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

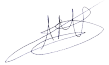
General Information

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)	-	-

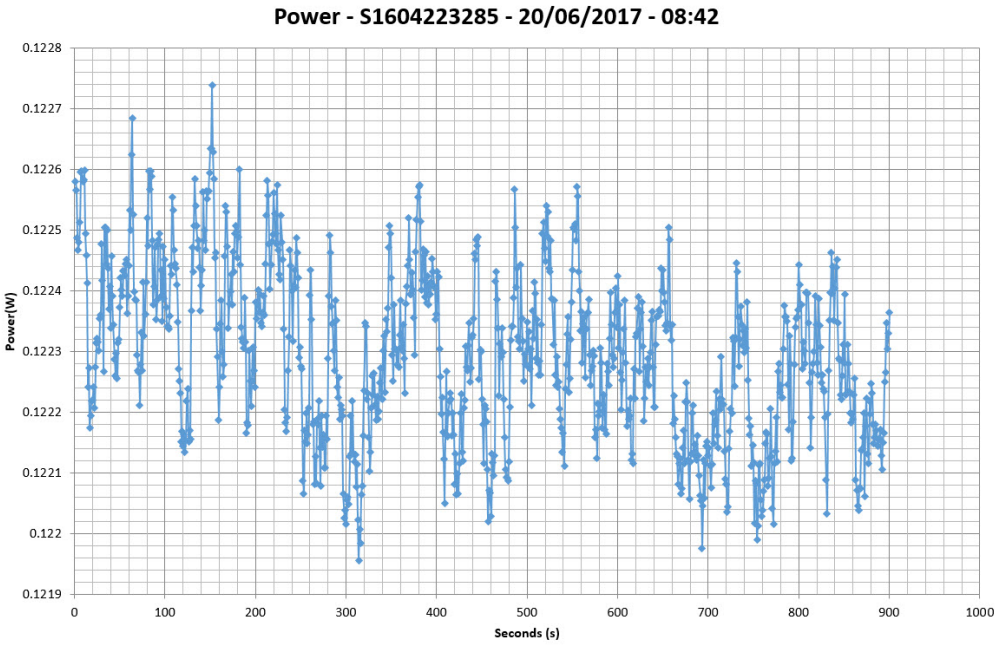
Hold-Up Time & PWR_OK Signal

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

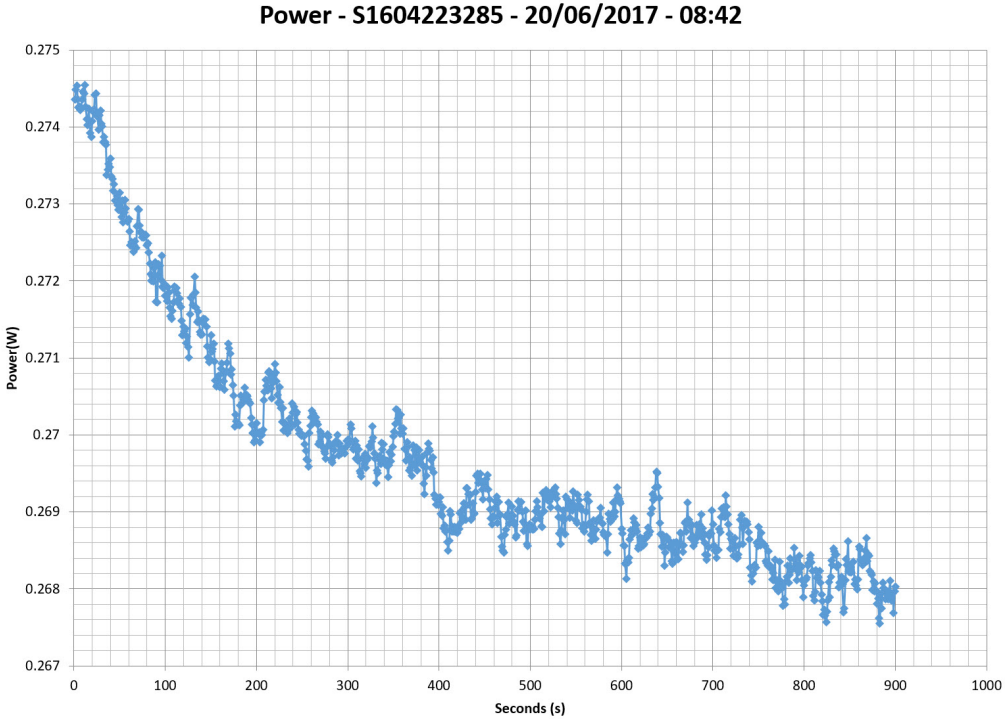
Stromverbrauch im Ruhezustand

Graphs

115V

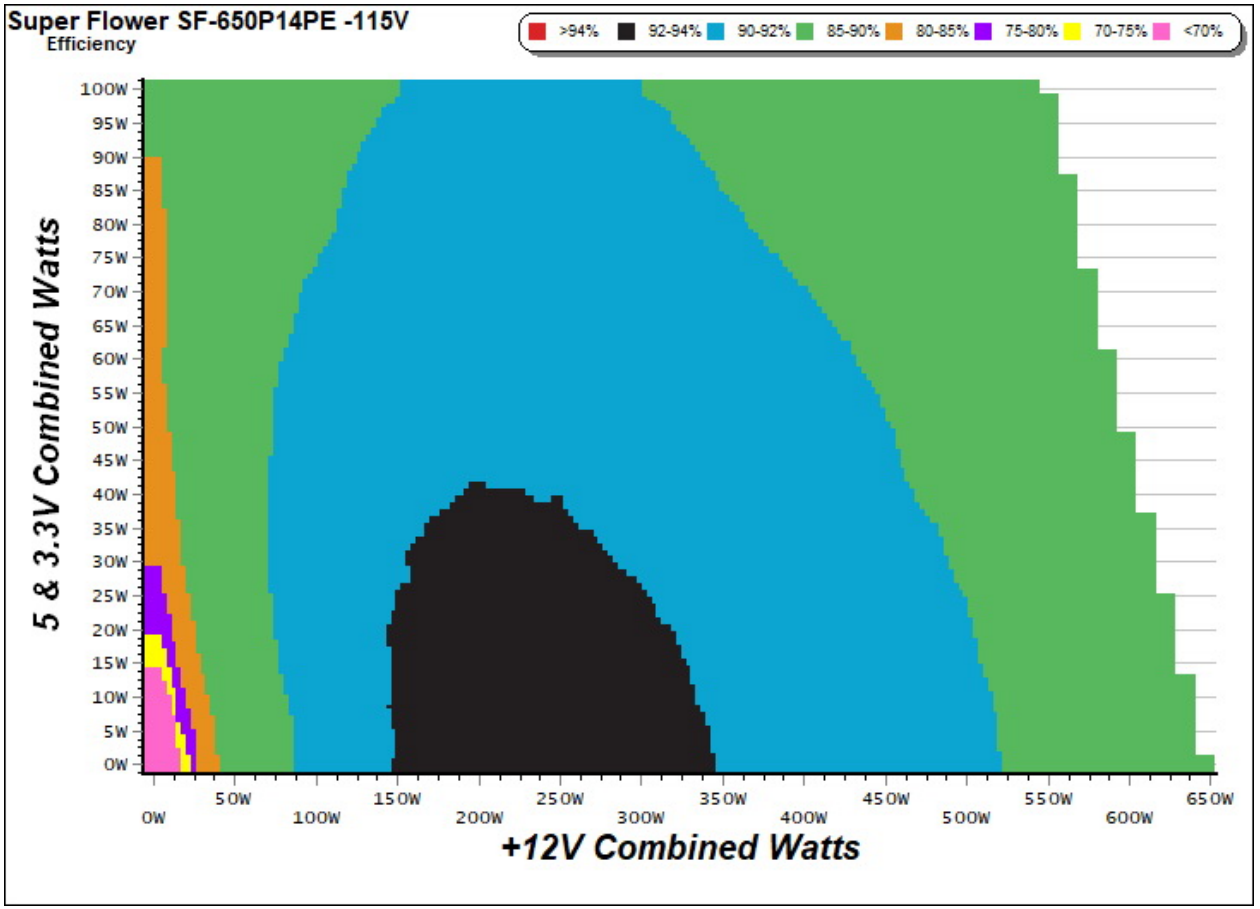


230V



Efficiency Graph

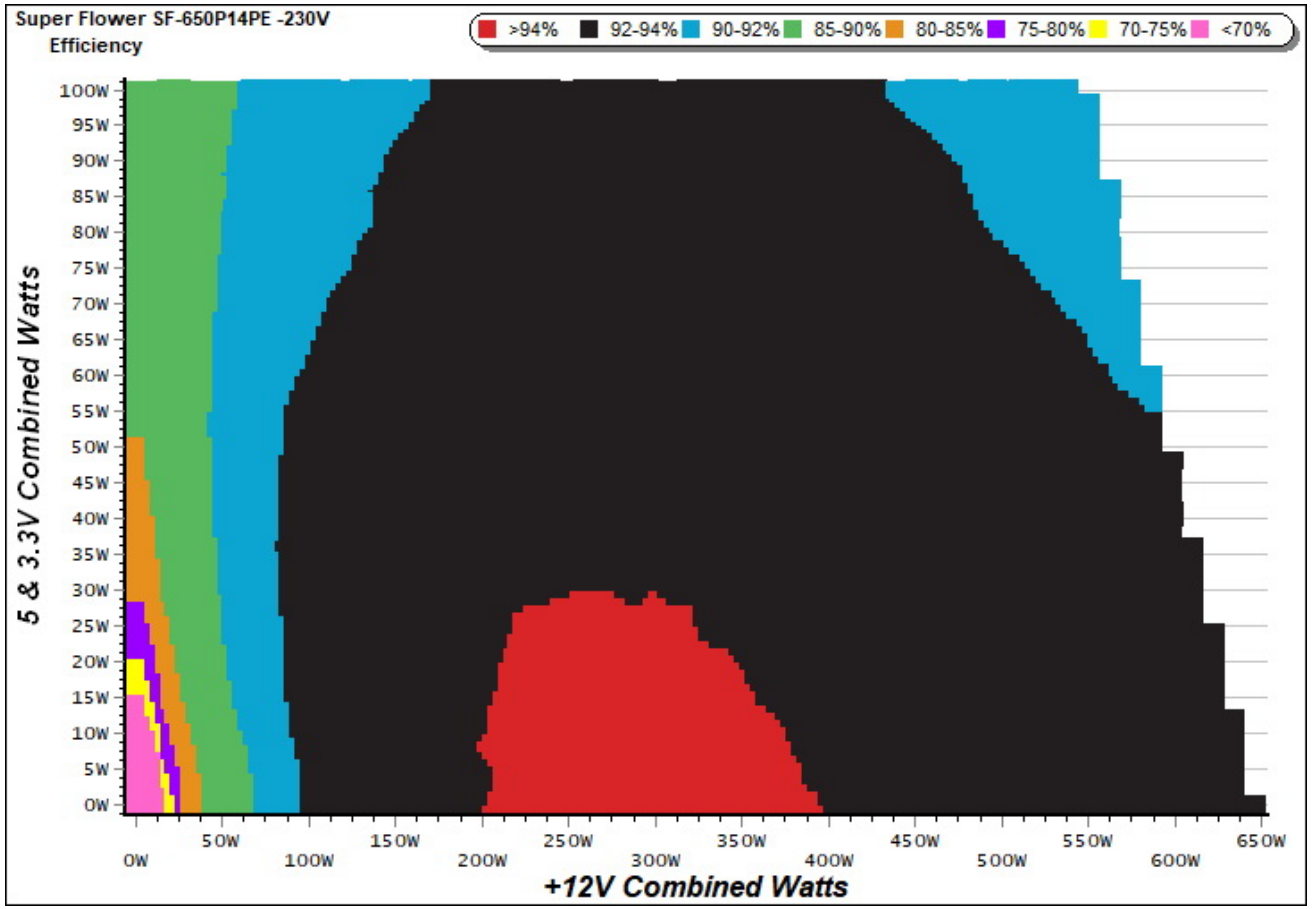
115V



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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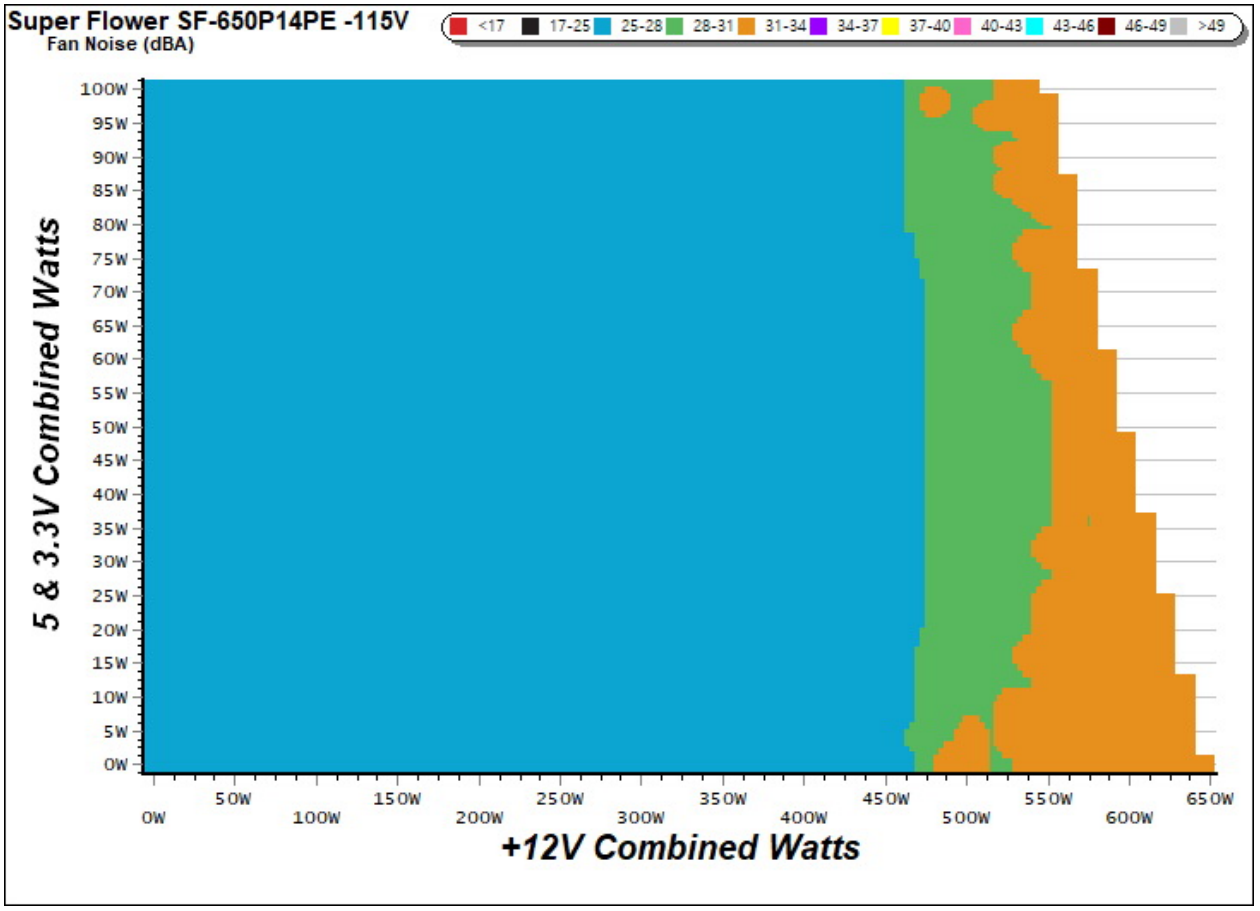
Noise Graph

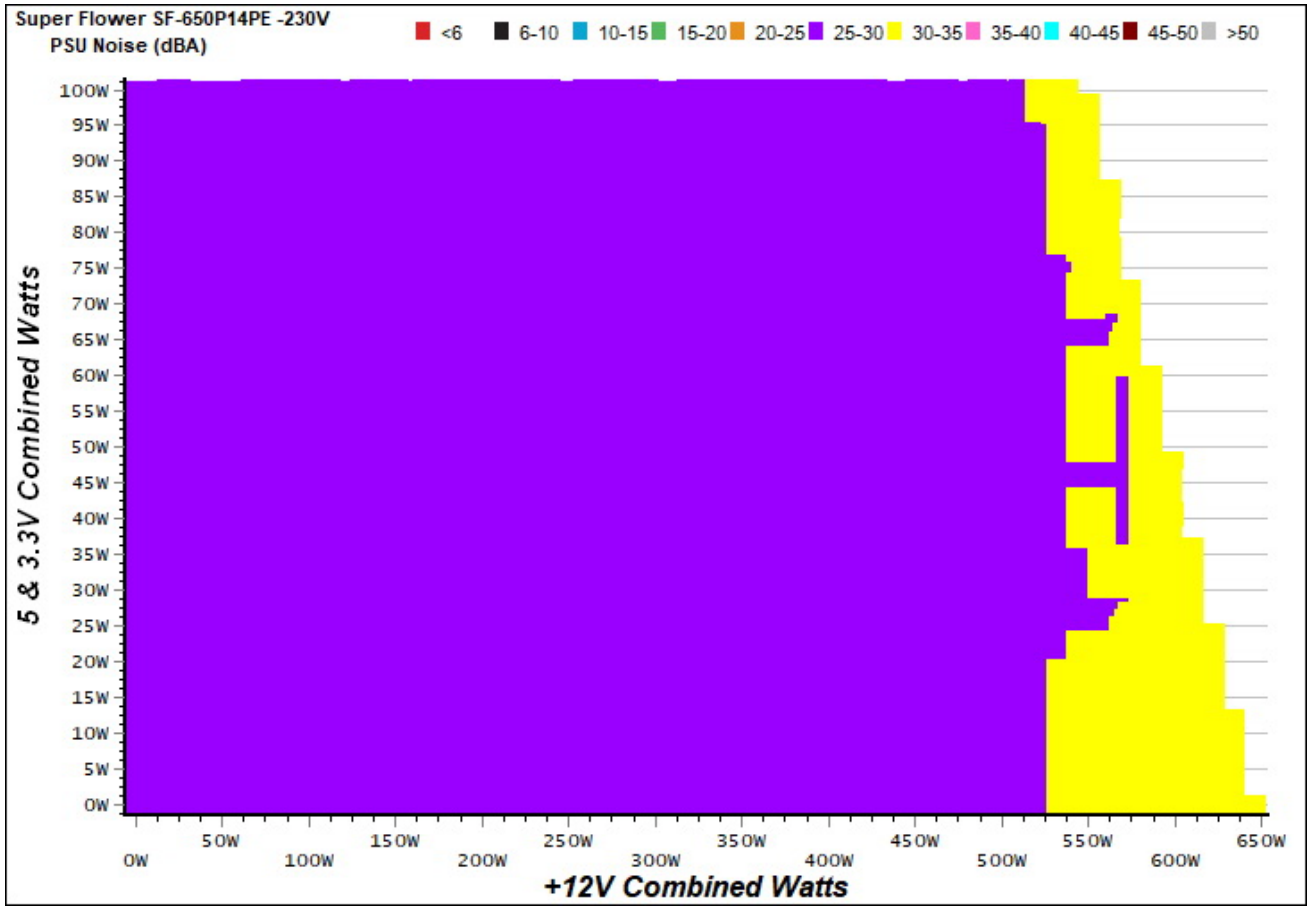
115V



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

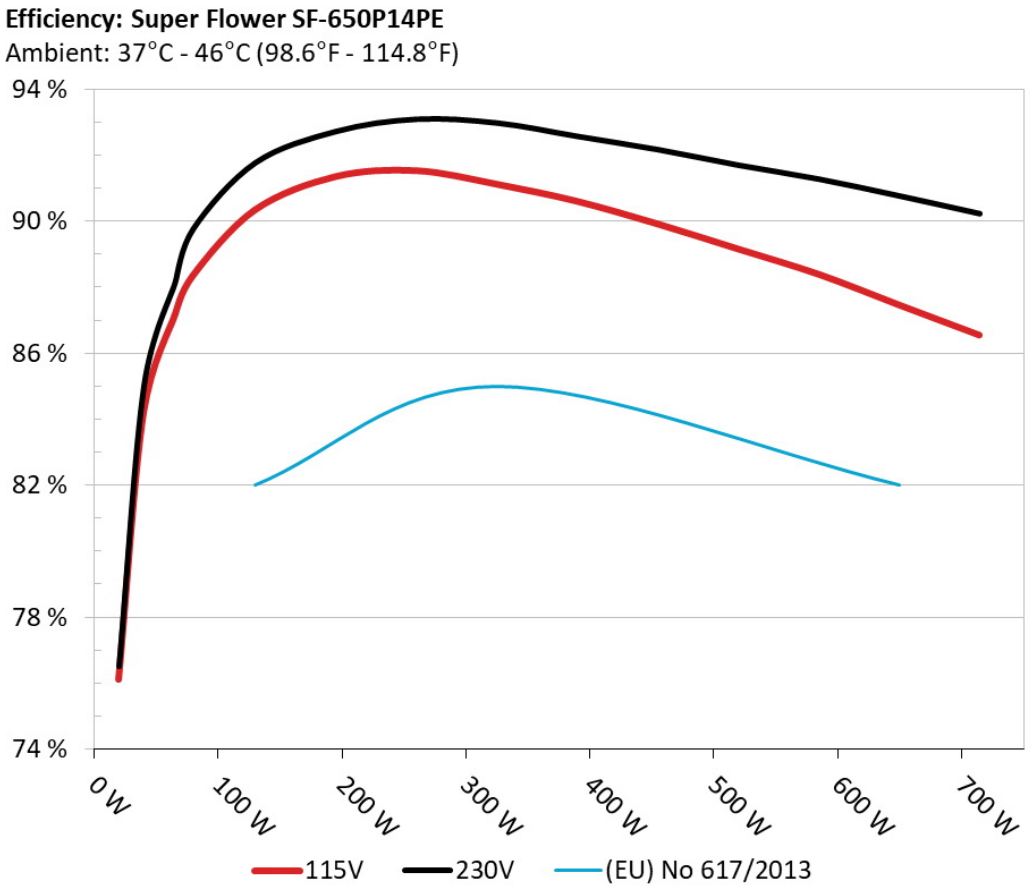


INFO

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

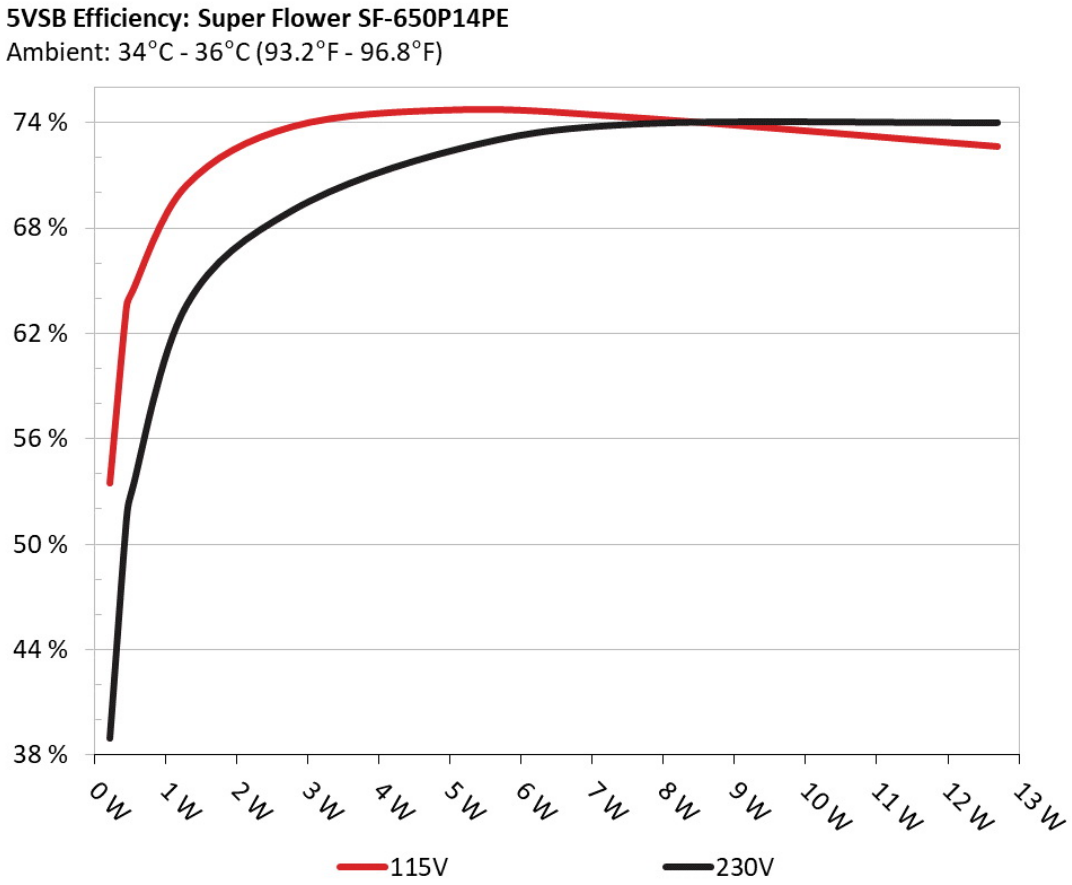
Efficiency under high ambient temperature



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

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern

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