

## Anex

## Thermaltake Toughpower PF1 850W

Lab ID#: TT85001727  
 Receipt Date: Jul 28, 2020  
 Test Date: Oct 2, 2020

Report: 20PS1727A  
 Report Date: Oct 3, 2020

### DUT INFORMATION

Brand	Thermaltake
Manufacturer (OEM)	Jiu Zhou Yang Guang Power Supply (HKC)
Series	Toughpower PF1
Model Number	TTP-850AH2FKP
Serial Number	PSTPD0850FNFAPE1XD000041
DUT Notes	Toughpower PF1

### DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	120mm Hydraulic Bearing Fan [TT-1225(XW12025MS)]
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

### 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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### RESULTS

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

### 115V

Average Efficiency	90.030%
Efficiency With 10W (≤500W) or 2% (>500W)	73.495
Average Efficiency 5VSB	80.111%
Standby Power Consumption (W)	0.0554739
Average PF	0.983
Avg Noise Output	29.24 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A-

### 230V

Average Efficiency	92.101%
Average Efficiency 5VSB	79.826%
Standby Power Consumption (W)	0.0786161
Average PF	0.929
Avg Noise Output	28.45 dB(A)
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	A-

### POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70	2.5	0.3
	Watts	100		840	12.5	3.6
Total Max. Power (W)		850				

### HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	18.7
AC Loss to PWR_OK Hold Up Time (ms)	17.8
PWR_OK Inactive to DC Loss Delay (ms)	0.9

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### CABLES AND CONNECTORS

#### Modular Cables

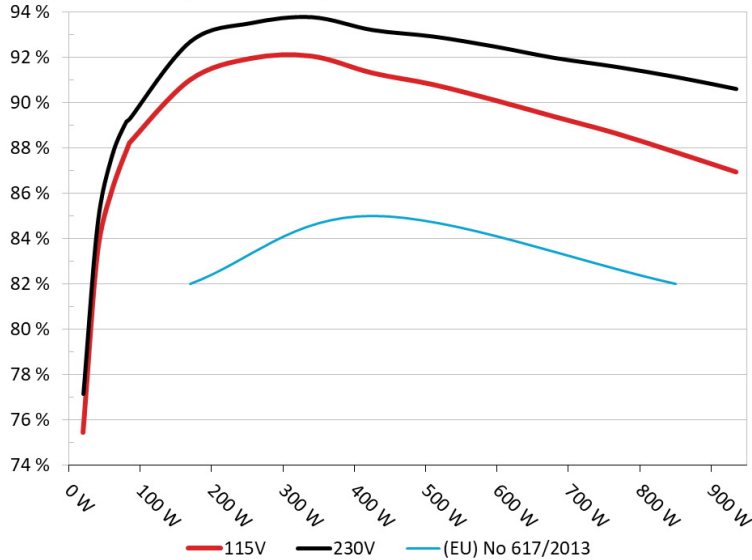
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16-18AWG	No
4+4 pin EPS12V (650mm)	2	2	16AWG	No
6+2 pin PCIe (500mm+150mm)	3	6	16-18AWG	No
SATA (520mm+150mm+150mm+150mm)	3	12	18AWG	No
4-pin Molex (490mm+150mm+150mm+150mm)	1	4	18AWG	No
FDD Adapter (+100mm)	1	1	22AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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### EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Thermaltake TTP-850AH2FKP  
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

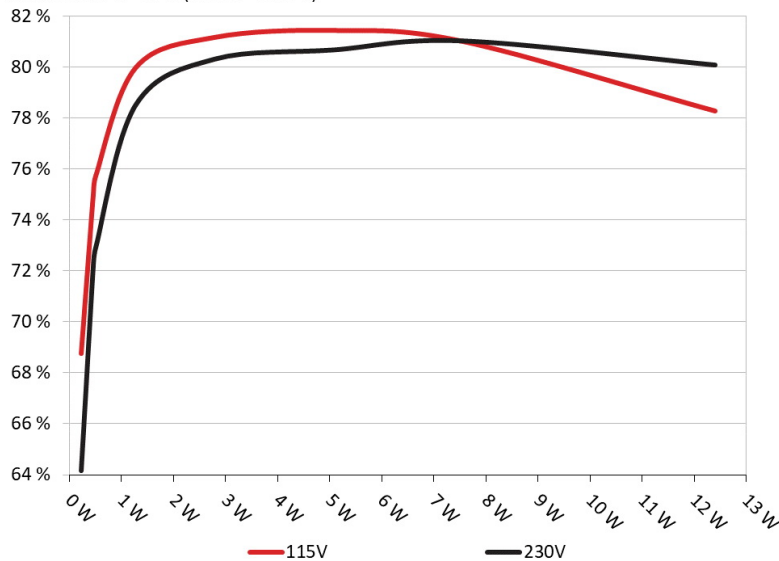


#### INFO

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 TTP-850AH2FKP  
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	0.231	68.750%	0.039
	5.123V	0.336		115.13V
2	0.090A	0.461	74.959%	0.069
	5.120V	0.615		115.12V
3	0.550A	2.801	81.165%	0.269
	5.091V	3.451		115.12V
4	1.000A	5.062	81.435%	0.346
	5.062V	6.216		115.12V
5	1.500A	7.542	81.010%	0.388
	5.027V	9.310		115.12V
6	2.500A	12.399	78.272%	0.433
	4.960V	15.841		115.12V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	64.167%	0.012
	5.123V	0.360		230.29V
2	0.090A	0.461	72.144%	0.022
	5.120V	0.639		230.29V
3	0.550A	2.800	80.298%	0.111
	5.090V	3.487		230.29V
4	1.000A	5.061	80.653%	0.179
	5.060V	6.275		230.29V
5	1.500A	7.541	81.008%	0.232
	5.027V	9.309		230.30V
6	2.500A	12.397	80.063%	0.300
	4.958V	15.484		230.30V

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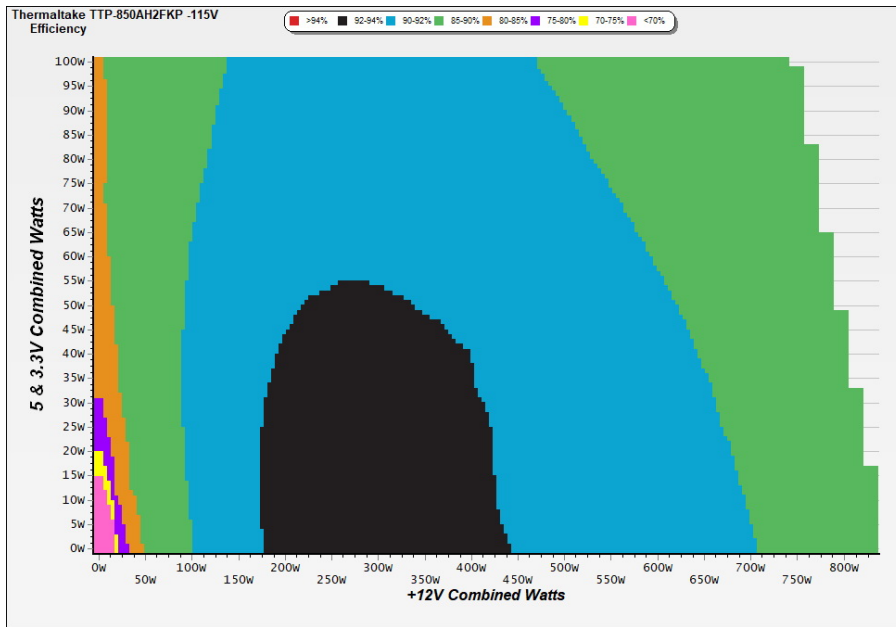
# 115V

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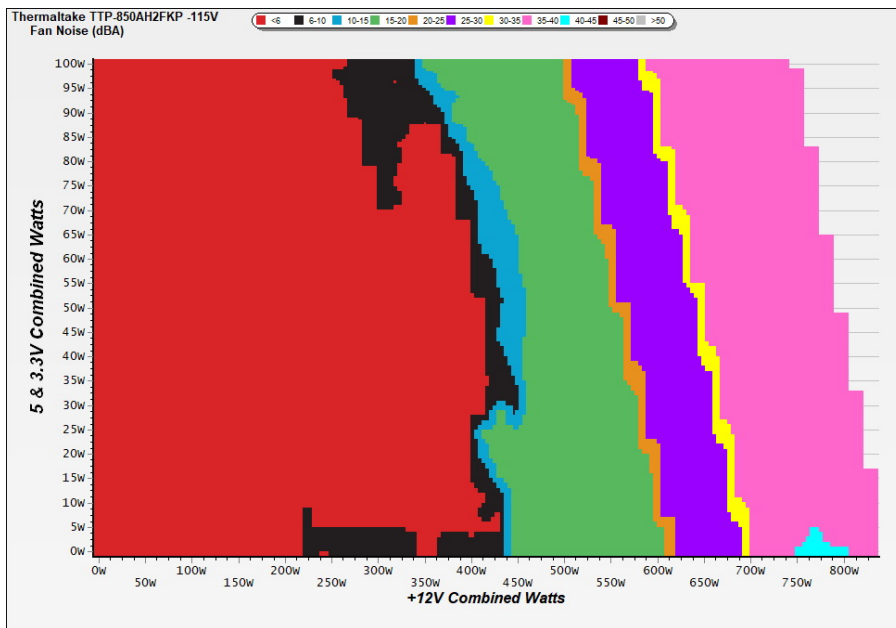
### EFFICIENCY GRAPH 115V



#### 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

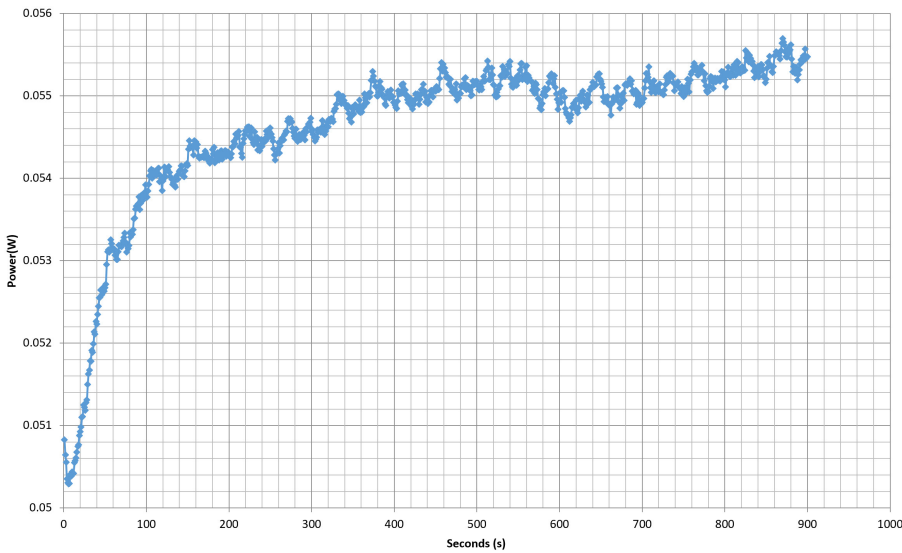
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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**VAMPIRE POWER -115V**

Power - PSTPD0850FNFAPE1XD000041 - 30/09/2020 - 09:03



**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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### 10-110% 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	5.263A	1.982A	1.987A	0.992A	84.975	88.085%	0			

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## Thermaltake Toughpower PF1 850W

### 20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.235A	0.495A	0.496A	0.196A	19.999	75.439%	0	<6.0	0.645
	12.022V	5.049V	3.328V	5.109V	26.510				115.14V
2	2.468A	0.991A	0.993A	0.393A	39.990	83.311%	0	<6.0	0.837
	12.027V	5.048V	3.326V	5.091V	48.001				115.14V
3	3.704A	1.485A	1.491A	0.592A	60.021	86.071%	0	<6.0	0.920
	12.032V	5.047V	3.324V	5.074V	69.734				115.14V
4	4.933A	1.982A	1.985A	0.791A	79.974	88.216%	0	<6.0	0.949
	12.037V	5.046V	3.322V	5.056V	90.657				115.14V

### RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.50mV	11.60mV	17.80mV	4.20mV	Pass
20% Load	13.80mV	11.80mV	15.60mV	5.10mV	Pass
30% Load	14.40mV	12.60mV	16.90mV	5.70mV	Pass
40% Load	17.90mV	13.90mV	17.90mV	7.20mV	Pass
50% Load	16.80mV	16.50mV	18.90mV	8.90mV	Pass
60% Load	17.60mV	16.70mV	18.20mV	9.20mV	Pass
70% Load	18.10mV	17.30mV	18.80mV	9.90mV	Pass
80% Load	18.90mV	17.80mV	19.90mV	13.10mV	Pass
90% Load	19.00mV	19.40mV	20.70mV	15.40mV	Pass
100% Load	26.40mV	21.50mV	23.60mV	17.00mV	Pass
110% Load	27.40mV	22.90mV	24.30mV	19.40mV	Pass
Crossload1	21.00mV	15.50mV	20.00mV	10.10mV	Pass
Crossload2	26.20mV	20.00mV	21.70mV	12.80mV	Pass

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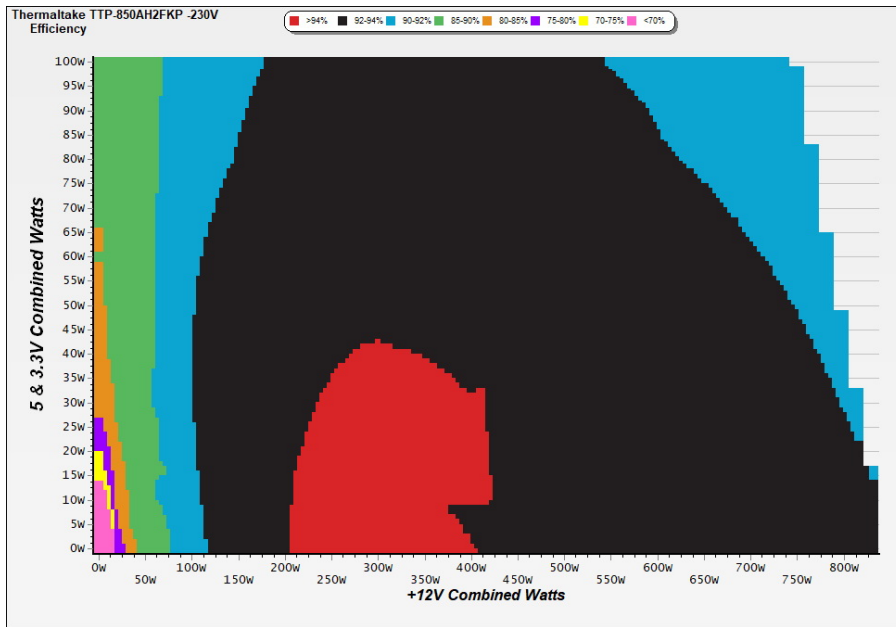
# 230V

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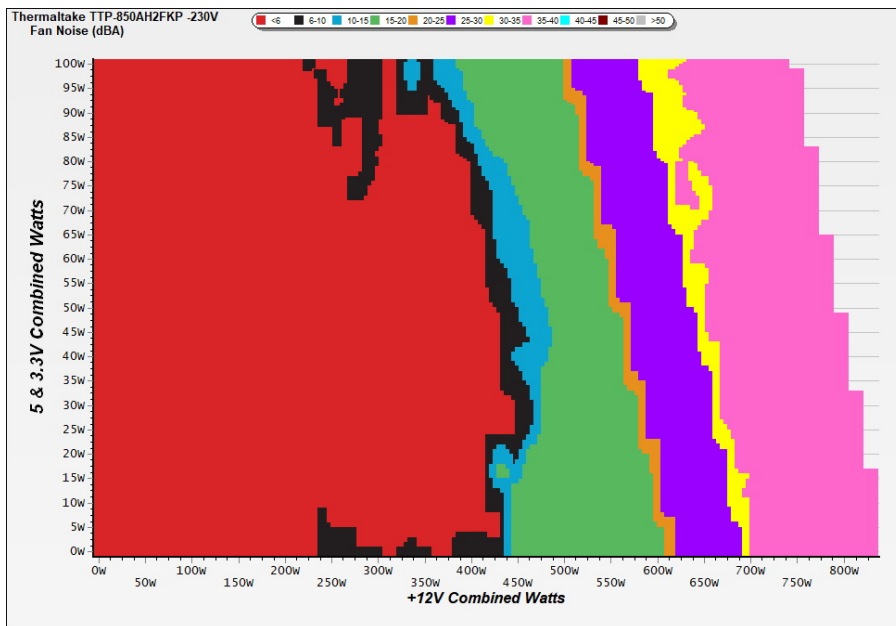
### EFFICIENCY GRAPH 230V



#### INFO

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### NOISE GRAPH 230V



#### INFO

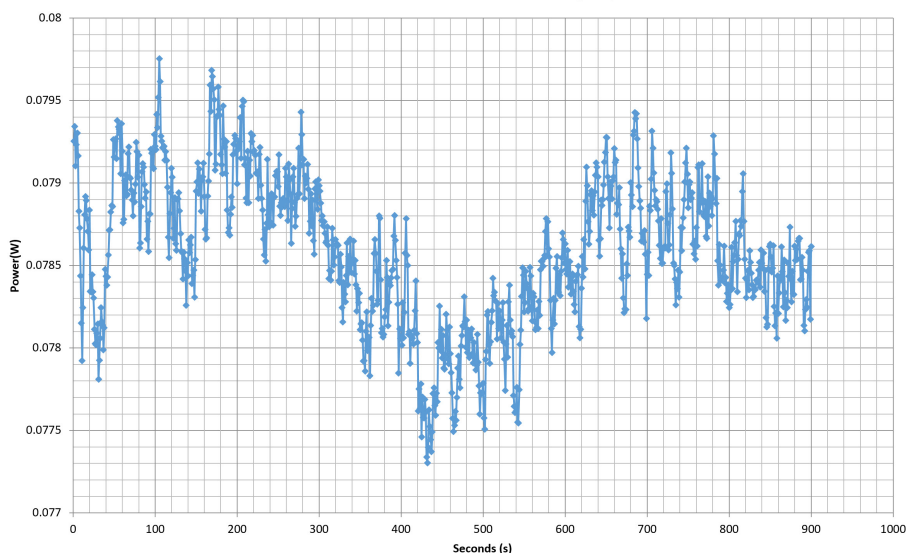
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### 10-110% LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	5.258A	1.981A	1.987A	0.992A	84.976	89.292%	0	<6.0	44.51°C	0.713
	12.054V	5.046V	3.321V	5.041V	95.166				40.01°C	230.28V
2	11.546A	2.972A	2.986A	1.197A	170.067	92.705%	0	<6.0	46.37°C	0.877
	12.054V	5.043V	3.316V	5.014V	183.450				41.02°C	230.28V
3	18.173A	3.472A	3.488A	1.403A	255.089	93.521%	484	<6.0	41.20°C	0.934
	12.053V	5.040V	3.312V	4.988V	272.762				47.37°C	230.28V
4	24.802A	3.973A	3.992A	1.613A	340.110	93.779%	586	6.1	41.52°C	0.956
	12.051V	5.037V	3.308V	4.962V	362.673				48.20°C	230.27V
5	31.074A	4.968A	4.996A	1.824A	425.135	93.213%	588	6.3	42.18°C	0.967
	12.056V	5.034V	3.302V	4.935V	456.090				50.00°C	230.28V
6	37.298A	5.965A	6.007A	2.000A	509.487	92.928%	857	18.2	42.60°C	0.973
	12.061V	5.031V	3.297V	4.911V	548.261				50.83°C	230.27V
7	43.617A	6.964A	7.020A	2.255A	594.963	92.491%	1239	30.7	43.40°C	0.978
	12.056V	5.027V	3.291V	4.881V	643.269				52.48°C	230.27V
8	49.957A	7.967A	8.038A	2.476A	680.319	91.980%	1701	39.9	43.64°C	0.982
	12.048V	5.023V	3.286V	4.849V	739.638				53.25°C	230.28V
9	56.656A	8.470A	8.536A	2.482A	765.239	91.593%	1798	41.1	44.31°C	0.985
	12.050V	5.020V	3.281V	4.838V	835.480				54.27°C	230.28V
10	63.280A	8.972A	9.065A	2.597A	849.949	91.140%	1802	41.1	45.09°C	0.987
	12.053V	5.018V	3.277V	4.816V	932.577				55.73°C	230.27V
11	70.297A	8.977A	9.072A	2.604A	934.727	90.611%	2162	46.0	47.06°C	0.989
	12.056V	5.015V	3.274V	4.802V	1031.587				57.86°C	230.27V
CL1	0.101A	12.005A	12.000A	0.000A	101.170	85.700%	585	6.1	42.55°C	0.785
	12.085V	5.034V	3.293V	5.087V	118.051				50.55°C	230.27V
CL2	70.018A	1.000A	1.001A	1.000A	857.553	91.787%	1801	41.4	45.22°C	0.987
	12.058V	5.027V	3.299V	4.947V	934.284				55.68°C	230.27V

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### 20-80W LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.233A	0.493A	0.496A	0.196A	20.003	77.139%	0	<6.0	0.388
	12.054V	5.049V	3.327V	5.107V	25.931				230.26V
2	2.463A	0.991A	0.993A	0.393A	39.993	84.652%	0	<6.0	0.554
	12.053V	5.049V	3.325V	5.090V	47.244				230.28V
3	3.698A	1.486A	1.489A	0.592A	60.024	87.642%	0	<6.0	0.605
	12.053V	5.048V	3.323V	5.073V	68.488				230.27V
4	4.926A	1.982A	1.987A	0.791A	79.975	89.154%	0	<6.0	0.701
	12.053V	5.047V	3.321V	5.056V	89.704				230.28V

### RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.60mV	11.40mV	13.90mV	4.20mV	Pass
20% Load	12.10mV	11.60mV	14.40mV	4.80mV	Pass
30% Load	12.40mV	12.10mV	14.90mV	5.50mV	Pass
40% Load	14.60mV	12.00mV	14.10mV	6.40mV	Pass
50% Load	14.70mV	15.10mV	16.00mV	8.10mV	Pass
60% Load	15.30mV	15.80mV	15.90mV	8.30mV	Pass
70% Load	15.90mV	14.60mV	15.90mV	8.40mV	Pass
80% Load	17.10mV	15.70mV	16.70mV	9.00mV	Pass
90% Load	17.60mV	17.00mV	17.10mV	9.80mV	Pass
100% Load	25.60mV	18.30mV	22.20mV	11.20mV	Pass
110% Load	26.40mV	19.10mV	20.40mV	11.90mV	Pass
Crossload1	17.50mV	14.70mV	19.90mV	9.80mV	Pass
Crossload2	24.80mV	16.60mV	19.20mV	10.50mV	Pass

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## Thermaltake Toughpower PF1 850W



Top side



Power specifications label

## CERTIFICATIONS 115V



**Aristeidis Bitziopoulos**  
Lab Director

## CERTIFICATIONS 230V



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