Anex

Seasonic Prime TX-1300 ATX3.0

Lab ID#: SS13002266
Receipt Date: Sep 29, 2023
Test Date: Oct 23, 2023

Report: 23PS2266A
Report Date: Oct 26, 2023

DUT INFORMATION

Brand	Seasonic
Manufacturer (OEM)	Seasonic
Series	Prime Titanium
Model Number	SSR-1300TR
Serial Number	R2304AA132930002
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	15-8
Rated Frequency (Hz)	50-60
Rated Power (W)	1300
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P
Power Analyzers	RS HMC8015, N4L PPA1530, N4L PPA5530
Oscilloscopes	Picoscope 4444, Rigol DS7014, Siglent SDS2104X PLUS
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Tachometer	UNI-T UT372
Multimeters	Keysight 34465A, Keithley 2015 - THD
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Isolation Transformer	4kVA

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.0 PSU Power Excursion	✓

115V

Average Efficiency	92.559%
Efficiency With 10W (≤500W) or 2% (>500W)	72.918
Average Efficiency 5VSB	84.363%
Standby Power Consumption (W)	0.0192000
Average PF	0.985
Avg Noise Output	11.02 dB(A)
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A++

230V

Average Efficiency	94.044%
Average Efficiency 5VSB	84.076%
Standby Power Consumption (W)	0.1095000
Average PF	0.940
Avg Noise Output	11.44 dB(A)
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	108.33	3	0.5
	Watts	125		1300	15	6
Total Max. Power (W)		1300				

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

Hold-Up Time (ms)	22.6
AC Loss to PWR_OK Hold Up Time (ms)	19.2
PWR_OK Inactive to DC Loss Delay (ms)	3.4

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	16-18AWG	No
4+4 pin EPS12V (700mm)	3	3	16AWG	No
6+2 pin PCIe (750mm)	6	6	16AWG	No
12+4 pin PCIe (750mm) (600W)	1	1	16-28AWG	No
SATA (510mm+155mm+155mm+155mm)	4	16	18AWG	No
SATA (410mm+150mm)	1	2	18AWG	No
4-pin Molex (460mm+125mm+125mm)	1	3	18AWG	No
AC Power Cord (1390mm) - C19 coupler	1	1	14AWG	-

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General Data	-
Manufacturer (OEM)	Seasonic
PCB Type	Double-Sided
Primary Side	-
Transient Filter	6x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	2x NTC Thermistor MF72-20D20M (20 Ohm) & Relay
Rectifier FETs	4x IPB60R040C7
APFC MOSFETs	4x Infineon IPW60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm)
APFC Boost Diode	2x CREE C6D08065A (650V, 30A @ 25°C)
Bulk Cap(s)	2x Nippon Chemi-Con (420V, 680uF each or 1360uF combined, 2000h @ 105°C, KMZ) & 1x Nippon Chemi-Con (420V, 820uF, 2000h @ 105°C, KHE)
Main Switchers	4x Infineon IPW60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm)
IC Driver	2x Silicon Labs Si8230BD
APFC Controller	Texas Instruments UCC28070
Resonant Controller	Champion CM6901T2X
Topology	Primary side: Bridgeless, Interleaved PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x Nexperia PSMN1R0-40YLD (40V, 198A @ 100°C, Rds(on): 1.93mOhm)
5V & 3.3V	DC-DC Converters: 2x PWM Controllers: 1x
Filtering Capacitors	Electrolytic: Nippon Chemi-Con (2-5,000 @ 105°C, KZE), Nippon Chemi-Con (5-6,000 @ 105°C, KZH) 5x Nippon Chemi-Con (@ 105°C, W) 3x Nichicon (6,000 @ 105°C, HV), Polymer: 39x CAP
Supervisor IC	Weltrend WT7527RA (OCP, OVP, UVP, SCP, PG)
Fan Controller	Nuvoton M031FB0AE
Fan Model	Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifier	1x Infineon BSC100N06LS3 FET (60V, 36A @ 100°C, Rds(on): 10mOhm)
Standby PWM Controller	Power Integrations INN3164C

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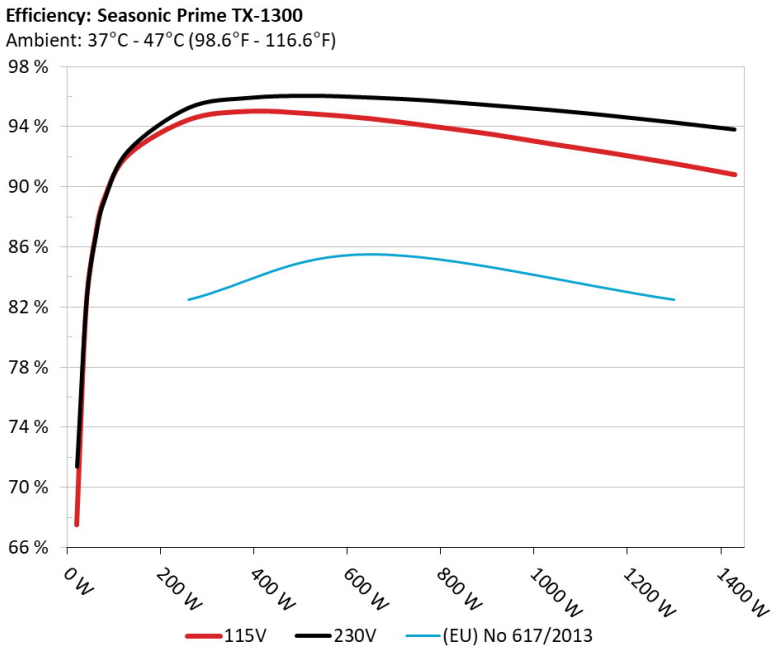
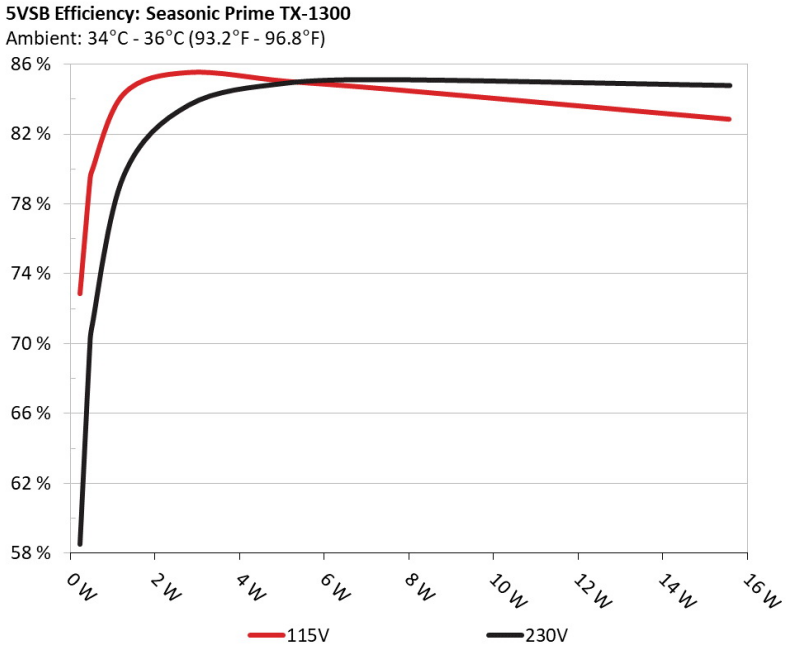
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	73.061%	0.03
	5.064V	0.312W		114.84V
2	0.09A	0.456W	79.386%	0.054
	5.063V	0.574W		114.85V
3	0.55A	2.791W	85.748%	0.255
	5.075V	3.255W		114.85V
4	1A	5.101W	85.242%	0.369
	5.101V	5.983W		114.84V
5	1.5A	7.704W	84.753%	0.425
	5.136V	9.09W		114.85V
6	3A	15.574W	83.066%	0.523
	5.191V	18.748W		114.84V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	58.687%	0.011
	5.067V	0.389W		229.85V
2	0.09A	0.456W	69.843%	0.018
	5.063V	0.653W		229.85V
3	0.55A	2.792W	83.867%	0.091
	5.075V	3.329W		229.85V
4	1A	5.103W	85.137%	0.156
	5.103V	5.994W		229.84V
5	1.5A	7.697W	85.331%	0.218
	5.131V	9.02W		229.85V
6	3A	15.596W	85%	0.322
	5.199V	18.349W		229.85V

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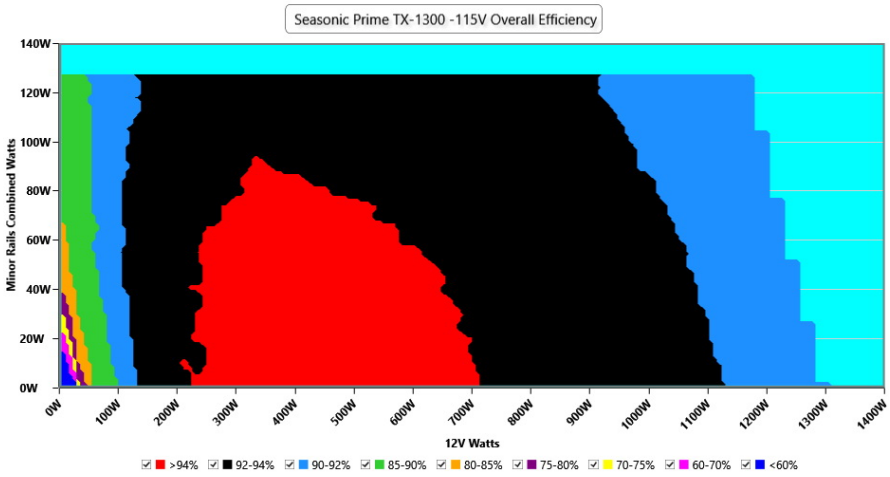
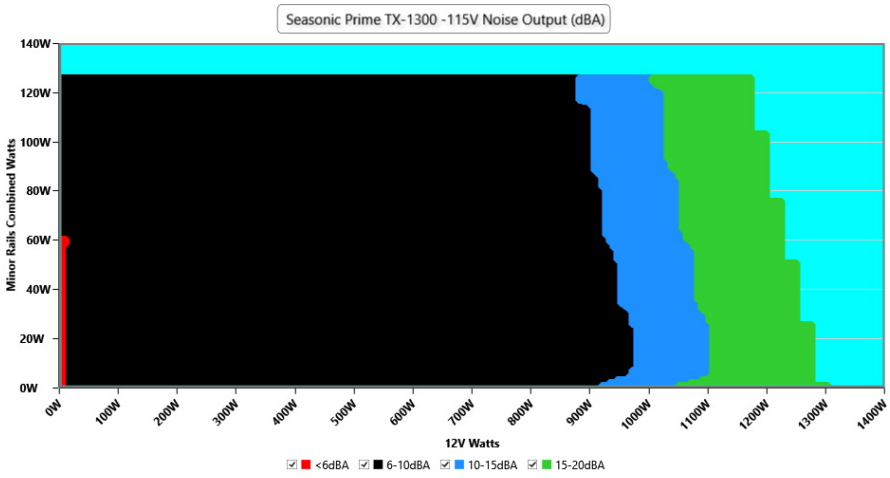
EFFICIENCY GRAPH 115V



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 115V



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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VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.85 V	114.79 V	113.85 V	114.91 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.98 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.419	1.418	1.340	1.421	1.490	PASS
Mains Voltage THD:	0.15 %	0.10 %	N/A	0.27 %	2.00 %	PASS
Real Power:	0.019 W	0.006 W	N/A	0.035 W	N/A	N/A
Apparent Power:	11.679 W	11.648 W	N/A	11.720 W	N/A	N/A
Power Factor:	0.003	N/A	N/A	N/A	N/A	N/A

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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10-110% LOAD TESTS 115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	9.039A	1.978A	1.988A	0.98A	129.993	91.642%	0	<6.0	44.46°C	0.967
	11.992V	5.056V	3.32V	5.104V	141.84				40.23°C	114.81V
20%	19.106A	2.968A	2.984A	1.175A	259.942	93.988%	0	<6.0	45.31°C	0.978
	11.988V	5.054V	3.318V	5.106V	276.555				40.63°C	114.78V
30%	29.497A	3.463A	3.483A	1.369A	389.522	94.549%	0	<6.0	46.22°C	0.983
	11.983V	5.053V	3.316V	5.113V	411.982				41.13°C	114.73V
40%	39.930A	3.959A	3.983A	1.568A	519.521	94.387%	0	<6.0	47.46°C	0.983
	11.979V	5.052V	3.314V	5.102V	550.423				41.93°C	114.69V
50%	50.040A	4.951A	4.982A	1.763A	649.694	94.055%	497	9.7	42.33°C	0.987
	11.974V	5.049V	3.312V	5.105V	690.754				48.34°C	114.65V
60%	60.158A	5.944A	5.983A	1.961A	779.849	93.554%	499	9.8	42.65°C	0.989
	11.969V	5.048V	3.31V	5.101V	833.577				49.19°C	114.6V
70%	70.258A	6.937A	6.982A	2.156A	909.768	93.013%	497	9.7	43.39°C	0.992
	11.966V	5.046V	3.308V	5.103V	978.122				50.43°C	114.56V
80%	80.388A	7.928A	7.984A	2.256A	1039.438	92.363%	544	12.4	43.7°C	0.993
	11.961V	5.045V	3.306V	5.096V	1125.377				51.74°C	114.52V
90%	90.937A	8.425A	8.473A	2.357A	1169.724	91.74%	590	15.1	44.52°C	0.993
	11.956V	5.044V	3.304V	5.09V	1275.044				53.56°C	114.46V
100%	101.226A	8.922A	8.993A	2.941A	1299.362	91.07%	637	17.7	45.47°C	0.994
	11.950V	5.043V	3.302V	5.101V	1426.761				55.56°C	114.42V
110%	111.456A	9.916A	10.09A	2.947A	1429.606	90.332%	899	29.0	46.72°C	0.994
	11.945V	5.042V	3.3V	5.09V	1582.614				57.58°C	114.36V
CL1	0.117A	14.924A	15.02A	0A	126.301	87.611%	499	9.8	41.9°C	0.968
	11.991V	5.046V	3.302V	5.057V	144.168				47.38°C	114.81V
CL2	0.115A	24.726A	0A	0A	126.232	86.311%	499	9.8	40.52°C	0.968
	11.991V	5.049V	3.314V	5.06V	146.25				47.56°C	114.81V
CL3	0.115A	0A	24.995A	0A	83.883	81.152%	498	9.7	40.16°C	0.958
	11.991V	5.055V	3.301V	5.06V	103.361				49.23°C	114.81V
CL4	108.807A	0A	0A	0.001A	1299.941	91.443%	637	17.7	44.88°C	0.994
	11.947V	5.06V	3.318V	4.994V	1421.583				55.86°C	114.41V

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20-80W LOAD TESTS 115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20W	1.238A	0.494A	0.496A	0.197A	19.998	67.04%	0	<6.0	39.85°C	0.845
	11.989V	5.063V	3.326V	5.07V	29.837				36.78°C	114.85V
40W	2.728A	0.691A	0.695A	0.295A	39.999	81.459%	0	<6.0	40.82°C	0.907
	11.986V	5.062V	3.325V	5.077V	49.101				37.53°C	114.83V
60W	4.213A	0.889A	0.894A	0.394A	59.999	86.214%	0	<6.0	42.17°C	0.941
	11.994V	5.059V	3.323V	5.077V	69.593				38.36°C	114.84V
80W	5.696A	1.087A	1.093A	0.492A	79.944	88.81%	0	<6.0	42.99°C	0.951
	11.994V	5.058V	3.322V	5.083V	90.015				39.07°C	114.83V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.40mV	11.80mV	13.85mV	20.27mV	Pass
20% Load	12.28mV	9.70mV	11.80mV	25.76mV	Pass
30% Load	12.63mV	10.72mV	12.93mV	26.22mV	Pass
40% Load	14.73mV	12.83mV	14.88mV	26.89mV	Pass
50% Load	14.98mV	12.63mV	15.65mV	14.21mV	Pass
60% Load	15.34mV	13.19mV	15.49mV	22.17mV	Pass
70% Load	12.84mV	10.16mV	13.90mV	27.45mV	Pass
80% Load	13.04mV	10.62mV	13.96mV	31.35mV	Pass
90% Load	12.99mV	10.98mV	15.44mV	31.71mV	Pass
100% Load	19.85mV	12.50mV	18.03mV	32.89mV	Pass
110% Load	20.90mV	12.33mV	18.12mV	32.54mV	Pass
Crossload1	16.98mV	10.07mV	16.01mV	6.78mV	Pass
Crossload2	12.89mV	17.76mV	15.85mV	7.18mV	Pass
Crossload3	10.53mV	10.11mV	16.67mV	7.13mV	Pass
Crossload4	21.13mV	12.06mV	15.57mV	11.22mV	Pass

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230V

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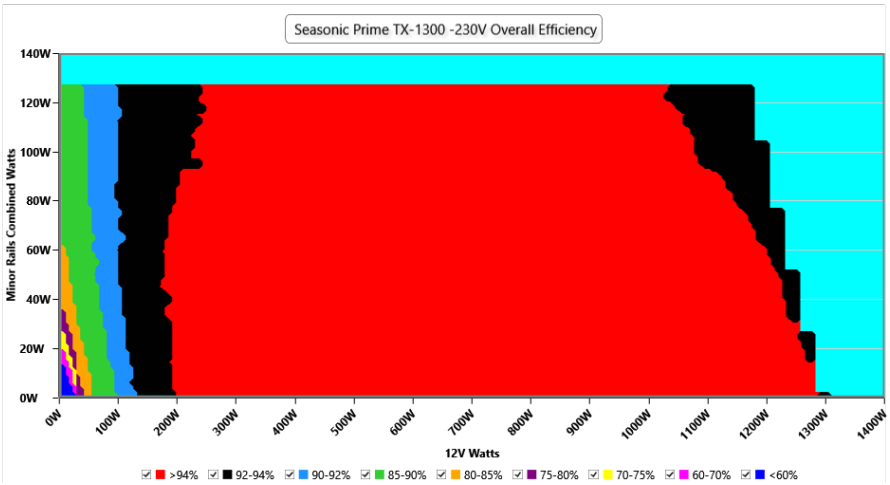
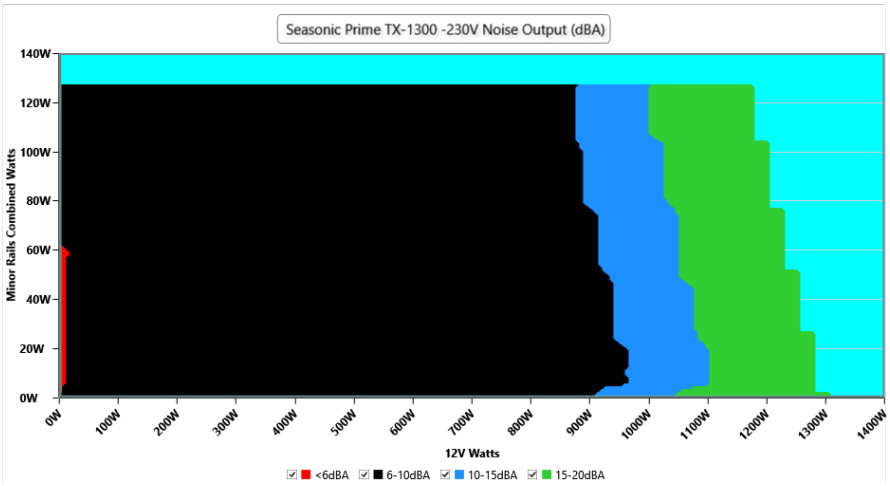
EFFICIENCY GRAPH 230V



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 230V



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VAMPIRE POWER -230V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.88 V	229.80 V	227.70 V	229.95 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.99 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.418	1.417	1.340	1.419	1.490	PASS
Mains Voltage THD:	0.16 %	0.12 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.110 W	0.074 W	N/A	0.176 W	N/A	N/A
Apparent Power:	40.532 W	40.485 W	N/A	40.591 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

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Seasonic Prime TX-1300 ATX3.0

10-110% LOAD TESTS 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	9.038A	1.977A	1.988A	0.98A	129.993	91.891%	0	<6.0	44.41°C	0.837
	11.993V	5.057V	3.32V	5.104V	141.466				40.21°C	229.83V
20%	19.108A	2.968A	2.984A	1.175A	259.959	94.747%	0	<6.0	45.49°C	0.906
	11.988V	5.055V	3.317V	5.107V	274.373				40.92°C	229.81V
30%	29.505A	3.463A	3.484A	1.37A	389.611	95.399%	0	<6.0	46.2°C	0.93
	11.983V	5.053V	3.316V	5.111V	408.405				41.13°C	229.79V
40%	39.939A	3.959A	3.983A	1.568A	519.612	95.532%	0	<6.0	47.35°C	0.939
	11.979V	5.052V	3.314V	5.102V	543.913				41.87°C	229.77V
50%	50.052A	4.951A	4.982A	1.763A	649.747	95.416%	499	9.8	42.05°C	0.946
	11.972V	5.05V	3.312V	5.105V	680.962				48.07°C	229.75V
60%	60.160A	5.943A	5.983A	1.961A	779.849	95.212%	496	9.7	42.62°C	0.95
	11.969V	5.048V	3.31V	5.101V	819.081				49.25°C	229.73V
70%	70.281A	6.936A	6.984A	2.157A	909.926	94.897%	503	10.0	43.3°C	0.955
	11.964V	5.047V	3.308V	5.1V	958.849				50.39°C	229.71V
80%	80.407A	7.927A	7.986A	2.257A	1039.523	94.58%	548	12.6	43.74°C	0.96
	11.959V	5.045V	3.306V	5.095V	1099.096				51.76°C	229.69V
90%	90.950A	8.424A	8.474A	2.358A	1169.767	94.192%	594	15.3	44.18°C	0.964
	11.954V	5.045V	3.304V	5.09V	1241.892				53.22°C	229.67V
100%	101.235A	8.922A	8.993A	2.94A	1299.401	93.762%	639	17.8	46°C	0.968
	11.949V	5.044V	3.302V	5.101V	1385.854				56.07°C	229.64V
110%	111.460A	9.916A	10.09A	2.946A	1429.616	93.295%	806	25.5	46.84°C	0.972
	11.944V	5.042V	3.3V	5.092V	1532.35				57.72°C	229.62V
CL1	0.117A	14.924A	15.02A	0A	126.302	87.796%	501	9.9	41.27°C	0.84
	11.991V	5.046V	3.302V	5.058V	143.843				46.77°C	229.83V
CL2	0.115A	24.729A	0A	0A	126.236	86.465%	500	9.8	40.72°C	0.842
	11.992V	5.049V	3.314V	5.061V	145.984				47.76°C	229.83V
CL3	0.115A	0A	24.994A	0A	83.882	80.827%	499	9.8	40°C	0.789
	11.991V	5.055V	3.301V	5.061V	103.785				49.05°C	229.84V
CL4	108.807A	0A	0A	0.001A	1299.957	94.065%	639	17.8	45.17°C	0.968
	11.947V	5.06V	3.318V	4.994V	1381.981				56.09°C	229.64V

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Anex

Seasonic Prime TX-1300 ATX3.0

20-80W LOAD TESTS 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20W	1.238A	0.494A	0.496A	0.197A	19.997	70.88%	0	<6.0	39.7°C	0.463
	11.989V	5.065V	3.326V	5.071V	28.22				36.63°C	229.85V
40W	2.727A	0.691A	0.695A	0.295A	39.995	81.789%	0	<6.0	40.99°C	0.634
	11.984V	5.064V	3.325V	5.077V	48.91				37.69°C	229.84V
60W	4.212A	0.889A	0.893A	0.394A	59.994	86.206%	0	<6.0	41.95°C	0.711
	11.995V	5.061V	3.323V	5.077V	69.596				38.39°C	229.85V
80W	5.694A	1.087A	1.093A	0.492A	79.932	88.697%	0	<6.0	42.89°C	0.763
	11.995V	5.059V	3.322V	5.081V	90.112				39.04°C	229.84V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.43mV	10.11mV	11.95mV	21.91mV	Pass
20% Load	13.19mV	10.98mV	12.78mV	25.29mV	Pass
30% Load	13.40mV	12.42mV	13.19mV	28.73mV	Pass
40% Load	13.96mV	12.57mV	15.19mV	28.48mV	Pass
50% Load	14.27mV	12.37mV	15.08mV	15.70mV	Pass
60% Load	12.07mV	9.08mV	11.95mV	21.96mV	Pass
70% Load	11.97mV	9.19mV	12.93mV	26.68mV	Pass
80% Load	12.22mV	10.57mV	13.70mV	30.33mV	Pass
90% Load	12.63mV	10.37mV	14.37mV	33.71mV	Pass
100% Load	20.90mV	11.84mV	18.14mV	34.40mV	Pass
110% Load	21.44mV	11.92mV	18.71mV	31.21mV	Pass
Crossload1	18.00mV	10.75mV	15.57mV	7.06mV	Pass
Crossload2	12.84mV	18.06mV	16.06mV	7.95mV	Pass
Crossload3	11.56mV	10.78mV	18.73mV	7.44mV	Pass
Crossload4	20.20mV	11.88mV	17.31mV	11.30mV	Pass

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Cybenetics offers the ETA and Lambda voluntary certification programs, through which the efficient and silent power supplies are promoted

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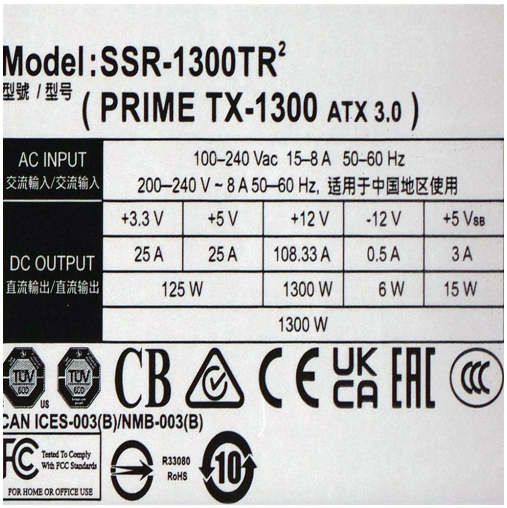
Anex

Seasonic Prime TX-1300 ATX3.0

Top side



Power specifications label

CERTIFICATIONS 115V

CYBENETICS TITANIUM

CYBENETICS A++

CERTIFICATIONS 230V

CYBENETICS TITANIUM 230v

CYBENETICS A++ 230v

Aristeidis Bitziopoulos
Lab Director

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