

Lab ID#: SF19650138
Receipt Date: Nov 18, 2019
Test Date: Nov 28, 2019

Report: 19PS892A

Report Date: Nov 30, 2019

DUT INFORMATION

Brand	Super Flower
Manufacturer (OEM)	Super Flower
Series	Leadex III Gold ARGB
Model Number	SF-650F14RG
Serial Number	S1908199005
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	130mm Fluid Dynamic Bearing Fan (RL4C S1302412L)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54.1	3	0.5
	Watts	100		649.2	15	6
Total Max. Power (W)		650				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (590mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (690mm)	2	2	18-22AWG	Yes
6+2 pin PCIe (540mm+150mm)	2	4	18-22AWG	Yes
SATA (550mm+120mm+120mm)	2	6	18AWG	No
4-pin Molex (550mm+100mm+100mm+100mm)	1	4	18AWG	No
ARGB Sync cable (550mm+180mm)	1	2	28AWG	No
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

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General Data	
Manufacturer (OEM)	Super Flower
Platform Model	Leadex III
PCB Type	Single Sided
Primary Side	
Transient Filter	3x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x
APFC MOSFETS	2x Infineon IPA50R199CP (550V, 11A @ 100°C, 0.199Ohm) & 1x SPN5003 FET (for reduced no-load consumption)
APFC Boost Diode	1x STMicroelectronics STTH8R06D (600V, 8A @ 130°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 470uF, 2,000h @ 105°C, KMQ)
Main Switchers	2x Infineon IPA50R199CP (550V, 11A @ 100°C, 0.199Ohm)
APFC Controller	SF29603 & S9602
Resonant Controllers	SF29605
Topology	Primary side: Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Infineon IPP041N04N (40V, 80A @ 100°C, 4.1mOhm)
5V & 3.3V	DC-DC Converters: 8x Alpha & Omega AON6516 (30V, 25A @ 100°C, 8mOhm @ 125°C) PWM Controllers: 2x ON Semiconductor NCP1587A
Filtering Capacitors	Electrolytics: 4x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 9x Nippon Chemi-Con (1-5,000h @ 105°C, KZE), 2x Nippon Chemi-Con (1-2,000h @ 105°C, KMG), 7x Nichicon (1,000h @ 105°C, RZ) Polymers: 8x FPCAP, 3x United Chemi-Con, 2x Jamicon
Supervisor IC	SF29603 & LM339A
Fan controller	STMicroelectronics STM8S003F3
Fan Model	Globe Fan S1302412L (130mm, 12V, 0.25A, Fluid Dynamic Bearing Fan)
5VSB Circuit	
Rectifier	1x PFC PFR20L60CT SBR (60V, 20A)
Standby PWM Controller	SF29604

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	88.832%
Efficiency With 10W (≤500W) or 2% (>500W)	65.596
Average Efficiency 5VSB	80.520%
Standby Power Consumption (W)	0.0453548
Average PF	0.982
Avg Noise Output	20.99 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A

230V

Average Efficiency	90.774%
Average Efficiency 5VSB	79.568%
Standby Power Consumption (W)	0.0754545
Average PF	0.917
Avg Noise Output	20.65 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	A

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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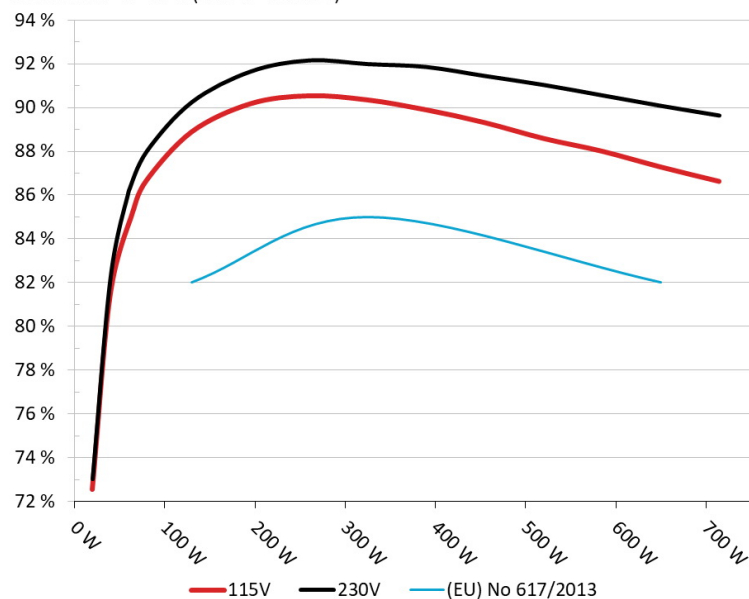
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Super Flower SF-650F14RG

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



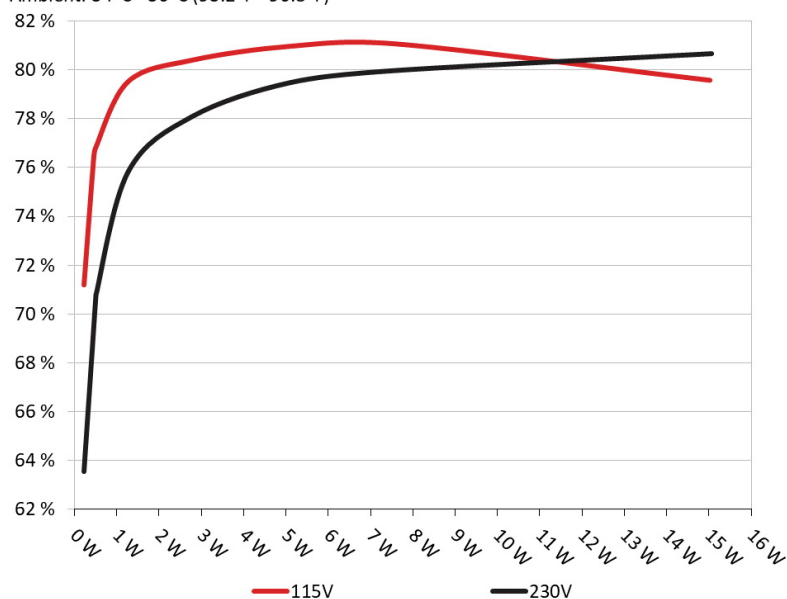
INFO

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: Super Flower SF-650F14RG

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	0.230	71.207%	0.023
	5.115V	0.323		115.12V
2	0.090A	0.460	76.412%	0.042
	5.114V	0.602		115.11V
3	0.550A	2.806	80.401%	0.211
	5.100V	3.490		115.11V
4	1.000A	5.086	80.961%	0.313
	5.086V	6.282		115.11V
5	1.500A	7.605	81.059%	0.380
	5.070V	9.382		115.12V
6	3.000A	15.030	79.574%	0.466
	5.010V	18.888		115.12V

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

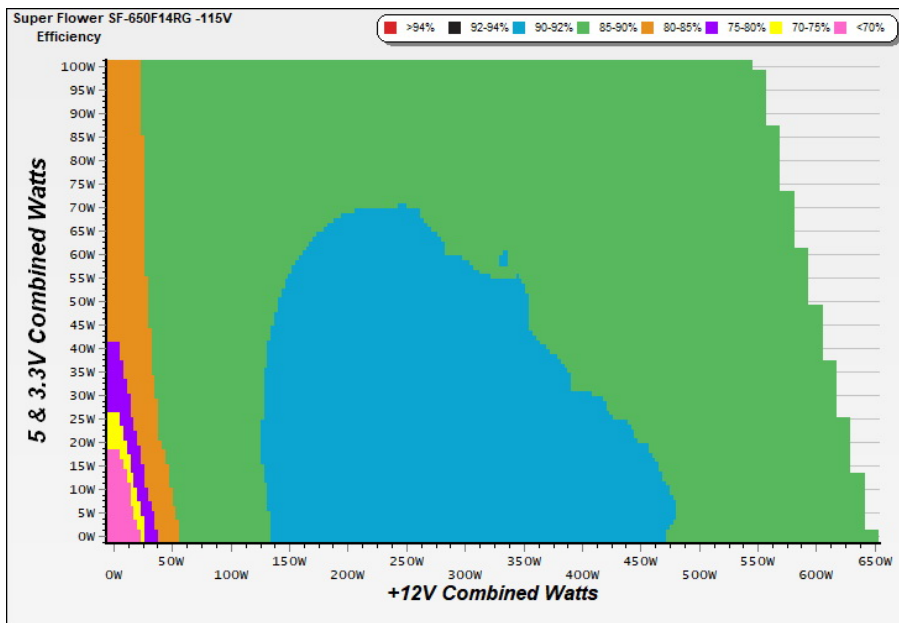
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	64.167%	0.008
	5.121V	0.360		230.26V
2	0.090A	0.461	70.706%	0.014
	5.119V	0.652		230.27V
3	0.550A	2.807	77.456%	0.077
	5.103V	3.624		230.27V
4	1.000A	5.089	78.595%	0.132
	5.088V	6.475		230.26V
5	1.500A	7.606	79.320%	0.183
	5.070V	9.589		230.26V
6	3.000A	15.050	79.575%	0.288
	5.016V	18.913		230.26V

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115V

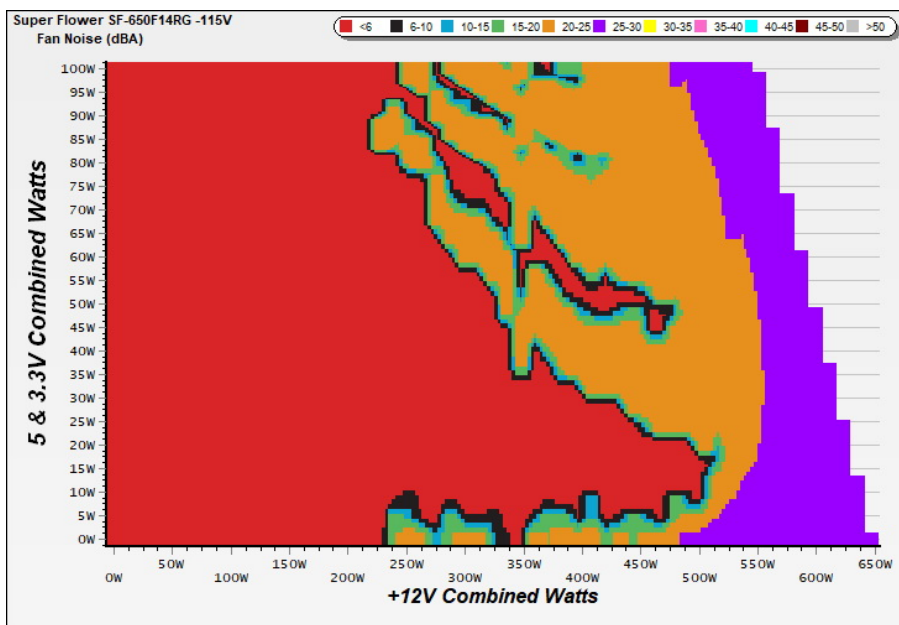
EFFICIENCY GRAPH 115V



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

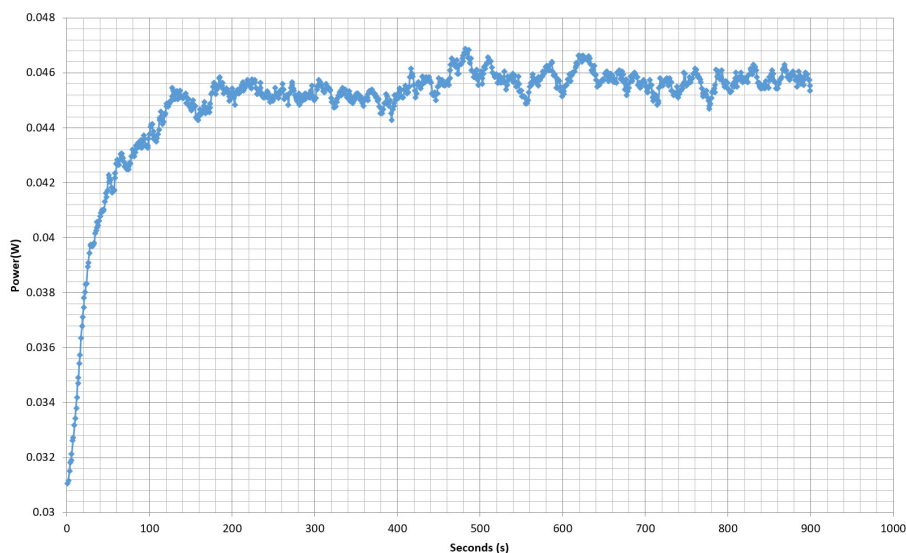
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - S1908199006 - 11/09/2019 - 17:49



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	3.572A	1.984A	1.991A	0.985A	64.961	85.102%	0	<6.0	43.73°C	0.921
	12.141V	5.037V	3.314V	5.078V	76.333				40.07°C	115.12V
2	8.169A	2.981A	2.990A	1.185A	130.028	88.872%	0	<6.0	45.25°C	0.965
	12.134V	5.033V	3.311V	5.066V	146.309				40.83°C	115.12V
5	22.672A	4.978A	5.000A	1.790A	325.092	90.336%	0	<6.0	48.87°C	0.992
	12.111V	5.023V	3.301V	5.029V	359.870				42.30°C	115.12V
10	46.253A	8.987A	9.035A	3.024A	649.889	87.272%	1562	37.4	45.40°C	0.996
	12.111V	5.009V	3.287V	4.962V	744.668				54.62°C	115.11V

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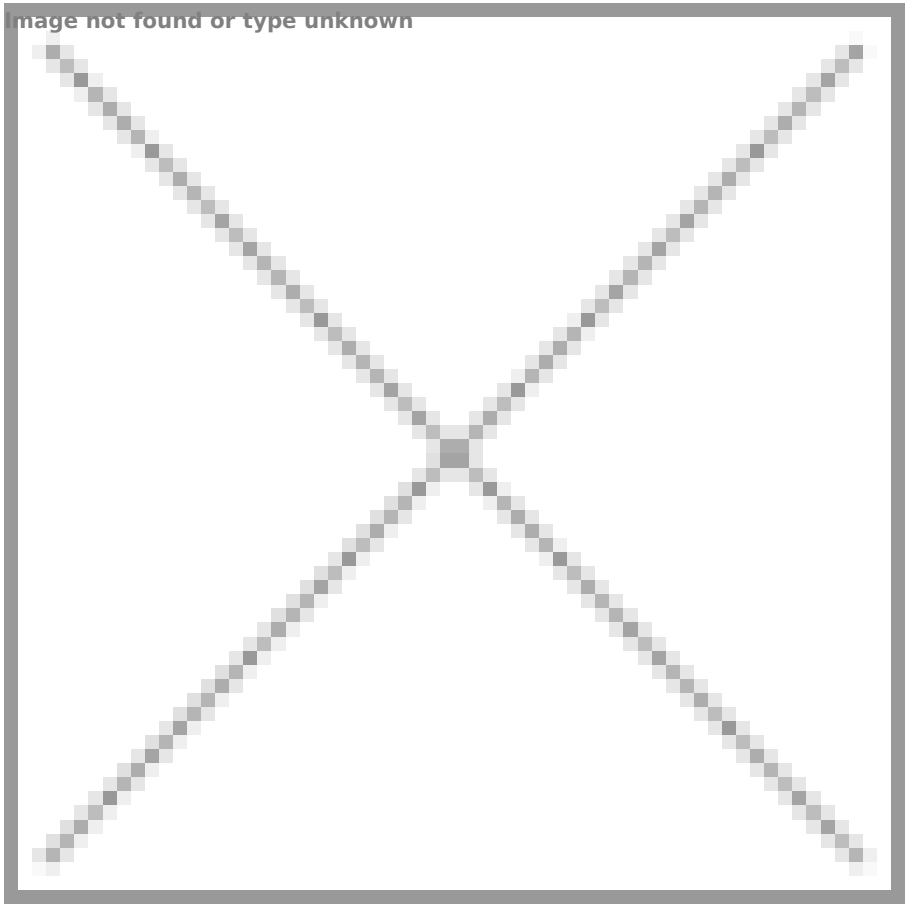
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230V

EFFICIENCY GRAPH 230V

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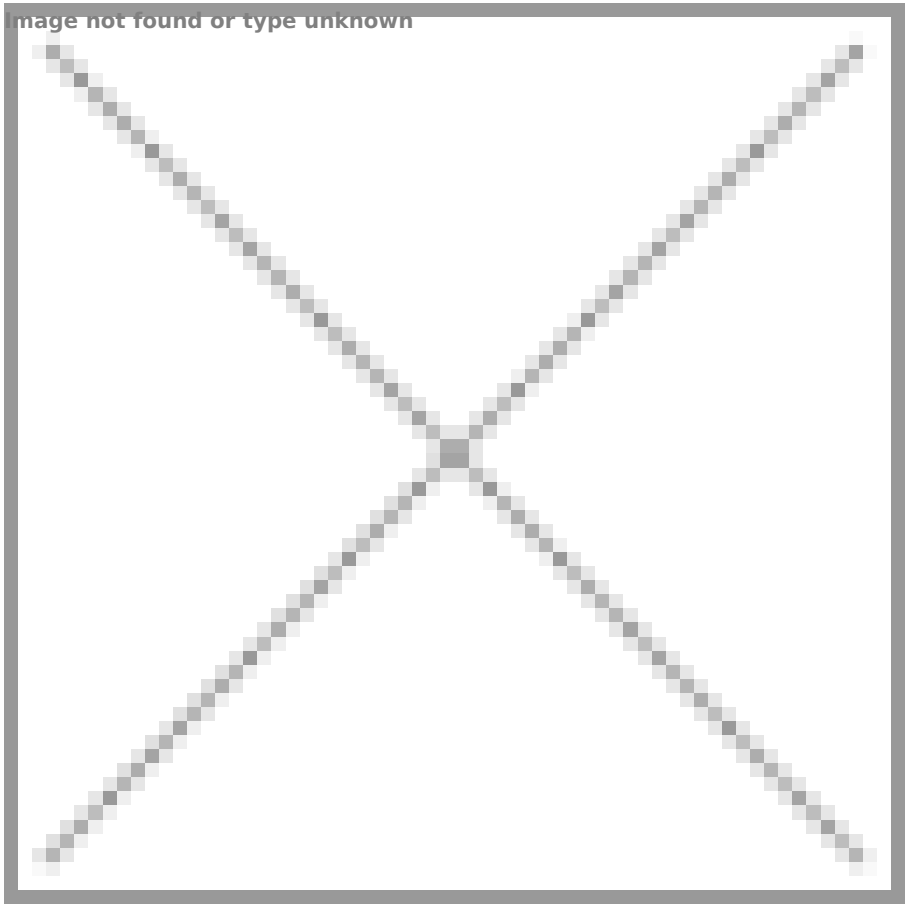
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VAMPIRE POWER -230V

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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	3.572A	1.986A	1.991A	0.985A	64.956	86.208%	0	<6.0	43.57°C	0.645
	12.137V	5.036V	3.314V	5.078V	75.348				40.16°C	230.24V
2	8.171A	2.981A	2.988A	1.184A	130.014	90.267%	0	<6.0	44.86°C	0.831
	12.131V	5.032V	3.311V	5.066V	144.033				40.48°C	230.24V
5	22.686A	4.980A	5.000A	1.790A	325.090	92.005%	925	24.5	42.16°C	0.951
	12.103V	5.023V	3.301V	5.029V	353.341				48.51°C	230.25V
10	46.258A	8.988A	9.037A	3.023A	649.858	90.097%	1554	37.3	45.05°C	0.983
	12.109V	5.008V	3.287V	4.963V	721.291				53.74°C	230.26V

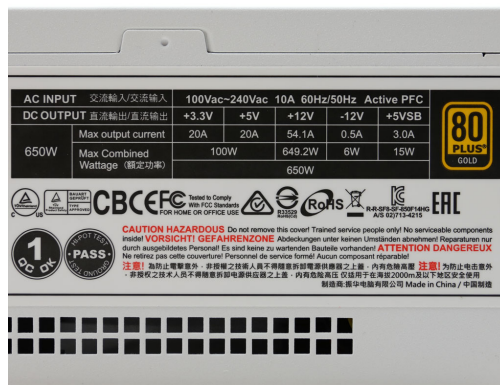
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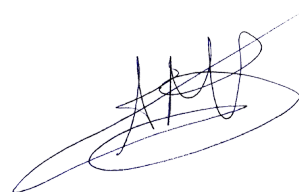


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Power specifications label

CERTIFICATIONS 115V

Aris Mpitsiopoulos
Lab Director

CERTIFICATIONS 230V



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