FSP Technology Advan GM 1000W

Serial Number S3161030004

Lab ID FS10002425

Certification ID 252425

Test Result Report ID: 24PS2425A

Certificate Issue Date: Apr 24, 2024

Scheme: ETA-EMI PSU

115V

230V

Scheme: LAMBDA PSU

115V

230V

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	FSP Technology
Model	Advan GM 1000W
OEM/ODM	FSP
Serial Number	S3161030004
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6
Rated Frequency (Hz)	50-60

Rated Power (W)	1000
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Rifle Bearing Fan (D12SH-12)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	FS10002425
Date of receipt	Apr 9, 2024
Testing Date	Apr 23, 2024
Report Issued Date	Apr 24, 2024
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	No
4+4 pin EPS12V (700mm)	2	2	18AWG	No
6+2 pin PCIe (650mm+155mm)	1	2	16-18AWG	No
6+2 pin PCIe (500mm+150mm)	1	2	16-18AWG	No
12+4 pin PCIe (700mm) (600W)	1	1	16-28AWG	No
SATA (500mm+155mm+155mm+155mm)	2	8	18AWG	No
SATA (500mm+155mm) / 4-pin Molex (+155mm+100mm)	1	2 / 2	18AWG	No

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	83.33	3	0.3
	Watts	100		1000	15	3.6
Total Max. Power (W)		1000				

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	✓
ALPM (Alternative Low Power Mode) compatible	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	87.736%
Average Noise Output (>1450 Load Combinations)	31.98dBA
Average PF (>1450 Load Combinations)	0.991
Efficiency With 10W (≤500W) or 2% (>500W) Load	64.459%
Standby Power Consumption	0.0663W
Non-Accredited	
12V Ripple (Full Load)	44.84mV
5V Ripple (Full Load)	22.97mV
3.3V Ripple (Full Load)	22.70mV
5VSB Ripple (Full Load)	18.83mV
12V Load Regulation	3.33%
5V Load Regulation	2.57%

3.3V Load Regulation	3.90%
5VSB Load Regulation	2.75%
Inrush Current	48.660A

230V

Accredited		
Average Efficiency (>1450 load combinations)	89.888%	
Average Noise Output (>1450 Load Combinations)	32.16dBA	
Average PF (>1450 Load Combinations)	0.959	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.2110W	
Non-Accredited		
12V Ripple (Full Load)	34.23mV	
5V Ripple (Full Load)	20.27mV	
3.3V Ripple (Full Load)	19.97mV	
5VSB Ripple (Full Load)	14.59mV	
12V Load Regulation	3.37%	
5V Load Regulation	2.57%	
3.3V Load Regulation	3.90%	
5VSB Load Regulation	2.75%	
Inrush Current	61.050A	
12V Transient Response (200%)	11.35V	
5V Transient Response (200%)	4.881V	
3.3V Transient Response (200%)	3.093V	
5VSB Transient Response (200%)	4.934V	
Hold-Up Time & PWR_OK Signal	18.30ms	
AC Loss to PWR_OK Hold Up Time	17.60ms	
PWR_OK Inactive to DC Loss Delay	0.70ms	
PSU Timings: T1 (20% / 100%)	45.0ms	44.0ms
PSU Timings: T3 (20% / 100%)	128.0ms	128.0ms
OPP (26.61°C / 41.80°C)	122.96%	111.94%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	18.3
AC Loss to PWR_OK Hold Up Time (ms)	17.6
PWR_OK Inactive to DC Loss Delay (ms)	0.7

Stromverbrauch im Ruhezustand

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.84 V	114.78 V	113.85 V	114.90 V	116.15 V	PASS
Mains Frequency:	60.01 Hz	59.99 Hz	59.40 Hz	60.03 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.420	1.419	1.340	1.423	1.490	PASS
Mains Voltage THD:	0.15 %	0.09 %	N/A	0.25 %	2.00 %	PASS
Real Power:	0.066 W	0.016 W	N/A	0.097 W	N/A	N/A
Apparent Power:	10.317 W	10.296 W	N/A	10.337 W	N/A	N/A
Power Factor:	0.008	N/A	N/A	N/A	N/A	N/A

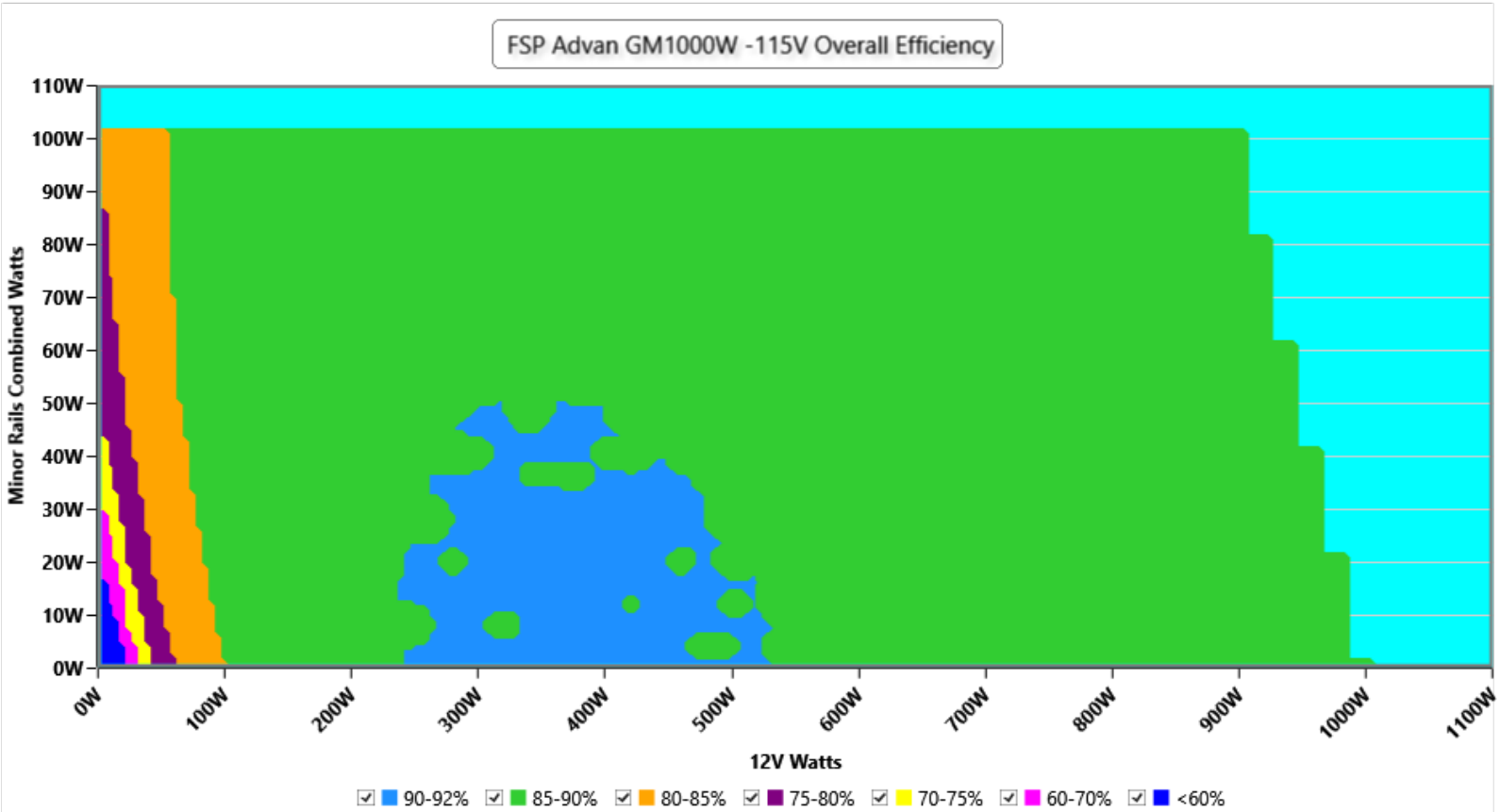
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.87 V	229.78 V	227.70 V	229.94 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.98 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.419	1.418	1.340	1.420	1.490	PASS
Mains Voltage THD:	0.16 %	0.12 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.211 W	0.171 W	N/A	0.249 W	N/A	N/A
Apparent Power:	34.878 W	34.853 W	N/A	34.902 W	N/A	N/A

Power Factor:	0.007	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

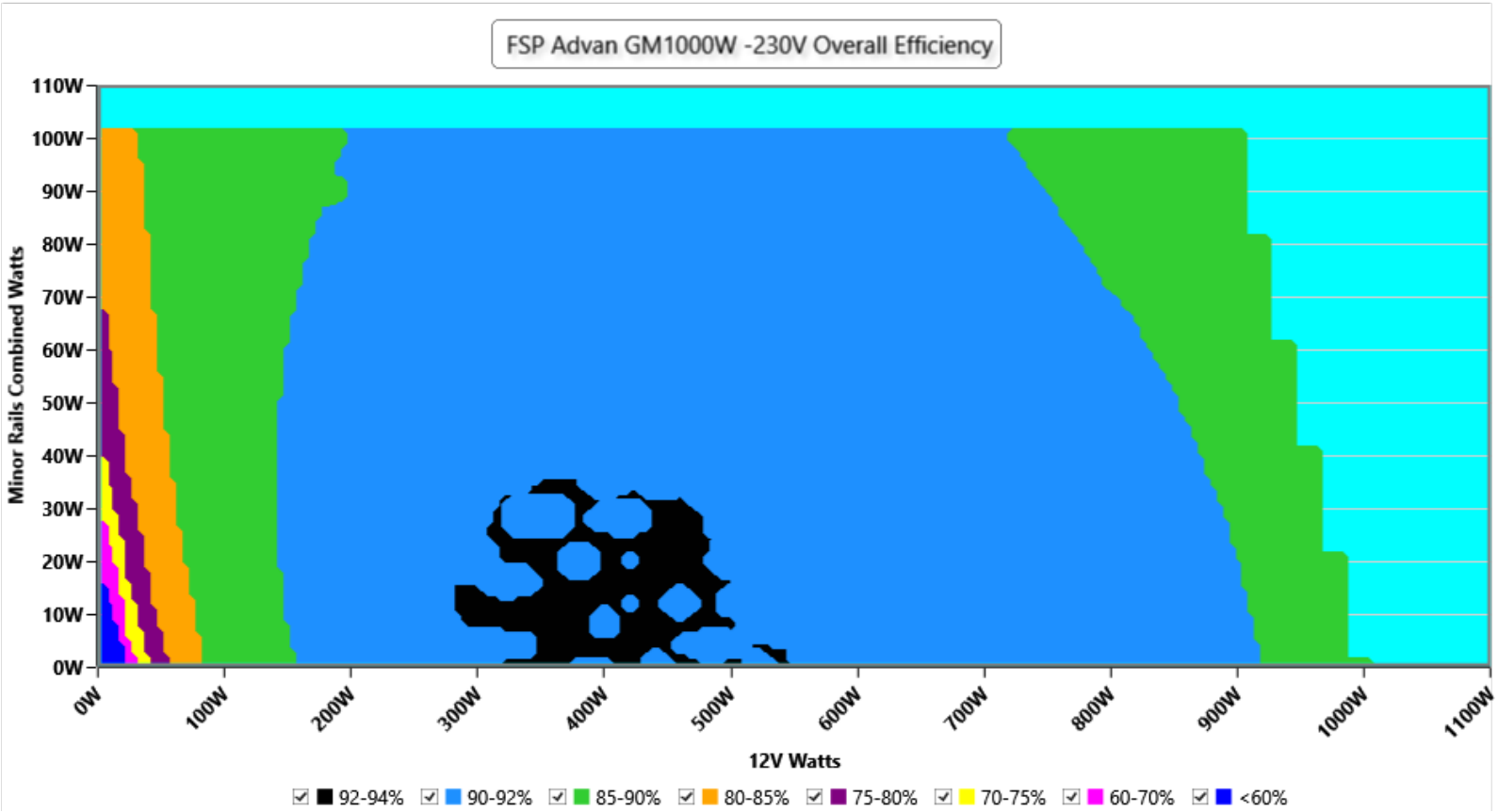
115V



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

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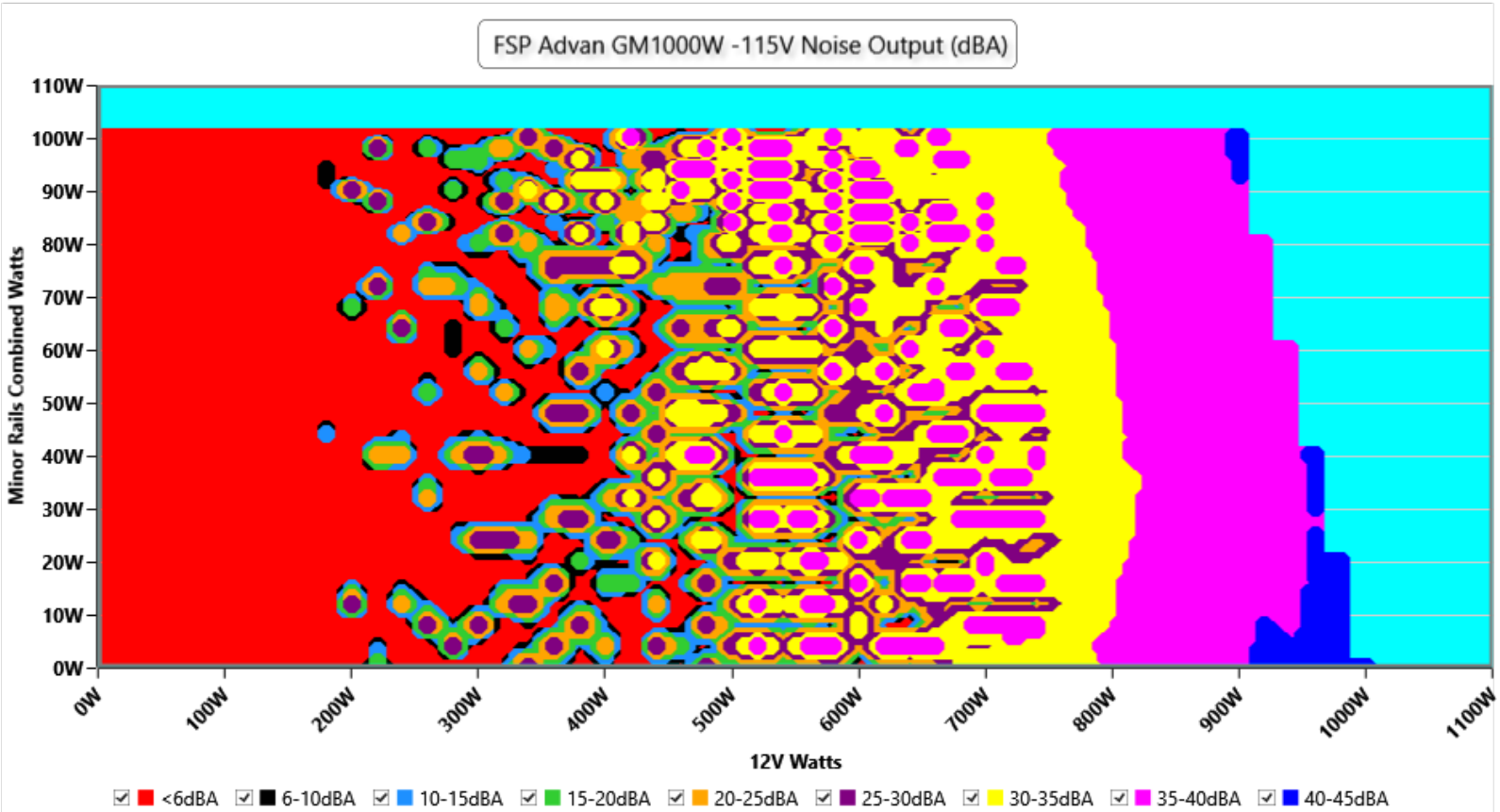
Noise Graph

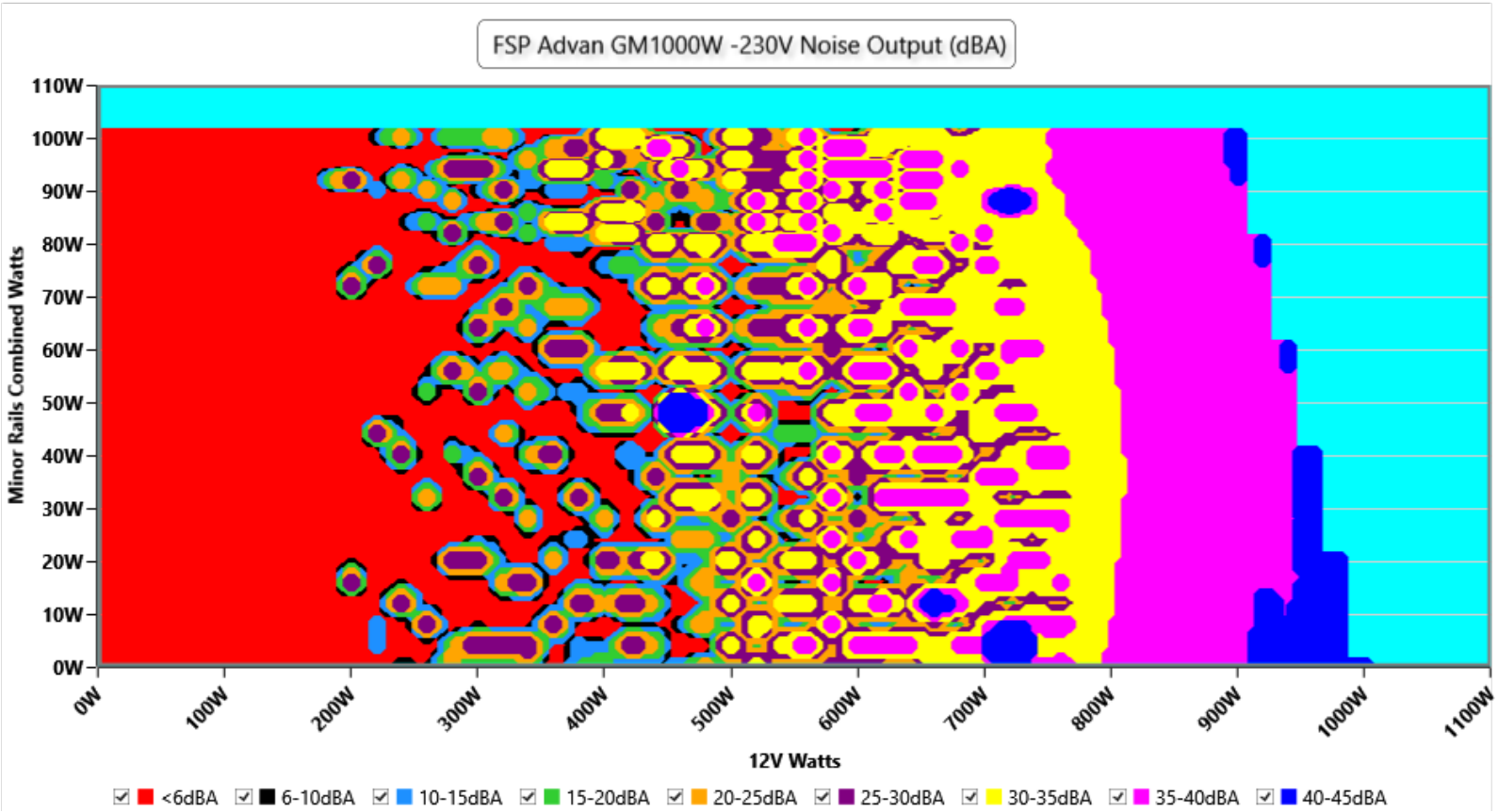
115V



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

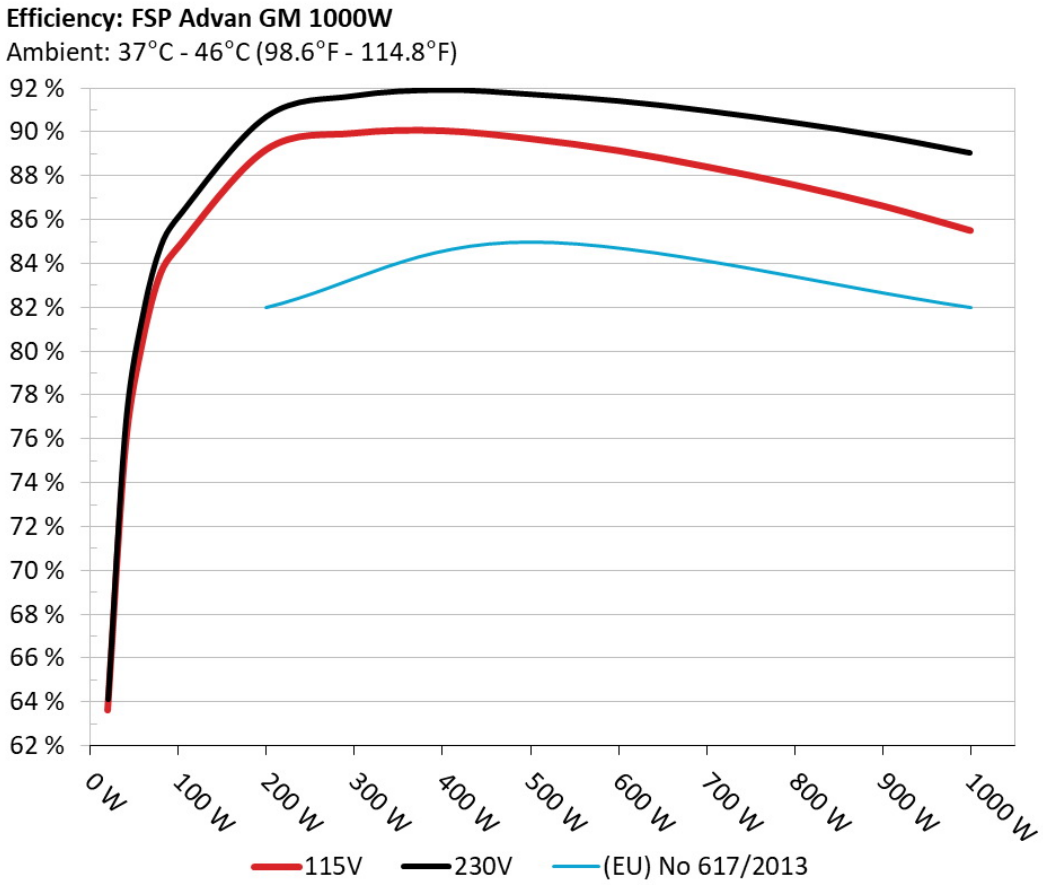


INFO

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

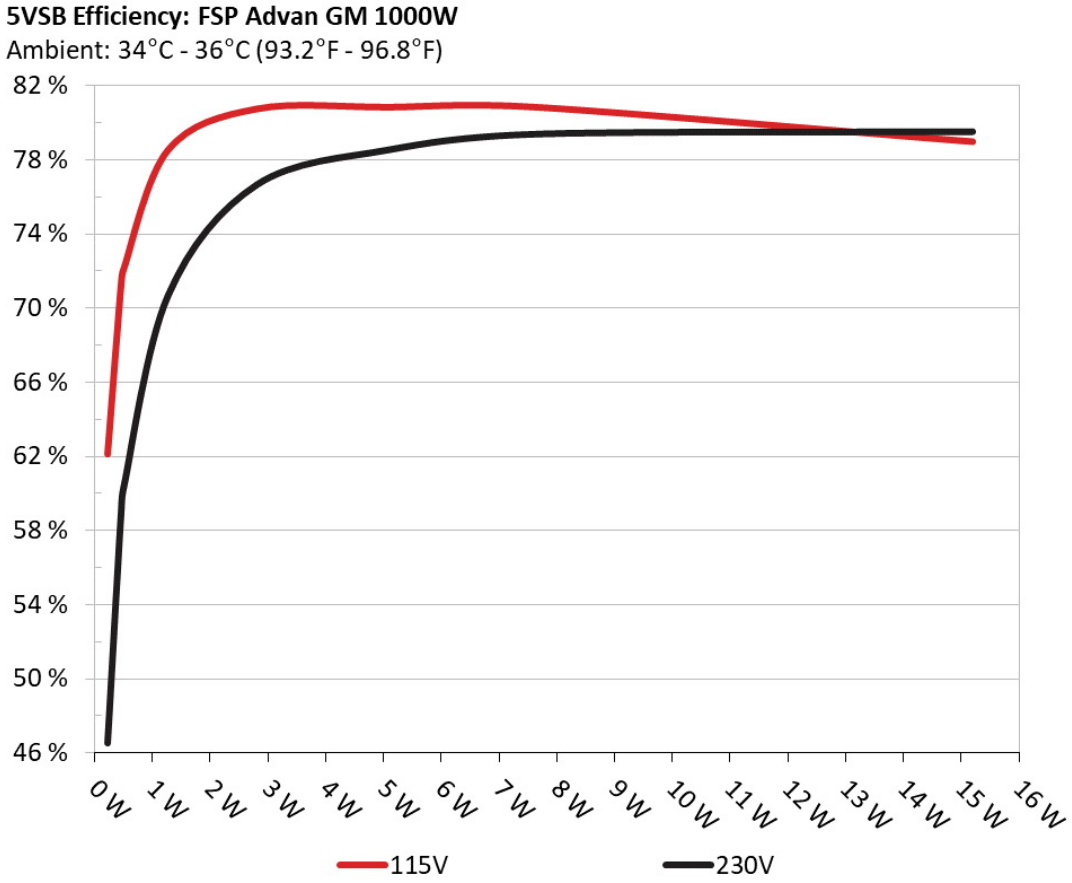
Efficiency under high ambient temperature



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	0.23W	62.117%	0.036
	5.12V	0.371W		114.85V
2	0.09A	0.461W	71.201%	0.062
	5.119V	0.648W		114.84V
3	0.55A	2.811W	80.756%	0.262
	5.11V	3.481W		114.84V
4	1A	5.102W	80.85%	0.346
	5.101V	6.311W		114.84V
5	1.5A	7.638W	80.848%	0.406
	5.092V	9.447W		114.83V
6	3A	15.19W	78.987%	0.479
	5.063V	19.231W		114.84V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	46.538%	0.014
	5.12V	0.495W		229.84V
2	0.09A	0.461W	58.842%	0.022
	5.119V	0.783W		229.85V
3	0.55A	2.811W	76.65%	0.101
	5.11V	3.668W		229.85V
4	1A	5.102W	78.538%	0.167
	5.101V	6.496W		229.84V
5	1.5A	7.638W	79.379%	0.208
	5.092V	9.623W		229.84V
6	3A	15.19W	79.514%	0.318
	5.063V	19.104W		229.85V

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
10%	6.498A	1.976A	1.976A	0.982A	99.996	84.739%	0	<6.0	44.3°C	0.979
	12.064V	5.062V	3.339V	5.09V	118.006				40.03°C	114.82V
20%	14.054A	2.971A	2.976A	1.182A	199.95	89.191%	0	<6.0	45.22°C	0.995
	12.029V	5.049V	3.326V	5.077V	224.181				40.66°C	114.78V
30%	21.961A	3.474A	3.484A	1.382A	300.008	89.939%	1002	29.0	41.36°C	0.993
	12.019V	5.038V	3.315V	5.065V	333.568				46.55°C	114.75V
40%	29.846A	3.979A	3.996A	1.584A	399.591	90.051%	1027	29.7	41.76°C	0.994
	12.008V	5.027V	3.304V	5.053V	443.746				47.26°C	114.72V
50%	37.420A	4.988A	5.014A	1.786A	499.32	89.686%	1135	32.2	42.34°C	0.995
	11.994V	5.013V	3.291V	5.041V	556.726				48.37°C	114.69V
60%	45.083A	6.002A	6.041A	1.989A	599.867	89.139%	1401	37.1	42.85°C	0.995
	11.979V	4.999V	3.278V	5.028V	672.962				49.35°C	114.65V
70%	52.694A	7.022A	7.077A	2.193A	699.584	88.406%	1287	35.2	43.4°C	0.994
	11.965V	4.985V	3.265V	5.017V	791.332				50.45°C	114.61V
80%	60.387A	8.045A	8.12A	2.297A	799.556	87.575%	1419	37.4	43.79°C	0.994
	11.951V	4.971V	3.251V	5.007V	912.994				51.93°C	114.58V
90%	68.427A	8.568A	8.644A	2.402A	899.322	86.621%	1721	41.7	44.59°C	0.993
	11.938V	4.959V	3.239V	4.997V	1038.229				53.63°C	114.53V
100%	76.288A	9.096A	9.203A	3.015A	999.33	85.495%	2036	45.3	45.67°C	0.992
	11.924V	4.947V	3.227V	4.976V	1168.873				55.61°C	114.49V
CL1	0.115A	11.984A	12.024A	0A	101.279	80.912%	961	28.4	41.48°C	0.98
	12.045V	5.023V	3.302V	5.104V	125.176				50.06°C	114.81V
CL2	0.115A	19.9A	0A	0A	101.326	79.46%	945	28.0	40.8°C	0.981
	12.043V	5.022V	3.318V	5.106V	127.517				49.65°C	114.81V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL3	0.113A	0A	19.993A	0A	67.379	73.898%	859	24.9	40.25°C	0.969
	12.151V	5.045V	3.301V	5.106V	91.186				50.41°C	114.83V
CL4	83.822A	0A	0A	0A	999.879	86.27%	2002	44.9	44.7°C	0.992
	11.929V	4.986V	3.262V	5.043V	1159.018				54.35°C	114.5V

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
10%	6.490A	1.975A	1.976A	0.982A	99.982	86.123%	0	<6.0	44.57°C	0.869
	12.077V	5.062V	3.339V	5.089V	116.094				40.29°C	229.83V
20%	14.050A	2.97A	2.976A	1.182A	199.925	90.68%	0	<6.0	45.4°C	0.943
	12.031V	5.05V	3.327V	5.077V	220.473				40.86°C	229.81V
30%	21.957A	3.473A	3.484A	1.382A	299.966	91.63%	1021	29.5	41.42°C	0.966
	12.019V	5.039V	3.315V	5.065V	327.361				46.43°C	229.8V
40%	29.837A	3.978A	3.994A	1.583A	399.46	91.896%	1023	29.5	41.66°C	0.977
	12.007V	5.027V	3.305V	5.054V	434.691				47.27°C	229.78V
50%	37.409A	4.986A	5.012A	1.785A	499.189	91.699%	1332	36.2	42.27°C	0.981
	11.994V	5.014V	3.292V	5.042V	544.382				48.3°C	229.77V
60%	45.069A	6A	6.039A	1.988A	599.731	91.396%	1411	37.3	42.98°C	0.983
	11.980V	5V	3.279V	5.03V	656.195				49.52°C	229.74V
70%	52.680A	7.019A	7.074A	2.192A	699.457	90.948%	1284	35.1	43.04°C	0.984
	11.966V	4.986V	3.266V	5.018V	769.064				50.05°C	229.73V
80%	60.377A	8.043A	8.118A	2.296A	799.486	90.406%	1398	37.1	43.8°C	0.982
	11.952V	4.972V	3.252V	5.007V	884.328				51.89°C	229.71V
90%	68.420A	8.567A	8.642A	2.401A	899.281	89.787%	1704	41.4	44.21°C	0.979
	11.938V	4.96V	3.24V	4.997V	1001.574				53.36°C	229.7V
100%	76.285A	9.095A	9.202A	3.014A	999.303	89.029%	2029	45.2	45.68°C	0.977
	11.924V	4.947V	3.227V	4.976V	1122.45				55.62°C	229.68V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL1	0.115A	11.985A	12.023A	0A	101.289	82.085%	898	26.0	40.04°C	0.879
	12.053V	5.023V	3.302V	5.104V	123.399				49.72°C	229.83V
CL2	0.115A	19.9A	0A	0A	101.331	80.799%	925	27.1	40.88°C	0.881
	12.048V	5.022V	3.318V	5.106V	125.414				50.36°C	229.83V
CL3	0.113A	0A	19.991A	0A	67.38	75.208%	787	22.4	41.69°C	0.813
	12.163V	5.045V	3.301V	5.106V	89.591				49.96°C	229.83V
CL4	83.814A	0A	0A	0A	999.883	89.72%	2003	44.9	45.88°C	0.977
	11.930V	4.986V	3.262V	5.043V	1114.458				54.7°C	229.68V

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])	Temps (In/Out)	PF/AC Volts
20W	1.205A	0.493A	0.492A	0.196A	19.996	63.603%	0	<6.0	39.82°C	0.864
	12.321V	5.074V	3.353V	5.113V	31.439				36.69°C	114.84V
40W	2.666A	0.69A	0.69A	0.294A	39.998	75.548%	0	<6.0	40.66°C	0.936
	12.262V	5.071V	3.35V	5.11V	52.944				37.33°C	114.83V
60W	4.140A	0.888A	0.887A	0.392A	59.998	80.501%	0	<6.0	42.18°C	0.959
	12.206V	5.069V	3.347V	5.106V	74.531				38.57°C	114.83V
80W	5.632A	1.085A	1.085A	0.49A	79.942	83.538%	0	<6.0	43.11°C	0.972
	12.129V	5.067V	3.345V	5.102V	95.696				39.12°C	114.83V

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
20W	1.204A	0.493A	0.492A	0.196A	19.996	64.118%	0	<6.0	39.69°C	0.491
	12.326V	5.074V	3.353V	5.113V	31.186				36.56°C	229.84V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
40W	2.664A	0.69A	0.69A	0.294A	39.998	76.671%	0	<6.0	40.43°C	0.658
	12.269V	5.071V	3.35V	5.109V	52.17				37.05°C	229.84V
60W	4.136A	0.888A	0.887A	0.392A	59.998	81.743%	0	<6.0	41.76°C	0.763
	12.218V	5.069V	3.347V	5.105V	73.398				38.26°C	229.83V
80W	5.625A	1.085A	1.085A	0.49A	79.934	84.783%	0	<6.0	42.98°C	0.827
	12.143V	5.067V	3.345V	5.102V	94.28				39.27°C	229.83V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	21.69mV	12.42mV	12.93mV	7.64mV	Pass
20% Load	20.66mV	13.75mV	14.21mV	7.75mV	Pass
30% Load	21.74mV	13.50mV	14.62mV	8.01mV	Pass
40% Load	19.18mV	16.01mV	14.67mV	8.21mV	Pass
50% Load	31.35mV	15.45mV	16.36mV	8.77mV	Pass
60% Load	35.70mV	14.98mV	15.44mV	11.59mV	Pass
70% Load	32.48mV	16.89mV	16.83mV	11.80mV	Pass
80% Load	25.78mV	19.96mV	18.88mV	13.08mV	Pass
90% Load	22.66mV	19.29mV	19.50mV	15.19mV	Pass
100% Load	44.84mV	22.97mV	22.70mV	18.83mV	Pass
110% Load	0.00mV	0.00mV	0.00mV	0.00mV	Pass
Crossload1	35.72mV	16.93mV	22.18mV	8.87mV	Pass
Crossload2	27.31mV	22.99mV	18.42mV	8.67mV	Pass
Crossload3	36.57mV	15.76mV	25.34mV	8.36mV	Pass
Crossload4	40.29mV	20.13mV	16.00mV	9.85mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	26.39mV	12.88mV	14.01mV	8.77mV	Pass
20% Load	20.51mV	14.32mV	14.98mV	8.72mV	Pass
30% Load	19.28mV	14.42mV	14.52mV	8.88mV	Pass
40% Load	51.96mV	17.09mV	16.32mV	8.67mV	Pass
50% Load	39.69mV	16.88mV	18.57mV	9.96mV	Pass
60% Load	30.12mV	16.01mV	16.26mV	9.39mV	Pass
70% Load	35.24mV	18.17mV	17.60mV	10.83mV	Pass
80% Load	24.19mV	18.68mV	19.03mV	10.57mV	Pass
90% Load	21.99mV	19.30mV	19.55mV	12.98mV	Pass
100% Load	34.23mV	20.27mV	19.97mV	14.59mV	Pass
110% Load	0.00mV	0.00mV	0.00mV	0.00mV	Pass
Crossload1	34.54mV	16.20mV	21.16mV	8.70mV	Pass
Crossload2	24.19mV	22.43mV	18.77mV	7.80mV	Pass
Crossload3	36.21mV	15.30mV	26.11mV	16.11mV	Pass
Crossload4	34.51mV	20.68mV	14.18mV	9.53mV	Pass

The results above are not used in the certification process

FSP Technology Advan GM 1000W

Top side

Power specifications label

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern

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