EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

SilverStone ST80F-TI

Lab ID#: 143
Receipt Date: -
Test Date: -

Report:
Report Date: Jul 19, 2018

DUT INFORMATION

Brand	SilverStone
Manufacturer (OEM)	Enhance Electronics
Series	Strider Titanium
Model Number	ST80F-TI
Serial Number	155200454
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5.5
Rated Frequency (Hz)	50-60
Rated Power (W)	800
Type	ATX12V
Cooling	120mm Fluid Dymanic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✓
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	66	2.5	0.3
	Watts	120		792	12.5	3.6
Total Max. Power (W)		800				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (550mm)	1	1	16-22AWG
4+4 pin EPS12V (550mm)	1	1	16AWG
4+4 pin EPS12V (550mm)	1	1	16AWG
6+2 pin PCIe (560mm)	6	4	16AWG
SATA (600mm+145mm+145mm+145mm)	3	12	18AWG
4 pin Molex (610mm+150mm+150mm)	1	3	18AWG
FDD Adapter (+105mm)	1	1	24AWG

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Primary Side	
Transient Filter	4x Y caps, 4x X caps, 2x CM chokes, 1x MOV, CM02X
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	2x Vishay BU1506 (600V, 15A @ 150°C)
APFC MOSFETS	2x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14 Ohm)
APFC Boost Diode	1x CREE C3D10060A (600V, 8A @ 153°C)
Hold-up Cap(s)	1x Panasonic (450V, 560uF, 2000h @ 105°C, HD)
Main Switchers	2x Infineon IPP50R140CP (550V, 15A @ 100Â°C, 0.14 Ohm) Driver IC: 1x Silicon Labs Si8230BD
APFC Controller	Champion CM6502S & CM03X Green PFC controller
Switching Controller	Champion CM6901
Topology	Primary side: Half-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4 mOhm)
5V & 3.3V	DC-DC Converters: 2x BSC050NE2LS FETs (25V, 37A @ 100°C, 5.0mÎ©) 2x BSC018NE2LS FETs (25V, 97A @ 100°C, 1.8mÎ©) PWM Controller: 2x APW7073
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, KY 4,000-10,000h, KZH 5,000-6,000h), Rubycon (105°C, ZLH 6,000-10,000h, YXG 3,000-6,000h), Suncon (105°C) Polymers: Unicon (TW)
Supervisor IC	SITI PS223 (OVP, UVP, OCP, SCP, OTP)
Fan Model	Hong Hua HA1225H12F-ZÂ (120mm, 12V, 0.58A, 2200RPM, Fluid Dynamic Bearing)
5VSB Circuit	
Rectifier	1x PFR10V45CT & 1x SG30N04D
Standby PWM Controller	SankenÂ STR-A6069H

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	91.136
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	80.240
Standby Power Consumption (W) -115V	0.0587303
Standby Power Consumption (W) -230V	0.0927473
Average PF	0.980
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	22.77
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A

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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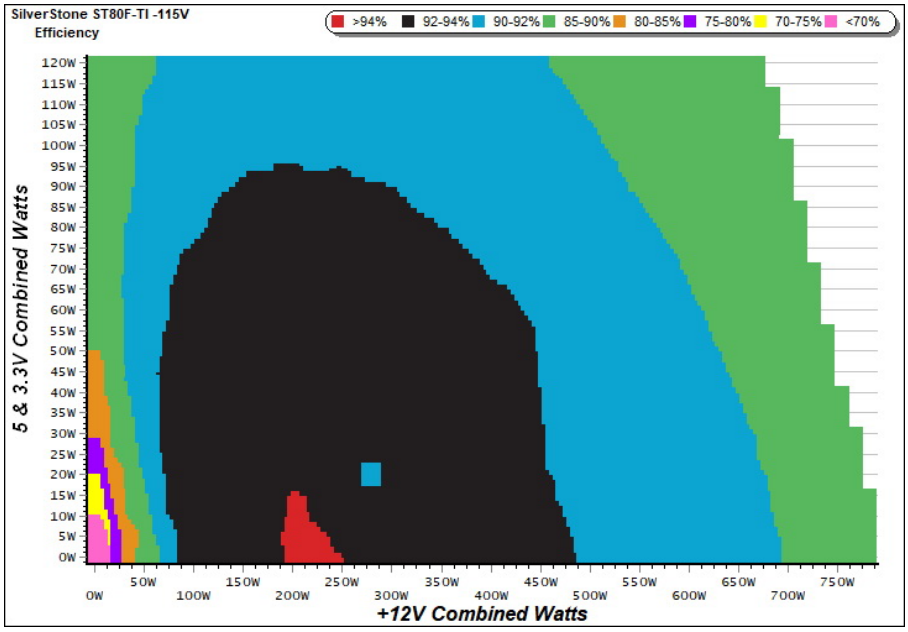
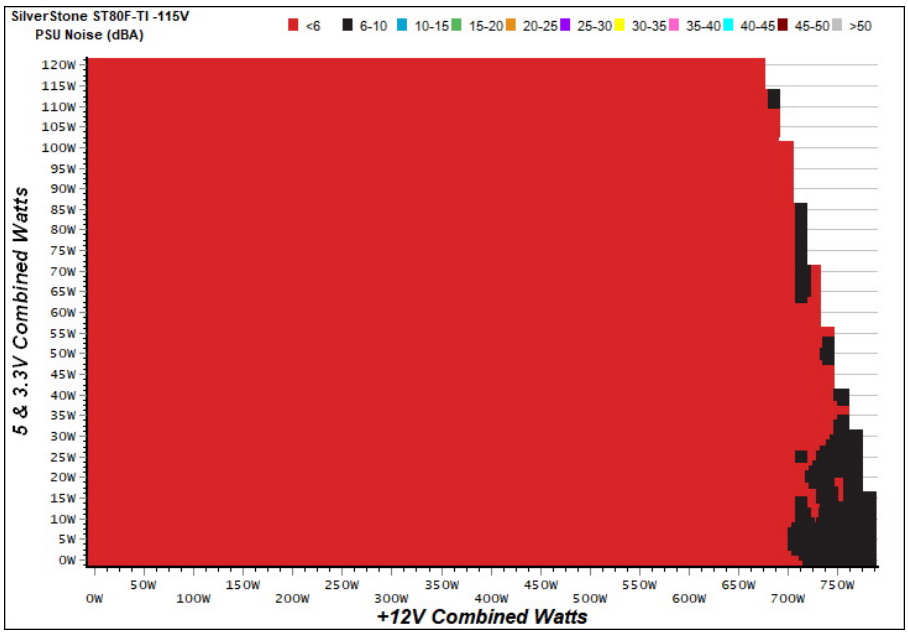
EFFICIENCY GRAPH



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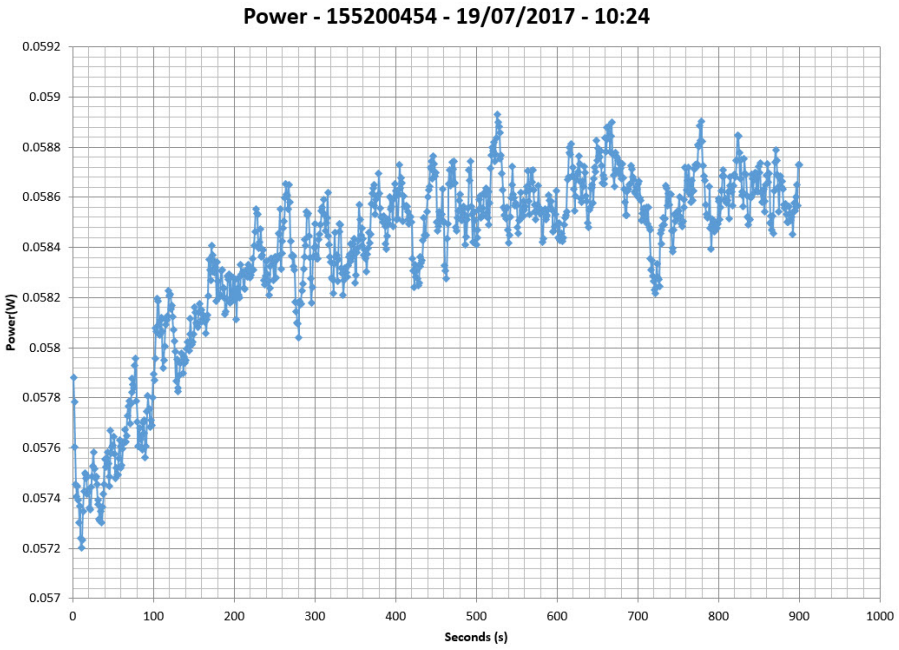
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.205	63.077%	0.022
	4.937V	0.325		115.16V
2	0.087A	0.430	70.492%	0.041
	4.935V	0.610		115.16V
3	0.542A	2.665	80.905%	0.188
	4.919V	3.294		115.15V
4	1.002A	4.913	82.364%	0.274
	4.904V	5.965		115.16V
5	1.502A	7.338	82.561%	0.329
	4.887V	8.888		115.16V
6	2.501A	12.139	81.018%	0.385
	4.853V	14.983		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.205	53.665%	0.008
	4.937V	0.382		230.38V
2	0.087A	0.429	62.445%	0.014
	4.935V	0.687		230.39V
3	0.542A	2.666	72.054%	0.072
	4.919V	3.700		230.39V
4	1.002A	4.912	77.476%	0.119
	4.904V	6.340		230.39V
5	1.501A	7.337	81.036%	0.160
	4.887V	9.054		230.39V
6	2.501A	12.136	80.858%	0.231
	4.852V	15.009		230.39V

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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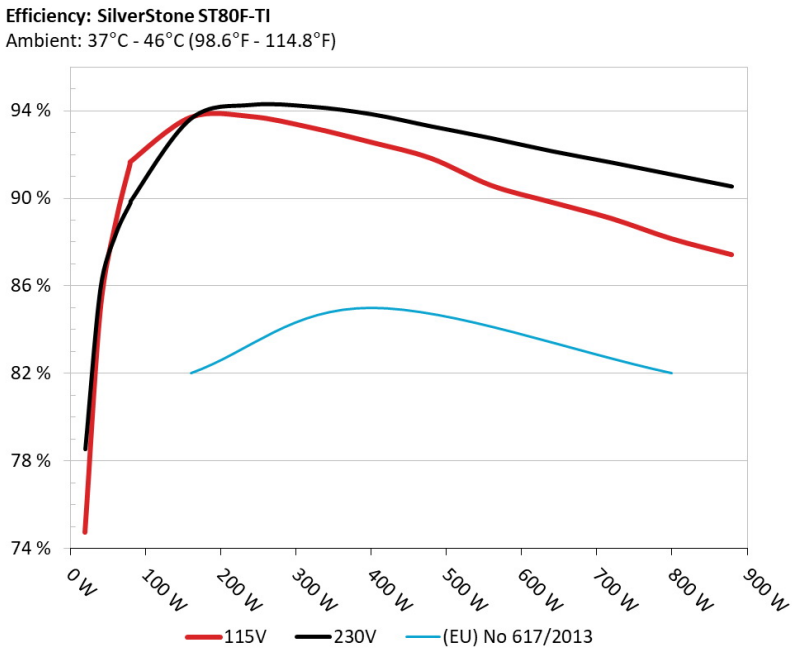
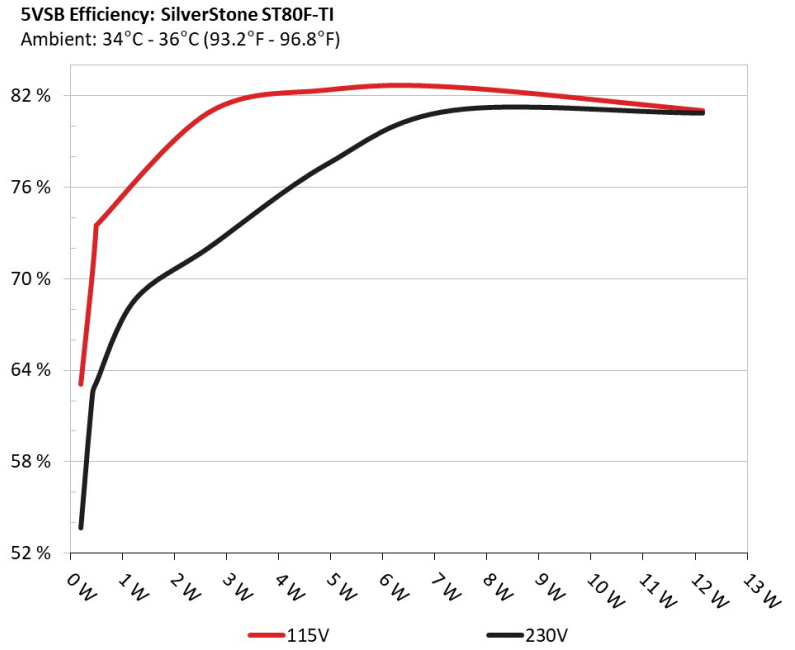
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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



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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	4.912A	2.006A	1.962A	1.006A	79.771	91.586%	765	19.8	38.16°C	0.937
	11.845V	4.993V	3.355V	4.960V	87.100				39.92°C	115.17V
2	10.881A	3.004A	2.954A	1.210A	159.640	93.682%	765	19.8	38.47°C	0.964
	11.837V	4.984V	3.347V	4.945V	170.406				40.35°C	115.16V
3	17.225A	3.514A	3.471A	1.415A	239.827	93.727%	765	19.8	38.97°C	0.978
	11.830V	4.975V	3.340V	4.933V	255.879				41.30°C	115.16V
4	23.557A	4.027A	3.955A	1.625A	319.740	93.222%	910	22.1	39.59°C	0.981
	11.825V	4.968V	3.334V	4.915V	342.988				42.05°C	115.16V
5	29.548A	5.043A	4.959A	1.835A	399.649	92.553%	1200	27.0	40.15°C	0.984
	11.817V	4.958V	3.324V	4.901V	431.807				42.63°C	115.16V
6	35.550A	6.067A	5.968A	2.044A	479.650	91.819%	1500	33.5	40.74°C	0.986
	11.810V	4.949V	3.316V	4.887V	522.387				43.23°C	115.16V
7	41.556A	7.085A	6.982A	2.255A	559.566	90.580%	1920	39.2	41.50°C	0.988
	11.803V	4.939V	3.308V	4.874V	617.760				44.02°C	115.16V
8	47.574A	8.119A	8.001A	2.466A	639.576	89.815%	2100	43.3	42.35°C	0.990
	11.796V	4.930V	3.298V	4.858V	712.105				45.00°C	115.16V
9	54.033A	8.639A	8.536A	2.470A	719.595	89.069%	2180	44.3	43.78°C	0.991
	11.789V	4.923V	3.290V	4.853V	807.904				46.79°C	115.17V
10	60.438A	9.162A	9.049A	2.580A	799.415	88.145%	2250	44.1	45.25°C	0.991
	11.784V	4.914V	3.282V	4.842V	906.933				48.70°C	115.17V
11	67.255A	9.173A	9.069A	2.582A	879.326	87.418%	2250	44.1	46.40°C	0.992
	11.778V	4.908V	3.274V	4.835V	1005.890				50.43°C	115.17V
CL1	0.099A	14.026A	14.004A	0.004A	117.619	86.114%	2100	43.3	43.93°C	0.959
	11.840V	4.970V	3.336V	5.027V	136.585				45.65°C	115.18V
CL2	65.777A	1.003A	1.003A	1.002A	788.536	88.725%	2250	44.1	44.96°C	0.991
	11.788V	4.933V	3.294V	4.896V	888.737				48.13°C	115.17V

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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	1.233A	0.492A	0.475A	0.201A	19.662	74.735%	765	19.8	0.817
	11.841V	5.003V	3.362V	4.993V	26.309				115.17V
2	2.491A	0.999A	0.979A	0.400A	39.768	84.806%	765	19.8	0.886
	11.839V	4.999V	3.360V	4.985V	46.893				115.17V
3	3.748A	1.499A	1.484A	0.600A	59.856	88.785%	765	19.8	0.922
	11.846V	4.996V	3.358V	4.975V	67.417				115.17V
4	4.999A	2.006A	1.962A	0.805A	79.808	91.652%	765	19.8	0.937
	11.844V	4.993V	3.356V	4.968V	87.077				115.17V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	24.2 mV	6.9 mV	6.7 mV	6.8 mV	Pass
20% Load	28.6 mV	7.8 mV	7.8 mV	7.9 mV	Pass
30% Load	38.7 mV	18.4 mV	11.6 mV	18.2 mV	Pass
40% Load	46.2 mV	10.9 mV	15.8 mV	10.9 mV	Pass
50% Load	56.6 mV	12.9 mV	14.2 mV	14.3 mV	Pass
60% Load	66.0 mV	15.5 mV	17.4 mV	16.9 mV	Pass
70% Load	72.9 mV	21.9 mV	26.7 mV	21.7 mV	Pass
80% Load	84.1 mV	47.3 mV	32.0 mV	46.9 mV	Pass
90% Load	91.3 mV	41.2 mV	33.0 mV	41.6 mV	Pass
100% Load	99.8 mV	24.7 mV	35.0 mV	26.2 mV	Pass
110% Load	109.1 mV	26.5 mV	37.5 mV	27.8 mV	Pass
Crossload 1	26.7 mV	9.4 mV	8.4 mV	8.6 mV	Pass
Crossload 2	98.6 mV	23.3 mV	23.7 mV	24.5 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	11.0
AC Loss to PWR_OK Hold Up Time (ms)	15.8
PWR_OK Inactive to DC Loss Delay (ms)	-4.8

Top side

Power specifications label

CERTIFICATIONS

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