Anex

SilverStone ST1100-TI

Lab ID#: 209
Receipt Date: -
Test Date: -

Report: 19PS209A
Report Date: Mar 11, 2018

DUT INFORMATION

Brand	SilverStone
Manufacturer (OEM)	Enhance Electronics
Series	Strider Titanium Series
Model Number	ST1100-TI
Serial Number	DB17250307STK10TI0
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6
Rated Frequency (Hz)	50-60
Rated Power (W)	1100
Type	ATX12V
Cooling	140mm Double Ball-Bearing Fan (D14BH-12)
Semi-Passive Operation	✓
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	22	92	3	0.3
	Watts	120		1100	15	3.6
Total Max. Power (W)		1100				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (550mm)	1	1	16-22AWG	No
4+4 pin EPS12V (750mm)	1	1	16AWG	No
4+4 pin EPS12V (550mm)	1	1	16AWG	No
6+2 pin PCIe (550mm)	8	8	16AWG	No
SATA (600mm+140mm+140mm140mm)	4	16	18AWG	No
4 pin Molex (600mm+150mm+150mm)	2	6	18AWG	No
FDD Adapter (+120mm)	1	1	22AWG	No

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General Data	
Manufacturer (OEM)	Enhance Electronics
Primary Side	
Transient Filter	6x Y caps, 4x X caps, 2x CM chokes, 1x MOV, 1x CM02X
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x
APFC MOSFETS	2x Infineon IPP60R190C6 (650V, 12.8A @ 100°C, 0.19Ohm)
APFC Boost Diode	2x CREE C3D08060A (600V, 8A @ 152°C)
Hold-up Cap(s)	2x Nippon Chemi-Con (420V, 470uF, 2000h @ 105°C, KMQ)
Main Switchers	4x Infineon IPP60R190C6 (650V, 12.8A @ 100°C, 0.19Ohm)
Driver ICs	2x Silicon Labs Si8230BD
APFC Controller	Champion CM6502S & CM03X Green PFC controller
LLC Resonant Controller	Champion CM6901T6X
Topology	Primary side: Full-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	2x DC-DC Converters
Filtering Capacitors	Electrolytics: 5x Rubycon (6-10,000h @ 105°C, ZLH), 8x Suncon (105°C), 1x Nippon Chemi-Con (4000-1000h @105°C, Polymers: Unicon (UPH, 2,000h @ 125°C)
Supervisor IC	SITI PS223 (OVP, UVP, OCP, SCP, OTP)
Fan Model	Yate Loon D14BH (140mm, 12V, 0.7A, 2800 RPM, 140 CFM, 48.5 dBA, Double Ball Bearing)
5VSB Circuit	
Rectifier	1x PFR10V45CT SBR (45V, 10A)
Standby PWM Controller	Sanken STR-A6062H

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	91.719
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	78.929
Standby Power Consumption (W) -115V	0.1099970
Standby Power Consumption (W) -230V	0.1503930
Average PF	0.983
ErP Lot 3/6 Ready	ErP Lot 3/6 2010: ✓ ErP Lot 3/6 2013: ✓ ErP Lot 3/6 2014, CEC: Partially
(EU) No 617/2013 Compliance	✓
Avg Noise Output	41.37
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 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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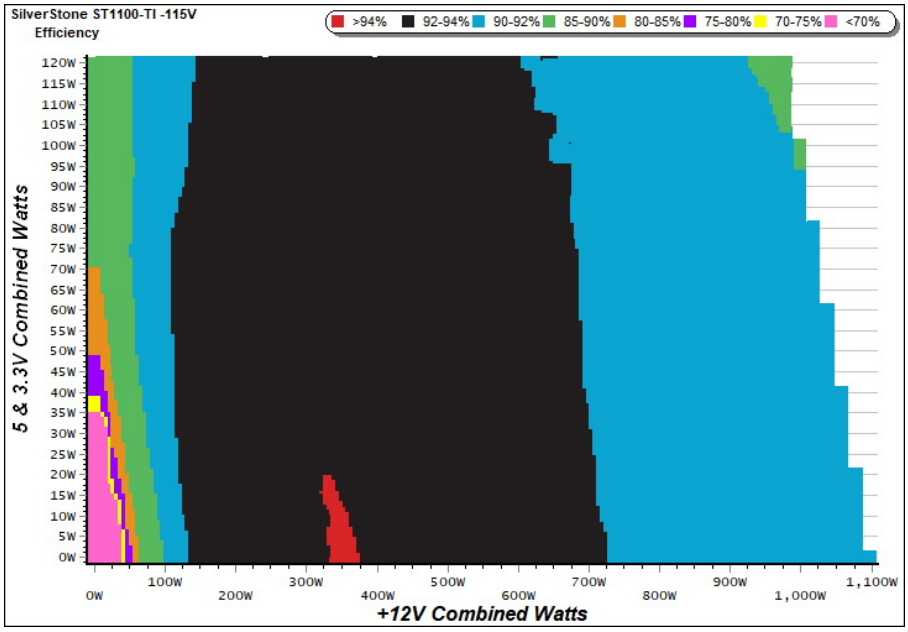
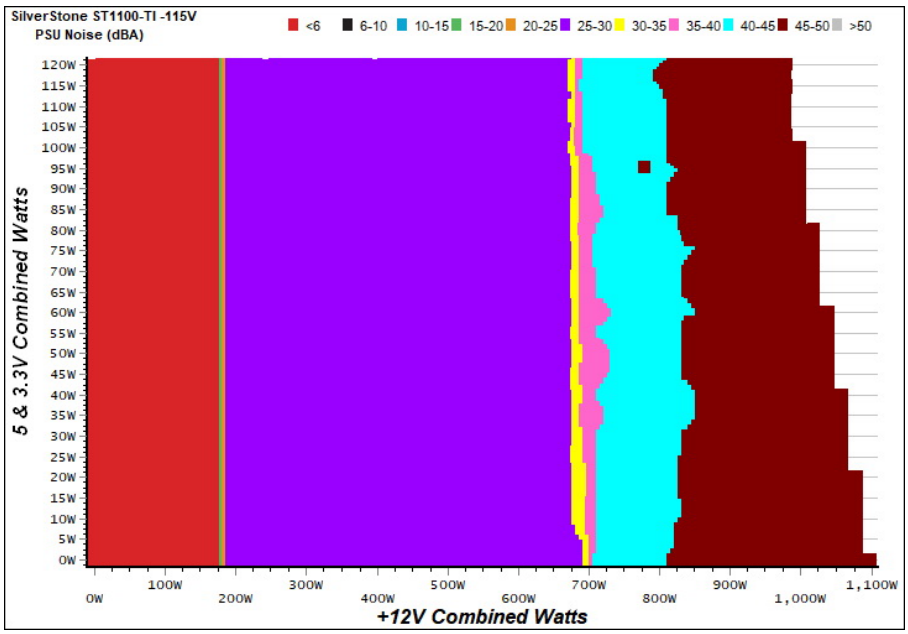
EFFICIENCY GRAPH



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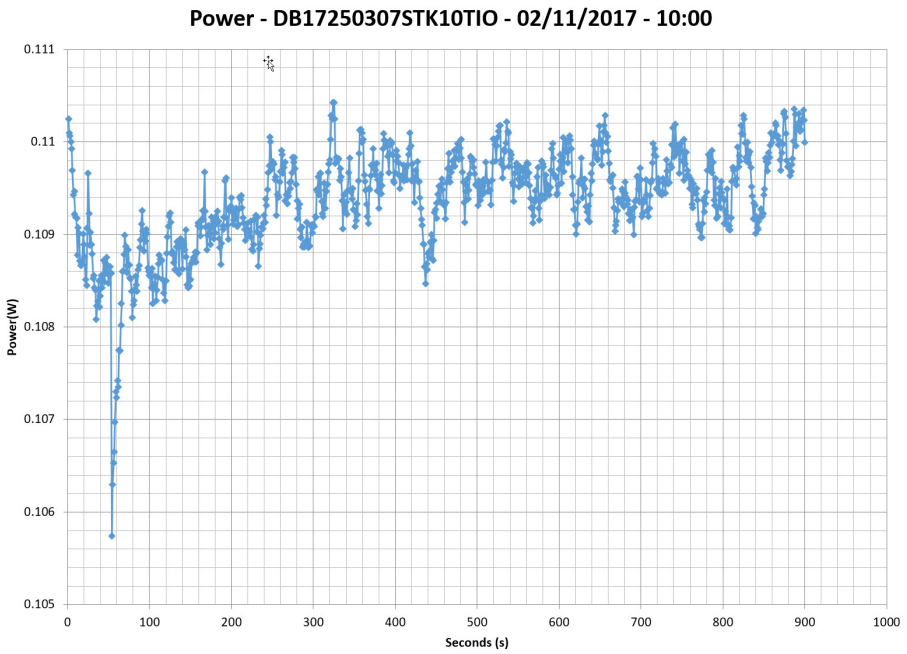
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.210	56.150%	0.019
	4.973V	0.374		115.03V
2	0.088A	0.436	66.769%	0.033
	4.971V	0.653		115.03V
3	0.543A	2.686	76.765%	0.165
	4.951V	3.499		115.02V
4	1.002A	4.945	80.302%	0.263
	4.933V	6.158		115.02V
5	1.502A	7.378	81.841%	0.341
	4.912V	9.015		115.02V
6	3.002A	14.547	79.137%	0.475
	4.846V	18.382		115.01V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.209	49.061%	0.007
	4.973V	0.426		230.19V
2	0.088A	0.436	61.064%	0.011
	4.971V	0.714		230.20V
3	0.542A	2.686	74.076%	0.054
	4.952V	3.626		230.16V
4	0.966A	4.764	73.213%	0.096
	4.931V	6.507		230.17V
5	1.502A	7.374	79.667%	0.133
	4.909V	9.256		230.18V
6	3.001A	14.551	79.254%	0.237
	4.848V	18.360		230.18V

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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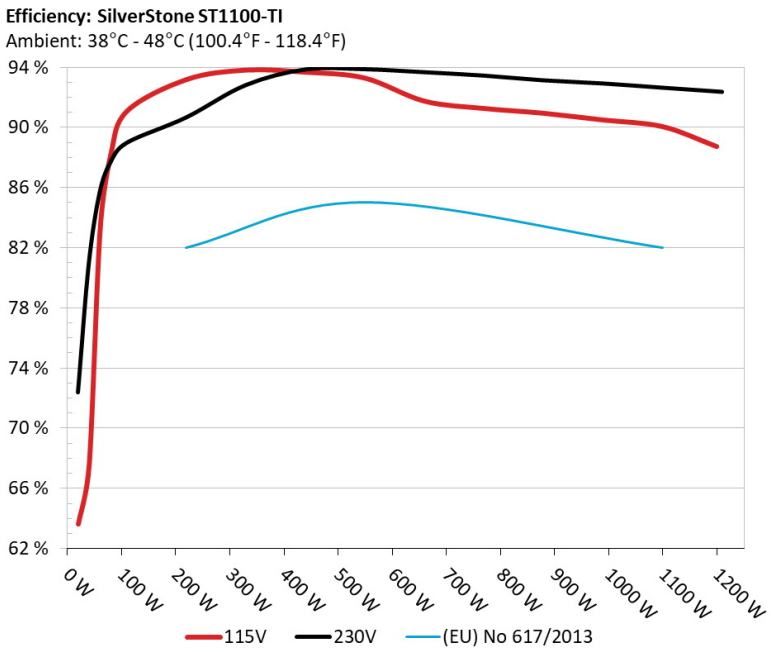
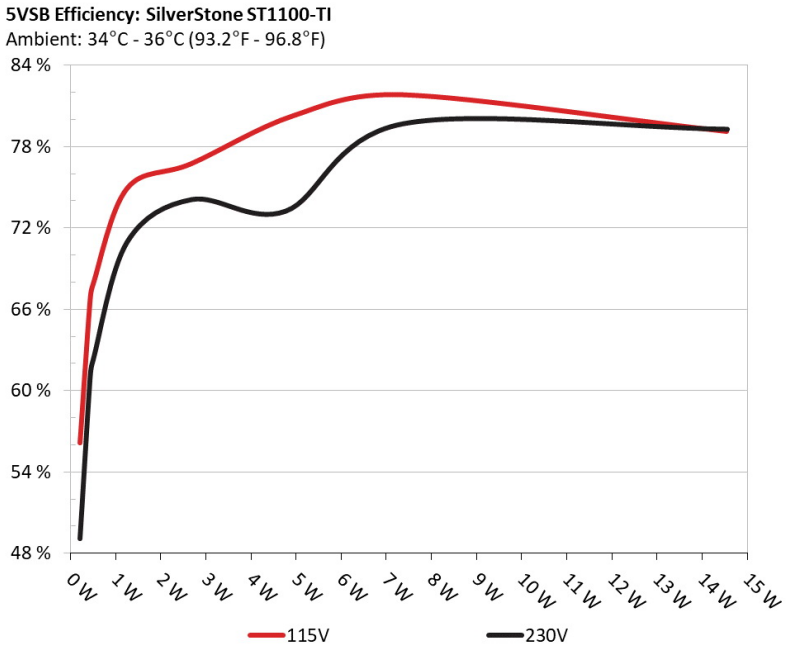
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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	7.258A	1.975A	1.980A	0.996A	109.808	91.080%	0	<6.0	41.94°C	0.946
	12.156V	5.058V	3.328V	5.021V	120.562				38.41°C	115.05V
2	15.551A	2.971A	2.985A	1.196A	219.649	93.170%	980	27.9	38.45°C	0.975
	12.139V	5.047V	3.316V	5.002V	235.750				42.15°C	115.07V
3	24.225A	3.476A	3.505A	1.401A	329.790	93.798%	980	27.9	38.58°C	0.983
	12.124V	5.036V	3.308V	4.987V	351.595				42.45°C	115.07V
4	32.900A	3.975A	4.001A	1.606A	439.553	93.660%	980	27.9	39.16°C	0.988
	12.109V	5.028V	3.298V	4.972V	469.308				43.42°C	115.08V
5	41.264A	4.983A	5.017A	1.815A	549.537	93.264%	1074	30.5	39.54°C	0.990
	12.094V	5.018V	3.287V	4.956V	589.226				44.29°C	115.08V
6	49.653A	5.993A	6.040A	2.020A	659.481	91.735%	2040	45.8	40.36°C	0.992
	12.078V	5.007V	3.276V	4.940V	718.894				45.52°C	115.09V
7	58.048A	7.012A	7.073A	2.231A	769.387	91.252%	2240	48.7	41.40°C	0.992
	12.064V	4.994V	3.265V	4.924V	843.146				47.16°C	115.08V
8	66.429A	8.030A	8.112A	2.445A	879.271	90.933%	2275	49.0	42.37°C	0.992
	12.056V	4.983V	3.254V	4.905V	966.943				48.60°C	115.09V
9	75.199A	8.546A	8.656A	2.446A	989.321	90.486%	2283	49.1	44.00°C	0.991
	12.058V	4.974V	3.244V	4.899V	1093.344				50.73°C	115.08V
10	83.659A	9.065A	9.177A	3.094A	1099.202	90.046%	2283	49.1	45.58°C	0.993
	12.067V	4.967V	3.235V	4.840V	1220.714				52.61°C	115.13V
11	95.192A	9.076A	9.199A	3.091A	1199.326	88.725%	2250	48.8	47.77°C	0.993
	11.657V	4.958V	3.227V	4.849V	1351.729				54.99°C	115.16V
CL1	0.099A	14.027A	14.004A	0.004A	117.222	84.099%	2275	49.0	44.47°C	0.957
	12.157V	5.002V	3.273V	5.060V	139.386				48.69°C	115.10V
CL2	91.596A	1.004A	1.002A	1.002A	1120.768	90.348%	2283	49.1	47.07°C	0.993
	12.091V	5.005V	3.276V	4.963V	1240.499				52.14°C	115.17V

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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	1.202A	0.491A	0.476A	0.196A	19.683	63.650%	0	<6.0	0.821
	12.157V	5.069V	3.340V	5.061V	30.924				115.08V
2	2.428A	0.980A	0.986A	0.396A	39.769	67.593%	0	<6.0	0.898
	12.156V	5.066V	3.336V	5.052V	58.836				115.06V
3	3.651A	1.476A	1.499A	0.594A	59.875	83.162%	0	<6.0	0.926
	12.164V	5.063V	3.333V	5.042V	71.998				115.06V
4	4.868A	1.975A	1.979A	0.793A	79.768	88.205%	0	<6.0	0.933
	12.160V	5.060V	3.330V	5.032V	90.435				115.07V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.3 mV	7.1 mV	6.7 mV	4.2 mV	Pass
20% Load	17.5 mV	10.0 mV	7.8 mV	6.0 mV	Pass
30% Load	19.9 mV	10.5 mV	8.7 mV	5.9 mV	Pass
40% Load	21.3 mV	10.9 mV	9.9 mV	6.3 mV	Pass
50% Load	23.5 mV	11.0 mV	10.9 mV	6.1 mV	Pass
60% Load	21.8 mV	10.6 mV	11.2 mV	5.9 mV	Pass
70% Load	23.9 mV	11.2 mV	12.1 mV	5.9 mV	Pass
80% Load	25.0 mV	12.1 mV	15.7 mV	6.2 mV	Pass
90% Load	25.6 mV	12.7 mV	17.7 mV	6.6 mV	Pass
100% Load	25.4 mV	13.6 mV	15.9 mV	7.1 mV	Pass
110% Load	548.8 mV	20.1 mV	21.6 mV	16.8 mV	Fail
Crossload 1	20.6 mV	11.2 mV	10.3 mV	4.9 mV	Pass
Crossload 2	24.1 mV	11.9 mV	13.3 mV	6.4 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	11.44
AC Loss to PWR_OK Hold Up Time (ms)	14.50
PWR_OK Inactive to DC Loss Delay (ms)	-3.06

Top side

Power specifications label

CERTIFICATIONS

CYBENETICS PLATINUM

CYBENETICS STANDARD