Thermaltake Toughpower Grand RGB 1200W Platinum

Serial Number PSTG1200F1FAPU1AL000009

Lab ID 199

Certification ID 25199

Test Result Report ID:

Certificate Issue Date: Oct 18, 2018

115V

Scheme: ETA-EMI PSU



115V



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 1200W Platinum
OEM/ODM	Channel Well Technology
Serial Number	PSTG1200F1FAPU1AL000009
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	14
Rated Frequency (Hz)	50-60

Rated Power (W)	1200
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	140mm HDB RGB Fan (TT-1425/A1425H12S)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	199
Date of receipt	Oct 9, 2018
Testing Date	Oct 15, 2018
Report Issued Date	Oct 18, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (600mm)	1	1	16AWG
4+4 pin EPS12V (650mm)	1	1	16AWG
8 pin EPS12V (650mm)	1	1	16AWG
6+2 pin PCIe (500mm+150mm)	4	8	16-18AWG
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG
4 pin Molex (500mm+150mm+150mm+150mm)	2	8	18AWG
FDD Adapter (+100mm)	1	1	22AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	100	3	0.3
	Watts	130		1200	15	3.6
Total Max. Power (W)		1200				

Parts Description

General Data	
Manufacturer (OEM)	CWT
Primary Side	
Transient Filter	6x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CM02X
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x Vishay LVB2560 (600V, 25A @ 105°C)
APFC MOSFETS	2x Toshiba TK25A60X (600V, 25A @ 150°C, 0.105Ohm)
APFC Boost Diode	2x CREE C3D10060A (600V, 10A @ 153°C)
Hold-up Cap(s)	2x Nichicon (400V, 680uF, 2000h @ 105°C, GG)
Main Switchers	4x A26N60EFL
Driver ICs	2x Silicon Labs Si8230BD
APFC MCU	Texas Instruments UCD3138A (31.25 MHz, 32-bit ARM7TDMI-S Processor, 32KB Flash, 4KB RAM, 3x Feedback loop control, 14-bit DAC, up to 2 MHz switching frequency)
LLC Resonant MCU	Texas Instruments UCD3138A (31.25 MHz, 32-bit ARM7TDMI-S Processor, 32KB Flash, 4KB RAM, 3x Feedback loop control, 14-bit DAC, up to 2 MHz switching frequency)
Topology	Primary side: Interleaved PFC, Full-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon BSC014N06NS (60V, 100A @ 100°C, 1.45mOhm)
5V & 3.3V	DC-DC Converters: 5x FETS PWM Controller: 1x
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (1-5,000 @ 105°C, KZE), Nippon Chemi-Con (4-10,000 @ 105°C, KY) Polymers: CapXon, Su' scon, APAQ
Supervisor IC	Weltrend WT751002 (OVP, UVP, PG) & LM358
Fan Model	Thermaltake TT-1425 (Hong Sheng OEM, A1425H12S, 140mm, 12V, 0.39A, Hydro Dynamic Bearing, RGB LED Lighting)

5VSB Circuit	
Rectifiers	ISD04N65A (650V, 4A, 2.5Ohm), SPN5003 (N-Channel Enhancement Mode FET) & PS1045L SBR
Driver IC	Texas Instruments UCC27324
PWM Controller	On-Bright OB5282CP

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary 115V

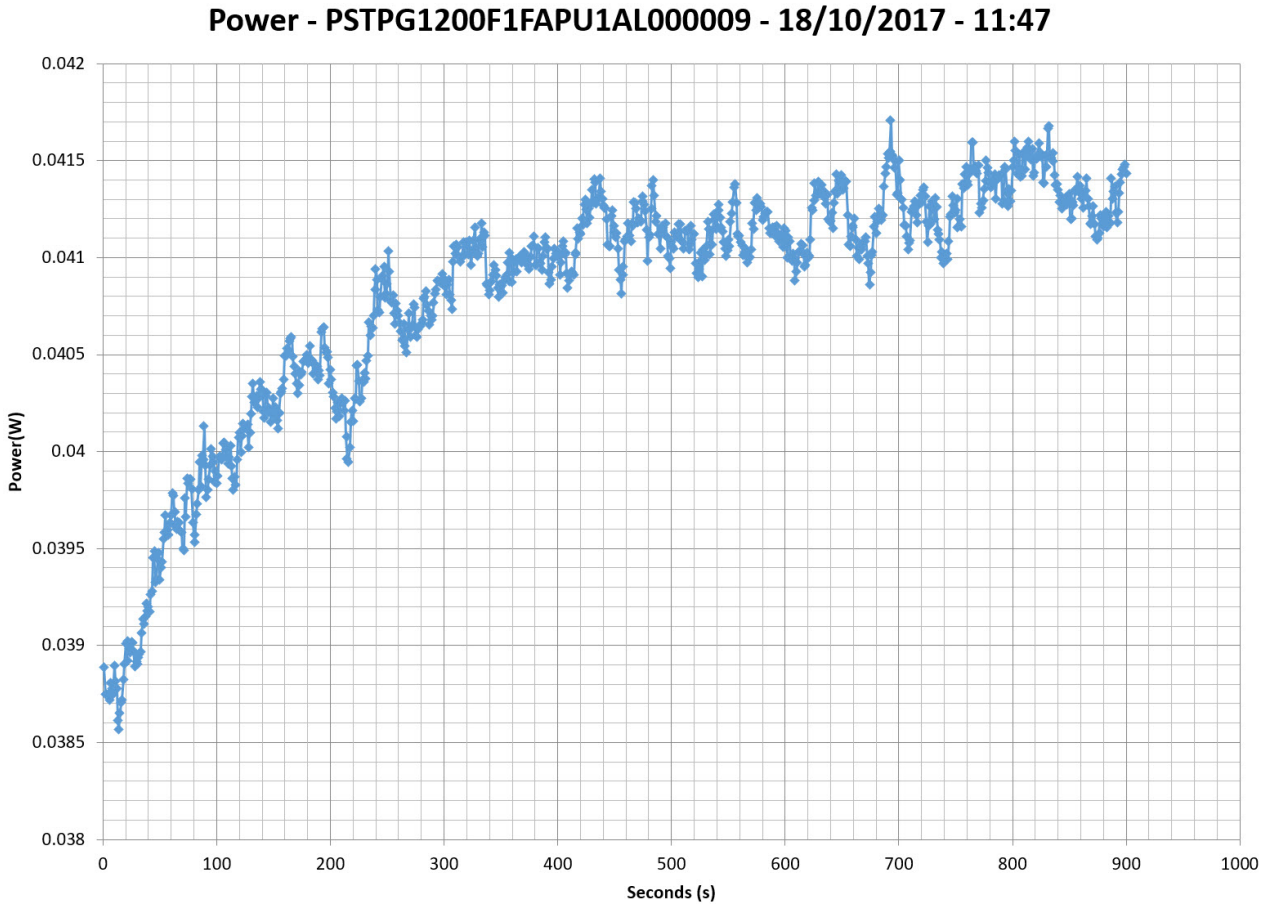
Accredited	
Average Efficiency (>1450 load combinations)	89.944%
Average Noise Output (>1450 Load Combinations)	32.74dBA
Average PF (>1450 Load Combinations)	0.993
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0414W
Non-Accredited	
12V Ripple (Full Load)	20.38mV
5V Ripple (Full Load)	13.24mV
3.3V Ripple (Full Load)	11.51mV
5VSB Ripple (Full Load)	10.31mV
12V Load Regulation	0.46%
5V Load Regulation	0.41%
3.3V Load Regulation	0.75%
5VSB Load Regulation	1.27%
Inrush Current	33.791A

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	19.1
AC Loss to PWR_OK Hold Up Time (ms)	20.9
PWR_OK Inactive to DC Loss Delay (ms)	-1.8

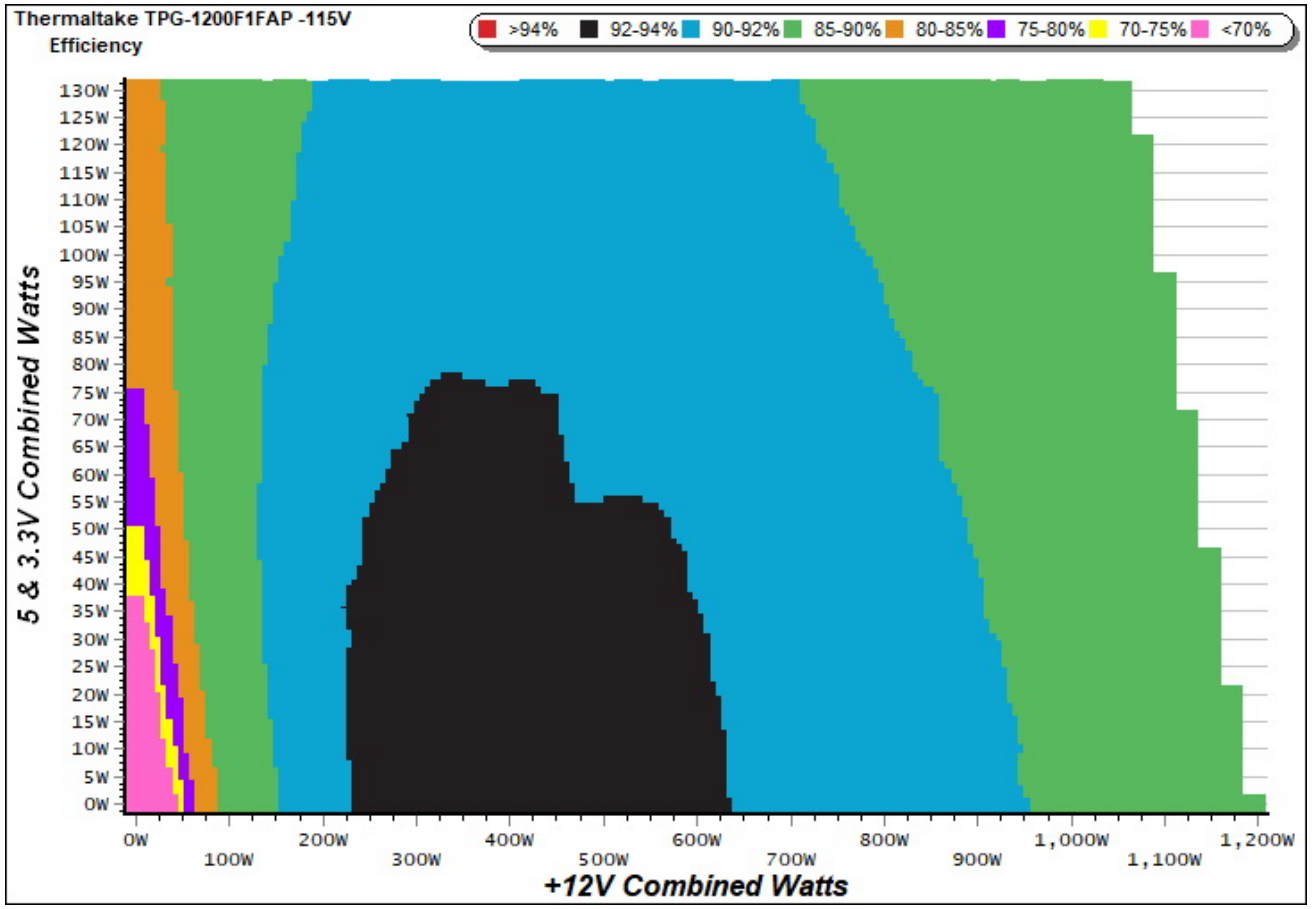
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Graphs 115V



Efficiency Graph

115V

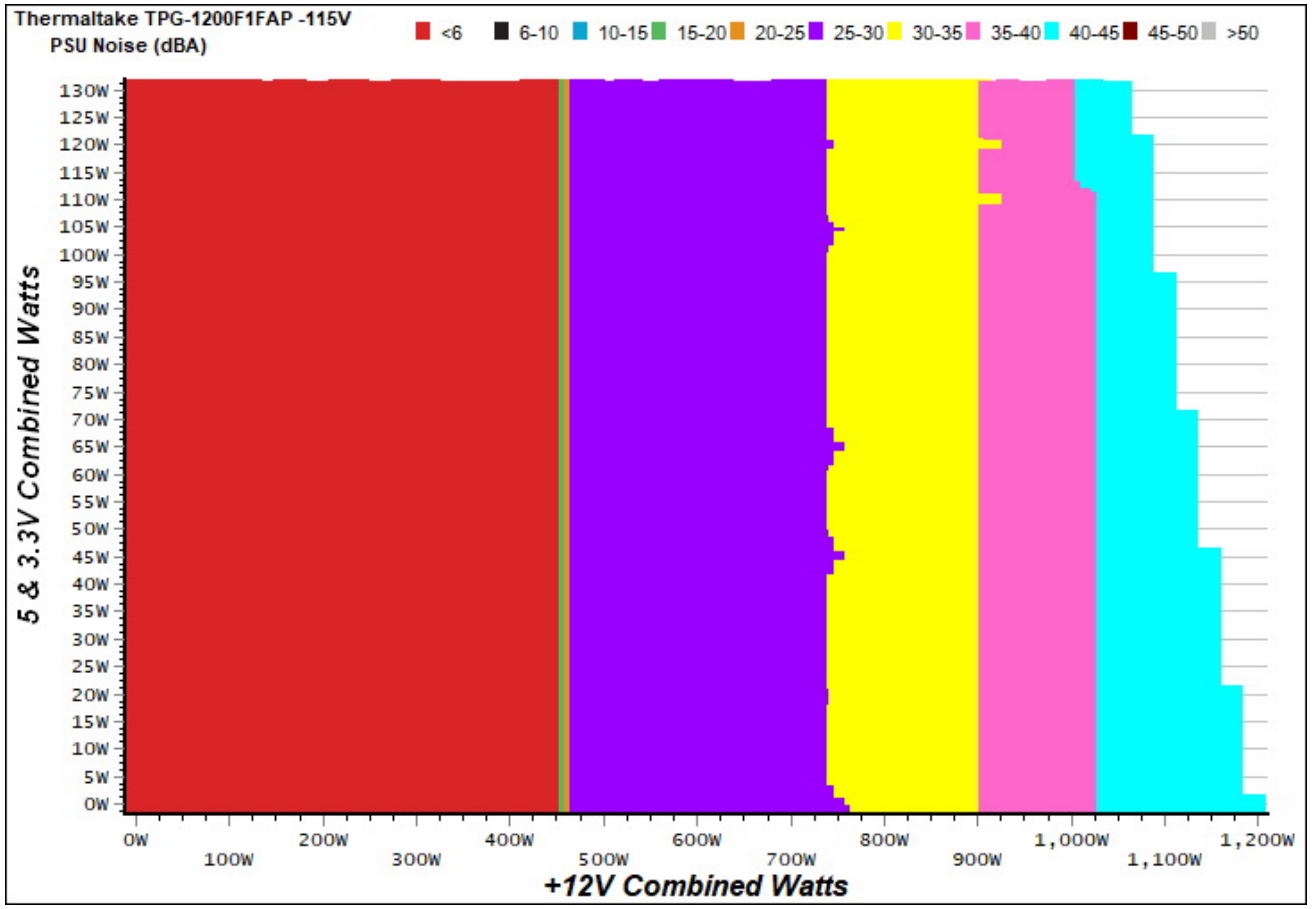


INFO

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.

Noise Graph

115V

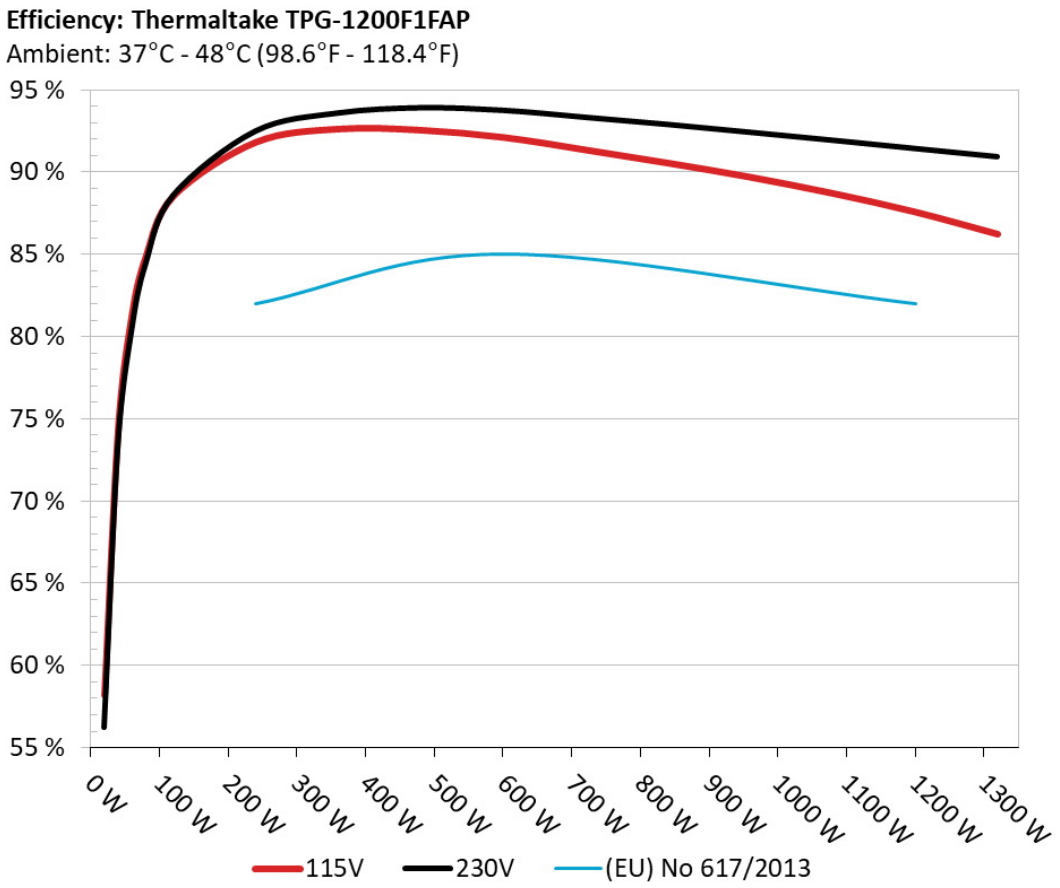


INFO

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

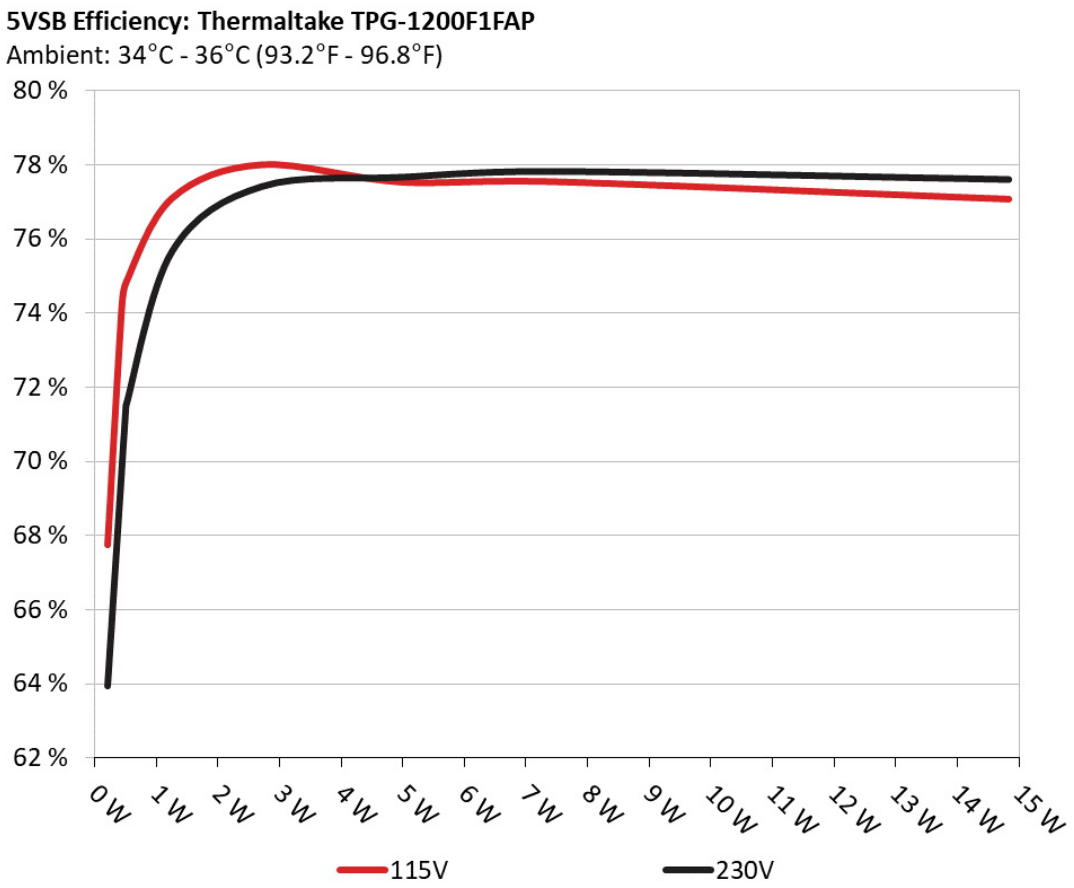
Efficiency under high ambient temperature



INFO

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 Efficiency



INFO

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input.

5VSB Efficiency (ERP LOT 3/6 & CEC) 115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.210	67.742%	0.031
	5.003V	0.310		115.09V

2	0.088A	0.438	74.112%	0.059
	5.001V	0.591		115.10V
3	0.543A	2.708	77.995%	0.269
	4.991V	3.472		115.09V
4	1.002A	4.994	77.523%	0.374
	4.982V	6.442		115.09V
5	1.502A	7.469	77.536%	0.430
	4.973V	9.633		115.09V
6	3.002A	14.837	77.067%	0.497
	4.943V	19.252		115.09V

Supplementary Tests (For Reference)

Typical Load Tests 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	8.167A	1.975A	1.990A	0.991A	119.832	88.535%	0	<6.0	46.70°C	0.983
	12.028V	5.064V	3.315V	5.047V	135.350				38.25°C	115.13V
2	17.360A	2.960A	2.985A	1.188A	239.635	91.810%	0	<6.0	47.44°C	0.994
	12.026V	5.062V	3.313V	5.042V	261.013				38.47°C	115.12V
3	26.924A	3.459A	3.500A	1.386A	359.803	92.617%	0	<6.0	48.80°C	0.996
	12.024V	5.060V	3.310V	5.036V	388.483				38.89°C	115.12V
4	36.477A	3.954A	3.987A	1.588A	479.669	92.547%	0	<6.0	49.86°C	0.995
	12.021V	5.058V	3.308V	5.032V	518.300				39.31°C	115.12V
5	45.702A	4.949A	4.990A	1.790A	599.565	92.111%	1015	27.7	40.00°C	0.996
	12.014V	5.055V	3.304V	5.026V	650.915				50.91°C	115.12V
6	54.962A	5.936A	5.998A	1.990A	719.495	91.347%	1033	28.3	41.10°C	0.998
	12.003V	5.053V	3.301V	5.021V	787.652				53.74°C	115.13V
7	64.237A	6.935A	6.999A	2.191A	839.369	90.547%	1158	31.3	42.68°C	0.998
	11.991V	5.050V	3.299V	5.017V	926.996				56.43°C	115.13V
8	73.511A	7.924A	8.008A	2.393A	959.273	89.689%	1288	34.0	44.20°C	0.998
	11.983V	5.049V	3.296V	5.010V	1069.552				59.01°C	115.13V

9	83.210A	8.431A	8.529A	2.395A	1079.333	88.701%	1442	37.3	45.26°C	0.997
	11.978V	5.047V	3.294V	5.009V	1216.819				60.94°C	115.12V
10	92.670A	8.929A	9.022A	3.001A	1199.248	87.573%	1572	41.4	45.97°C	0.993
	11.973V	5.043V	3.291V	4.995V	1369.434				61.92°C	115.10V
11	102.733A	8.933A	9.032A	3.003A	1319.228	86.225%	1820	43.3	47.93°C	0.987
	11.968V	5.040V	3.289V	4.992V	1529.987				65.70°C	115.07V
CL1	0.100A	16.027A	16.002A	0.005A	135.516	82.663%	0	<6.0	49.88°C	0.983
	12.030V	5.065V	3.319V	5.088V	163.937				44.24°C	115.13V
CL2	99.939A	1.002A	1.000A	1.002A	1210.762	87.547%	1820	43.3	48.42°C	0.991
	11.981V	5.047V	3.296V	5.029V	1382.982				64.65°C	115.10V

The results above are not used in the certification process

Light Load Tests 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.213A	0.493A	0.480A	0.196A	19.665	58.180%	0	<6.0	0.846
	12.024V	5.064V	3.316V	5.059V	33.800				115.12V
2	2.454A	0.980A	0.994A	0.396A	39.774	74.531%	0	<6.0	0.931
	12.026V	5.064V	3.316V	5.057V	53.366				115.13V
3	3.695A	1.477A	1.504A	0.591A	59.893	81.363%	0	<6.0	0.950
	12.027V	5.064V	3.316V	5.054V	73.612				115.13V
4	4.924A	1.975A	1.990A	0.791A	79.822	84.846%	0	<6.0	0.965
	12.028V	5.064V	3.316V	5.052V	94.079				115.13V

The results above are not used in the certification process

Ripple Measurements 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.3 mV	4.3 mV	3.6 mV	3.9 mV	Pass
20% Load	14.3 mV	4.8 mV	4.0 mV	4.5 mV	Pass
30% Load	16.4 mV	5.2 mV	4.6 mV	5.2 mV	Pass
40% Load	15.8 mV	10.3 mV	7.9 mV	10.1 mV	Pass

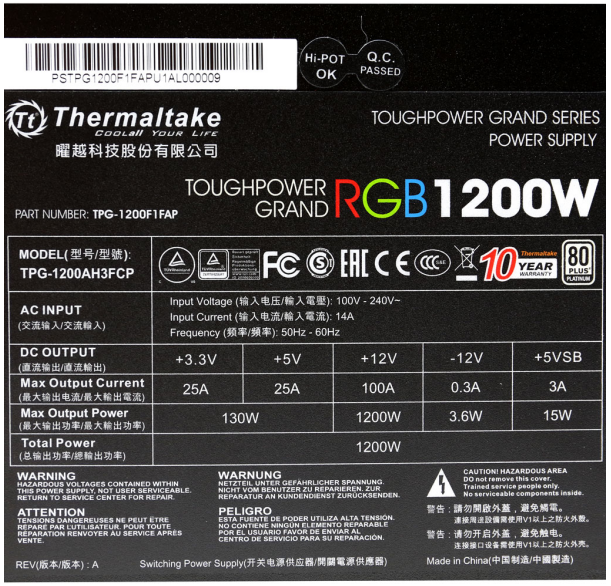
Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	19.4 mV	8.0 mV	9.2 mV	7.6 mV	Pass
60% Load	17.0 mV	6.5 mV	6.5 mV	5.9 mV	Pass
70% Load	16.8 mV	9.5 mV	7.4 mV	8.6 mV	Pass
80% Load	18.9 mV	10.8 mV	9.3 mV	10.4 mV	Pass
90% Load	18.5 mV	9.4 mV	9.0 mV	9.0 mV	Pass
100% Load	20.4 mV	13.2 mV	11.5 mV	10.3 mV	Pass
110% Load	23.0 mV	25.1 mV	22.2 mV	23.2 mV	Pass
Crossload 1	10.4 mV	5.3 mV	4.9 mV	3.1 mV	Pass
Crossload 2	22.5 mV	13.1 mV	11.5 mV	10.2 mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower Grand RGB 1200W Platinum



Top side



Power specifications label