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

Super Flower Leadex III Gold 650W rev.3 (mode 1)

Lab ID#: SF19650062
Receipt Date: Jun 20, 2019
Test Date: Feb 7, 2019

Report:
Report Date: Jul 17, 2019

DUT INFORMATION

Brand	Super Flower
Manufacturer (OEM)	Super Flower
Series	Leadex III Gold
Model Number	SF-650F14HG rev.3
Serial Number	S1906198802
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 (S1282412L)
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
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

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

Super Flower Leadex III Gold 650W rev.3 (mode 1)

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	88.801%
Efficiency With 10W (≤500W) or 2% (>500W)	66.336
Average Efficiency 5VSB	80.418%
Standby Power Consumption (W)	0.0479006
Average PF	0.982
Avg Noise Output	11.12 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A++

230V

Average Efficiency	90.833%
Average Efficiency 5VSB	78.972%
Standby Power Consumption (W)	0.0826411
Average PF	0.921
Avg Noise Output	10.91 dB(A)
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	A++

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				

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

CABLES AND CONNECTORS

Modular Cables

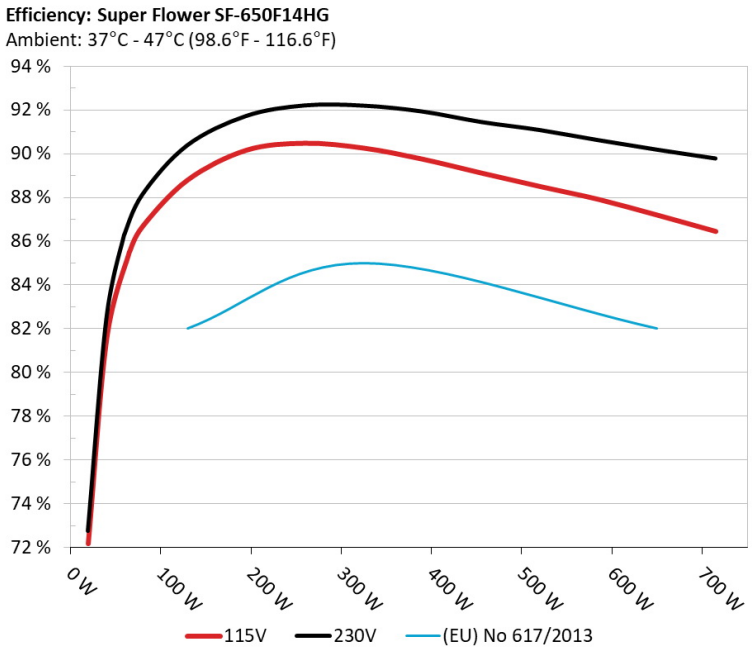
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (700mm)	2	2	18-22AWG	Yes
6+2 pin PCIe (550mm+150mm)	2	4	18-20AWG	Yes
SATA (550mm+120mm+120mm)	2	6	18AWG	No
4 pin Molex (550mm+100mm+100mm+100mm)	1	4	18AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Super Flower Leadex III Gold 650W rev.3 (mode 1)

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)
APFC Boost Diode	1x STMicroelectronics STTH8R06D (600V, 8A @ 130°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 470uF, 2000h @ 105°C, KMQ)
Main Switchers	2x Infineon IPA50R199CP (550V, 11A @ 100°C, 0.199Ohm)
APFC Controller	SF29603
Resonant Controllers	SF29605 & S9602
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:6x Alpha & Omega AON6516 (30V, 25A @ 100°C, 8mOhm) PWM Controllers: 2x ON Semiconductor NCP1587A
Filtering Capacitors	Electrolytics: 7x Nichicon (2-5,000h @ 105°C, HD), 2x Nichicon (4-10,000h @ 105°C, HE), 2x Nichicon (5-6,000h @ 105°C, HV), 2x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 3x Nippon Chemi-Con (1-2,000h @ 105°C, KMG), 8x United Chemi-Con (1,000h @ 105°C, KRG) Polymers: 3x FPCAP, 7x Teapo
Supervisor IC	SF29603
Fan Model	Globe Fan S1282412L (130mm, 12V, 0.18A, Fluid Dynamic Bearing)
5VSB Circuit	
Rectifier	1x PFC Device PFR20L60CT SBR (60V, 20A)
Standby PWM Controller	SF29604

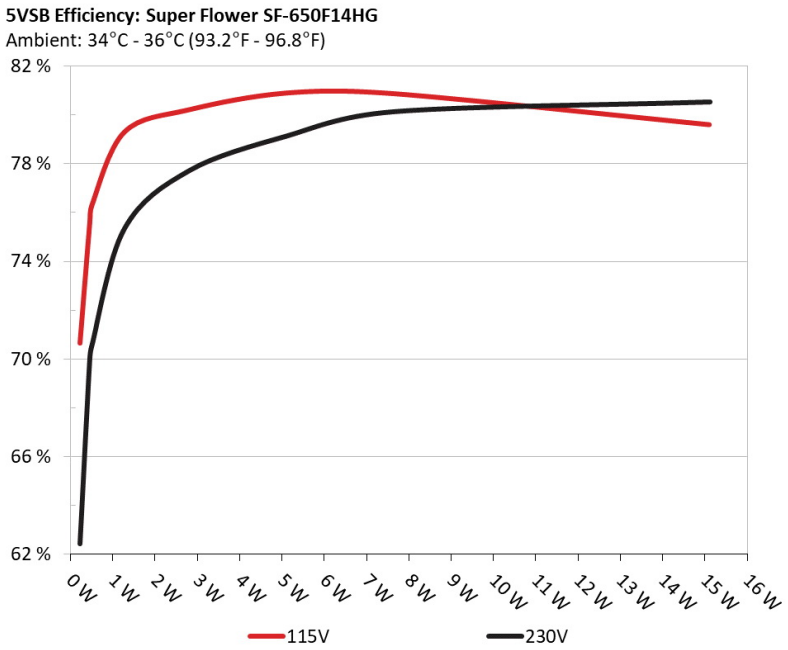
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	70.642%	0.025
	5.123V	0.327		115.17V
2	0.090A	0.461	75.574%	0.046
	5.122V	0.610		115.17V
3	0.550A	2.811	80.223%	0.221
	5.110V	3.504		115.17V
4	1.000A	5.098	80.908%	0.318
	5.098V	6.301		115.17V
5	1.500A	7.625	80.885%	0.380
	5.083V	9.427		115.16V
6	2.999A	15.097	79.609%	0.463
	5.034V	18.964		115.16V

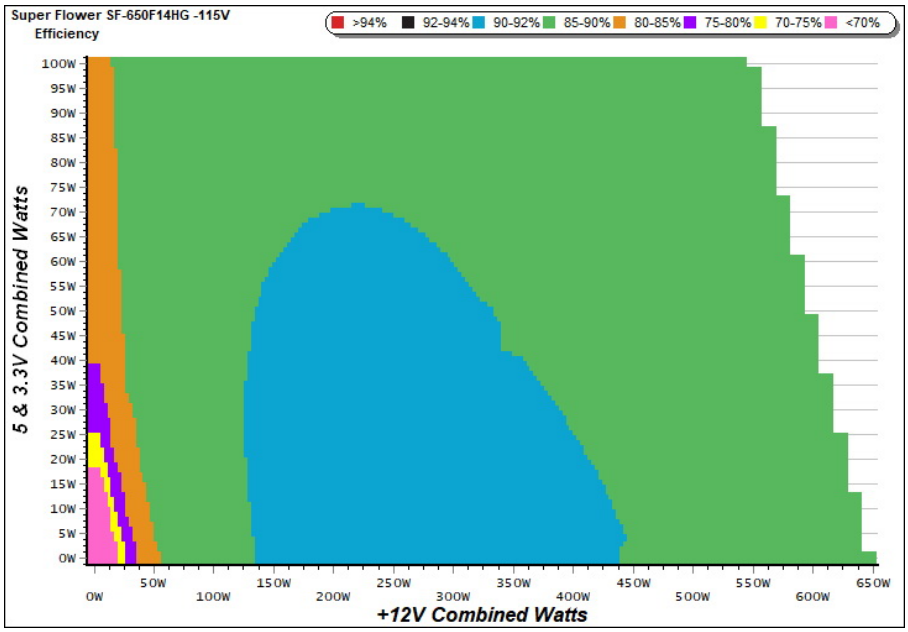
5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	62.432%	0.008
	5.123V	0.370		230.35V
2	0.090A	0.462	70.000%	0.015
	5.122V	0.660		230.36V
3	0.550A	2.811	77.716%	0.080
	5.110V	3.617		230.36V
4	1.000A	5.098	79.125%	0.135
	5.098V	6.443		230.36V
5	1.500A	7.625	80.128%	0.187
	5.083V	9.516		230.36V
6	3.000A	15.111	80.528%	0.292
	5.037V	18.765		230.36V

115V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

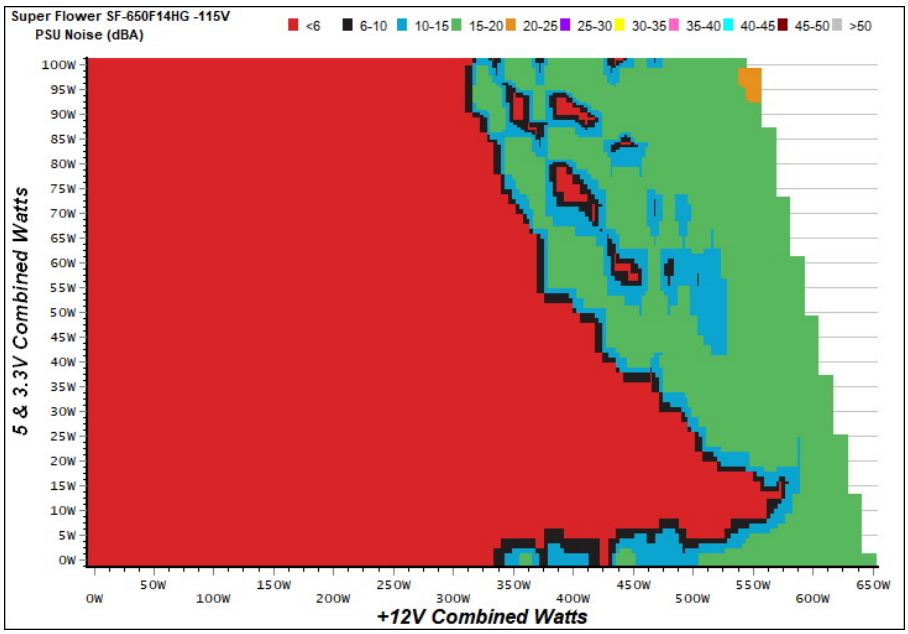
EFFICIENCY GRAPH 115V



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

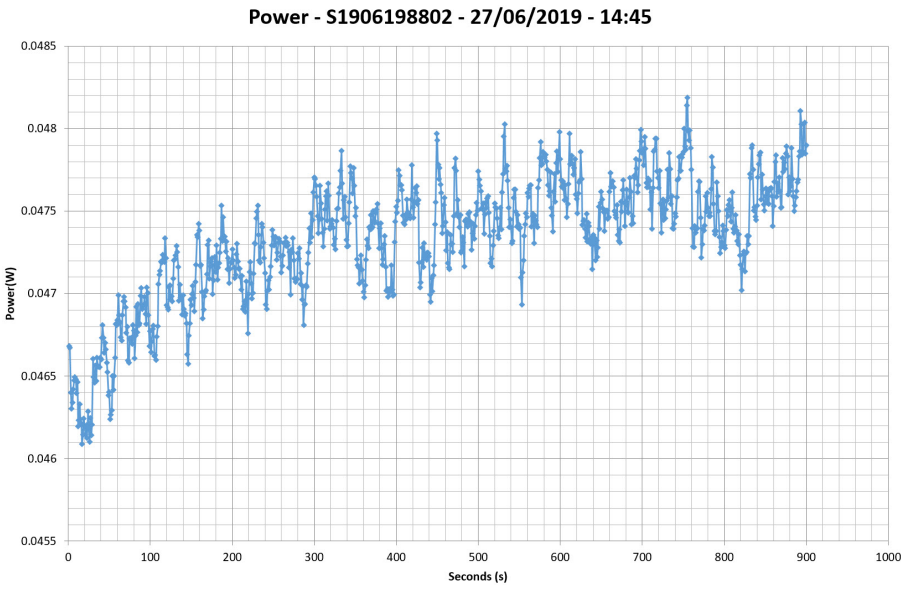


INFO

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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

VAMPIRE POWER -115V



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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Super Flower Leadex III Gold 650W rev.3 (mode 1)

COMMISSION REGULATION (EU) NO 617/2013 TESTING 115V

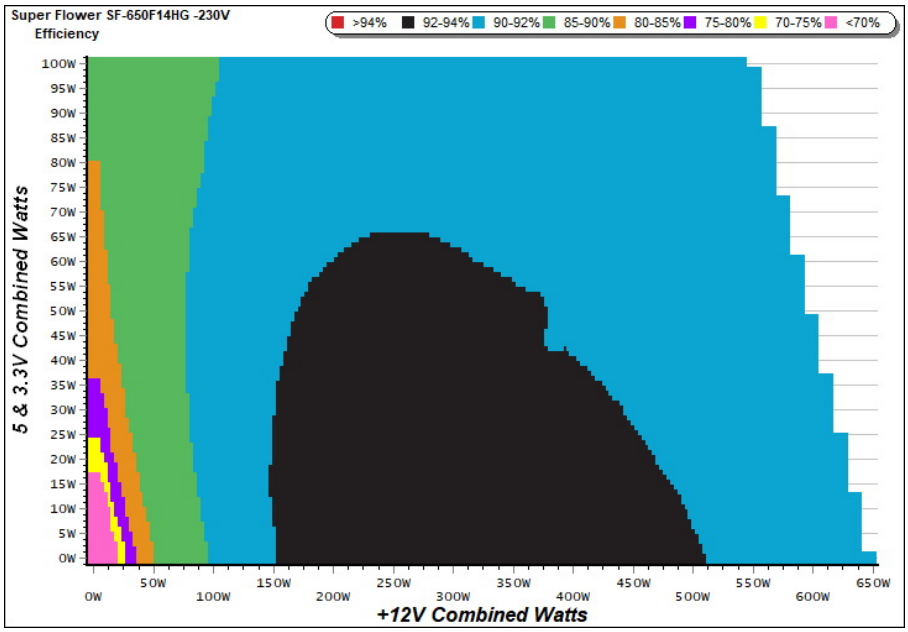
Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.565A	1.988A	1.993A	0.983A	64.925	85.146%	0	<6.0	47.32°C	0.934
	12.154V	5.029V	3.310V	5.088V	76.251				40.52°C	115.16V
2	8.111A	2.986A	2.994A	1.182A	129.436	88.776%	0	<6.0	48.04°C	0.965
	12.147V	5.026V	3.308V	5.076V	145.801				40.84°C	115.16V
5	22.665A	4.986A	5.001A	1.786A	325.073	90.238%	0	<6.0	52.94°C	0.992
	12.114V	5.016V	3.299V	5.040V	360.241				42.55°C	115.16V
10	46.274A	9.000A	9.032A	3.014A	650.023	87.180%	1259	30.5	45.23°C	0.996
	12.108V	5.003V	3.289V	4.978V	745.613				59.68°C	115.16V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

230V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

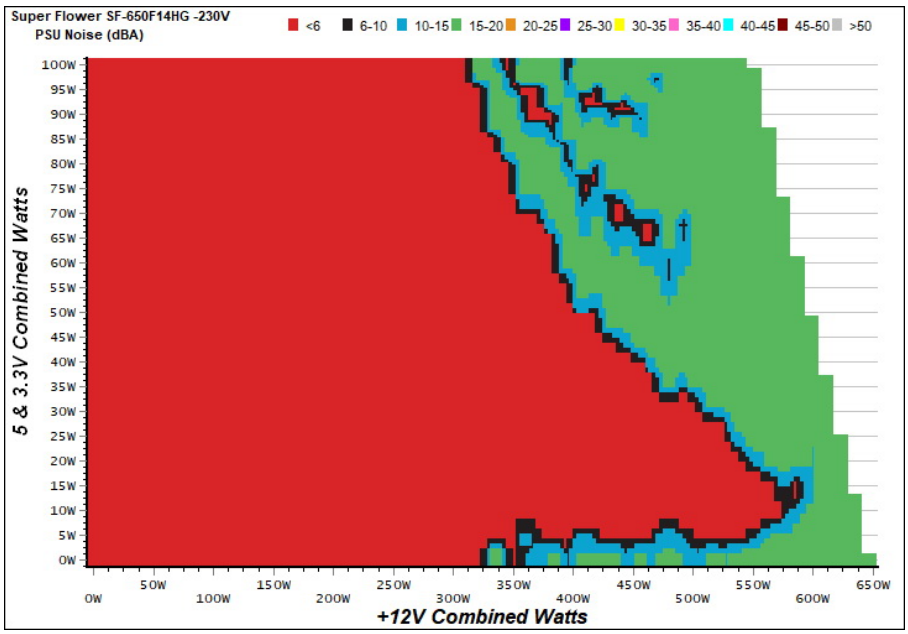
EFFICIENCY GRAPH 230V



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 230V

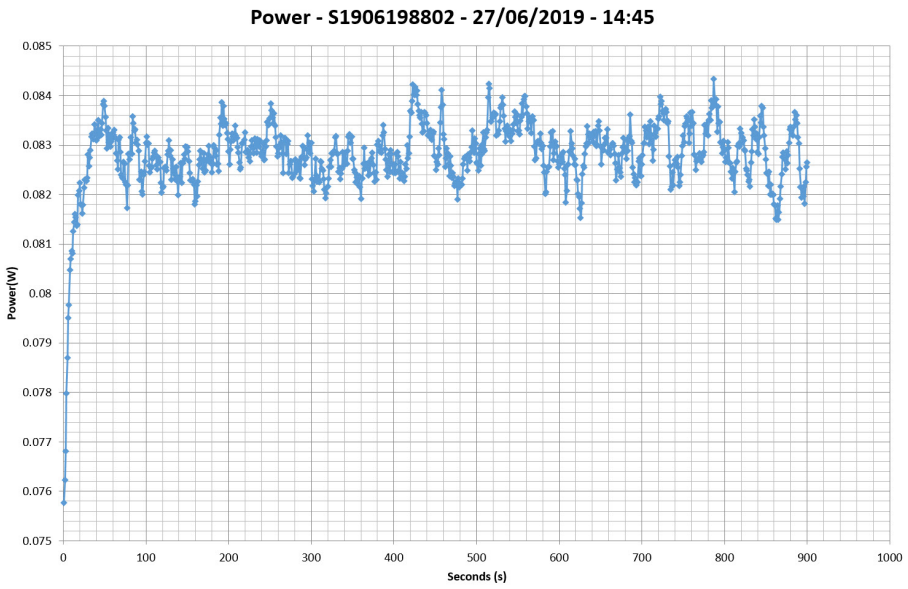


INFO

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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

VAMPIRE POWER -230V



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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Super Flower Leadex III Gold 650W rev.3 (mode 1)

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	3.565A	1.988A	1.993A	0.983A	64.925	85.146%	0	<6.0	47.32°C	0.934
	12.154V	5.029V	3.310V	5.088V	76.251				40.52°C	115.16V
2	8.111A	2.986A	2.994A	1.182A	129.436	88.776%	0	<6.0	48.04°C	0.965
	12.147V	5.026V	3.308V	5.076V	145.801				40.84°C	115.16V
5	22.665A	4.986A	5.001A	1.786A	325.073	90.238%	0	<6.0	52.94°C	0.992
	12.114V	5.016V	3.299V	5.040V	360.241				42.55°C	115.16V
10	46.274A	9.000A	9.032A	3.014A	650.023	87.180%	1259	30.5	45.23°C	0.996
	12.108V	5.003V	3.289V	4.978V	745.613				59.68°C	115.16V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

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

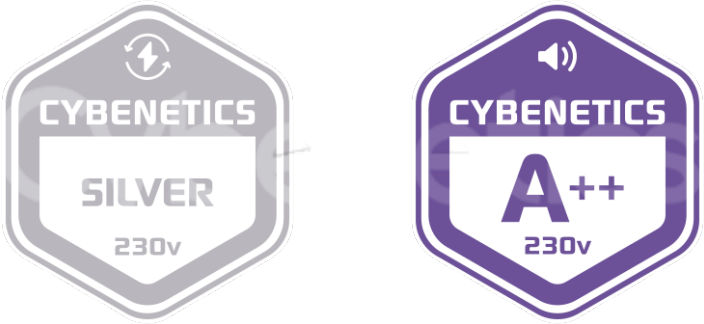
Super Flower Leadex III Gold 650W rev.3 (mode 1)

Top side

Power specifications label

CERTIFICATIONS 115V

CERTIFICATIONS 230V



Aristeidis Bitziopoulos
Lab Director