

Anex

SilverStone ST45SF

Lab ID#: 121

Receipt Date: -

Test Date: -

Report:

Report Date: Aug 6, 2018

DUT INFORMATION

Brand	SilverStone
Manufacturer (OEM)	Sirfa
Series	SFX
Model Number	ST45SF
Serial Number	163491450BR31F03001651
DUT Notes	V3.0

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	6.3
Rated Frequency (Hz)	50-60
Rated Power (W)	450
Type	SFX
Cooling	92mm Duro Bearing Fan (RL4L S0921512H)
Semi-Passive Operation	X
Cable Design	Fixed cables

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	37.5	3	0.3
	Watts	110		450	15	3.6
Total Max. Power (W)		450				

CABLES AND CONNECTORS

Captive Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (305mm)	1	1	18-20AWG
4+4 pin EPS12V (405mm)	1	1	18-20AWG
6+2 pin PCIe (410mm+150mm)	1	2	18-20AWG
SATA (310mm+205mm+100mm)	1	3	20AWG
4 pin Molex (300mm+200mm) / FDD (+200mm)	2	1 / 1	20-22AWG

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General Data	
Manufacturer (OEM)	Sirfa
Platform Model	-
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	GBU1506F (600V, 15A @ 100°C)
APFC MOSFETS	2x SPTA22N50A (550V, 22A @ 25°C, 0.150hm)
APFC Boost Diode	1x BYC10-600 (600V, 10A @ 150°C)
Hold-up Cap(s)	1x Chemi-Con (400V, 330uF, 2000h @ 105°C, KMR)
Main Switchers	2x Infineon IPP50R250CP (550V, 9A @ 100°C, 0.250hm)
Combo APFC/PWM Controller	Champion CM6806
Topology	Primary side: Double Forward Secondary side: Passive Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	2x PFR30V45CT (45V, 15A x 2)
5V & 3.3V	DC-DC Converters: 4x Infineon BSC0906NS (30V, 40A @ 100°C, 4.5mOhm) PWM Controller: APW7159C
Filtering Capacitors	Electrolytics: 2x Nippon Chemi-Con (5-6,000 @ 105°C, KZH), 8x Teapo (3,000h @ 105°C, SC) Polymers: Teapo
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Globe Fan S0921512HÅ (92mm, 12V, 0.30A, 3000RPM, 29.5 dBA, Duro Bearing)
5VSB Circuit	
Rectifiers	Diodes
Standby PWM Controller	Sanken STR-A6069H
-12V Circuit	
Rectifiers	KIA7912PI

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RESULTS		
Temperature Range (°C /°F)	30-32 / 86-89.6	
Average Efficiency	84.903	
Efficiency With 10W ($\leq 500W$) or 2% ($> 500W$) Load -115V	0.000	
Average Efficiency 5VSB	77.428	
Standby Power Consumption (W) -115V	0.0823419	
Standby Power Consumption (W) -230V	0.1914190	
Average PF	0.988	
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓ ErP Lot 6 2013: ✓ ErP Lot 3 2014: Partially	
(EU) No 617/2013 Compliance	✓	
Avg Noise Output	32.45	
Efficiency Rating (ETA)	SILVER	
Noise Rating (LAMBDA)	Standard++	

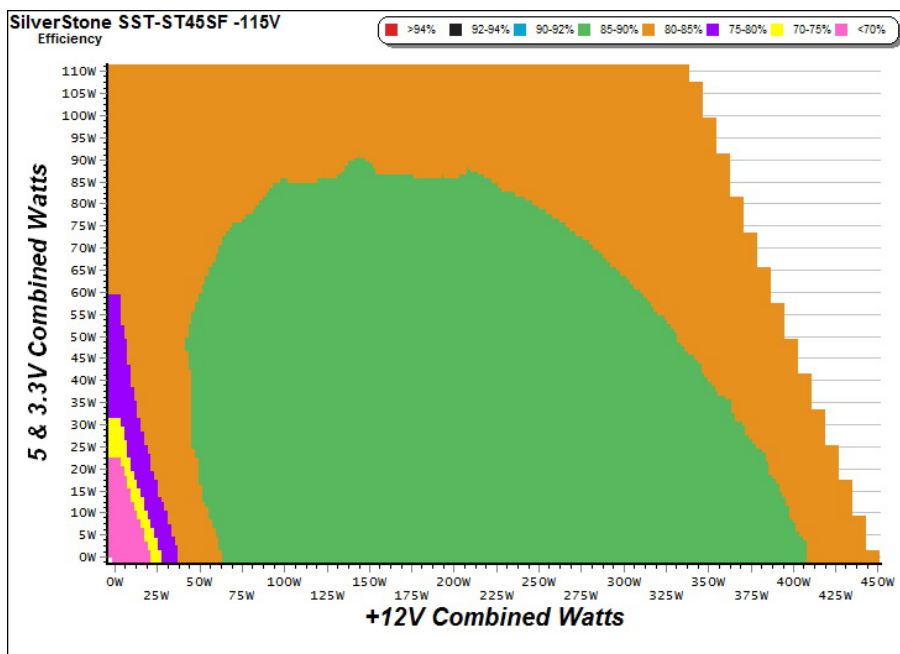
TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley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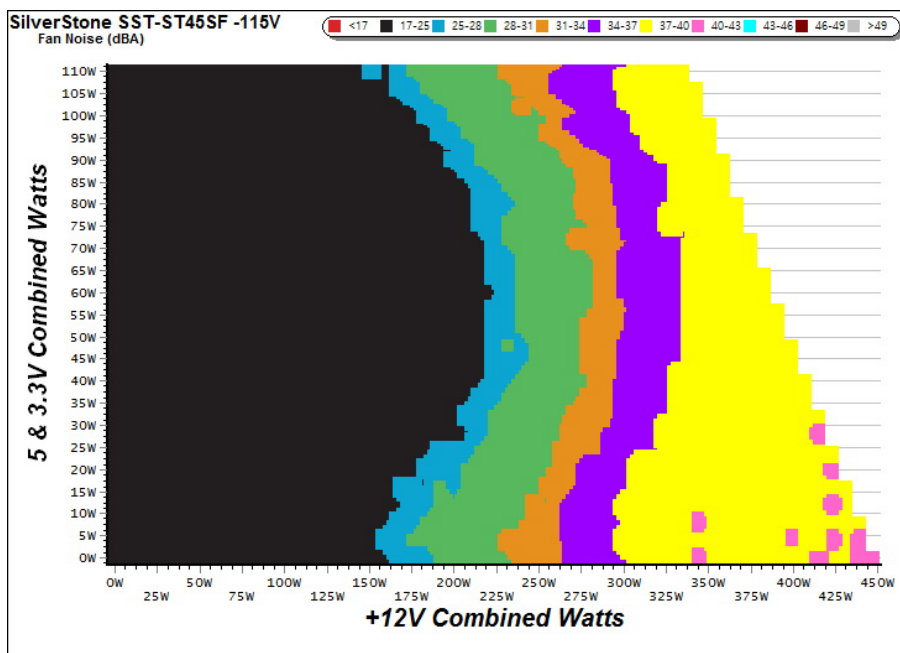
EFFICIENCY GRAPH



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)

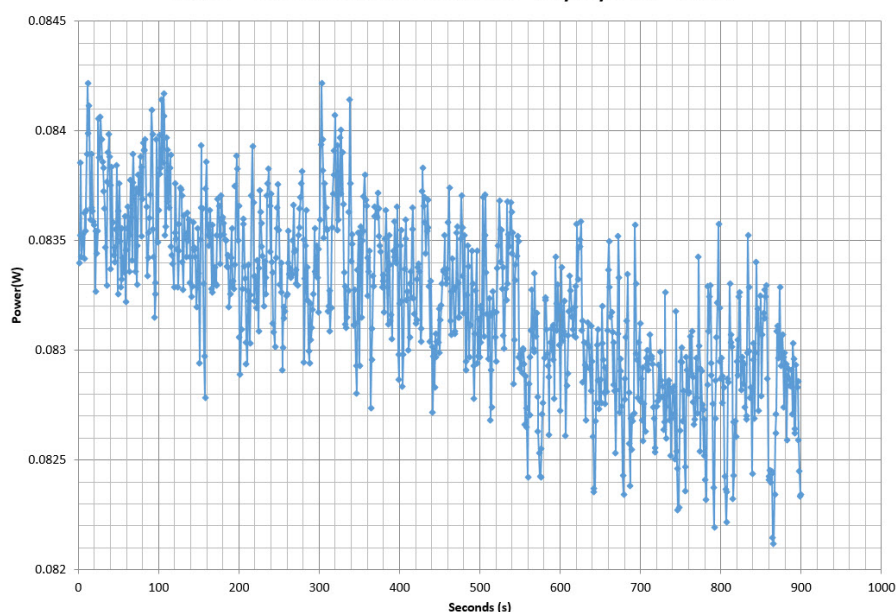
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.216	67.500%	0.054
	5.179V	0.320		115.18V
2	0.087A	0.450	72.698%	0.100
	5.179V	0.619		115.18V
3	0.542A	2.800	78.103%	0.307
	5.167V	3.585		115.17V
4	1.002A	5.165	78.364%	0.359
	5.155V	6.591		115.17V
5	1.501A	7.722	78.571%	0.386
	5.143V	9.828		115.17V
6	3.002A	15.311	76.246%	0.427
	5.101V	20.081		115.17V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.215	55.412%	0.020
	5.179V	0.388		230.42V
2	0.087A	0.450	64.470%	0.035
	5.179V	0.698		230.42V
3	0.542A	2.801	73.964%	0.163
	5.167V	3.787		230.42V
4	1.002A	5.165	75.967%	0.236
	5.155V	6.799		230.42V
5	1.501A	7.722	77.328%	0.282
	5.143V	9.986		230.42V
6	3.001A	15.313	76.788%	0.346
	5.103V	19.942		230.42V

VAMPIRE POWER -115V

Power - 163491450BR31F03001651 - 07/06/2017 - 12:08



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

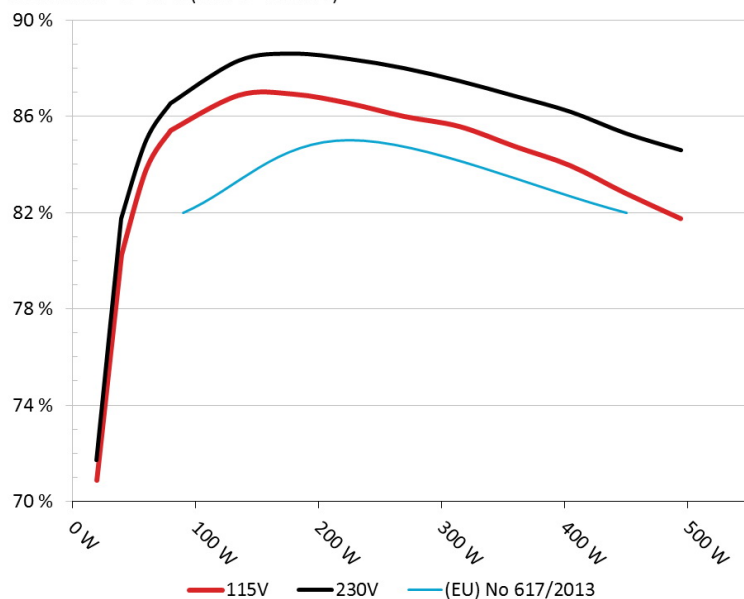
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: SilverStone SST-ST45SF

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



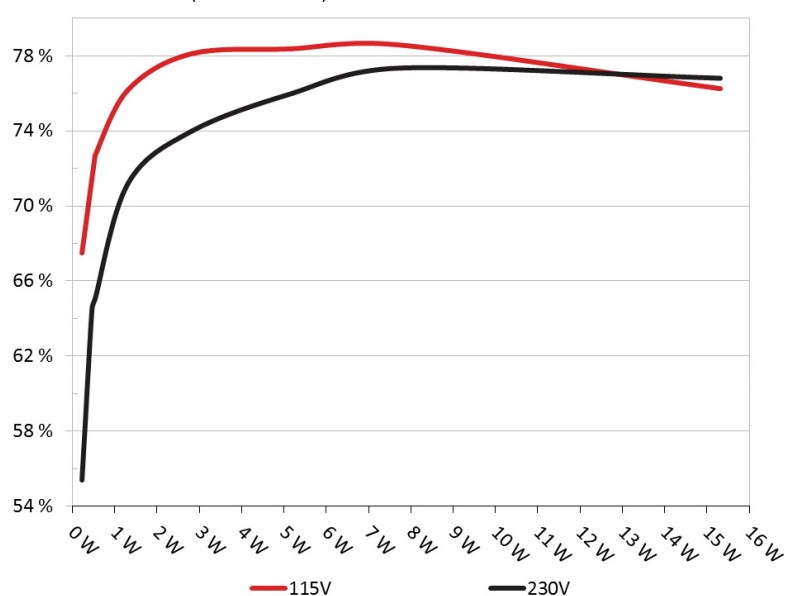
INFO

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: SilverStone SST-ST45SF

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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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	1.911A	1.966A	1.956A	0.971A	44.777	80.270%	1050	17.5	38.14°C	0.964
	12.148V	5.076V	3.368V	5.144V	55.783				41.06°C	115.19V
2	4.853A	2.959A	2.945A	1.166A	89.742	85.431%	1050	17.5	38.42°C	0.981
	12.133V	5.065V	3.359V	5.130V	105.046				41.55°C	115.19V
3	8.153A	3.464A	3.459A	1.365A	134.904	86.886%	1050	17.5	38.94°C	0.985
	12.119V	5.058V	3.351V	5.117V	155.265				42.09°C	115.20V
4	11.450A	3.963A	3.944A	1.565A	179.761	86.936%	1250	19.0	39.65°C	0.988
	12.103V	5.049V	3.344V	5.102V	206.775				43.06°C	115.20V
5	14.418A	4.969A	4.946A	1.766A	224.784	86.555%	1640	24.5	40.61°C	0.990
	12.088V	5.036V	3.334V	5.088V	259.702				44.17°C	115.20V
6	17.393A	5.973A	5.954A	1.970A	269.756	86.010%	2050	29.8	41.51°C	0.991
	12.072V	5.024V	3.323V	5.073V	313.633				45.17°C	115.20V
7	20.374A	6.987A	6.968A	2.170A	314.751	85.591%	2350	35.0	42.17°C	0.995
	12.057V	5.013V	3.315V	5.059V	367.737				46.56°C	115.20V
8	23.365A	7.999A	7.985A	2.375A	359.696	84.762%	2675	37.5	43.04°C	0.995
	12.040V	5.002V	3.305V	5.044V	424.360				47.64°C	115.19V
9	26.797A	8.516A	8.523A	2.380A	404.724	83.969%	2750	40.5	43.86°C	0.993
	12.022V	4.990V	3.296V	5.035V	481.992				48.58°C	115.18V
10	29.978A	9.046A	9.030A	2.995A	449.577	82.823%	2765	41.1	44.96°C	0.991
	12.004V	4.979V	3.288V	5.005V	542.814				49.82°C	115.18V
11	33.771A	9.061A	9.050A	3.000A	494.522	81.766%	2785	41.5	45.63°C	0.987
	11.986V	4.972V	3.282V	4.996V	604.800				50.69°C	115.19V
CL1	0.098A	13.019A	13.003A	0.004A	109.720	79.906%	1680	25.3	42.86°C	0.983
	12.112V	5.012V	3.327V	5.131V	137.311				47.03°C	115.20V
CL2	37.472A	1.004A	1.002A	1.002A	463.530	83.791%	2750	40.5	44.22°C	0.991
	12.011V	5.022V	3.316V	5.079V	553.198				48.14°C	115.18V

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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	1.200A	0.493A	0.472A	0.191A	19.680	70.896%	1050	17.5	0.920
	12.159V	5.089V	3.375V	5.170V	27.759				115.19V
2	2.427A	0.981A	0.975A	0.386A	39.757	80.149%	1050	17.5	0.959
	12.152V	5.082V	3.371V	5.162V	49.604				115.19V
3	3.659A	1.467A	1.482A	0.581A	59.877	83.819%	1050	17.5	0.974
	12.145V	5.078V	3.367V	5.153V	71.436				115.19V
4	4.876A	1.974A	1.959A	0.775A	79.770	85.319%	1050	17.5	0.979
	12.138V	5.071V	3.363V	5.144V	93.496				115.19V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.3 mV	10.8 mV	17.0 mV	7.7 mV	Pass
20% Load	21.4 mV	13.8 mV	18.7 mV	10.0 mV	Pass
30% Load	17.5 mV	16.0 mV	21.3 mV	11.5 mV	Pass
40% Load	20.2 mV	17.4 mV	25.0 mV	13.4 mV	Pass
50% Load	24.9 mV	19.8 mV	26.0 mV	14.2 mV	Pass
60% Load	26.8 mV	21.1 mV	24.9 mV	17.3 mV	Pass
70% Load	29.6 mV	23.6 mV	28.6 mV	19.7 mV	Pass
80% Load	35.6 mV	25.6 mV	36.7 mV	23.9 mV	Pass
90% Load	41.3 mV	28.1 mV	41.4 mV	25.1 mV	Pass
100% Load	50.2 mV	32.7 mV	40.8 mV	29.7 mV	Pass
110% Load	60.3 mV	32.7 mV	42.5 mV	31.1 mV	Pass
Crossload 1	23.7 mV	33.2 mV	37.5 mV	29.3 mV	Pass
Crossload 2	51.8 mV	18.8 mV	32.6 mV	11.9 mV	Pass

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

Hold-Up Time (ms)	16.78
AC Loss to PWR_OK Hold Up Time (ms)	16.34
PWR_OK Inactive to DC Loss Delay (ms)	0.44



Top side



Power specifications label

CERTIFICATIONS



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