

Lab ID#: TT20850006
Receipt Date: Sep 11, 2019
Test Date: Feb 3, 2020

Report: 20PSA

Report Date: Feb 18, 2020

DUT INFORMATION

Brand	Thermaltake
Manufacturer (OEM)	Channel Well Technology
Series	Toughpower Grand RGB
Model Number	TPG-0850F1FAP
Serial Number	PSTPG0850F1FAPU1LE000286
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	140mm Hydro Dynamic Bearing Fan (TT-1425 (A1425L12S))
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	83.33	3	0.3
	Watts	100		850	15	3.6
Total Max. Power (W)		850				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16AWG	No
4+4 pin EPS12V (650mm)	1	1	16AWG	No
8 pin EPS12V (650mm)	1	1	16AWG	No
6+2 pin PCIe (500mm+150mm)	3	6	16-18AWG	No
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG	No
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	No
FDD Adapter (+100mm)	1	1	22AWG	No
AC Power Cord (1440mm) - C13 coupler	1	1	18AWG	-

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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

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	90.434%
Efficiency With 10W (≤500W) or 2% (>500W)	66.795
Average Efficiency 5VSB	76.359%
Standby Power Consumption (W)	0.0354533
Average PF	0.978
Avg Noise Output	33.78 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	S++

230V

Average Efficiency	92.180%
Average Efficiency 5VSB	75.676%
Standby Power Consumption (W)	0.0528815
Average PF	0.929
Avg Noise Output	33.76 dB(A)
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	S++

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

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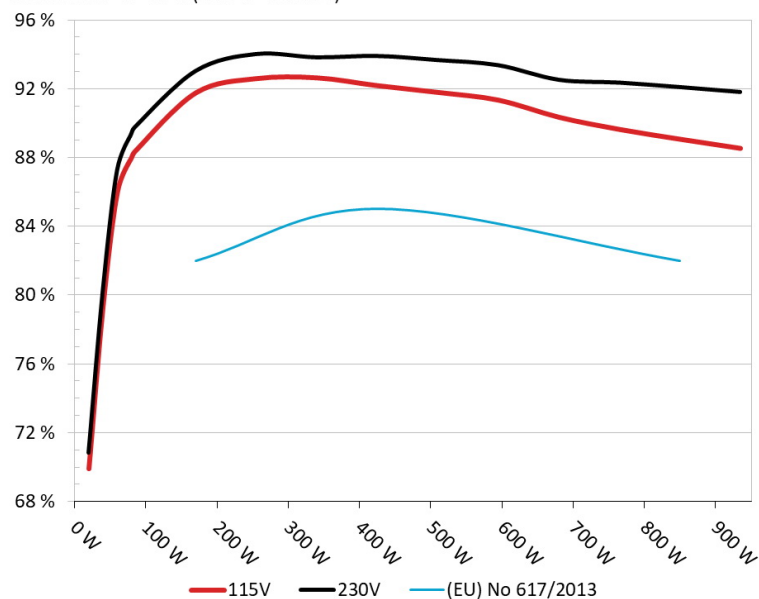
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Thermaltake TPG-850F1FAP

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



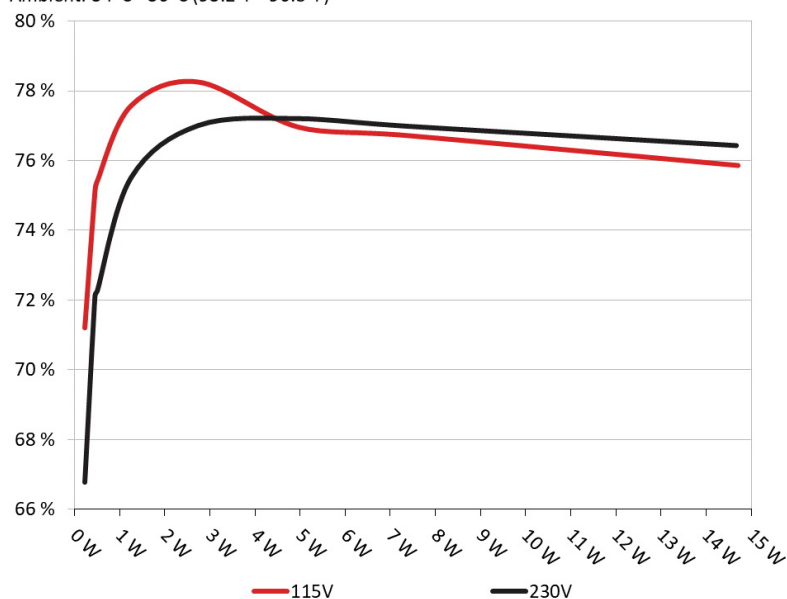
INFO

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

5VSB Efficiency: Thermaltake TPG-850F1FAP

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



INFO

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

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.225	71.203%	0.026
	5.003V	0.316		115.15V
2	0.090A	0.450	75.125%	0.049
	5.001V	0.599		115.15V
3	0.550A	2.743	78.260%	0.240
	4.987V	3.505		115.15V
4	1.000A	4.974	76.961%	0.351
	4.973V	6.463		115.15V
5	1.500A	7.437	76.718%	0.418
	4.957V	9.694		115.15V
6	2.999A	14.708	75.865%	0.503
	4.905V	19.387		115.14V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.225	66.766%	0.008
	5.004V	0.337		230.21V
2	0.090A	0.450	72.115%	0.015
	5.001V	0.624		230.21V
3	0.550A	2.742	77.001%	0.085
	4.985V	3.561		230.22V
4	1.000A	4.970	77.198%	0.146
	4.970V	6.438		230.23V
5	1.500A	7.429	76.976%	0.205
	4.952V	9.651		230.23V
6	2.999A	14.675	76.424%	0.321
	4.894V	19.202		230.24V

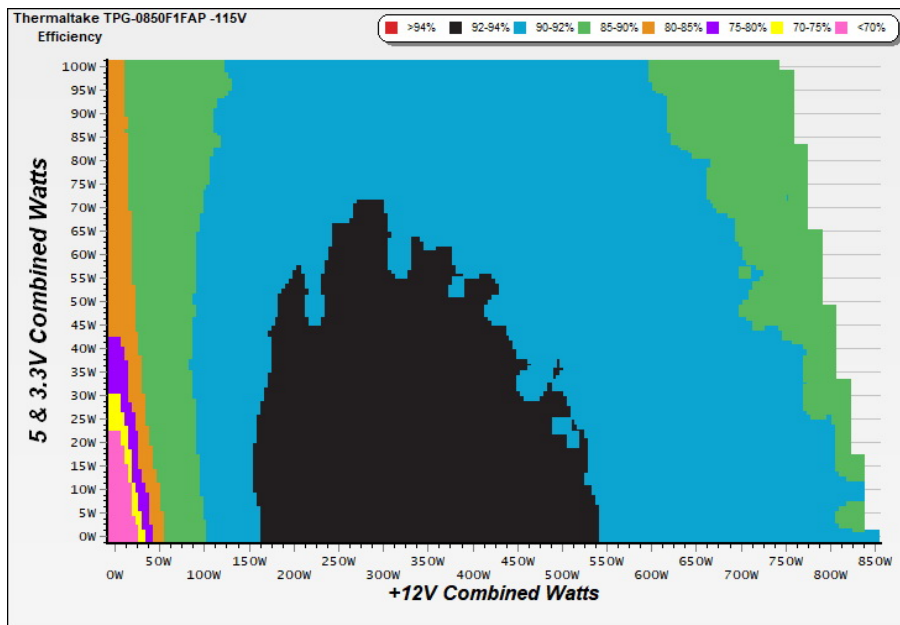
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115V

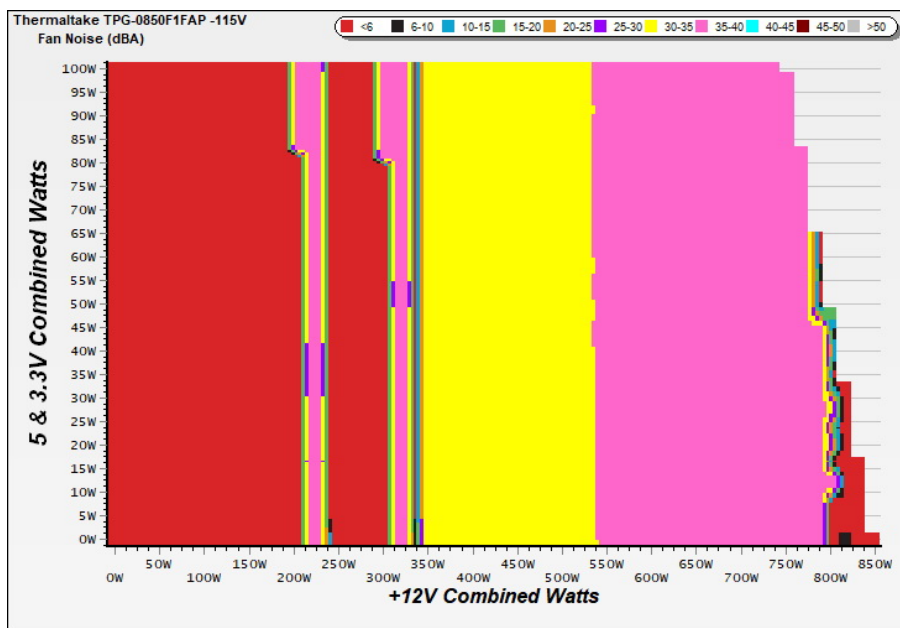
EFFICIENCY GRAPH 115V



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

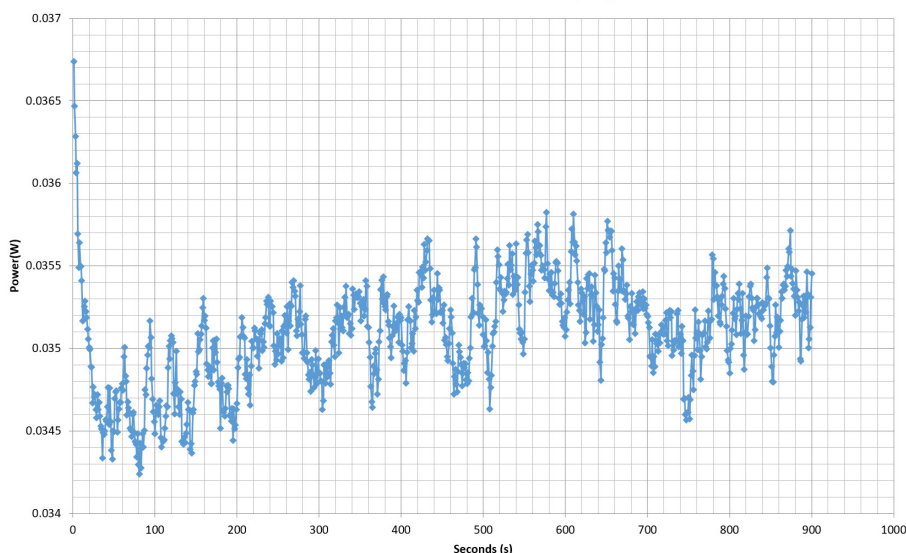
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - PSTPG0850F1FAPU1LE000286 - 27/01/2020 - 09:28



INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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COMMISSION REGULATION (EU) NO 617/2013 TESTING 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	5.250A	1.974A	2.001A	0.991A	84.958	88.370%	0	<6.0	45.88°C	0.825
	12.068V	5.065V	3.298V	5.049V	96.139				40.70°C	115.16V
2	11.533A	2.965A	3.005A	1.190A	170.036	91.759%	0	<6.0	46.63°C	0.991
	12.064V	5.059V	3.295V	5.042V	185.307				40.78°C	115.15V
5	31.079A	4.956A	5.024A	1.794A	424.994	92.180%	1156	33.9	42.40°C	0.997
	12.049V	5.046V	3.286V	5.020V	461.046				49.89°C	115.15V
10	63.328A	8.961A	9.080A	3.023A	849.959	89.066%	1387	38.8	45.97°C	0.998
	12.005V	5.022V	3.271V	4.963V	954.304				56.74°C	115.17V

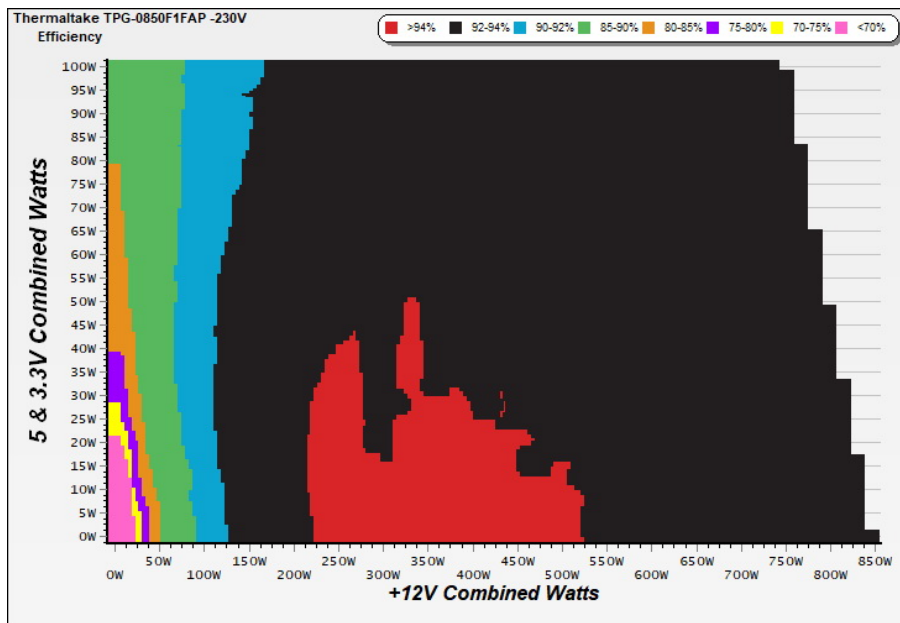
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230V

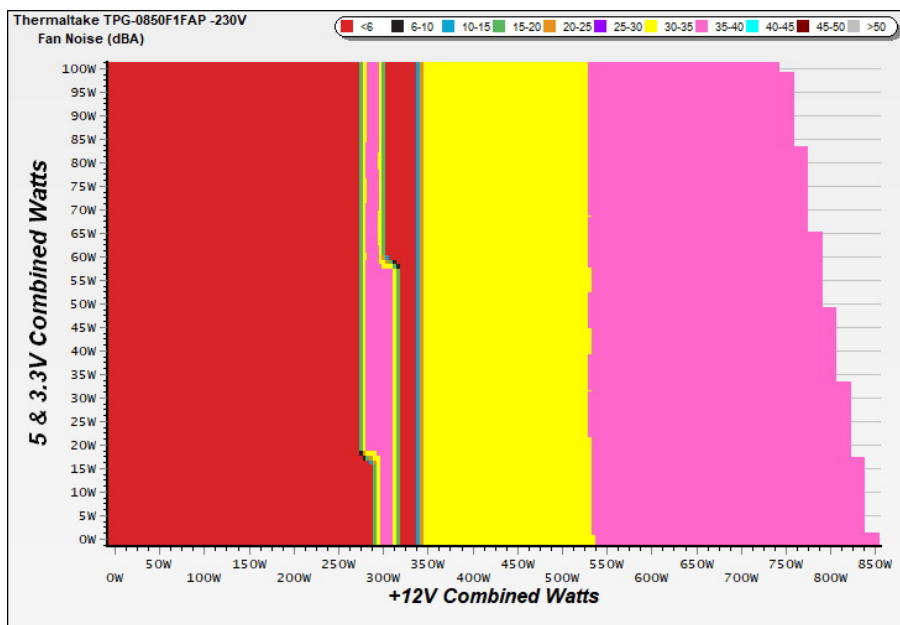
EFFICIENCY GRAPH 230V



INFO

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NOISE GRAPH 230V



INFO

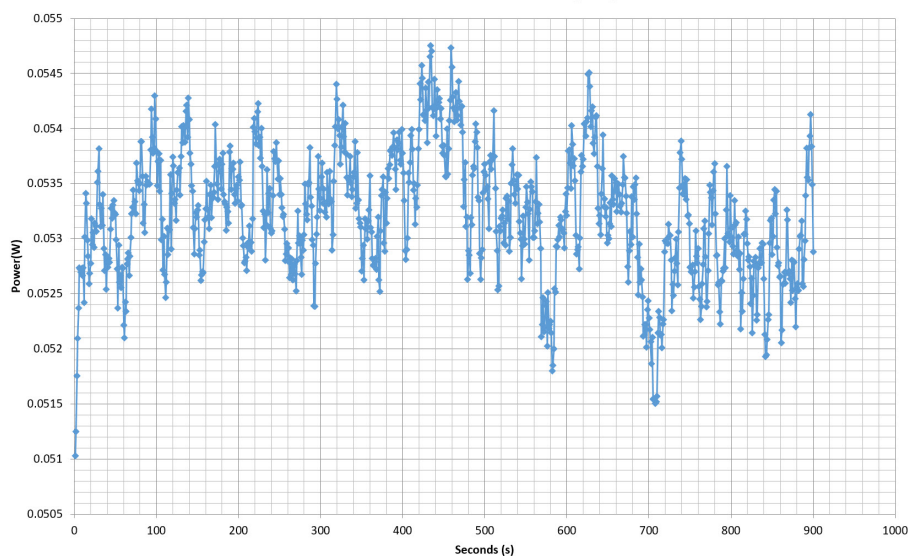
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COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	5.251A	1.976A	2.001A	0.990A	84.956	89.761%	0	<6.0	45.97°C	0.680
	12.064V	5.064V	3.299V	5.051V	94.647				40.12°C	230.32V
2	11.537A	2.966A	3.002A	1.190A	170.024	93.019%	0	<6.0	46.87°C	0.889
	12.059V	5.058V	3.296V	5.044V	182.784				40.67°C	230.31V
5	31.068A	4.958A	5.019A	1.792A	424.917	93.895%	1159	34.0	42.35°C	0.964
	12.051V	5.044V	3.289V	5.023V	452.546				50.11°C	230.30V
10	63.325A	8.971A	9.068A	3.012A	849.865	92.088%	1390	38.9	45.86°C	0.988
	12.004V	5.017V	3.275V	4.982V	922.883				56.84°C	230.28V

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EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Thermaltake Toughpower Grand RGB 850W Platinum (#2)

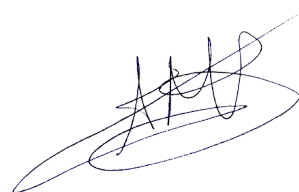


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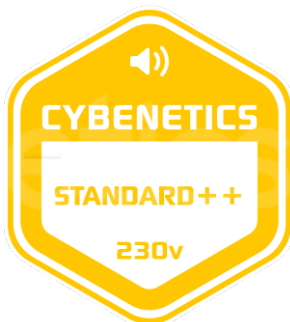
Power specifications label

CERTIFICATIONS 115V

Aris Mpitsiopoulos
Lab Director

CERTIFICATIONS 230V



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