91.924%	583	26.6	39.42°C	0.920
	12.088V	5.013V	3.324V	5.087V	217.297				45.68°C	230.81V
3	21.777A	3.492A	3.459A	1.379A	299.242	92.959%	586	26.7	40.00°C	0.958
	12.088V	5.013V	3.323V	5.078V	321.909				46.81°C	230.74V
4	29.649A	3.991A	3.973A	1.579A	399.662	93.083%	595	26.8	40.70°C	0.972
	12.090V	5.012V	3.322V	5.069V	429.361				48.49°C	230.66V
5	37.154A	4.988A	4.968A	1.780A	499.797	92.873%	600	26.9	41.08°C	0.979
	12.093V	5.011V	3.321V	5.056V	538.150				50.83°C	230.58V
6	44.647A	5.989A	5.963A	1.982A	599.907	92.753%	610	27.1	41.84°C	0.982
	12.097V	5.011V	3.320V	5.048V	646.782				52.64°C	230.61V
7	52.106A	6.988A	6.958A	2.185A	699.654	92.326%	640	27.5	42.66°C	0.985
	12.101V	5.011V	3.320V	5.035V	757.809				54.54°C	230.54V
8	59.640A	7.986A	7.954A	2.389A	800.176	91.886%	1133	33.0	43.36°C	0.986
	12.102V	5.010V	3.319V	5.024V	870.837				56.35°C	230.46V
9	67.513A	8.486A	8.437A	2.392A	899.487	91.515%	1150	33.2	44.40°C	0.987
	12.101V	5.010V	3.318V	5.018V	982.884				58.29°C	230.47V
10	75.213A	8.986A	8.954A	3.003A	999.876	90.999%	1160	33.3	45.92°C	0.988
	12.101V	5.010V	3.317V	4.996V	1098.773				60.90°C	230.39V
11	83.459A	8.986A	8.956A	3.007A	1099.912	90.415%	1160	33.3	47.23°C	0.989
	12.104V	5.010V	3.316V	4.990V	1216.521				63.64°C	230.31V
CL1	0.146A	15.003A	14.999A	0.000A	126.941	85.563%	622	27.2	42.79°C	0.854
	12.119V	5.015V	3.329V	5.105V	148.360				55.46°C	230.93V

CL2	83.016A	1.002A	1.001A	1.000A	1017.968	91.311%	1160	33.3	46.28°C	0.988
	12.101V	5.011V	3.316V	5.050V	1114.833				60.81°C	230.39V

The results above are not used in the certification process

20-80mm

115V

#	12V	5V	3.3V	5VSB	DC/AC (%)	Efficiency (%)	Speed (RPM)	Noise (dB[A])	PF/AC Volts
1	1.211A	0.501A	0.484A	0.196A	19.758	66.175%	570	25.5	0.661
	12.082V	5.016V	3.327V	5.120V	29.857				115.34V
2	2.472A	0.999A	0.995A	0.391A	40.196	79.025%	570	25.5	0.835
	12.087V	5.014V	3.325V	5.114V	50.865				115.31V
3	3.663A	1.498A	1.474A	0.588A	59.693	83.840%	573	26.4	0.906
	12.088V	5.014V	3.325V	5.108V	71.199				115.28V
4	4.920A	1.996A	1.988A	0.784A	80.096	86.664%	573	26.4	0.945
	12.089V	5.014V	3.325V	5.103V	92.421				115.26V

The results above are not used in the certification process

230V

#	12V	5V	3.3V	5VSB	DC/AC (%)	Efficiency (%)	Speed (RPM)	Noise (dB[A])	PF/AC Volts
1	1.195A	0.499A	0.478A	0.195A	19.531	66.921%	573	26.4	0.387
	12.082V	5.016V	3.327V	5.121V	29.185				230.81V
2	2.454A	0.998A	0.992A	0.391A	39.962	79.544%	573	26.4	0.582
	12.086V	5.014V	3.325V	5.115V	50.239				230.80V
3	3.645A	1.495A	1.472A	0.587A	59.448	83.841%	577	26.5	0.698
	12.087V	5.014V	3.326V	5.109V	70.906				230.80V
4	4.903A	1.994A	1.984A	0.784A	79.863	86.267%	580	26.6	0.707
	12.088V	5.014V	3.325V	5.103V	92.576				230.80V

The results above are not used in the certification process



115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	18.5 mV	5.9 mV	5.1 mV	4.5 mV	Pass
20% Load	20.8 mV	6.2 mV	5.7 mV	4.9 mV	Pass
30% Load	21.7 mV	6.9 mV	6.4 mV	5.1 mV	Pass
40% Load	21.3 mV	8.1 mV	7.2 mV	5.4 mV	Pass
50% Load	14.4 mV	9.3 mV	8.3 mV	6.1 mV	Pass
60% Load	13.5 mV	9.2 mV	7.7 mV	6.5 mV	Pass
70% Load	14.1 mV	9.3 mV	8.0 mV	6.6 mV	Pass
80% Load	14.5 mV	9.8 mV	9.2 mV	11.3 mV	Pass
90% Load	15.6 mV	11.0 mV	9.5 mV	11.9 mV	Pass
100% Load	17.1 mV	10.9 mV	10.1 mV	12.0 mV	Pass
110% Load	22.5 mV	16.5 mV	17.2 mV	16.2 mV	Pass
Crossload 1	18.6 mV	9.4 mV	9.7 mV	5.6 mV	Pass
Crossload 2	17.5 mV	9.5 mV	6.2 mV	9.6 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	15.4 mV	5.8 mV	5.2 mV	4.3 mV	Pass
20% Load	18.5 mV	6.2 mV	5.9 mV	4.7 mV	Pass
30% Load	20.4 mV	7.0 mV	6.3 mV	4.9 mV	Pass
40% Load	20.3 mV	8.4 mV	7.5 mV	5.3 mV	Pass
50% Load	14.2 mV	9.4 mV	8.7 mV	5.5 mV	Pass
60% Load	13.3 mV	9.3 mV	7.9 mV	6.0 mV	Pass
70% Load	13.6 mV	9.7 mV	8.3 mV	6.5 mV	Pass
80% Load	14.5 mV	10.1 mV	9.6 mV	11.2 mV	Pass

