

Anex

Seasonic SSR-850TD

Lab ID#: 49
Receipt Date: -
Test Date: -

Report:

Report Date: Jan 24, 2018

DUT INFORMATION	
Brand	Seasonic
Manufacturer (OEM)	Seasonic
Series	Prime Titanium
Model Number	SSR-850TD
Serial Number	R1606TA106460008
DUT Notes	Retested on 4/28/17

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5.5
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525M12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70	3	0.3
	Watts	100		840	15	3.6
Total Max. Power (W)		850				

CABLES AND CONNECTORS				
Modular Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18-22AWG	No
4+4 pin EPS12V (650mm)	2	2	18AWG	No
6+2 pin PCIe (750mm)	6	6	18AWG	No
SATA (450mm+115mm+115mm+115mm)	2	8	18AWG	No
SATA (350mm+115mm)	1	2	18AWG	No
4 pin Molex (450mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex (350mm+120mm)	1	2	18AWG	No
FDD Adapter (+110mm)	1	1	22AWG	No
AC Power Cord (1350mm) - C13 coupler	1	1	18AWG	-

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Primary Side	
Transient Filter	6x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x Vishay LVB2560 (600V, 25A @ 105°C)
APFC MOSFETS	2x Infineon IPP60R099CP (650V, 19A @ 100°C, 0.099 Ohm)
APFC Boost Diode	1x SCS110AG (600V, 10A @ 117°C)
Hold-up Cap(s)	2x Nippon Chemi-Con (400V, 650uF & 450uF or 1100uF combined, 2000h @ 105°C, CE)
Main Switchers	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.140 Ohm)
Drivers For Main Switchers	2x Silicon Labs Si8230BD
APFC Controller	ON Semiconductor NPC1654
Switching Controller	Champion CM6901
Topology	Primary side: Full-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4 mOhm)
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0906NS PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, KZE, KZH) 1x Rubycon (5VSB circuit, 105°C, YXD) Polymers: FPCAP, Nippon Chemi-Con
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Hong Hua HA13525M12F-Z (135mm, 12V, 0.36A, 1800 RPM, Fluid Dynamic Bearing)
5VSB Circuit	
Buck Converter	Leadtrend LD7750R
Rectifiers	STMicroelectronics STU6N65K3 (650V, 3A @ 100°C, 1.30), Infineon BSC0906NS(30V, 40A @ 100°C, 4.5 mOhm)
-12V Circuit	
Buck Converter	Lite-On LSP5523 (3A max output current)

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	91.986
Efficiency With 10W ($\leq 500W$) or 2% ($> 500W$) Load -115V	0.000
Average Efficiency 5VSB	79.413
Standby Power Consumption (W) -115V	0.0574072
Standby Power Consumption (W) -230V	0.0987592
Average PF	0.990
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	16.40
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A+

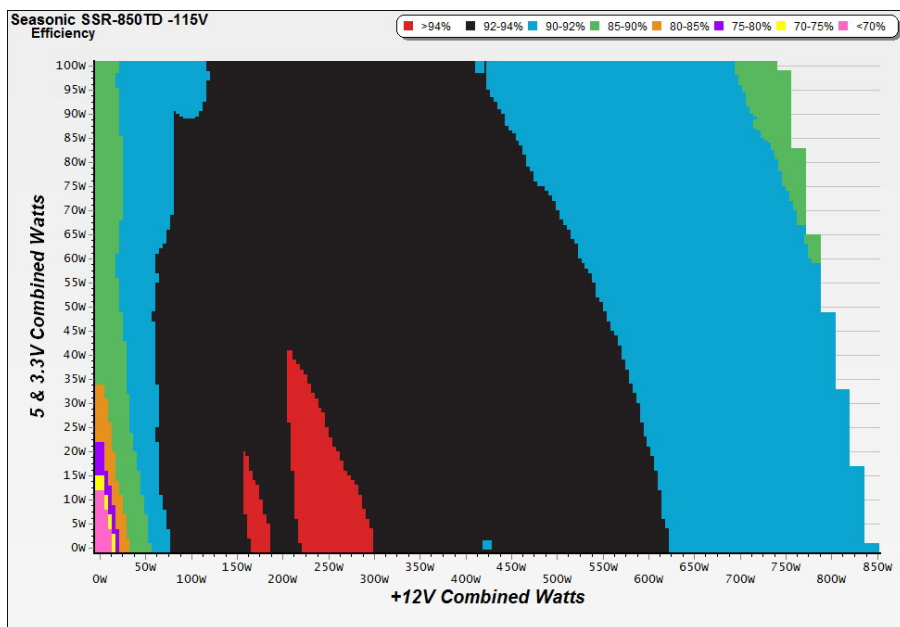
TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Briel & Kjaer 2250-L G4	
Microphone	Briel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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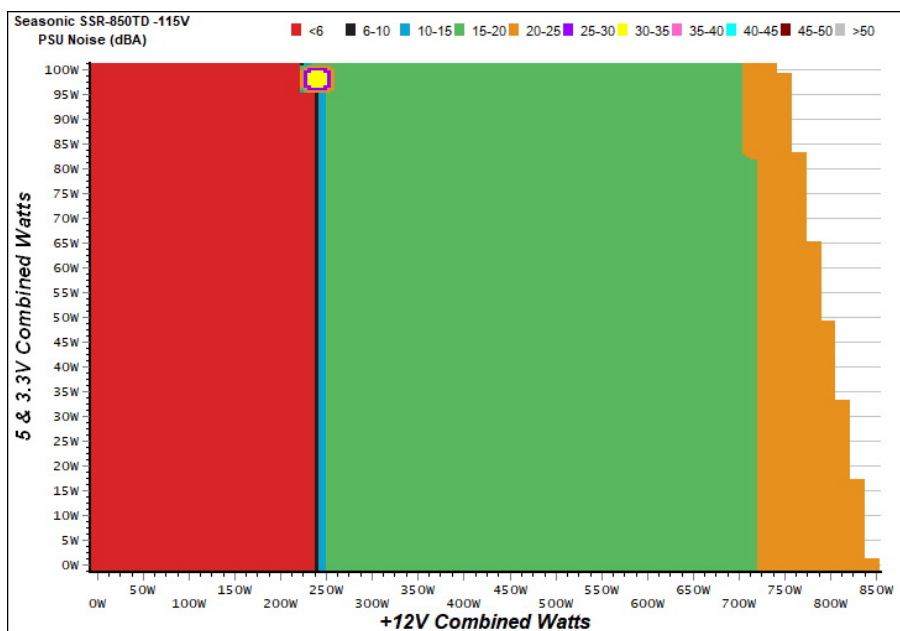
EFFICIENCY GRAPH



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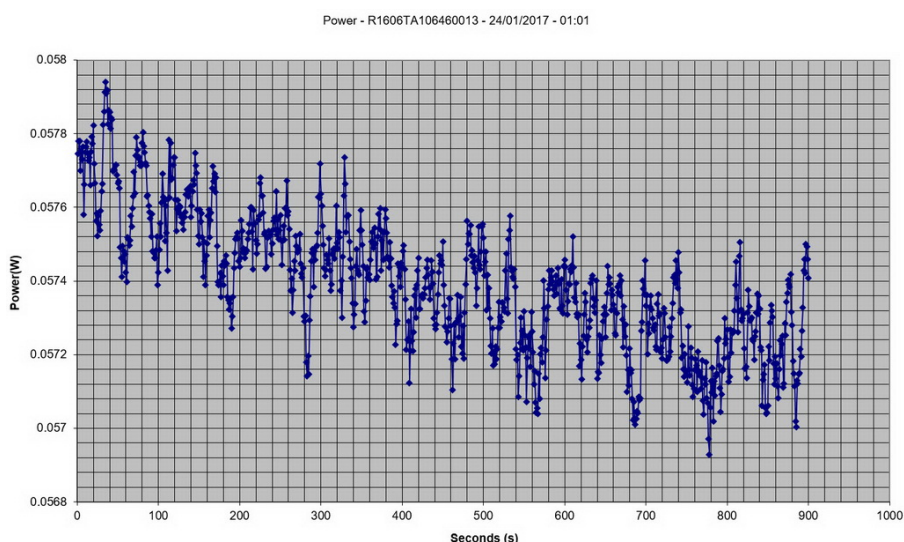
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.208	64.596%	0.036
	5.013V	0.322		115.16V
2	0.087A	0.435	71.664%	0.067
	5.011V	0.607		115.12V
3	0.542A	2.707	79.900%	0.277
	4.991V	3.388		115.16V
4	1.003A	4.983	80.087%	0.373
	4.970V	6.222		115.16V
5	1.502A	7.429	79.676%	0.425
	4.947V	9.324		115.16V
6	3.002A	14.655	78.617%	0.490
	4.882V	18.641		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.208	57.778%	0.012
	5.013V	0.360		230.29V
2	0.087A	0.435	66.923%	0.022
	5.011V	0.650		230.29V
3	0.542A	2.702	77.002%	0.110
	4.989V	3.509		230.30V
4	1.002A	4.974	78.430%	0.182
	4.966V	6.342		230.30V
5	1.502A	7.422	79.312%	0.241
	4.943V	9.358		230.30V
6	3.001A	14.604	78.130%	0.344
	4.866V	18.692		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

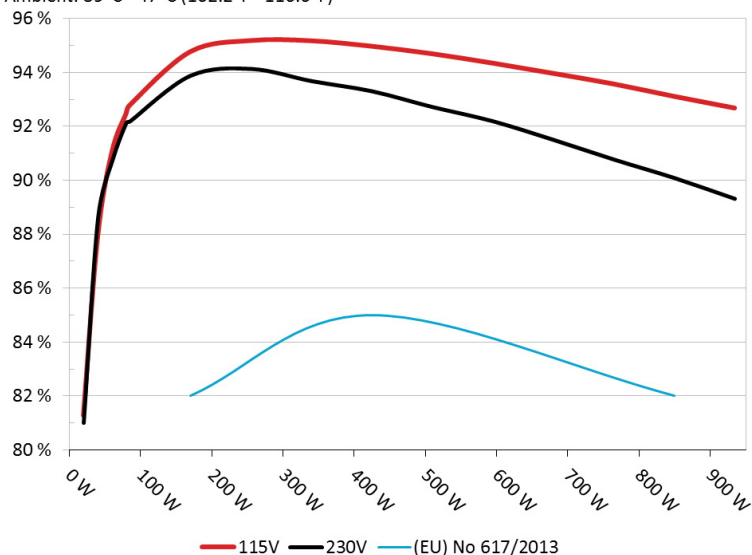
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Seasonic SSR-850TD

Ambient: 39°C - 47°C (102.2°F - 116.6°F)



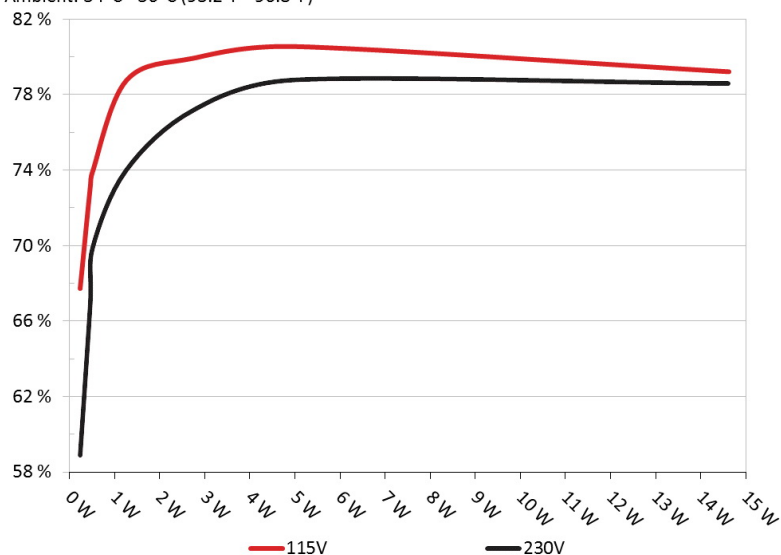
INFO

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: Seasonic SSR-850TD

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)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	5.206A	1.985A	1.974A	0.995A	84.73	92.178%	395	16.4	38.67°C	0.968
	12.130V	5.041V	3.341V	5.005V	91.92				41.04°C	115.1V
2	11.444A	2.970A	2.961A	1.200A	169.61	93.868%	400	16.5	38.86°C	0.991
	12.125V	5.039V	3.340V	4.998V	180.69				41.35°C	115.1V
3	18.043A	3.478A	3.472A	1.400A	254.81	94.120%	405	16.5	39.48°C	0.996
	12.122V	5.036V	3.338V	4.990V	270.73				42.51°C	115.1V
4	24.629A	3.974A	3.954A	1.605A	339.70	93.669%	408	16.5	40.60°C	0.993
	12.120V	5.035V	3.335V	4.982V	362.66				43.86°C	115.1V
5	30.874A	4.969A	4.946A	1.805A	424.62	93.292%	435	15.0	41.37°C	0.992
	12.118V	5.034V	3.334V	4.975V	455.15				44.18°C	115.1V
6	37.126A	5.961A	5.939A	2.009A	509.58	92.708%	508	17.8	42.15°C	0.994
	12.116V	5.032V	3.332V	4.968V	549.66				45.22°C	115.1V
7	43.380A	6.959A	6.931A	2.214A	594.51	92.181%	395	15.2	43.00°C	0.995
	12.112V	5.032V	3.332V	4.960V	644.94				47.34°C	115.1V
8	49.638A	7.949A	7.922A	2.420A	679.48	91.492%	500	17.2	44.40°C	0.996
	12.110V	5.031V	3.331V	4.953V	742.67				48.87°C	115.1V
9	56.324A	8.455A	8.440A	2.420A	764.57	90.759%	590	21.6	45.44°C	0.997
	12.108V	5.029V	3.329V	4.950V	842.42				50.37°C	115.1V
10	62.760A	8.957A	8.927A	3.042A	849.30	90.078%	925	29.3	46.64°C	0.997
	12.103V	5.027V	3.327V	4.927V	942.85				51.93°C	115.1V
11	69.828A	8.965A	8.934A	3.049A	934.33	89.306%	1300	36.2	46.64°C	0.997
	12.096V	5.021V	3.323V	4.917V	1046.21				52.38°C	115.1V
CL1	0.098A	12.011A	12.005A	0.004A	102.84	89.582%	425	16.0	45.28°C	0.980
	12.139V	5.082V	3.381V	5.089V	114.80				50.51°C	115.2V
CL2	69.946A	1.003A	1.003A	1.001A	859.43	90.329%	915	29.3	46.44°C	0.997
	12.097V	4.997V	3.300V	4.964V	951.44				52.04°C	115.1V

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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	1.200A	0.492A	0.477A	0.195A	19.610	81.000%	0	<6.0	0.799
	12.131V	5.039V	3.341V	5.031V	24.210				115.1V
2	2.429A	0.990A	0.986A	0.396A	39.740	88.587%	0	<6.0	0.912
	12.131V	5.038V	3.340V	5.024V	44.860				115.1V
3	3.662A	1.476A	1.493A	0.594A	59.830	90.720%	0	<6.0	0.952
	12.131V	5.039V	3.341V	5.019V	65.950				115.1V
4	4.880A	1.985A	1.974A	0.797A	79.790	92.136%	0	<6.0	0.966
	12.130V	5.040V	3.341V	5.012V	86.600				115.1V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.4 mV	5.5 mV	7.3 mV	2.6 mV	Pass
20% Load	9.6 mV	5.5 mV	7.5 mV	3.7 mV	Pass
30% Load	11.5 mV	6.3 mV	7.8 mV	3.6 mV	Pass
40% Load	8.9 mV	6.8 mV	8.3 mV	4.6 mV	Pass
50% Load	8.8 mV	6.2 mV	9.6 mV	5.0 mV	Pass
60% Load	9.8 mV	6.3 mV	10.0 mV	5.2 mV	Pass
70% Load	10.9 mV	6.5 mV	10.8 mV	5.8 mV	Pass
80% Load	11.1 mV	6.6 mV	11.2 mV	6.3 mV	Pass
90% Load	12.6 mV	7.4 mV	12.6 mV	6.7 mV	Pass
100% Load	13.4 mV	7.5 mV	13.1 mV	7.6 mV	Pass
110% Load	13.8 mV	8.3 mV	14.5 mV	8.5 mV	Pass
Crossload 1	8.3 mV	6.6 mV	8.3 mV	3.6 mV	Pass
Crossload 2	13.4 mV	6.5 mV	12.1 mV	6.6 mV	Pass

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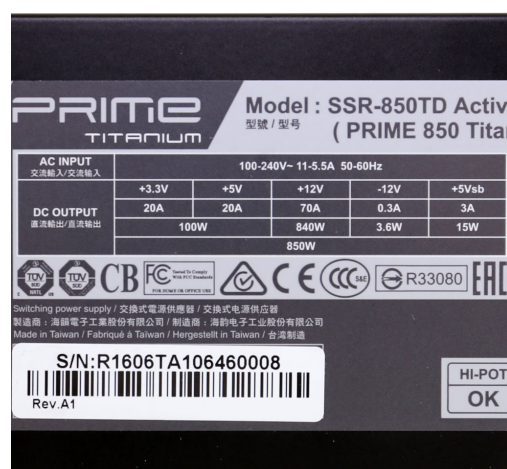
Seasonic SSR-850TD

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

Hold-Up Time (ms)	31.34
AC Loss to PWR_OK Hold Up Time (ms)	30.10
PWR_OK Inactive to DC Loss Delay (ms)	1.24



Top side



Power specifications label

CERTIFICATIONS



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