SILVERSTONE

SilverStone SFX 550W

Serial Number S6101000173

Lab ID 130

Certification ID 25130

Test Result Report ID:

Certificate Issue Date: Jun 22, 2018

115V 230V

Scheme: ETA-EMI PSU

CYBENETICS GOLD

115V 230V

CYBENETICS A-

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	SilverStone
Model	SFX 550W
OEM/ODM	FSP
Serial Number	S6101000173
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60

Rated Power (W)	550
Operating Temperature (Continuous Full Load) (°C)	
Type	SFX
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	80mm Sleeve Bearing Fan (MGA8012YS-A15)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	130
Date of receipt	Jun 16, 2018
Testing Date	Jun 20, 2018
Report Issued Date	Jun 22, 2018
DUT Notes	Retested on 10/16/2017
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 (310mm)	1	1	20AWG
4+4 pin EPS12V (420mm)	1	1	18AWG
6+2 pin PCIe (420mm+155mm)	1	2	18AWG
SATA (315mm+200mm+100mm)	1	3	20AWG
4 pin Molex (315mm+200mm) / FDD (+200mm)	1	2 / 1	20-22AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	21	22	45	2.5	0.3
	Watts	120		540	12.5	3.6
Total Max. Power (W)		550				

Parts Description

Primary Side	
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU10V06 (600V, 2.9A @ 100°C - without heatsink)
APFC MOSFETS	2x Infineon IPA60R125CP (650V, 16A @ 100°C, 0.125 Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8R06FP (600V, 8A @ 85°C)
Hold-up Cap(s)	2x Nippon Chemi-Con (420V, 150uF each, 2000h @ 105°C, KMG)
Main Switcher	1x Infineon SPA17N80C3 (800V, 11A @ 100°C, 0.29 ohm)
Reset Switch	Fairchild FQPF3N80C (800V, 1.9A @ 100°C, 4.8 ohm)
APFC/Switching Controller	FSP 6600 IC
Topology	Primary side: Active Clamp Reset Forward Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	2x Texas Instruments CSD19506KCS (80V, 193A @ 100°C, 2.2 mOhm)
5V & 3.3V	DC-DC Converters: 4x Infineon BSC030N03LS G (30V, 77A @ 100°C, 3 mOhm) PWM Controller: ANPEC APW7159C
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, KZE, KZH) Polymers: Teapo
Supervisor IC	FSP6601

Fan Model	Protechnic Electric MGA8012YS-A15 (80mm, 12V, 0.28A, Sleeve Bearing)
5VSB Circuit	
Rectifier	1x A-Power AP03N70I-H FET (700V, 2.5A, 4.4 Ohm)

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

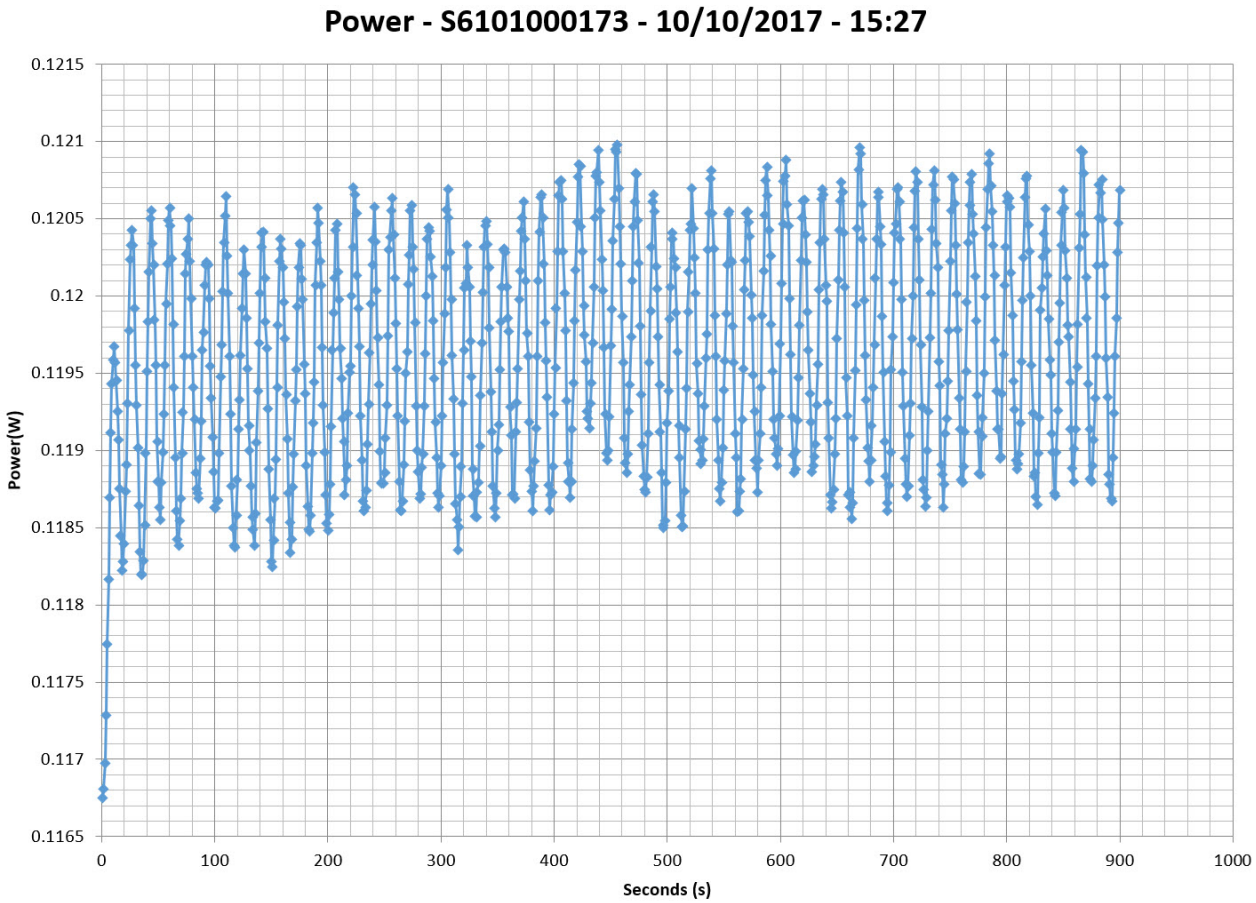
Performance Summary 115V

Accredited	
Average Efficiency (>1450 load combinations)	87.847%
Average Noise Output (>1450 Load Combinations)	29.14dBA
Average PF (>1450 Load Combinations)	0.992
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1207W
Non-Accredited	
12V Ripple (Full Load)	61.55mV
5V Ripple (Full Load)	39.36mV
3.3V Ripple (Full Load)	26.07mV
5VSB Ripple (Full Load)	14.06mV
12V Load Regulation	1.62%
5V Load Regulation	2.34%
3.3V Load Regulation	2.49%
5VSB Load Regulation	3.64%
Inrush Current	39.893A

Hold-Up Time & PWR_OK Signal

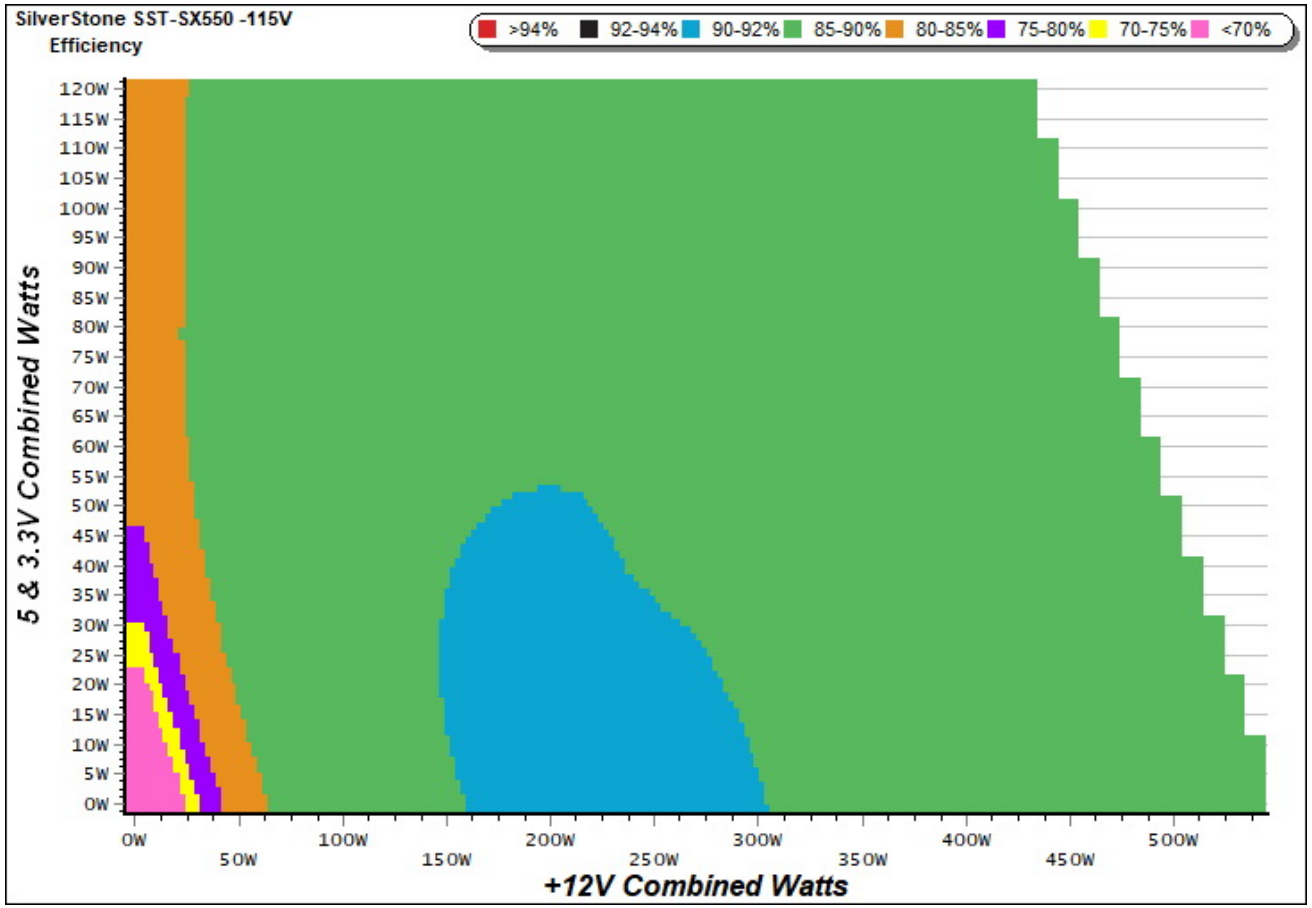
Hold-Up Time (ms)	21.7
AC Loss to PWR_OK Hold Up Time (ms)	17.5
PWR_OK Inactive to DC Loss Delay (ms)	4.2

Graphs 115V



Efficiency Graph

115V

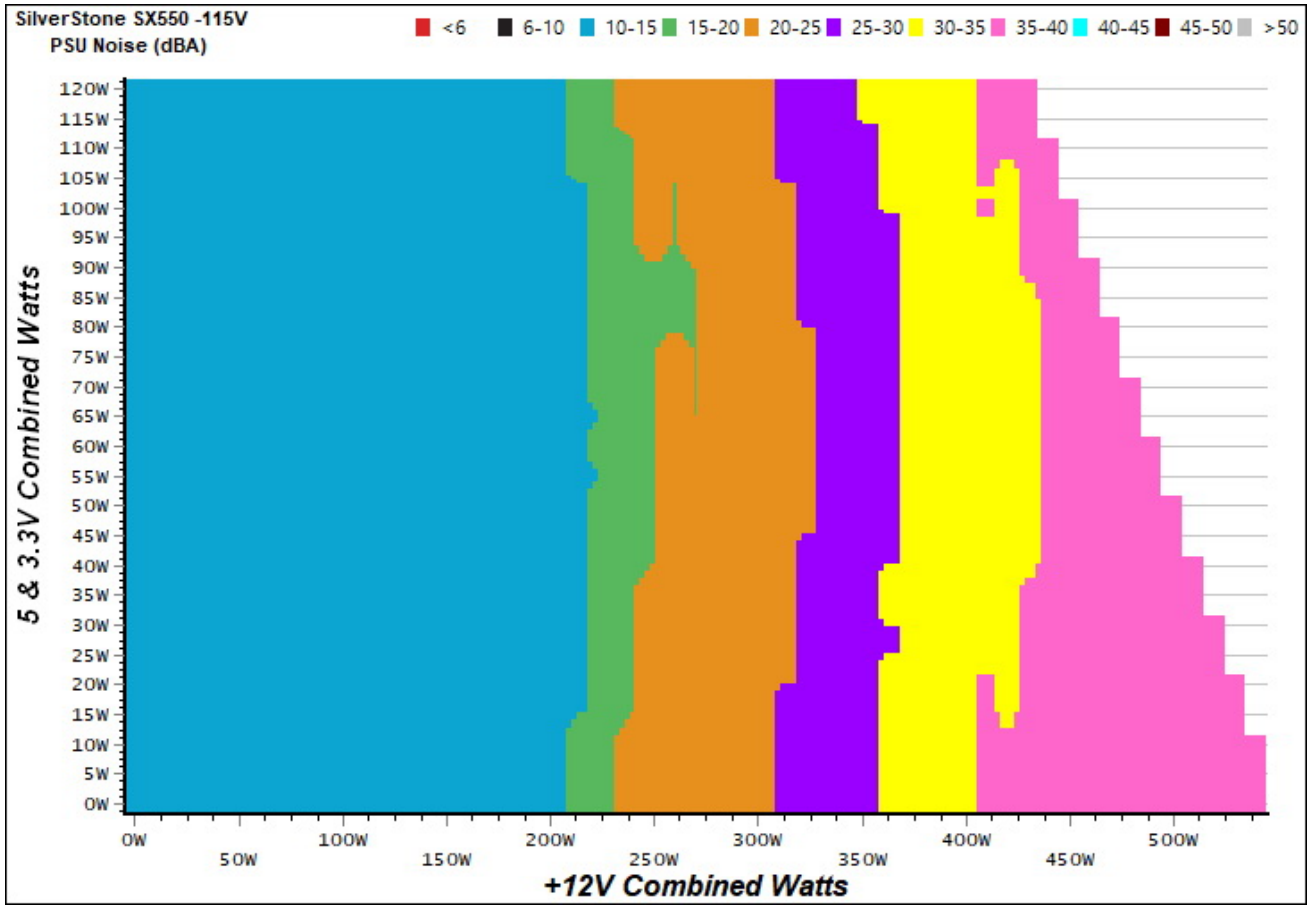


INFO

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.

Noise Graph

115V

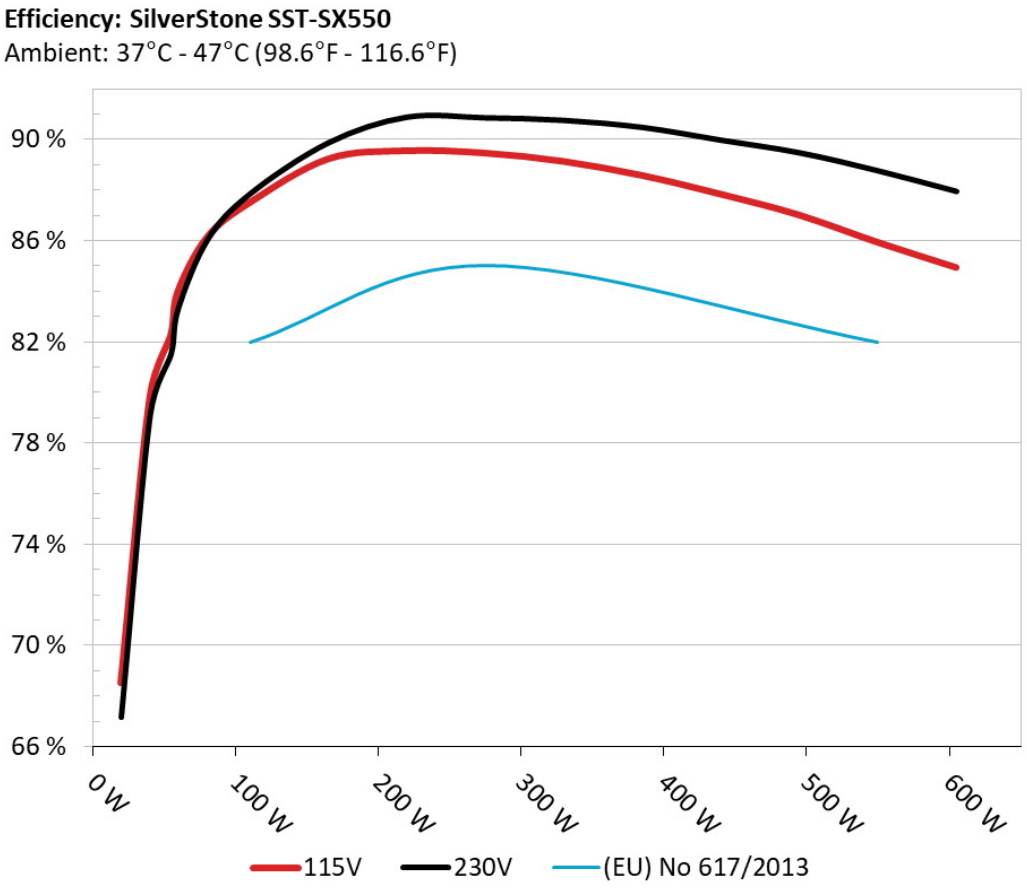


INFO

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.

Indicative Performance

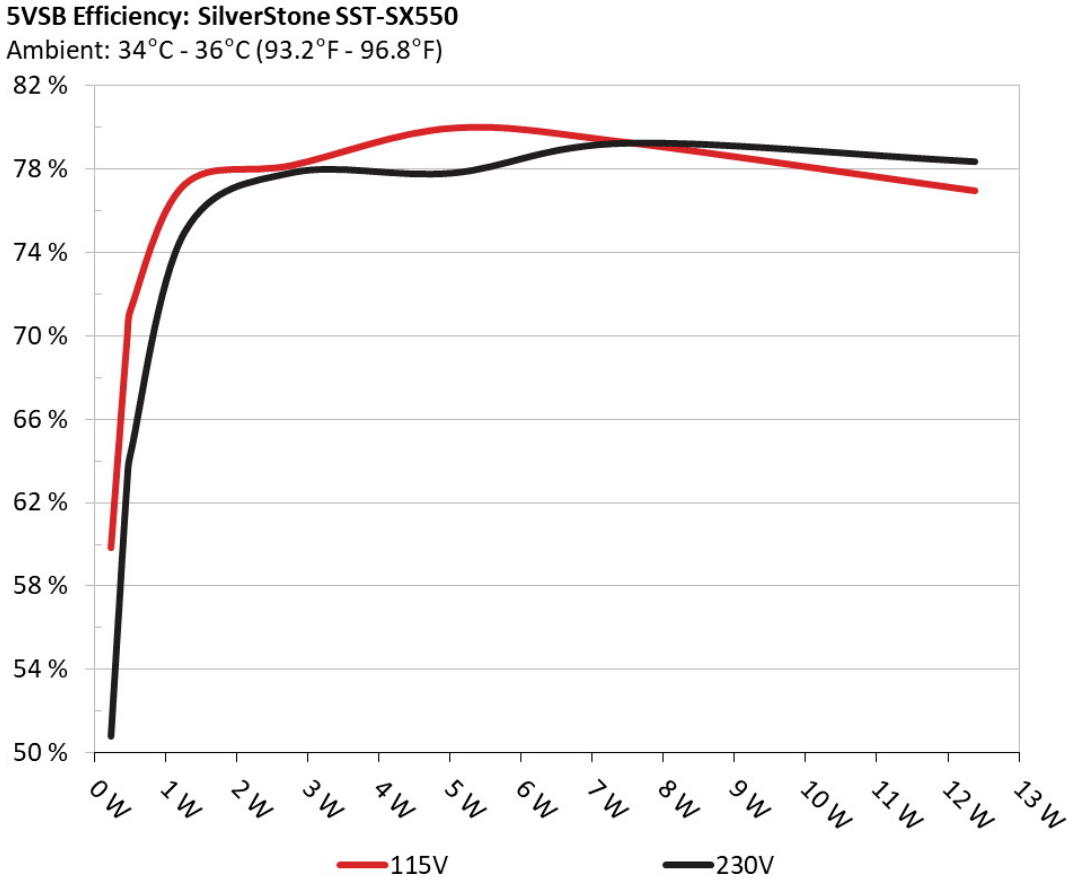
Efficiency under high ambient temperature



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	0.045A	0.228	59.843%	0.035
	5.063V	0.381		115.39V

2	0.090A	0.456	69.939%	0.059
	5.063V	0.652		115.39V
3	0.550A	2.775	78.191%	0.256
	5.044V	3.549		115.38V
4	1.000A	5.024	79.975%	0.351
	5.024V	6.282		115.38V
5	1.500A	7.501	79.283%	0.409
	5.000V	9.461		115.37V
6	2.499A	12.380	76.971%	0.463
	4.953V	16.084		115.36V

Supplementary Tests (For Reference)

Typical 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	2.737A	1.966A	1.958A	0.998A	54.473	82.258%	1412	15.8	38.29°C	0.962
	12.011V	5.087V	3.369V	5.011V	66.222				46.83°C	115.31V
2	6.547A	2.957A	2.947A	1.202A	109.366	87.493%	1412	15.8	38.60°C	0.980
	11.984V	5.074V	3.359V	4.995V	125.000				48.55°C	115.23V
3	10.761A	3.456A	3.430A	1.406A	164.872	89.239%	1412	15.8	39.15°C	0.989
	11.976V	5.064V	3.352V	4.979V	184.753				49.84°C	115.14V
4	14.908A	3.960A	3.946A	1.612A	219.690	89.562%	1594	20.0	39.39°C	0.995
	11.972V	5.053V	3.345V	4.964V	245.293				51.52°C	115.16V
5	18.738A	4.962A	4.946A	1.820A	274.582	89.470%	1919	25.2	40.07°C	0.997
	11.958V	5.040V	3.336V	4.948V	306.899				53.20°C	115.07V
6	22.577A	5.970A	5.952A	2.029A	329.510	89.145%	2265	30.2	40.84°C	0.998
	11.946V	5.026V	3.326V	4.931V	369.632				55.27°C	114.99V
7	26.472A	6.983A	6.964A	2.240A	384.809	88.587%	2602	34.2	42.13°C	0.998
	11.926V	5.012V	3.317V	4.913V	434.385				58.24°C	115.01V
8	30.402A	8.005A	7.983A	2.453A	440.109	87.845%	2957	38.4	42.55°C	0.999
	11.897V	4.998V	3.307V	4.895V	501.004				61.20°C	114.92V

9	34.754A	8.522A	8.489A	2.457A	494.630	87.030%	3250	40.7	44.29°C	0.999
	11.858V	4.988V	3.299V	4.886V	568.343				63.97°C	114.83V
10	39.131A	9.043A	9.027A	2.567A	549.744	85.951%	3460	42.2	45.73°C	0.999
	11.820V	4.977V	3.291V	4.870V	639.602				66.99°C	114.84V
11	44.160A	9.055A	9.046A	2.572A	604.956	84.953%	3460	42.2	46.73°C	0.999
	11.724V	4.971V	3.284V	4.862V	712.108				69.73°C	114.75V
CL1	0.737A	14.003A	13.999A	0.000A	125.036	82.678%	2745	35.6	44.38°C	0.985
	11.993V	4.981V	3.318V	5.026V	151.233				58.28°C	115.19V
CL2	45.005A	1.002A	1.000A	1.000A	545.702	86.687%	3450	42.0	45.35°C	0.999
	11.829V	5.046V	3.322V	4.960V	629.508				63.22°C	114.77V

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)	PSU Noise (dB[A])	PF/AC Volts
1	1.204A	0.490A	0.473A	0.198A	19.564	68.547%	1412	15.8	0.826
	12.015V	5.101V	3.379V	5.054V	28.541				115.36V
2	2.465A	0.984A	0.978A	0.397A	39.934	79.834%	1412	15.8	0.939
	12.015V	5.096V	3.375V	5.043V	50.021				115.33V
3	3.669A	1.473A	1.451A	0.597A	59.458	83.994%	1412	15.8	0.965
	12.010V	5.090V	3.371V	5.031V	70.788				115.30V
4	4.937A	1.967A	1.961A	0.797A	79.862	86.137%	1412	15.8	0.972
	12.003V	5.085V	3.366V	5.019V	92.715				115.27V

The results above are not used in the certification process

Ripple Measurements 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.9 mV	15.9 mV	13.7 mV	11.5 mV	Pass
20% Load	28.6 mV	23.1 mV	15.5 mV	14.5 mV	Pass
30% Load	28.0 mV	22.7 mV	14.9 mV	7.8 mV	Pass
40% Load	29.2 mV	22.9 mV	15.6 mV	8.7 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	33.2 mV	25.5 mV	16.5 mV	9.3 mV	Pass
60% Load	33.9 mV	28.8 mV	18.9 mV	10.2 mV	Pass
70% Load	36.6 mV	32.1 mV	20.7 mV	10.6 mV	Pass
80% Load	38.0 mV	33.2 mV	20.9 mV	11.0 mV	Pass
90% Load	46.3 mV	36.5 mV	22.9 mV	12.3 mV	Pass
100% Load	61.6 mV	39.4 mV	26.1 mV	14.1 mV	Pass
110% Load	97.3 mV	41.8 mV	27.3 mV	15.2 mV	Pass
Crossload 1	33.4 mV	26.5 mV	18.7 mV	17.0 mV	Pass
Crossload 2	60.2 mV	38.3 mV	25.4 mV	18.2 mV	Pass

The results above are not used in the certification process

SilverStone SFX 550W

Top side

Power specifications label