Cougar GEX X2 1000

Serial Number 12BC02GX10000097

Lab ID CG10002170

Certification ID 252170

Test Result Report ID: 23PS2170A

Certificate Issue Date: Apr 24, 2023

Scheme: ETA-EMI PSU

115V

230V

Scheme: LAMBDA PSU

115V

230V

Outside Validation Scope

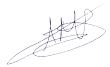
General Information

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	Cougar
Model	GEX X2 1000
OEM/ODM	XHY-Power
Serial Number	12BC02GX10000097
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	50-60

Rated Frequency (Hz)	13-7
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 Hydraulic Dynamic Bearing Fan (EFH-12E12H)
Semi-Passive Operation	✓
Cybenetics Testing Information	
Lab ID	CG10002170
Date of receipt	Apr 12, 2023
Testing Date	Apr 19, 2023
Report Issued Date	Apr 24, 2023
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 (660mm)	1	1	18AWG	No
4+4 pin EPS12V (650mm)	1	1	18AWG	No
8 pin EPS12V (650mm)	1	1	18AWG	No
6+2 pin PCIe (650mm+100mm)	3	6	18AWG	No
12+4 pin PCIe (650mm) (450W)	1	1	16-28AWG	No
SATA (510mm+115mm+115mm+115mm)	1	4	18AWG	No
SATA (500mm+115mm+115mm) / 4-pin Molex (+115mm)	2	6 / 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	83.3	3	0.3
	Watts	100		1000	15	3.6
Total Max. Power (W)		1000				

Parts Description

General Data	-
Manufacturer (OEM)	HEC
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x Mov
Inrush Protection	NTC Thermistor MF72 5D15 & Relay HF46F-G
Bridge Rectifier(s)	2x ALB1560U (600V, 15A @ 100°C)
APFC MOSFETs	2x NCE65TF099 IPP50R140CP (650V, 24A @ 100°C, Rds(on): 109mOhm)
APFC Boost Diode	1x DS065008C
Bulk Cap(s)	1x TK (400V, 820uF, 2000h @ 105°C, LGW)
Main Switchers	4x IPP50R140CP (500V, 12.5A @ 100°C, Rds(on): 0.25Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901T6
Topology	Primary side: APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x JieJie Microelectronics DS065008C (60V, 174A @ 100°C, Rds(on): 1.2mOhm)
5V & 3.3V	DC-DC Converters: 6x Excelliance MOS EMB04N03H (20V, 35A @ 100°C, Rds(on): 7mOhm) PWM Controller(s): uPI-Semi uP3861P
Filtering Capacitors	Electrolytic: 9x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 3x Nichicon (2-8,000h @ 105°C), 2x PLH, 2x TK Polymer: 22x FPCAP,
Supervisor IC	Infino IN1S424I (OCP, OVP, UVP, SCP, PG)
Fan Model	DWPH EFH-12E12H (120mm, 12V, 0.5A, Hydraulic Dynamic Bearing Fan)

5VSB Circuit	-
Rectifier	1x HM69-60R10 SBR (42V, 22A)
Standby PWM Controller	Excelliance MOS EM8569C

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	✓
ATX v3.0 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.802%
Average Noise Output (>1450 Load Combinations)	26.56dBA
Average PF (>1450 Load Combinations)	0.977
Efficiency With 10W (≤500W) or 2% (>500W) Load	70.530%
Standby Power Consumption	0.0510W
Non-Accredited	
12V Ripple (Full Load)	33.79mV
5V Ripple (Full Load)	13.85mV
3.3V Ripple (Full Load)	14.06mV
5VSB Ripple (Full Load)	15.70mV
12V Load Regulation	0.17%
5V Load Regulation	0.36%
3.3V Load Regulation	0.82%
5VSB Load Regulation	2.31%

Inrush Current	43.350A

230V

Accredited		
Average Efficiency (>1450 load combinations)		91.880%
Average Noise Output (>1450 Load Combinations)		26.03dBA
Average PF (>1450 Load Combinations)		0.953
Efficiency With 10W (≤500W) or 2% (>500W) Load		70.447%
Standby Power Consumption		0.0865W
Non-Accredited		
12V Ripple (Full Load)		31.87mV
5V Ripple (Full Load)		12.33mV
3.3V Ripple (Full Load)		14.65mV
5VSB Ripple (Full Load)		15.85mV
12V Load Regulation		0.17%
5V Load Regulation		0.38%
3.3V Load Regulation		0.82%
5VSB Load Regulation		2.33%
Inrush Current		81.240A
12V Transient Response (200%)		11.24V
5V Transient Response (200%)		4.944V
3.3V Transient Response (200%)		3.234V
5VSB Transient Response (200%)		4.878V
Hold-Up Time & PWR_OK Signal		21.10ms
AC Loss to PWR_OK Hold Up Time		17.20ms
PWR_OK Inactive to DC Loss Delay		3.90ms
PSU Timings: T1 (20% / 100%)	56.0ms	55.0ms
PSU Timings: T3 (20% / 100%)	136.0ms	135.0ms
OPP (28.86°C / 38.64°C)	127.11%	127.13%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	21.1
AC Loss to PWR_OK Hold Up Time (ms)	17.2
PWR_OK Inactive to DC Loss Delay (ms)	3.9

Vampire Power

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.86 V	114.79 V	113.85 V	114.92 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.03 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.419	1.417	1.340	1.420	1.490	PASS
Mains Voltage THD:	0.15 %	0.09 %	N/A	0.24 %	2.00 %	PASS
Real Power:	0.051 W	0.031 W	N/A	0.072 W	N/A	N/A
Apparent Power:	6.553 W	6.532 W	N/A	6.586 W	N/A	N/A
Power Factor:	0.006	N/A	N/A	N/A	N/A	N/A

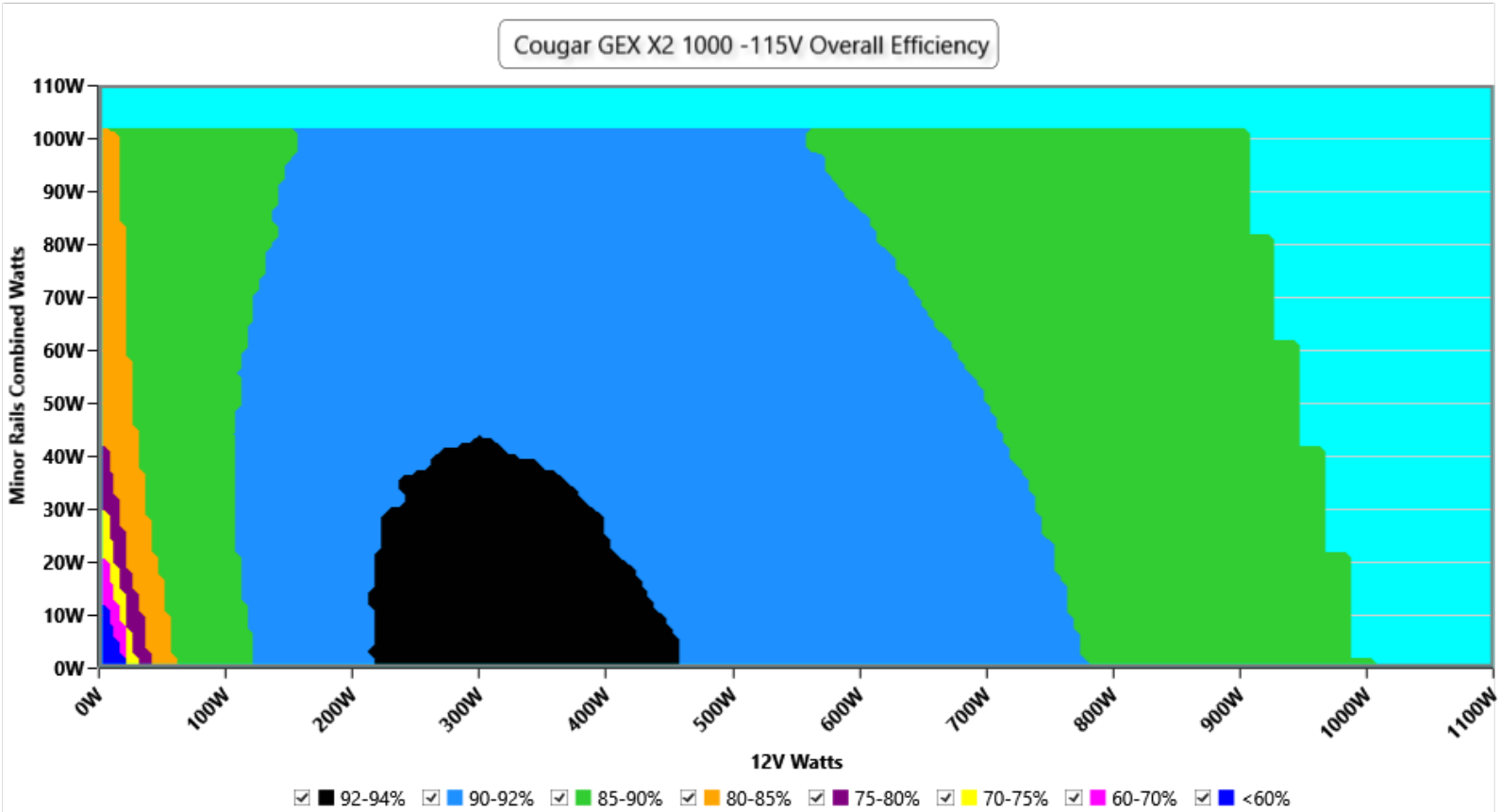
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.89 V	229.83 V	227.70 V	229.96 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:	1.417	1.416	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.13 %	0.10 %	N/A	0.19 %	2.00 %	PASS
Real Power:	0.087 W	0.048 W	N/A	0.128 W	N/A	N/A
Apparent Power:	23.081 W	22.996 W	N/A	23.171 W	N/A	N/A

Power Factor:	0.003	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

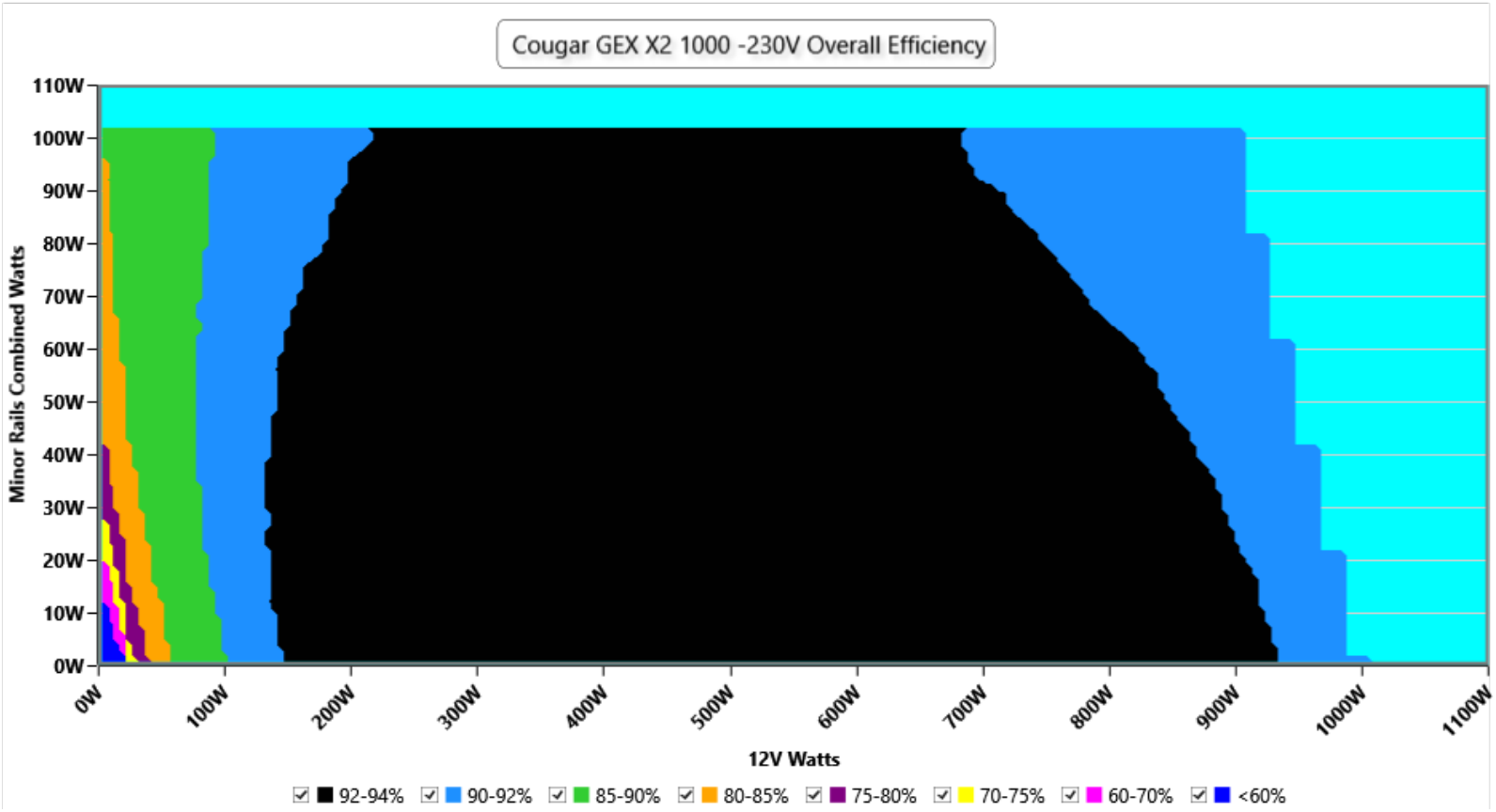
115V



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



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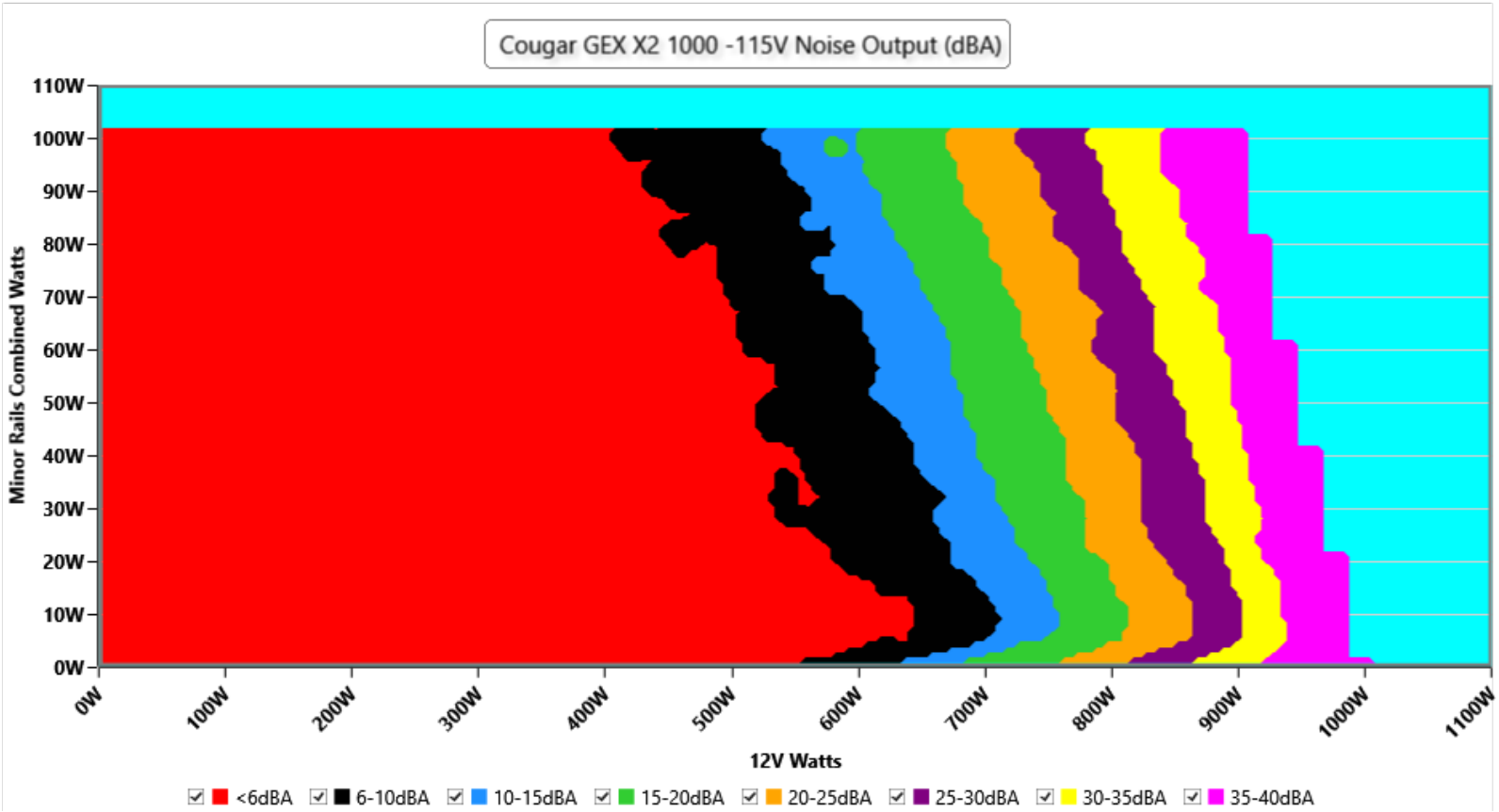
Noise Graph

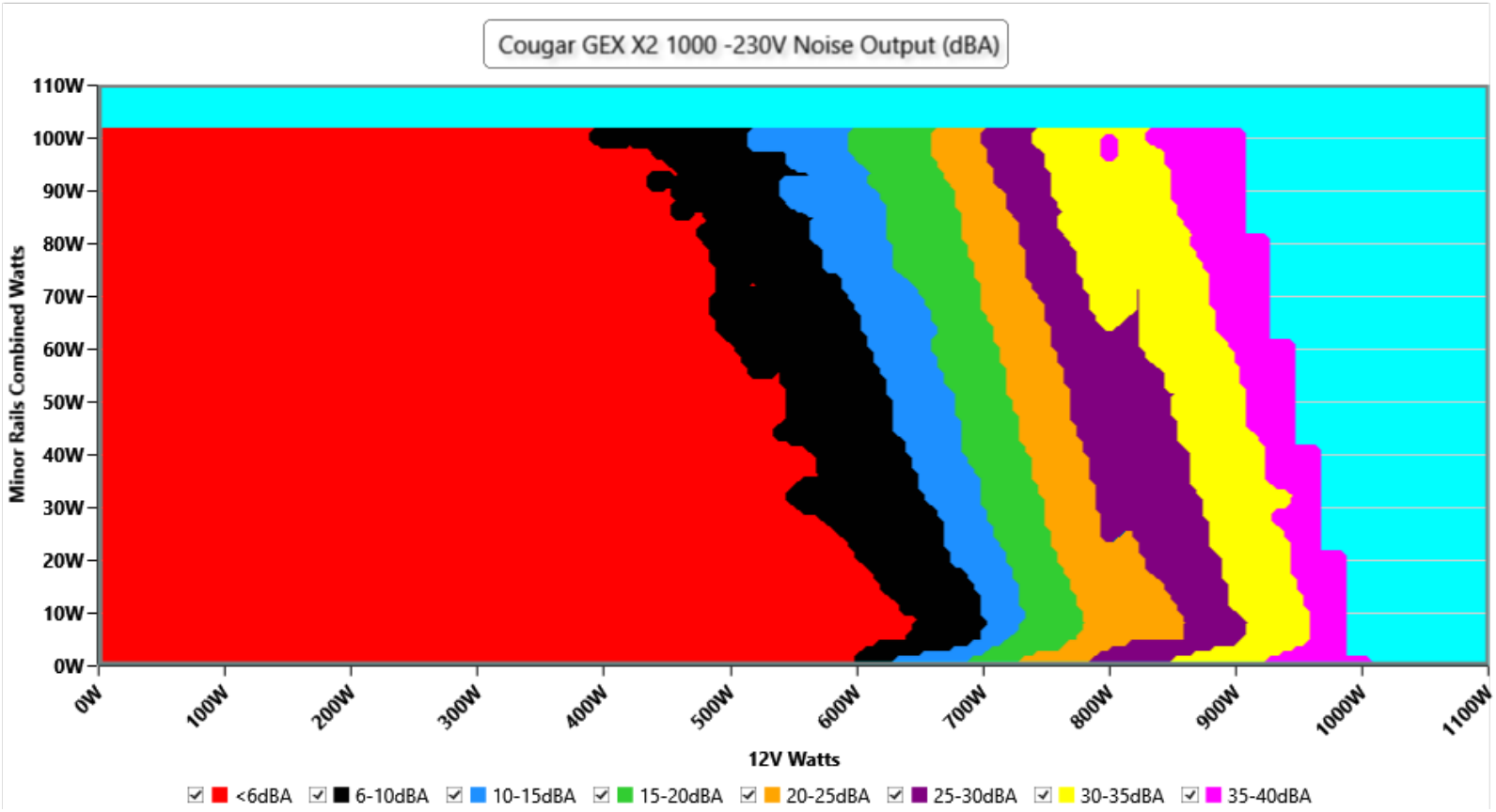
115V



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

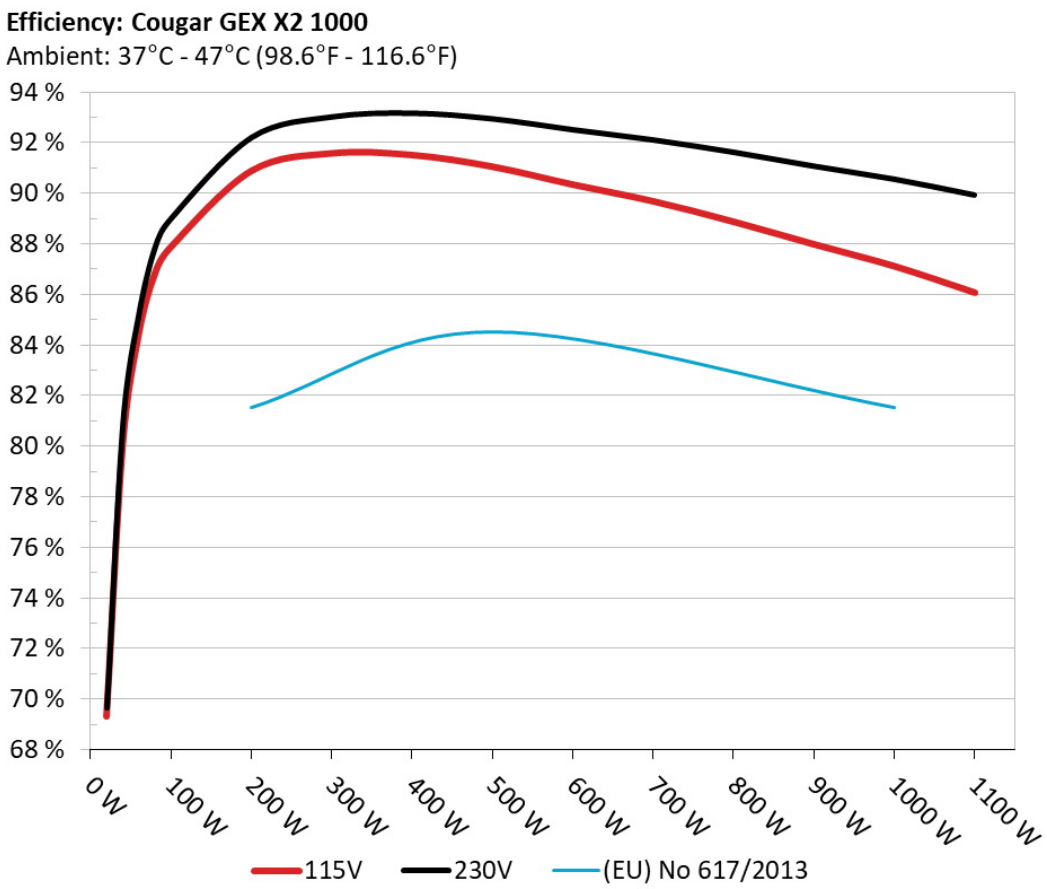


INFO

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

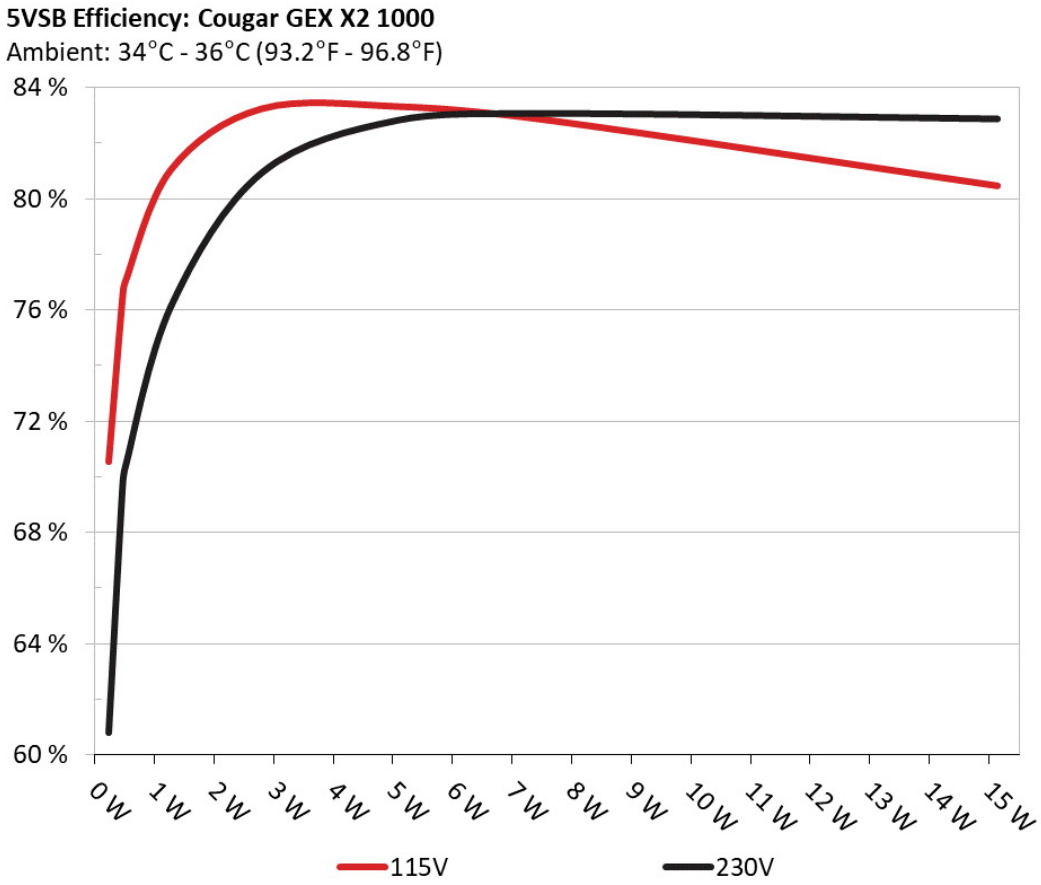
Efficiency under high ambient temperature



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	0.229W	70.227%	0.051
	5.096V	0.326W		114.84V
2	0.09A	0.459W	76.117%	0.092
	5.096V	0.603W		114.85V
3	0.55A	2.798W	82.943%	0.327
	5.088V	3.373W		114.85V
4	1A	5.08W	83.021%	0.407
	5.08V	6.119W		114.84V
5	1.5A	7.608W	82.526%	0.443
	5.072V	9.219W		114.85V
6	3A	15.139W	80.165%	0.498
	5.047V	18.885W		114.84V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229W	60.519%	0.017
	5.097V	0.379W		229.87V
2	0.09A	0.459W	69.319%	0.03
	5.096V	0.66W		229.86V
3	0.55A	2.798W	80.638%	0.144
	5.088V	3.471W		229.86V
4	1A	5.08W	82.521%	0.224
	5.08V	6.156W		229.86V
5	1.5A	7.608W	82.762%	0.286
	5.072V	9.192W		229.87V
6	3A	15.139W	82.568%	0.373
	5.046V	18.336W		229.86V

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%	6.480A	1.991A	1.978A	0.985A	99.973	88.379%	0	<6.0	44.33°C	0.96
	12.095V	5.021V	3.336V	5.075V	113.118				40.07°C	114.82V
20%	13.977A	2.988A	2.97A	1.185A	199.911	91.392%	0	<6.0	45.56°C	0.958
	12.093V	5.019V	3.334V	5.065V	218.743				40.85°C	114.79V
30%	21.826A	3.488A	3.467A	1.385A	299.947	92.089%	0	<6.0	46.49°C	0.969
	12.091V	5.017V	3.331V	5.055V	325.714				41.38°C	114.76V
40%	29.630A	3.988A	3.965A	1.586A	399.4	92.027%	0	<6.0	47.23°C	0.977
	12.089V	5.014V	3.329V	5.046V	434.004				41.62°C	114.72V
50%	37.115A	4.988A	4.961A	1.787A	499.129	91.568%	0	<6.0	48.41°C	0.983
	12.088V	5.012V	3.326V	5.035V	545.091				42.41°C	114.69V
60%	44.669A	5.988A	5.958A	1.99A	599.668	90.855%	775	18.4	42.67°C	0.986
	12.086V	5.01V	3.323V	5.025V	660.022				49.19°C	114.65V
70%	52.166A	6.986A	6.957A	2.194A	699.409	90.196%	1239	32.6	43.16°C	0.988
	12.083V	5.01V	3.321V	5.014V	775.436				50.2°C	114.62V
80%	59.730A	7.986A	7.957A	2.297A	799.438	89.386%	1863	43.7	43.75°C	0.99
	12.080V	5.009V	3.317V	5.005V	894.375				51.84°C	114.58V
90%	67.630A	8.487A	8.446A	2.402A	899.257	88.492%	2291	48.9	44.34°C	0.991
	12.077V	5.007V	3.315V	4.996V	1016.208				53.54°C	114.54V
100%	75.331A	8.99A	8.967A	3.013A	999.278	87.626%	2309	49.1	45.28°C	0.992
	12.075V	5.005V	3.312V	4.979V	1140.398				55.29°C	114.51V
110%	82.961A	9.996A	10.063A	3.017A	1099.904	86.573%	2322	49.3	46.53°C	0.993
	12.073V	5.002V	3.309V	4.971V	1270.51				57.46°C	114.46V
CL1	0.115A	12.014A	11.912A	0A	101.291	83.444%	0	<6.0	46.99°C	0.962
	12.095V	5.011V	3.333V	5.084V	121.399				41.6°C	114.82V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.114A	20.042A	0A	0A	101.331	81.626%	562	9.1	41.44°C	0.96
	12.098V	4.987V	3.34V	5.089V	124.141				48.53°C	114.81V
CL3	0.114A	0A	19.876A	0A	67.381	76.287%	407	<6.0	42.62°C	0.949
	12.096V	5.009V	3.321V	5.084V	88.325				51.64°C	114.83V
CL4	82.781A	0A	0A	0A	999.859	88.198%	2308	49.1	45.13°C	0.992
	12.078V	5.005V	3.318V	5.039V	1133.656				56.08°C	114.52V

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%	6.480A	1.992A	1.978A	0.985A	99.98	89.52%	0	<6.0	44.55°C	0.884
	12.097V	5.02V	3.336V	5.075V	111.69				40.26°C	229.85V
20%	13.974A	2.989A	2.969A	1.185A	199.921	92.714%	0	<6.0	45.39°C	0.931
	12.095V	5.019V	3.334V	5.065V	215.634				40.75°C	229.83V
30%	21.822A	3.488A	3.467A	1.385A	299.96	93.529%	0	<6.0	46.58°C	0.948
	12.093V	5.017V	3.331V	5.055V	320.713				41.46°C	229.81V
40%	29.627A	3.988A	3.965A	1.586A	399.434	93.678%	0	<6.0	47.31°C	0.959
	12.091V	5.014V	3.329V	5.045V	426.391				41.84°C	229.8V
50%	37.110A	4.989A	4.96A	1.788A	499.16	93.456%	0	<6.0	48.23°C	0.965
	12.090V	5.011V	3.326V	5.035V	534.114				42.37°C	229.78V
60%	44.663A	5.988A	5.957A	1.99A	599.695	93.024%	745	17.4	42.74°C	0.971
	12.088V	5.01V	3.324V	5.024V	644.673				49.28°C	229.77V
70%	52.158A	6.986A	6.957A	2.194A	699.436	92.622%	1331	34.6	43.39°C	0.975
	12.085V	5.011V	3.321V	5.014V	755.159				50.46°C	229.75V
80%	59.723A	7.985A	7.957A	2.298A	799.467	92.136%	1832	43.3	43.62°C	0.977
	12.082V	5.01V	3.318V	5.005V	867.7				51.72°C	229.73V
90%	67.620A	8.486A	8.446A	2.402A	899.275	91.586%	2296	49.0	44.02°C	0.98
	12.079V	5.008V	3.315V	4.996V	981.893				53.08°C	229.72V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	75.319A	8.99A	8.967A	3.013A	999.298	91.073%	2314	49.2	44.81°C	0.982
	12.077V	5.005V	3.312V	4.978V	1097.254				54.82°C	229.7V
110%	82.950A	9.996A	10.063A	3.018A	1099.923	90.442%	2328	49.3	46.55°C	0.984
	12.075V	5.002V	3.309V	4.971V	1216.153				57.49°C	229.68V
CL1	0.115A	12.013A	11.911A	0A	101.294	84.74%	530	8.8	41.34°C	0.892
	12.098V	5.012V	3.333V	5.084V	119.544				46.83°C	229.85V
CL2	0.114A	20.041A	0A	0A	101.33	82.871%	577	10.3	40.36°C	0.893
	12.100V	4.987V	3.34V	5.089V	122.272				47.39°C	229.84V
CL3	0.114A	0A	19.877A	0A	67.383	77.237%	364	<6.0	41.29°C	0.855
	12.097V	5.009V	3.32V	5.084V	87.248				50.37°C	229.85V
CL4	82.770A	0A	0A	0A	999.882	91.628%	2312	49.2	45°C	0.982
	12.080V	5.005V	3.317V	5.039V	1091.233				55.97°C	229.7V

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	1.228A	0.498A	0.494A	0.196A	19.993	69.792%	0	<6.0	39.58°C	0.881
	12.094V	5.023V	3.339V	5.094V	28.647				36.51°C	114.84V
40W	2.702A	0.697A	0.692A	0.295A	39.993	80.534%	0	<6.0	40.27°C	0.926
	12.095V	5.022V	3.338V	5.091V	49.661				37.02°C	114.84V
60W	4.178A	0.896A	0.89A	0.393A	59.991	84.937%	0	<6.0	41.84°C	0.928
	12.095V	5.022V	3.337V	5.088V	70.63				38.06°C	114.84V
80W	5.647A	1.095A	1.088A	0.492A	79.925	87.305%	0	<6.0	43.18°C	0.952
	12.094V	5.022V	3.337V	5.085V	91.548				39.21°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	1.227A	0.498A	0.494A	0.196A	19.992	70.156%	0	<6.0	39.58°C	0.638
	12.097V	5.024V	3.339V	5.094V	28.5				36.53°C	229.87V
40W	2.702A	0.697A	0.692A	0.295A	39.993	81.444%	0	<6.0	40.35°C	0.759
	12.097V	5.023V	3.338V	5.091V	49.101				37.07°C	229.86V
60W	4.176A	0.896A	0.89A	0.393A	59.994	85.766%	0	<6.0	41.55°C	0.822
	12.097V	5.023V	3.337V	5.088V	69.953				38.08°C	229.85V
80W	5.646A	1.095A	1.088A	0.492A	79.932	88.372%	0	<6.0	43.49°C	0.859
	12.097V	5.022V	3.337V	5.085V	90.448				39.6°C	229.85V

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Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.92mV	8.37mV	9.13mV	10.83mV	Pass
20% Load	15.40mV	8.42mV	9.23mV	10.62mV	Pass
30% Load	18.06mV	8.42mV	9.29mV	10.47mV	Pass
40% Load	19.38mV	8.83mV	9.85mV	10.88mV	Pass
50% Load	17.39mV	8.88mV	9.75mV	12.36mV	Pass
60% Load	18.26mV	8.93mV	10.36mV	13.49mV	Pass
70% Load	18.62mV	11.34mV	11.75mV	13.96mV	Pass
80% Load	20.77mV	10.93mV	12.98mV	13.90mV	Pass
90% Load	21.23mV	10.57mV	14.06mV	15.65mV	Pass
100% Load	33.79mV	13.85mV	14.06mV	15.70mV	Pass
110% Load	35.21mV	13.15mV	14.66mV	16.42mV	Pass
Crossload1	19.31mV	11.65mV	14.56mV	17.12mV	Pass
Crossload2	17.85mV	22.48mV	12.21mV	16.78mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	12.38mV	10.68mV	16.62mV	16.68mV	Pass
Crossload4	33.22mV	10.34mV	9.44mV	18.40mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.73mV	8.67mV	10.11mV	11.03mV	Pass
20% Load	17.29mV	9.08mV	10.16mV	10.46mV	Pass
30% Load	19.13mV	8.62mV	9.28mV	10.47mV	Pass
40% Load	18.11mV	8.62mV	9.59mV	11.39mV	Pass
50% Load	17.34mV	10.32mV	9.96mV	12.78mV	Pass
60% Load	17.85mV	9.34mV	10.88mV	13.19mV	Pass
70% Load	19.44mV	11.34mV	11.54mV	13.65mV	Pass
80% Load	19.90mV	9.75mV	13.34mV	14.62mV	Pass
90% Load	21.94mV	11.08mV	13.49mV	13.60mV	Pass
100% Load	31.87mV	12.33mV	14.65mV	15.85mV	Pass
110% Load	33.79mV	12.35mV	15.61mV	15.31mV	Pass
Crossload1	18.41mV	11.59mV	15.27mV	16.12mV	Pass
Crossload2	14.42mV	22.84mV	12.31mV	15.65mV	Pass
Crossload3	11.97mV	11.39mV	16.67mV	16.62mV	Pass
Crossload4	31.15mV	9.91mV	9.56mV	18.58mV	Pass

The results above are not used in the certification process

Cougar GEX X2 1000

Top side

Power specifications label

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 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

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com