Thermaltake Toughpower Grand RGB 1050W Platinum (#2)

PSTPG1050FIFAPU1LK000666

Lab ID TT20105013

Certification ID 251601

Test Result Report ID: 20PSA

Certificate Issue Date: Feb 19, 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	Thermaltake
Model	Toughpower Grand RGB 1050W Platinum (#2)
OEM/ODM	Channel Well Technology
Serial Number	PSTPG1050FIFAPU1LK000666
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	13
□□□□ (Hz)	50-60

□□□□ (W)	1050
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	TT20105013
Date of receipt	Sep 11, 2019
Testing Date	Feb 19, 2020
Report Issued Date	Feb 19, 2020
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	□
4+4 pin EPS 12V □□ (650mm)	1	1	16AWG	□
8 pin EPS 12V □□ (650mm)	1	1	16AWG	□
6+2pin PCIe□□ (500mm+150mm)	4	8	16-18AWG	□
SATA□□ (500mm+150mm+150mm+150mm)	3	12	18AWG	□
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	□
□ 4pin □□ (+100mm)	1	1	22AWG	□
AC Power Cord (1440mm) - C13 coupler	1	1	16AWG	-

		3.3V	5V	12V	5VSB	-12V
		22	22	83.33	3	0.3
		120		1000	15	3.6
(W)		1050				

Parts Description

General Data	-
Manufacturer (OEM)	Enhance Electronics
PCB Type	Single Sided
Primary Side	-
Transient Filter	6x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x RS2505M-U1 (600V, 25A @ 150°C)
APFC MOSFETs	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14Ohm)
APFC Boost Diode	2x CREEC3D08060A(600V, 8A @ 152°C)
Hold-up Cap(s)	2x Nippon Chemi-Con (450V, 560uF, 2000h @ 105°C, KMW)
Main Switchers	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14Ohm)
IC Driver	2x Silicon Labs Si8230BD
APFC Controller	ATK AT6101ZS & CM03X Green PFC Controller
Resonant Controller	Champion CM6901T6
Topology	Primary side: Interleaved PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4mOhm)
5V & 3.3V	DC-DC Converters: 4x Infineon BSC018NE2LS (25V, 97A @ 100°C, 1.4mOhm) PWM Controllers: ANPEC APW7160A
Filtering Capacitors	Electrolytic: Nippon Chemi-Con (4-10,000 @ 105°C, KY), Rubycon (3-6,000 @ 105°C, YXG), Rubycon (6-10000 @ 105°C, ZLH), Suncon (105°C) Polymer: Unicon (UPH)
Supervisor IC	SITI PS223 (OCP, OTP, OVP, UVP, SCP, PG)
Fan Model	Yate Loon D12SH (120mm, 12V, 0.30A, Rifle Bearing Fan)

5VSB Circuit	-
Rectifier	1x PFR10V45CT SBR (45V, 10A)
Standby PWM Controller	ATK AT6002H

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)	89.741%
Average Noise Output (>1450 Load Combinations)	34.17dBA
PF□□□ (>1450 Load Combinations)	0.984
Efficiency With 10W (≤500W) or 2% (>500W) Load	65.027%
□□□□□□	0.0417W
Non-Accredited	
12V Ripple (Full Load)	24.54mV
5V Ripple (Full Load)	9.45mV
3.3V Ripple (Full Load)	18.54mV
5VSB Ripple (Full Load)	8.14mV
12V Load Regulation	0.30%
5V Load Regulation	0.53%
3.3V Load Regulation	0.55%
5VSB Load Regulation	1.30%
Inrush Current	18.410A

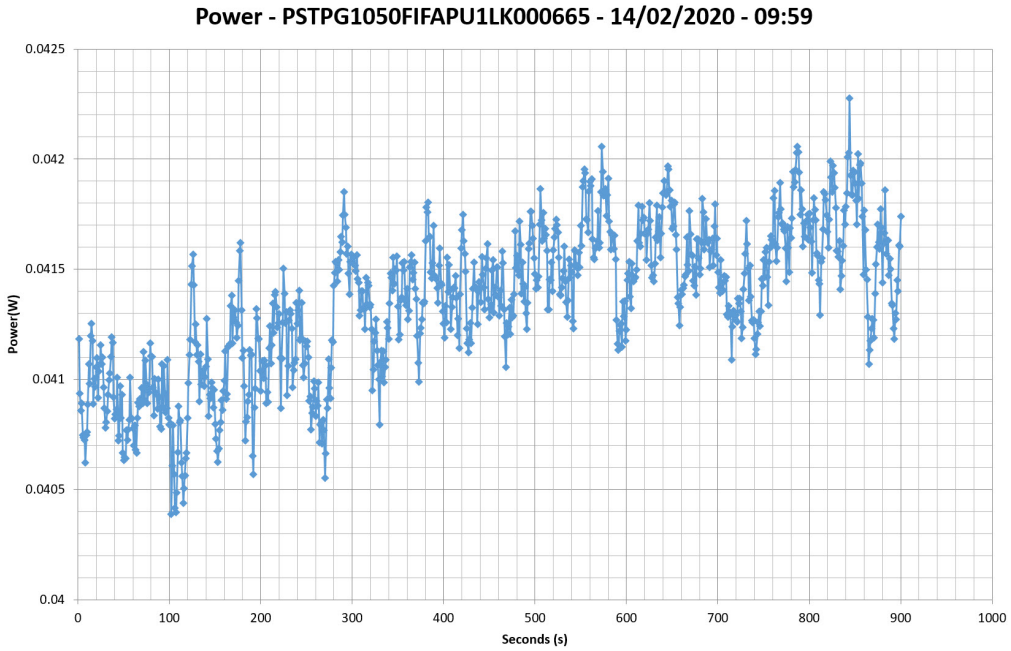
230V		
Accredited		
□□□□ (>1450 load combinations)		91.631%
Average Noise Output (>1450 Load Combinations)		35.08dBA
PF□□□ (>1450 Load Combinations)		0.936
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0720W
Non-Accredited		
12V Ripple (Full Load)		24.71mV
5V Ripple (Full Load)		9.51mV
3.3V Ripple (Full Load)		17.77mV
5VSB Ripple (Full Load)		8.04mV
12V Load Regulation		0.28%
5V Load Regulation		0.55%
3.3V Load Regulation		0.58%
5VSB Load Regulation		1.33%
Inrush Current		39.220A
□□□□ & PG□□		25.50ms
AC Loss to PWR_OK Hold Up Time		17.30ms
PWR_OK Inactive to DC Loss Delay		8.20ms
PSU Timings: T1 (20% / 100%)	99.0ms	94.0ms
PSU Timings: T3 (20% / 100%)	285.0ms	282.0ms
OPP (0.00°C / 0.00°C)	121.32%	-

□□□□ & PG□□

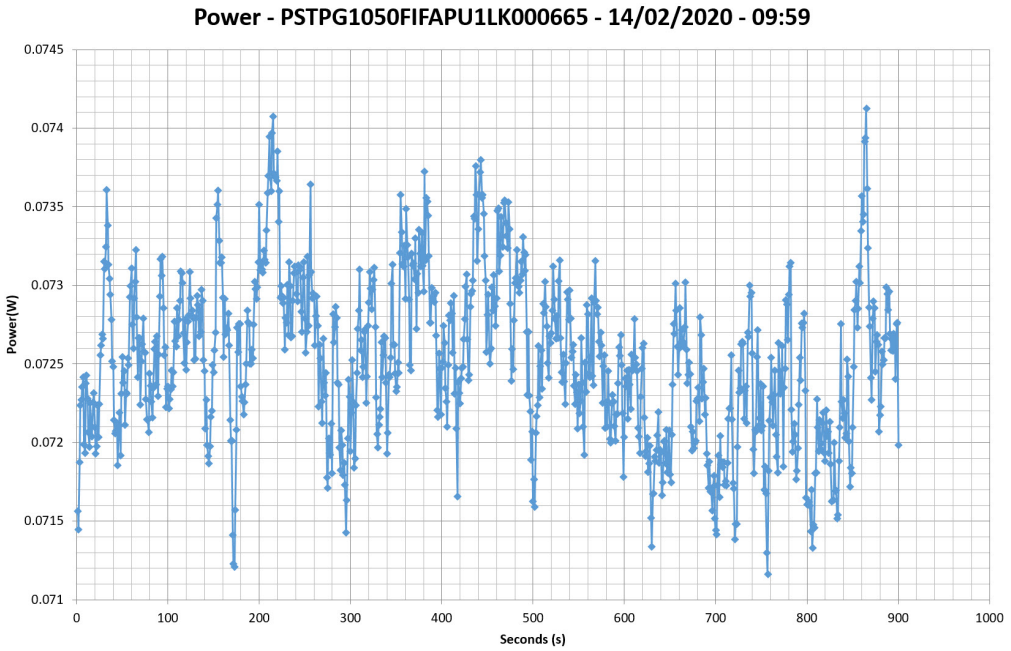
Hold-Up Time (ms)	25.5
AC Loss to PWR_OK Hold Up Time (ms)	17.3
PWR_OK Inactive to DC Loss Delay (ms)	8.2

Graphs

115V



230V



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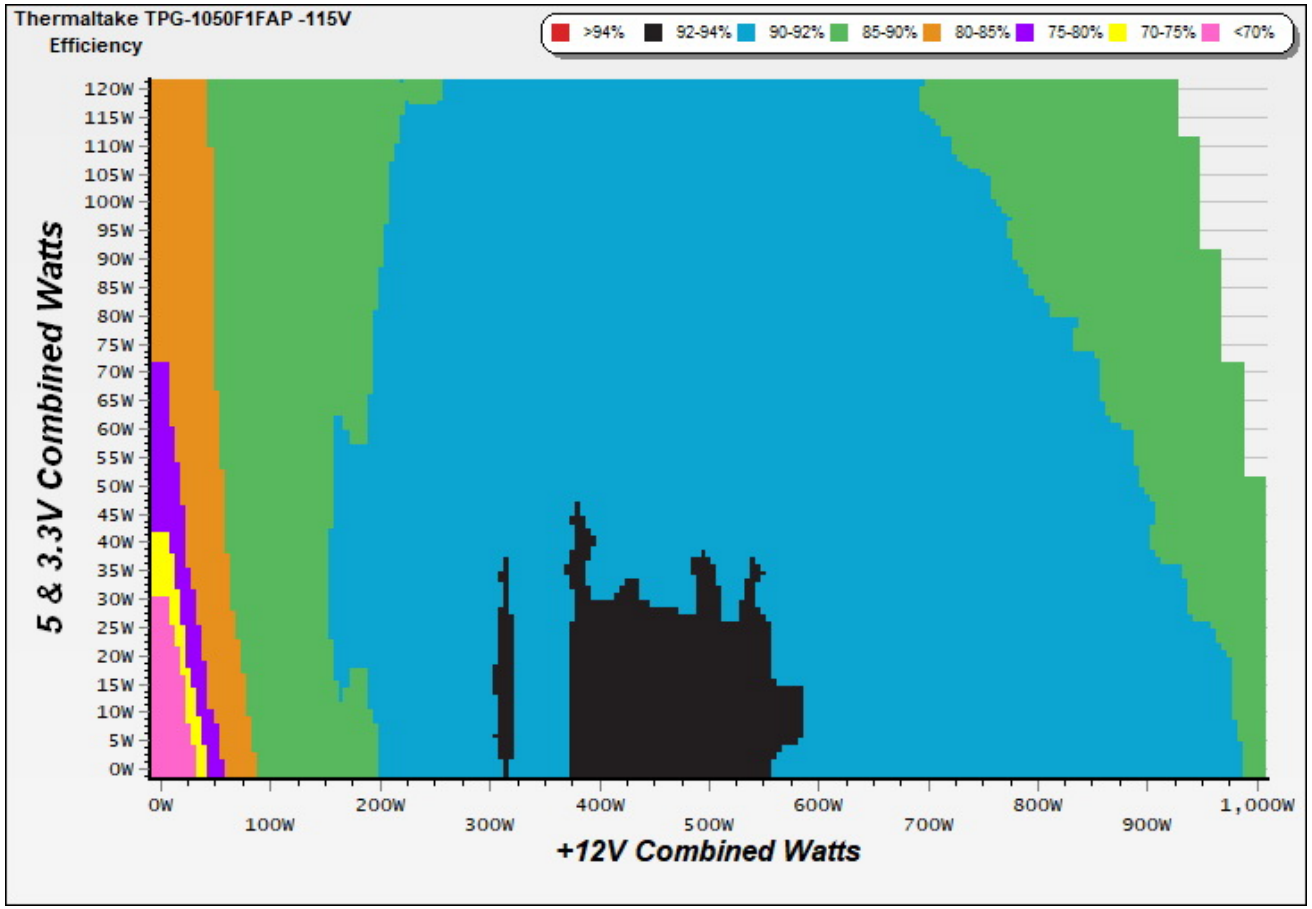
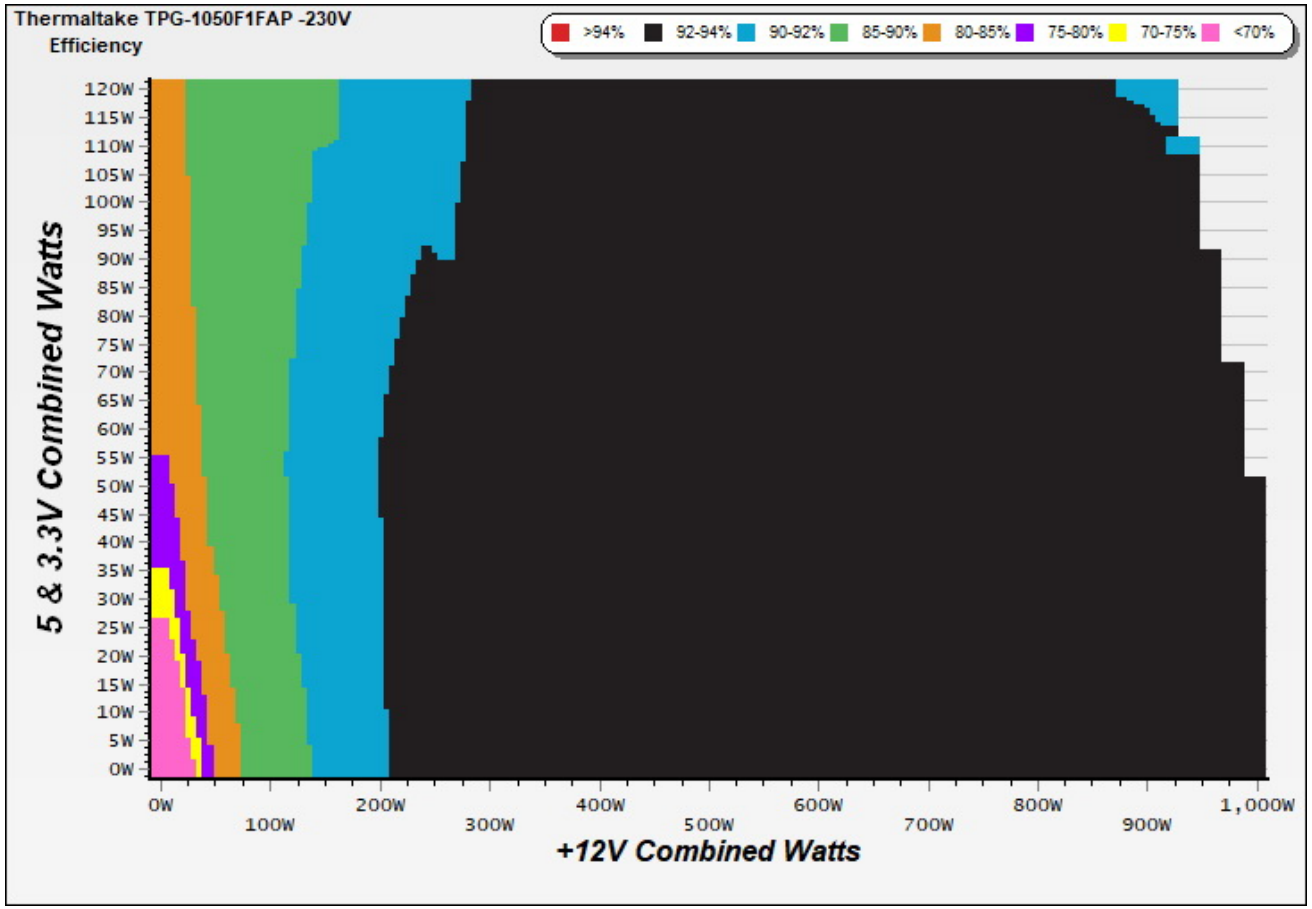
115V



□□

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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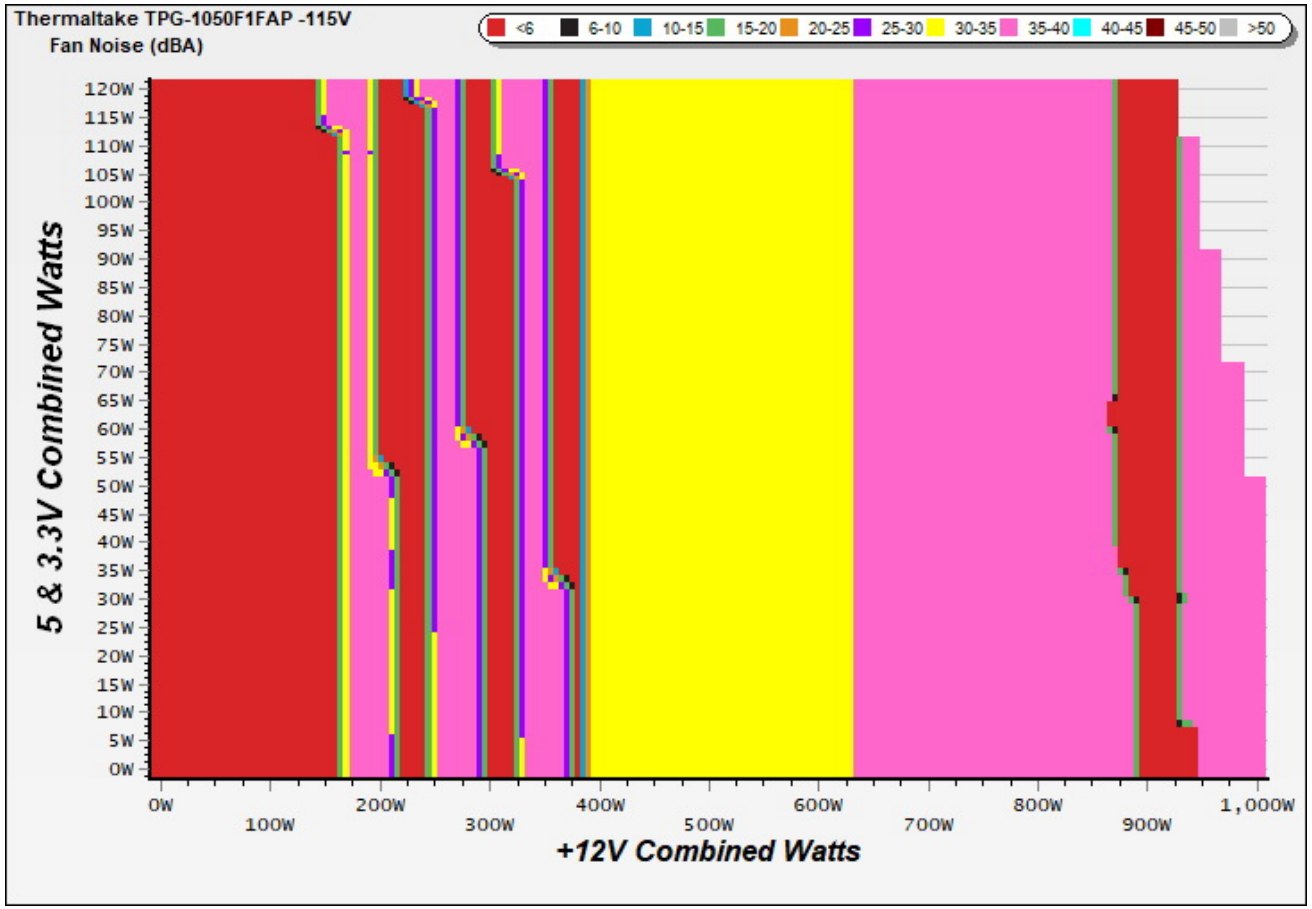
□□□□□

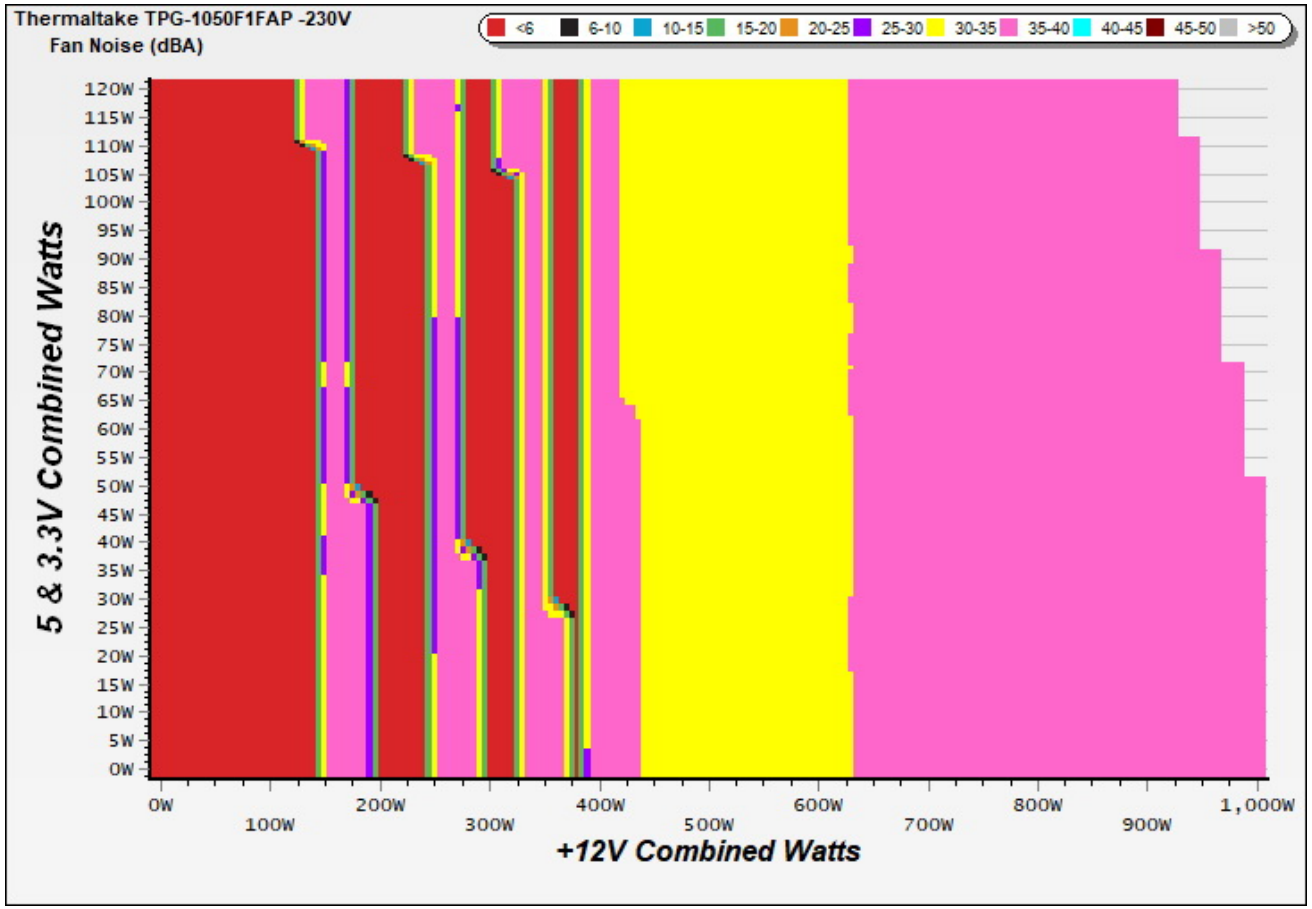
115V



□□

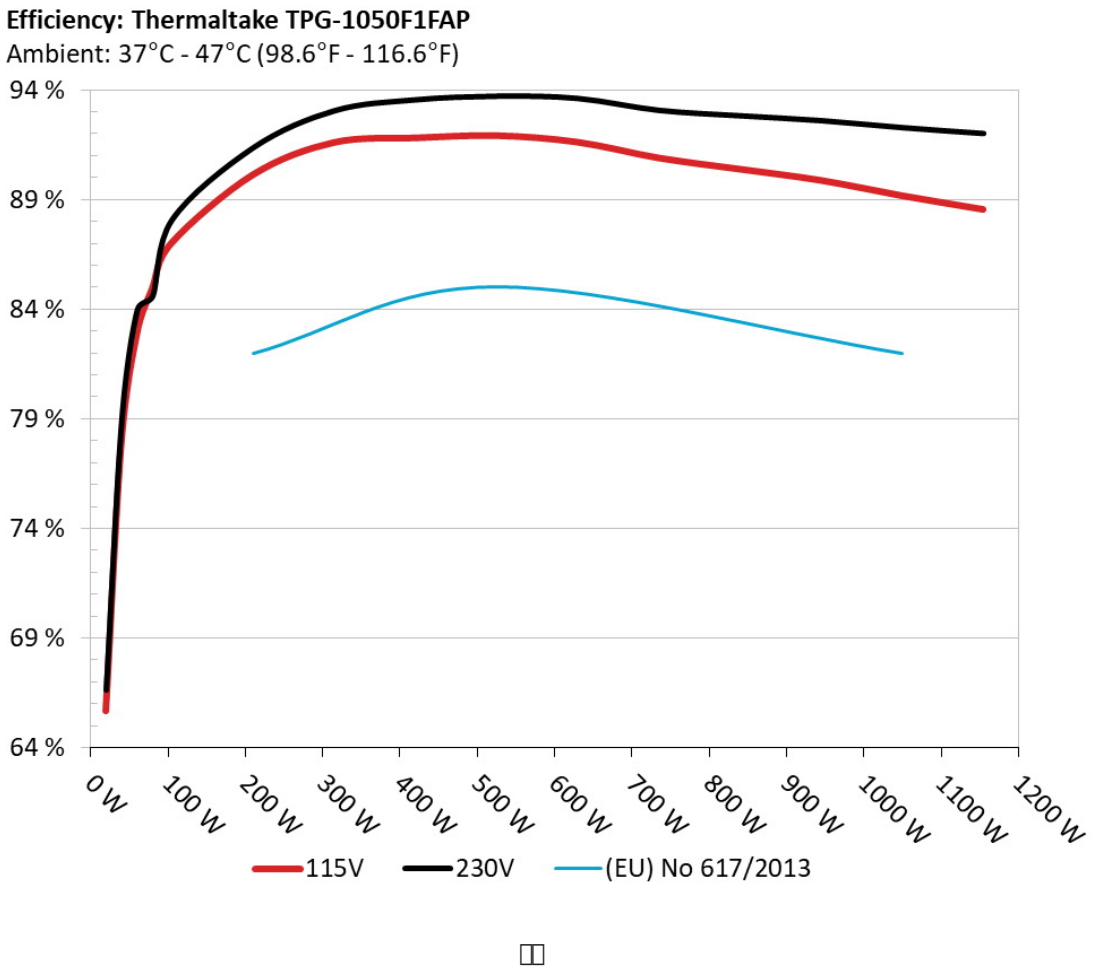
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

230V



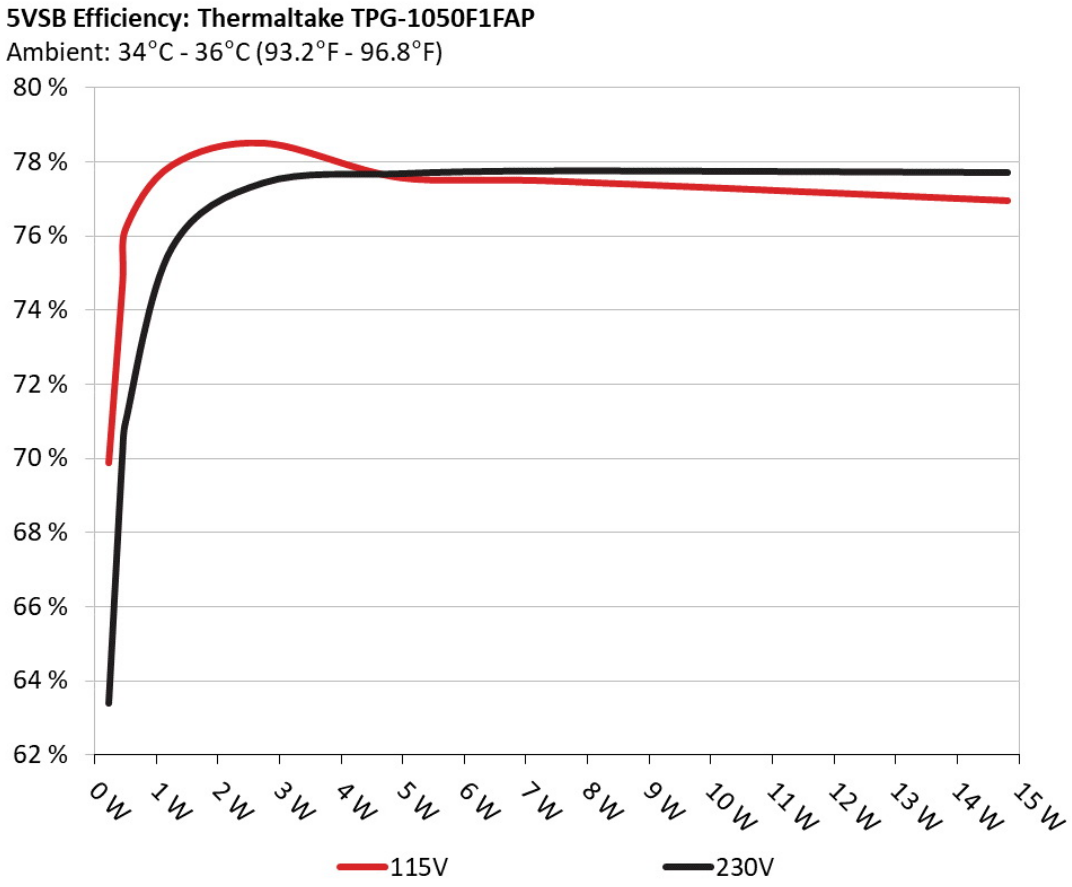
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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	0.225	69.876%	0.026
	4.993V	0.322		115.14V
2	0.090A	0.449	74.709%	0.048
	4.991V	0.601		115.14V
3	0.550A	2.740	78.488%	0.234
	4.982V	3.491		115.14V
4	1.000A	4.975	77.553%	0.344
	4.974V	6.415		115.14V
5	1.500A	7.449	77.465%	0.410
	4.965V	9.616		115.14V
6	3.000A	14.816	76.938%	0.490
	4.938V	19.257		115.13V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.225	63.380%	0.009
	4.991V	0.355		230.24V
2	0.090A	0.449	70.156%	0.016
	4.990V	0.640		230.24V
3	0.550A	2.741	77.429%	0.083
	4.982V	3.540		230.24V
4	1.000A	4.975	77.674%	0.143
	4.974V	6.405		230.25V
5	1.500A	7.450	77.750%	0.200
	4.966V	9.582		230.25V
6	3.000A	14.816	77.705%	0.315
	4.938V	19.067		230.26V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	6.976A	1.962A	2.002A	0.985A	105.044	87.034%	0	<6.0	44.82°C	0.979
	11.962V	5.094V	3.296V	5.080V	120.693				39.33°C	115.14V
2	14.983A	2.946A	3.008A	1.183A	210.044	90.148%	1374	38.5	40.62°C	0.993
	11.956V	5.091V	3.293V	5.075V	233.000				46.65°C	115.13V
3	23.342A	3.443A	3.510A	1.381A	315.057	91.627%	1372	38.5	41.98°C	0.996
	11.952V	5.088V	3.292V	5.069V	343.847				48.60°C	115.23V
4	31.676A	3.934A	4.013A	1.580A	419.706	91.832%	1372	38.5	42.99°C	0.997
	11.949V	5.085V	3.290V	5.064V	457.035				50.02°C	115.14V
5	39.700A	4.920A	5.021A	1.780A	525.045	91.939%	1153	33.8	43.31°C	0.998
	11.953V	5.082V	3.287V	5.058V	571.082				50.85°C	115.18V
6	47.677A	5.910A	6.029A	1.980A	629.608	91.645%	1194	34.6	43.51°C	0.997
	11.951V	5.078V	3.285V	5.052V	687.004				51.60°C	115.13V
7	55.766A	6.899A	7.037A	2.180A	734.979	90.921%	1382	38.7	43.88°C	0.997
	11.940V	5.076V	3.284V	5.048V	808.367				52.58°C	115.17V
8	63.835A	7.887A	8.044A	2.380A	840.277	90.409%	1386	38.8	44.49°C	0.998
	11.935V	5.073V	3.281V	5.043V	929.418				53.78°C	115.14V
9	72.273A	8.383A	8.536A	2.381A	945.164	89.895%	1388	38.8	45.07°C	0.998
	11.936V	5.071V	3.280V	5.042V	1051.407				54.71°C	115.16V
10	80.471A	8.878A	9.059A	2.984A	1049.974	89.196%	1391	39.0	45.64°C	0.999
	11.933V	5.069V	3.279V	5.029V	1177.151				55.70°C	115.16V
11	89.298A	8.883A	9.064A	2.985A	1154.856	88.569%	1392	39.0	46.56°C	0.999
	11.928V	5.066V	3.277V	5.027V	1303.907				57.32°C	115.17V
CL1	0.117A	14.002A	14.000A	0.000A	118.575	81.784%	1367	38.5	43.53°C	0.876
	11.954V	5.091V	3.278V	5.111V	144.985				50.58°C	115.16V

CL2	83.358A	1.000A	1.000A	1.000A	1008.801	89.976%	1386	38.8	45.78°C	0.998
	11.941V	5.074V	3.287V	5.062V	1121.183				55.71°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 □□
1	6.976A	1.964A	2.002A	0.985A	105.052	88.070%	0	<6.0	45.32°C	0.805
	11.962V	5.094V	3.295V	5.080V	119.282				40.39°C	230.36V
2	14.985A	2.948A	3.007A	1.183A	210.055	91.358%	1376	38.6	40.51°C	0.905
	11.955V	5.090V	3.293V	5.074V	229.926				46.14°C	230.36V
3	23.345A	3.441A	3.509A	1.381A	315.075	93.047%	1372	38.5	41.07°C	0.941
	11.952V	5.088V	3.291V	5.069V	338.619				47.48°C	230.36V
4	31.679A	3.934A	4.014A	1.580A	419.740	93.545%	1377	38.6	41.87°C	0.957
	11.949V	5.085V	3.289V	5.064V	448.706				48.68°C	230.37V
5	39.699A	4.921A	5.020A	1.780A	525.067	93.710%	1149	33.7	42.29°C	0.967
	11.954V	5.081V	3.287V	5.057V	560.311				49.64°C	230.35V
6	47.678A	5.912A	6.030A	1.980A	629.618	93.611%	1187	34.4	42.55°C	0.972
	11.951V	5.077V	3.284V	5.051V	672.590				50.69°C	230.35V
7	55.766A	6.898A	7.039A	2.180A	734.965	93.066%	1381	38.7	43.21°C	0.980
	11.940V	5.075V	3.283V	5.047V	789.728				51.97°C	230.36V
8	63.818A	7.889A	8.049A	2.381A	840.287	92.818%	1387	38.8	43.74°C	0.985
	11.938V	5.072V	3.281V	5.042V	905.306				53.13°C	230.35V
9	72.266A	8.385A	8.540A	2.381A	945.165	92.597%	1386	38.8	44.75°C	0.988
	11.937V	5.070V	3.280V	5.041V	1020.734				54.60°C	230.36V
10	80.468A	8.882A	9.061A	2.984A	1050.025	92.276%	1390	38.9	45.23°C	0.989
	11.934V	5.068V	3.278V	5.028V	1137.919				55.28°C	230.36V
11	89.300A	8.885A	9.064A	2.985A	1154.886	92.009%	1392	39.0	46.71°C	0.990
	11.928V	5.066V	3.277V	5.026V	1255.184				57.49°C	230.37V
CL1	0.118A	14.002A	14.000A	0.000A	118.573	82.900%	1365	38.5	42.25°C	0.709
	11.953V	5.090V	3.278V	5.110V	143.031				49.55°C	230.38V

CL2	83.357A	1.000A	1.000A	1.000A	1008.955	92.850%	1385	38.8	45.59°C	0.989
	11.943V	5.073V	3.287V	5.061V	1086.653				55.13°C	230.37V

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	1.240A	0.491A	0.499A	0.196A	19.986	65.657%	0	<6.0	0.729
	11.967V	5.096V	3.298V	5.095V	30.440				115.13V
2	2.480A	0.980A	1.000A	0.393A	39.975	77.898%	0	<6.0	0.800
	11.969V	5.096V	3.297V	5.091V	51.317				115.13V
3	3.723A	1.472A	1.500A	0.590A	60.005	82.875%	0	<6.0	0.829
	11.968V	5.095V	3.297V	5.088V	72.404				115.14V
4	4.961A	1.963A	2.002A	0.787A	79.954	84.945%	0	<6.0	0.848
	11.964V	5.095V	3.296V	5.084V	94.124				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 □□
1	1.241A	0.489A	0.500A	0.196A	19.991	66.619%	0	<6.0	0.425
	11.966V	5.097V	3.299V	5.095V	30.008				230.35V
2	2.480A	0.981A	1.001A	0.393A	39.981	78.914%	0	<6.0	0.542
	11.968V	5.096V	3.298V	5.091V	50.664				230.35V
3	3.724A	1.471A	1.501A	0.590A	60.010	83.939%	0	<6.0	0.612
	11.967V	5.095V	3.297V	5.088V	71.492				230.36V
4	4.960A	1.964A	2.002A	0.787A	79.959	84.587%	0	<6.0	0.661
	11.967V	5.094V	3.296V	5.083V	94.529				230.36V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.50mV	4.40mV	11.70mV	4.30mV	Pass
20% Load	8.10mV	4.60mV	11.30mV	4.20mV	Pass
30% Load	9.70mV	4.70mV	12.10mV	4.70mV	Pass
40% Load	10.70mV	5.30mV	12.30mV	5.70mV	Pass
50% Load	13.00mV	6.20mV	16.40mV	5.90mV	Pass
60% Load	18.90mV	6.50mV	13.40mV	5.40mV	Pass
70% Load	13.90mV	9.40mV	21.60mV	8.90mV	Pass
80% Load	15.20mV	11.00mV	23.90mV	9.40mV	Pass
90% Load	17.90mV	10.40mV	24.70mV	8.90mV	Pass
100% Load	24.50mV	9.50mV	18.50mV	8.10mV	Pass
110% Load	27.70mV	10.10mV	18.50mV	9.10mV	Pass
Crossload1	9.00mV	5.10mV	17.10mV	4.90mV	Pass
Crossload2	23.50mV	8.80mV	15.40mV	6.80mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.00mV	4.10mV	10.30mV	3.90mV	Pass
20% Load	8.50mV	4.90mV	11.10mV	4.30mV	Pass
30% Load	9.00mV	4.60mV	11.30mV	4.40mV	Pass
40% Load	10.70mV	4.90mV	11.10mV	4.80mV	Pass
50% Load	12.70mV	5.60mV	15.30mV	5.50mV	Pass
60% Load	18.20mV	6.00mV	12.30mV	5.70mV	Pass
70% Load	14.60mV	9.10mV	19.50mV	8.30mV	Pass
80% Load	16.20mV	10.70mV	22.50mV	9.10mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	18.00mV	9.70mV	20.00mV	8.00mV	Pass
100% Load	24.70mV	9.50mV	17.80mV	8.00mV	Pass
110% Load	26.20mV	10.30mV	19.30mV	8.80mV	Pass
Crossload1	8.80mV	4.90mV	16.30mV	4.70mV	Pass
Crossload2	22.90mV	8.70mV	14.20mV	7.40mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower Grand RGB 1050W Platinum (#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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