CHIEFTEC

Chieftec Proton 600W

1933070061391600ABR1F02003168

Lab ID CF60001677

Certification ID 251677

Test Result Report ID: 20PS1677A

Certificate Issue Date: Jul 14, 2020

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	Chieftec
Model	Proton 600W
OEM/ODM	High Power
Serial Number	1933070061391600ABR1F02003168
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	115-230
□□□□ (Arms)	10
□□□□ (Hz)	50-60

□□□□ (W)	600
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Sleeve Bearing Fan (S1202512L)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	CF60001677
Date of receipt	Jul 3, 2020
Testing Date	Jul 8, 2020
Report Issued Date	Jul 14, 2020
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

Native Cables				
□□	□□□□	□□□□□□	Gauge	In Cable Caps
ATX □□ 20+4 pin (460mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (540mm)	1	1	18AWG	□
6+2pin PCIe□□ (460mm+150mm)	1	2	18AWG	□
SATA□□ (410mm+150mm+150mm)	2	6	18AWG	□
4-pin Molex (410mm+150mm+150mm)	1	3	18AWG	□
□□□□□				
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	18	18	50	2.5	0.3
	□	103		600	12.5	3.6
□□□□□ (W)		600				

Parts Description

General Data	-
Manufacturer (OEM)	High Power
PCB Type	Single Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x MPS HF81 (Discharge IC)
Inrush Protection	NTC Thermistor SCK-1R38
Bridge Rectifier(s)	1x Diodes GBU1006 (600V, 10A @ 100°C)
APFC MOSFETs	2x Infineon IPA60R190P6 (650V, 12.7A @ 100°C, Rds(on): 0.19Ohm) & 1x SPN5003 FET (for reduced no-load consumption)
APFC Boost Diode	1x Power Integrations QH12TZ600 (600V, 12A @ 90°C)
Bulk Cap(s)	1x Teapo (400V, 390uF, 105°C, LE)
Main Switchers	2x MagnaChip MDP18N50 (500V, 11A @ 100°C, Rds(on): 0.27Ohm)
Combo APFC / PWM Controller	Champion CM6805BG
Topology	Primary side: APFC, Double-Forward Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x ISC TK72E08N1 (80V, 72A @ 25°C, Rds(on): 4.3mOhm)
5V & 3.3V	DC-DC Converters: 4x Advanced Power Electronics AP3R303GMT (30V, 25A @ 70°C, Rds(on): 3.3mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytic: 13x Teapo (1-3,000h @ 105°C, SC), 2x Rubycon (3-6,000h @ 105°C, YXG), 1x Rubycon (4-10,000h @ 105°C, YXJ) Polymer: 2x FPCAP
Supervisor IC	Weltrend WT7527V (OCP, OVP, UVP, SCP, PG)
Fan Model	Globe Fan S1202512L (120mm, 12V, 0.18A, Sleeve Bearing Fan)
5VSB Circuit	-
Rectifier	1x UTC 2N70L FET (700V, 2A, Rds(on): 6.3Ohm)

-12V	-
Rectifier	1x KEC KIA7912PI (-12V, 1A)

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)	85.007%
Average Noise Output (>1450 Load Combinations)	35.35dBA
PF□□□ (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	57.197%
□□□□□□	0.0330W
Non-Accredited	
12V Ripple (Full Load)	71.34mV
5V Ripple (Full Load)	32.40mV
3.3V Ripple (Full Load)	25.05mV
5VSB Ripple (Full Load)	18.61mV
12V Load Regulation	1.29%
5V Load Regulation	3.07%
3.3V Load Regulation	4.44%
5VSB Load Regulation	5.28%
Inrush Current	51.420A

230V

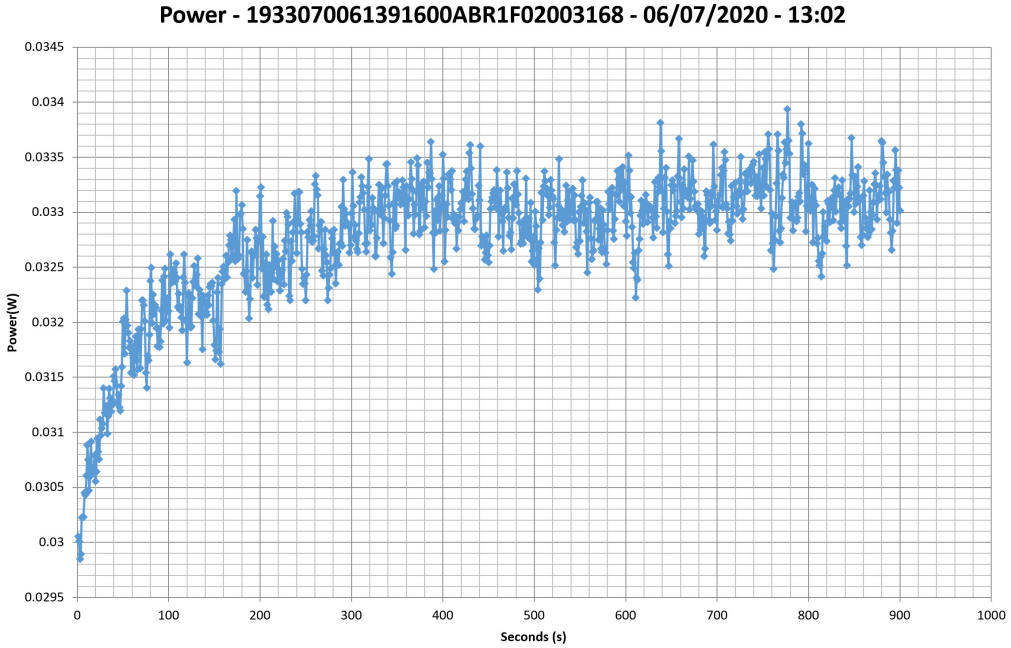
Accredited		
□□□□ (>1450 load combinations)		87.127%
Average Noise Output (>1450 Load Combinations)		36.06dBA
PF□□□ (>1450 Load Combinations)		0.954
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0791W
Non-Accredited		
12V Ripple (Full Load)		59.15mV
5V Ripple (Full Load)		30.80mV
3.3V Ripple (Full Load)		23.34mV
5VSB Ripple (Full Load)		17.00mV
12V Load Regulation		1.26%
5V Load Regulation		2.94%
3.3V Load Regulation		4.24%
5VSB Load Regulation		5.07%
Inrush Current		80.190A
□□□□ & PG□□		13.40ms
AC Loss to PWR_OK Hold Up Time		13.90ms
PWR_OK Inactive to DC Loss Delay		-0.50ms
PSU Timings: T1 (20% / 100%)	44.0ms	62.0ms
PSU Timings: T3 (20% / 100%)	318.0ms	318.0ms
OPP (0.00°C / 0.00°C)	128.30%	-

□□□□ & PG□□

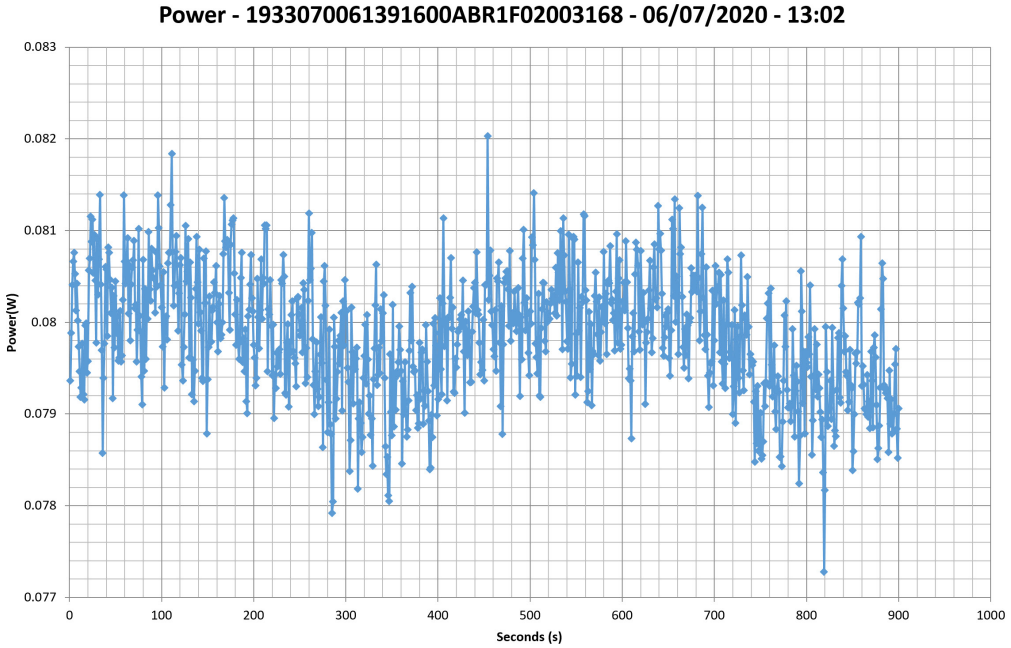
Hold-Up Time (ms)	13.4
AC Loss to PWR_OK Hold Up Time (ms)	13.9
PWR_OK Inactive to DC Loss Delay (ms)	-0.5

Graphs

115V



230V



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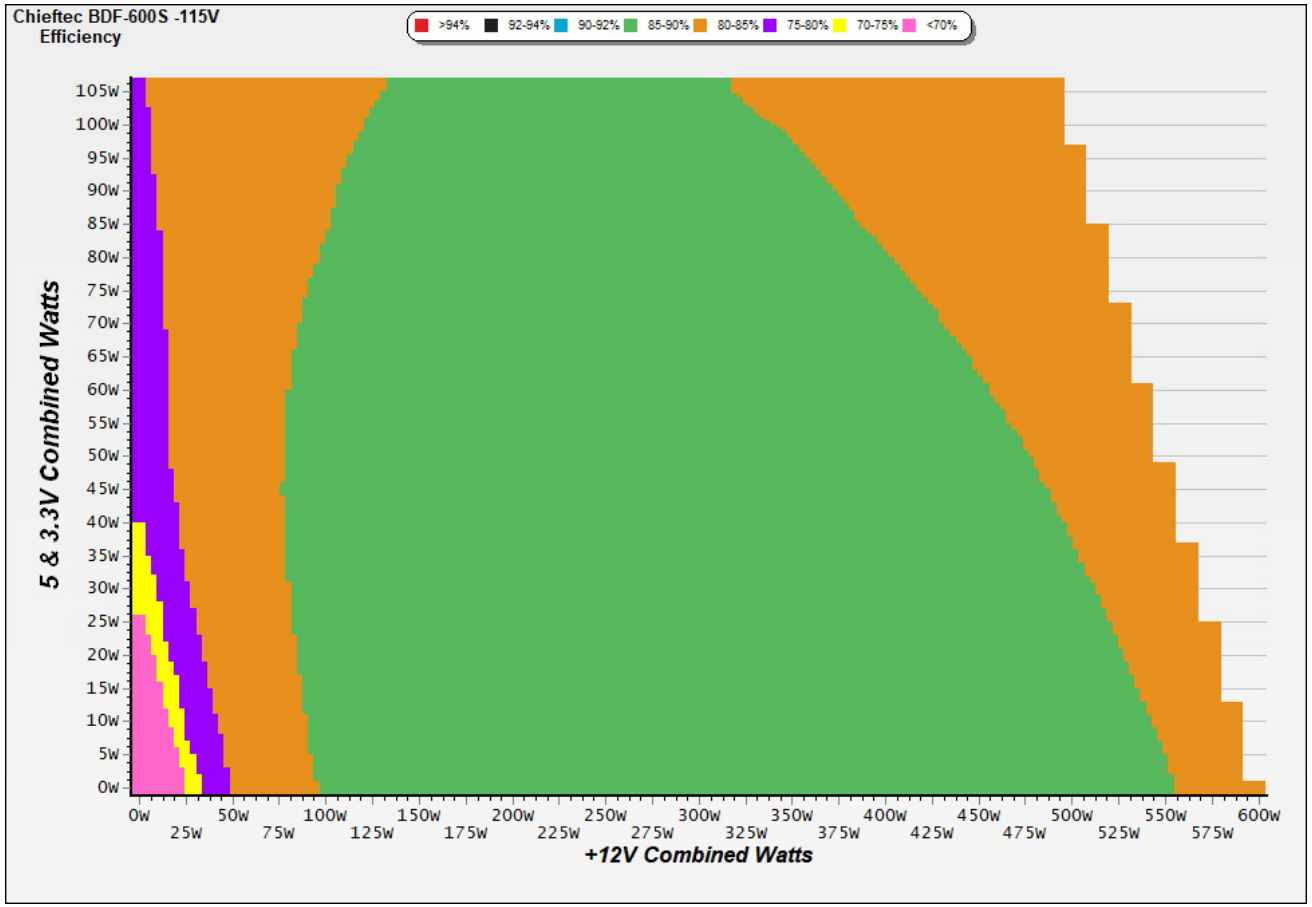
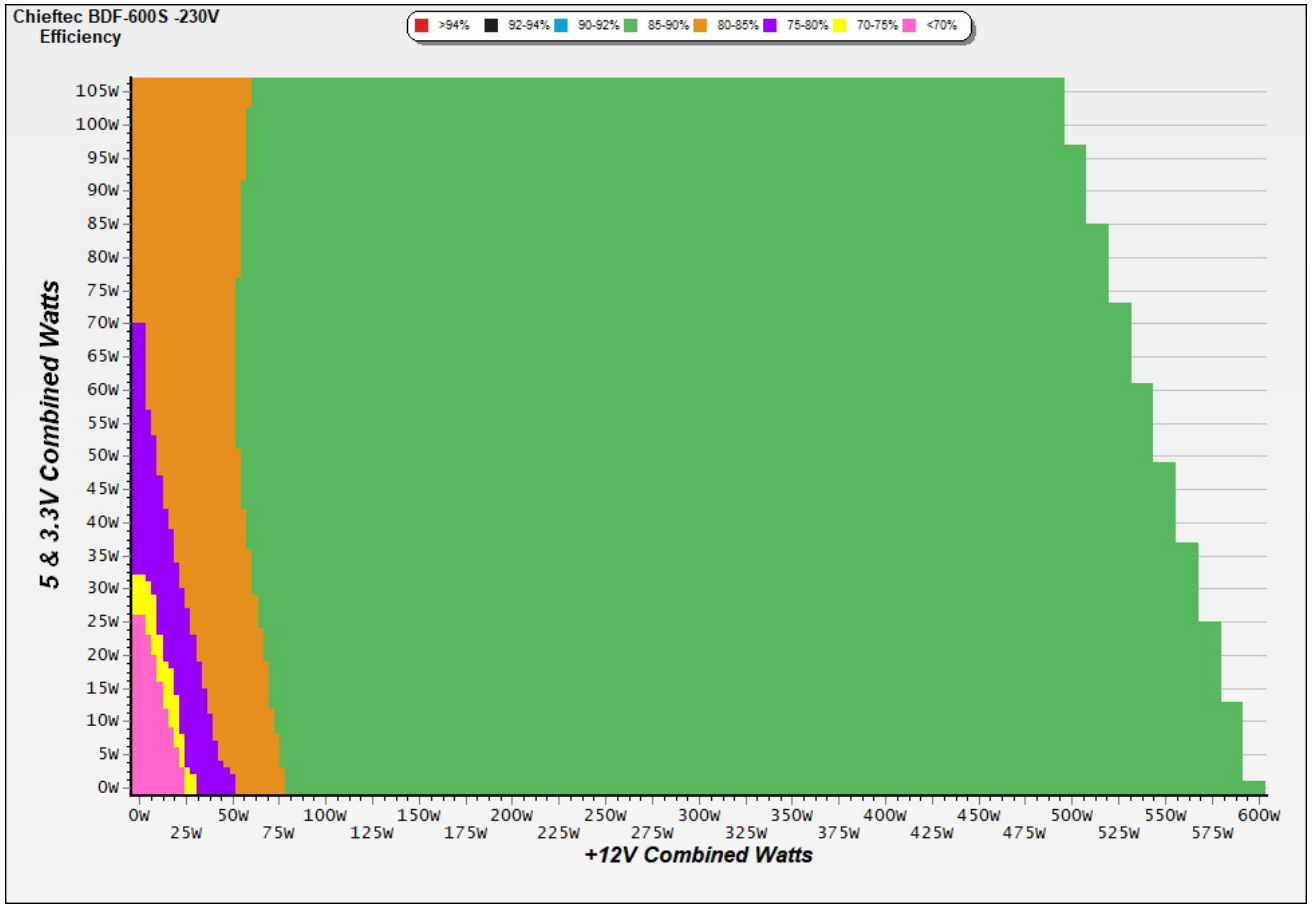
115V



□□

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



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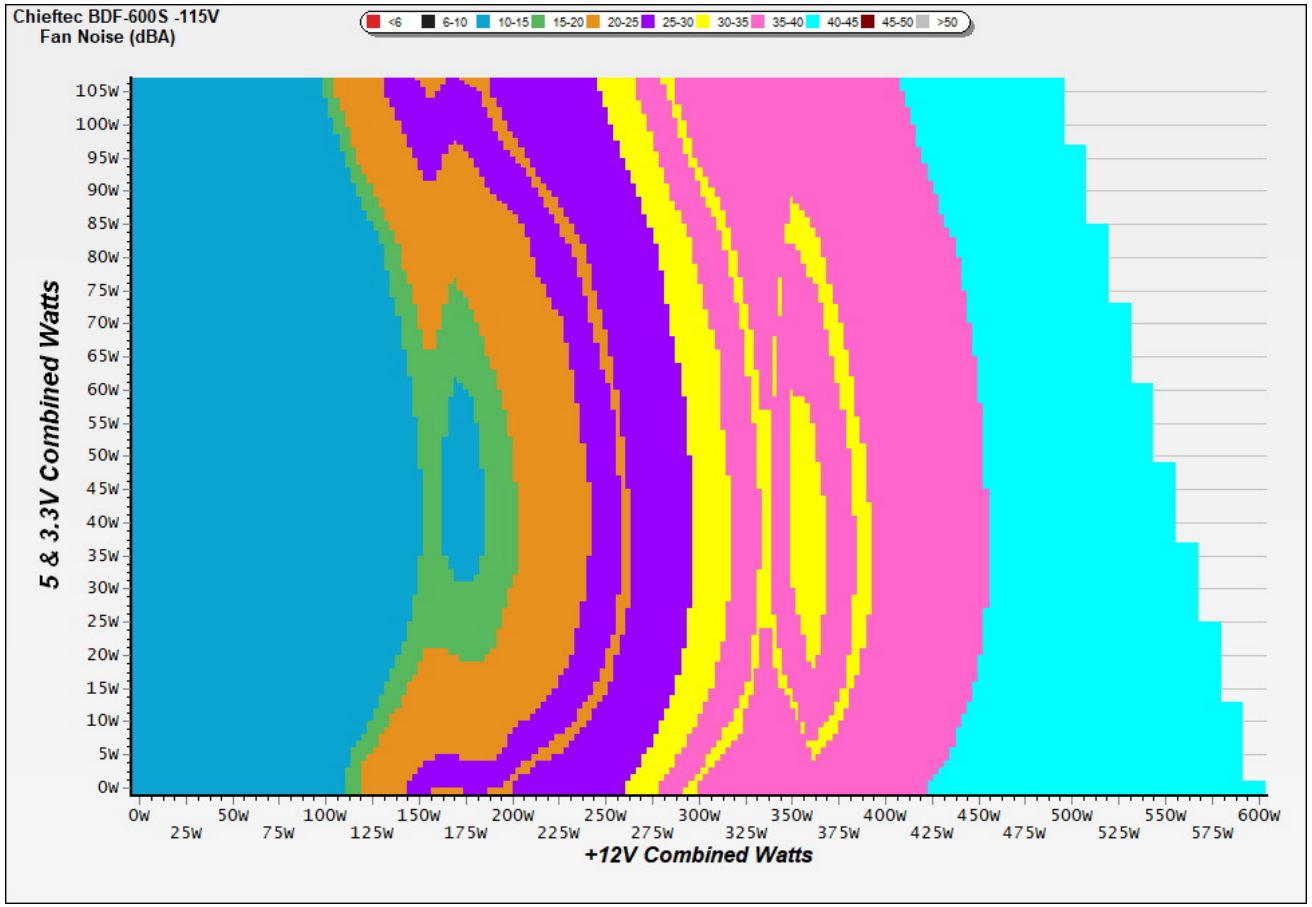
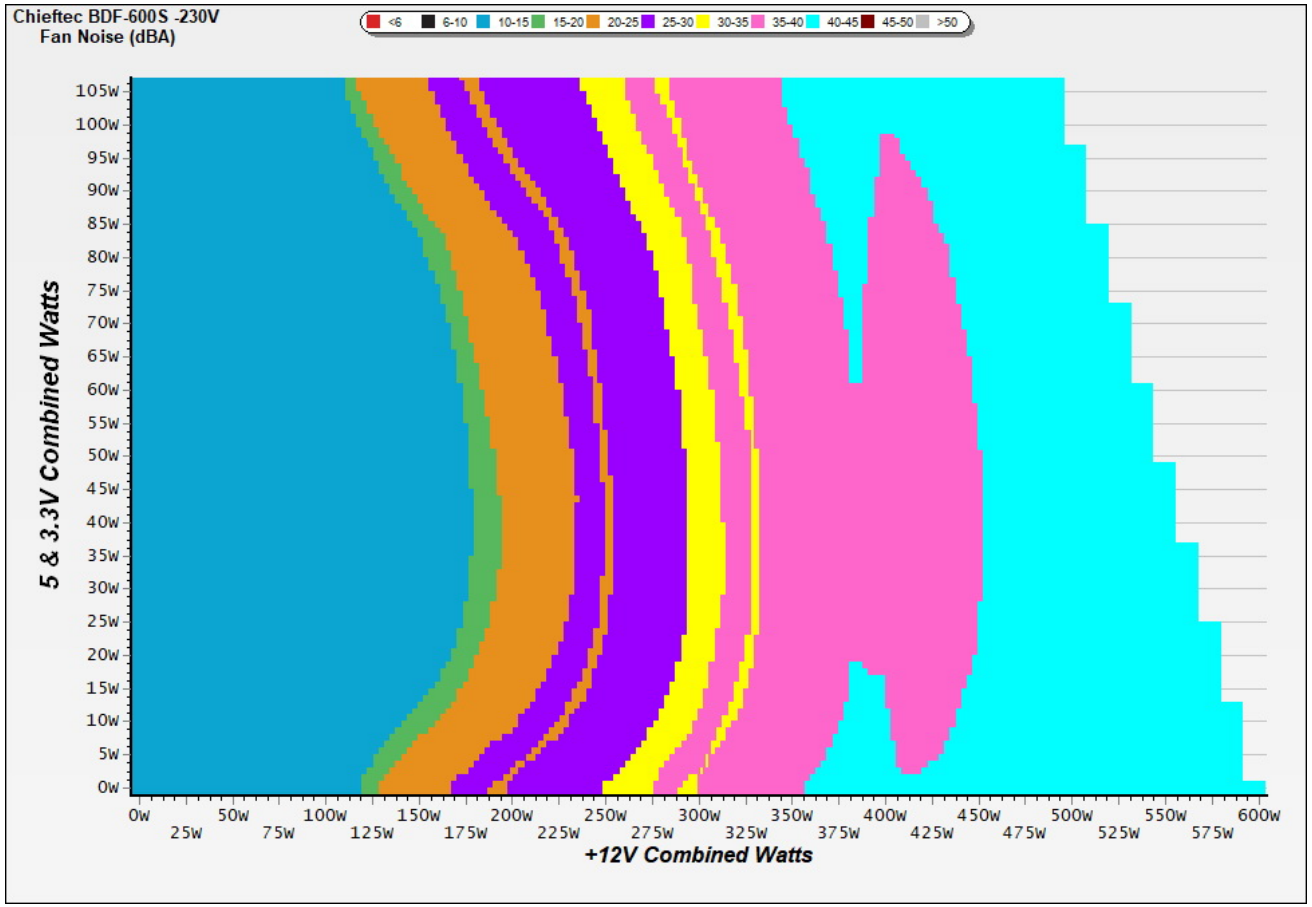
115V



□□

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

Noise under high ambient temperature (indicative)

115V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	687 RPM · 12.9 dB(A) · 34.1 °C	687 RPM · 12.9 dB(A) · 34.1 °C	**+0.0 dB(A)**
20%	841 RPM · 19.3 dB(A) · 34.8 °C	841 RPM · 19.3 dB(A) · 34.8 °C	**+0.0 dB(A)**
50%	1560 RPM · 36.4 dB(A) · 36.5 °C	1560 RPM · 36.4 dB(A) · 36.5 °C	**+0.0 dB(A)**
100%	1818 RPM · 40.5 dB(A) · 39.2 °C	1818 RPM · 40.5 dB(A) · 39.2 °C	**+0.0 dB(A)**

230V

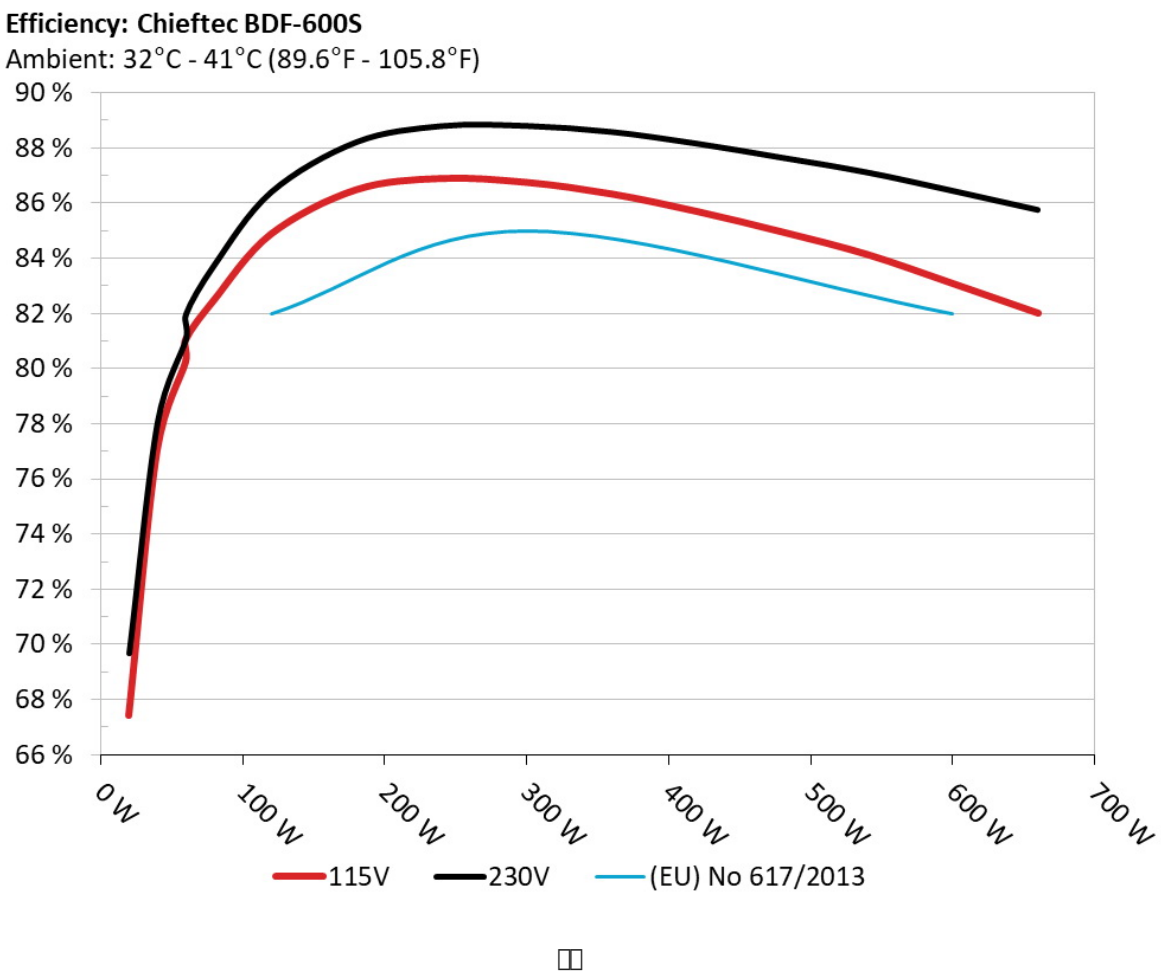
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	686 RPM · 12.4 dB(A) · 34.2 °C	686 RPM · 12.4 dB(A) · 34.2 °C	**+0.0 dB(A)**
20%	691 RPM · 14.7 dB(A) · 34.6 °C	691 RPM · 14.7 dB(A) · 34.6 °C	**+0.0 dB(A)**
50%	1448 RPM · 34.2 dB(A) · 36.4 °C	1448 RPM · 34.2 dB(A) · 36.4 °C	**+0.0 dB(A)**
100%	1816 RPM · 40.4 dB(A) · 39.6 °C	1816 RPM · 40.4 dB(A) · 39.6 °C	**+0.0 dB(A)**

INFO

Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative of how the fan behaves when it is hot. "<6.0" is the floor of our sound meter, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

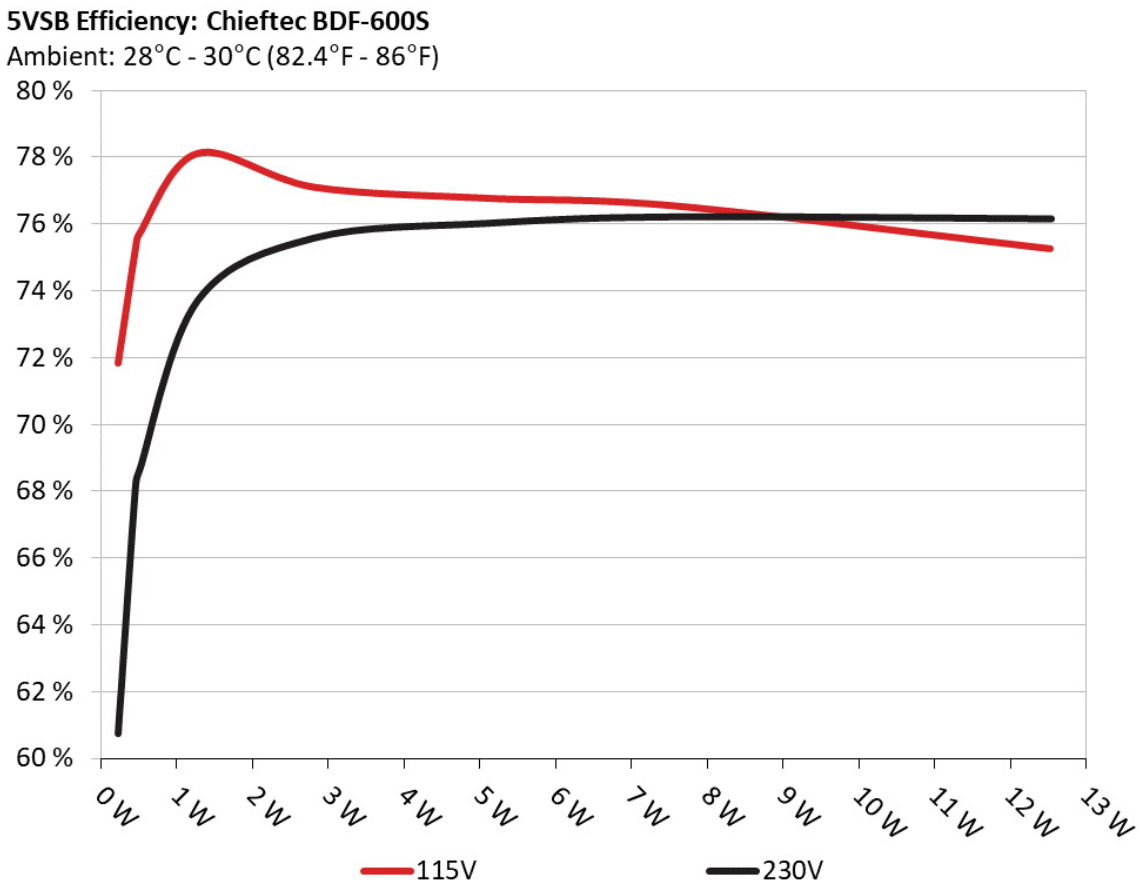
Informational. Not part of the ETA or LAMBDA rating.

Indicative Performance



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□□□□



□□

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	71.827%	0.055
	5.143V	0.323		115.13V
2	0.090A	0.463	75.285%	0.100
	5.141V	0.615		115.13V
3	0.550A	2.816	77.087%	0.304
	5.117V	3.653		115.13V
4	1.000A	5.096	76.759%	0.356
	5.094V	6.639		115.13V
5	1.500A	7.604	76.522%	0.385
	5.068V	9.937		115.13V
6	2.500A	12.534	75.248%	0.418
	5.013V	16.657		115.13V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.232	60.733%	0.020
	5.143V	0.382		230.26V
2	0.090A	0.463	68.189%	0.035
	5.141V	0.679		230.26V
3	0.550A	2.815	75.570%	0.159
	5.117V	3.725		230.27V
4	1.000A	5.095	76.011%	0.230
	5.094V	6.703		230.27V
5	1.500A	7.603	76.205%	0.274
	5.068V	9.977		230.26V
6	2.500A	12.539	76.146%	0.319
	5.015V	16.467		230.26V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.156A	1.934A	1.973A	0.985A	60.014	80.262%	687	12.9	34.09°C	0.984
	12.172V	5.172V	3.344V	5.076V	74.773				38.34°C	115.13V
2	7.335A	2.910A	2.973A	1.188A	120.055	84.895%	841	19.3	34.75°C	0.981
	12.155V	5.156V	3.328V	5.051V	141.416				39.82°C	115.13V
3	11.862A	3.405A	3.486A	1.393A	180.070	86.507%	1058	24.5	35.01°C	0.989
	12.140V	5.141V	3.315V	5.028V	208.157				41.41°C	115.13V
4	16.400A	3.903A	3.998A	1.599A	240.091	86.916%	1326	32.4	35.84°C	0.992
	12.127V	5.126V	3.301V	5.005V	276.233				43.22°C	115.13V
5	20.615A	4.895A	5.026A	1.808A	300.138	86.774%	1560	36.4	36.52°C	0.994
	12.109V	5.108V	3.284V	4.979V	345.883				44.66°C	115.13V
6	24.834A	5.897A	6.060A	2.000A	360.021	86.353%	1766	40.8	36.84°C	0.994
	12.092V	5.090V	3.268V	4.954V	416.919				45.55°C	115.13V
7	29.050A	6.904A	7.109A	2.235A	419.825	85.723%	1807	40.3	37.49°C	0.995
	12.072V	5.072V	3.251V	4.924V	489.748				46.89°C	115.13V
8	33.340A	7.919A	8.166A	2.452A	480.312	84.972%	1813	40.3	37.82°C	0.995
	12.054V	5.054V	3.233V	4.897V	565.258				47.99°C	115.13V
9	37.986A	8.437A	8.698A	2.460A	539.605	84.164%	1816	40.4	38.82°C	0.995
	12.033V	5.039V	3.219V	4.881V	641.136				50.49°C	115.12V
10	42.703A	8.962A	9.269A	2.575A	600.307	83.103%	1818	40.5	39.22°C	0.995
	12.015V	5.024V	3.204V	4.857V	722.367				51.74°C	115.12V
11	47.772A	8.983A	9.308A	2.583A	660.317	82.028%	1819	40.5	40.92°C	0.995
	11.996V	5.012V	3.192V	4.843V	804.994				53.77°C	115.11V
CL1	0.102A	12.005A	12.000A	0.001A	101.897	79.446%	1715	40.1	36.01°C	0.981
	12.104V	5.098V	3.288V	5.082V	128.259				44.69°C	115.13V

CL2	50.012A	1.000A	1.002A	1.000A	614.705	83.911%	1817	40.5	39.22°C	0.995
	12.025V	5.083V	3.249V	4.973V	732.565				51.75°C	115.11V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.156A	1.934A	1.974A	0.986A	60.010	81.089%	686	12.4	34.17°C	0.716
	12.169V	5.171V	3.344V	5.075V	74.005				38.99°C	230.27V
2	7.334A	2.911A	2.973A	1.188A	120.038	86.412%	691	14.7	34.63°C	0.924
	12.154V	5.154V	3.329V	5.051V	138.913				39.61°C	230.27V
3	11.860A	3.406A	3.483A	1.393A	180.041	88.227%	861	23.6	35.24°C	0.975
	12.140V	5.140V	3.316V	5.028V	204.065				40.77°C	230.27V
4	16.398A	3.903A	3.998A	1.599A	240.053	88.809%	1100	26.2	35.68°C	0.982
	12.126V	5.126V	3.302V	5.005V	270.304				41.85°C	230.27V
5	20.611A	4.895A	5.023A	1.808A	300.090	88.815%	1448	34.2	36.43°C	0.983
	12.109V	5.108V	3.286V	4.979V	337.882				43.41°C	230.27V
6	24.832A	5.895A	6.056A	2.000A	359.963	88.598%	1654	38.1	36.71°C	0.983
	12.091V	5.090V	3.270V	4.955V	406.290				44.56°C	230.26V
7	29.038A	6.902A	7.099A	2.233A	419.713	88.176%	1785	41.1	37.25°C	0.983
	12.074V	5.072V	3.254V	4.927V	475.993				45.87°C	230.26V
8	33.330A	7.917A	8.157A	2.449A	480.220	87.663%	1807	40.3	37.76°C	0.984
	12.055V	5.055V	3.237V	4.901V	547.805				47.01°C	230.25V
9	37.975A	8.435A	8.687A	2.457A	539.544	87.135%	1810	40.3	38.40°C	0.985
	12.035V	5.040V	3.223V	4.886V	619.208				48.60°C	230.26V
10	42.695A	8.957A	9.258A	2.571A	600.246	86.463%	1816	40.4	39.55°C	0.985
	12.016V	5.026V	3.208V	4.864V	694.219				50.40°C	230.26V
11	47.770A	8.975A	9.292A	2.579A	660.264	85.773%	1815	40.4	40.66°C	0.986
	11.996V	5.014V	3.197V	4.850V	769.780				52.29°C	230.26V
CL1	0.102A	12.004A	12.002A	0.001A	101.898	81.297%	1476	35.0	36.80°C	0.888
	12.103V	5.097V	3.289V	5.082V	125.340				43.93°C	230.27V

CL2	50.017A	1.000A	0.999A	1.000A	614.611	87.215%	1816	40.4	40.41°C	0.986
	12.022V	5.083V	3.251V	4.976V	704.704				51.20°C	230.26V

The results above are not used in the certification process

20-80□□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.219A	0.483A	0.491A	0.195A	19.997	67.432%	680	11.0	0.865
	12.175V	5.189V	3.359V	5.128V	29.655				115.12V
2	2.439A	0.965A	0.984A	0.391A	39.989	77.077%	682	11.1	0.956
	12.172V	5.183V	3.353V	5.114V	51.882				115.13V
3	3.663A	1.449A	1.478A	0.589A	60.021	81.065%	683	11.4	0.984
	12.168V	5.176V	3.347V	5.098V	74.041				115.13V
4	4.882A	1.934A	1.975A	0.787A	79.974	82.504%	686	12.4	0.978
	12.163V	5.169V	3.340V	5.083V	96.933				115.13V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.220A	0.482A	0.490A	0.195A	19.999	69.697%	681	11.1	0.415
	12.174V	5.189V	3.359V	5.127V	28.694				230.27V
2	2.440A	0.965A	0.984A	0.391A	39.990	78.073%	681	11.1	0.595
	12.169V	5.181V	3.353V	5.112V	51.221				230.27V
3	3.663A	1.451A	1.479A	0.589A	60.020	81.993%	683	11.4	0.713
	12.165V	5.174V	3.347V	5.097V	73.201				230.27V
4	4.882A	1.936A	1.975A	0.787A	79.971	83.770%	684	11.4	0.795
	12.161V	5.167V	3.341V	5.082V	95.465				230.27V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	33.50mV	24.00mV	16.60mV	12.60mV	Pass
20% Load	35.00mV	26.10mV	18.80mV	13.70mV	Pass
30% Load	35.20mV	26.00mV	20.60mV	13.60mV	Pass
40% Load	41.00mV	26.70mV	20.00mV	14.30mV	Pass
50% Load	41.60mV	26.50mV	19.90mV	14.00mV	Pass
60% Load	42.70mV	26.40mV	20.10mV	14.30mV	Pass
70% Load	50.80mV	28.30mV	20.30mV	14.90mV	Pass
80% Load	55.10mV	29.00mV	21.70mV	14.90mV	Pass
90% Load	58.20mV	29.30mV	21.80mV	15.70mV	Pass
100% Load	71.30mV	32.40mV	25.10mV	18.60mV	Pass
110% Load	82.80mV	31.60mV	26.10mV	18.40mV	Pass
Crossload1	39.70mV	30.50mV	23.90mV	20.30mV	Pass
Crossload2	64.50mV	27.10mV	24.40mV	16.10mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	32.60mV	23.10mV	18.00mV	12.70mV	Pass
20% Load	33.60mV	25.00mV	18.70mV	13.30mV	Pass
30% Load	34.10mV	25.30mV	19.00mV	13.30mV	Pass
40% Load	38.80mV	28.60mV	18.70mV	14.30mV	Pass
50% Load	36.40mV	26.90mV	19.00mV	13.90mV	Pass
60% Load	39.70mV	27.10mV	19.20mV	14.10mV	Pass
70% Load	44.40mV	28.90mV	19.30mV	14.30mV	Pass
80% Load	46.60mV	28.40mV	21.90mV	14.80mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	53.20mV	28.50mV	21.40mV	15.10mV	Pass
100% Load	59.20mV	30.80mV	23.30mV	17.00mV	Pass
110% Load	63.20mV	29.60mV	23.30mV	16.40mV	Pass
Crossload1	34.90mV	29.30mV	23.70mV	19.80mV	Pass
Crossload2	59.80mV	25.80mV	23.00mV	14.70mV	Pass

The results above are not used in the certification process

Chieftec Proton 600W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

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