Anex

SilverStone Nightjar 450W (#2)

Lab ID#: 441
Receipt Date: Jul 17, 2018
Test Date: Jul 23, 2018

Report: 19PS441A
Report Date: Jul 27, 2018

DUT INFORMATION

Brand	SilverStone
Manufacturer (OEM)	Enhance Electronics
Series	Nightjar
Model Number	NJ450-SXL
Serial Number	DB18160814J450SXL0
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60
Rated Power (W)	450
Type	SFX-L
Cooling	Fanless
Semi-Passive Operation	
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, 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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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	91.600%
Efficiency With 10W (≤500W) or 2% (>500W)	63.235
Average Efficiency 5VSB	82.311%
Standby Power Consumption (W)	0.0539259
Average PF	0.952
Avg Noise Output	6.00 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	A++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	16	15	37.5	2.5	0.3
	Watts	80		450	12.5	3.6
Total Max. Power (W)		450				

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

Hold-Up Time (ms)	13.4
AC Loss to PWR_OK Hold Up Time (ms)	13.9
PWR_OK Inactive to DC Loss Delay (ms)	-0.5

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (300mm)	1	1	16-22AWG	No
4+4 pin EPS12V (400mm)	1	1	16AWG	No
6+2 pin PCIe (400mm+150mm)	2	4	16-18AWG	No
SATA (300mm+200mm+90mm+90mm)	2	8	18AWG	No
4 pin Molex (300mm+200mm+200mm)	1	3	18AWG	No
FDD Adapter (+105mm)	1	1	22AWG	No
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

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General Data	
Manufacturer (OEM)	Enhance Electronics
Primary Side	
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	2x GBU15J (600V, 15A @ 100°C)
APFC MOSFETS	2x Infineon IPL60R104C7 (650V, 15A @ 100°C, 0.104Ohm)
APFC Boost Diode	1x CREE C3D08060A (600V, 8A @ 152°C)
Hold-up Cap(s)	1x Hitachi (450V, 390uF, 2000h @ 105°C, HU)
Main Switchers	2x Infineon IPB50R140CP (550V, 15A @ 100°C, 0.14Ohm) Driver IC: Si8230BD
APFC Controller	ATK AT6101L
Resonant Controller	Champion CM6901T6X
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4mOhm)
5V & 3.3V	DC-DC Converters: 4x Infineon BSC018NE2LS (25V, 97A @ 100°C, 1.4mOhm), 2x Infineon BSC050N04LS (40V, 54A @ 100°C, 5mOhm) PWM Controller: 2x Anpec APW7160A
Filtering Capacitors	Polymers: FPCAP, Suncon, Unicon (2000h @ 125°C, UPL, UPH)
Supervisor IC	SITI PS223 (OCP, OTP, OVP, UVP, SCP, PG)
5VSB Circuit	
Rectifiers	MOSPEC S10L45 (45V, 10A) , SVF2N70MJ (700V, 2A, 6.5Ohm)
Standby PWM Controller	ATK AT6002H

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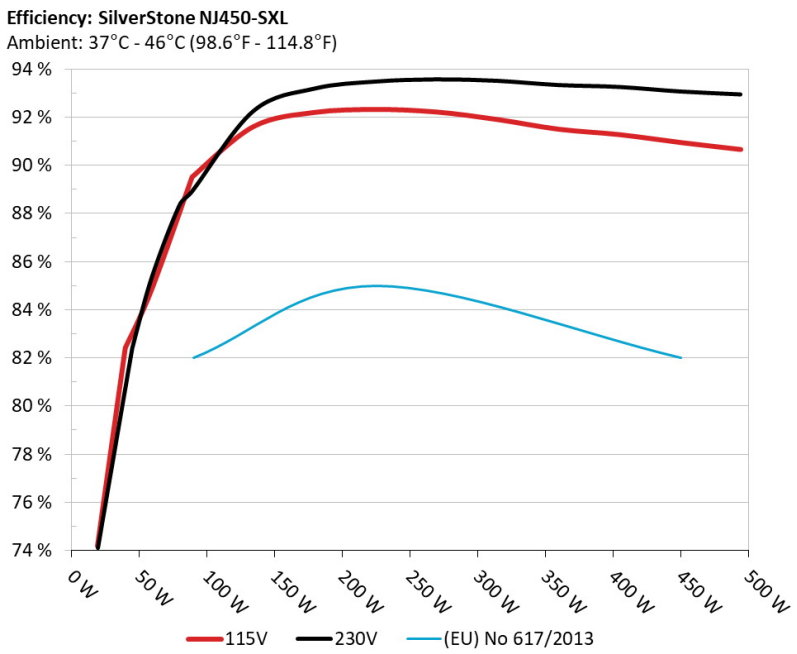
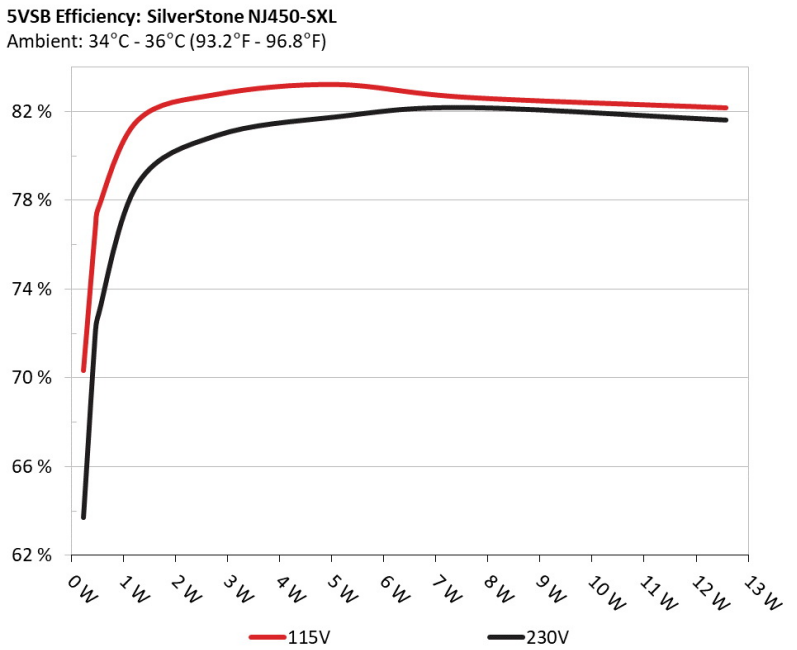
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	70.336%	0.020
	5.102V	0.327		115.15V
2	0.090A	0.460	76.795%	0.036
	5.101V	0.599		115.17V
3	0.550A	2.798	82.781%	0.178
	5.087V	3.380		115.11V
4	1.000A	5.074	83.221%	0.268
	5.074V	6.097		115.11V
5	1.500A	7.589	82.642%	0.329
	5.059V	9.183		115.11V
6	2.500A	12.572	82.170%	0.392
	5.028V	15.300		115.10V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	63.712%	0.007
	5.102V	0.361		230.34V
2	0.090A	0.459	72.057%	0.012
	5.101V	0.637		230.34V
3	0.550A	2.799	80.919%	0.061
	5.087V	3.459		230.41V
4	1.000A	5.075	81.749%	0.106
	5.073V	6.208		230.34V
5	1.500A	7.589	82.168%	0.150
	5.058V	9.236		230.48V
6	2.500A	12.572	81.610%	0.222
	5.028V	15.405		230.34V

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115V

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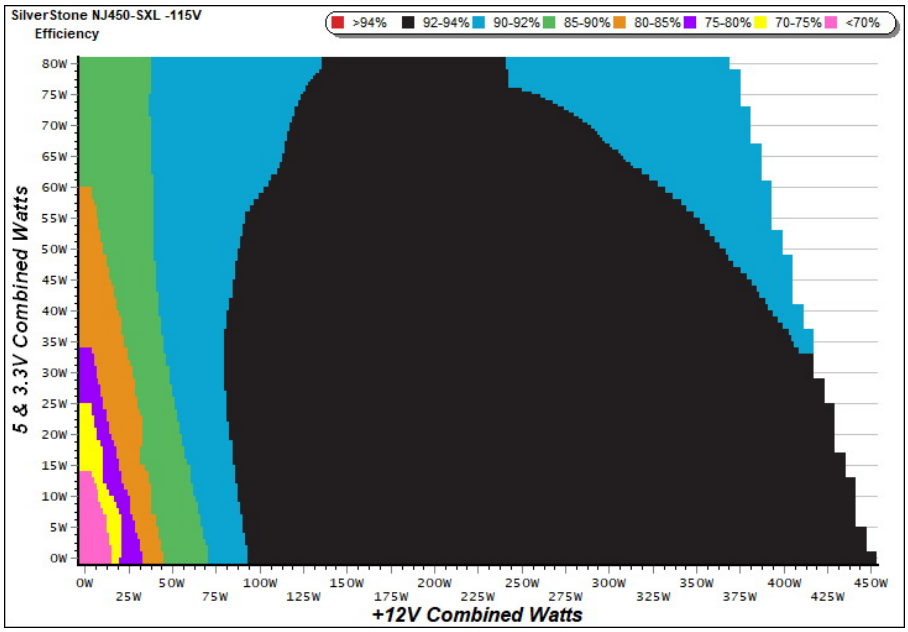
EFFICIENCY GRAPH 115V



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

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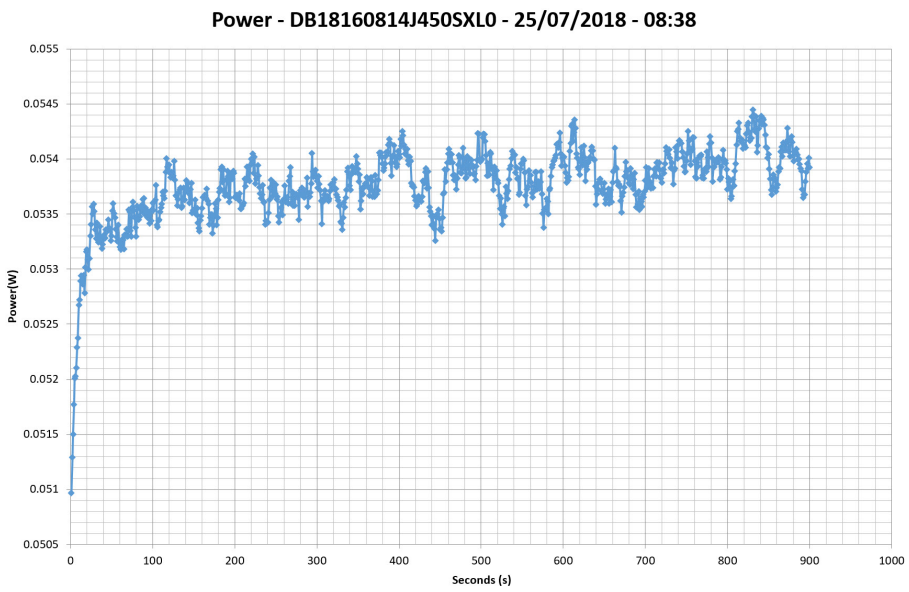
VAMPIRE POWER -115V



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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10-110% LOAD TESTS 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	1.926A	1.988A	1.996A	0.987A	44.764	82.402%	0	<6.0	43.17°C	0.879
	12.033V	5.029V	3.303V	5.065V	54.324				39.41°C	115.11V
2	4.847A	2.986A	3.002A	1.188A	89.240	89.735%	0	<6.0	43.92°C	0.941
	12.038V	5.021V	3.297V	5.052V	99.448				39.83°C	115.12V
3	8.172A	3.489A	3.492A	1.389A	134.331	91.587%	0	<6.0	44.73°C	0.958
	12.034V	5.015V	3.291V	5.040V	146.670				40.38°C	115.13V
4	11.500A	3.993A	4.015A	1.592A	179.569	92.180%	0	<6.0	45.42°C	0.960
	12.033V	5.008V	3.285V	5.027V	194.802				40.81°C	115.14V
5	14.496A	5.000A	5.032A	1.796A	224.855	92.303%	0	<6.0	46.49°C	0.962
	12.028V	5.000V	3.278V	5.013V	243.606				41.62°C	115.14V
6	17.429A	6.009A	6.054A	2.001A	269.386	92.200%	0	<6.0	47.51°C	0.962
	12.025V	4.992V	3.271V	4.999V	292.175				42.27°C	115.15V
7	20.427A	7.022A	7.075A	2.207A	314.693	91.887%	0	<6.0	48.73°C	0.961
	12.023V	4.985V	3.264V	4.985V	342.477				43.37°C	115.16V
8	23.428A	8.039A	8.105A	2.415A	360.008	91.484%	0	<6.0	49.94°C	0.962
	12.020V	4.976V	3.257V	4.970V	393.521				44.00°C	115.16V
9	26.827A	8.553A	8.612A	2.419A	404.917	91.259%	0	<6.0	51.62°C	0.963
	12.018V	4.970V	3.251V	4.963V	443.700				45.40°C	115.17V
10	30.162A	9.067A	9.153A	2.525A	449.629	90.935%	0	<6.0	52.75°C	0.964
	12.016V	4.963V	3.245V	4.951V	494.451				46.24°C	115.22V
11	33.894A	9.081A	9.165A	2.529A	494.449	90.642%	0	<6.0	53.45°C	0.966
	12.015V	4.957V	3.240V	4.944V	545.497				46.44°C	115.18V
CL1	0.136A	9.998A	9.999A	0.000A	84.456	87.652%	0	<6.0	47.53°C	0.941
	12.054V	5.003V	3.280V	5.073V	96.354				42.25°C	115.12V
CL2	37.510A	1.001A	0.998A	1.000A	464.393	91.811%	0	<6.0	52.00°C	0.965
	12.027V	4.982V	3.265V	5.014V	505.813				45.97°C	115.18V

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20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.189A	0.496A	0.481A	0.196A	19.397	74.187%	0	<6.0	0.722
	12.034V	5.036V	3.310V	5.095V	26.146				115.10V
2	2.458A	0.993A	0.997A	0.393A	39.872	82.117%	0	<6.0	0.864
	12.034V	5.032V	3.307V	5.086V	48.555				115.11V
3	3.651A	1.491A	1.479A	0.591A	59.321	84.822%	0	<6.0	0.910
	12.034V	5.029V	3.303V	5.077V	69.936				115.11V
4	4.912A	1.990A	1.998A	0.789A	79.730	89.502%	0	<6.0	0.932
	12.040V	5.025V	3.300V	5.067V	89.082				115.12V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.2 mV	7.7 mV	13.1 mV	12.5 mV	Pass
20% Load	12.8 mV	7.7 mV	14.1 mV	13.6 mV	Pass
30% Load	8.9 mV	8.8 mV	14.7 mV	13.9 mV	Pass
40% Load	10.3 mV	10.1 mV	14.4 mV	14.9 mV	Pass
50% Load	11.7 mV	11.8 mV	15.8 mV	16.0 mV	Pass
60% Load	12.7 mV	12.8 mV	17.9 mV	15.8 mV	Pass
70% Load	13.8 mV	13.4 mV	17.6 mV	17.2 mV	Pass
80% Load	15.0 mV	17.0 mV	20.1 mV	17.5 mV	Pass
90% Load	16.4 mV	17.7 mV	18.5 mV	18.3 mV	Pass
100% Load	20.3 mV	18.6 mV	23.5 mV	19.5 mV	Pass
110% Load	21.8 mV	19.7 mV	23.8 mV	20.9 mV	Pass
Crossload 1	15.2 mV	9.0 mV	16.5 mV	9.2 mV	Pass
Crossload 2	20.4 mV	18.5 mV	20.1 mV	21.8 mV	Pass

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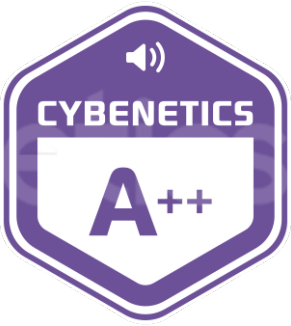
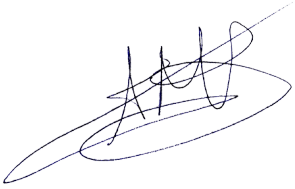
Top side

Power specifications label

CERTIFICATIONS 115V





Aristeidis Bitziopoulos
Lab Director

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