Seasonic Prime Fanless TX-700

Serial Number R2007AA150600197

Lab ID SS70001872

Certification ID 251872

Test Result Report ID: 21PS1872A

Certificate Issue Date: Jul 20, 2021

Scheme: ETA-EMI PSU

115V



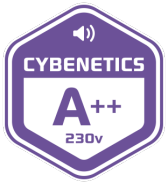
230V



115V



230V



Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 Chroma 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500
Power Analyzers	Rohde & Schwarz HMC8015 & NPA701
Oscilloscopes	Picoscope 4444, 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
EMI Analyzer	TekBox TBMR-110M-EU
Isolation Transformer	4kVA
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Testing Methodology	Cybenetics PSU Test Protocol

DUT Information
(Non-accredited measurements)

Product Identification Details	
Brand	Seasonic
Model	Prime Fanless TX-700
OEM/ODM	Seasonic
Serial Number	R2007AA150600197
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	9.5-4.5

Rated Frequency (Hz)	50-60
Rated Power (W)	700
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	-
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	SS70001872
Date of receipt	Jul 7, 2021
Testing Date	Jul 16, 2021
Report Issued Date	Jul 20, 2021
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors
(Non-accredited measurements)

Modular Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (660mm)	2	2	18AWG	No
6+2 pin PCIe (760mm)	4	4	18AWG	No
SATA (410mm+150mm+150mm+150mm)	1	4	18AWG	No
SATA (450mm+120mm+120mm+120mm)	1	4	18AWG	No
SATA (300mm+160mm)	1	2	18AWG	No

4 pin Molex (450mm+125mm+125mm)	1	3	18AWG	No
4 pin Molex (360mm+125mm)	1	2	18AWG	No
4 pin Molex to SATA 3.3 Adapter (150mm+150mm)	1	2	18AWG	No
AC Power Cord (1360mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	58	2.5	0.3
	Watts	100		696	12.5	3.6
Total Max. Power (W)		700				

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	91.629%
Average Noise Output (>1450 Load Combinations)	6.00dBA
Average PF (>1450 Load Combinations)	0.989
Efficiency With 10W (≤500W) or 2% (>500W) Load	71.651%
Standby Power Consumption	0.0538W
Non-Accredited	
12V Ripple (Full Load)	23.84mV
5V Ripple (Full Load)	12.95mV

3.3V Ripple (Full Load)	16.41mV
5VSB Ripple (Full Load)	11.81mV
12V Load Regulation	0.45%
5V Load Regulation	2.75%
3.3V Load Regulation	5.58%
5VSB Load Regulation	5.45%
Inrush Current	67.950A

230V

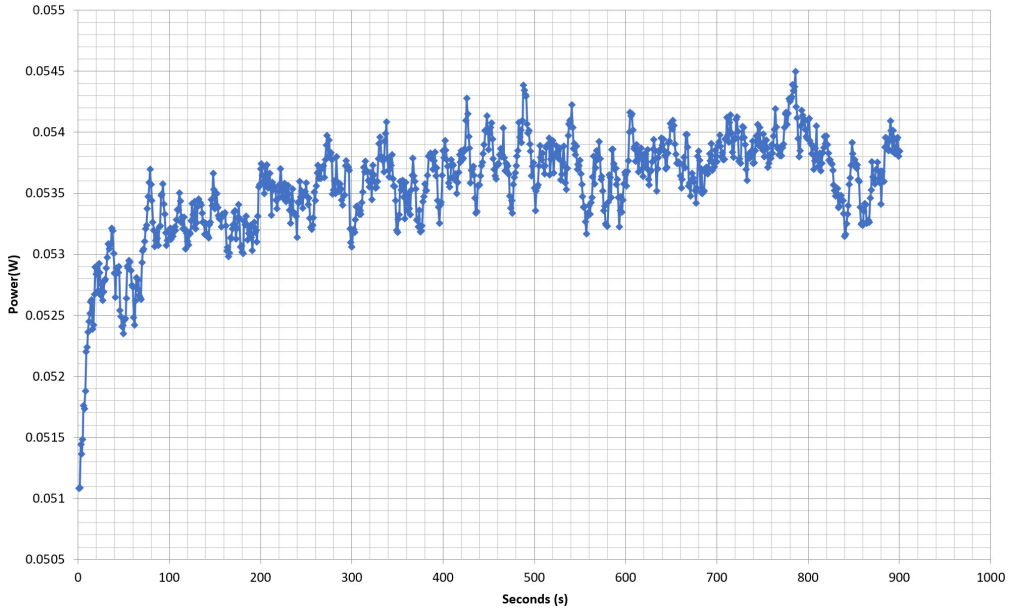
Accredited		
Average Efficiency (>1450 load combinations)		93.046%
Average Noise Output (>1450 Load Combinations)		6.00dBA
Average PF (>1450 Load Combinations)		0.943
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
Standby Power Consumption		0.0835W
Non-Accredited		
12V Ripple (Full Load)		23.20mV
5V Ripple (Full Load)		12.02mV
3.3V Ripple (Full Load)		16.10mV
5VSB Ripple (Full Load)		12.24mV
12V Load Regulation		0.25%
5V Load Regulation		2.49%
3.3V Load Regulation		4.96%
5VSB Load Regulation		4.24%
Inrush Current		93.680A
Hold-Up Time & PWR_OK Signal		30.20ms
AC Loss to PWR_OK Hold Up Time		25.20ms
PWR_OK Inactive to DC Loss Delay		5.00ms
PSU Timings: T1 (20% / 100%)	142.0ms	146.0ms
PSU Timings: T3 (20% / 100%)	336.0ms	334.0ms
OPP (25.83°C / 44.20°C)	139.35%	139.35%

Hold-Up Time & PWR_OK Signal

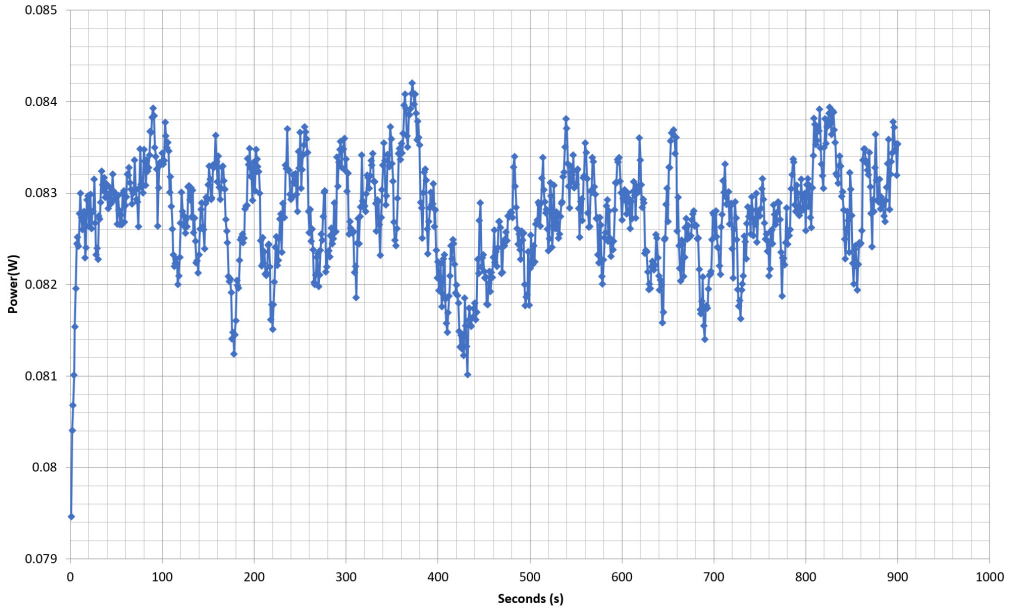
Hold-Up Time (ms)	30.2
AC Loss to PWR_OK Hold Up Time (ms)	25.2
PWR_OK Inactive to DC Loss Delay (ms)	5

Graphs

115V

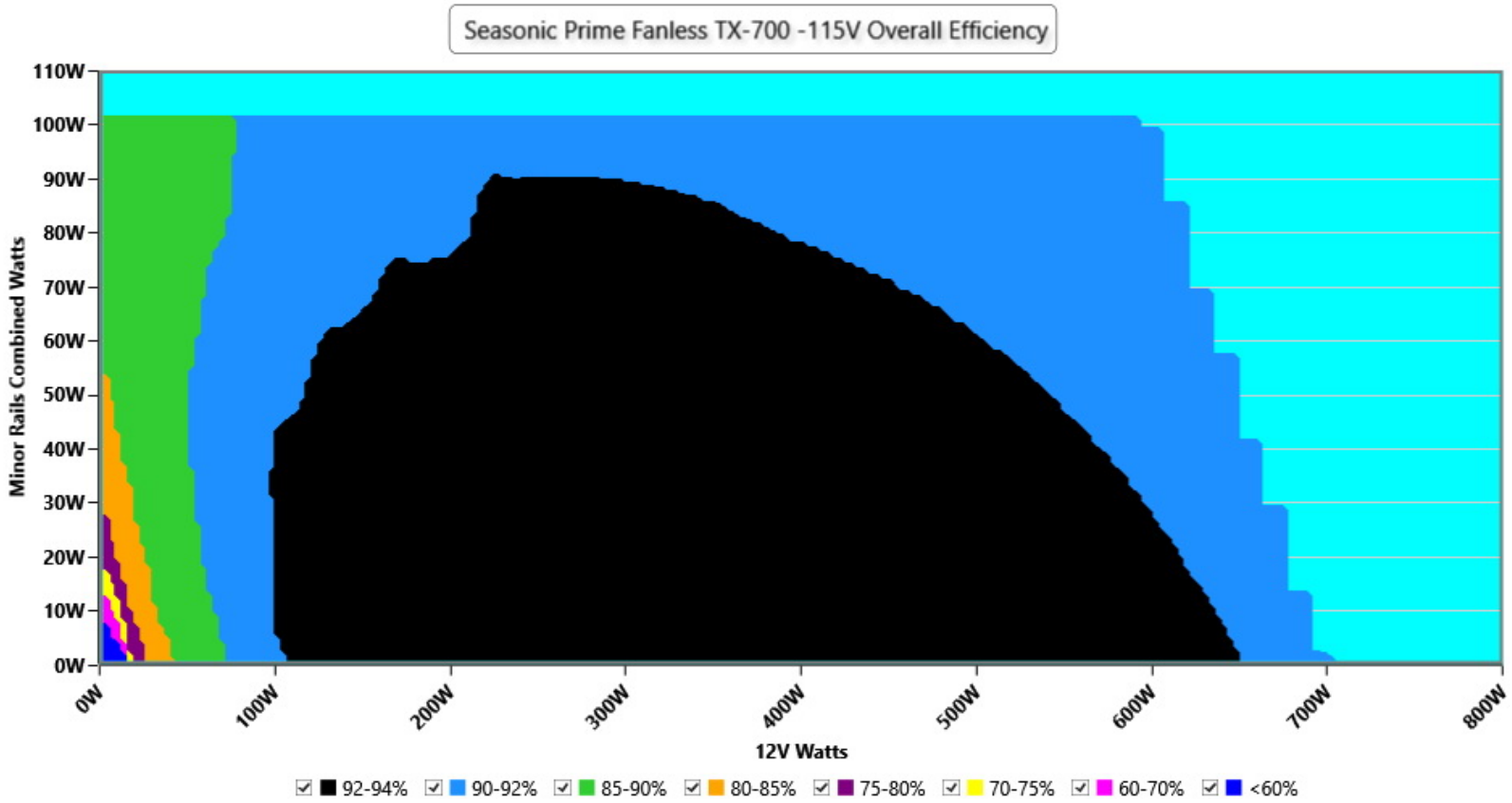


230V



Efficiency Graph

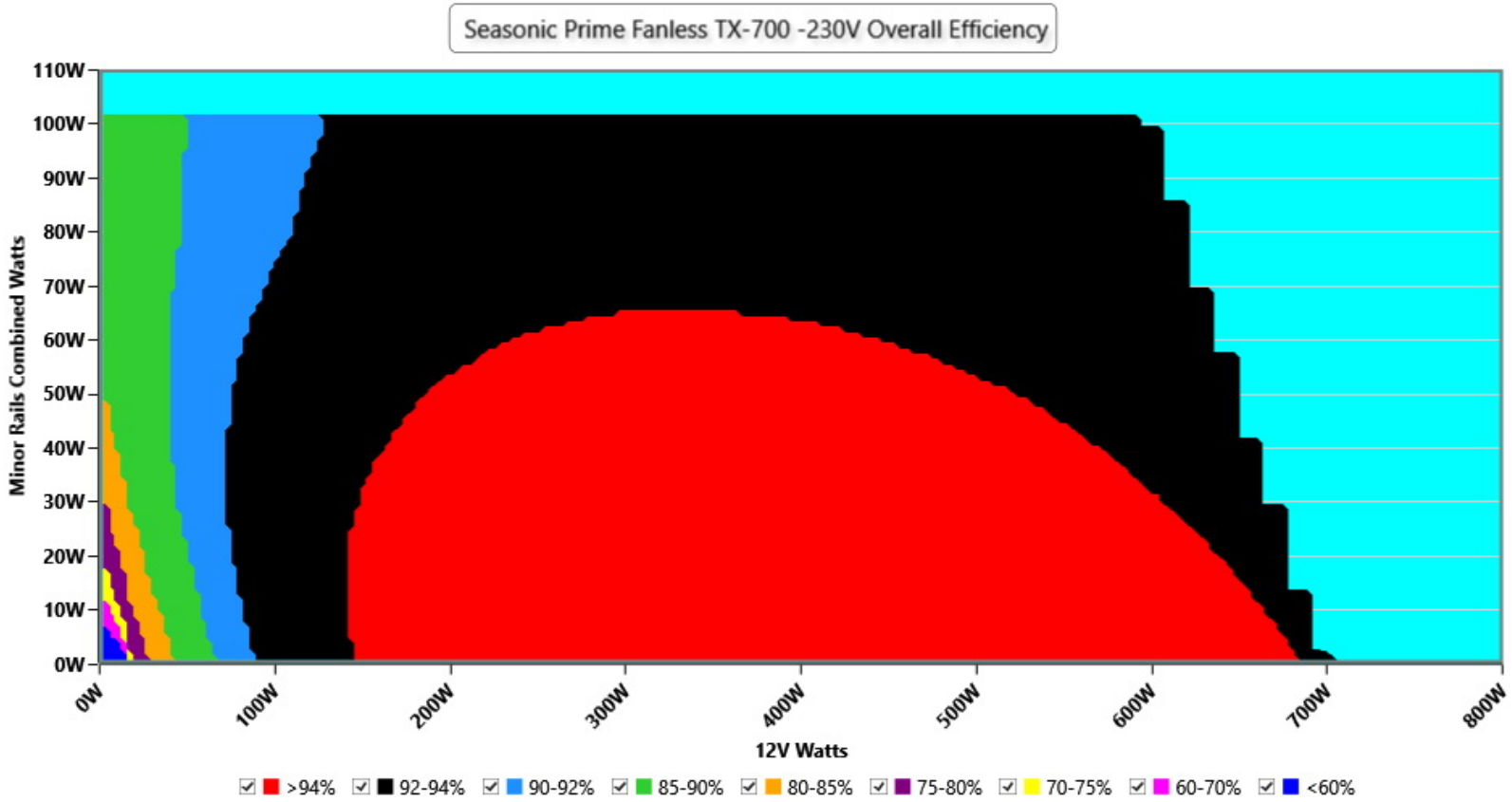
115V



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

230V

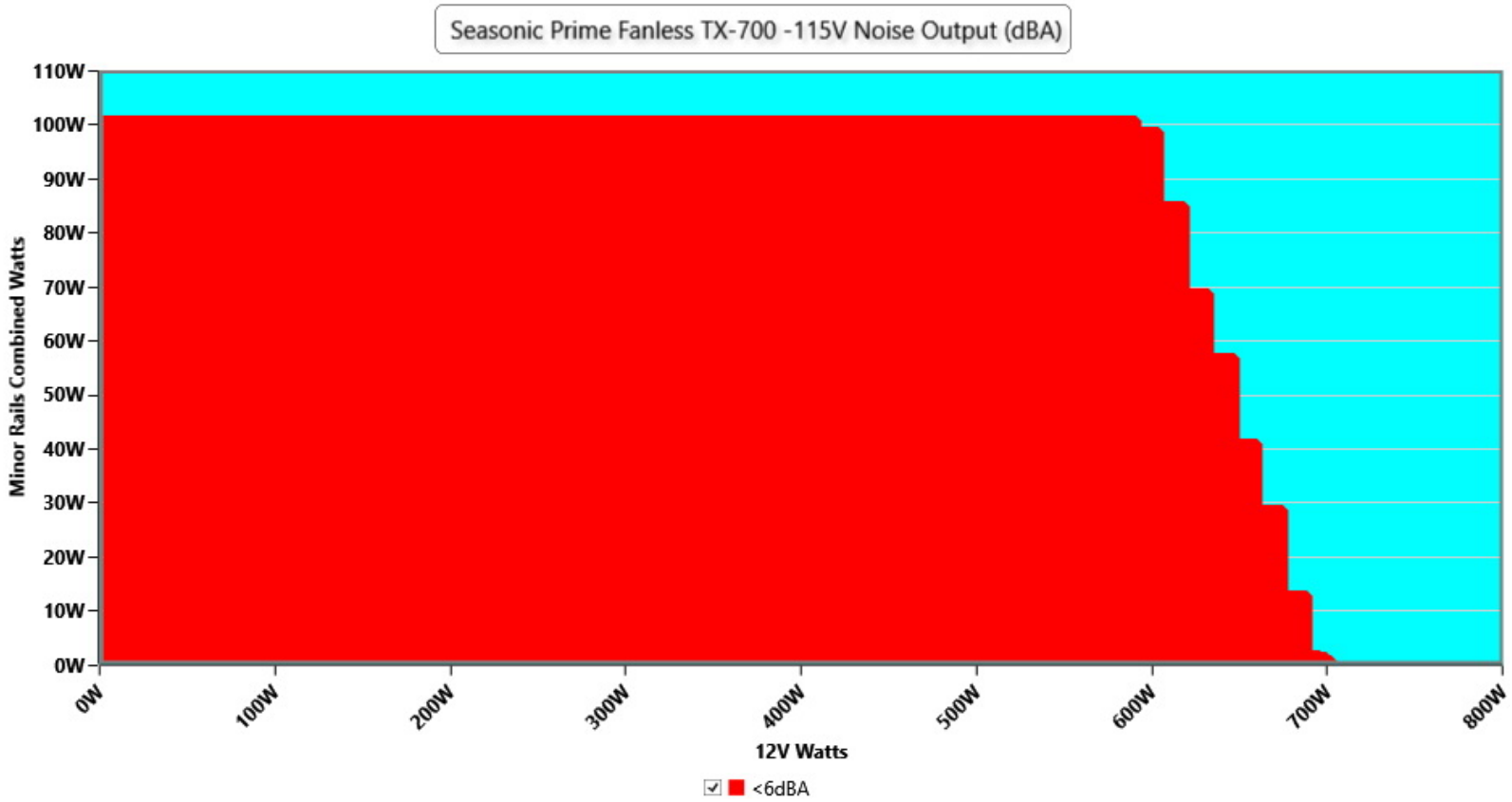


INFO

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

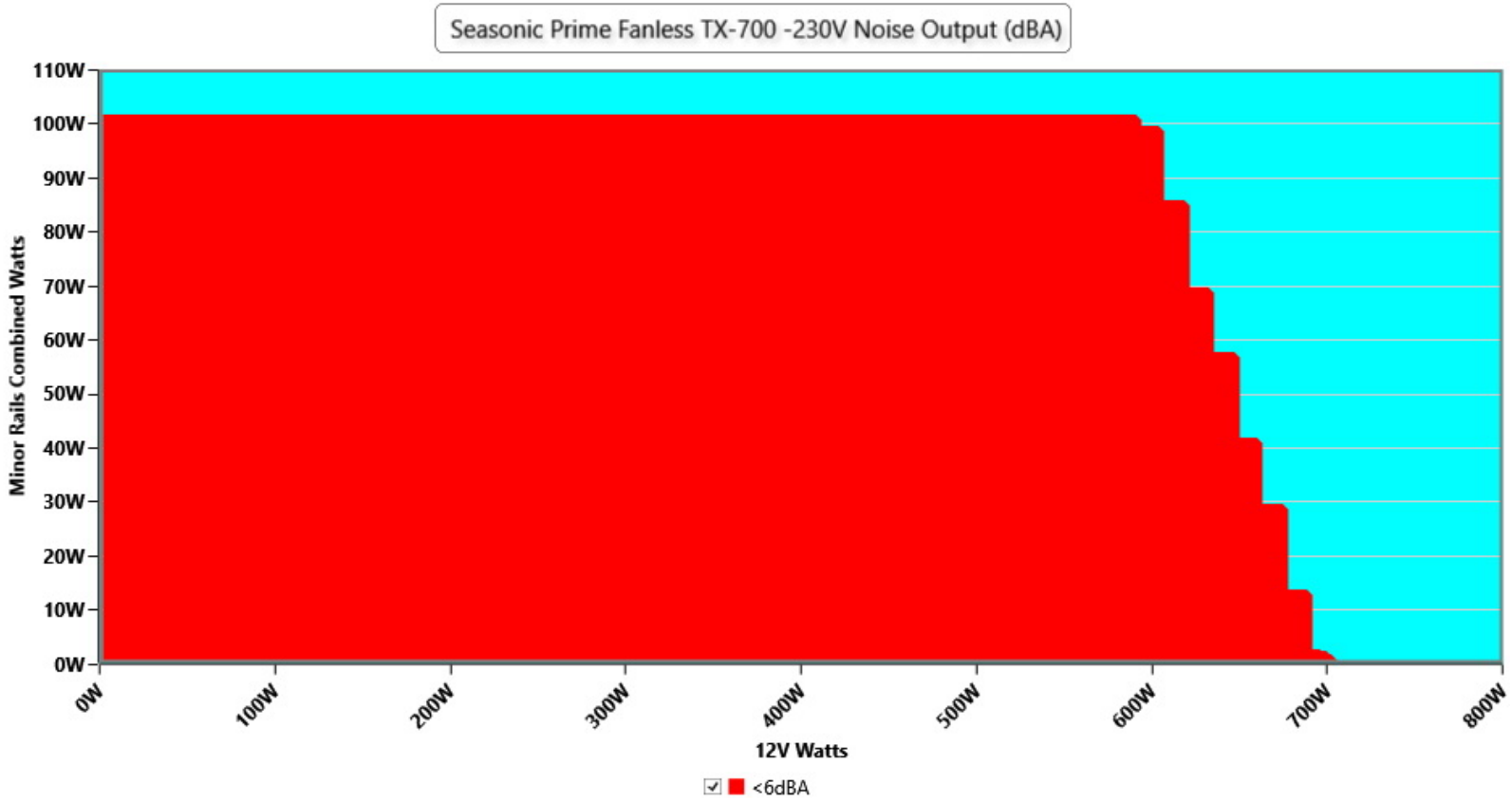
115V



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

230V

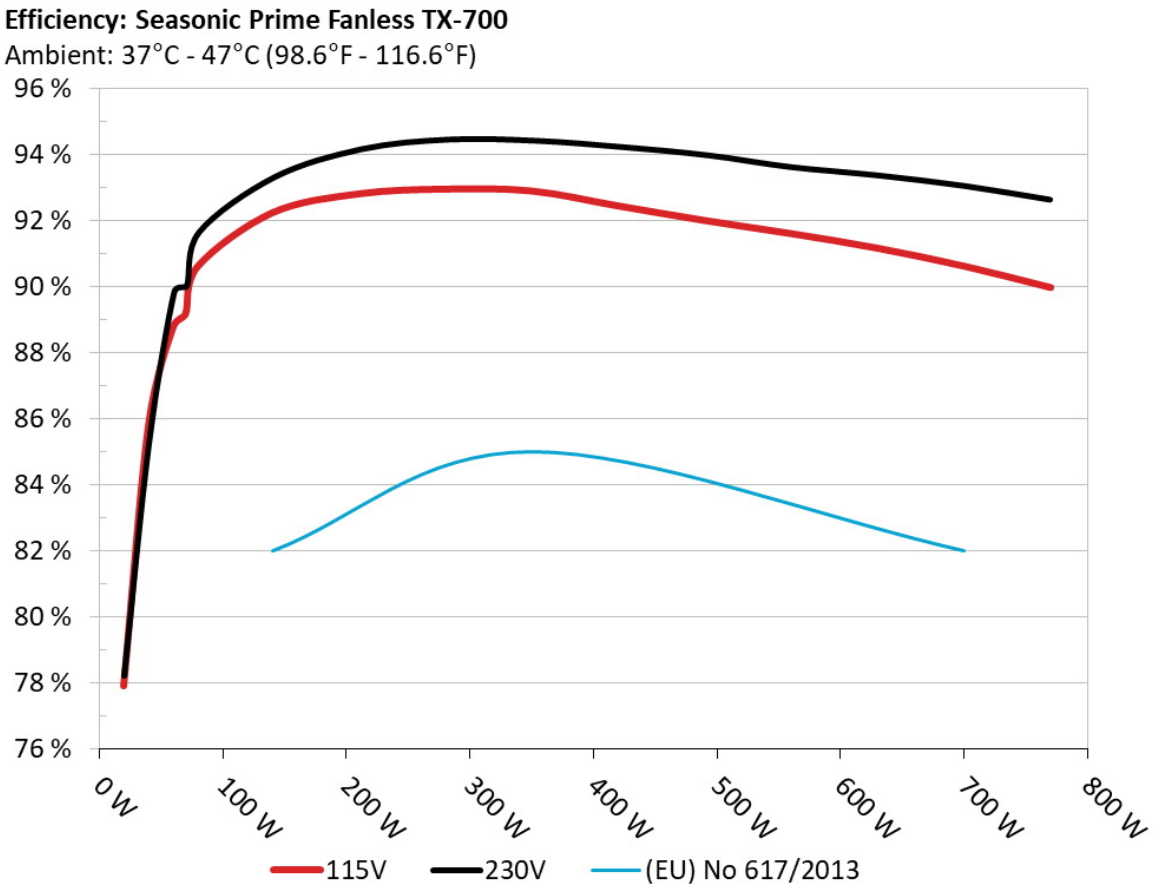


INFO

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

Indicative Performance

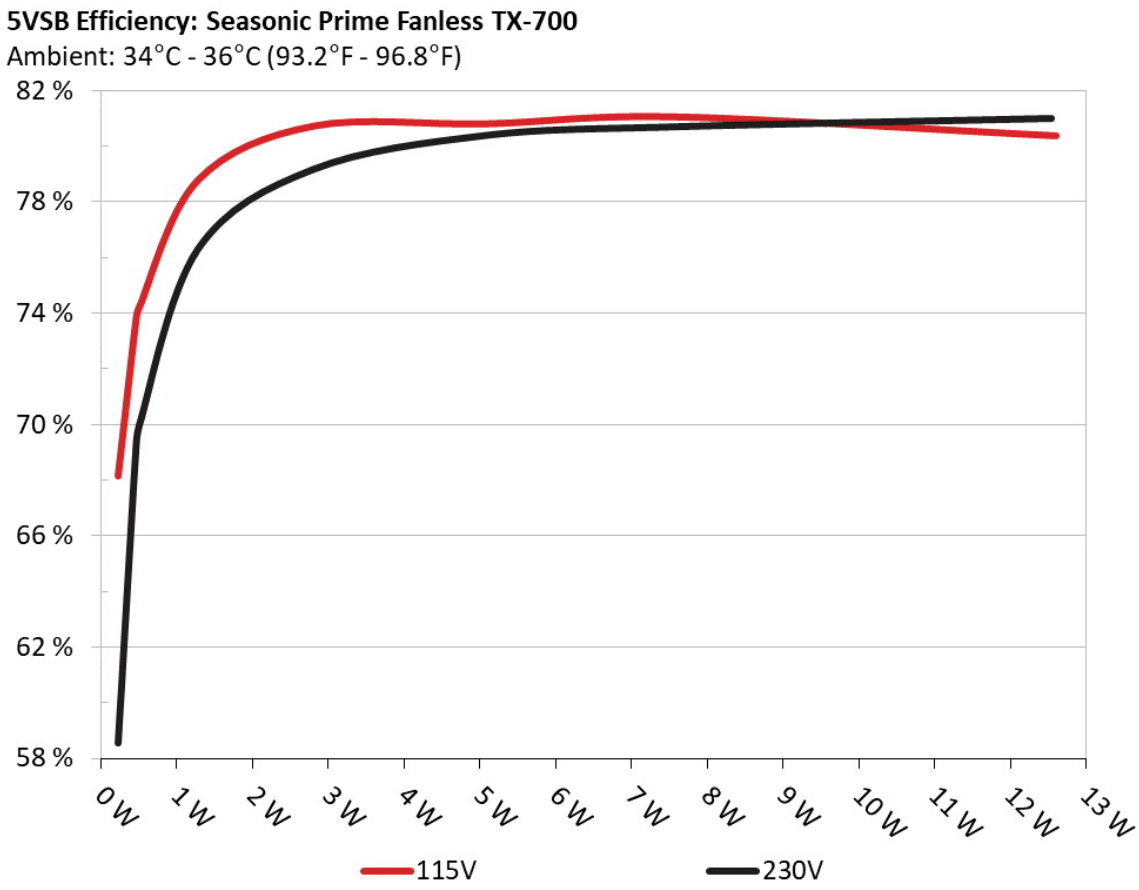
Efficiency under high ambient temperature



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

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231W	68.145%	0.033
	5.122V	0.339W		115.16V
2	0.09A	0.461W	73.64%	0.061
	5.121V	0.626W		115.16V
3	0.55A	2.807W	80.719%	0.262
	5.103V	3.477W		115.17V
4	1A	5.087W	80.799%	0.358
	5.085V	6.295W		115.17V
5	1.5A	7.604W	81.047%	0.413
	5.068V	9.382W		115.17V
6	2.501A	12.599W	80.37%	0.467
	5.038V	15.676W		115.16V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231W	58.552%	0.012
	5.12V	0.395W		230.37V
2	0.09A	0.461W	68.924%	0.02
	5.119V	0.669W		230.36V
3	0.55A	2.805W	79.146%	0.102
	5.098V	3.544W		230.34V
4	1A	5.079W	80.364%	0.171
	5.078V	6.32W		230.32V
5	1.5A	7.585W	80.675%	0.238
	5.056V	9.402W		230.27V
6	2.501A	12.54W	80.973%	0.319
	5.015V	15.486W		230.31V

Supplementary Tests (For Reference)

Typical Load Tests

115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
10%	3.988A	1.96A	1.973A	1.008A	70.006	89.185%	45.37°C	0.957
	12.137V	5.104V	3.346V	4.96V	78.495		40.36°C	115.2V
20%	8.990A	2.948A	2.976A	1.216A	139.962	92.251%	46.16°C	0.984
	12.131V	5.09V	3.327V	4.935V	151.718		40.57°C	115.19V
30%	14.348A	3.447A	3.485A	1.426A	210.01	92.829%	47.57°C	0.989
	12.124V	5.078V	3.314V	4.91V	226.233		41.35°C	115.21V
40%	19.711A	3.949A	4A	1.637A	280.06	92.973%	48.71°C	0.992
	12.117V	5.066V	3.3V	4.887V	301.226		42.15°C	115.18V
50%	24.730A	4.95A	5.031A	1.851A	350.02	92.916%	49.31°C	0.997
	12.111V	5.052V	3.28V	4.862V	376.703		42.35°C	115.17V
60%	29.759A	5.957A	6.075A	2.001A	419.752	92.465%	50.16°C	0.995
	12.105V	5.037V	3.26V	4.839V	453.959		42.48°C	115.14V
70%	34.801A	6.971A	7.133A	2.286A	490.204	92.02%	51.28°C	0.995
	12.100V	5.022V	3.239V	4.812V	532.715		43.27°C	115.13V
80%	39.846A	7.99A	8.203A	2.4A	559.822	91.624%	52.11°C	0.996
	12.095V	5.008V	3.218V	4.792V	610.997		43.49°C	115.15V
90%	45.294A	8.512A	8.744A	2.514A	630.065	91.18%	53.92°C	0.997
	12.089V	4.994V	3.202V	4.774V	691.011		44.82°C	115.16V
100%	50.748A	9.038A	9.312A	2.629A	700.4	90.633%	55.54°C	0.997
	12.083V	4.98V	3.19V	4.756V	772.786		45.6°C	115.18V
110%	55.806A	10.08A	10.519A	2.638A	769.828	89.989%	57.27°C	0.997
	12.078V	4.961V	3.166V	4.739V	855.467		46.61°C	115.18V
CL1	0.115A	11.925A	12.268A	0A	101.318	87.273%	49.7°C	0.975
	12.152V	5.049V	3.236V	4.979V	116.094		42.76°C	115.21V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
CL2	0.115A	19.859A	0A	0A	101.4	86.567%	51.4°C	0.975
	12.152V	5.036V	3.343V	4.997V	117.134		43.77°C	115.21V
CL3	0.115A	0A	20.726A	0A	67.398	80.033%	53.47°C	0.96
	12.149V	5.083V	3.184V	4.97V	84.213		44.77°C	115.2V
CL4	57.975A	0A	0A	0A	700.244	91.733%	54.96°C	0.997
	12.078V	5.027V	3.295V	4.911V	763.347		45.7°C	115.15V

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
10%	4.040A	2A	2A	1A	70.914	90.014%	45.38°C	0.756
	12.140V	5.103V	3.346V	4.961V	78.781		40.44°C	230.41V
20%	9.106A	3.001A	3A	1.2A	141.691	93.303%	46.03°C	0.891
	12.136V	5.089V	3.328V	4.936V	151.862		40.78°C	230.41V
30%	14.507A	3.501A	3.5A	1.4A	212.262	94.154%	46.81°C	0.938
	12.132V	5.077V	3.315V	4.913V	225.442		40.96°C	230.42V
40%	19.908A	4.001A	4A	1.6A	282.765	94.448%	48.17°C	0.959
	12.129V	5.066V	3.301V	4.89V	299.387		41.88°C	230.43V
50%	24.966A	5.001A	5.001A	1.8A	353.196	94.412%	49.23°C	0.971
	12.126V	5.052V	3.282V	4.866V	374.101		42.29°C	230.42V
60%	30.033A	6.001A	6A	2.001A	423.603	94.22%	50.21°C	0.976
	12.124V	5.037V	3.263V	4.842V	449.589		42.79°C	230.44V
70%	35.091A	7.003A	7A	2.201A	493.819	93.967%	51.61°C	0.982
	12.121V	5.022V	3.243V	4.82V	525.524		43.65°C	230.44V
80%	39.775A	7.989A	8.199A	2.398A	559.7	93.615%	52.53°C	0.984
	12.112V	5.008V	3.22V	4.796V	597.872		44.14°C	230.44V
90%	45.206A	8.512A	8.738A	2.512A	630.023	93.365%	53.84°C	0.987
	12.112V	4.994V	3.205V	4.778V	674.794		44.68°C	230.44V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
100%	50.637A	9.039A	9.315A	2.627A	700.385	93.045%	55.63°C	0.988
	12.109V	4.979V	3.188V	4.759V	752.735		45.55°C	230.44V
110%	55.675A	10.079A	10.516A	2.637A	769.816	92.628%	57.37°C	0.989
	12.106V	4.962V	3.166V	4.742V	831.082		46.59°C	230.44V
CL1	0.115A	11.928A	12.269A	0A	101.32	88.016%	49.47°C	0.845
	12.150V	5.048V	3.236V	4.976V	115.116		42.53°C	230.42V
CL2	0.115A	19.866A	0A	0A	101.401	87.304%	51.41°C	0.847
	12.151V	5.034V	3.342V	4.995V	116.147		43.68°C	230.42V
CL3	0.115A	0A	20.734A	0A	67.397	80.506%	52.69°C	0.769
	12.148V	5.082V	3.183V	4.971V	83.716		44.34°C	230.42V
CL4	57.825A	0A	0A	0A	700.245	94.158%	54.87°C	0.988
	12.110V	5.027V	3.295V	4.911V	743.69		45.83°C	230.43V

The results above are not used in the certification process

Light Load Tests

115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
20W	1.225A	0.489A	0.49A	0.199A	20.005	77.906%	39.83°C	0.802
	12.129V	5.117V	3.368V	5.015V	25.678		36.69°C	115.18V
40W	2.696A	0.684A	0.687A	0.3A	40.004	85.782%	40.86°C	0.912
	12.127V	5.113V	3.364V	5.005V	46.634		37.21°C	115.16V
60W	4.165A	0.881A	0.884A	0.4A	60.003	88.788%	42.05°C	0.949
	12.133V	5.111V	3.359V	4.996V	67.58		37.98°C	115.2V
80W	5.631A	1.077A	1.082A	0.501A	79.964	90.633%	43.56°C	0.964
	12.135V	5.108V	3.355V	4.986V	88.228		39.09°C	115.22V

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Temps (In/Out)	PF/AC Volts
20W	1.240A	0.5A	0.5A	0.2A	20.298	78.225%	39.75°C	0.459
	12.132V	5.117V	3.368V	5.013V	25.948		36.63°C	230.4V
40W	2.720A	0.7A	0.7A	0.3A	40.442	85.283%	40.94°C	0.626
	12.132V	5.114V	3.364V	5.004V	47.421		37.36°C	230.41V
60W	4.224A	0.9A	0.9A	0.4A	60.907	89.848%	42.56°C	0.721
	12.140V	5.11V	3.36V	4.996V	67.789		38.54°C	230.42V
80W	5.704A	1.1A	1.1A	0.5A	81.049	91.648%	43.74°C	0.783
	12.139V	5.107V	3.355V	4.986V	88.435		39.27°C	230.42V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	15.36mV	7.06mV	5.94mV	7.03mV	Pass
20% Load	16.43mV	7.67mV	6.09mV	7.34mV	Pass
30% Load	17.25mV	8.08mV	6.55mV	8.41mV	Pass
40% Load	10.86mV	8.28mV	6.55mV	8.57mV	Pass
50% Load	13.03mV	9.46mV	9.31mV	16.82mV	Pass
60% Load	12.75mV	10.94mV	7.88mV	9.69mV	Pass
70% Load	14.29mV	11.20mV	9.52mV	10.20mV	Pass
80% Load	15.36mV	11.25mV	15.71mV	9.58mV	Pass
90% Load	16.13mV	11.71mV	14.89mV	9.63mV	Pass
100% Load	23.84mV	12.95mV	16.41mV	11.81mV	Pass
110% Load	25.25mV	13.64mV	17.11mV	12.23mV	Pass
Crossload1	16.85mV	9.46mV	16.37mV	6.06mV	Pass
Crossload2	14.80mV	9.26mV	6.50mV	6.12mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	14.64mV	9.15mV	20.32mV	6.22mV	Pass
Crossload4	23.95mV	12.12mV	7.56mV	10.83mV	Pass

The results above are not used in the certification process

230V

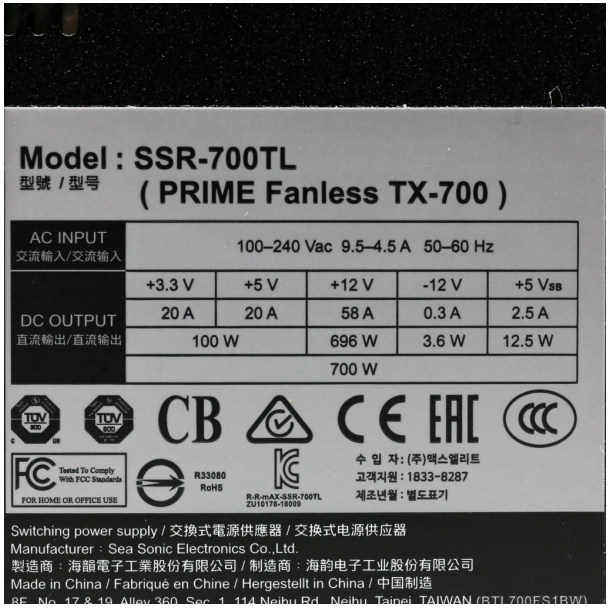
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.45mV	7.06mV	6.09mV	6.88mV	Pass
20% Load	17.71mV	7.57mV	6.09mV	7.44mV	Pass
30% Load	16.94mV	8.23mV	6.35mV	7.80mV	Pass
40% Load	11.17mV	8.69mV	6.70mV	9.02mV	Pass
50% Load	10.25mV	9.21mV	7.27mV	8.72mV	Pass
60% Load	11.17mV	10.64mV	10.44mV	9.28mV	Pass
70% Load	13.16mV	11.46mV	11.77mV	9.58mV	Pass
80% Load	14.90mV	11.81mV	14.84mV	10.91mV	Pass
90% Load	15.46mV	11.61mV	15.30mV	9.33mV	Pass
100% Load	23.20mV	12.02mV	16.10mV	12.24mV	Pass
110% Load	25.52mV	12.78mV	17.56mV	12.42mV	Pass
Crossload1	19.40mV	9.81mV	15.31mV	6.01mV	Pass
Crossload2	16.13mV	9.67mV	6.55mV	5.96mV	Pass
Crossload3	15.25mV	8.74mV	19.75mV	5.76mV	Pass
Crossload4	23.93mV	12.20mV	17.37mV	11.06mV	Pass

The results above are not used in the certification process

Seasonic Prime Fanless TX-700



Top side



Power specifications label