EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

SilverStone SX700-LPT

Lab ID#: 60
Receipt Date: -
Test Date: -

Report:
Report Date: Jul 3, 2018

DUT INFORMATION

Brand	SilverStone
Manufacturer (OEM)	Sirfa / High Power
Series	SFX
Model Number	SX700-LPT
Serial Number	163391700PTW1F02004054
DUT Notes	Edited on 05/29/2018

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	700
Type	SFX-L
Cooling	120mm Sleeve Bearing Fan (PY-12015H12S)
Semi-Passive Operation	✓
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	58.33	3	0.3
	Watts	120		700	15	3.6
Total Max. Power (W)		700				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (300mm)	1	1	18AWG
4+4 pin EPS12V (400mm)	1	1	16AWG
6+2 pin PCIe (550mm+150mm)	1	2	16-18AWG
6+2 pin PCIe (400mm+150mm)	1	2	16-18AWG
SATA (300mm+210mm+110mm)	2	6	18AWG
4 pin Molex (610mm+155mm+155mm)	1	3	18AWG
4 pin Molex (300mm+200mm+200mm)	1	3	18AWG
FDD Adapter (+105mm)	1	1	22AWG

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General Data	
Manufacturer (OEM)	Sirfa / High Power
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CMD02X
Inrush Protection	-
Bridge Rectifier	GBU1506 (600 V, 15 A @ 100 °C)
APFC MOSFETS	2x Sigmachip SGF110N60W3 (630 V, 16 A @ 100 °C, 0.11 Ohm)
APFC Boost Diode	Infineon IDH08G65C5 (650 V, 8 A @ 145 °C)
Hold-up Cap	Rubycon (420 V, 390 uF, 3000 h @ 85 °C, USG)
Main Switchers	2x Infineon IPA50R140CP (550 V, 15 A @ 100 °C, 0.14 Ohm) Driver IC: Silicon Labs Si8233BD
APFC Controller	Infineon ICE3PCS01
Switching Controller	Infineon ICE2HS01G
Topology	Primary side: Half-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	6X 2x Toshiba TPHR85 04PL (SOP Advance Series, 40V, 150A @ 25C, 0.85 mΩ)
5V & 3.3V	DC-DC Converters: 4x Infineon BSC0902NS (30 V, 67 A @ 100 °C, 2.6 mOhm) PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105 °C, KY, KZE) Polymers: Nippon Chemi-Con
Supervisor IC	SITI PS223 (OVP, UVP, OCP, SCP, OTP)
Fan Model	PowerYear PY-12015H12S (120 mm, 12 V, 0.22 A, 1900 RPM, Sleeve Bearing)
5VSB Circuit	
Rectifier	2x Infineon IPD060N03L G (30 V, 50 A @ 100 °C, 6 mOhm)
Standby PWM Controller	Sanken STR-A6069H
-12V Circuit	
Regulator	KEC KIA7912PI

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	89.780
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	79.039
Standby Power Consumption (W) -115V	0.0732422
Standby Power Consumption (W) -230V	0.1035780
Average PF	0.994
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	30.13
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard++

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 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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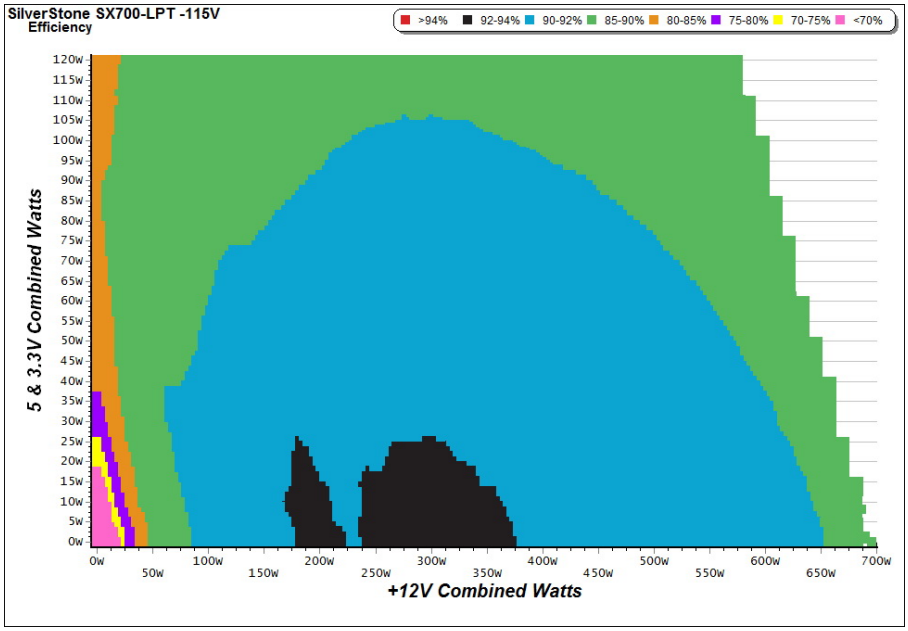
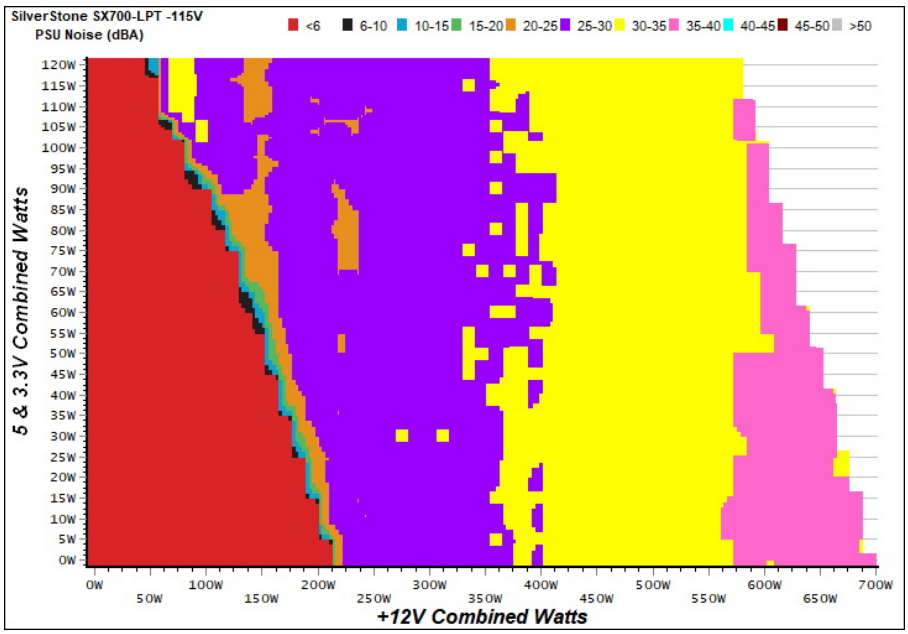
EFFICIENCY GRAPH



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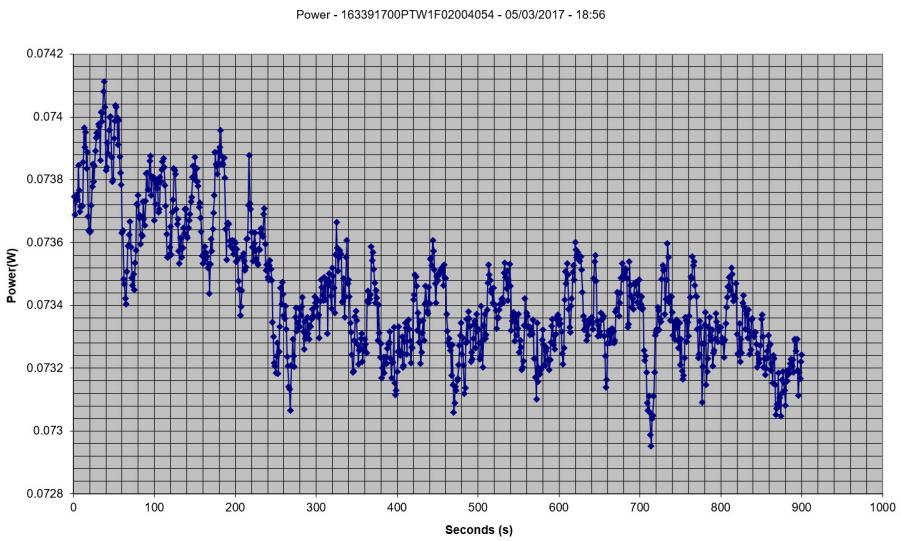
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.213	62.832%	0.048
	5.121V	0.339		115.13V
2	0.087A	0.446	71.246%	0.086
	5.119V	0.626		115.13V
3	0.532A	2.713	80.648%	0.266
	5.101V	3.364		115.12V
4	3.002A	14.983	78.281%	0.380
	4.992V	19.140		115.11V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.212	55.352%	0.017
	5.121V	0.383		230.32V
2	0.087A	0.445	65.058%	0.029
	5.119V	0.684		230.32V
3	0.532A	2.712	75.670%	0.136
	5.100V	3.584		230.31V
4	3.002A	14.987	78.622%	0.317
	4.993V	19.062		230.30V

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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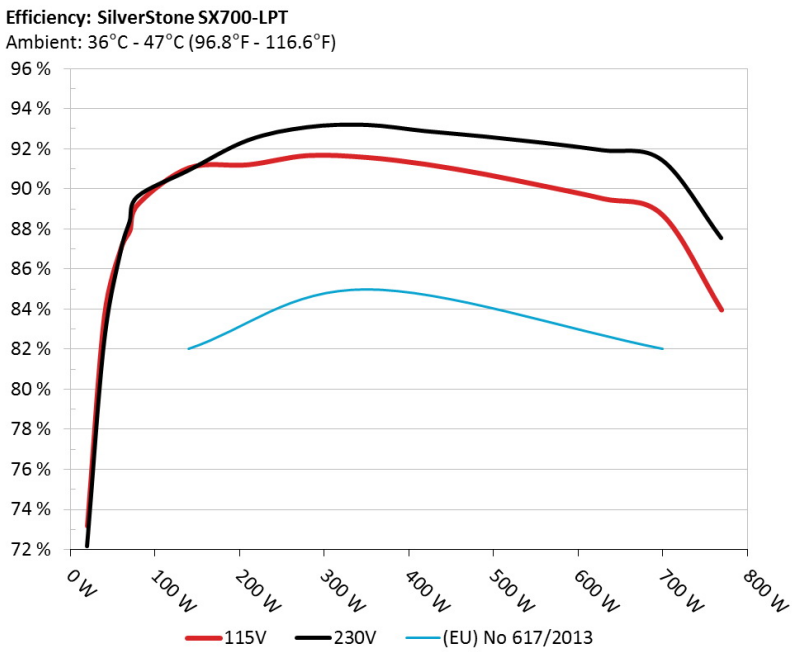
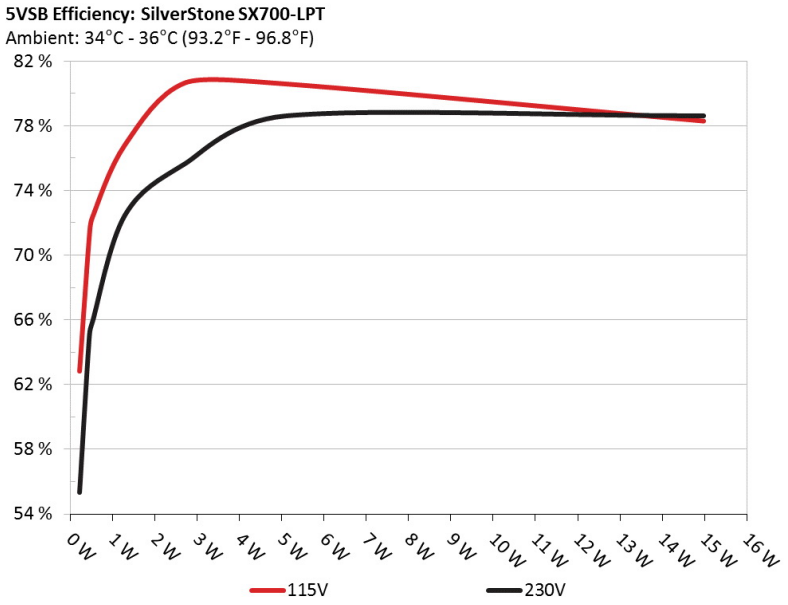
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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	3.920A	1.976A	1.961A	0.996A	69.772	87.894%	0	<6.0	44.94°C	0.971
	12.296V	5.052V	3.360V	5.021V	79.382				39.32°C	115.08V
2	8.865A	2.969A	2.947A	1.195A	139.741	91.042%	0	<6.0	46.32°C	0.989
	12.286V	5.037V	3.356V	5.005V	153.491				40.17°C	115.08V
3	14.177A	3.488A	3.462A	1.400A	209.907	91.198%	1567	33.2	38.24°C	0.994
	12.260V	5.024V	3.348V	4.988V	230.167				47.19°C	115.09V
4	19.474A	3.987A	3.944A	1.606A	279.740	91.656%	1595	33.6	38.84°C	0.996
	12.251V	5.015V	3.343V	4.972V	305.208				48.04°C	115.10V
5	24.460A	4.997A	4.938A	1.815A	349.731	91.563%	1645	34.4	39.63°C	0.997
	12.235V	4.999V	3.339V	4.956V	381.958				49.36°C	115.09V
6	29.448A	6.017A	5.931A	2.019A	419.640	91.220%	1720	35.9	40.36°C	0.998
	12.221V	4.985V	3.336V	4.941V	460.030				51.17°C	115.10V
7	34.441A	7.040A	6.928A	2.230A	489.623	90.723%	1800	37.4	41.45°C	0.998
	12.211V	4.970V	3.333V	4.925V	539.688				53.71°C	115.10V
8	39.468A	8.075A	7.928A	2.443A	559.642	90.129%	1845	38.8	42.56°C	0.999
	12.193V	4.956V	3.330V	4.907V	620.935				57.02°C	115.10V
9	44.912A	8.595A	8.449A	2.445A	629.697	89.500%	1875	39.2	43.96°C	0.999
	12.182V	4.946V	3.324V	4.901V	703.572				61.12°C	115.10V
10	50.106A	9.119A	8.949A	3.079A	699.523	88.691%	1940	39.8	45.54°C	0.999
	12.171V	4.935V	3.318V	4.868V	788.718				65.28°C	115.10V
11	55.836A	9.135A	8.972A	3.086A	769.383	83.949%	1960	39.9	47.35°C	0.999
	12.173V	4.927V	3.310V	4.856V	916.489				71.90°C	115.09V
CL1	0.100A	14.023A	14.005A	0.007A	118.210	83.685%	0	0	55.27°C	0.988
	12.284V	4.954V	3.390V	5.051V	141.256				44.02°C	115.09V
CL2	58.243A	1.002A	1.003A	1.002A	722.646	89.226%	1907	39.5	40.58°C	0.999
	12.179V	5.002V	3.305V	4.969V	809.907				62.07°C	115.09V

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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	1.190A	0.491A	0.475A	0.195A	19.704	73.167%	0	<6.0	0.856
	12.299V	5.065V	3.360V	5.059V	26.930				115.06V
2	2.400A	0.979A	0.981A	0.396A	39.765	83.608%	0	<6.0	0.944
	12.298V	5.060V	3.360V	5.049V	47.561				115.07V
3	3.613A	1.476A	1.486A	0.595A	59.873	87.079%	0	<6.0	0.961
	12.295V	5.056V	3.359V	5.039V	68.757				115.07V
4	4.816A	1.978A	1.964A	0.797A	79.803	89.237%	0	<6.0	0.979
	12.294V	5.050V	3.359V	5.029V	89.428				115.08V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.8 mV	10.0 mV	12.2 mV	7.2 mV	Pass
20% Load	14.9 mV	12.2 mV	14.0 mV	7.7 mV	Pass
30% Load	15.9 mV	14.1 mV	14.5 mV	6.6 mV	Pass
40% Load	19.6 mV	16.6 mV	16.3 mV	7.3 mV	Pass
50% Load	24.7 mV	17.9 mV	19.3 mV	8.1 mV	Pass
60% Load	28.7 mV	20.4 mV	21.3 mV	9.0 mV	Pass
70% Load	34.2 mV	22.4 mV	24.7 mV	10.4 mV	Pass
80% Load	38.3 mV	24.0 mV	25.4 mV	12.1 mV	Pass
90% Load	54.7 mV	26.2 mV	29.0 mV	12.7 mV	Pass
100% Load	83.1 mV	27.2 mV	31.5 mV	15.3 mV	Pass
110% Load	513.1 mV	76.7 mV	77.1 mV	58.5 mV	Fail
Crossload 1	17.5 mV	22.0 mV	27.5 mV	10.2 mV	Pass
Crossload 2	142.0 mV	27.7 mV	27.3 mV	21.8 mV	Fail

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	7.0
AC Loss to PWR_OK Hold Up Time (ms)	9.3
PWR_OK Inactive to DC Loss Delay (ms)	-2.3

Top side

Power specifications table

CERTIFICATIONS

CYBENETICS PLATINUM

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