Thermaltake Toughpower GF1 1000W

PSTPD1000FNFAGU1XU000245

Lab ID TT10001885

Certification ID 251885

Test Result Report ID: 21PS1885A

Certificate Issue Date: Aug 26, 2021

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

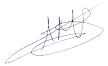
General Information

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 1000W
OEM/ODM	Channel Well Technology
Serial Number	PSTPD1000FNFAGU1XU000245
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	15
□□□□ (Hz)	50-60

□□□□ (W)	1000
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	140mm Hydraulic Bearing Fan [TT-1425 (A1425L12S)]
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	TT10001885
Date of receipt	Jul 19, 2021
Testing Date	Aug 24, 2021
Report Issued Date	Aug 26, 2021
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	16AWG	□
8 pin EPS 12V □□ (700mm)	1	1	16AWG	□
4+4 pin EPS 12V □□ (700mm)	1	1	16AWG	□
6+2pin PCIe□□ (500mm+150mm)	3	6	16-18AWG	□
SATA□□ (500mm+150mm+150mm+150mm)	3	12	18AWG	□
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	□
□ 4pin □□ (150mm)	1	1	20AWG	□
AC Power Cord (1420mm) - C13 coupler	1	1	14AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	24	24	83.3	3	0.5
	□	120		1000	15	6
□□□□□ (W)		1000				

Parts Description

General Data	-
Manufacturer (OEM)	CWT
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CAP200DG (Discharge IC)
Inrush Protection	NTC Thermistor SCK-055 (5 Ohm) & Relay
Bridge Rectifier(s)	2x GBU1510 (1000V, 15A @ 100°C)
APFC MOSFETs	3x Infineon IPA50R140CP (500V, 15A @ 100°C, Rds(on): 0.14 Ohm)
APFC Boost Diode	1x Infineon IDH10G65C6 (650V, 10A @ 140°C)
Bulk Cap(s)	2x Nichicon (400V, 680uF & 470uF each or 1.150uF compined, 2,000h @ 105°C, GG)
Main Switchers	2x Infineon IPW60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm)
APFC Controller	Champion CM6500UNX & Champion CM03X
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x International Rectifier IRFH7004PbF (40V, 164A @ 100°C, Rds(on): 1.4mOhm)
5V & 3.3V	DC-DC Converters: 4x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm) & 2x UBIQ QN3107M6N (30V, 70A @ 100°C, Rds(on): 2.6mOhm) PWM Controllers: UPI Semi uP3861P
Filtering Capacitors	Electrolytic: 10x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 6x Nichicon (4-10,000h @ 105°C, HE), 1x Rubycon (6-10,000h @ 105°C, ZLH), 1x Rubycon (3-6,000h @ 105°C, YXG) Polymer: 10x FPCAP, 11x NIC, 5x Nippon Chemi-Con
Supervisor IC	IN1S429I (OCP, OVP, UVP, SCP, PG)
Fan Model	Thermaltake TT-1425 (Hong Sheng A1425L12S) (140mm, 12V, 0.30A, Hydraulic Bearing Fan)
5VSB Circuit	-

Rectifier	1x Galaxy Microelectronics D10PS45L SBR (45V, 10A) & IPS ISD04N65A FET
Standby PWM Controller	On-Bright OB5282

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓
ALPM (Alternative Low Power Mode) compatible	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.220%
Average Noise Output (>1450 Load Combinations)	35.61dBA
PF□□□ (>1450 Load Combinations)	0.976
Efficiency With 10W (≤500W) or 2% (>500W) Load	63.714%
□□□□□□	0.0438W
Non-Accredited	
12V Ripple (Full Load)	15.76mV
5V Ripple (Full Load)	16.16mV
3.3V Ripple (Full Load)	19.13mV
5VSB Ripple (Full Load)	7.30mV
12V Load Regulation	0.63%
5V Load Regulation	0.68%
3.3V Load Regulation	1.09%
5VSB Load Regulation	4.16%
Inrush Current	33.900A

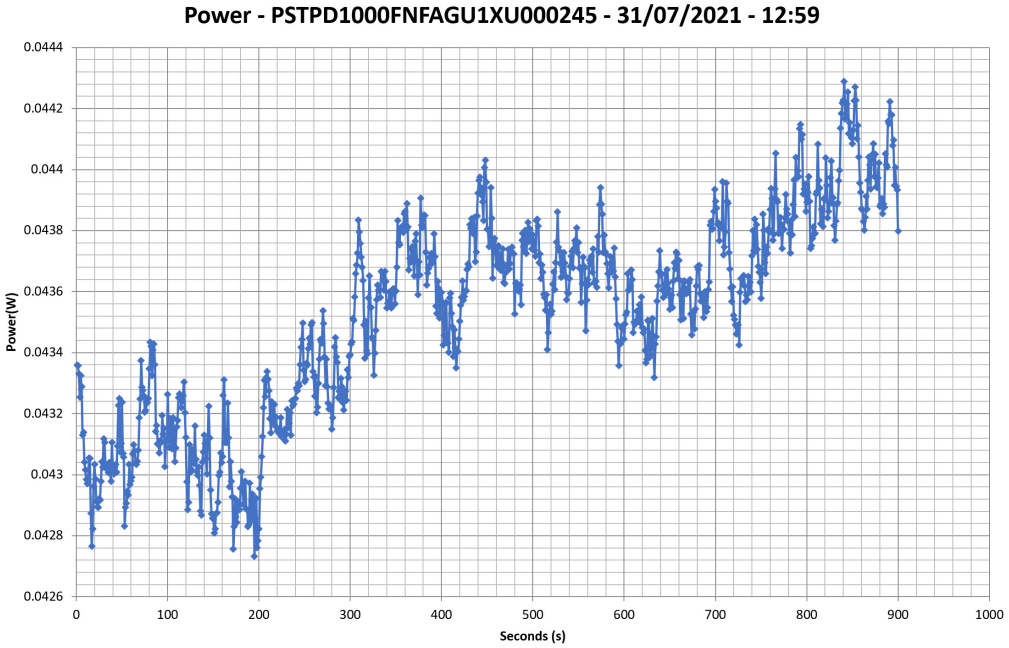
230V		
Accredited		
□□□□ (>1450 load combinations)		90.422%
Average Noise Output (>1450 Load Combinations)		35.58dBA
PF□□□ (>1450 Load Combinations)		0.931
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0624W
Non-Accredited		
12V Ripple (Full Load)		15.04mV
5V Ripple (Full Load)		16.87mV
3.3V Ripple (Full Load)		19.56mV
5VSB Ripple (Full Load)		7.39mV
12V Load Regulation		0.61%
5V Load Regulation		0.68%
3.3V Load Regulation		1.06%
5VSB Load Regulation		4.14%
Inrush Current		66.480A
□□□□ & PG□□		19.00ms
AC Loss to PWR_OK Hold Up Time		17.40ms
PWR_OK Inactive to DC Loss Delay		1.60ms
PSU Timings: T1 (20% / 100%)	36.0ms	36.0ms
PSU Timings: T3 (20% / 100%)	134.0ms	134.0ms
OPP (29.73°C / 40.76°C)	131.54%	120.14%

□□□□ & PG□□

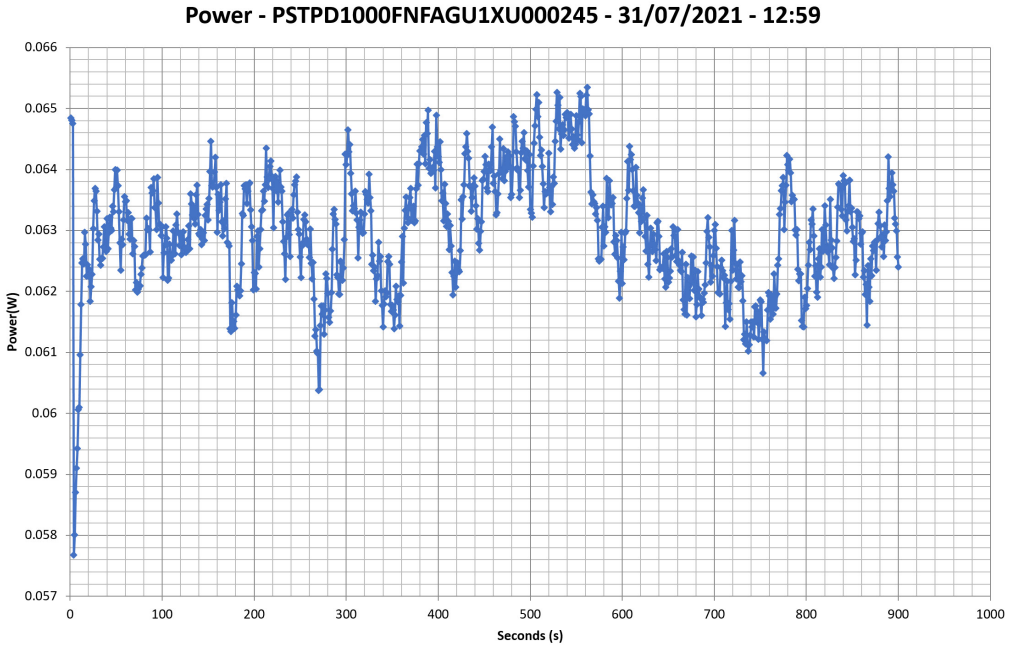
Hold-Up Time (ms)	19
AC Loss to PWR_OK Hold Up Time (ms)	17.4
PWR_OK Inactive to DC Loss Delay (ms)	1.6

Graphs

115V



230V



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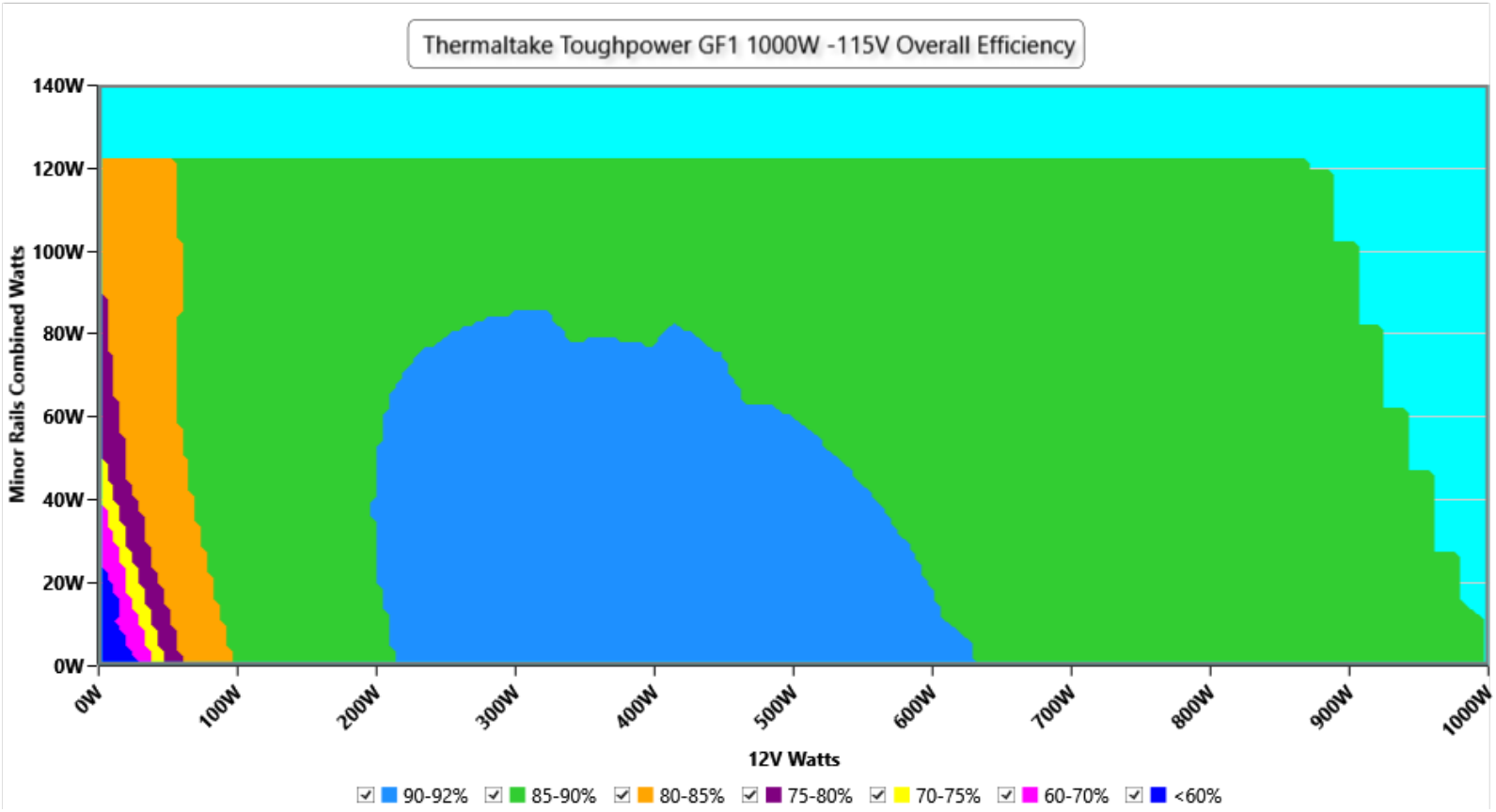
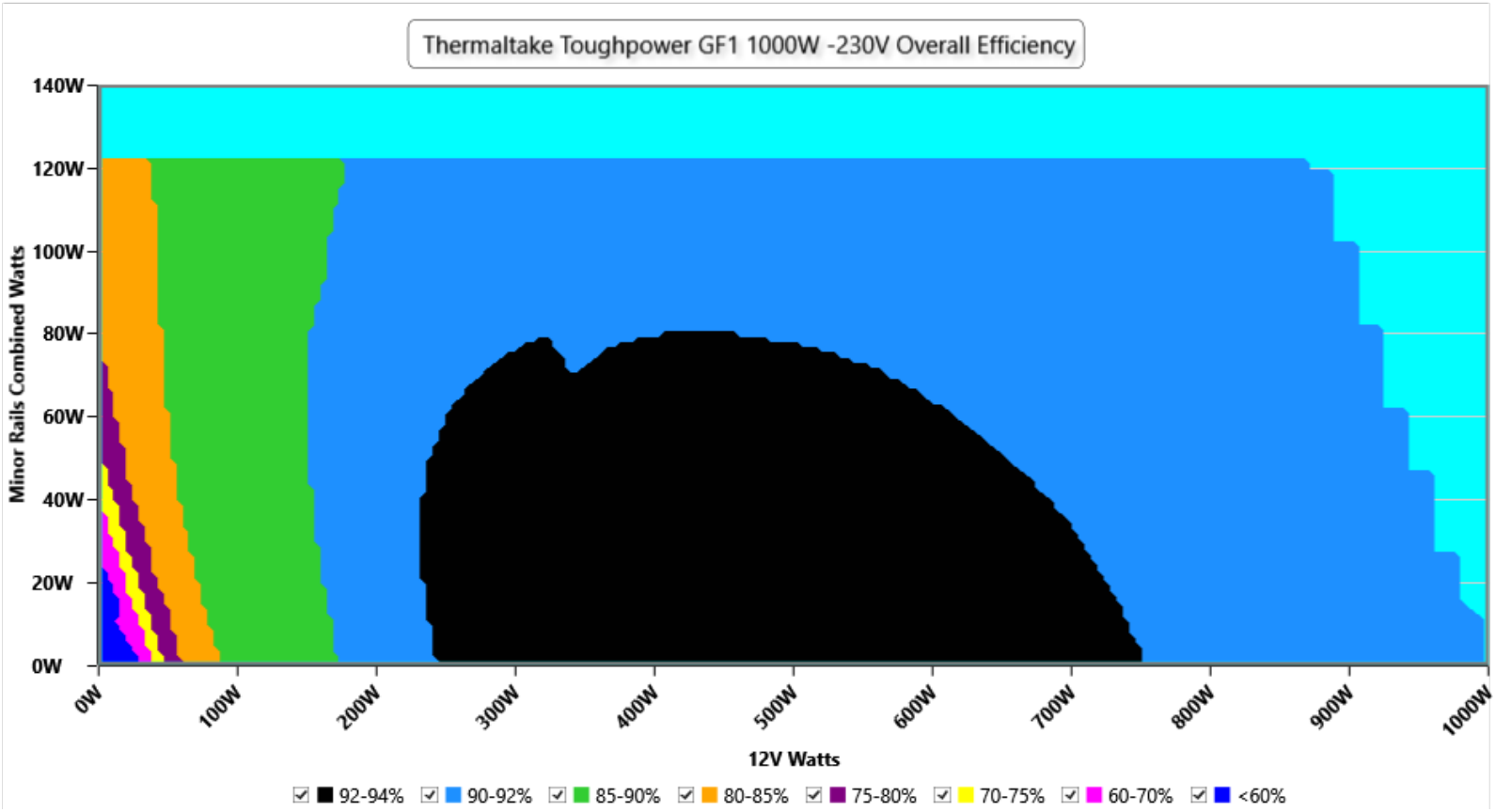
115V



□□

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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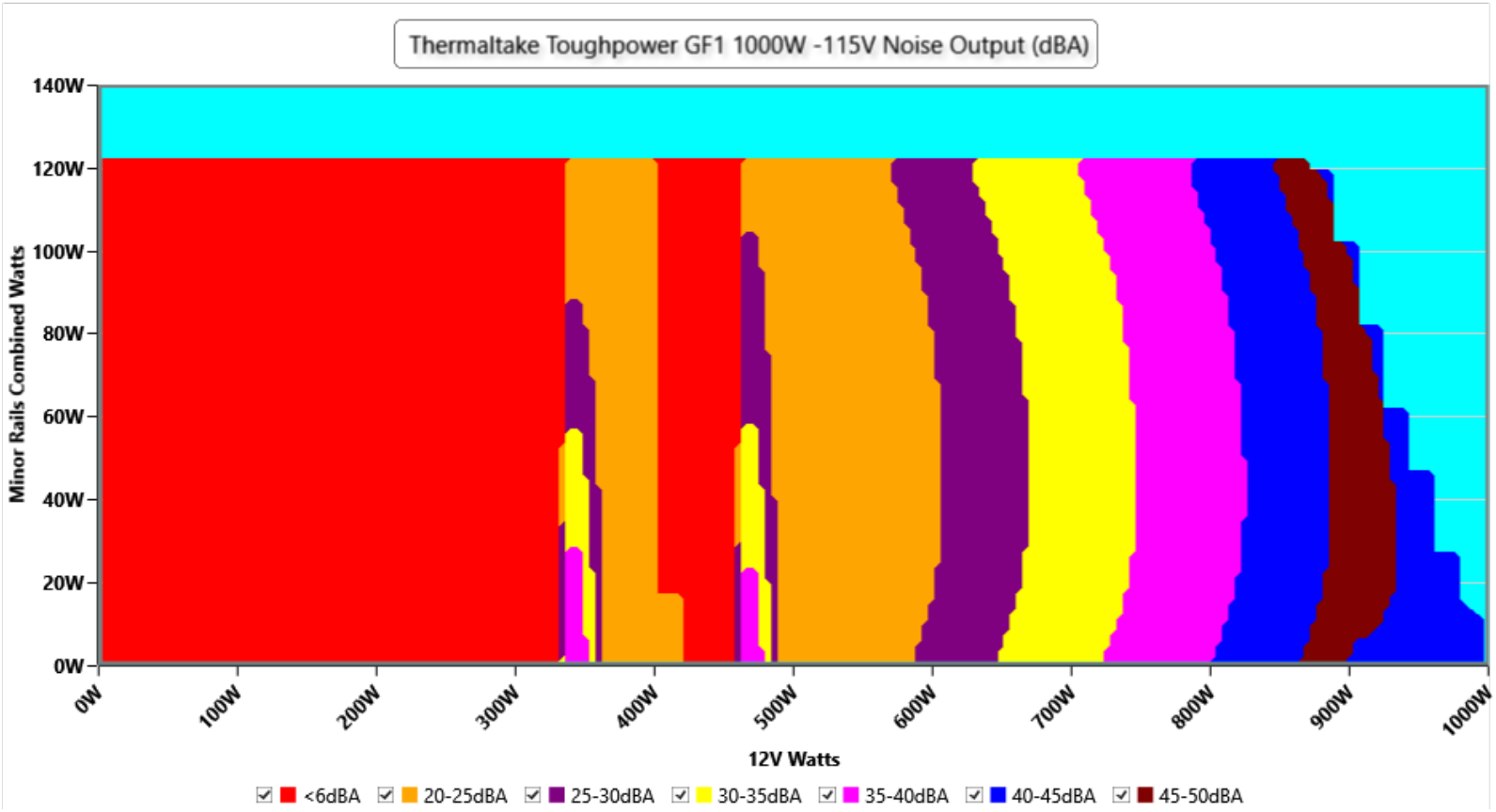
□□□□□

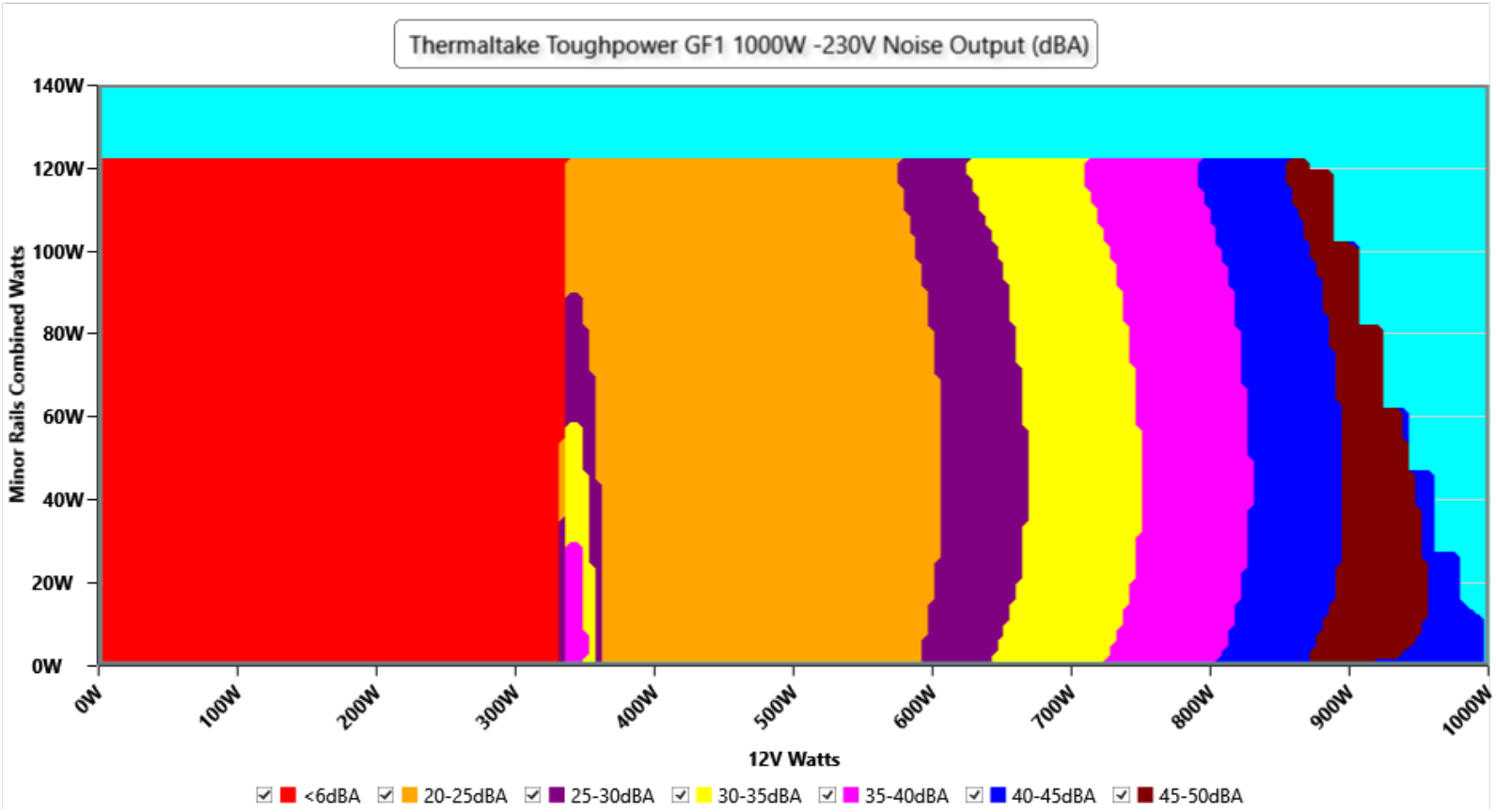
115V



□□

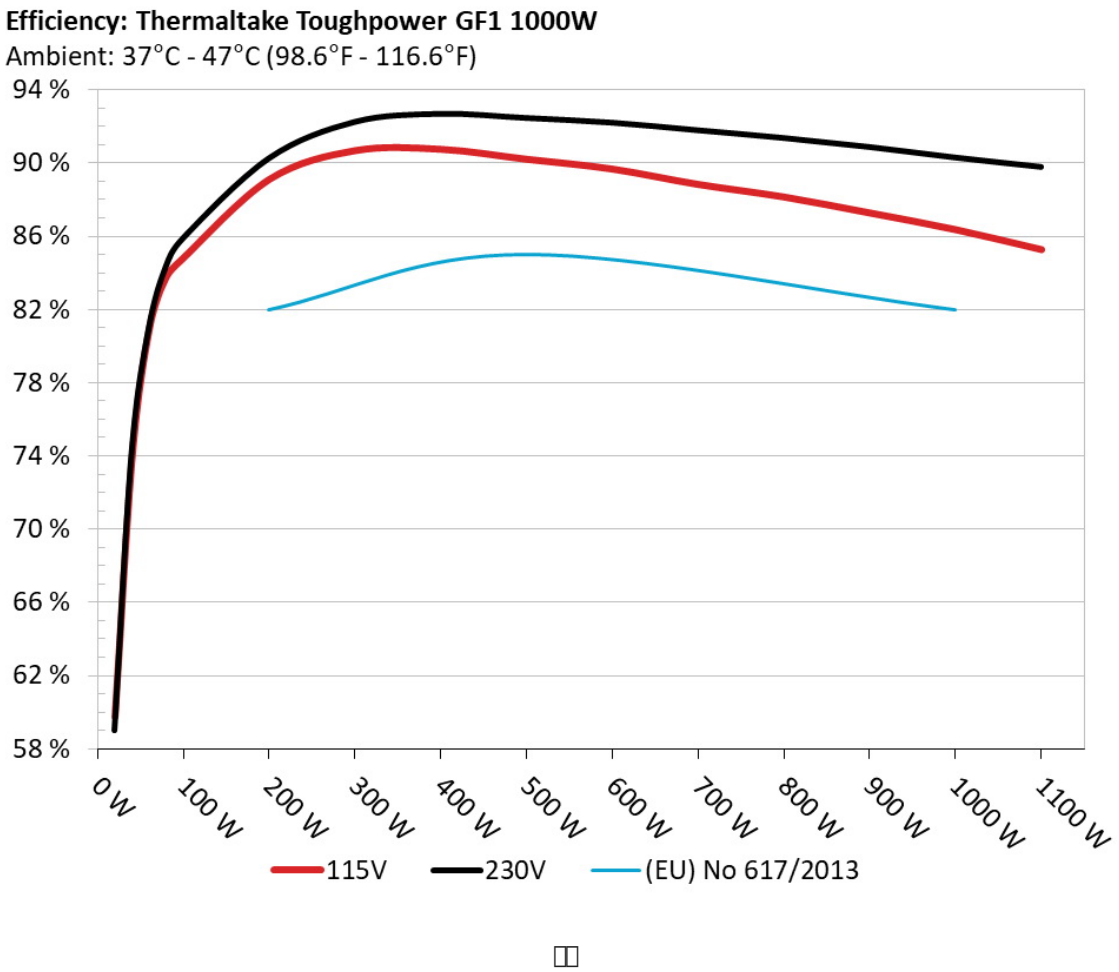
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

230V



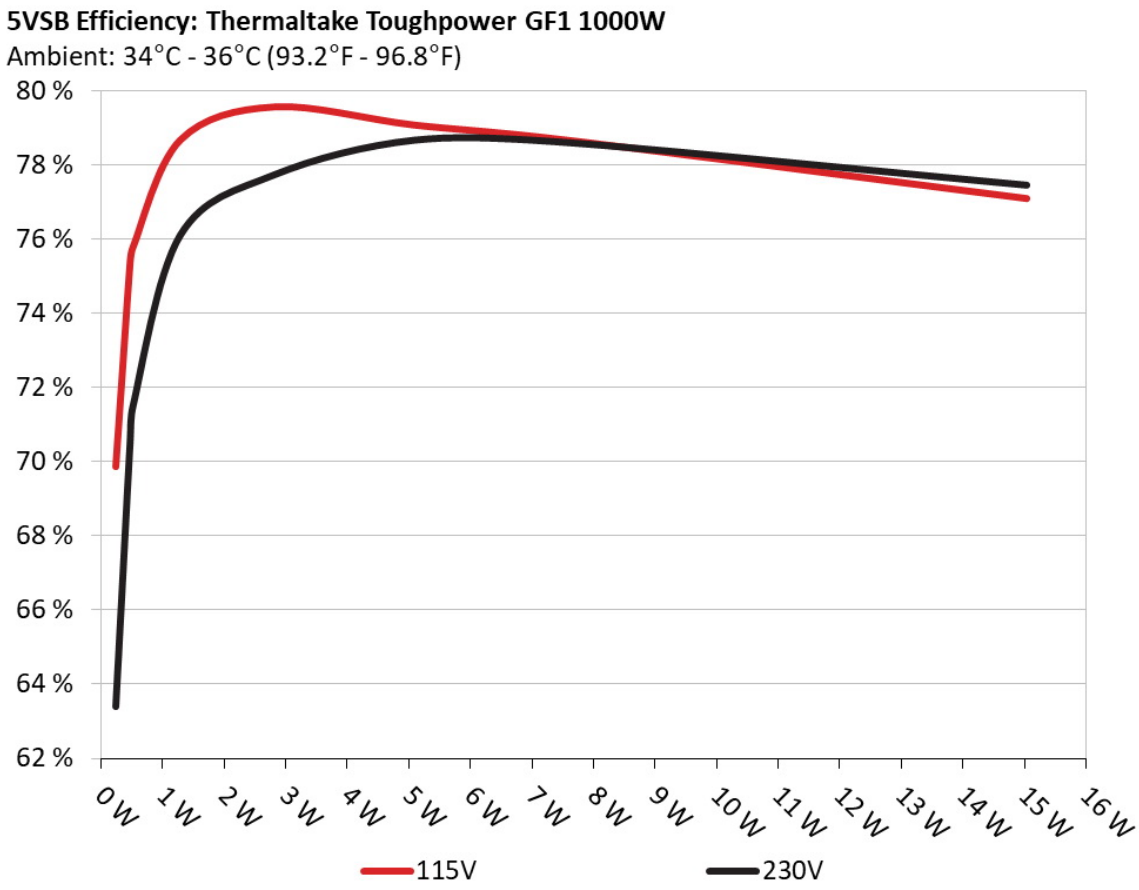
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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	0.23W	69.871%	0.033
	5.117V	0.329W		115.13V
2	0.09A	0.461W	75.340%	0.061
	5.115V	0.612W		115.12V
3	0.55A	2.805W	79.553%	0.269
	5.099V	3.526W		115.13V
4	1A	5.084W	79.064%	0.364
	5.083V	6.43W		115.13V
5	1.5A	7.6W	78.650%	0.417
	5.066V	9.663W		115.13V
6	3.001A	15.039W	77.088%	0.479
	5.012V	19.509W		115.12V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.23W	63.404%	0.011
	5.116V	0.363W		230.26V
2	0.09A	0.461W	70.486%	0.02
	5.115V	0.654W		230.26V
3	0.55A	2.805W	77.723%	0.103
	5.099V	3.609W		230.26V
4	1A	5.084W	78.656%	0.17
	5.083V	6.464W		230.26V
5	1.5A	7.599W	78.587%	0.229
	5.065V	9.67W		230.26V
6	3.001A	15.038W	77.446%	0.334
	5.012V	19.418W		230.26V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	6.476A	1.985A	1.972A	0.987A	100.032	84.851%	0	<6.0	46.19°C	0.963
	12.110V	5.038V	3.347V	5.069V	117.892				40.82°C	115.14V
20%	13.961A	2.98A	2.961A	1.188A	199.998	89.134%	0	<6.0	46.83°C	0.976
	12.112V	5.034V	3.344V	5.052V	224.379				40.97°C	115.14V
30%	21.792A	3.479A	3.457A	1.391A	300.071	90.708%	0	<6.0	47.73°C	0.976
	12.116V	5.031V	3.341V	5.034V	330.809				41.35°C	115.14V
40%	29.626A	3.978A	3.955A	1.595A	399.894	90.78%	0	<6.0	48.4°C	0.972
	12.107V	5.029V	3.338V	5.017V	440.509				41.65°C	115.14V
50%	37.162A	4.976A	4.949A	1.801A	499.627	90.238%	960	27.3	41.95°C	0.975
	12.085V	5.026V	3.335V	4.999V	553.68				49.2°C	115.13V
60%	44.792A	5.975A	5.947A	2A	600.119	89.698%	993	28.3	42.48°C	0.978
	12.063V	5.023V	3.33V	4.984V	669.041				50.26°C	115.13V
70%	52.300A	6.976A	6.945A	2.216A	699.853	88.86%	1266	35.6	42.87°C	0.98
	12.060V	5.019V	3.327V	4.965V	787.592				51.23°C	115.12V
80%	59.899A	7.979A	7.946A	2.324A	799.904	88.173%	1530	41.1	43.59°C	0.982
	12.053V	5.016V	3.323V	4.951V	907.2				52.32°C	115.12V
90%	67.824A	8.483A	8.436A	2.432A	899.71	87.305%	1751	45.0	44.54°C	0.984
	12.049V	5.012V	3.32V	4.936V	1030.542				53.83°C	115.12V
100%	75.572A	8.988A	8.957A	3.061A	999.721	86.393%	1745	44.6	45.97°C	0.985
	12.042V	5.009V	3.316V	4.902V	1157.18				55.8°C	115.11V
110%	83.271A	9.995A	10.055A	3.069A	1100.351	85.298%	1743	44.3	46.64°C	0.987
	12.033V	5.005V	3.312V	4.89V	1290.012				57.38°C	115.11V
CL1	0.116A	14.389A	14.31A	0A	121.346	82.461%	840	22.7	42.26°C	0.973
	12.083V	5.02V	3.333V	5.09V	147.156				49.4°C	115.15V

CL2	0.116A	23.955A	0A	0A	121.452	80.603%	0	<6.0	51.45°C	0.973
	12.087V	5.011V	3.348V	5.096V	150.679				43.45°C	115.15V
CL3	0.116A	0A	23.801A	0A	80.6	74.691%	0	<6.0	53.87°C	0.962
	12.105V	5.035V	3.327V	5.094V	107.911				44.91°C	115.15V
CL4	83.012A	0A	0A	0A	1000.252	86.873%	1758	45.4	45.93°C	0.985
	12.049V	5.025V	3.329V	5.027V	1151.392				55.75°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 □□
10%	6.474A	1.985A	1.972A	0.987A	100.026	85.89%	0	<6.0	45.29°C	0.822
	12.115V	5.038V	3.347V	5.069V	116.459				40.01°C	230.29V
20%	13.962A	2.98A	2.961A	1.188A	199.986	90.242%	0	<6.0	46.75°C	0.9
	12.109V	5.034V	3.344V	5.052V	221.61				40.95°C	230.29V
30%	21.798A	3.479A	3.457A	1.39A	300.052	92.232%	0	<6.0	47.86°C	0.929
	12.111V	5.031V	3.341V	5.035V	325.324				41.47°C	230.29V
40%	29.626A	3.978A	3.954A	1.595A	399.853	92.672%	0	<6.0	48.68°C	0.94
	12.105V	5.029V	3.338V	5.017V	431.471				41.87°C	230.28V
50%	37.188A	4.975A	4.949A	1.8A	499.599	92.447%	878	24.1	42.24°C	0.949
	12.076V	5.026V	3.334V	5.001V	540.415				49.62°C	230.28V
60%	44.751A	5.974A	5.945A	2A	600.066	92.192%	1126	32.0	42.88°C	0.953
	12.073V	5.023V	3.33V	4.983V	650.885				50.83°C	230.29V
70%	52.274A	6.975A	6.944A	2.216A	699.819	91.778%	1336	37.2	43.45°C	0.956
	12.065V	5.019V	3.327V	4.965V	762.513				51.84°C	230.29V
80%	59.883A	7.978A	7.945A	2.323A	799.84	91.356%	1547	41.2	43.88°C	0.959
	12.055V	5.016V	3.323V	4.952V	875.524				52.77°C	230.28V
90%	67.820A	8.482A	8.435A	2.431A	899.618	90.865%	1748	44.8	44.46°C	0.961
	12.048V	5.013V	3.32V	4.938V	990.056				53.79°C	230.29V
100%	75.566A	8.987A	8.956A	3.06A	999.634	90.29%	1746	44.7	45.47°C	0.963
	12.042V	5.009V	3.316V	4.903V	1107.14				55.38°C	230.28V

110%	83.236A	9.993A	10.053A	3.066A	1100.212	89.779%	1747	44.7	46.54°C	0.965
	12.036V	5.005V	3.312V	4.893V	1225.474				57.33°C	230.28V
CL1	0.116A	14.386A	14.309A	0A	121.33	82.899%	840	22.7	42.43°C	0.854
	12.086V	5.021V	3.333V	5.091V	146.36				49.61°C	230.28V
CL2	0.116A	23.95A	0A	0A	121.438	81.305%	0	<6.0	51.65°C	0.856
	12.095V	5.012V	3.349V	5.096V	149.361				43.92°C	230.28V
CL3	0.116A	0A	23.798A	0A	80.591	75.471%	0	<6.0	53.21°C	0.803
	12.113V	5.034V	3.328V	5.094V	106.784				44.7°C	230.28V
CL4	82.980A	0A	0A	0A	1000.131	90.895%	1754	45.1	45.25°C	0.962
	12.053V	5.025V	3.329V	5.028V	1100.316				54.51°C	230.28V

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 □□
20W	1.226A	0.496A	0.492A	0.196A	20.012	59.778%	0	<6.0	40.23°C	0.847
	12.116V	5.043V	3.352V	5.106V	33.478				36.95°C	115.14V
40W	2.698A	0.694A	0.689A	0.294A	40.013	73.993%	0	<6.0	41.35°C	0.923
	12.116V	5.042V	3.351V	5.101V	54.077				37.65°C	115.14V
60W	4.172A	0.893A	0.887A	0.393A	60.014	80.979%	0	<6.0	42.42°C	0.938
	12.116V	5.042V	3.35V	5.095V	74.11				38.24°C	115.14V
80W	5.640A	1.091A	1.084A	0.491A	79.981	83.813%	0	<6.0	44.06°C	0.958
	12.117V	5.041V	3.35V	5.089V	95.428				39.34°C	115.14V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.226A	0.496A	0.492A	0.196A	20.011	59.026%	0	<6.0	39.89°C	0.53
	12.113V	5.043V	3.351V	5.106V	33.902				36.78°C	230.29V
40W	2.700A	0.694A	0.689A	0.294A	40.012	74.232%	0	<6.0	40.7°C	0.652
	12.114V	5.042V	3.351V	5.101V	53.9				37.17°C	230.29V
60W	4.172A	0.893A	0.887A	0.393A	60.012	80.984%	0	<6.0	42.82°C	0.727
	12.113V	5.041V	3.35V	5.095V	74.103				38.7°C	230.29V
80W	5.642A	1.091A	1.084A	0.491A	79.974	84.346%	0	<6.0	44.61°C	0.78
	12.113V	5.04V	3.349V	5.09V	94.816				39.87°C	230.29V

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□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.03mV	12.67mV	14.37mV	4.25mV	Pass
20% Load	8.55mV	12.61mV	12.02mV	4.30mV	Pass
30% Load	12.67mV	13.43mV	12.17mV	4.86mV	Pass
40% Load	10.69mV	13.33mV	12.63mV	4.86mV	Pass
50% Load	9.93mV	13.64mV	15.90mV	5.17mV	Pass
60% Load	9.93mV	13.69mV	15.29mV	5.42mV	Pass
70% Load	9.82mV	14.51mV	15.34mV	5.53mV	Pass
80% Load	9.98mV	14.40mV	15.80mV	6.04mV	Pass
90% Load	10.03mV	15.68mV	17.44mV	6.50mV	Pass
100% Load	15.76mV	16.16mV	19.13mV	7.30mV	Pass
110% Load	15.57mV	16.86mV	19.75mV	7.84mV	Pass
Crossload1	8.61mV	13.42mV	13.64mV	8.47mV	Pass
Crossload2	9.31mV	12.62mV	14.01mV	8.09mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	9.21mV	12.56mV	12.78mV	7.93mV	Pass
Crossload4	15.16mV	16.33mV	19.18mV	10.58mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.68mV	12.36mV	11.35mV	4.40mV	Pass
20% Load	8.50mV	12.62mV	11.66mV	4.50mV	Pass
30% Load	12.31mV	13.59mV	14.98mV	4.71mV	Pass
40% Load	15.76mV	18.85mV	12.53mV	8.44mV	Pass
50% Load	9.41mV	14.45mV	14.16mV	5.48mV	Pass
60% Load	9.88mV	14.25mV	14.57mV	5.68mV	Pass
70% Load	9.82mV	14.86mV	15.50mV	5.88mV	Pass
80% Load	9.78mV	14.55mV	25.16mV	6.19mV	Pass
90% Load	9.77mV	15.02mV	16.41mV	6.24mV	Pass
100% Load	15.04mV	16.87mV	19.56mV	7.39mV	Pass
110% Load	15.22mV	17.09mV	19.87mV	7.50mV	Pass
Crossload1	8.25mV	13.97mV	13.48mV	8.00mV	Pass
Crossload2	8.85mV	12.51mV	12.17mV	8.29mV	Pass
Crossload3	8.80mV	13.07mV	12.63mV	7.93mV	Pass
Crossload4	14.15mV	16.81mV	18.26mV	10.34mV	Pass

The results above are not used in the certification process





Thermaltake Toughpower GF1 1000W

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。
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