

Anex

Thermaltake Toughpower SFX 1000W

Lab ID#: TT10002124
Receipt Date: Dec 19, 2022
Test Date: Jan 31, 2023

Report: 23PS2124A
Report Date: Jan 31, 2023

DUT INFORMATION		DUT SPECIFICATIONS	
Brand	Thermaltake	Rated Voltage (Vrms)	100-240
Manufacturer (OEM)	HKC	Rated Current (Arms)	15
Series	Toughpower SFX	Rated Frequency (Hz)	50-60
Model Number	PS-STP-1000FNFAGU-1	Rated Power (W)	1000
Serial Number	PSSTP1000FNFAGU1SV000073	Type	SFX-L
DUT Notes		Cooling	120mm Fluid Dynamic Bearing Fan (HA1215H12SF-Z)
		Semi-Passive Operation	✓
		Cable Design	Fully Modular

TEST EQUIPMENT	
Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P
Power Analyzers	RS HMC8015, N4L PPA1530, N4L PPA5530
Oscilloscopes	Picoscope 4444, Rigol DS7014, 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, Keithley 2015 - THD
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Isolation Transformer	4kVA

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 1/12

Anex

Thermaltake Toughpower SFX 1000W

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX 3.0 Ready	✓

115V

Average Efficiency	90.451%
Efficiency With 10W (≤500W) or 2% (>500W)	67.911
Average Efficiency 5VSB	84.023%
Standby Power Consumption (W)	0.0881000
Average PF	0.981
Avg Noise Output	32.94 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	83.3	3	0.3
	Watts	100		999.6	15	3.6
Total Max. Power (W)		1000				

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

Hold-Up Time (ms)	21
AC Loss to PWR_OK Hold Up Time (ms)	18.2
PWR_OK Inactive to DC Loss Delay (ms)	2.8

All data and graphs included in this test report can be used by any individual on the following conditions:

- › It should be mentioned that the test results are provided by Cybenetics
- › The link to the original test results document should be provided in any case

PAGE 2/12

Anex

Thermaltake Toughpower SFX 1000W

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (300mm)	1	1	16-18AWG	No
4+4 pin EPS12V (400mm)	2	2	16AWG	No
6+2 pin PCIe (400mm+150mm)	2	4	16-18AWG	No
12+4 pin PCIe (400mm) (600W)	1	1	16-26AWG	No
SATA (300mm+145mm+145mm+145mm)	2	8	18AWG	No
4-pin Molex (300mm+150mm+150mm+150mm)	1	4	18AWG	No
FDD Adapter (150mm)	1	1	22AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

All data and graphs included in this test report can be used by any individual on the following conditions:

- › It should be mentioned that the test results are provided by Cybenetics
- › The link to the original test results document should be provided in any case

PAGE 3/12

Anex

Thermaltake Toughpower SFX 1000W

General Data	-
Manufacturer (OEM)	HKC
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 3x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU25KH (800V, 25A @ 90°C)
APFC MOSFETs	2x Lonten LSB65R070GF (650V, 30A @ 100°C, Rds(on): 0.070Ohm) & CM03AX (reduce the no load consumption)
APFC Boost Diode	1x CH3D16065I
Bulk Cap(s)	2x Nippon Chemi-Con (400V, 590uF & 390uF each or 980uF combined, 2,000h @ 105°C, KHE)
Main Switchers	2x Wayon WMK53N65F2 (650V, 26A @ 100°C, Rds(on): 0.0780Ohm)
APFC Controller	Champion CM6502UHHX
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x Infineon ISC012N04LM6 (40V, 168A @ 100°C, Rds(on): 1.2mOhm)
5V & 3.3V	DC-DC Converters: 4x Infineon Infineon ISC012N04LM6 (40V, 168A @ 100°C, Rds(on): 1.2mOhm) PWM Controller(s): ANPEC APW7159C
Isolated Gate Driver	Novosense NSi6602
Filtering Capacitors	Electrolytic: 1x Nichicon (2-4,000h @ 105°C, HD), 1x Nippon Chemi-Con (5-6,000h @ 105°C, KZH) 2x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KYA), 1x Rubycon (2-10,000h @ 105°C, YXF), Polymer: 11x Nippon Chemi-Con, 16x NIC
Supervisor IC	INFSitronix IN1S429I (OCP, OVP, UVP, SCP, PG)
Fan Model	Thermaltake (Hong Hua) HA1215H12SF-Z (120mm, 12V, 0.55A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifiers	Infineon ICE5QR1680AG FET (800V, 5.8A, Rds(on): 1.75Ohm) & Meraki-IC MK91736 FET
Standby PWM Controller	Infineon ICE5QR1680AG

All data and graphs included in this test report can be used by any individual on the following conditions:

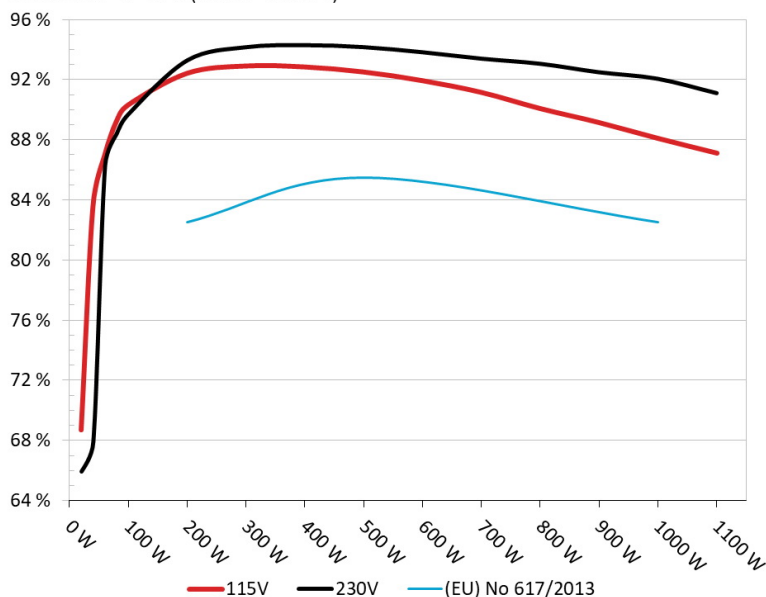
- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 4/12

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Thermaltake Toughpower SFX 1000W

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



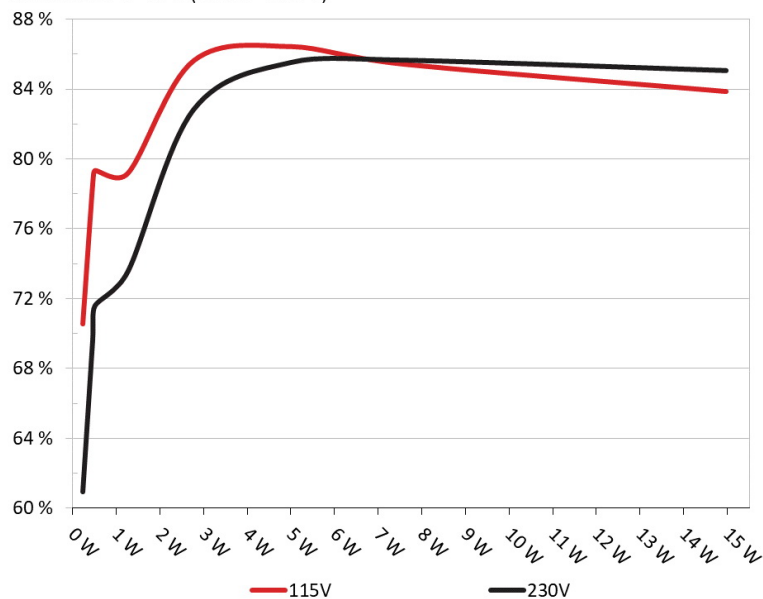
INFO

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 Toughpower SFX 1000W

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

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

Anex

Thermaltake Toughpower SFX 1000W

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	70.031%	0.031
	5.054V	0.324W		114.94V
2	0.09A	0.455W	78.103%	0.055
	5.053V	0.583W		114.94V
3	0.55A	2.773W	85.14%	0.249
	5.042V	3.257W		114.93V
4	1A	5.033W	85.937%	0.351
	5.033V	5.857W		114.92V
5	1.5A	7.534W	84.946%	0.403
	5.023V	8.869W		114.93V
6	3A	14.974W	83.364%	0.48
	4.991V	17.962W		114.92V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	60.431%	0.011
	5.054V	0.382W		229.93V
2	0.09A	0.455W	69.096%	0.019
	5.052V	0.659W		229.9V
3	0.55A	2.772W	82.328%	0.092
	5.039V	3.367W		229.89V
4	1A	5.03W	85.028%	0.153
	5.03V	5.915W		229.89V
5	1.5A	7.531W	85.143%	0.212
	5.02V	8.845W		229.89V
6	3A	14.962W	84.545%	0.312
	4.987V	17.695W		229.89V

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 6/12

Anex

Thermaltake Toughpower SFX 1000W

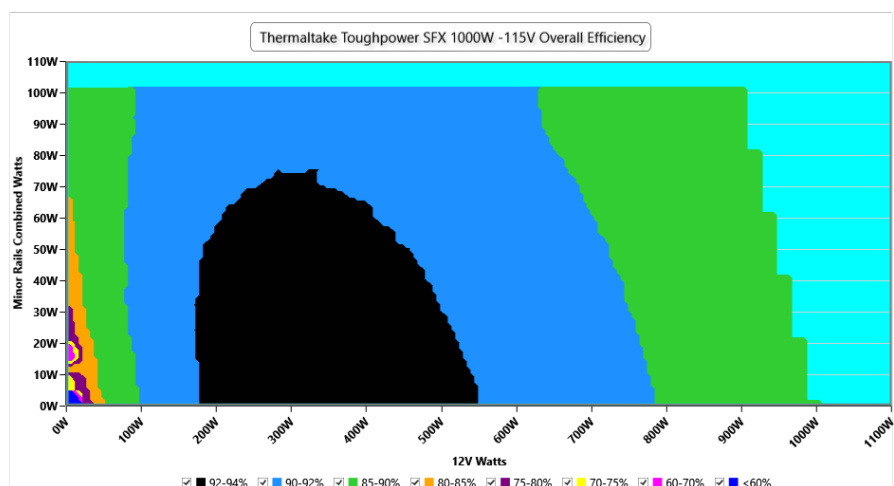
115V

All data and graphs included in this test report can be used by any individual on the following conditions:

- › It should be mentioned that the test results are provided by Cybenetics
- › The link to the original test results document should be provided in any case

PAGE 7/12

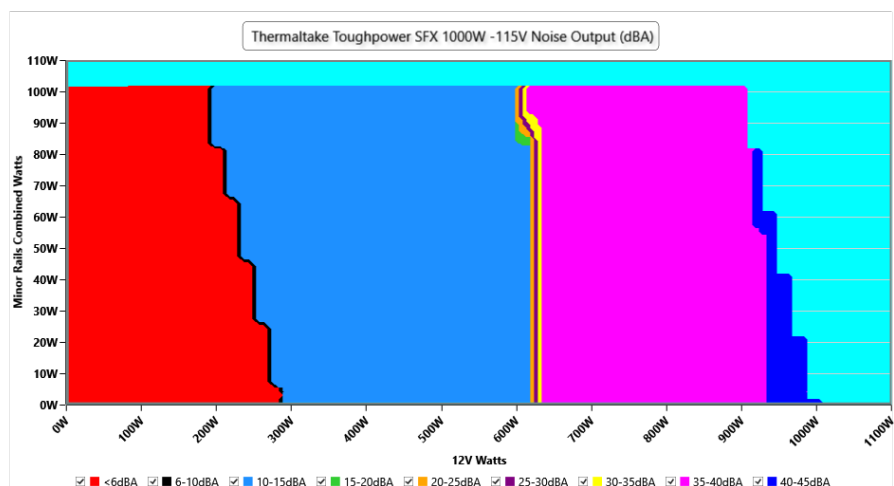
EFFICIENCY GRAPH 115V



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

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.94 V	114.89 V	113.85 V	114.98 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.98 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.417	1.416	1.340	1.419	1.490	PASS
Mains Voltage THD:	0.15 %	0.11 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.088 W	0.013 W	N/A	0.158 W	N/A	N/A
Apparent Power:	10.441 W	10.420 W	N/A	10.463 W	N/A	N/A
Power Factor:	0.012	N/A	N/A	N/A	N/A	N/A

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

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 9/12

Anex

Thermaltake Toughpower SFX 1000W

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
10%	6.489A	1.974A	1.961A	0.997A	100.02	89.841%	0	<6.0	44.24°C	0.964
	12.086V	5.066V	3.366V	5.016V	111.331				39.9°C	114.91V
20%	13.994A	2.962A	2.944A	1.199A	199.982	91.948%	0	<6.0	45.68°C	0.963
	12.082V	5.064V	3.363V	5.006V	217.494				40.91°C	114.89V
30%	21.856A	3.459A	3.439A	1.401A	300.048	92.434%	777	16.2	41.37°C	0.978
	12.079V	5.06V	3.359V	4.996V	324.612				46.59°C	114.87V
40%	29.689A	3.954A	3.934A	1.605A	399.703	92.37%	780	16.2	41.87°C	0.986
	12.075V	5.058V	3.356V	4.985V	432.724				47.51°C	114.84V
50%	37.189A	4.944A	4.922A	1.811A	499.415	92.035%	782	16.2	42.14°C	0.99
	12.071V	5.057V	3.353V	4.971V	542.639				48.16°C	114.82V
60%	44.762A	5.936A	5.911A	2A	599.865	91.453%	783	16.2	43.07°C	0.992
	12.067V	5.055V	3.35V	4.958V	655.928				49.61°C	114.79V
70%	52.276A	6.928A	6.903A	2.225A	699.688	90.673%	1548	37.3	43.25°C	0.994
	12.062V	5.053V	3.347V	4.945V	771.665				50.28°C	114.77V
80%	59.858A	7.923A	7.896A	2.331A	799.707	89.597%	1546	37.3	43.49°C	0.995
	12.058V	5.05V	3.343V	4.935V	892.564				51.53°C	114.73V
90%	67.786A	8.42A	8.382A	2.438A	899.484	88.667%	1546	37.3	44.08°C	0.995
	12.053V	5.049V	3.34V	4.923V	1014.448				53.09°C	114.7V
100%	75.523A	8.918A	8.899A	3.059A	999.503	87.612%	1745	40.6	45.92°C	0.996
	12.047V	5.047V	3.337V	4.904V	1140.827				55.97°C	114.69V
110%	83.189A	9.909A	9.986A	3.064A	1099.99	86.628%	2105	45.3	47.35°C	0.997
	12.041V	5.047V	3.334V	4.897V	1269.806				58.29°C	114.66V
CL1	0.116A	11.901A	11.798A	0A	101.323	85.78%	0	<6.0	44.56°C	0.961
	12.077V	5.06V	3.365V	5.035V	118.125				50.07°C	114.9V
CL2	0.116A	19.768A	0A	0A	101.429	84.907%	0	<6.0	43.22°C	0.961
	12.083V	5.06V	3.371V	5.04V	119.456				50.24°C	114.9V
CL3	0.116A	0A	19.597A	0A	67.388	80.783%	0	<6.0	43.06°C	0.928
	12.080V	5.077V	3.367V	5.035V	83.419				52.16°C	114.91V
CL4	83.001A	0A	0A	0A	1000.041	88.139%	1756	41.1	47.02°C	0.996
	12.048V	5.057V	3.341V	4.984V	1134.627				57.92°C	114.68V

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 10/12

Anex

Thermaltake Toughpower SFX 1000W

20-80W 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
20W	1.230A	0.493A	0.49A	0.198A	20.007	68.19%	0	<6.0	39.91°C	0.733
	12.088V	5.07V	3.37V	5.043V	27.086				36.84°C	114.92V
40W	2.704A	0.69A	0.686A	0.298A	40.006	83.099%	0	<6.0	42.19°C	0.87
	12.087V	5.069V	3.369V	5.039V	48.147				38.83°C	114.93V
60W	4.181A	0.888A	0.882A	0.397A	60.006	86.506%	0	<6.0	43.18°C	0.912
	12.087V	5.069V	3.368V	5.035V	69.363				39.44°C	114.92V
80W	5.654A	1.085A	1.078A	0.497A	79.968	88.751%	0	<6.0	43.38°C	0.938
	12.086V	5.068V	3.367V	5.031V	90.107				39.45°C	114.93V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.37mV	7.41mV	7.46mV	6.24mV	Pass
20% Load	9.11mV	7.71mV	7.82mV	6.65mV	Pass
30% Load	10.13mV	7.46mV	8.54mV	7.06mV	Pass
40% Load	11.98mV	8.12mV	8.64mV	7.62mV	Pass
50% Load	13.61mV	10.32mV	10.43mV	7.88mV	Pass
60% Load	16.94mV	10.93mV	11.35mV	8.80mV	Pass
70% Load	18.88mV	11.49mV	12.22mV	8.60mV	Pass
80% Load	19.19mV	9.81mV	11.61mV	9.21mV	Pass
90% Load	20.98mV	11.49mV	13.14mV	9.41mV	Pass
100% Load	27.09mV	12.61mV	14.31mV	12.07mV	Pass
110% Load	31.24mV	17.06mV	14.99mV	13.04mV	Pass
Crossload1	12.77mV	10.09mV	10.18mV	6.23mV	Pass
Crossload2	15.92mV	12.36mV	9.10mV	13.97mV	Pass
Crossload3	14.38mV	7.86mV	12.73mV	11.98mV	Pass
Crossload4	23.83mV	9.22mV	12.70mV	17.72mV	Pass

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 11/12

Anex

Thermaltake Toughpower SFX 1000W

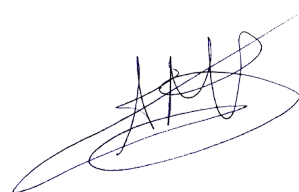


Top side

thermaltake		TOUGHPower SERIES ATX 3.0 POWER SUPPLY			
TOUGHPower SFX 1000W					
AC INPUT (交流輸入/交流輸入)	Input Voltage (輸入電壓/輸入電壓): 100 - 240V~ Input Current (輸入電流/輸入電流): 15A Max. Frequency (頻率/頻率): 50 - 60Hz 200 - 240V~, 10A Max, 50 - 60Hz (Only for China 适用于中国地区使用)				Hi-POT OK Q.C. PASSED
DC OUTPUT (直流輸出/直流輸出)	+3.3V	+5V	+12V	-12V	+5VSB
Max Output Current (最大輸出電流/最大輸出電流)	20A	20A	83.3A	0.3A	3.0A
Max Output Power (最大輸出功率/最大輸出功率)	100W		999.6W	3.6W	15W
Total Power (總輸出功率/總輸出功率)	1000W				
 TUV C  UL E  FCC  CE  RoHS  UL  UL  UL  UL  UL  UL  UL  UL MODEL (型號): SFX-1000AH2PKG Switching Power Supply (開關電源) 監製 (製造商/製造商) REV (版本/版本): A 用戶請至各銷售商處索取說明書, 請參考 http://my.thermaltake.com/tw/pcPower.aspx CAN ICES-003(B) / NMB-003(B) WARNING: HAZARDOUS VOLTAGES CONTAINED WITHIN. THIS POWER SUPPLY IS NOT USER SERVICEABLE. RETURN TO SERVICE CENTER FOR REPAIR. CAUTION: HAZARDOUS AREA. DO NOT REMOVE THIS COVER. Trained service people only. No serviceable components inside. 警告: 請勿拆開外蓋, 避免觸電。 建議用專業技術人員使用以上之工具拆開外蓋。 80 PLUS EFFECTIVE 80% EFFICIENCY 100-240V AC INPUT 50/60Hz					

Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 12/12