

Anex

EVGA SuperNOVA 850 T2

Lab ID#: 153

Receipt Date: -

Test Date: -

Report:

Report Date: Feb 8, 2018

DUT INFORMATION		DUT SPECIFICATIONS	
Brand	EVGA	Rated Voltage (Vrms)	100-240
Manufacturer (OEM)	Super Flower	Rated Current (Arms)	10
Series	SuperNOVA	Rated Frequency (Hz)	50-60
Model Number	SuperNOVA 850 T2	Rated Power (W)	850
Serial Number	1603440810850008	Type	ATX12V
DUT Notes		Cooling	140mm Double Ball-Bearing Fan (RL4Z B1402512M)
		Semi-Passive Operation	✓ (selectable)
		Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70.8	2.5	0.5
	Watts	100		849.6	12.5	6
Total Max. Power (W)		850				

CABLES AND CONNECTORS			
Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (590mm)	1	1	16-22AWG
4+4 pin EPS12V (700mm)	2	2	16-22AWG
6+2 pin PCIe (700mm)	2	2	16-22AWG
6+2 pin PCIe (700mm+145mm)	2	4	16-22AWG
SATA (550mm+100mm+100mm)	2	6	18AWG
SATA (550mm+100mm+100mm)	1	4	18AWG
4 pin Molex (550mm+100mm+100mm+100mm)	1	4	18AWG
FDD Adapter (+105mm)	1	1	20AWG

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PAGE 1/9

Anex

EVGA SuperNOVA 850 T2

Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	Bridgeless Design - 1x US30K80R & 8x Infineon MOSFETs
APFC MOSFETS	4x FETs
APFC Boost Diode	4x Infineon IDH04G65C5
Hold-up Cap(s)	3x Nippon Chemi-Con (400V, 390uF & 2x 330uF or 1050uF combined, 2000h @ 105°C, KMW)
Main Switchers	4x Infineon IPB50R140CP (550V, 15A @ 100°C, 0.14 Ohm)
APFC Controller	SF29603
Switching Controller	SFAA9013
Topology	Primary side: Bridgeless PFC & Full-Bridge LLC & Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon BSC027N04LS G (40V, 88A @ 100°C, 2.7 mOhm)
5V & 3.3V	DC-DC Converters: 8x Infineon IPD060N03 FETs PWM Controller: 2x NCP1587A
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, KY, KZE, KRG) Polymers: Nippon Chemi-Con
Supervisor IC	AA9013 & LM324ADG
Fan Model	Globe Fan RL4Z B1402512M (140mm, 12V, 0.3A, 1200 RPM, 92.16 CFM, 24.9 dBA, DBB)
5VSB Circuit	
Rectifier	1x Mospec S10C60C SBR
Standby PWM Controller	29604

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PAGE 2/9

Anex

EVGA SuperNOVA 850 T2

RESULTS		
Temperature Range (°C /°F)		30-32 / 86-89.6
Average Efficiency		92.156
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V		0.000
Average Efficiency 5VSB		80.454
Standby Power Consumption (W) -115V		0.1104940
Standby Power Consumption (W) -230V		0.1985010
Average PF		0.988
ErP Lot 3/6 Ready		✓
(EU) No 617/2013 Compliance		✓
Avg Noise Output		13.25
Efficiency Rating (ETA)		TITANIUM
Noise Rating (LAMBDA)		A++

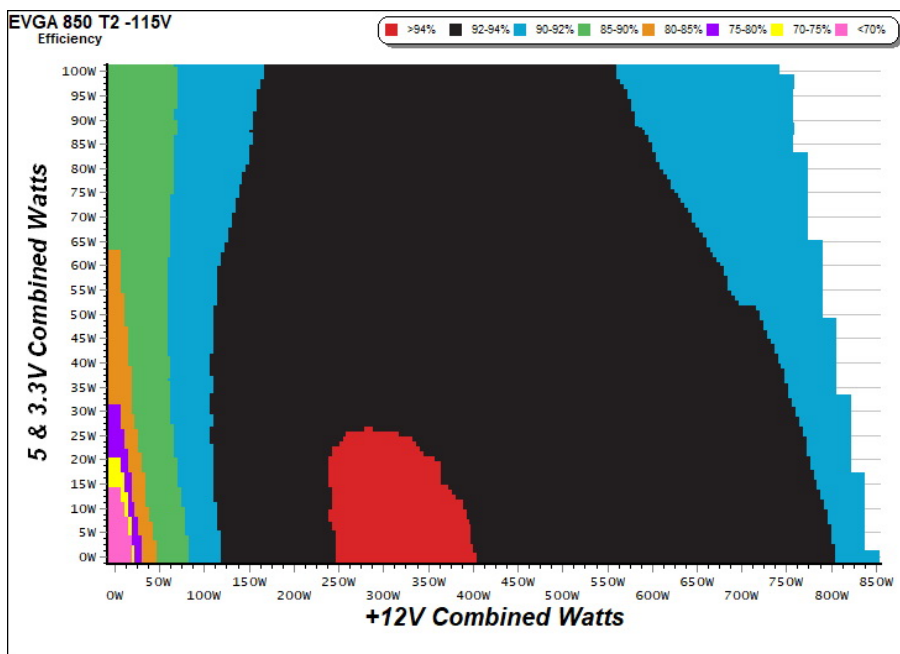
TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 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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PAGE 3/9

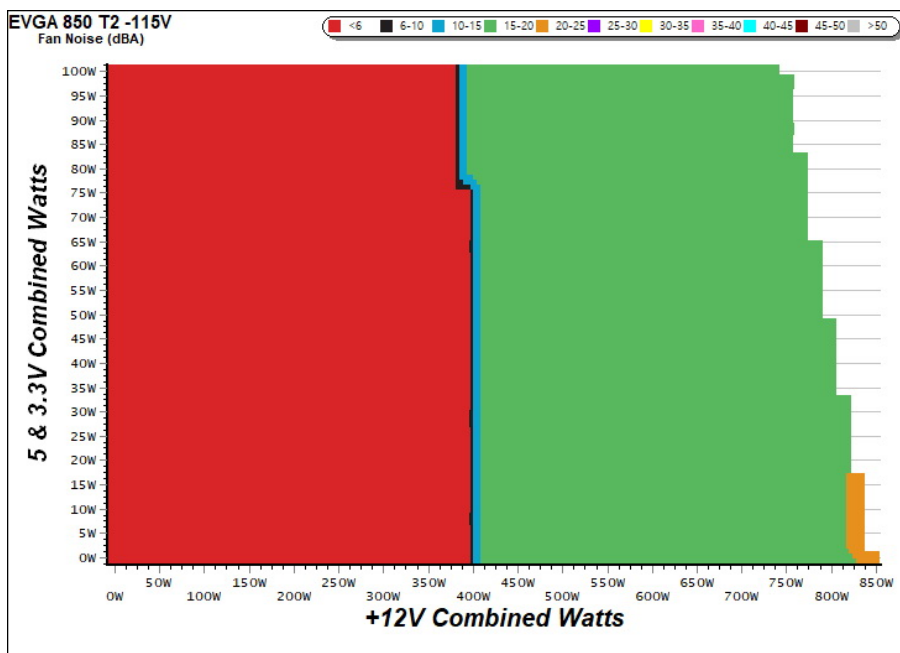
EFFICIENCY GRAPH



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)

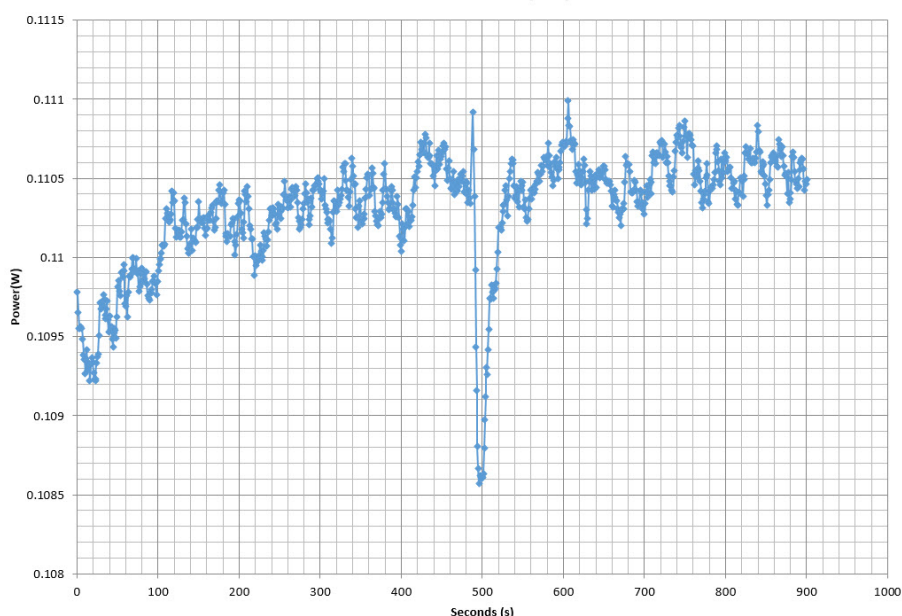
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.213	58.840%	0.016
	5.113V	0.362		115.14V
2	0.087A	0.445	70.079%	0.029
	5.112V	0.635		115.14V
3	0.542A	2.766	80.477%	0.146
	5.103V	3.437		115.11V
4	1.002A	5.106	81.293%	0.240
	5.096V	6.281		115.12V
5	1.502A	7.638	81.429%	0.316
	5.086V	9.380		115.13V
6	2.501A	12.676	81.111%	0.407
	5.068V	15.628		115.13V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.213	46.507%	0.006
	5.113V	0.458		230.38V
2	0.087A	0.445	60.462%	0.010
	5.112V	0.736		230.38V
3	0.542A	2.767	77.790%	0.048
	5.104V	3.557		230.37V
4	1.002A	5.106	79.856%	0.084
	5.096V	6.394		230.37V
5	1.501A	7.638	80.962%	0.121
	5.087V	9.434		230.37V
6	2.501A	12.678	81.196%	0.188
	5.069V	15.614		230.37V

VAMPIRE POWER -115V

Power - 1603440810850008 - 31/07/2017 - 19:28



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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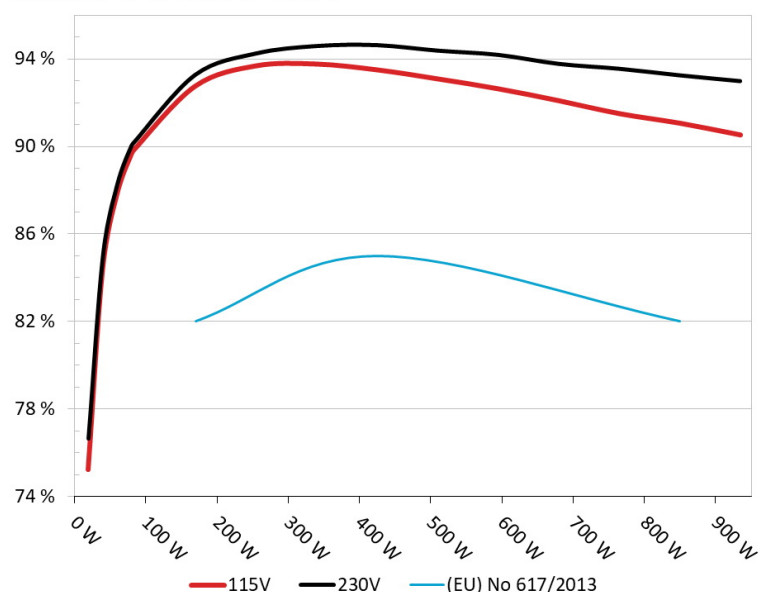
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PAGE 5/9

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: EVGA 850 T2

Ambient: 37°C - 46°C (98.6°F - 114.8°F)



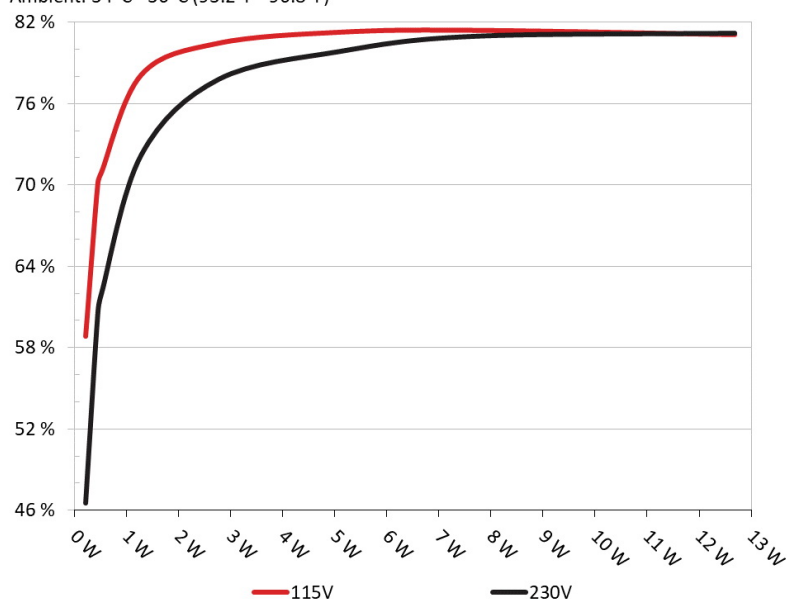
INFO

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: EVGA 850 T2

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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EVGA SuperNOVA 850 T2

10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	5.167A	1.987A	1.986A	0.981A	84.781	89.888%	0	< 6	42.98°C	0.944
	12.227V	5.042V	3.318V	5.093V	94.319				38.33°C	115.19V
2	11.355A	2.971A	2.984A	1.176A	169.619	92.763%	0	< 6	43.74°C	0.976
	12.222V	5.036V	3.316V	5.086V	182.852				38.79°C	115.19V
3	17.910A	3.479A	3.498A	1.375A	254.903	93.695%	0	< 6	44.37°C	0.988
	12.218V	5.032V	3.313V	5.079V	272.057				39.24°C	115.19V
4	24.446A	3.976A	3.982A	1.575A	339.732	93.777%	0	< 6	45.16°C	0.994
	12.213V	5.029V	3.312V	5.073V	362.276				39.81°C	115.18V
5	30.643A	4.975A	4.982A	1.776A	424.628	93.514%	0	< 6	46.39°C	0.995
	12.210V	5.023V	3.310V	5.066V	454.080				40.83°C	115.18V
6	36.854A	5.978A	5.985A	1.975A	509.656	93.099%	0	< 6	48.16°C	0.996
	12.207V	5.018V	3.307V	5.058V	547.435				42.35°C	115.17V
7	43.074A	6.987A	6.986A	2.175A	594.605	92.647%	620	14.3	42.51°C	0.997
	12.200V	5.013V	3.305V	5.052V	641.795				50.13°C	115.17V
8	49.297A	7.990A	7.994A	2.375A	679.514	92.102%	620	14.3	43.16°C	0.997
	12.194V	5.008V	3.302V	5.043V	737.787				54.18°C	115.16V
9	55.950A	8.492A	8.516A	2.379A	764.562	91.510%	940	23.6	44.62°C	0.998
	12.189V	5.005V	3.299V	5.040V	835.498				56.85°C	115.17V
10	62.566A	9.010A	9.004A	2.480A	849.404	91.072%	1315	33.7	45.63°C	0.998
	12.182V	5.000V	3.297V	5.036V	932.678				58.42°C	115.16V
11	69.563A	9.014A	9.015A	2.480A	934.307	90.537%	1315	33.7	46.20°C	0.998
	12.177V	4.998V	3.295V	5.033V	1031.966				59.80°C	115.17V
CL1	0.099A	12.014A	12.006A	0.004A	101.293	86.385%	930	23.5	44.16°C	0.961
	12.231V	5.016V	3.315V	5.102V	117.258				54.75°C	115.20V
CL2	70.786A	1.004A	1.003A	1.002A	875.458	91.483%	930	23.5	44.88°C	0.998
	12.178V	5.018V	3.297V	5.071V	956.962				57.89°C	115.17V

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PAGE 7/9

Anex

EVGA SuperNOVA 850 T2

20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.194A	0.495A	0.479A	0.196A	19.691	75.231%	0	< 6	0.715
	12.227V	5.050V	3.321V	5.112V	26.174				115.17V
2	2.411A	0.991A	0.993A	0.391A	39.773	84.352%	0	< 6	0.863
	12.227V	5.047V	3.320V	5.105V	47.151				115.18V
3	3.633A	1.478A	1.505A	0.586A	59.860	87.811%	0	< 6	0.918
	12.227V	5.044V	3.319V	5.100V	68.169				115.18V
4	4.842A	1.985A	1.985A	0.782A	79.778	89.627%	0	< 6	0.941
	12.226V	5.042V	3.318V	5.096V	89.011				115.18V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.5 mV	5.0 mV	5.9 mV	5.7 mV	Pass
20% Load	6.1 mV	6.1 mV	6.8 mV	6.3 mV	Pass
30% Load	6.8 mV	6.3 mV	7.0 mV	7.4 mV	Pass
40% Load	8.3 mV	7.3 mV	8.7 mV	8.2 mV	Pass
50% Load	8.8 mV	8.1 mV	9.3 mV	10.1 mV	Pass
60% Load	9.6 mV	8.6 mV	10.6 mV	10.9 mV	Pass
70% Load	9.2 mV	9.3 mV	11.3 mV	10.1 mV	Pass
80% Load	10.1 mV	10.6 mV	12.8 mV	11.6 mV	Pass
90% Load	11.0 mV	10.8 mV	13.4 mV	11.7 mV	Pass
100% Load	10.4 mV	13.1 mV	13.0 mV	13.8 mV	Pass
110% Load	11.2 mV	14.1 mV	14.4 mV	14.4 mV	Pass
Crossload 1	6.7 mV	7.3 mV	8.1 mV	13.6 mV	Pass
Crossload 2	9.8 mV	12.9 mV	12.8 mV	14.3 mV	Pass

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PAGE 8/9

Anex

EVGA SuperNOVA 850 T2

HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	24.68
AC Loss to PWR_OK Hold Up Time (ms)	18.40
PWR_OK Inactive to DC Loss Delay (ms)	6.28

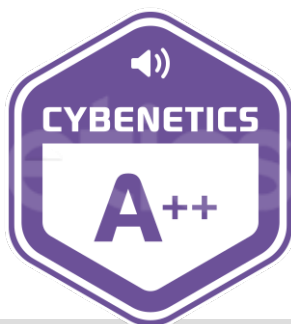


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Power specifications label

CERTIFICATIONS



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PAGE 9/9