



Seasonic Prime Titanium Fanless 600W

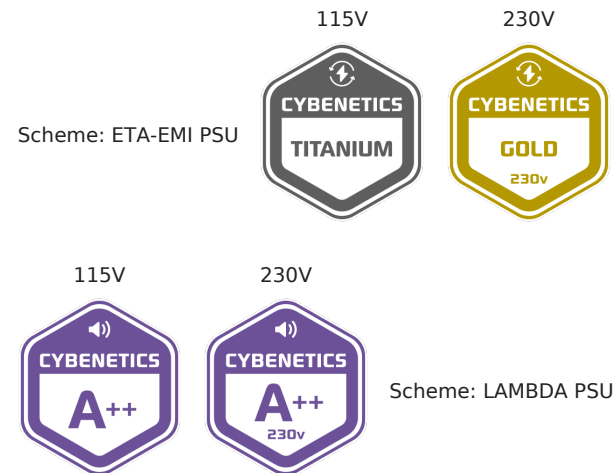
Serial Number R1708TA105680169

Lab ID 258

Certification ID 25258

Test Result Report ID:

Certificate Issue Date: Dec 29, 2018



A handwritten signature in blue ink, appearing to read 'A. Bitziopoulos', written over a faint circular stamp.

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 Titanium Fanless 600W
OEM/ODM	Seasonic
Serial Number	R1708TA105680169
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60

Rated Power (W)	600
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	Passive
Semi-Passive Operation	X
Cybenetics Testing Information	
Lab ID	258
Date of receipt	Dec 22, 2018
Testing Date	Dec 26, 2018
Report Issued Date	Dec 29, 2018
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 (650mm)	2	2	18AWG	No
6+2 pin PCIe (680mm+80mm)	2	4	18AWG	No
SATA (450mm+110mm+110mm+110mm)	1	4	18AWG	No
SATA (350mm+110mm)	1	2	18AWG	No
4 pin Molex (450mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex (350mm+120mm)	1	2	18AWG	No
AC Power Cord (1350mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	50	2.5	0.3
	Watts	100		600	12.5	3.6
Total Max. Power (W)		600				

Parts Description

General Data	
Manufacturer (OEM)	Seasonic
Platform Model	Prime Fanless
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 IPP50R140CP (550V, 15A @ 100°C, 0.14 Ohm)
APFC Boost Diode	1x CREE C3D06060A (600V, 6A @ 154°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 450uF, 2000h @ 105°C, CE) 1x Nippon Chemi-Con (400V, 390uF, 2000h @ 105°C, CE)
Main Switchers	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14 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 @ 25°C, 1.4mOhm)
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0906NS PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105°C, W), Nippon Chemi-Con (4,000-10,000h @ 105°C, KY), Nippon Chemi-Con (4,000-10,000h @ 105°C, KYB), Rubycon (5VSB circuit, 3,000-6,000h @ 105°C, YXG), Nichicon (4,000-10,000h @ 105°C, HE) Polymers: FPCAP, Nippon Chemi-Con

Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG) & AS393M
5VSB Circuit	
Buck Converter	AME5268 (3A
Rectifiers	STMicroelectronics STU6N65K3 (650V, 3A @ 100°C, 1.3Ohm), 6A4 SBR (400V, 6A @ 75°C), Infineon BSC0906NS (30V, 40A @ 100°C, 4.5 mOhm)

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)	92.462%
Average Noise Output (>1450 Load Combinations)	6.00dBA
Average PF (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0544W
Non-Accredited	
12V Ripple (Full Load)	18.31mV
5V Ripple (Full Load)	14.62mV
3.3V Ripple (Full Load)	11.11mV
5VSB Ripple (Full Load)	8.75mV
12V Load Regulation	0.13%
5V Load Regulation	0.12%
3.3V Load Regulation	0.24%
5VSB Load Regulation	1.13%
Inrush Current	25.419A

230V

Accredited		
Average Efficiency (>1450 load combinations)	93.957%	
Average Noise Output (>1450 Load Combinations)	6.00dBA	
Average PF (>1450 Load Combinations)	0.932	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0888W	
Non-Accredited		
12V Ripple (Full Load)	18.19mV	
5V Ripple (Full Load)	14.28mV	
3.3V Ripple (Full Load)	11.24mV	
5VSB Ripple (Full Load)	8.21mV	
12V Load Regulation	0.10%	
5V Load Regulation	0.10%	
3.3V Load Regulation	0.21%	
5VSB Load Regulation	1.15%	
Inrush Current	63.971A	
Hold-Up Time & PWR_OK Signal	41.00ms	
AC Loss to PWR_OK Hold Up Time	36.20ms	
PWR_OK Inactive to DC Loss Delay	4.80ms	
OPP (0.00°C / 0.00°C)	-	-

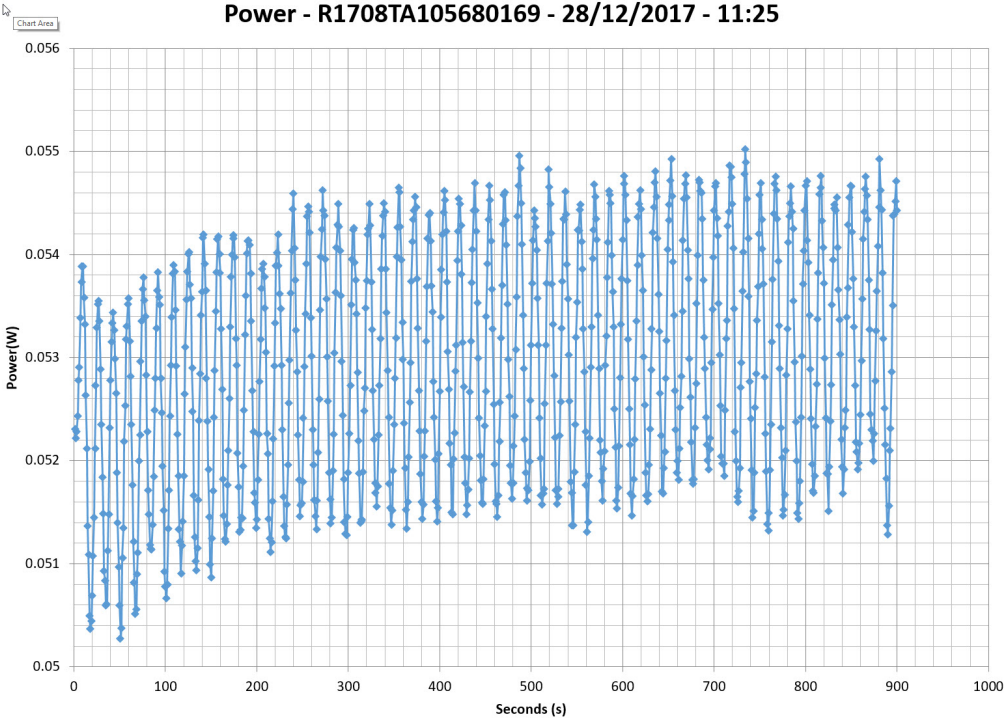
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	41
AC Loss to PWR_OK Hold Up Time (ms)	36.2
PWR_OK Inactive to DC Loss Delay (ms)	4.8

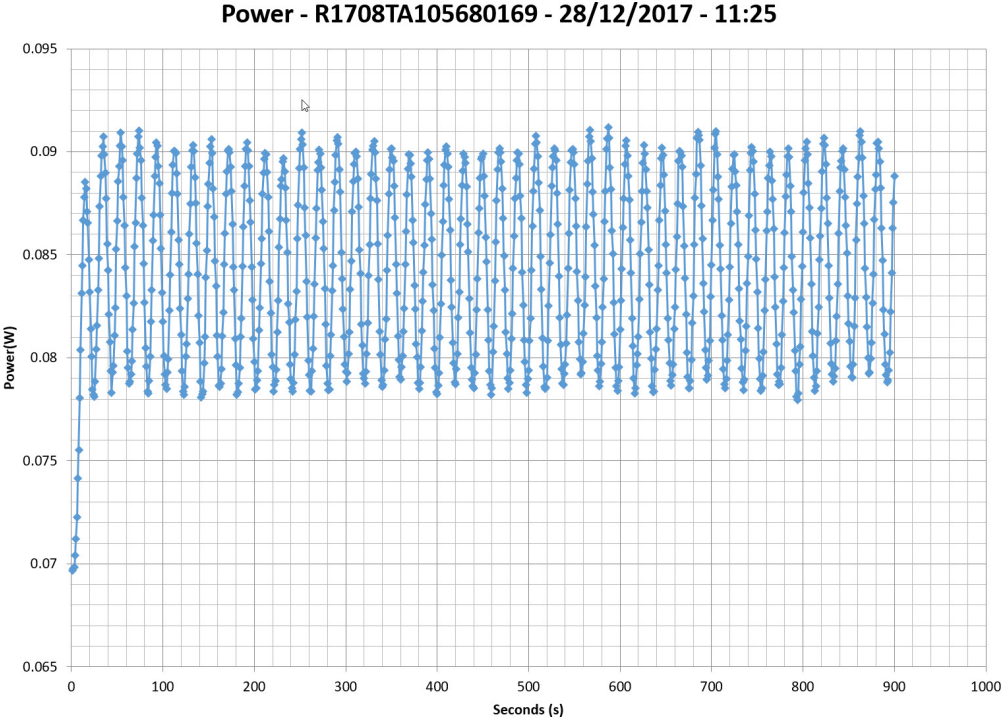
Vampire Power

Graphs

115V

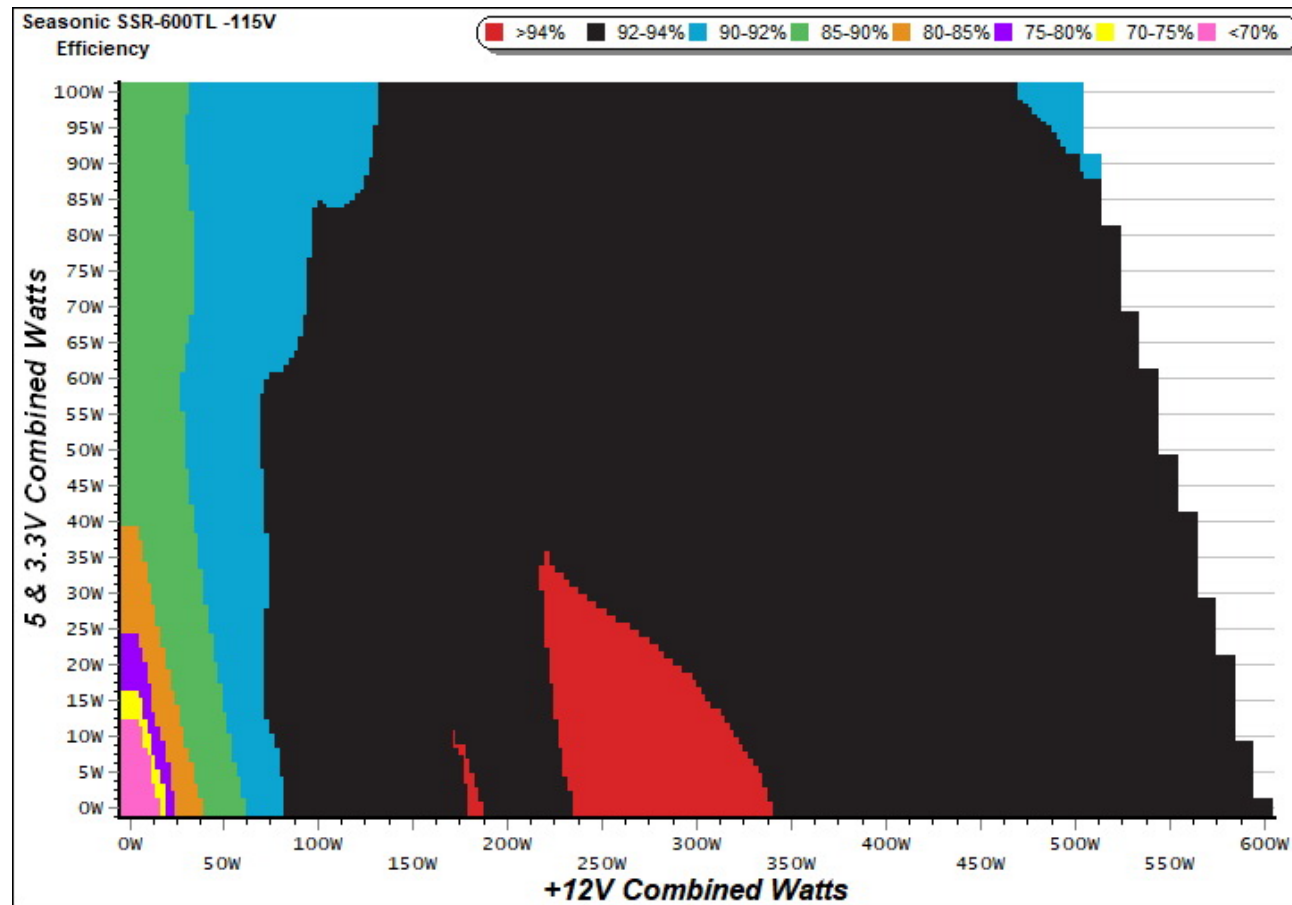


230V



Efficiency Graph

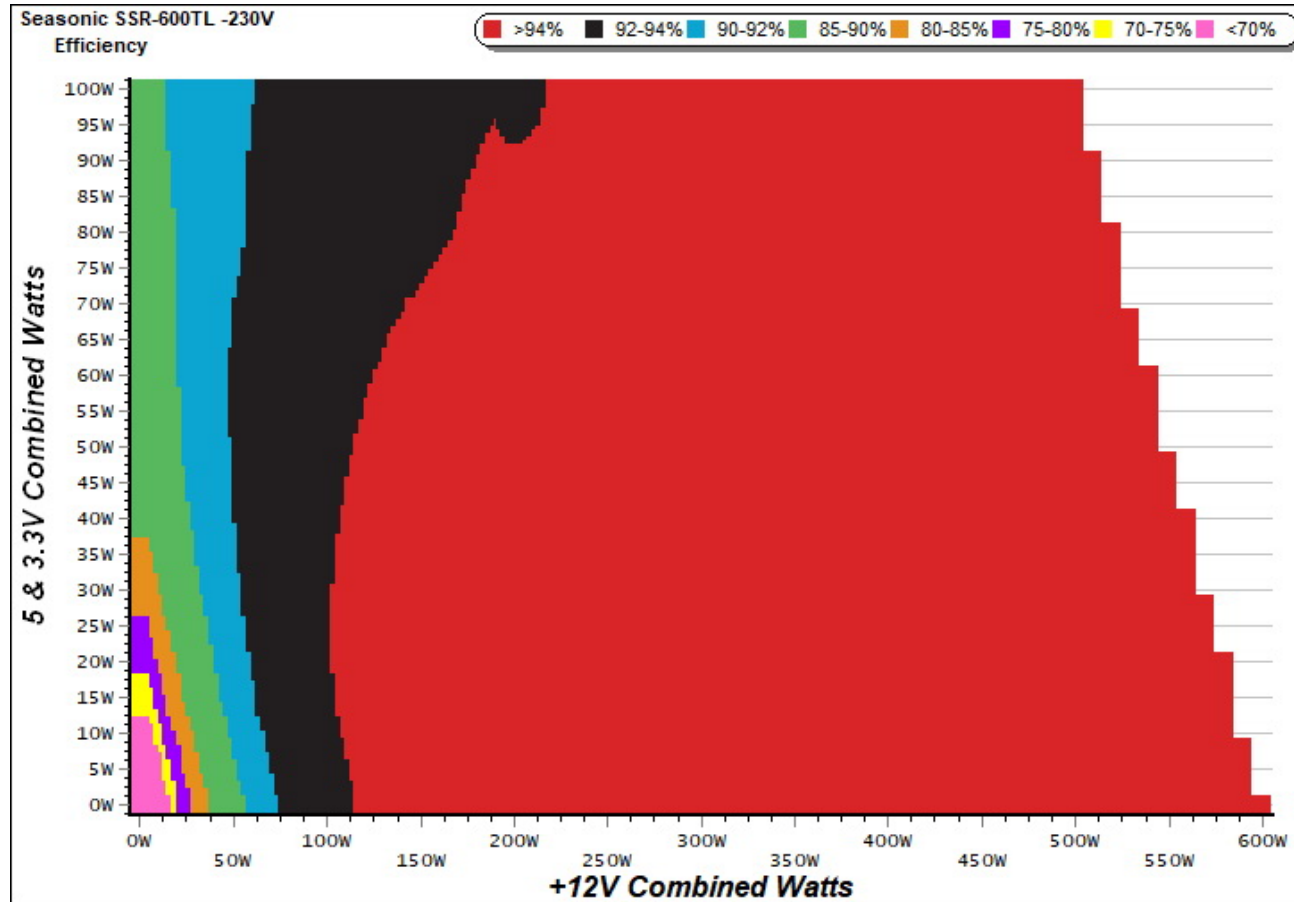
115V



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

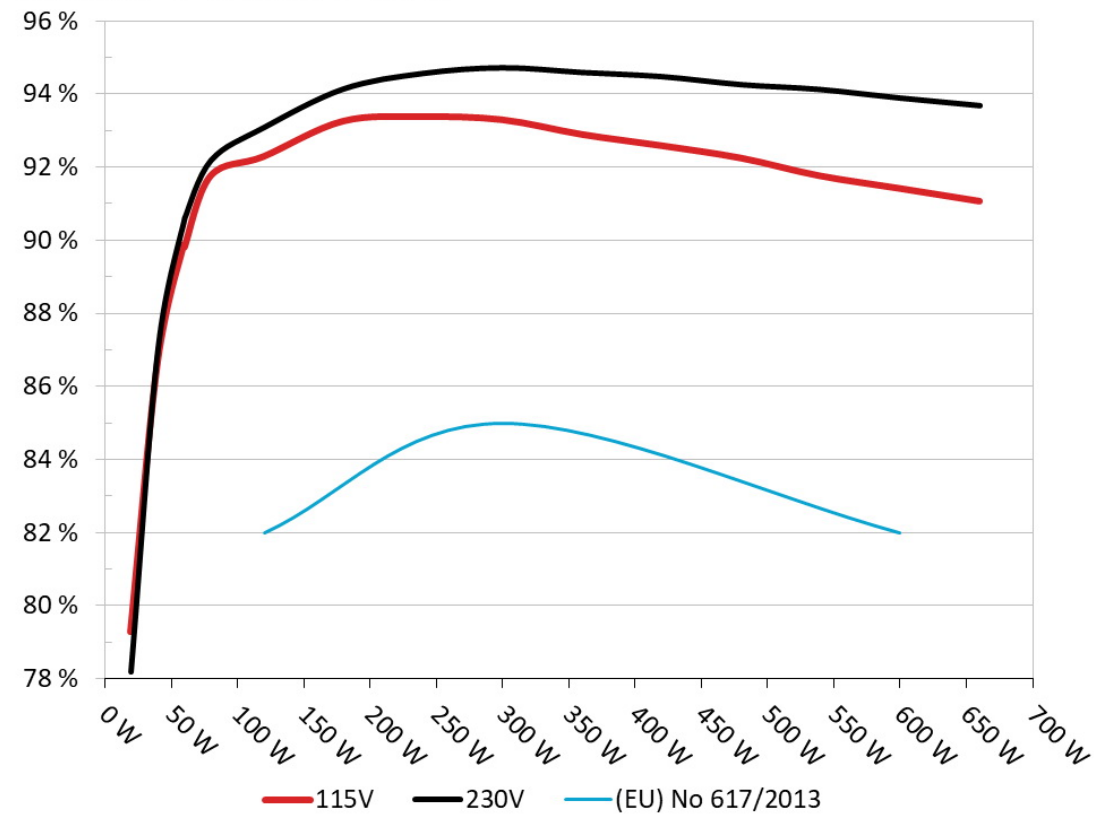
This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

Indicative Performance

Efficiency under high ambient temperature

Efficiency: Seasonic SSR-600TL

Ambient: 37°C - 45°C (98.6°F - 113°F)

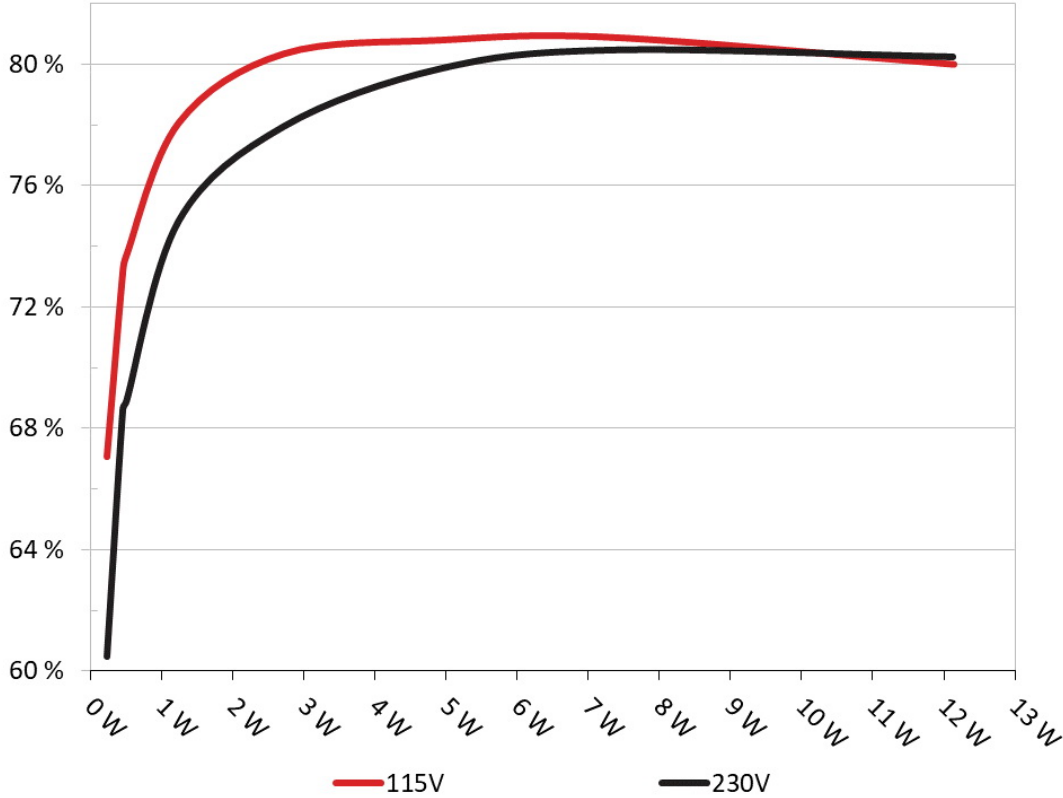


INFO

The PSU's efficiency under high ambient temperatures

5VSB Efficiency

5VSB Efficiency: Seasonic SSR-600TL
Ambient: 34°C - 36°C (93.2°F - 96.8°F)



INFO

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	0.222	67.069%	0.029
	4.938V	0.331		115.27V
2	0.090A	0.444	73.147%	0.053
	4.936V	0.607		115.27V
3	0.550A	2.706	80.344%	0.240
	4.920V	3.368		115.26V
4	1.000A	4.906	80.797%	0.343
	4.906V	6.072		115.25V
5	1.500A	7.335	80.889%	0.404
	4.890V	9.068		115.26V
6	2.500A	12.143	79.999%	0.464
	4.857V	15.179		115.25V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.222	60.490%	0.011
	4.937V	0.367		230.81V
2	0.090A	0.444	68.624%	0.019
	4.936V	0.647		230.81V
3	0.550A	2.705	77.954%	0.095
	4.918V	3.470		230.81V
4	1.000A	4.904	79.857%	0.158
	4.903V	6.141		230.81V
5	1.500A	7.330	80.479%	0.216
	4.886V	9.108		230.81V
6	2.500A	12.128	80.254%	0.298
	4.851V	15.112		230.81V

Supplementary Tests (For Reference)

Typical 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
1	3.152A	1.983A	1.972A	0.997A	59.929	89.810%	0	<6.0	43.80°C	0.945
	12.164V	5.041V	3.343V	5.015V	66.729				37.70°C	115.29V
2	7.298A	2.976A	2.960A	1.198A	119.660	92.300%	0	<6.0	44.52°C	0.983
	12.163V	5.040V	3.342V	5.011V	129.643				37.87°C	115.21V
3	11.804A	3.474A	3.441A	1.399A	179.568	93.269%	0	<6.0	44.98°C	0.992
	12.162V	5.040V	3.341V	5.005V	192.526				38.08°C	115.13V
4	16.316A	3.969A	3.950A	1.601A	239.601	93.393%	0	<6.0	45.76°C	0.993
	12.160V	5.039V	3.340V	5.000V	256.550				38.46°C	115.05V
5	20.495A	4.962A	4.940A	1.802A	299.693	93.308%	0	<6.0	46.86°C	0.995
	12.159V	5.038V	3.339V	4.995V	321.186				39.33°C	115.06V
6	24.679A	5.953A	5.929A	2.004A	359.813	92.907%	0	<6.0	48.67°C	0.992
	12.157V	5.038V	3.339V	4.991V	387.284				40.51°C	114.98V
7	28.829A	6.949A	6.917A	2.207A	419.540	92.601%	0	<6.0	50.42°C	0.992
	12.156V	5.037V	3.338V	4.986V	453.064				41.33°C	114.89V
8	33.046A	7.943A	7.910A	2.410A	480.051	92.258%	0	<6.0	52.65°C	0.993
	12.154V	5.037V	3.337V	4.981V	520.338				42.76°C	114.81V
9	37.595A	8.441A	8.393A	2.410A	539.364	91.774%	0	<6.0	54.01°C	0.994
	12.152V	5.036V	3.336V	4.980V	587.707				43.64°C	114.81V
10	42.210A	8.939A	8.904A	2.512A	600.069	91.425%	0	<6.0	55.02°C	0.995
	12.150V	5.035V	3.336V	4.978V	656.353				44.26°C	114.72V
11	47.161A	8.940A	8.904A	2.512A	660.122	91.077%	0	<6.0	57.43°C	0.995
	12.148V	5.035V	3.335V	4.977V	724.796				45.18°C	114.63V
CL1	0.733A	12.002A	12.000A	0.000A	109.494	88.811%	0	<6.0	54.21°C	0.980
	12.158V	5.038V	3.343V	5.062V	123.289				43.91°C	115.21V

CL2	50.007A	1.001A	1.000A	1.000A	620.818	91.973%	0	<6.0	55.39°C	0.995
	12.147V	5.036V	3.335V	5.007V	675.002				43.84°C	114.70V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.151A	1.982A	1.972A	0.997A	59.900	90.519%	0	<6.0	45.23°C	0.720
	12.161V	5.040V	3.342V	5.015V	66.174				37.45°C	230.80V
2	7.297A	2.975A	2.961A	1.198A	119.616	93.087%	0	<6.0	45.75°C	0.855
	12.159V	5.040V	3.342V	5.010V	128.499				37.71°C	230.76V
3	11.803A	3.470A	3.441A	1.399A	179.500	94.141%	0	<6.0	46.63°C	0.914
	12.159V	5.040V	3.341V	5.005V	190.672				38.19°C	230.72V
4	16.314A	3.969A	3.950A	1.601A	239.525	94.568%	0	<6.0	47.62°C	0.945
	12.157V	5.039V	3.340V	4.999V	253.283				39.07°C	230.72V
5	20.494A	4.961A	4.939A	1.802A	299.610	94.723%	0	<6.0	48.37°C	0.959
	12.156V	5.038V	3.339V	4.995V	316.300				39.55°C	230.73V
6	24.675A	5.953A	5.930A	2.004A	359.710	94.595%	0	<6.0	49.12°C	0.971
	12.155V	5.038V	3.338V	4.990V	380.265				40.27°C	230.68V
7	28.825A	6.947A	6.920A	2.207A	419.432	94.483%	0	<6.0	51.43°C	0.974
	12.154V	5.037V	3.338V	4.985V	443.921				41.48°C	230.64V
8	33.044A	7.942A	7.908A	2.410A	479.937	94.262%	0	<6.0	53.09°C	0.980
	12.152V	5.036V	3.337V	4.980V	509.154				42.32°C	230.59V
9	37.592A	8.440A	8.389A	2.410A	539.234	94.130%	0	<6.0	54.19°C	0.983
	12.150V	5.036V	3.336V	4.980V	572.862				43.07°C	230.54V
10	42.204A	8.937A	8.902A	2.512A	599.934	93.894%	0	<6.0	56.54°C	0.984
	12.149V	5.035V	3.336V	4.977V	638.945				44.00°C	230.54V
11	47.158A	8.938A	8.903A	2.512A	659.975	93.687%	0	<6.0	59.14°C	0.987
	12.146V	5.035V	3.335V	4.976V	704.446				45.24°C	230.54V
CL1	0.726A	12.000A	11.995A	0.000A	109.381	89.696%	0	<6.0	56.03°C	0.847
	12.156V	5.038V	3.343V	5.061V	121.946				43.75°C	230.95V

CL2	49.996A	0.999A	0.997A	1.000A	620.614	94.409%	0	<6.0	57.99°C	0.985
	12.146V	5.035V	3.335V	5.007V	657.368				44.11°C	230.58V

The results above are not used in the certification process

Light Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.171A	0.491A	0.476A	0.199A	19.304	79.277%	0	<6.0	0.779
	12.156V	5.041V	3.344V	5.035V	24.350				115.34V
2	2.427A	0.991A	0.985A	0.398A	39.795	86.688%	0	<6.0	0.904
	12.156V	5.041V	3.344V	5.030V	45.906				115.32V
3	3.610A	1.486A	1.464A	0.597A	59.305	89.879%	0	<6.0	0.944
	12.166V	5.041V	3.343V	5.026V	65.983				115.29V
4	4.860A	1.984A	1.973A	0.797A	79.715	91.769%	0	<6.0	0.965
	12.164V	5.041V	3.343V	5.021V	86.865				115.26V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.176A	0.494A	0.476A	0.199A	19.372	78.201%	0	<6.0	0.456
	12.151V	5.040V	3.344V	5.035V	24.772				230.82V
2	2.431A	0.989A	0.985A	0.398A	39.817	87.056%	0	<6.0	0.631
	12.151V	5.040V	3.343V	5.030V	45.737				230.81V
3	3.612A	1.486A	1.464A	0.597A	59.308	90.614%	0	<6.0	0.717
	12.161V	5.040V	3.342V	5.025V	65.451				230.79V
4	4.861A	1.982A	1.972A	0.797A	79.695	92.192%	0	<6.0	0.783
	12.161V	5.040V	3.342V	5.021V	86.445				230.79V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.2 mV	7.5 mV	5.8 mV	3.3 mV	Pass
20% Load	15.4 mV	8.3 mV	6.8 mV	3.5 mV	Pass
30% Load	17.4 mV	9.1 mV	7.2 mV	3.8 mV	Pass
40% Load	11.9 mV	9.4 mV	7.6 mV	4.3 mV	Pass
50% Load	10.6 mV	9.7 mV	8.1 mV	4.7 mV	Pass
60% Load	12.5 mV	10.9 mV	8.5 mV	5.3 mV	Pass
70% Load	14.1 mV	11.9 mV	8.9 mV	6.3 mV	Pass
80% Load	15.2 mV	13.5 mV	10.1 mV	7.5 mV	Pass
90% Load	16.4 mV	13.7 mV	9.9 mV	8.1 mV	Pass
100% Load	18.3 mV	14.6 mV	11.1 mV	8.8 mV	Pass
110% Load	19.6 mV	15.0 mV	11.3 mV	9.1 mV	Pass
Crossload 1	16.3 mV	11.2 mV	9.8 mV	4.2 mV	Pass
Crossload 2	18.4 mV	12.8 mV	8.5 mV	8.3 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	15.8 mV	7.3 mV	5.9 mV	3.4 mV	Pass
20% Load	17.1 mV	8.1 mV	6.9 mV	3.4 mV	Pass
30% Load	18.9 mV	8.5 mV	7.0 mV	3.7 mV	Pass
40% Load	11.9 mV	8.9 mV	7.7 mV	4.1 mV	Pass
50% Load	10.5 mV	9.8 mV	8.1 mV	4.6 mV	Pass
60% Load	12.1 mV	10.5 mV	8.4 mV	5.1 mV	Pass
70% Load	14.4 mV	11.7 mV	9.0 mV	5.9 mV	Pass
80% Load	15.1 mV	12.8 mV	9.9 mV	6.9 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	16.5 mV	13.7 mV	10.4 mV	7.7 mV	Pass
100% Load	18.2 mV	14.3 mV	11.2 mV	8.2 mV	Pass
110% Load	19.2 mV	14.5 mV	11.3 mV	8.6 mV	Pass
Crossload 1	18.3 mV	11.1 mV	10.1 mV	4.2 mV	Pass
Crossload 2	18.3 mV	12.5 mV	8.2 mV	7.8 mV	Pass

The results above are not used in the certification process

Seasonic Prime Titanium Fanless 600W



Top side

All data and graphs included in this test report can be used by any individual on the following conditions:

- › It should be mentioned that the test results are provided by Cybenetics
- › The link to the original test results document should be provided in any case

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus



Power specifications label

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

www.cybenetics.com - info@cybenetics.com