Anex

EVGA 450 B3

Lab ID#: 148
Receipt Date: -
Test Date: -

Report:
Report Date: Jul 27, 2018

DUT INFORMATION

Brand	EVGA
Manufacturer (OEM)	Super Flower
Series	B3
Model Number	450 B3
Serial Number	1703460405800888
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	450
Type	ATX12V
Cooling	130mm Sleeve Bearing Fan (S1282412H)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	37.4	3	0.5
	Watts	110		448.8	15	6
Total Max. Power (W)		450				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (600mm)	1	1	18-22AWG
4+4 pin EPS12V (600mm)	1	1	18-22AWG
6+2 pin PCIe (550mm+150mm)	1	2	18-22AWG
SATA (500mm+100mm+100mm)	2	6	18-20AWG
4 pin Molex (500mm+100mm+100mm)	1	3	18AWG
FDD Adapter (+105mm)	1	1	24AWG

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General Data	
Manufacturer (OEM)	Super Flower
Platform Model	Leadex Bronze
Primary Side	
Transient Filter	5x Y caps, 3x X caps, 2x CM chokes, 1x MOV, 1x TVS Diode
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	1x GBU806 (600V, 8A @ 100°C)
APFC MOSFETS	1x A&O AOTF14N50 (500V, 11A @ 100°C, 0.38Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8R06D (600V, 8A @ 130°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 330uF, 95°C)
Main Switchers	2x A&O AOTF12N50 (500V, 8.4A @ 100°C, 0.52Ohm)
APFC Controller	SF29603 & S9602
Resonant Controller	SF29605
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	2x A&O AOT240L (40V, 82A @ 100°C, 4.7mOhm @ 125°C)
5V & 3.3V	DC-DC Converters: 4x A&O AON6516 (30V, 25A @ 100°C, 8mOhm) PWM Controller: 2x On Semiconductor NCP1587A
Filtering Capacitors	Electrolytics: Teapo (3-6,000h @ 105°C, SY) Polymers: Teapo
Supervisor IC	SF29605 & LM339A
Fan Model	S1282412H (120mm, 12V, 0.35A, Sleeve Bearing)
5VSB Circuit	
Rectifier	Mospec S10C60C
Standby PWM Controller	29604

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	84.922
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	76.574
Standby Power Consumption (W) -115V	0.1312100
Standby Power Consumption (W) -230V	0.2160150
Average PF	0.984
ErP Lot 3/6 Ready	ErP Lot 3/6 2010: ✓ ErP Lot 3/6 2013: Partially ErP Lot 3/6 2014, CEC: Partially
(EU) No 617/2013 Compliance	✓
Avg Noise Output	28.95
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	A-

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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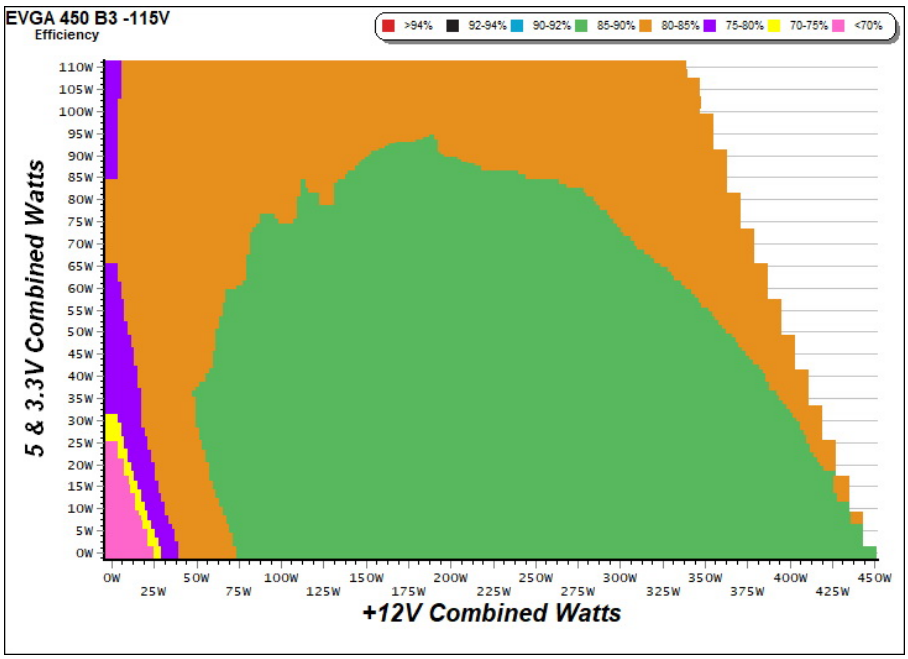
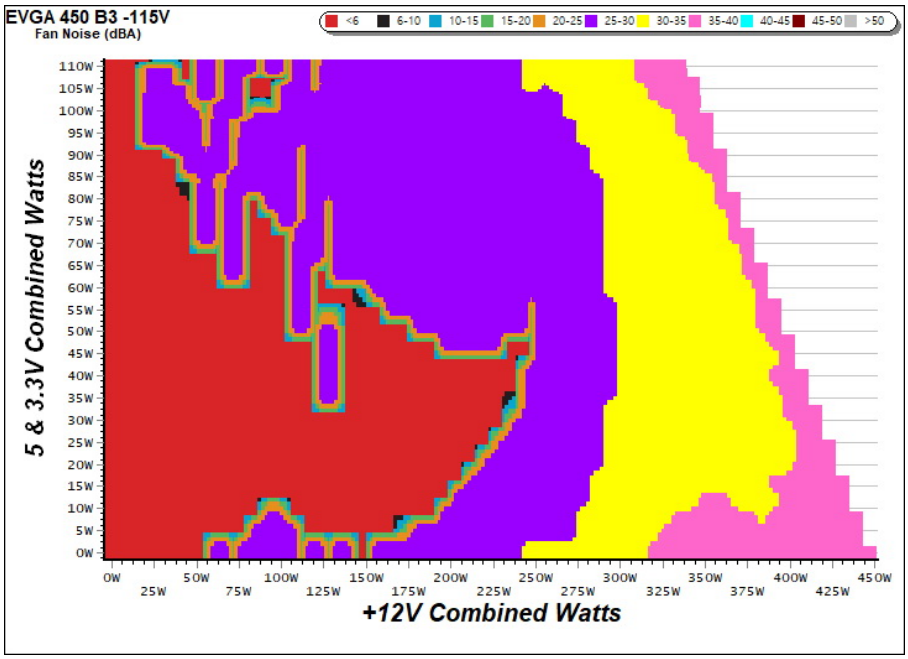
EFFICIENCY GRAPH



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



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

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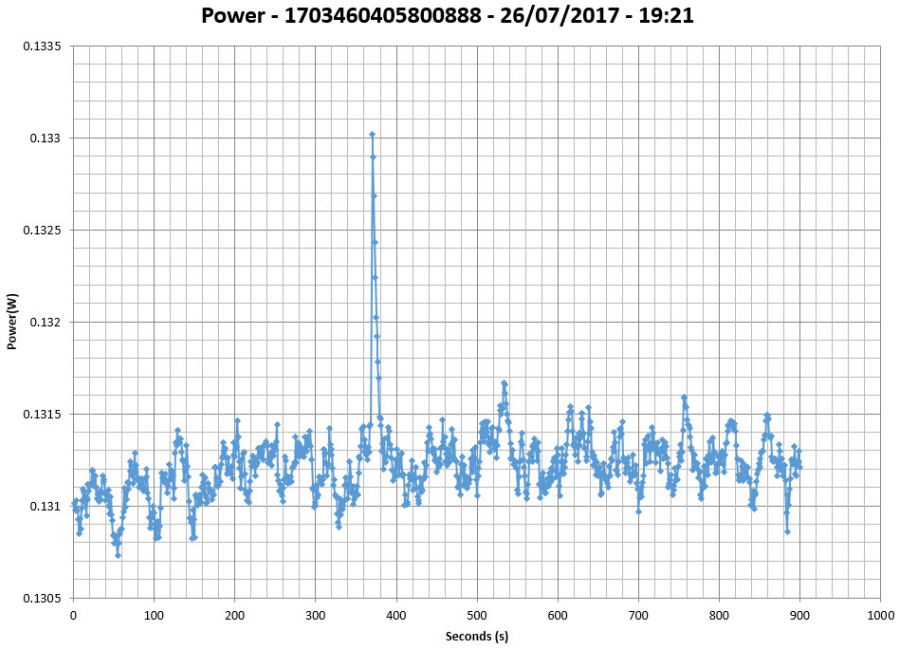
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.213	54.337%	0.029
	5.145V	0.392		115.16V
2	0.087A	0.447	65.929%	0.049
	5.143V	0.678		115.17V
3	0.542A	2.777	76.145%	0.214
	5.126V	3.647		115.13V
4	1.002A	5.118	77.463%	0.300
	5.109V	6.607		115.14V
5	1.502A	7.643	77.720%	0.350
	5.090V	9.834		115.15V
6	3.001A	15.085	76.218%	0.417
	5.026V	19.792		115.15V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.213	44.468%	0.011
	5.144V	0.479		230.40V
2	0.087A	0.448	58.182%	0.017
	5.143V	0.770		230.40V
3	0.542A	2.778	73.687%	0.079
	5.125V	3.770		230.39V
4	1.002A	5.118	75.833%	0.134
	5.108V	6.749		230.39V
5	1.501A	7.640	77.016%	0.182
	5.089V	9.920		230.39V
6	3.002A	15.095	77.327%	0.276
	5.029V	19.521		230.39V

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

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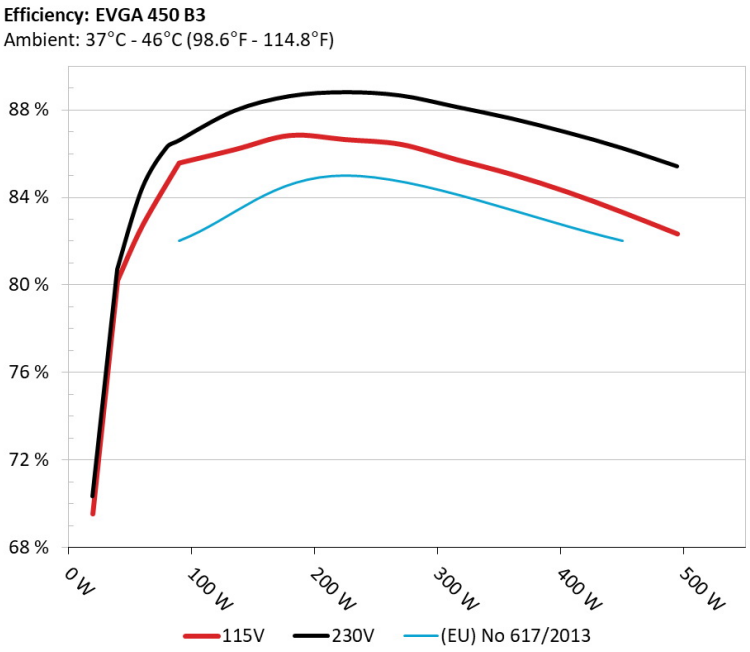
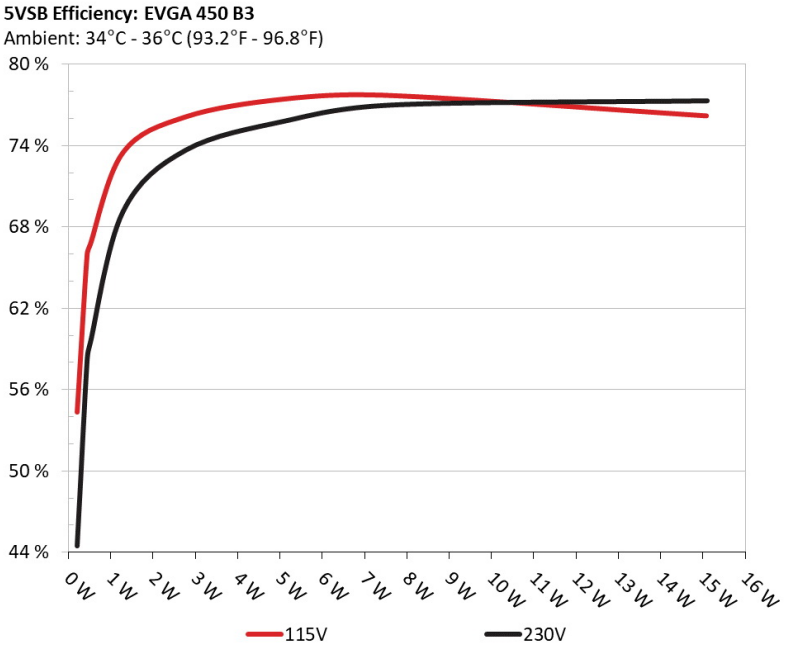
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	1.900A	1.985A	1.984A	0.981A	44.763	80.203%	0	<6.0	45.56°C	0.911
	12.195V	5.039V	3.322V	5.095V	55.812				38.04°C	115.19V
2	4.830A	2.970A	2.980A	1.181A	89.732	85.002%	1005	20.9	38.75°C	0.968
	12.192V	5.035V	3.319V	5.081V	105.564				40.79°C	115.18V
3	8.107A	3.478A	3.496A	1.380A	134.893	86.183%	1005	20.9	38.91°C	0.980
	12.188V	5.031V	3.316V	5.068V	156.519				40.97°C	115.19V
4	11.375A	3.976A	3.980A	1.580A	179.732	86.829%	1005	20.9	39.19°C	0.986
	12.182V	5.028V	3.313V	5.054V	206.996				41.74°C	115.18V
5	14.314A	4.976A	4.981A	1.785A	224.761	86.641%	1276	29.0	39.70°C	0.990
	12.176V	5.023V	3.310V	5.038V	259.417				42.38°C	115.18V
6	17.252A	5.977A	5.985A	1.990A	269.746	86.424%	1315	30.4	40.40°C	0.991
	12.170V	5.019V	3.307V	5.024V	312.119				43.12°C	115.18V
7	20.199A	6.986A	6.993A	2.195A	314.762	85.731%	1462	34.3	41.48°C	0.993
	12.162V	5.013V	3.302V	5.007V	367.152				44.33°C	115.17V
8	23.151A	7.988A	8.008A	2.400A	359.739	85.056%	1584	35.9	42.61°C	0.993
	12.153V	5.009V	3.296V	4.991V	422.943				45.57°C	115.17V
9	26.534A	8.491A	8.536A	2.405A	404.808	84.253%	1667	38.1	43.85°C	0.993
	12.144V	5.005V	3.291V	4.985V	480.472				47.08°C	115.17V
10	29.666A	9.009A	9.039A	3.025A	449.689	83.325%	1817	42.0	45.47°C	0.994
	12.134V	5.000V	3.285V	4.953V	539.682				48.76°C	115.18V
11	33.397A	9.014A	9.051A	3.030A	494.676	82.329%	1945	42.1	46.33°C	0.994
	12.125V	4.997V	3.282V	4.947V	600.854				49.83°C	115.17V
CL1	0.099A	13.019A	13.005A	0.004A	109.380	79.493%	1425	32.3	43.02°C	0.977
	12.175V	5.016V	3.295V	5.106V	137.597				45.80°C	115.19V
CL2	37.474A	1.004A	1.002A	1.002A	468.254	84.034%	1817	42.0	44.77°C	0.994
	12.138V	5.013V	3.297V	5.049V	557.221				47.98°C	115.18V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.194A	0.493A	0.477A	0.191A	19.626	69.527%	0	<6.0	0.770
	12.204V	5.045V	3.324V	5.135V	28.228				115.18V
2	2.415A	0.992A	0.990A	0.391A	39.755	80.129%	0	<6.0	0.895
	12.199V	5.042V	3.323V	5.123V	49.614				115.18V
3	3.643A	1.477A	1.503A	0.585A	59.843	82.694%	0	<6.0	0.941
	12.193V	5.039V	3.321V	5.111V	72.367				115.18V
4	4.858A	1.986A	1.983A	0.781A	79.786	85.571%	0	<6.0	0.967
	12.190V	5.036V	3.320V	5.099V	93.239				115.18V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.3 mV	5.0 mV	6.7 mV	4.7 mV	Pass
20% Load	7.9 mV	5.2 mV	8.1 mV	5.2 mV	Pass
30% Load	7.9 mV	5.9 mV	7.9 mV	5.5 mV	Pass
40% Load	8.4 mV	6.3 mV	8.3 mV	5.8 mV	Pass
50% Load	14.0 mV	6.3 mV	9.2 mV	5.9 mV	Pass
60% Load	10.5 mV	7.3 mV	10.4 mV	6.6 mV	Pass
70% Load	16.0 mV	7.8 mV	14.8 mV	10.7 mV	Pass
80% Load	10.9 mV	7.6 mV	12.9 mV	7.7 mV	Pass
90% Load	11.9 mV	7.4 mV	13.6 mV	7.7 mV	Pass
100% Load	11.8 mV	9.5 mV	13.5 mV	10.4 mV	Pass
110% Load	11.8 mV	9.3 mV	13.7 mV	11.0 mV	Pass
Crossload 1	9.3 mV	7.4 mV	7.9 mV	8.6 mV	Pass
Crossload 2	11.1 mV	8.6 mV	12.4 mV	9.3 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	21.78
AC Loss to PWR_OK Hold Up Time (ms)	18.44
PWR_OK Inactive to DC Loss Delay (ms)	3.34

Top side

Power specifications label

CERTIFICATIONS