Thermaltake Toughpower GF1 1200W

PSTPD1200FNFAGU1XU000327

Lab ID TT12001894

Certification ID 251894

Test Result Report ID: 21PS1894A

Certificate Issue Date: Sep 9, 2021

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





Aristeidis Bitziopoulos, Certification Body General Manager

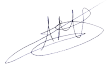
General Information

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	Thermaltake
Model	Toughpower GF1 1200W
OEM/ODM	Channel Well Technology
Serial Number	PSTPD1200FNFAGU1XU000327
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	15
□□□□ (Hz)	50-60

□□□□ (W)	1200
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	TT12001894
Date of receipt	Jul 19, 2021
Testing Date	Sep 8, 2021
Report Issued Date	Sep 9, 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 (1400mm) - C13 coupler	1	1	14AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	22	22	100	3	0.5
	□	120		1200	15	6
□□□□□ (W)		1200				

Parts Description

General Data	-
Manufacturer (OEM)	CTW
Platform	CST
PCB Type	Double Sided
Primary Side	-
Transient Filter	6x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK-0510 (5 Ohm) & Relay
Bridge Rectifier(s)	2x GBJ2506 (600V, 25A @ 100°C)
APFC MOSFETs	2x Infineon IPA60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm), 1x Sync Power SPN5003 FET (for reduced no-load consumption)
APFC Boost Diode	2x ON Semiconductor FFSP0865A (650V, 8A @ 155°C)
Bulk Cap(s)	2x Nippon Chemi-Con (420V, 680uF each or 1,360uF combined, 2,000h @ 105°C, KMZ)
Main Switchers	4x Alpha & Omega AOTF29S50 (500V, 18A @ 100°C, Rds(on): 0.15Ohm)
IC Driver	2x Silicon Labs Si8233BD
APFC FET Drivers	2x On Semiconductor NCP81071
Digital Controllers	2x Texas Instruments UCD3138A
Topology	Primary side: Semi-Digital, Interleaved PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x On Semiconductor NTMFS5C612N (60V, 160A @ 100°C, Rds(on): 1.6mOhm)
5V & 3.3V	DC-DC Converters: 2x Sync Power SPN3006 (30V, 57A @ 100°C, Rds(on): 5.5mOhm), 2x UBIQ QM3006D (30V, 57A @ 100°C, Rds(on): 5.5mOhm) PWM Controller(s): ANPEC APW7159C
Switch Over FET	Excelliance MOS EMB09N03A (30V, 35A @ 100°C, Rds(on): 9mOhm)

Filtering Capacitors	Electrolytic: 4x Nichicon (2-4,000h @ 105°C, HD), 1x Nichicon (4-10,000h @ 105°C, HE), 2x Rubycon (6-10,000h @ 105°C, ZLH), 3x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 3x Rubycon (4-10,000h @ 105°C, YXJ) Polymer: 24x Nippon Chemi-Con, 8x NIC, 6x FPCAP
Supervisor IC	Weltrend WT7502 (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□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.906%
Average Noise Output (>1450 Load Combinations)	37.21dBA
PF□□□ (>1450 Load Combinations)	0.993
Efficiency With 10W (≤500W) or 2% (>500W) Load	68.702%
□□□□□□	0.0513W
Non-Accredited	
12V Ripple (Full Load)	24.82mV
5V Ripple (Full Load)	11.71mV
3.3V Ripple (Full Load)	14.03mV
5VSB Ripple (Full Load)	13.67mV
12V Load Regulation	0.27%

5V Load Regulation	0.82%
3.3V Load Regulation	0.55%
5VSB Load Regulation	1.87%
Inrush Current	33.370A

230V

Accredited		
□□□□ (>1450 load combinations)		91.044%
Average Noise Output (>1450 Load Combinations)		38.62dBA
PF□□□ (>1450 Load Combinations)		0.952
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.1165W
Non-Accredited		
12V Ripple (Full Load)		25.90mV
5V Ripple (Full Load)		11.26mV
3.3V Ripple (Full Load)		13.35mV
5VSB Ripple (Full Load)		13.22mV
12V Load Regulation		0.26%
5V Load Regulation		0.82%
3.3V Load Regulation		0.55%
5VSB Load Regulation		1.87%
Inrush Current		65.300A
□□□□ & PG□□		18.50ms
AC Loss to PWR_OK Hold Up Time		17.40ms
PWR_OK Inactive to DC Loss Delay		1.10ms
PSU Timings: T1 (20% / 100%)	95.0ms	95.0ms
PSU Timings: T3 (20% / 100%)	283.0ms	285.0ms
OPP (26.77°C / 43.49°C)	134.10%	133.85%

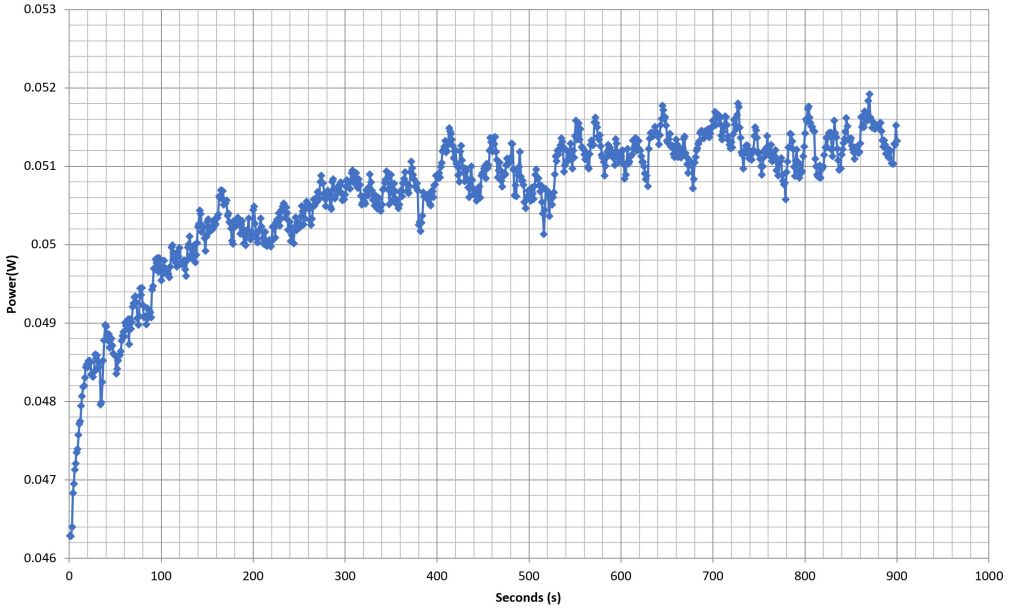
□□□□ & PG□□

Hold-Up Time (ms)	18.5
AC Loss to PWR_OK Hold Up Time (ms)	17.4
PWR_OK Inactive to DC Loss Delay (ms)	1.1

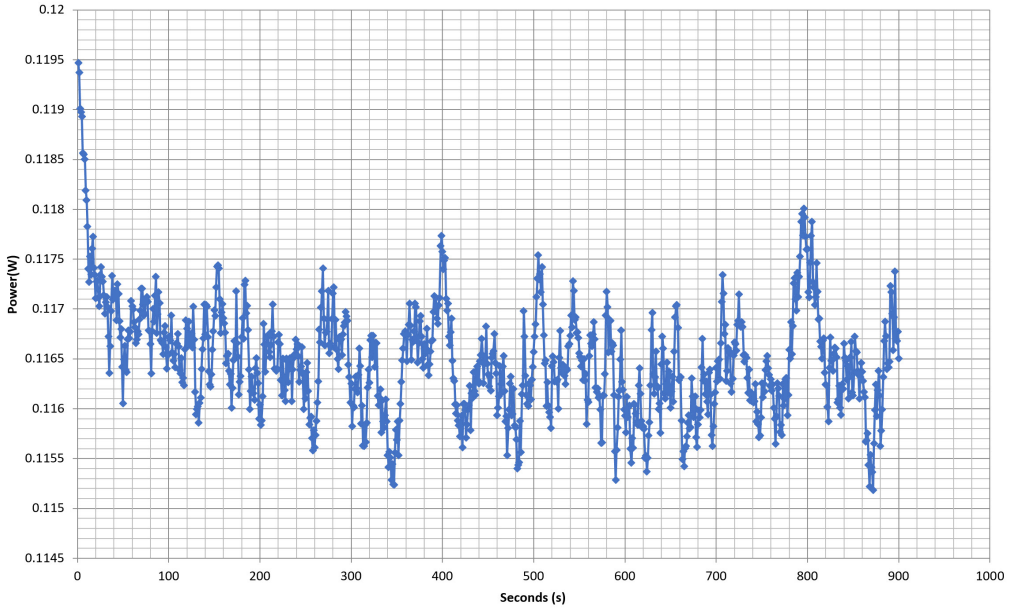
□□□□

Graphs

115V



230V



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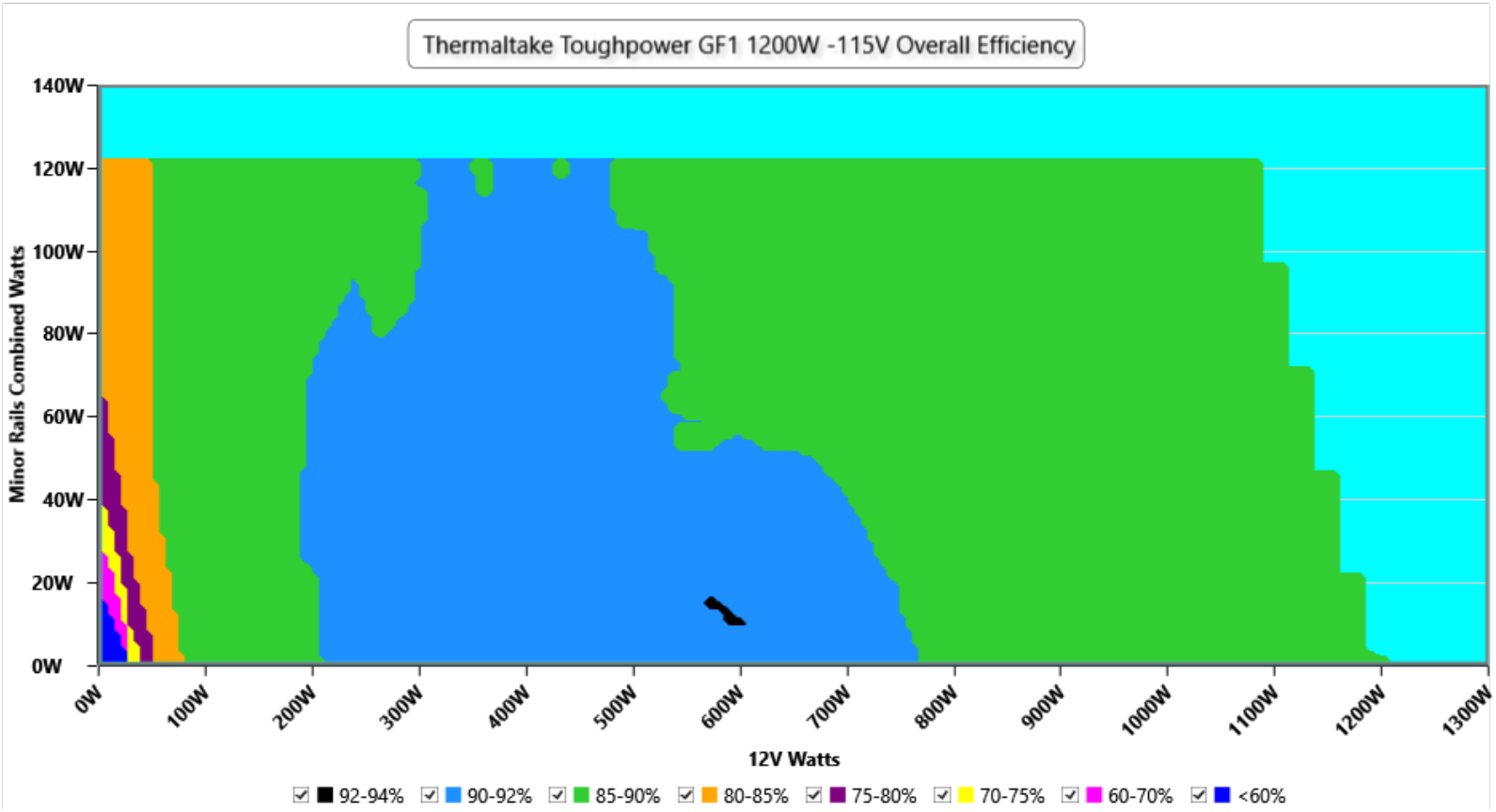
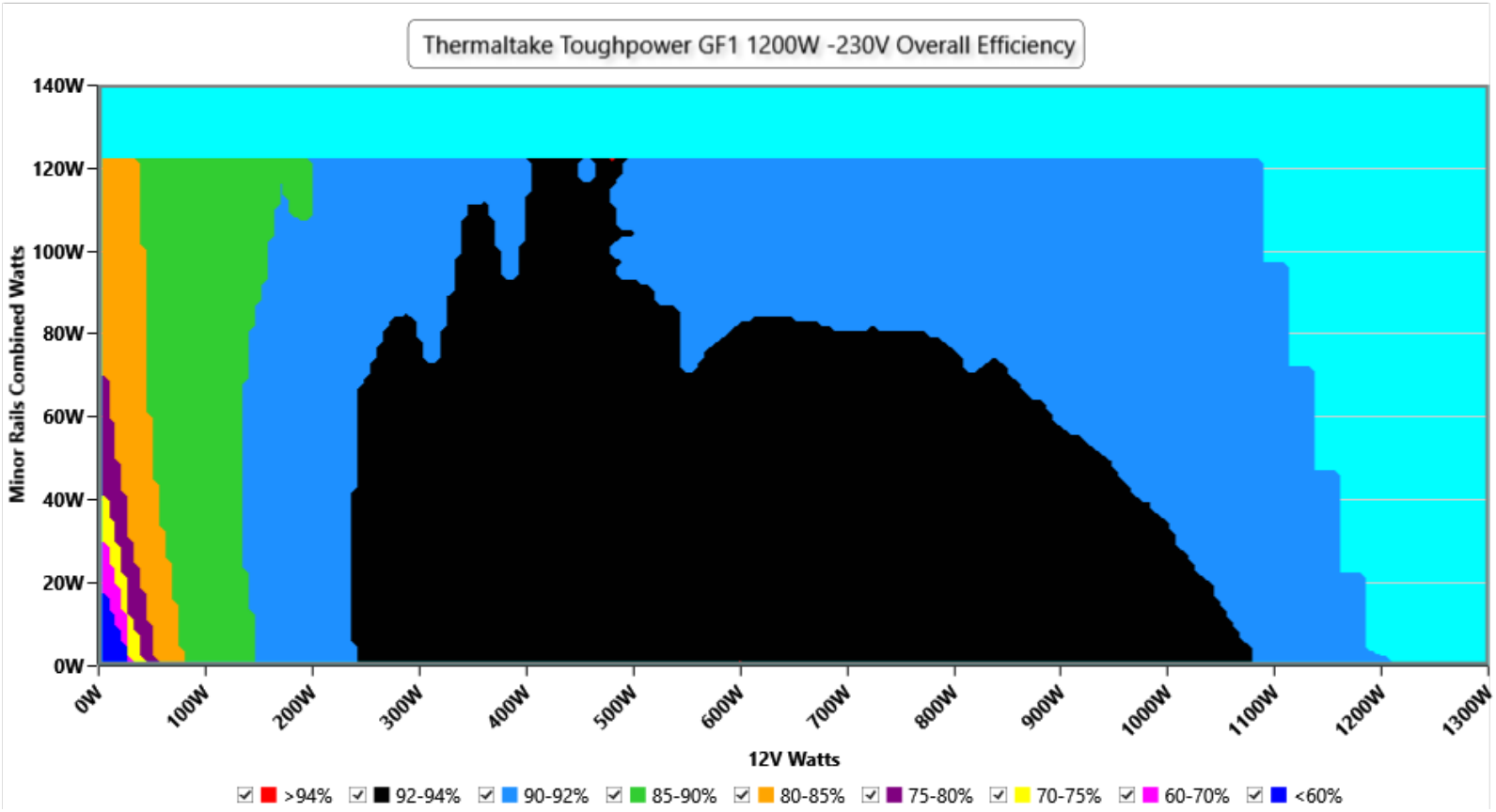
115V



□□

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

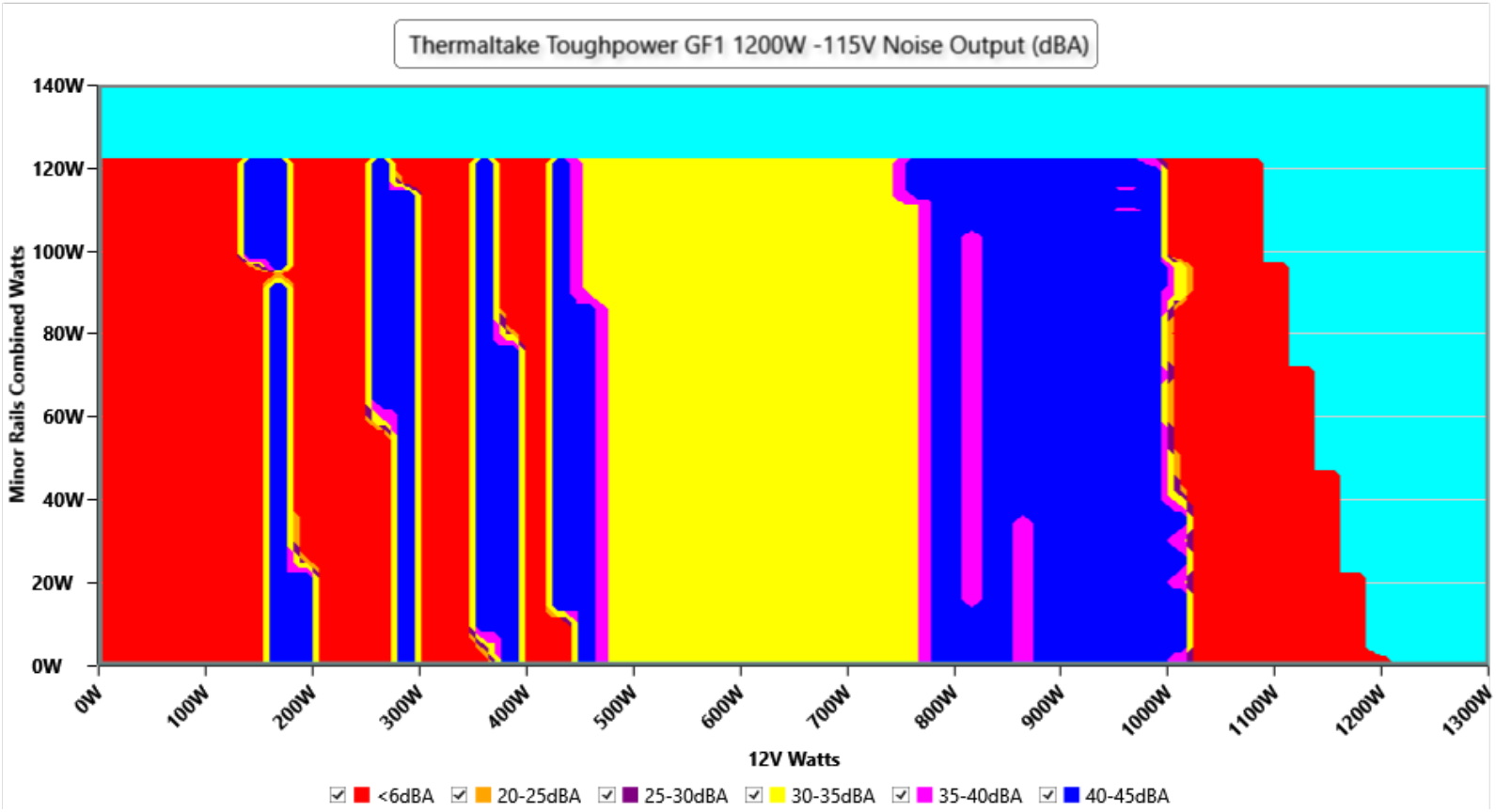
230V



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

□□□□□

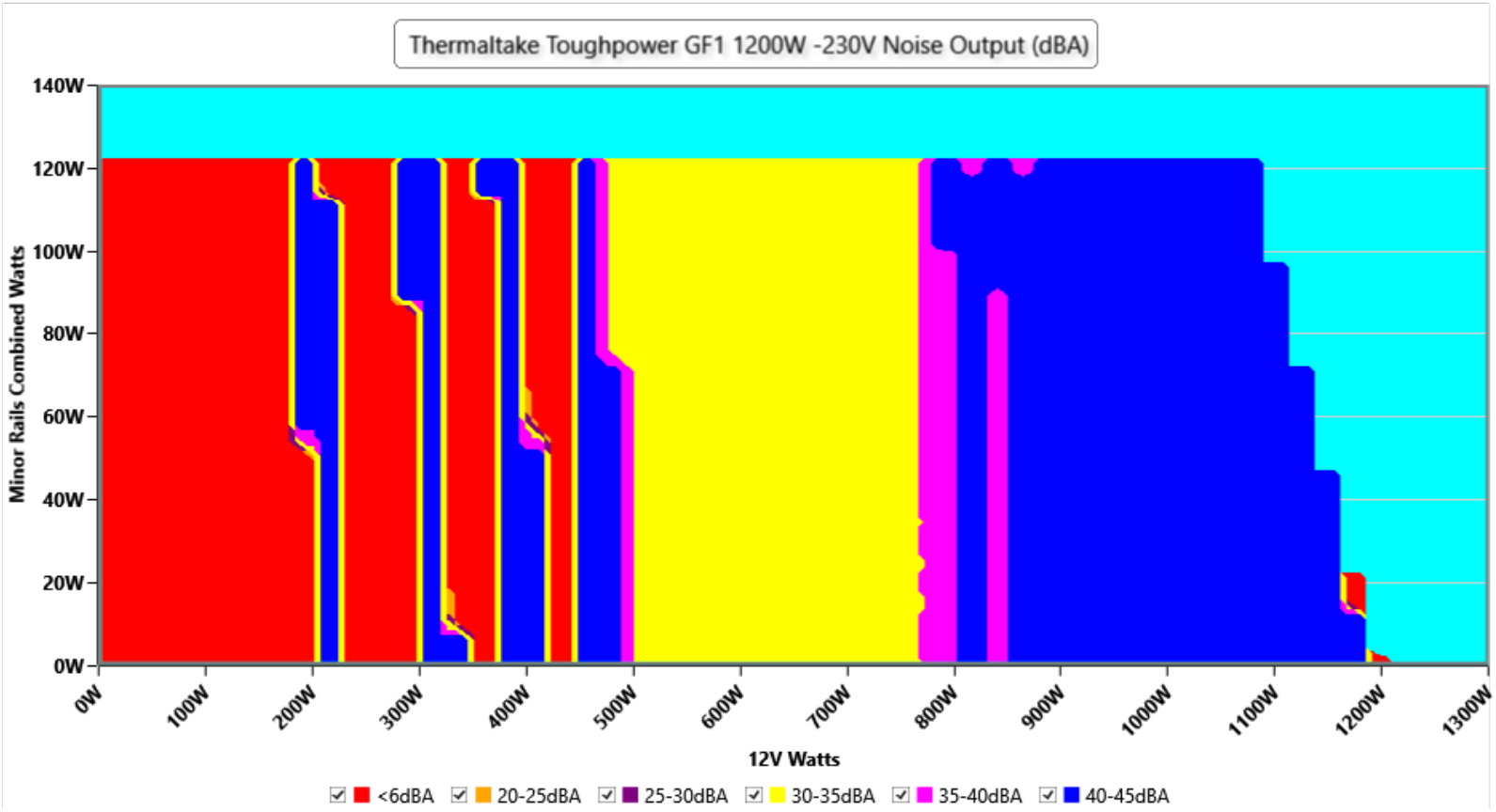
115V



□□

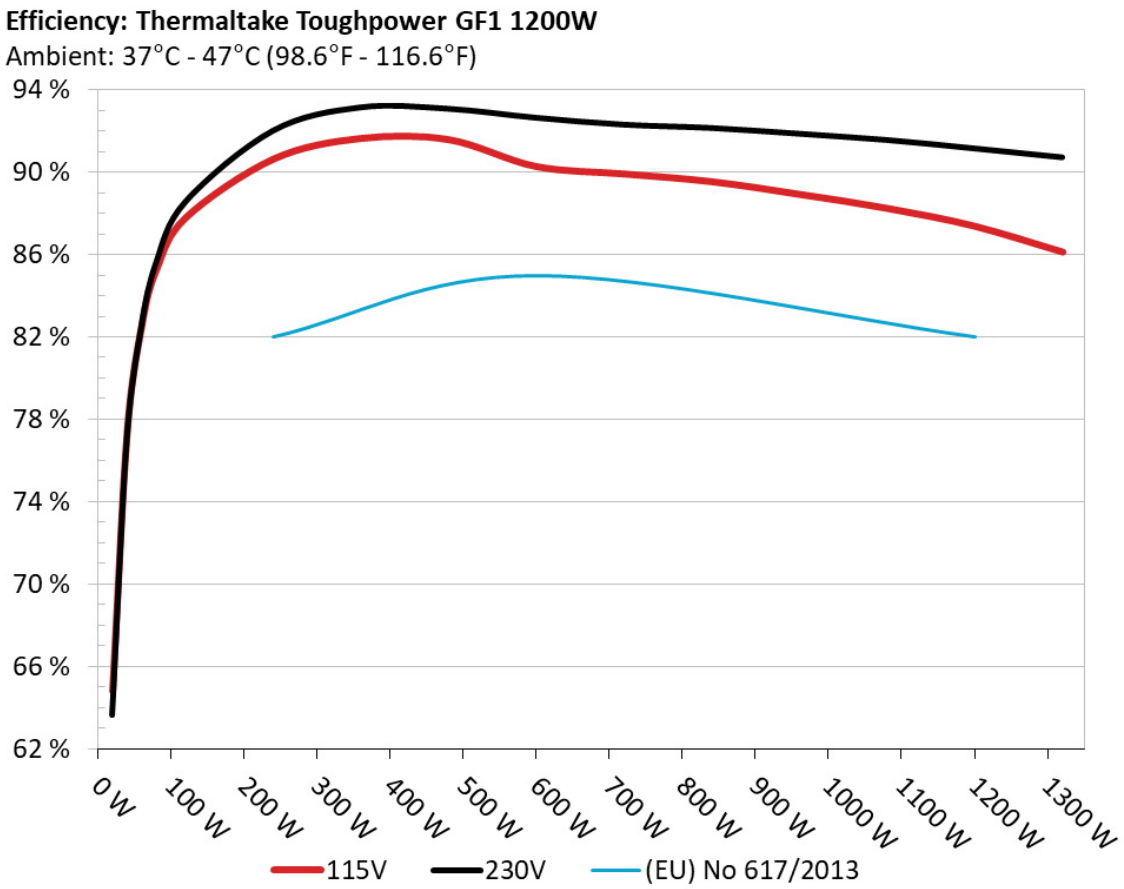
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

230V



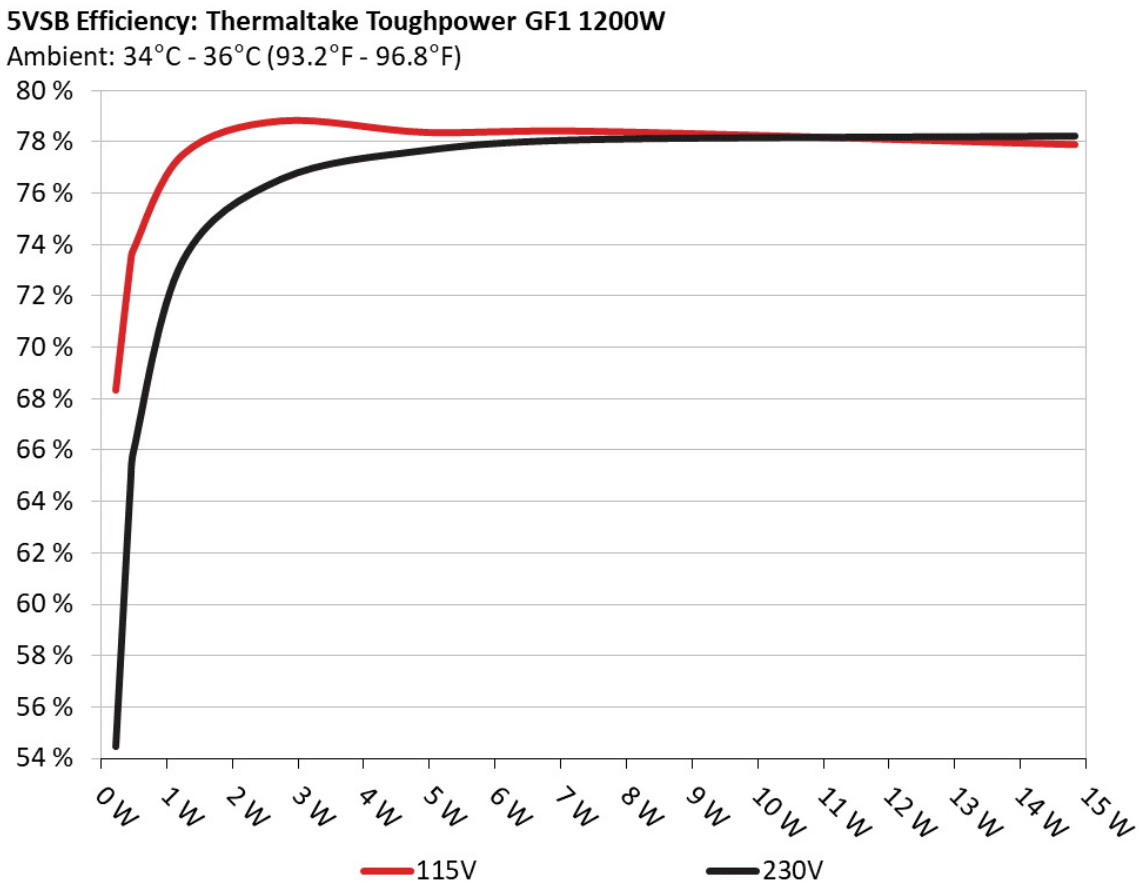
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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	0.225W	68.339%	0.026
	4.992V	0.329W		115.2V
2	0.09A	0.449W	73.298%	0.048
	4.991V	0.613W		115.2V
3	0.55A	2.742W	78.795%	0.225
	4.983V	3.48W		115.2V
4	1A	4.977W	78.347%	0.323
	4.976V	6.353W		115.2V
5	1.5A	7.454W	78.393%	0.383
	4.968V	9.509W		115.2V
6	3.001A	14.833W	77.877%	0.46
	4.944V	19.047W		115.2V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.225W	54.463%	0.01
	4.99V	0.413W		230.43V
2	0.09A	0.449W	64.709%	0.017
	4.989V	0.694W		230.43V
3	0.55A	2.741W	76.534%	0.083
	4.981V	3.581W		230.43V
4	1A	4.976W	77.666%	0.14
	4.975V	6.407W		230.43V
5	1.5A	7.453W	78.074%	0.194
	4.967V	9.546W		230.43V
6	3.001A	14.828W	78.209%	0.301
	4.942V	18.96W		230.42V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	8.182A	1.978A	1.995A	0.993A	120.015	87.807%	0	<6.0	45.39°C	0.985
	12.029V	5.057V	3.308V	5.039V	136.681				40.34°C	115.18V
20%	17.381A	2.969A	2.994A	1.193A	239.992	90.659%	0	<6.0	46.77°C	0.994
	12.030V	5.053V	3.307V	5.031V	264.727				41.17°C	115.18V
30%	26.896A	3.466A	3.495A	1.394A	359.495	91.662%	1575	42.0	41.71°C	0.996
	12.026V	5.05V	3.305V	5.024V	392.202				47.85°C	115.18V
40%	36.479A	3.964A	3.996A	1.595A	479.802	91.605%	1570	41.8	41.84°C	0.997
	12.023V	5.046V	3.304V	5.017V	523.778				48.55°C	115.17V
50%	45.586A	4.959A	4.998A	1.797A	599.61	90.299%	1598	42.5	42.2°C	0.998
	12.045V	5.043V	3.302V	5.01V	664.027				49.52°C	115.18V
60%	54.797A	5.956A	6.002A	1.999A	720.153	89.938%	1601	42.6	42.56°C	0.998
	12.051V	5.038V	3.3V	5.003V	800.717				50.53°C	115.19V
70%	63.993A	6.954A	7.006A	2.203A	839.906	89.564%	1615	43.4	43.35°C	0.998
	12.045V	5.034V	3.298V	4.995V	937.776				51.87°C	115.19V
80%	73.267A	7.955A	8.011A	2.305A	959.932	88.949%	1626	43.9	43.95°C	0.998
	12.039V	5.03V	3.296V	4.99V	1079.205				53.29°C	115.19V
90%	82.909A	8.458A	8.5A	2.408A	1079.76	88.27%	1635	44.4	44.81°C	0.998
	12.028V	5.026V	3.294V	4.985V	1223.235				54.64°C	115.19V
100%	92.365A	8.963A	9.021A	3.02A	1199.82	87.398%	1640	44.6	45.24°C	0.998
	12.018V	5.022V	3.293V	4.967V	1372.838				55.53°C	115.18V
110%	101.794A	9.967A	10.118A	3.022A	1320.451	86.144%	1643	44.8	46.79°C	0.998
	12.006V	5.018V	3.291V	4.964V	1532.839				57.65°C	115.18V
CL1	0.117A	14.313A	14.437A	0A	121.325	81.065%	1575	42.0	42.33°C	0.983
	12.020V	5.045V	3.304V	5.06V	149.66				49.69°C	115.19V

CL2	0.117A	21.795A	0A	0A	111.407	80.061%	0	<6.0	52.4°C	0.982
	12.025V	5.047V	3.301V	5.078V	139.156				43.51°C	115.18V
CL3	0.116A	0A	22.003A	0A	74.001	73.096%	1559	41.5	44.36°C	0.967
	12.029V	5.048V	3.3V	5.04V	101.248				53.56°C	115.18V
CL4	99.775A	0A	0A	0.001A	1200.276	87.908%	1638	44.5	45.45°C	0.998
	12.030V	5.033V	3.299V	5.039V	1365.386				55.53°C	115.18V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	8.182A	1.978A	1.995A	0.992A	120.018	88.563%	0	<6.0	45.48°C	0.858
	12.028V	5.058V	3.309V	5.039V	135.513				40.46°C	230.39V
20%	17.379A	2.969A	2.994A	1.193A	239.986	92.029%	0	<6.0	46.47°C	0.927
	12.031V	5.054V	3.307V	5.032V	260.775				40.72°C	230.39V
30%	26.895A	3.466A	3.494A	1.393A	359.431	93.163%	1556	41.5	41.16°C	0.941
	12.023V	5.05V	3.306V	5.025V	385.812				47.39°C	230.39V
40%	36.479A	3.964A	3.996A	1.595A	479.835	93.101%	1565	41.7	42.01°C	0.954
	12.024V	5.047V	3.304V	5.017V	515.385				48.66°C	230.39V
50%	45.614A	4.959A	4.998A	1.797A	599.582	92.665%	1590	42.3	42.59°C	0.973
	12.037V	5.043V	3.302V	5.01V	647.052				49.91°C	230.38V
60%	54.796A	5.956A	6A	1.999A	720.125	92.326%	1613	43.3	42.65°C	0.985
	12.050V	5.039V	3.3V	5.003V	779.988				50.76°C	230.38V
70%	63.989A	6.955A	7.005A	2.203A	839.877	92.165%	1620	43.6	43.31°C	0.986
	12.045V	5.034V	3.298V	4.995V	911.282				52.26°C	230.37V
80%	73.270A	7.956A	8.01A	2.305A	959.919	91.886%	1628	44.0	43.81°C	0.987
	12.038V	5.03V	3.296V	4.989V	1044.684				53.35°C	230.37V
90%	82.908A	8.459A	8.5A	2.408A	1079.735	91.583%	1635	44.4	44.43°C	0.988
	12.028V	5.026V	3.294V	4.984V	1178.958				54.35°C	230.37V
100%	92.369A	8.963A	9.02A	3.021A	1199.815	91.172%	1643	44.8	45.16°C	0.989
	12.018V	5.022V	3.293V	4.967V	1316.004				55.29°C	230.36V

110%	101.787A	9.967A	10.117A	3.022A	1320.417	90.741%	1647	45.0	46.63°C	0.99
	12.006V	5.018V	3.292V	4.964V	1455.147				57.35°C	230.36V
CL1	0.117A	14.313A	14.435A	0A	121.324	81.661%	1584	42.2	42.38°C	0.855
	12.020V	5.045V	3.305V	5.06V	148.572				49.62°C	230.39V
CL2	0.117A	21.803A	0A	0A	111.407	80.659%	1566	41.7	43.17°C	0.841
	12.025V	5.045V	3.302V	5.077V	138.125				51.36°C	230.38V
CL3	0.116A	0A	22.003A	0A	74.001	74.16%	0	<6.0	53.56°C	0.776
	12.029V	5.052V	3.299V	5.043V	99.799				44.36°C	230.38V
CL4	99.771A	0A	0A	0.001A	1200.264	91.649%	1634	44.3	45.62°C	0.989
	12.030V	5.033V	3.299V	5.039V	1309.634				56.2°C	230.36V

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	1.234A	0.494A	0.498A	0.198A	20.005	64.826%	0	<6.0	39.9°C	0.769
	12.041V	5.063V	3.311V	5.06V	30.858				36.78°C	115.19V
40W	2.714A	0.692A	0.698A	0.297A	40.004	77.434%	0	<6.0	41.32°C	0.919
	12.044V	5.061V	3.31V	5.056V	51.658				37.52°C	115.19V
60W	4.195A	0.889A	0.897A	0.396A	60.003	82.609%	0	<6.0	42.83°C	0.961
	12.046V	5.06V	3.31V	5.054V	72.634				38.45°C	115.18V
80W	5.676A	1.087A	1.097A	0.495A	79.964	85.29%	0	<6.0	44.75°C	0.973
	12.040V	5.059V	3.309V	5.051V	93.756				39.99°C	115.18V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.234A	0.494A	0.498A	0.198A	20.007	63.64%	0	<6.0	39.92°C	0.465
	12.041V	5.063V	3.311V	5.06V	31.441				36.82°C	230.39V
40W	2.714A	0.692A	0.698A	0.297A	40.005	77%	0	<6.0	41.35°C	0.632
	12.044V	5.061V	3.311V	5.057V	51.956				37.9°C	230.39V
60W	4.195A	0.89A	0.897A	0.396A	60.004	82.511%	0	<6.0	42.25°C	0.725
	12.045V	5.06V	3.311V	5.054V	72.712				38.34°C	230.39V
80W	5.676A	1.087A	1.097A	0.495A	79.967	85.598%	0	<6.0	44.14°C	0.786
	12.040V	5.06V	3.31V	5.051V	93.412				39.69°C	230.39V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.74mV	6.75mV	3.48mV	6.42mV	Pass
20% Load	9.70mV	7.21mV	4.71mV	6.12mV	Pass
30% Load	15.53mV	7.11mV	4.20mV	6.78mV	Pass
40% Load	12.26mV	7.82mV	4.35mV	7.60mV	Pass
50% Load	14.93mV	9.46mV	7.52mV	8.41mV	Pass
60% Load	13.13mV	8.85mV	5.78mV	9.23mV	Pass
70% Load	15.12mV	9.51mV	6.50mV	9.43mV	Pass
80% Load	16.50mV	11.05mV	17.25mV	11.37mV	Pass
90% Load	19.51mV	10.79mV	13.00mV	11.62mV	Pass
100% Load	24.82mV	11.71mV	14.03mV	13.67mV	Pass
110% Load	28.28mV	11.45mV	14.80mV	14.73mV	Pass
Crossload1	8.78mV	7.74mV	12.31mV	6.29mV	Pass
Crossload2	8.38mV	7.11mV	4.86mV	6.73mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	7.46mV	7.77mV	21.09mV	6.52mV	Pass
Crossload4	24.66mV	11.66mV	8.81mV	13.55mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.54mV	6.70mV	3.79mV	5.71mV	Pass
20% Load	8.58mV	7.16mV	4.76mV	6.52mV	Pass
30% Load	11.90mV	7.52mV	4.86mV	6.88mV	Pass
40% Load	12.97mV	7.67mV	4.61mV	7.65mV	Pass
50% Load	17.13mV	9.26mV	15.25mV	28.80mV	Pass
60% Load	14.71mV	9.05mV	5.37mV	8.51mV	Pass
70% Load	14.46mV	9.31mV	6.09mV	9.74mV	Pass
80% Load	18.44mV	11.45mV	15.97mV	10.81mV	Pass
90% Load	18.59mV	10.48mV	13.20mV	10.75mV	Pass
100% Load	25.90mV	11.26mV	13.35mV	13.22mV	Pass
110% Load	28.52mV	12.06mV	14.65mV	13.82mV	Pass
Crossload1	9.28mV	7.26mV	12.28mV	6.73mV	Pass
Crossload2	8.27mV	7.52mV	4.97mV	6.37mV	Pass
Crossload3	6.85mV	7.52mV	18.07mV	7.03mV	Pass
Crossload4	25.39mV	11.04mV	7.93mV	12.56mV	Pass

The results above are not used in the certification process





Thermaltake Toughpower GF1 1200W

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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CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com