



Cougar GX-F750 (#2)

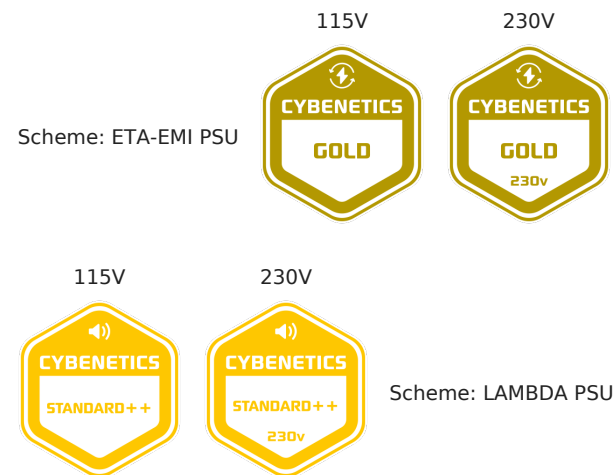
Serial Number H1801010998

Lab ID 335

Certification ID 25335

Test Result Report ID:

Certificate Issue Date: Mar 23, 2018



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	Cougar
Model	GX-F750 (#2)
OEM/ODM	HEC
Serial Number	H1801010998
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5
Rated Frequency (Hz)	47-63

Rated Power (W)	750
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	135mm Hydro Dynamic Bearing Fan (RL4Z S1352512H)
Semi-Passive Operation	X
Cybenetics Testing Information	
Lab ID	335
Date of receipt	Mar 15, 2018
Testing Date	Mar 21, 2018
Report Issued Date	Mar 23, 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 (580mm)	1	1	16-18AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
6+2 pin PCIe (600mm+120mm)	2	4	18AWG	No
SATA (450mm+120mm+120mm)	2	6	18AWG	No
SATA (450mm+120mm)	1	2	18AWG	No
4 pin Molex (400mm+120mm+120mm)	1	3	18AWG	No
AC Power Cord (1730mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	62	3	0.5
	Watts	150		744	15	6
Total Max. Power (W)		750				

Parts Description

General Data	
Manufacturer (OEM)	HEC/Compucase
Platform Model	TPK
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x MPS HF81 (X Capacitor Bleeder)
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x
APFC MOSFETS	2x Infineon IPA60R125P6 (650V, 19A @ 100°C, 0.125Ohm)
APFC Boost Diode	1x Hestia H2S060H006 (600V, 6A @ 152°C)
Hold-up Cap(s)	1x Chemi-Con (400V, 680uF, 2000h @ 105°C, KMW)
Main Switchers	2x Infineon IPP65R150CFD (700V, 14.2A @ 100°C, 0.15Ohm)
APFC Controller	Champion CM6502S
Resonant Controller	Champion CM6901
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	6x FETs
5V & 3.3V	DC-DC Converters: 2x TI CSD87355Q5D (30V, 45A @ 125°C) PWM Controller: 2x APW7073
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (1-5,000 @ 105°C, KY), Teapo (1-3,000h @ 105°C, SC) Polymers: APAQ
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Globe Fan RL4Z S1352512H (12V, 0.33A, 1550 RPM, Hydro Dynamic Bearing)
5VSB Circuit	

Rectifier	1x PFR10L60CT SBR (60V, 10A)
Standby PWM Controller	TinySwitch-III TNY280PN
-12V Circuit	
Rectifier	KIA7912PI

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)	88.619%
Average Noise Output (>1450 Load Combinations)	32.84dBA
Average PF (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0482W
Non-Accredited	
12V Ripple (Full Load)	26.37mV
5V Ripple (Full Load)	23.37mV
3.3V Ripple (Full Load)	36.65mV
5VSB Ripple (Full Load)	30.86mV
12V Load Regulation	0.98%
5V Load Regulation	1.36%
3.3V Load Regulation	1.85%
5VSB Load Regulation	2.11%
Inrush Current	57.886A

230V

Accredited		
Average Efficiency (>1450 load combinations)	90.298%	
Average Noise Output (>1450 Load Combinations)	32.75dBA	
Average PF (>1450 Load Combinations)	0.949	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0956W	
Non-Accredited		
12V Ripple (Full Load)	24.91mV	
5V Ripple (Full Load)	21.27mV	
3.3V Ripple (Full Load)	33.49mV	
5VSB Ripple (Full Load)	29.20mV	
12V Load Regulation	1.61%	
5V Load Regulation	1.34%	
3.3V Load Regulation	1.82%	
5VSB Load Regulation	2.10%	
Inrush Current	56.273A	
Hold-Up Time & PWR_OK Signal	18.60ms	
AC Loss to PWR_OK Hold Up Time	16.30ms	
PWR_OK Inactive to DC Loss Delay	2.30ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

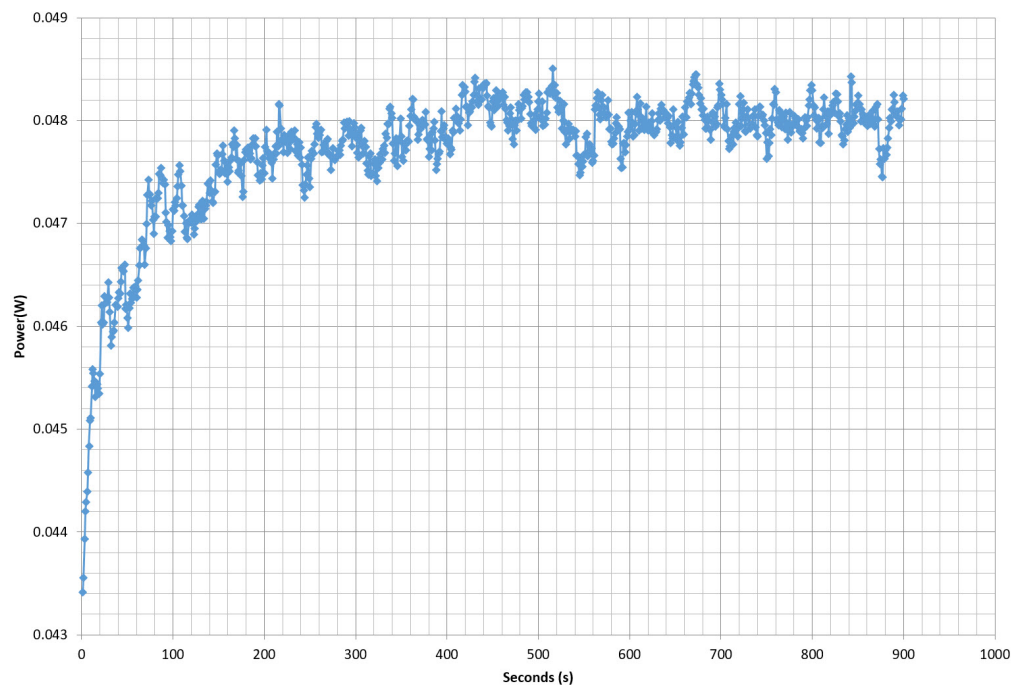
Hold-Up Time (ms)	18.6
AC Loss to PWR_OK Hold Up Time (ms)	16.3
PWR_OK Inactive to DC Loss Delay (ms)	2.3



Graphs

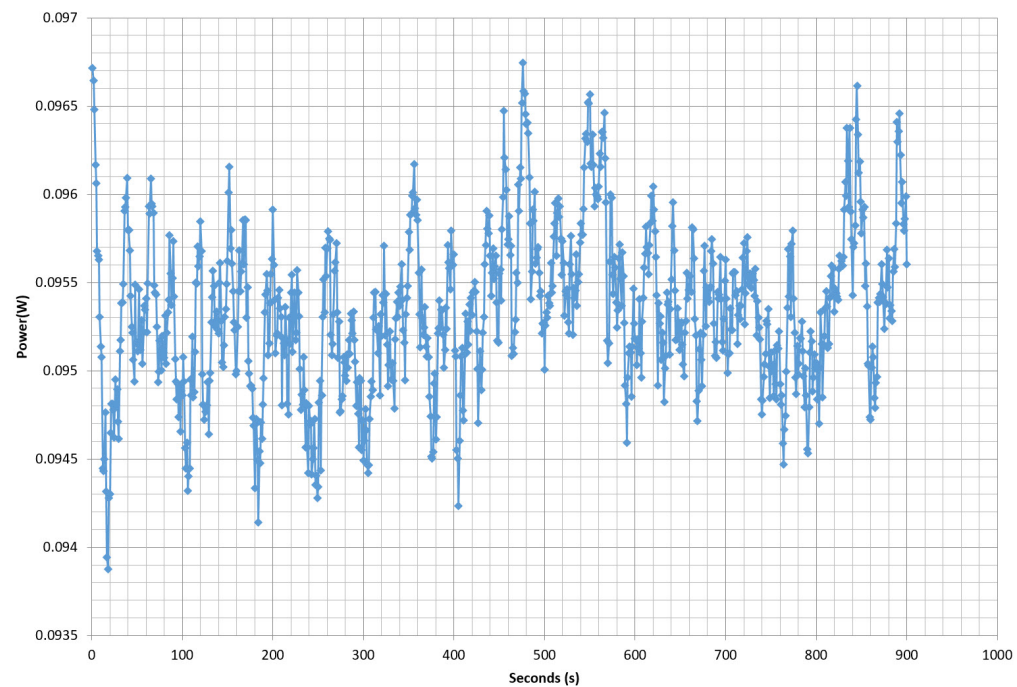
115V

Power - H1801010998 - 22/03/2018 - 09:19



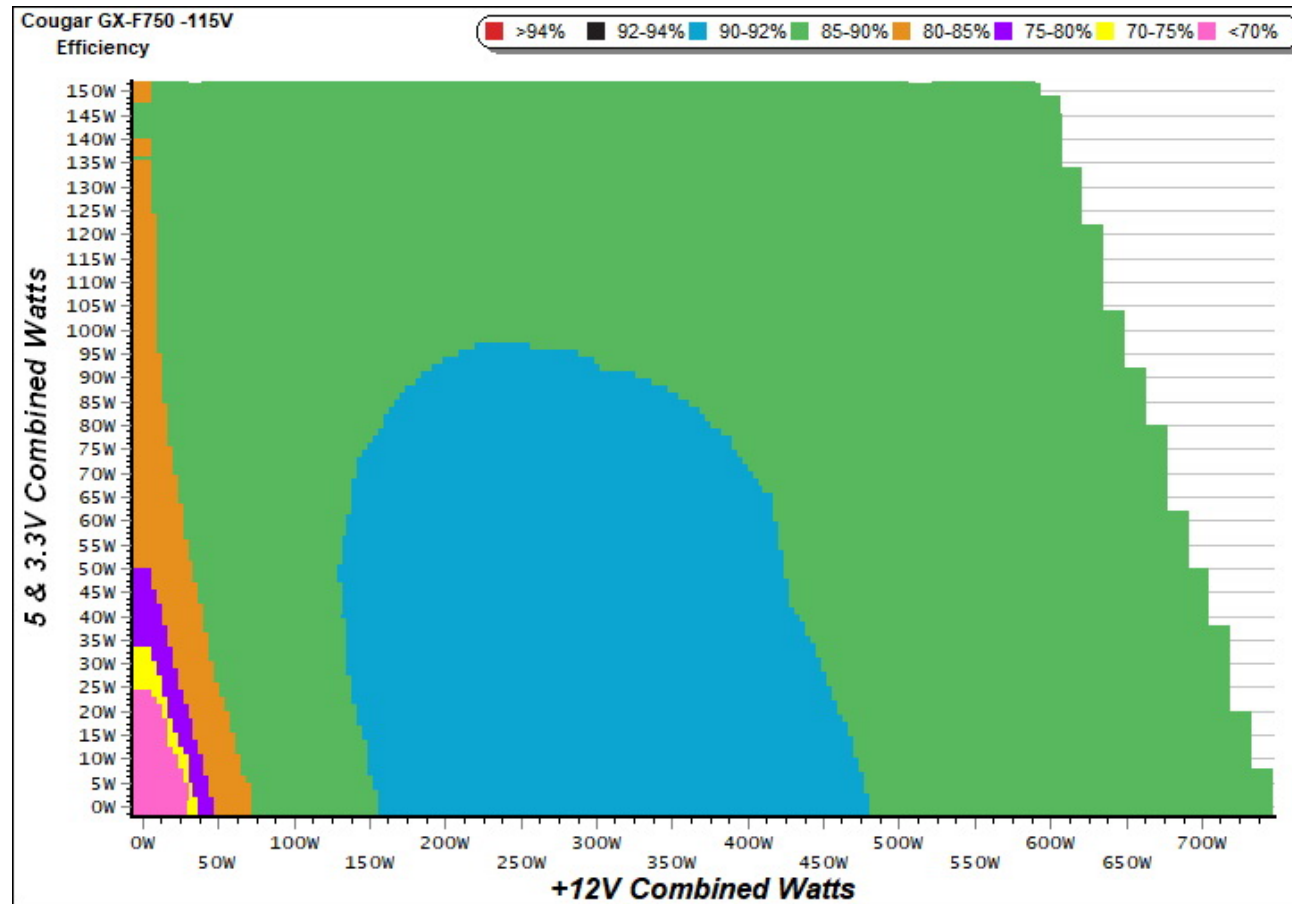
230V

Power - H1801010998 - 22/03/2018 - 09:19



Efficiency Graph

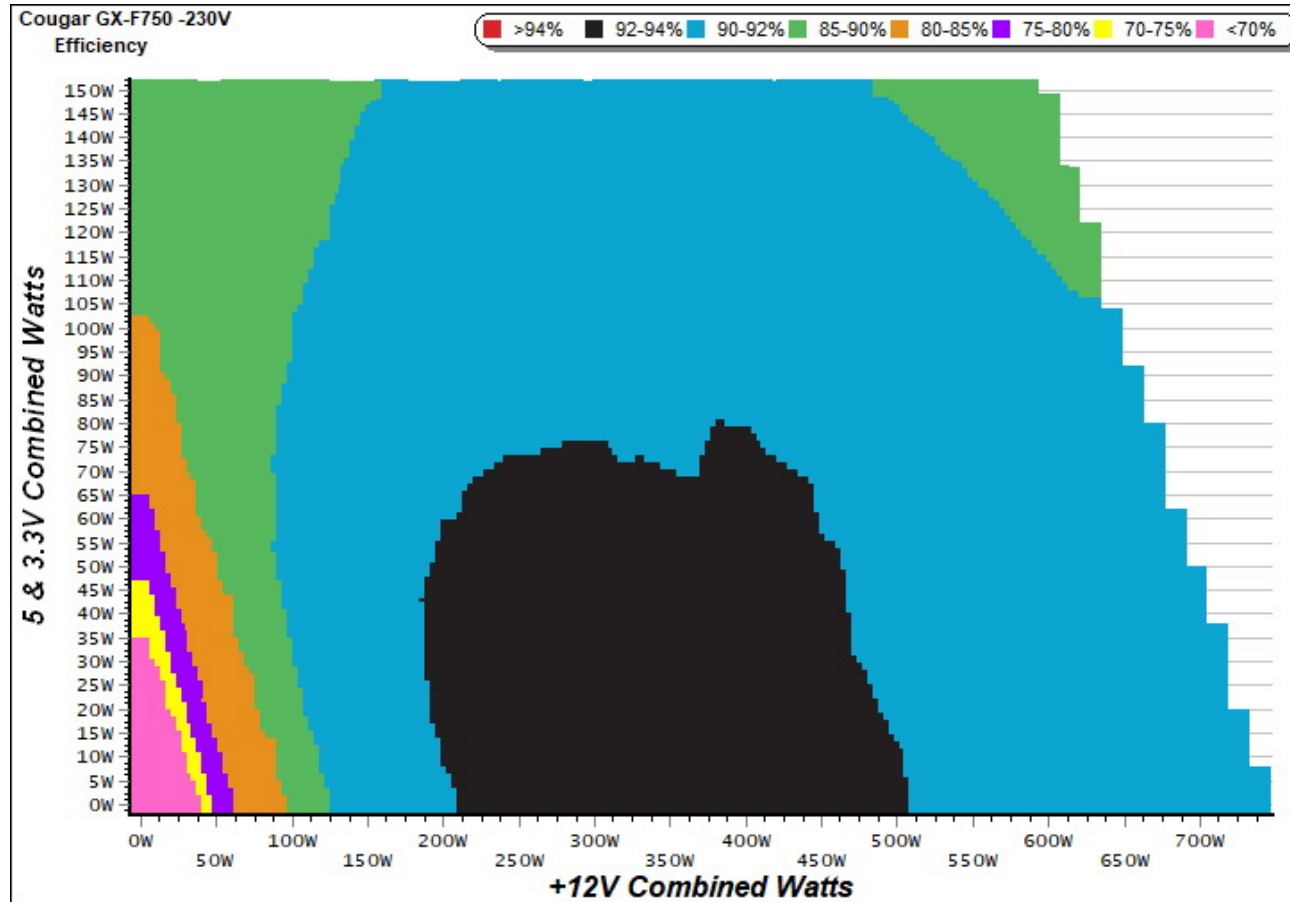
115V



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

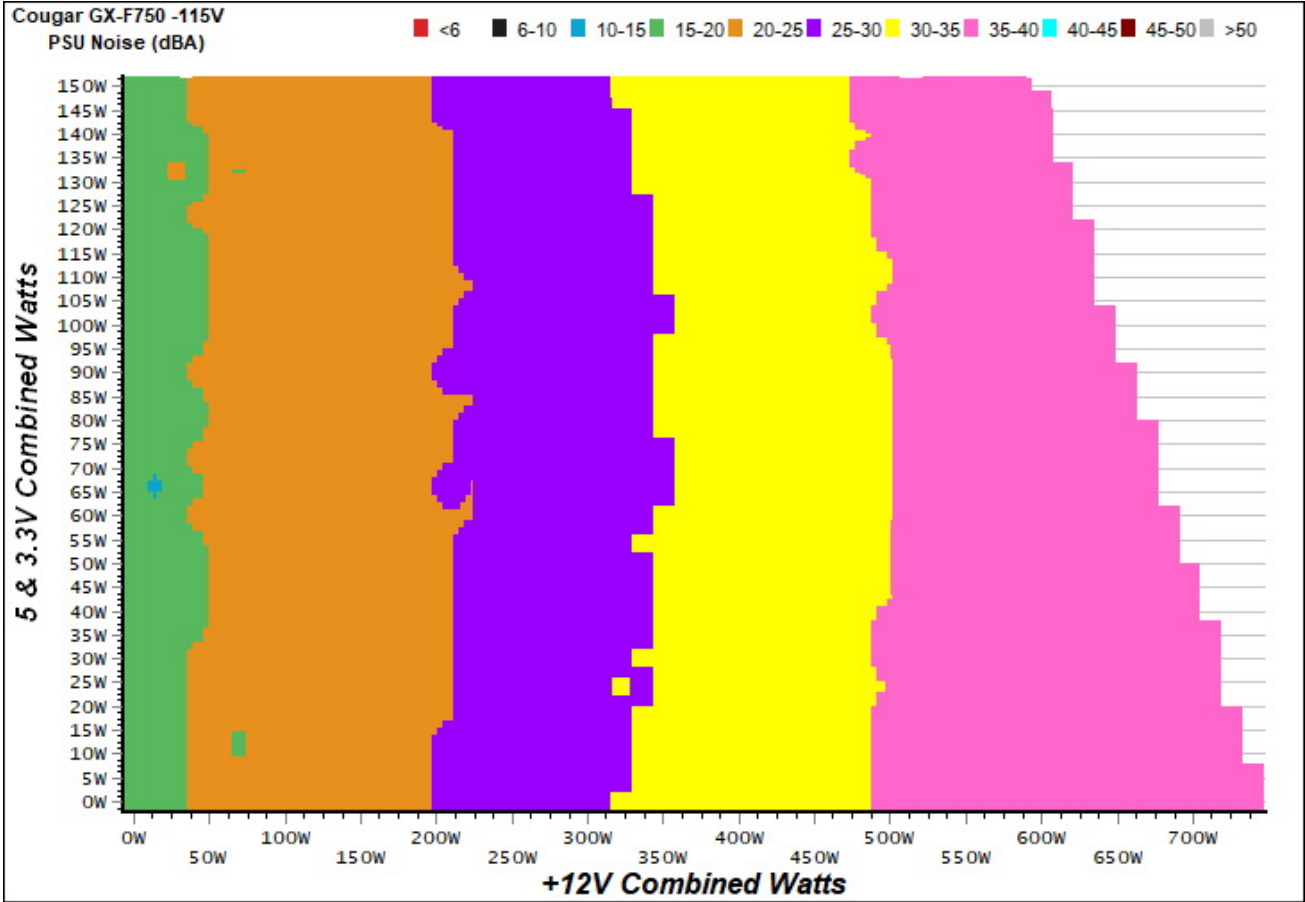


INFO

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

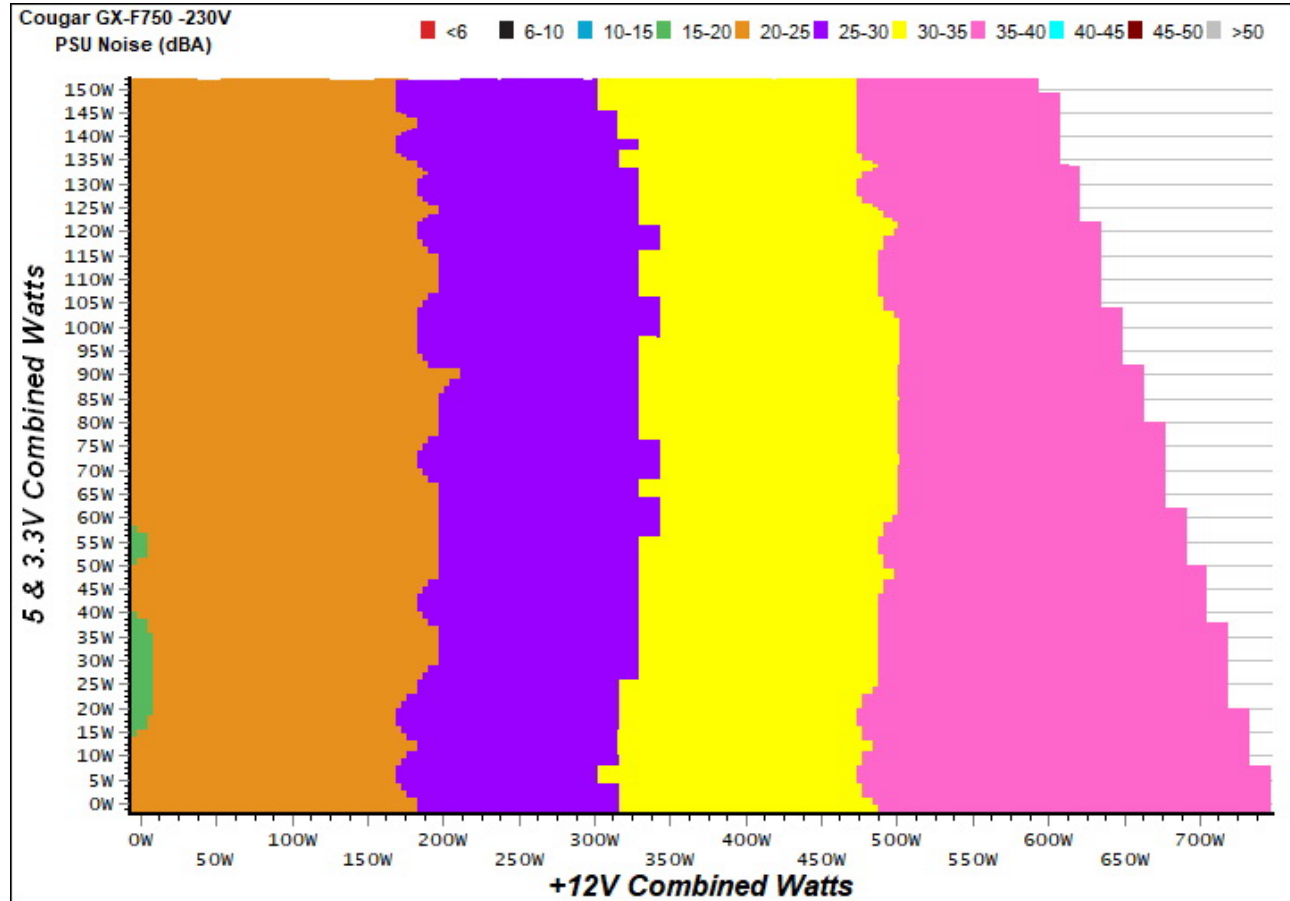
115V



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

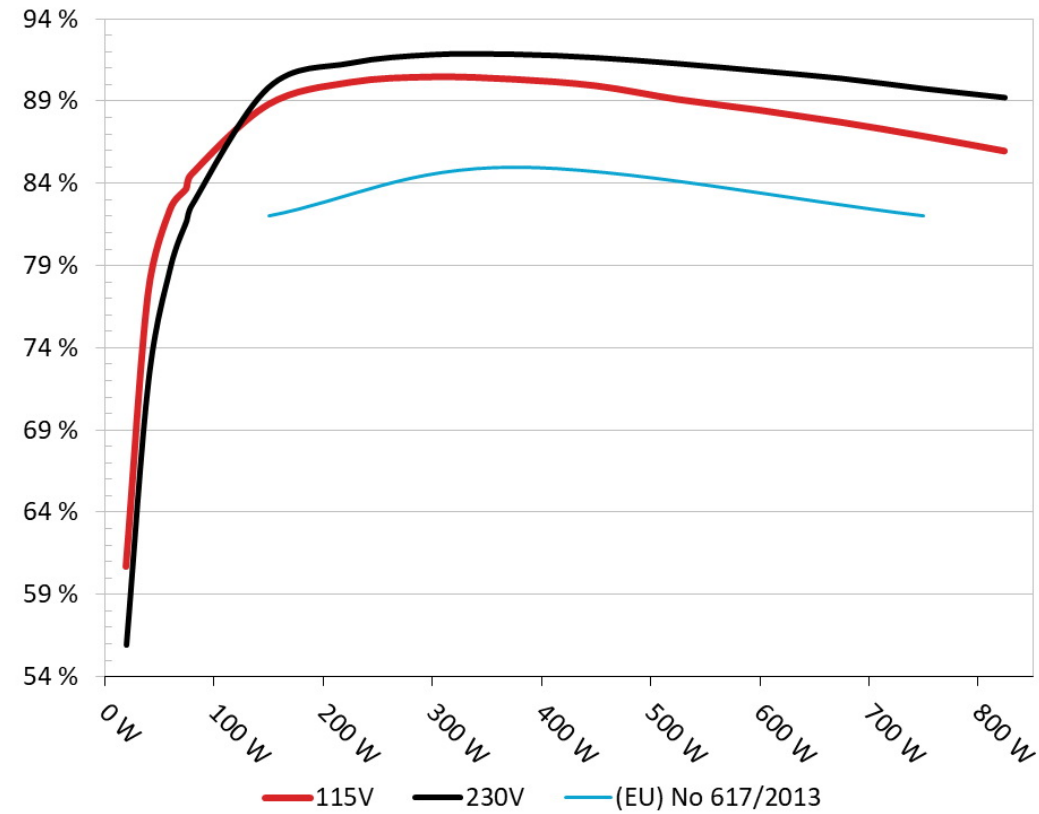
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance

Efficiency under high ambient temperature

Efficiency: Cougar GX-F750

Ambient: 37°C - 45°C (98.6°F - 113°F)



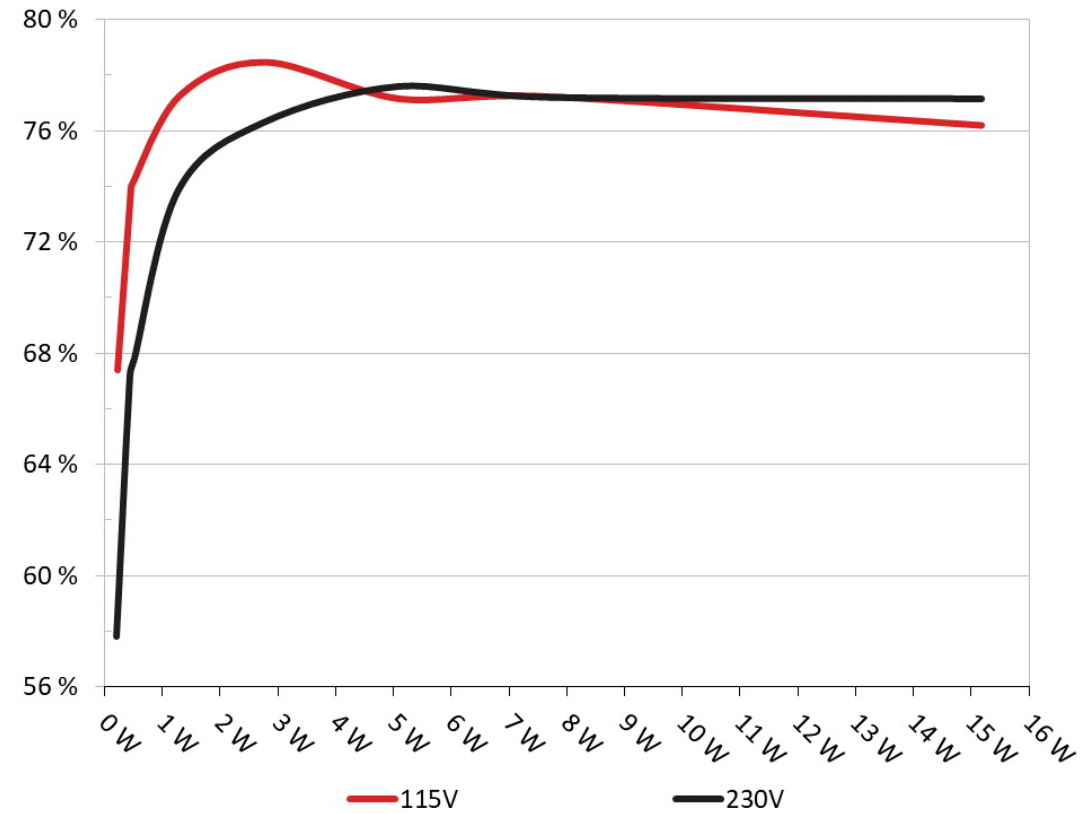
INFO

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

5VSB Efficiency: Cougar GX-F750

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



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	0.042A	0.215	67.398%	0.032
	5.114V	0.319		115.07V
2	0.088A	0.449	73.970%	0.060
	5.112V	0.607		115.07V
3	0.542A	2.768	78.480%	0.255
	5.104V	3.527		115.07V
4	1.003A	5.108	77.160%	0.342
	5.095V	6.620		115.07V
5	1.502A	7.639	77.247%	0.387
	5.086V	9.889		115.07V
6	3.002A	15.185	76.207%	0.443
	5.059V	19.926		115.06V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.214	57.838%	0.011
	5.113V	0.370		230.22V
2	0.087A	0.447	67.218%	0.020
	5.112V	0.665		230.22V
3	0.543A	2.769	76.323%	0.103
	5.104V	3.628		230.22V
4	1.002A	5.107	77.614%	0.169
	5.095V	6.580		230.22V
5	1.502A	7.639	77.224%	0.226
	5.086V	9.892		230.23V
6	3.002A	15.186	77.165%	0.318
	5.059V	19.680		230.23V

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	4.370A	2.002A	1.970A	0.981A	74.790	83.690%	925	27.8	38.12°C	0.974
	12.173V	4.999V	3.347V	5.089V	89.365				41.97°C	115.13V
2	9.786A	3.002A	2.958A	1.181A	149.738	88.814%	955	29.0	38.98°C	0.979
	12.147V	4.992V	3.341V	5.079V	168.598				43.15°C	115.13V
3	15.561A	3.509A	3.476A	1.380A	224.869	90.167%	1000	29.8	39.27°C	0.980
	12.132V	4.985V	3.335V	5.071V	249.393				43.81°C	115.11V
4	21.332A	4.018A	3.962A	1.580A	299.754	90.500%	1070	31.5	40.14°C	0.985
	12.121V	4.977V	3.330V	5.061V	331.220				45.05°C	115.11V
5	26.775A	5.030A	4.964A	1.781A	374.727	90.359%	1155	33.8	40.51°C	0.989
	12.110V	4.970V	3.321V	5.052V	414.710				45.91°C	115.11V
6	32.217A	6.047A	5.971A	1.981A	449.651	89.961%	1245	36.4	41.09°C	0.991
	12.101V	4.963V	3.315V	5.042V	499.827				46.72°C	115.11V
7	37.642A	7.061A	6.980A	2.185A	524.554	89.137%	1320	37.5	41.69°C	0.991
	12.100V	4.956V	3.309V	5.032V	588.479				47.80°C	115.09V
8	43.107A	8.088A	7.995A	2.385A	599.613	88.479%	1407	39.1	42.45°C	0.993
	12.091V	4.949V	3.302V	5.023V	677.687				48.86°C	115.10V
9	48.993A	8.600A	8.523A	2.391A	674.580	87.740%	1515	40.9	42.77°C	0.994
	12.083V	4.944V	3.295V	5.017V	768.843				49.90°C	115.11V
10	54.644A	9.117A	9.024A	2.999A	749.521	86.898%	1550	42.7	43.30°C	0.995
	12.075V	4.937V	3.290V	5.000V	862.527				50.92°C	115.15V
11	60.866A	9.128A	9.040A	3.000A	824.415	85.987%	1560	42.8	44.78°C	0.995
	12.071V	4.932V	3.285V	4.995V	958.769				53.11°C	115.13V
CL1	0.100A	18.030A	18.002A	0.004A	150.540	84.395%	1235	36.2	41.68°C	0.979
	12.147V	4.964V	3.322V	5.091V	178.375				47.46°C	115.11V

CL2	61.949A	1.002A	1.003A	1.002A	761.552	87.257%	1545	42.2	43.64°C	0.995
	12.078V	4.953V	3.304V	5.045V	872.764				50.71°C	115.13V

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	4.340A	2.002A	1.969A	0.981A	74.831	81.733%	985	29.6	38.11°C	0.817
	12.267V	4.999V	3.348V	5.088V	91.555				42.42°C	230.23V
2	9.763A	3.001A	2.962A	1.181A	149.778	89.850%	985	29.6	38.51°C	0.917
	12.180V	4.990V	3.340V	5.078V	166.697				43.10°C	230.23V
3	15.538A	3.509A	3.474A	1.380A	224.905	91.335%	1000	29.8	39.37°C	0.947
	12.153V	4.984V	3.335V	5.070V	246.241				44.37°C	230.23V
4	21.308A	4.019A	3.963A	1.581A	299.768	91.848%	1060	31.3	40.17°C	0.957
	12.135V	4.977V	3.329V	5.060V	326.375				45.32°C	230.29V
5	26.748A	5.030A	4.963A	1.781A	374.718	91.873%	1140	33.6	40.81°C	0.964
	12.122V	4.970V	3.321V	5.052V	407.866				46.29°C	230.29V
6	32.194A	6.048A	5.971A	1.981A	449.691	91.665%	1235	36.2	41.20°C	0.967
	12.111V	4.963V	3.314V	5.041V	490.579				47.24°C	230.24V
7	37.647A	7.060A	6.981A	2.186A	524.609	91.302%	1320	37.5	42.19°C	0.970
	12.100V	4.956V	3.308V	5.031V	574.587				48.57°C	230.26V
8	43.108A	8.088A	7.997A	2.386A	599.616	90.867%	1415	39.5	42.98°C	0.973
	12.091V	4.949V	3.300V	5.021V	659.885				49.85°C	230.26V
9	48.999A	8.601A	8.525A	2.391A	674.642	90.399%	1518	41.1	43.13°C	0.975
	12.083V	4.943V	3.294V	5.015V	746.293				50.64°C	230.28V
10	54.645A	9.119A	9.027A	3.000A	749.496	89.787%	1550	42.7	44.29°C	0.976
	12.074V	4.937V	3.290V	4.998V	834.746				52.21°C	230.28V
11	60.880A	9.131A	9.041A	3.000A	824.385	89.237%	1560	42.8	44.84°C	0.977
	12.068V	4.930V	3.284V	4.993V	923.813				53.60°C	230.29V
CL1	0.099A	18.030A	18.002A	0.004A	150.529	85.374%	1245	36.4	41.62°C	0.923
	12.176V	4.964V	3.322V	5.090V	176.318				47.46°C	230.26V

CL2	61.965A	1.002A	1.003A	1.002A	761.682	90.185%	1545	42.2	43.17°C	0.976
	12.077V	4.952V	3.304V	5.045V	844.579				50.48°C	230.29V

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	1.187A	0.492A	0.474A	0.196A	19.631	60.676%	925	27.8	0.869
	12.279V	5.007V	3.355V	5.108V	32.354				115.14V
2	2.416A	0.990A	0.981A	0.391A	39.702	77.235%	885	26.3	0.944
	12.195V	5.005V	3.352V	5.102V	51.404				115.13V
3	3.646A	1.490A	1.488A	0.586A	59.832	82.401%	885	26.3	0.968
	12.180V	5.002V	3.349V	5.097V	72.611				115.14V
4	4.861A	2.003A	1.968A	0.785A	79.756	84.578%	910	26.9	0.974
	12.170V	4.999V	3.347V	5.093V	94.299				115.13V

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	1.190A	0.492A	0.473A	0.196A	19.684	55.906%	925	27.8	0.519
	12.298V	5.006V	3.354V	5.106V	35.209				230.22V
2	2.407A	0.990A	0.982A	0.392A	39.791	71.957%	945	28.6	0.673
	12.275V	5.004V	3.352V	5.100V	55.298				230.23V
3	3.622A	1.489A	1.489A	0.586A	59.870	78.877%	955	29.0	0.770
	12.272V	5.002V	3.349V	5.096V	75.903				230.23V
4	4.831A	2.004A	1.969A	0.785A	79.840	82.719%	985	29.6	0.829
	12.262V	4.998V	3.347V	5.092V	96.520				230.23V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.2 mV	12.8 mV	9.8 mV	8.0 mV	Pass
20% Load	11.0 mV	12.0 mV	11.4 mV	10.2 mV	Pass
30% Load	12.9 mV	13.2 mV	15.1 mV	13.5 mV	Pass
40% Load	14.6 mV	14.0 mV	16.8 mV	14.0 mV	Pass
50% Load	16.6 mV	14.9 mV	19.1 mV	17.5 mV	Pass
60% Load	18.7 mV	16.4 mV	21.5 mV	19.9 mV	Pass
70% Load	19.6 mV	17.7 mV	22.6 mV	22.3 mV	Pass
80% Load	20.7 mV	18.1 mV	24.9 mV	33.3 mV	Pass
90% Load	22.8 mV	19.2 mV	26.7 mV	35.4 mV	Pass
100% Load	26.4 mV	23.4 mV	36.7 mV	30.9 mV	Pass
110% Load	27.8 mV	26.3 mV	37.3 mV	32.9 mV	Pass
Crossload 1	12.6 mV	12.1 mV	18.3 mV	7.7 mV	Pass
Crossload 2	25.7 mV	22.8 mV	31.1 mV	25.3 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.4 mV	14.0 mV	14.7 mV	9.4 mV	Pass
20% Load	14.1 mV	12.8 mV	15.1 mV	10.3 mV	Pass
30% Load	13.8 mV	13.7 mV	16.6 mV	12.6 mV	Pass
40% Load	15.2 mV	14.5 mV	18.4 mV	14.5 mV	Pass
50% Load	17.6 mV	16.0 mV	21.0 mV	17.2 mV	Pass
60% Load	18.2 mV	16.6 mV	22.4 mV	19.2 mV	Pass
70% Load	20.2 mV	17.6 mV	24.9 mV	21.7 mV	Pass
80% Load	21.1 mV	17.6 mV	24.9 mV	29.1 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	22.7 mV	19.7 mV	26.7 mV	30.7 mV	Pass
100% Load	24.9 mV	21.3 mV	33.5 mV	29.2 mV	Pass
110% Load	27.4 mV	25.6 mV	32.9 mV	30.9 mV	Pass
Crossload 1	15.2 mV	12.1 mV	15.9 mV	7.3 mV	Pass
Crossload 2	25.0 mV	21.8 mV	27.8 mV	24.5 mV	Pass

The results above are not used in the certification process

Cougar GX-F750 (#2)



Top side



Power specifications label

Cybenetics [REDACTED] ETA[REDACTED] LAMBDA[REDACTED] SAFE[REDACTED] DELTA[REDACTED] PHI[REDACTED]

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

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