Super Flower Golden King 650W

Serial Number S1604223285

Lab ID 129

Certification ID 25129

Test Result Report ID:

Certificate Issue Date: Jun 20, 2018

115V 230V

Scheme: ETA-EMI PSU



115V 230V





Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

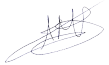
General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 Chroma 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500
Power Analyzers	Rohde & Schwarz HMC8015 & NPA701
Oscilloscopes	Picoscope 4444, 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
EMI Analyzer	TekBox TBMR-110M-EU
Isolation Transformer	4kVA
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Testing Methodology	Cybenetics PSU Test Protocol

DUT Information
(Non-accredited measurements)

Product Identification Details	
Brand	Super Flower
Model	Golden King 650W
OEM/ODM	Super Flower
Serial Number	S1604223285
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	115-240
Rated Current (Arms)	10

Rated Frequency (Hz)	50-60
Rated Power (W)	650
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	122mm Duro Bearing Fan (S1202512L)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	129
Date of receipt	Jun 6, 2018
Testing Date	Jun 18, 2018
Report Issued Date	Jun 20, 2018
DUT Notes	Low 5VSB Efficiency
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors
(Non-accredited measurements)

Captive Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (540mm)	1	1	16-24AWG
4+4 pin EPS12V (650mm)	1	1	16AWG
6+2 pin PCIe (500mm+125mm)	1	2	16-22AWG
6+2 pin PCIe (500mm)	1	1	16-22AWG

SATA (510mm+135mm+135mm) / 4 pin Molex (+135mm)	1	3 / 1	18AWG
SATA (510mm+135mm) / 4 pin Molex (+135mm+135mm)	1	2 / 2	18AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	2.5	0.5
	Watts	10		648	12.5	6
Total Max. Power (W)		650				

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓ ErP Lot 6 2013: Partially ErP Lot 3 2014 & CEC: ✗
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.935%
Average Noise Output (>1450 Load Combinations)	27.53dBA
Average PF (>1450 Load Combinations)	0.980
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1224W
Non-Accredited	
12V Ripple (Full Load)	41.90mV
5V Ripple (Full Load)	18.94mV
3.3V Ripple (Full Load)	28.21mV

5VSB Ripple (Full Load)	15.73mV
12V Load Regulation	0.90%
5V Load Regulation	2.24%
3.3V Load Regulation	2.40%
5VSB Load Regulation	2.32%
Inrush Current	33.613A

230V

Accredited		
Average Efficiency (>1450 load combinations)	92.226%	
Average Noise Output (>1450 Load Combinations)	27.12dBA	
Average PF (>1450 Load Combinations)	0.931	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.2680W	
Non-Accredited		
12V Ripple (Full Load)	45.08mV	
5V Ripple (Full Load)	17.98mV	
3.3V Ripple (Full Load)	29.54mV	
5VSB Ripple (Full Load)	15.73mV	
12V Load Regulation	0.57%	
5V Load Regulation	1.70%	
3.3V Load Regulation	1.75%	
5VSB Load Regulation	1.85%	
Inrush Current	58.157A	
Hold-Up Time & PWR_OK Signal	11.20ms	
AC Loss to PWR_OK Hold Up Time	9.90ms	
PWR_OK Inactive to DC Loss Delay	1.30ms	
OPP (0.00°C / 0.00°C)	-	-

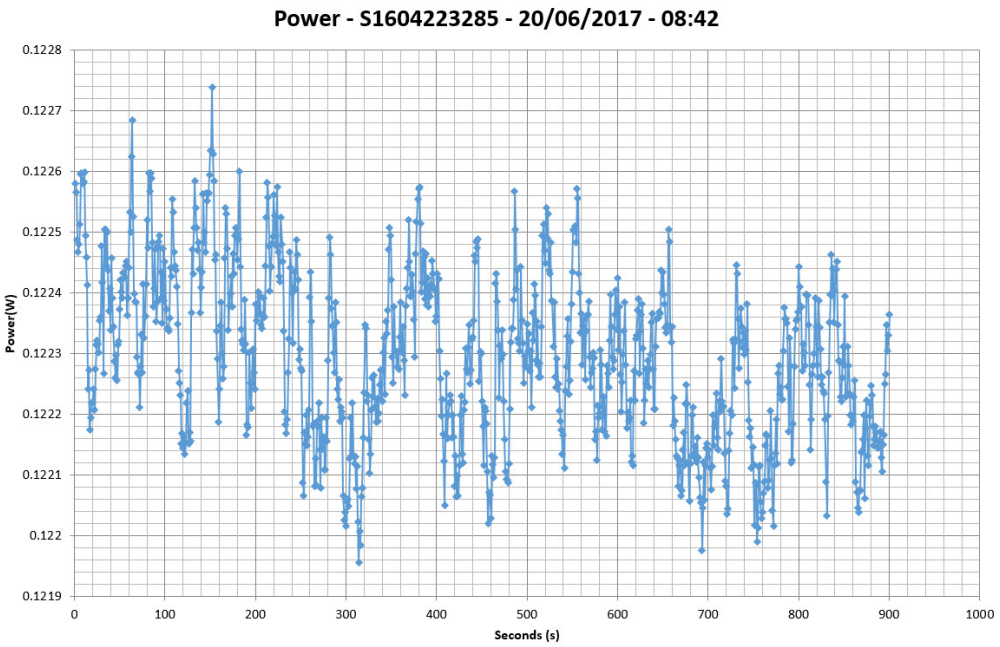
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	11.2
AC Loss to PWR_OK Hold Up Time (ms)	9.9
PWR_OK Inactive to DC Loss Delay (ms)	1.3

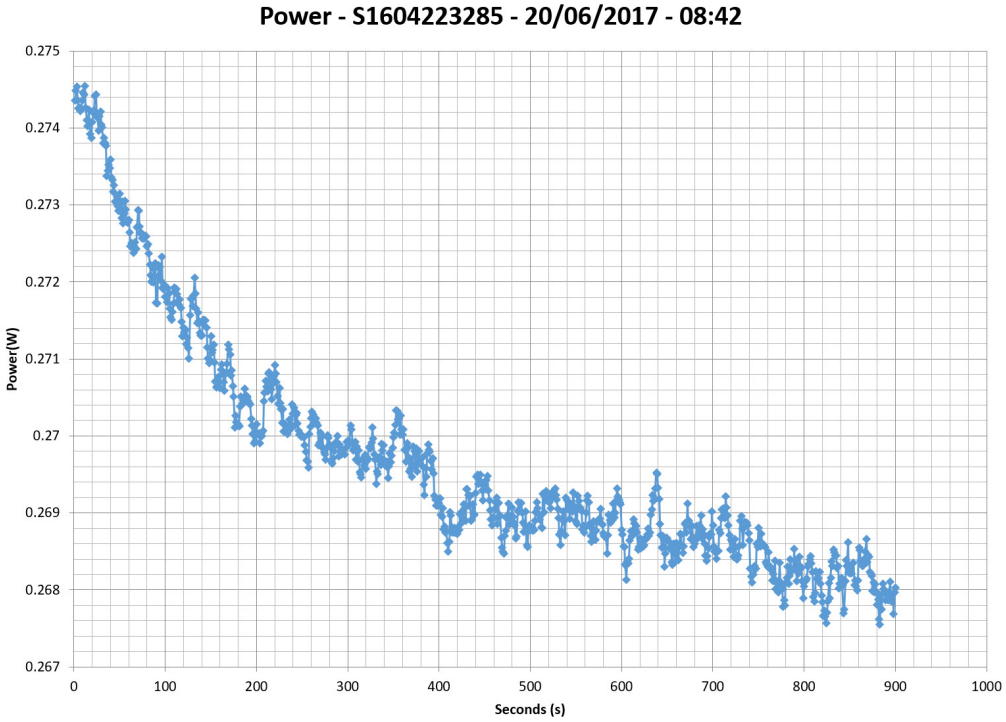
Vampire Power

Graphs

115V

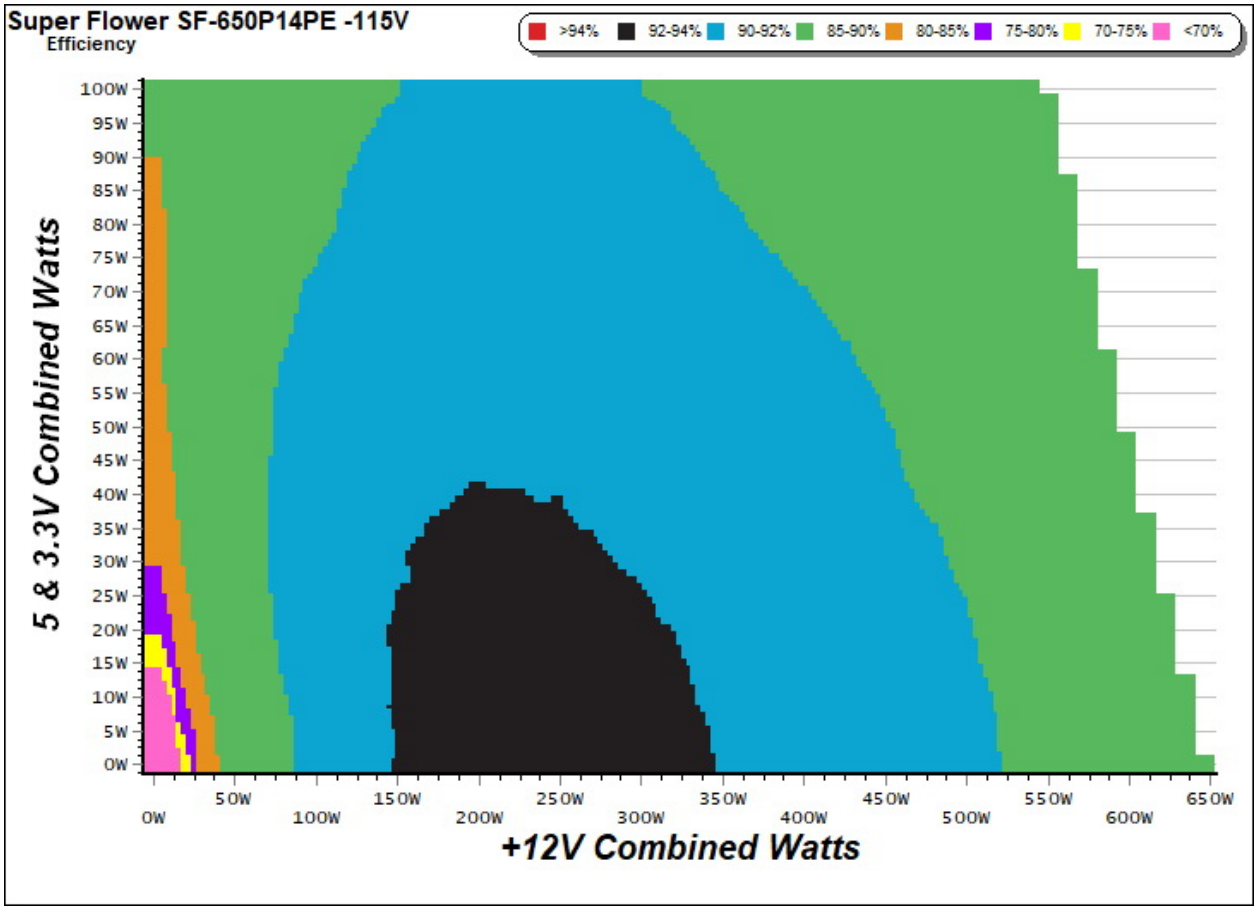


230V



Efficiency Graph

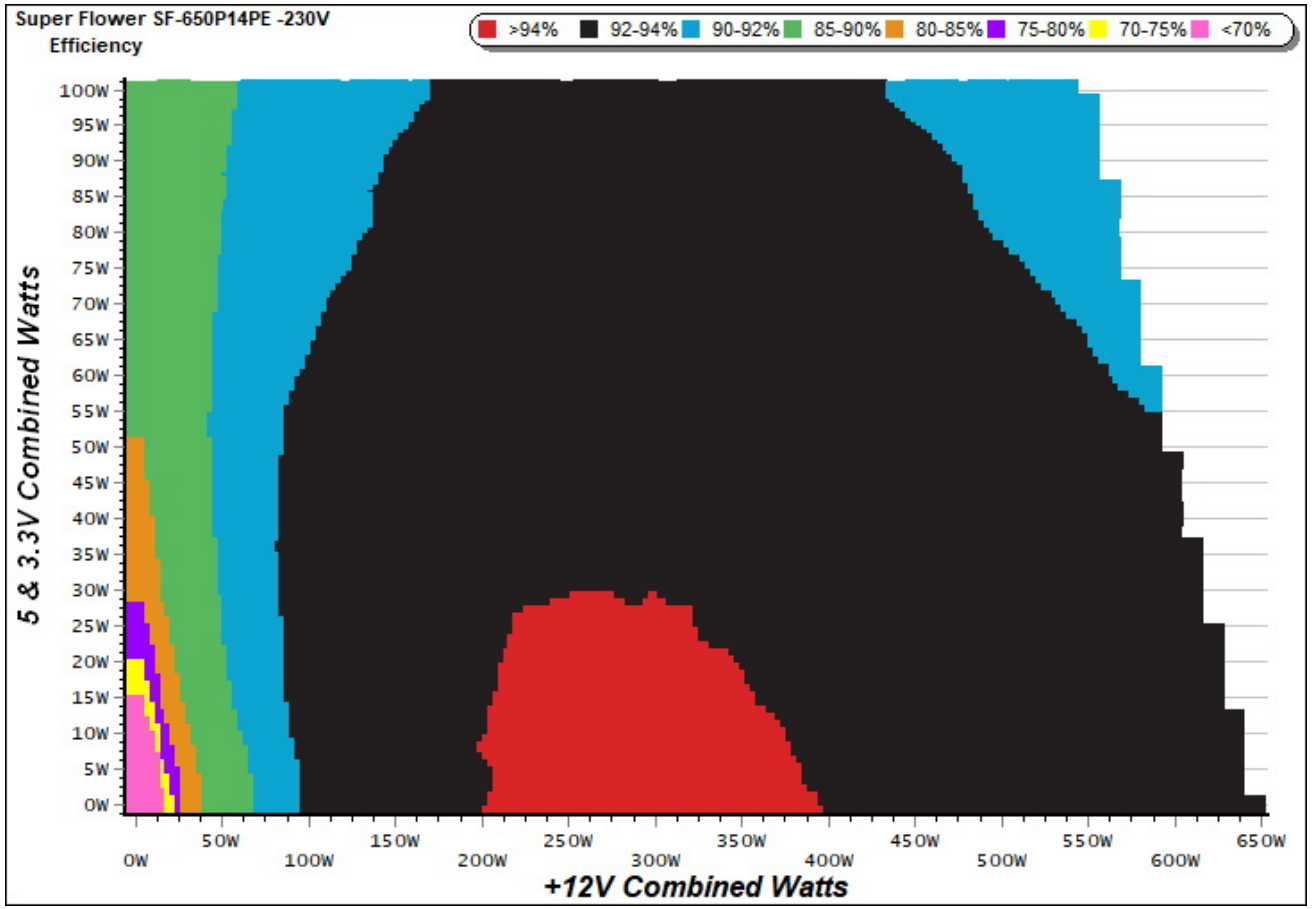
115V



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.

230V



INFO

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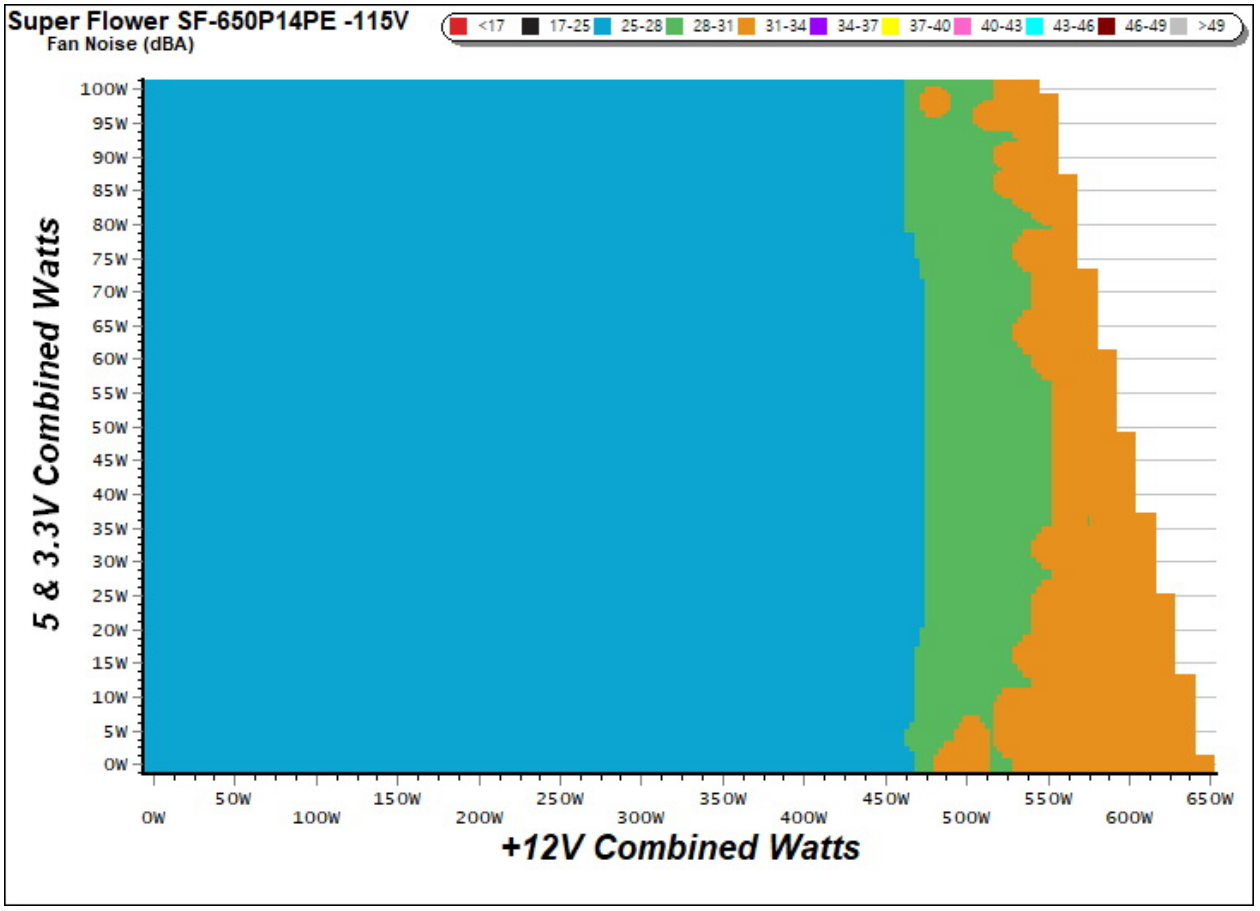
Noise Graph

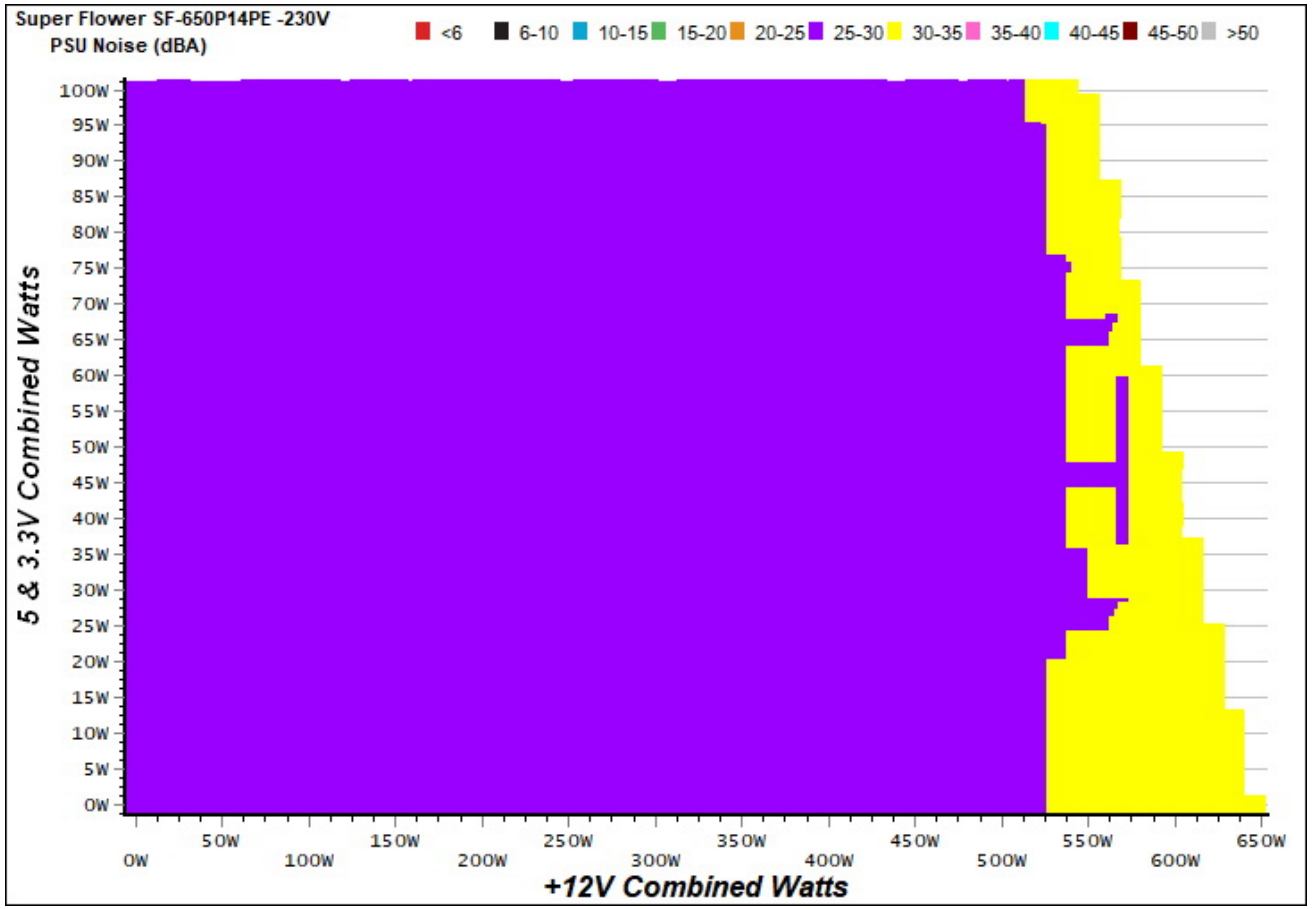
115V



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.

230V

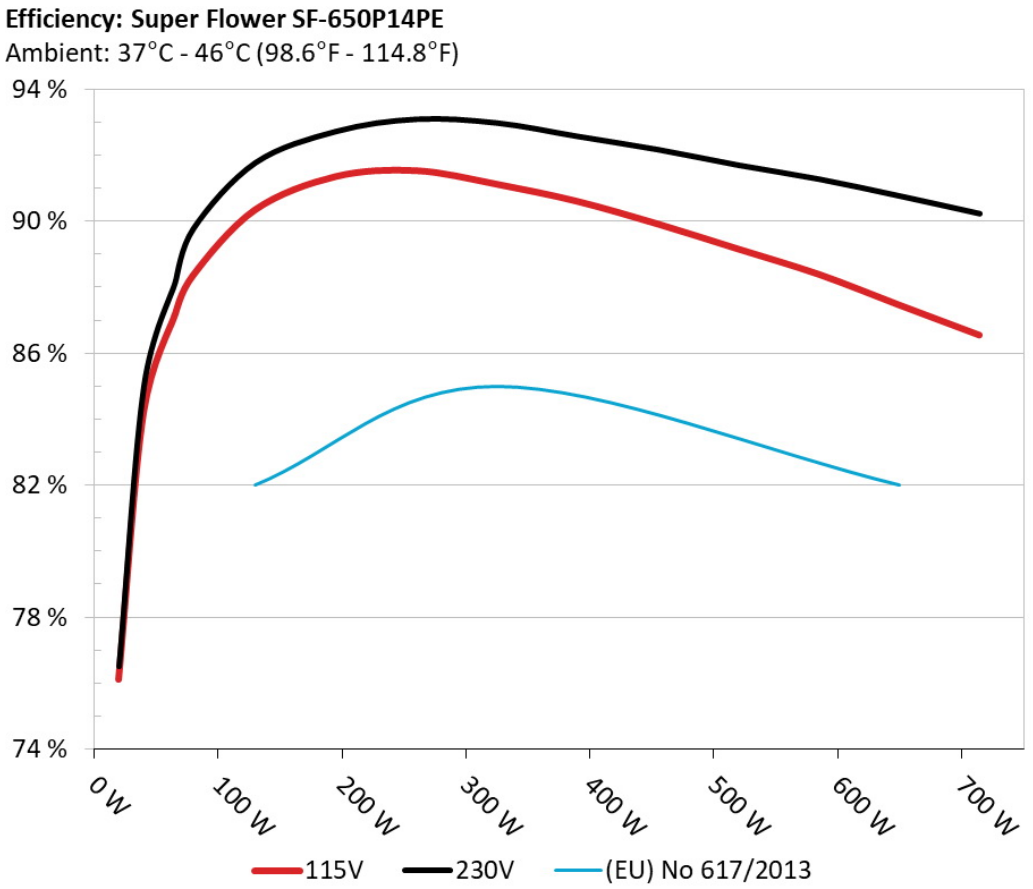


INFO

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.

Indicative Performance

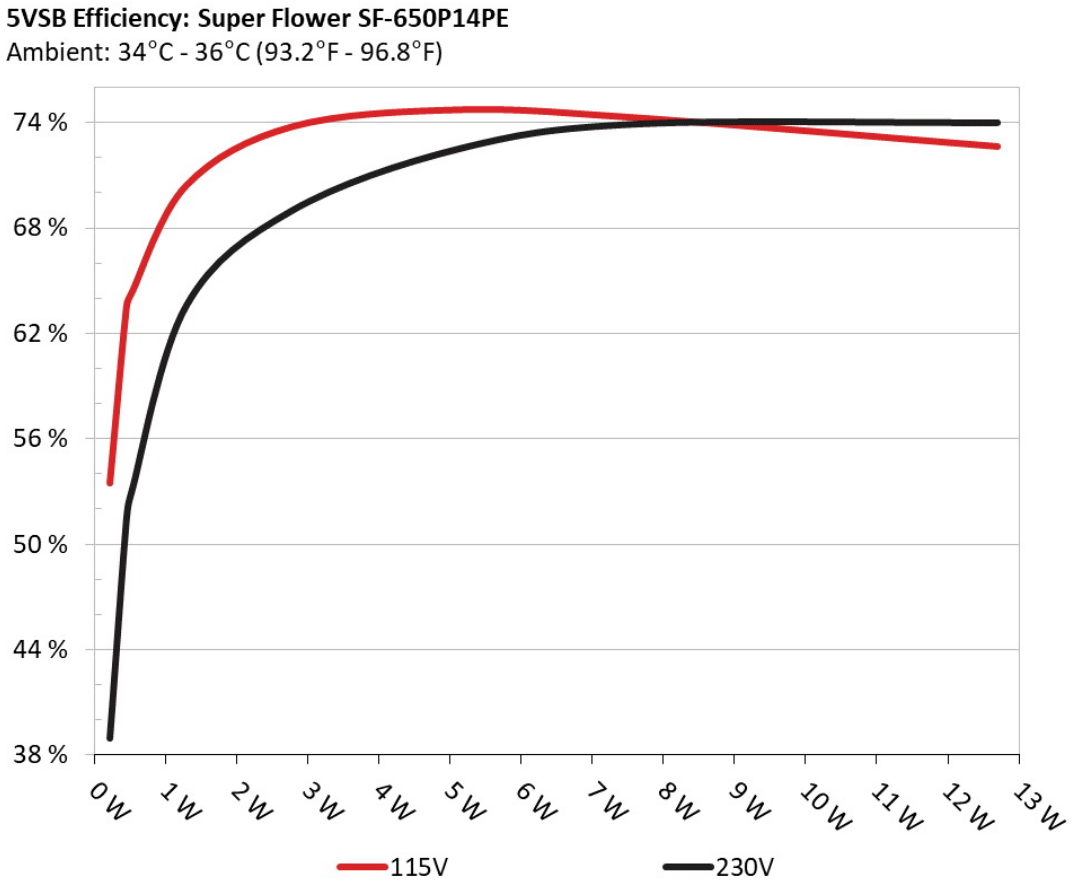
Efficiency under high ambient temperature



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.

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.214	53.500%	0.066
	5.133V	0.400		115.13V
2	0.087A	0.447	63.494%	0.112
	5.133V	0.704		115.13V
3	0.542A	2.779	73.772%	0.343
	5.125V	3.767		115.10V
4	1.002A	5.125	74.730%	0.411
	5.114V	6.858		115.11V
5	1.502A	7.661	74.263%	0.444
	5.101V	10.316		115.12V
6	2.501A	12.700	72.642%	0.480
	5.077V	17.483		115.12V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.215	38.949%	0.028
	5.134V	0.552		230.27V
2	0.087A	0.448	51.376%	0.043
	5.134V	0.872		230.30V
3	0.542A	2.780	68.983%	0.173
	5.125V	4.030		230.28V
4	1.002A	5.126	72.493%	0.253
	5.115V	7.071		230.29V
5	1.502A	7.663	73.910%	0.304
	5.102V	10.368		230.29V
6	2.501A	12.702	73.982%	0.362
	5.078V	17.169		230.29V

Supplementary Tests (For Reference)

Typical Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.541A	1.934A	1.953A	0.979A	64.776	86.840%	930	25.1	38.11°C	0.939
	12.204V	5.159V	3.374V	5.102V	74.592				40.55°C	115.15V
2	8.113A	2.918A	2.938A	1.175A	129.805	90.335%	930	25.1	38.45°C	0.962
	12.193V	5.145V	3.365V	5.093V	143.693				41.12°C	115.16V
3	13.036A	3.405A	3.450A	1.376A	194.867	91.343%	930	25.1	39.02°C	0.976
	12.182V	5.135V	3.358V	5.081V	213.335				42.26°C	115.15V
4	17.963A	3.902A	3.937A	1.575A	259.788	91.521%	930	25.1	39.45°C	0.984
	12.170V	5.125V	3.351V	5.071V	283.857				43.46°C	115.15V
5	22.559A	4.890A	4.935A	1.775A	324.765	91.113%	1020	27.7	39.99°C	0.988
	12.159V	5.113V	3.341V	5.059V	356.441				44.68°C	115.15V
6	27.167A	5.882A	5.937A	1.980A	389.769	90.595%	1230	33.6	40.22°C	0.990
	12.147V	5.098V	3.333V	5.049V	430.232				45.60°C	115.15V
7	31.775A	6.886A	6.947A	2.180A	454.662	89.911%	1395	38.3	41.55°C	0.992
	12.135V	5.084V	3.323V	5.036V	505.681				47.37°C	115.15V
8	36.397A	7.893A	7.965A	2.386A	519.643	89.151%	1550	39.8	42.58°C	0.993
	12.123V	5.070V	3.314V	5.025V	582.877				48.93°C	115.15V
9	41.457A	8.401A	8.497A	2.390A	584.707	88.386%	1710	43.8	43.61°C	0.994
	12.111V	5.062V	3.307V	5.019V	661.535				50.92°C	115.22V
10	46.476A	8.912A	9.003A	2.495A	649.523	87.458%	1850	45.0	45.10°C	0.994
	12.099V	5.052V	3.298V	5.008V	742.667				53.38°C	115.14V
11	51.902A	8.924A	9.020A	2.496A	714.445	86.545%	1865	43.9	46.25°C	0.995
	12.085V	5.045V	3.293V	5.002V	825.514				55.18°C	115.15V
CL1	0.100A	12.012A	12.004A	0.004A	102.427	84.444%	1215	33.2	42.99°C	0.955
	12.195V	5.083V	3.343V	5.106V	121.296				49.48°C	115.16V

CL2	54.123A	1.004A	1.002A	1.002A	668.198	87.953%	1750	41.6	44.77°C	0.994
	12.096V	5.109V	3.324V	5.055V	759.720				52.35°C	115.15V

The results above are not used in the certification process

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	3.539A	1.933A	1.952A	0.976A	64.760	88.096%	930	25.1	40.09°C	0.740
	12.210V	5.161V	3.376V	5.105V	73.511				42.68°C	230.24V
2	8.108A	2.918A	2.934A	1.176A	129.851	91.890%	930	25.1	40.44°C	0.874
	12.203V	5.151V	3.370V	5.095V	141.311				43.55°C	230.24V
3	13.022A	3.404A	3.443A	1.376A	194.911	92.863%	930	25.1	41.14°C	0.925
	12.196V	5.144V	3.365V	5.087V	209.890				44.50°C	230.25V
4	17.935A	3.890A	3.926A	1.575A	259.780	93.251%	930	25.1	41.75°C	0.943
	12.189V	5.137V	3.360V	5.077V	278.580				45.44°C	230.25V
5	22.520A	4.876A	4.918A	1.776A	324.784	93.137%	960	26.5	42.10°C	0.954
	12.180V	5.127V	3.353V	5.068V	348.715				46.58°C	230.25V
6	27.107A	5.859A	5.916A	1.976A	389.745	92.824%	1155	31.7	42.71°C	0.962
	12.173V	5.118V	3.345V	5.059V	419.873				47.94°C	230.25V
7	31.692A	6.855A	6.915A	2.176A	454.635	92.427%	1380	37.7	43.11°C	0.968
	12.166V	5.105V	3.339V	5.049V	491.883				48.66°C	230.26V
8	36.298A	7.855A	7.918A	2.380A	519.682	91.995%	1495	38.9	43.58°C	0.970
	12.157V	5.095V	3.333V	5.040V	564.904				49.40°C	230.26V
9	41.326A	8.357A	8.446A	2.380A	584.700	91.608%	1630	40.9	44.10°C	0.975
	12.150V	5.087V	3.326V	5.036V	638.262				50.37°C	230.26V
10	46.317A	8.860A	8.942A	2.484A	649.571	91.134%	1775	44.7	45.27°C	0.977
	12.142V	5.080V	3.320V	5.030V	712.767				51.98°C	230.26V
11	51.692A	8.868A	8.954A	2.485A	714.451	90.633%	1865	43.9	46.47°C	0.981
	12.135V	5.074V	3.315V	5.026V	788.289				53.64°C	230.26V
CL1	0.100A	12.012A	12.006A	0.005A	102.884	86.554%	990	27.4	42.93°C	0.846
	12.204V	5.105V	3.358V	5.117V	118.867				48.27°C	230.25V

CL2	53.974A	1.002A	1.001A	1.002A	668.911	91.829%	1675	42.8	45.30°C	0.978
	12.142V	5.126V	3.337V	5.071V	728.428				51.61°C	230.26V

The results above are not used in the certification process

Light Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.196A	0.480A	0.472A	0.195A	19.685	76.118%	930	25.1	0.779
	12.212V	5.173V	3.383V	5.127V	25.861				115.16V
2	2.416A	0.959A	0.974A	0.391A	39.748	84.192%	930	25.1	0.892
	12.209V	5.168V	3.379V	5.121V	47.211				115.16V
3	3.642A	1.454A	1.480A	0.586A	59.949	87.126%	930	25.1	0.941
	12.205V	5.163V	3.375V	5.113V	68.807				115.16V
4	4.853A	1.933A	1.957A	0.780A	79.769	88.352%	930	25.1	0.937
	12.202V	5.158V	3.373V	5.106V	90.285				115.16V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.196A	0.480A	0.473A	0.196A	19.696	76.397%	930	25.1	0.507
	12.215V	5.173V	3.383V	5.127V	25.781				230.25V
2	2.416A	0.959A	0.977A	0.391A	39.768	84.958%	930	25.1	0.637
	12.213V	5.169V	3.380V	5.122V	46.809				230.25V
3	3.638A	1.455A	1.480A	0.586A	59.937	88.156%	930	25.1	0.720
	12.211V	5.165V	3.379V	5.115V	67.990				230.26V
4	4.854A	1.932A	1.955A	0.780A	79.780	89.677%	930	25.1	0.783
	12.203V	5.158V	3.373V	5.112V	88.964				230.25V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.1 mV	9.6 mV	8.6 mV	7.3 mV	Pass
20% Load	12.4 mV	10.1 mV	10.4 mV	7.9 mV	Pass
30% Load	15.9 mV	9.9 mV	10.8 mV	8.4 mV	Pass
40% Load	18.0 mV	12.1 mV	12.1 mV	9.4 mV	Pass
50% Load	21.0 mV	12.1 mV	14.6 mV	9.8 mV	Pass
60% Load	24.5 mV	12.2 mV	16.1 mV	10.9 mV	Pass
70% Load	29.8 mV	13.0 mV	19.9 mV	11.4 mV	Pass
80% Load	33.7 mV	14.9 mV	20.8 mV	12.2 mV	Pass
90% Load	36.1 mV	15.5 mV	22.6 mV	13.6 mV	Pass
100% Load	41.9 mV	18.9 mV	28.2 mV	15.7 mV	Pass
110% Load	49.6 mV	19.1 mV	31.6 mV	15.7 mV	Pass
Crossload 1	22.8 mV	17.3 mV	24.2 mV	20.2 mV	Pass
Crossload 2	35.9 mV	15.8 mV	18.1 mV	13.4 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.7 mV	9.5 mV	10.3 mV	7.8 mV	Pass
20% Load	13.9 mV	10.0 mV	11.3 mV	8.5 mV	Pass
30% Load	17.8 mV	10.7 mV	12.2 mV	8.8 mV	Pass
40% Load	20.4 mV	12.5 mV	13.9 mV	10.0 mV	Pass
50% Load	24.2 mV	12.6 mV	16.4 mV	11.1 mV	Pass
60% Load	28.4 mV	12.5 mV	19.8 mV	11.5 mV	Pass
70% Load	32.8 mV	12.8 mV	21.1 mV	12.6 mV	Pass
80% Load	35.8 mV	13.2 mV	23.3 mV	12.9 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	40.0 mV	14.0 mV	25.9 mV	13.9 mV	Pass
100% Load	45.1 mV	18.0 mV	29.5 mV	15.7 mV	Pass
110% Load	52.4 mV	18.4 mV	32.2 mV	16.1 mV	Pass
Crossload 1	26.4 mV	14.0 mV	26.6 mV	19.8 mV	Pass
Crossload 2	36.0 mV	13.9 mV	18.8 mV	12.4 mV	Pass

The results above are not used in the certification process

Super Flower Golden King 650W



Top side



Power specifications label

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

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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