Thermaltake Toughpower GF1 850W (#2)

PSTPD0850FNFAGU1LF000041

Lab ID 617

Certification ID 25617

Test Result Report ID:

Certificate Issue Date: Jan 31, 2019

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	Thermaltake
Model	Toughpower GF1 850W (#2)
OEM/ODM	Channel Well Technology
Serial Number	PSTPD0850FNFAGU1LF000041
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	12
□□□□ (Hz)	47-63

□□□□ (W)	850
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	140mm Hydro Dynamic Bearing Fan [TT-1425 (A1425L12S)]
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	617
Date of receipt	Jan 22, 2019
Testing Date	Jan 27, 2019
Report Issued Date	Jan 31, 2019
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (600mm)	1	1	18AWG	□
4+4 pin EPS 12V □□ (650mm)	1	1	16AWG	□
8 pin EPS 12V □□ (650mm)	1	1	16AWG	□
6+2pin PCIe□□ (700mm+150mm)	3	6	16-18AWG	□
SATA□□ (500mm+150mm+150mm+150mm)	3	12	18AWG	□
□ 4pin Molex□□ (500mm+150mm+150mm+150mm)	1	4	18AWG	□
□ 4pin □□ (100mm)	1	1	22AWG	□
AC Power Cord (1420mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	22	22	70.9	3	0.3
	□	120		850	15	3.6
□□□□□ (W)		850				

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)	89.216%
Average Noise Output (>1450 Load Combinations)	28.45dBA
PF□□□ (>1450 Load Combinations)	0.979
Efficiency With 10W (≤500W) or 2% (>500W) Load	69.051%
□□□□□□	0.0470W
Non-Accredited	
12V Ripple (Full Load)	14.01mV
5V Ripple (Full Load)	15.07mV
3.3V Ripple (Full Load)	11.87mV
5VSB Ripple (Full Load)	13.94mV
12V Load Regulation	0.52%
5V Load Regulation	0.20%
3.3V Load Regulation	0.42%

5VSB Load Regulation	1.62%
Inrush Current	32.788A

230V

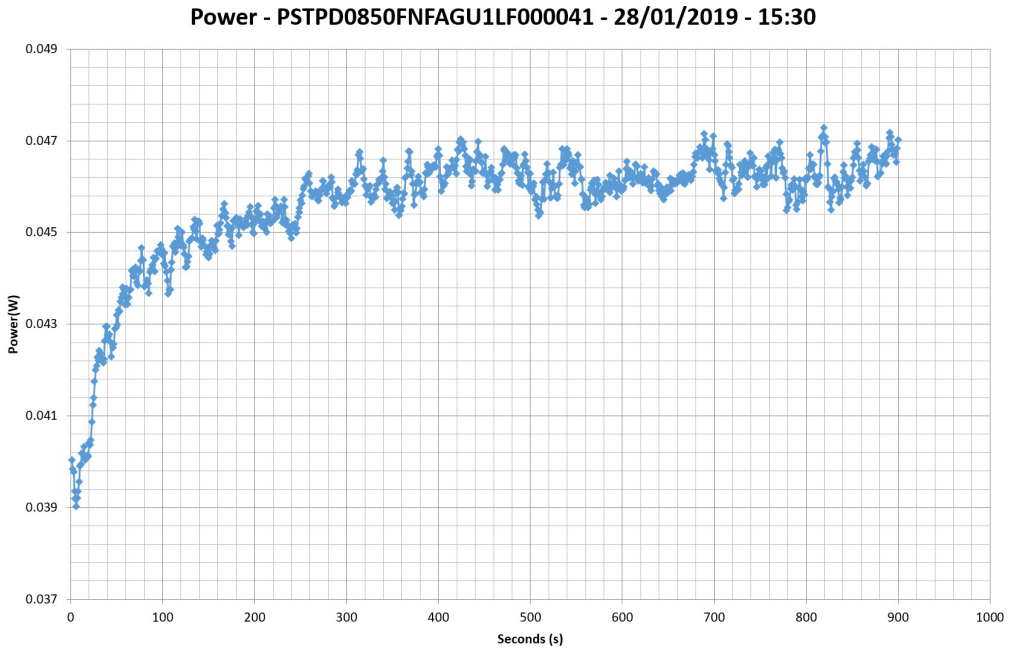
Accredited	
□□□□ (>1450 load combinations)	90.852%
Average Noise Output (>1450 Load Combinations)	27.91dBA
PF□□□ (>1450 Load Combinations)	0.937
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.0609W
Non-Accredited	
12V Ripple (Full Load)	-
5V Ripple (Full Load)	-
3.3V Ripple (Full Load)	-
5VSB Ripple (Full Load)	-
12V Load Regulation	-
5V Load Regulation	-
3.3V Load Regulation	-
5VSB Load Regulation	-
Inrush Current	66.240A
□□□□ & PG□□	20.00ms
AC Loss to PWR_OK Hold Up Time	18.60ms
PWR_OK Inactive to DC Loss Delay	1.40ms
OPP (0.00°C / 0.00°C)	- -

□□□□ & PG□□

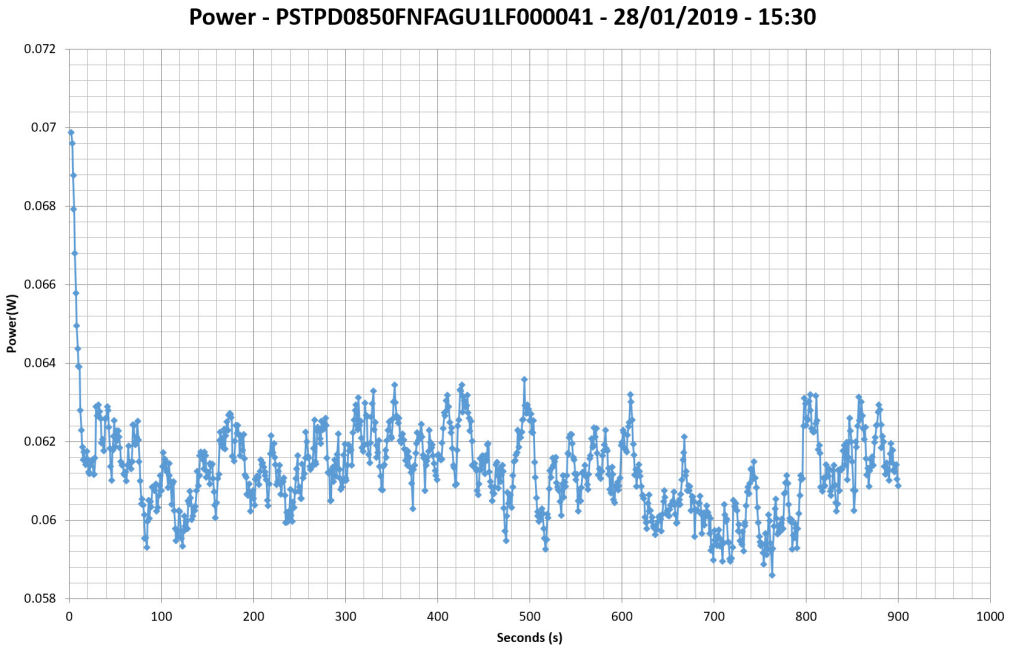
Hold-Up Time (ms)	20
AC Loss to PWR_OK Hold Up Time (ms)	18.6
PWR_OK Inactive to DC Loss Delay (ms)	1.4

Graphs

115V



230V



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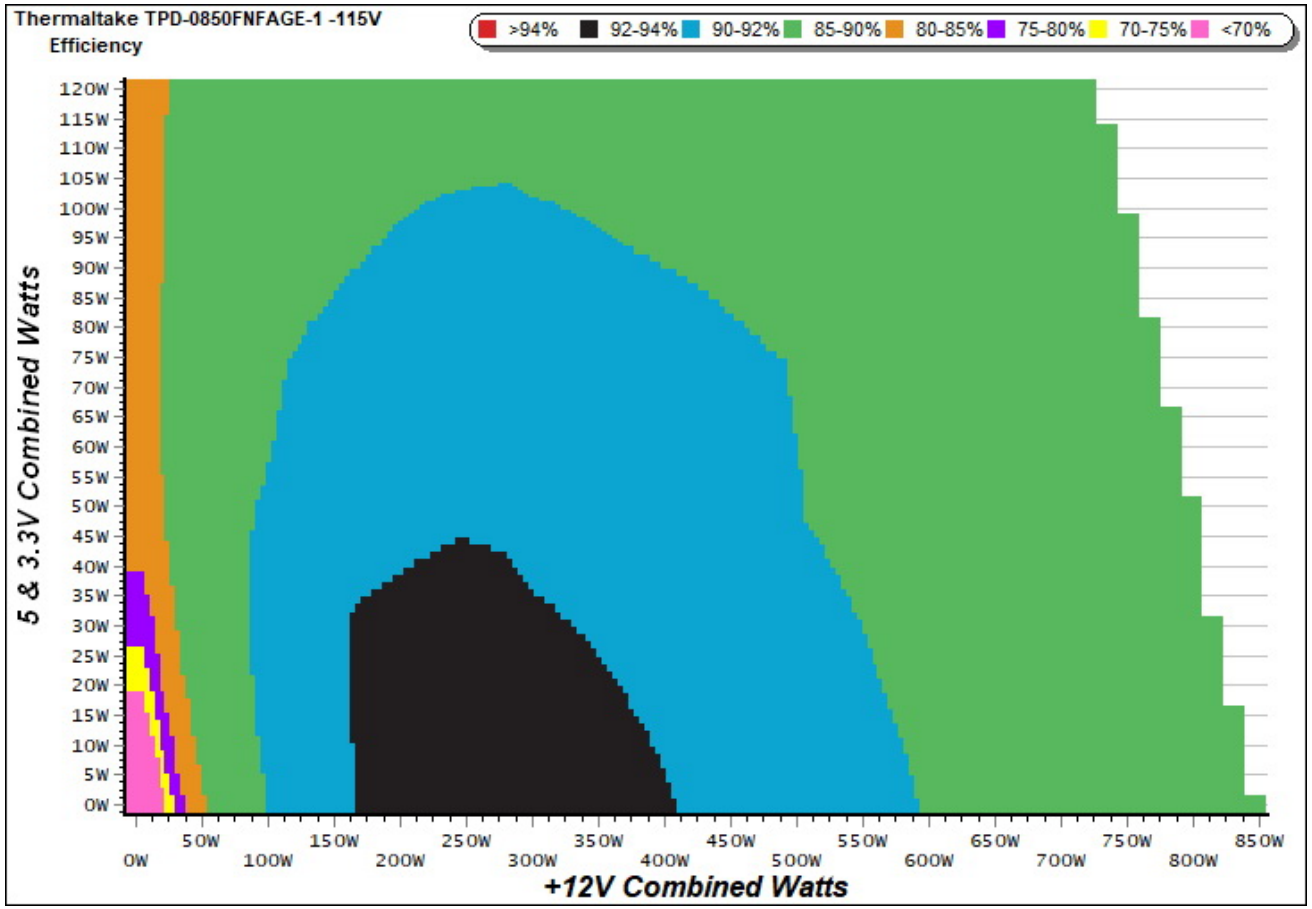
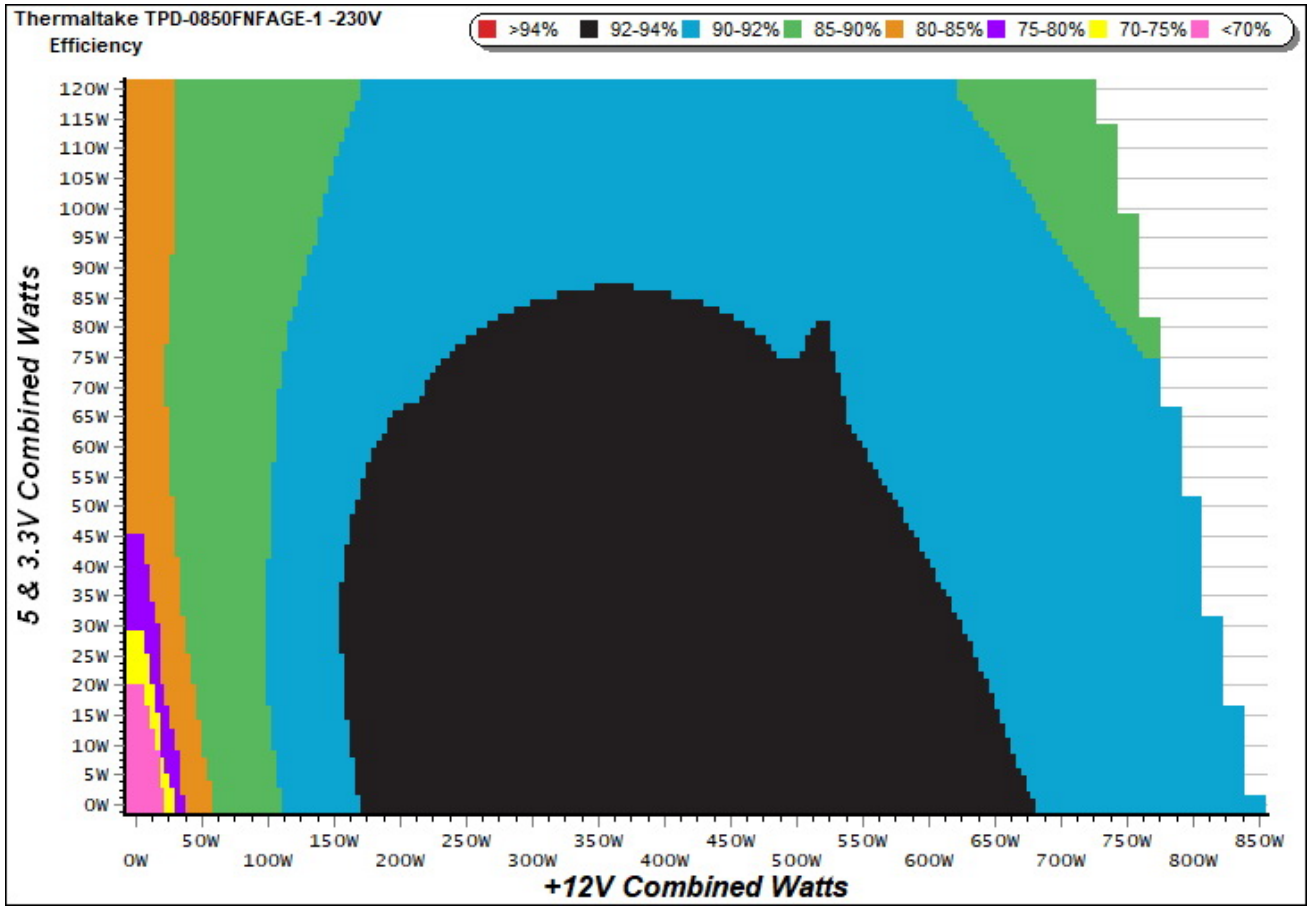
115V



□□

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.

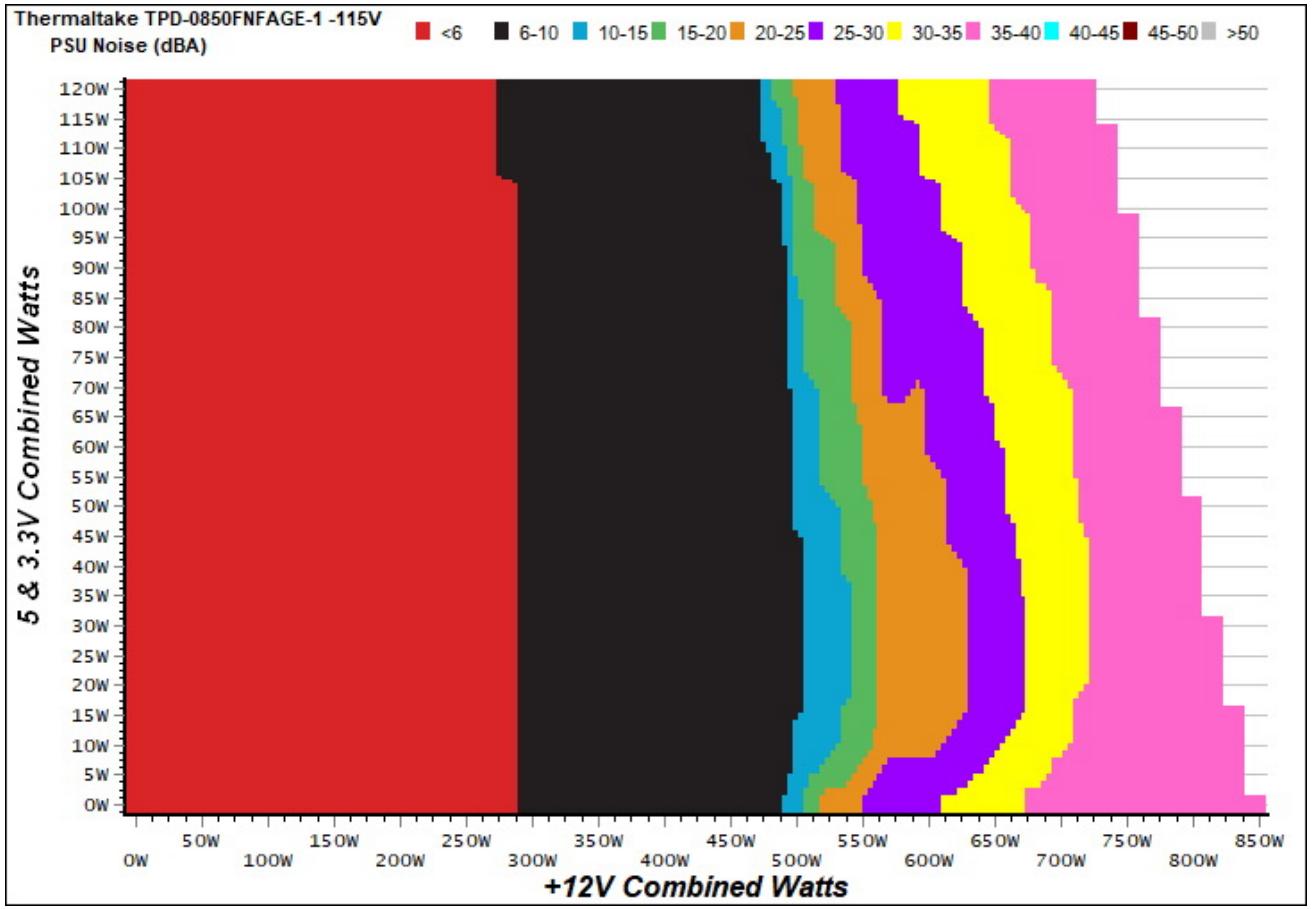
230V



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.

□□□□□

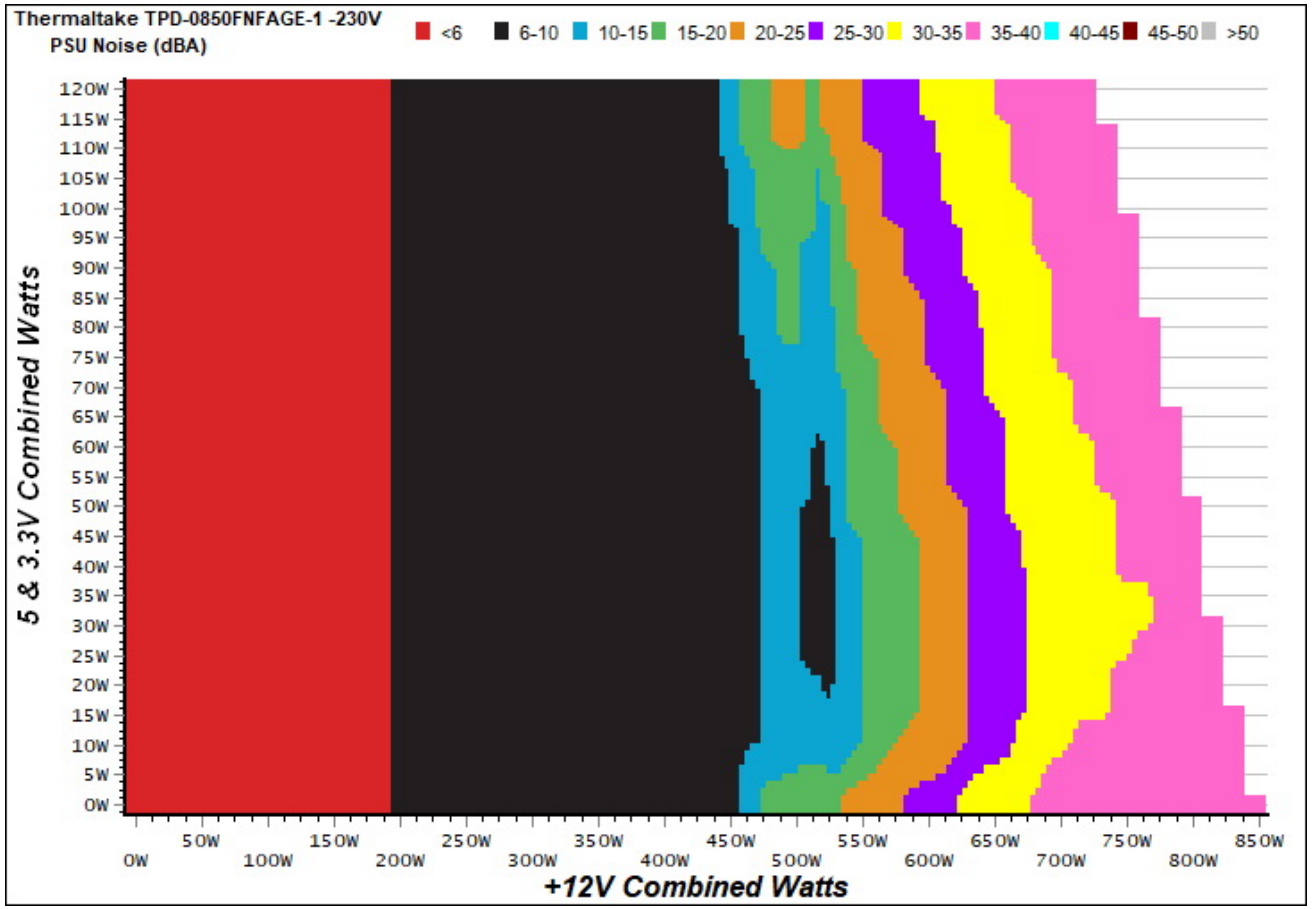
115V



□□

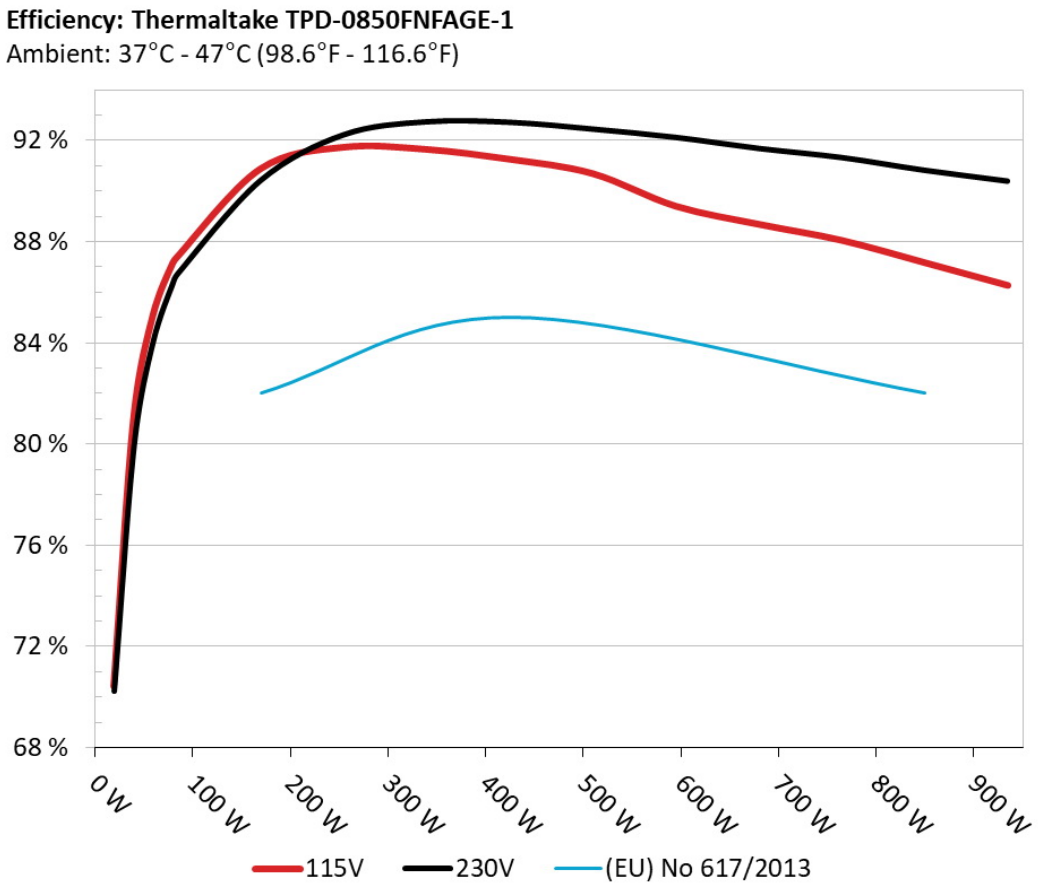
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



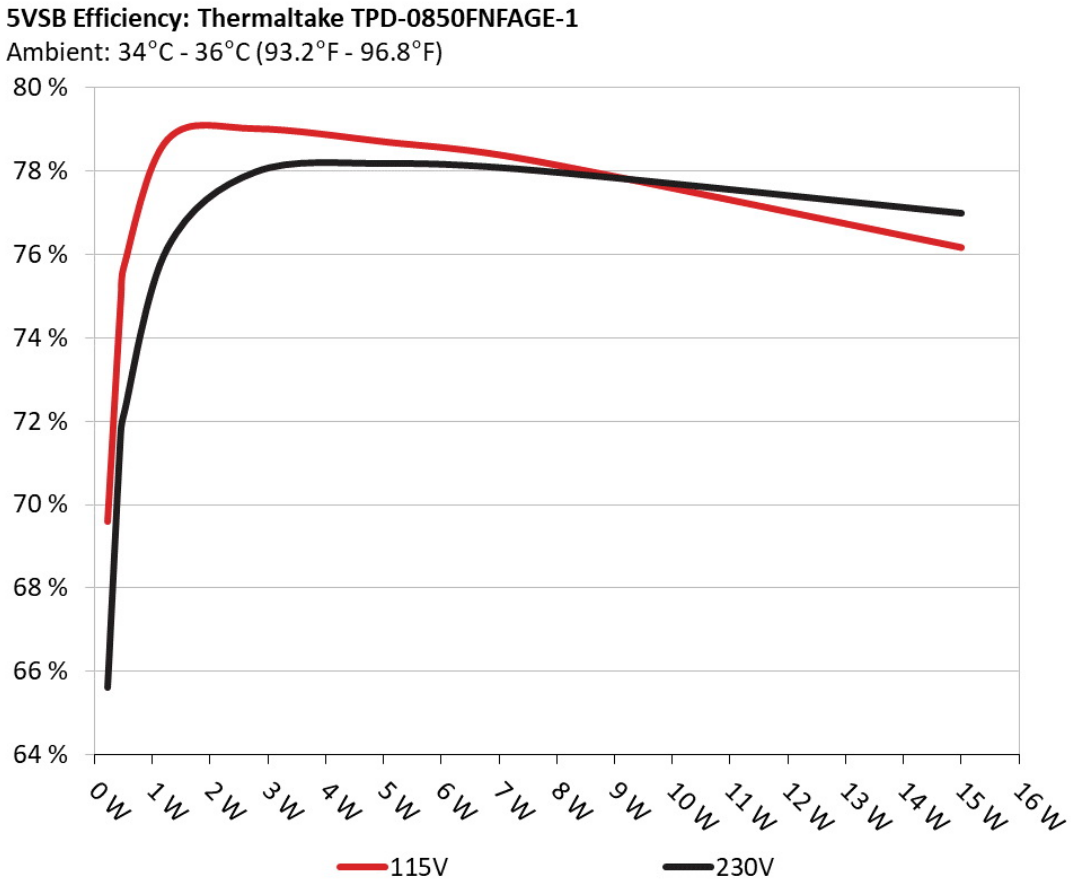
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance



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	0.229	69.605%	0.033
	5.078V	0.329		115.14V
2	0.090A	0.458	74.959%	0.061
	5.078V	0.611		115.14V
3	0.550A	2.788	79.025%	0.264
	5.067V	3.528		115.12V
4	1.000A	5.056	78.705%	0.356
	5.055V	6.424		115.13V
5	1.500A	7.566	78.266%	0.409
	5.044V	9.667		115.13V
6	3.000A	15.012	76.176%	0.472
	5.004V	19.707		115.14V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.229	65.616%	0.011
	5.078V	0.349		230.24V
2	0.090A	0.457	71.743%	0.019
	5.078V	0.637		230.24V
3	0.550A	2.787	77.980%	0.101
	5.067V	3.574		230.24V
4	1.000A	5.056	78.182%	0.169
	5.055V	6.467		230.24V
5	1.500A	7.563	78.025%	0.227
	5.042V	9.693		230.24V
6	3.000A	15.007	76.991%	0.330
	5.002V	19.492		230.22V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	5.264A	1.994A	1.996A	0.991A	84.845	87.408%	0	<6.0	43.65°C	0.962
	12.015V	5.014V	3.305V	5.048V	97.068				39.46°C	115.11V
2	11.527A	2.992A	2.994A	1.191A	169.337	90.870%	0	<6.0	44.87°C	0.980
	12.010V	5.014V	3.304V	5.040V	186.350				40.25°C	115.11V
3	18.196A	3.491A	3.483A	1.391A	254.429	91.733%	0	<6.0	46.04°C	0.983
	12.004V	5.013V	3.302V	5.034V	277.359				40.92°C	115.11V
4	24.879A	3.992A	3.997A	1.591A	339.629	91.648%	536	8.8	41.46°C	0.979
	11.995V	5.012V	3.301V	5.030V	370.581				47.97°C	115.11V
5	31.239A	4.990A	4.998A	1.792A	424.995	91.257%	578	9.6	42.17°C	0.978
	11.988V	5.011V	3.300V	5.024V	465.713				48.49°C	115.11V
6	37.528A	5.990A	6.003A	1.993A	509.470	90.694%	795	18.8	42.80°C	0.980
	11.982V	5.010V	3.298V	5.019V	561.749				49.79°C	115.11V
7	43.901A	6.991A	7.010A	2.195A	594.793	89.402%	1304	33.6	43.34°C	0.982
	11.974V	5.008V	3.296V	5.014V	665.299				51.30°C	115.11V
8	50.281A	7.993A	8.014A	2.396A	680.123	88.683%	1526	37.6	43.82°C	0.983
	11.967V	5.006V	3.294V	5.008V	766.918				52.37°C	115.11V
9	57.064A	8.493A	8.504A	2.397A	765.046	88.046%	1526	37.6	44.20°C	0.985
	11.961V	5.005V	3.292V	5.007V	868.914				53.31°C	115.11V
10	63.585A	8.995A	9.023A	3.007A	849.866	87.163%	1525	37.6	45.50°C	0.986
	11.955V	5.004V	3.291V	4.989V	975.033				55.32°C	115.10V
11	70.699A	8.995A	9.025A	3.009A	934.632	86.267%	1524	37.6	46.86°C	0.988
	11.951V	5.004V	3.290V	4.987V	1083.419				57.04°C	115.11V
CL1	0.144A	14.003A	13.999A	0.000A	118.082	83.744%	540	8.9	42.35°C	0.972
	12.007V	5.009V	3.301V	5.069V	141.004				48.35°C	115.13V

CL2	70.836A	1.002A	1.001A	1.000A	860.699	87.776%	1525	37.6	45.19°C	0.987
	11.962V	5.011V	3.295V	5.039V	980.567				55.22°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	5.265A	1.994A	1.995A	0.991A	84.811	86.742%	0	<6.0	43.83°C	0.805
	12.007V	5.015V	3.305V	5.046V	97.774				39.34°C	230.24V
2	11.534A	2.990A	2.996A	1.191A	169.286	90.411%	536	8.8	40.68°C	0.909
	11.999V	5.013V	3.304V	5.040V	187.241				45.42°C	230.24V
3	18.198A	3.492A	3.482A	1.390A	254.394	92.224%	537	8.8	41.08°C	0.937
	12.001V	5.012V	3.302V	5.036V	275.843				46.78°C	230.24V
4	24.879A	3.991A	3.998A	1.591A	339.595	92.739%	537	8.8	41.61°C	0.951
	11.994V	5.011V	3.300V	5.031V	366.185				47.88°C	230.24V
5	31.233A	4.989A	5.001A	1.791A	424.919	92.718%	587	10.1	42.16°C	0.957
	11.988V	5.011V	3.299V	5.025V	458.292				49.02°C	230.24V
6	37.528A	5.990A	6.001A	1.993A	509.422	92.452%	963	25.0	42.79°C	0.961
	11.981V	5.009V	3.298V	5.019V	551.012				50.36°C	230.25V
7	43.900A	6.991A	7.005A	2.194A	594.759	92.122%	1272	33.3	43.19°C	0.963
	11.974V	5.008V	3.296V	5.014V	645.619				51.24°C	230.24V
8	50.279A	7.992A	8.014A	2.397A	680.099	91.684%	1527	37.6	43.79°C	0.964
	11.967V	5.006V	3.294V	5.008V	741.782				52.82°C	230.25V
9	57.056A	8.493A	8.503A	2.397A	765.003	91.325%	1527	37.6	44.58°C	0.967
	11.962V	5.005V	3.292V	5.006V	837.673				54.46°C	230.24V
10	63.581A	8.994A	9.025A	3.007A	849.828	90.821%	1526	37.6	45.61°C	0.969
	11.955V	5.005V	3.291V	4.989V	935.715				55.86°C	230.24V
11	70.696A	8.994A	9.026A	3.008A	934.589	90.396%	1526	37.6	46.58°C	0.970
	11.951V	5.004V	3.290V	4.987V	1033.884				57.57°C	230.24V
CL1	0.141A	14.001A	13.998A	0.000A	118.030	83.099%	572	<6.0	42.60°C	0.875
	11.998V	5.009V	3.301V	5.069V	142.035				49.32°C	230.24V

CL2	70.832A	1.001A	0.999A	1.000A	860.566	91.492%	1525	37.6	45.95°C	0.969
	11.961V	5.009V	3.295V	5.039V	940.591				55.61°C	230.24V

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	1.205A	0.499A	0.481A	0.197A	19.563	70.416%	0	<6.0	0.786
	12.009V	5.015V	3.306V	5.071V	27.782				115.10V
2	2.466A	0.997A	0.997A	0.395A	39.931	81.032%	0	<6.0	0.904
	12.018V	5.014V	3.305V	5.065V	49.278				115.11V
3	3.666A	1.496A	1.483A	0.593A	59.453	85.049%	0	<6.0	0.943
	12.016V	5.014V	3.305V	5.060V	69.904				115.10V
4	4.929A	1.994A	1.997A	0.792A	79.827	87.145%	0	<6.0	0.959
	12.016V	5.014V	3.305V	5.054V	91.603				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	1.205A	0.494A	0.483A	0.197A	19.550	70.230%	0	<6.0	0.431
	12.013V	5.016V	3.307V	5.069V	27.837				230.26V
2	2.465A	0.996A	0.998A	0.395A	39.900	79.933%	0	<6.0	0.600
	12.010V	5.016V	3.306V	5.063V	49.917				230.25V
3	3.665A	1.495A	1.480A	0.593A	59.398	84.032%	0	<6.0	0.720
	12.008V	5.015V	3.305V	5.058V	70.685				230.24V
4	4.933A	1.993A	1.995A	0.792A	79.818	86.373%	0	<6.0	0.792
	12.007V	5.014V	3.305V	5.053V	92.411				230.24V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	26.1 mV	12.5 mV	6.2 mV	7.6 mV	Pass
20% Load	9.0 mV	11.8 mV	6.8 mV	5.6 mV	Pass
30% Load	8.8 mV	12.1 mV	7.2 mV	5.5 mV	Pass
40% Load	8.7 mV	13.2 mV	7.8 mV	7.5 mV	Pass
50% Load	8.3 mV	13.1 mV	8.2 mV	9.3 mV	Pass
60% Load	8.1 mV	13.7 mV	8.8 mV	9.8 mV	Pass
70% Load	8.4 mV	14.0 mV	9.6 mV	10.8 mV	Pass
80% Load	9.7 mV	25.7 mV	20.2 mV	12.4 mV	Pass
90% Load	9.4 mV	15.4 mV	12.7 mV	11.7 mV	Pass
100% Load	14.0 mV	15.1 mV	11.9 mV	13.9 mV	Pass
110% Load	13.8 mV	16.0 mV	12.4 mV	13.4 mV	Pass
Crossload 1	10.9 mV	14.4 mV	9.8 mV	5.4 mV	Pass
Crossload 2	13.7 mV	13.4 mV	9.1 mV	12.0 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	2.7 mV	11.5 mV	6.4 mV	8.0 mV	Pass
20% Load	8.1 mV	12.1 mV	7.0 mV	5.1 mV	Pass
30% Load	11.8 mV	12.2 mV	7.7 mV	5.3 mV	Pass
40% Load	9.4 mV	12.6 mV	8.1 mV	7.7 mV	Pass
50% Load	8.6 mV	13.9 mV	9.0 mV	10.1 mV	Pass
60% Load	8.3 mV	14.4 mV	9.9 mV	10.6 mV	Pass
70% Load	9.1 mV	14.0 mV	9.5 mV	11.4 mV	Pass
80% Load	9.6 mV	26.6 mV	20.7 mV	11.9 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	9.3 mV	15.7 mV	12.3 mV	12.6 mV	Pass
100% Load	13.1 mV	15.3 mV	12.1 mV	12.2 mV	Pass
110% Load	14.0 mV	16.2 mV	12.8 mV	13.3 mV	Pass
Crossload 1	5.4 mV	14.0 mV	10.1 mV	5.2 mV	Pass
Crossload 2	13.5 mV	13.7 mV	9.5 mV	11.1 mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower GF1 850W (#2)

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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