Anex

Cougar Polar 1200W

Lab ID#: CG12002004
Receipt Date: Apr 5, 2022
Test Date: Apr 15, 2022

Report: 22PS2004A
Report Date: Apr 15, 2022

DUT INFORMATION

Brand	Cougar
Manufacturer (OEM)	XHY-Power
Series	Polar
Model Number	CGR PR-1200
Serial Number	12BB02PR12000001
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	15-7
Rated Frequency (Hz)	47-63
Rated Power (W)	1200
Type	ATX12V
Cooling	135mm Hydraulic Dynamic Bearing Fan (DWPH EFF-14E12H)
Semi-Passive Operation	✓
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓

115V

Average Efficiency	90.029%
Efficiency With 10W (≤500W) or 2% (>500W)	69.186
Average Efficiency 5VSB	81.066%
Standby Power Consumption (W)	0.0536000
Average PF	0.976
Avg Noise Output	19.66 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A+

230V

Average Efficiency	92.232%
Average Efficiency 5VSB	79.809%
Standby Power Consumption (W)	0.0898000
Average PF	0.937
Avg Noise Output	17.97 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A+

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	100	3	0.3
	Watts	100		1200	15	3.6
Total Max. Power (W)		1200				

HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	18.8
AC Loss to PWR_OK Hold Up Time (ms)	17.2
PWR_OK Inactive to DC Loss Delay (ms)	1.6

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (650mm)	1	1	18-22AWG	No
4+4 pin EPS12V (650mm)	1	1	16AWG	No
8 pin EPS12V (650mm)	1	1	16AWG	No
6+2 pin PCIe (650mm)	7	7	16AWG	No
6+2 pin PCIe (650mm+100mm)	1	2	16AWG	No
SATA (500mm+115mm+115mm+115mm)	3	12	18AWG	No
4 pin Molex (500mm+120mm+120mm+120mm)	1	4	18AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	14AWG	-

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General Data	
Manufacturer (OEM)	XHY-Power
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor MF72-5D15 (5 Ohm) & Relay
Bridge Rectifier(s)	2x MCC GBU15KL (800V, 15A @ 100°C)
APFC MOSFETs	2x 65R078W
APFC Boost Diode	1x G3S06510A
Bulk Cap(s)	2x Nippon Chemi-Con (450V, 560uF each or 1120uF combined, 2,000h @ 105°C, KMW)
Main Switchers	4x NCE Power NCE65TF130 (650V, 18A @ 100°C, Rds(on): 0.13Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901T6X
Topology	Primary side: APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETs	8x Infineon BSC010N04LS (40V, 178A @ 100°C, Rds(on): 1mOhm)
5V & 3.3V	DC-DC Converters: 6x Excelliance MOS EMB04N03H (30V, 45A @ 100°C, Rds(on): 4mOhm) PWM Controller(s): uPI-Semi uP3861P
Filtering Capacitors	Electrolytic: 4x Nippon Chemi-Con (105°C, W), 14x Nippon Chemi-Con (4-10,000h @ 105°C, KY) Polymer: 9x FPCAP, 4x Elite, 8x no info
Supervisor IC	IN1S4241-SDG
Fan Model	DWPH EFF-14E12H (140mm, 12V, 0.30A, Hydraulic Bearing Fan)
5VSB Circuit	
Rectifier	60R10S SBR
Standby PWM Controller	Excelliance MOS EM8569C

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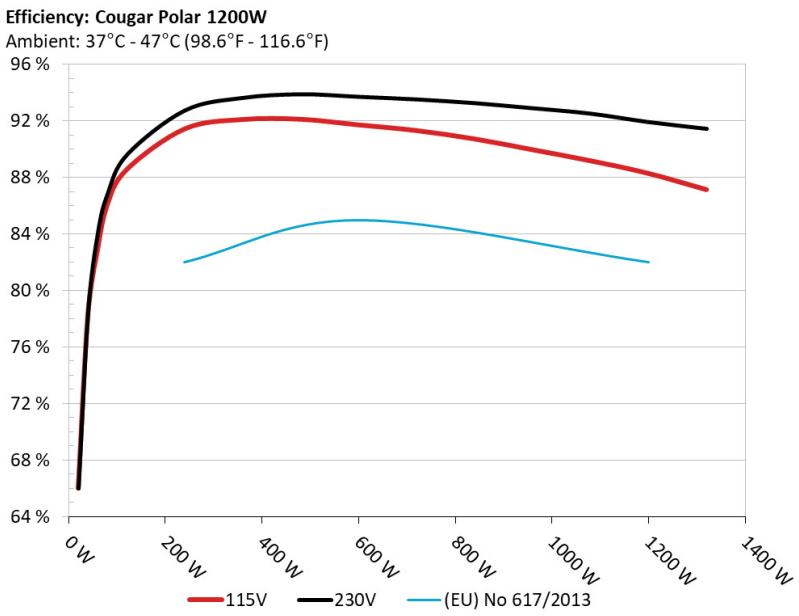
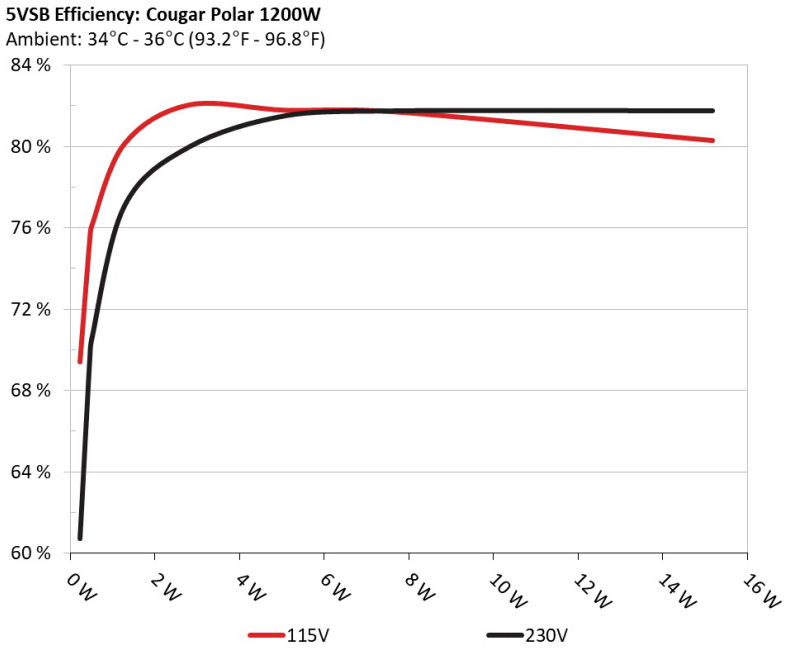
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	69.391%	0.051
	5.119V	0.332W		115.12V
2	0.09A	0.461W	75.429%	0.091
	5.118V	0.611W		115.12V
3	0.55A	2.81W	82.065%	0.327
	5.109V	3.424W		115.12V
4	1A	5.101W	81.8%	0.409
	5.1V	6.236W		115.12V
5	1.5A	7.636W	81.728%	0.444
	5.09V	9.343W		115.12V
6	3A	15.177W	80.311%	0.496
	5.059V	18.898W		115.11V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	60.728%	0.018
	5.119V	0.379W		230.28V
2	0.09A	0.461W	69.57%	0.031
	5.118V	0.663W		230.28V
3	0.55A	2.81W	79.998%	0.149
	5.109V	3.513W		230.28V
4	1A	5.1W	81.539%	0.229
	5.1V	6.255W		230.28V
5	1.5A	7.636W	81.773%	0.29
	5.09V	9.337W		230.28V
6	3A	15.181W	81.778%	0.375
	5.06V	18.565W		230.28V

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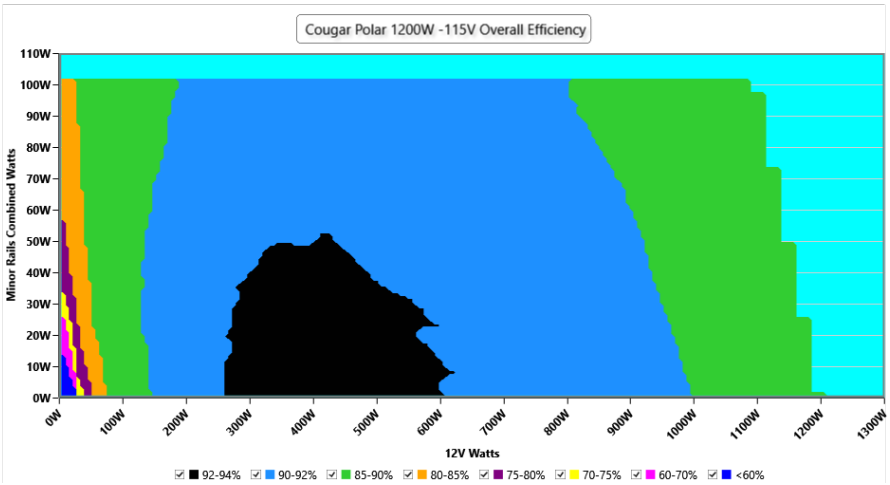
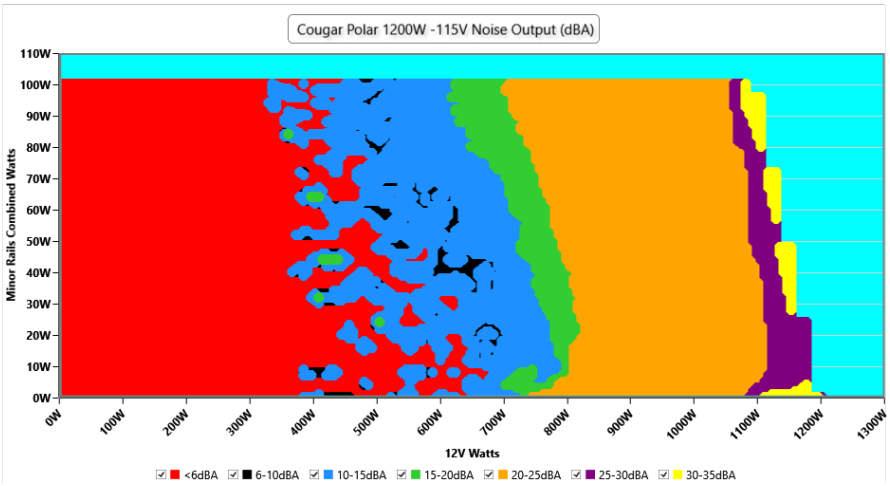
EFFICIENCY GRAPH 115V



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

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

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VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.12 V	115.09 V	113.85 V	115.16 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.416	1.415	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.13 %	0.10 %	N/A	0.18 %	2.00 %	PASS
Real Power:	0.054 W	0.047 W	N/A	0.063 W	N/A	N/A
Apparent Power:	6.483 W	6.419 W	N/A	6.541 W	N/A	N/A
Power Factor:	0.008	N/A	N/A	N/A	N/A	N/A

INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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Cougar Polar 1200W

10-110% 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%	8.094A	1.981A	1.97A	0.981A	119.965	88.518%	0	<6.0	45.73°C	0.98
	12.154V	5.047V	3.349V	5.097V	135.526				40.88°C	115.14V
20%	17.204A	2.973A	2.957A	1.179A	239.905	91.401%	0	<6.0	46.33°C	0.965
	12.149V	5.044V	3.348V	5.087V	262.475				41.04°C	115.14V
30%	26.592A	3.471A	3.451A	1.379A	358.975	92.064%	0	<6.0	47.29°C	0.968
	12.143V	5.042V	3.346V	5.077V	389.92				41.36°C	115.14V
40%	36.092A	3.969A	3.946A	1.579A	479.376	92.087%	0	<6.0	47.79°C	0.975
	12.141V	5.038V	3.345V	5.066V	520.571				41.49°C	115.13V
50%	45.206A	4.965A	4.934A	1.78A	599.094	91.69%	707	22.6	42.83°C	0.98
	12.136V	5.036V	3.344V	5.056V	653.39				49.65°C	115.13V
60%	54.398A	5.96A	5.923A	1.982A	719.63	91.288%	717	22.9	43.35°C	0.983
	12.130V	5.034V	3.343V	5.046V	788.309				50.83°C	115.12V
70%	63.532A	6.957A	6.913A	2.183A	839.367	90.696%	719	23.0	43.73°C	0.985
	12.124V	5.031V	3.342V	5.036V	925.471				51.5°C	115.11V
80%	72.731A	7.958A	7.9A	2.287A	959.356	89.935%	738	23.4	44.28°C	0.987
	12.120V	5.028V	3.34V	5.027V	1066.727				52.65°C	115.11V
90%	82.276A	8.456A	8.383A	2.39A	1079.162	89.154%	1325	39.5	44.83°C	0.989
	12.114V	5.025V	3.338V	5.018V	1210.444				53.83°C	115.1V
100%	91.645A	8.958A	8.896A	2.999A	1199.203	88.261%	1700	46.2	45.46°C	0.99
	12.106V	5.022V	3.337V	5V	1358.708				55.2°C	115.09V
110%	100.940A	9.961A	9.98A	3.003A	1319.82	87.108%	1717	46.7	47.04°C	0.991
	12.102V	5.019V	3.335V	4.993V	1515.162				57.84°C	115.08V
CL1	0.113A	11.955A	11.839A	0A	101.264	82.874%	718	22.9	42.47°C	0.974
	12.159V	5.035V	3.352V	5.107V	122.191				49.52°C	115.17V
CL2	0.113A	19.961A	0A	0A	101.375	81.179%	477	13.7	43.97°C	0.974
	12.158V	5.01V	3.346V	5.111V	124.879				52.34°C	115.16V
CL3	0.113A	0A	19.691A	0A	67.36	75.279%	433	11.2	44.7°C	0.975
	12.162V	5.04V	3.351V	5.108V	89.49				54.44°C	115.16V
CL4	99.059A	0A	0A	0A	1199.912	88.819%	1625	44.7	45.66°C	0.989
	12.113V	5.029V	3.335V	5.067V	1350.967				55.88°C	115.09V

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Cougar Polar 1200W

20-80W 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	1.221A	0.495A	0.492A	0.195A	19.983	65.989%	0	<6.0	40.09°C	0.897
	12.150V	5.048V	3.352V	5.118V	30.282				36.84°C	115.15V
40W	2.688A	0.693A	0.689A	0.293A	39.984	78.233%	0	<6.0	41.19°C	0.947
	12.158V	5.049V	3.352V	5.115V	51.109				37.39°C	115.15V
60W	4.156A	0.891A	0.886A	0.391A	59.984	82.888%	0	<6.0	42.3°C	0.966
	12.156V	5.049V	3.35V	5.112V	72.367				38.11°C	115.15V
80W	5.618A	1.089A	1.083A	0.489A	79.92	86.034%	0	<6.0	44.82°C	0.979
	12.156V	5.049V	3.349V	5.109V	92.894				40.37°C	115.15V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	16.18mV	4.37mV	6.78mV	7.24mV	Pass
20% Load	18.00mV	4.83mV	7.64mV	7.14mV	Pass
30% Load	15.22mV	5.39mV	7.99mV	7.54mV	Pass
40% Load	14.66mV	5.95mV	8.29mV	7.34mV	Pass
50% Load	13.80mV	6.40mV	9.00mV	8.25mV	Pass
60% Load	15.19mV	6.45mV	9.91mV	8.70mV	Pass
70% Load	15.75mV	6.91mV	9.70mV	9.01mV	Pass
80% Load	17.32mV	7.42mV	11.93mV	8.80mV	Pass
90% Load	18.88mV	9.91mV	13.25mV	9.26mV	Pass
100% Load	29.50mV	11.47mV	15.06mV	10.77mV	Pass
110% Load	31.60mV	11.92mV	16.03mV	11.41mV	Pass
Crossload1	20.91mV	10.03mV	14.43mV	9.53mV	Pass
Crossload2	16.68mV	12.81mV	13.14mV	9.01mV	Pass
Crossload3	12.74mV	5.74mV	14.36mV	8.70mV	Pass
Crossload4	31.16mV	13.71mV	12.50mV	13.25mV	Pass

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230V

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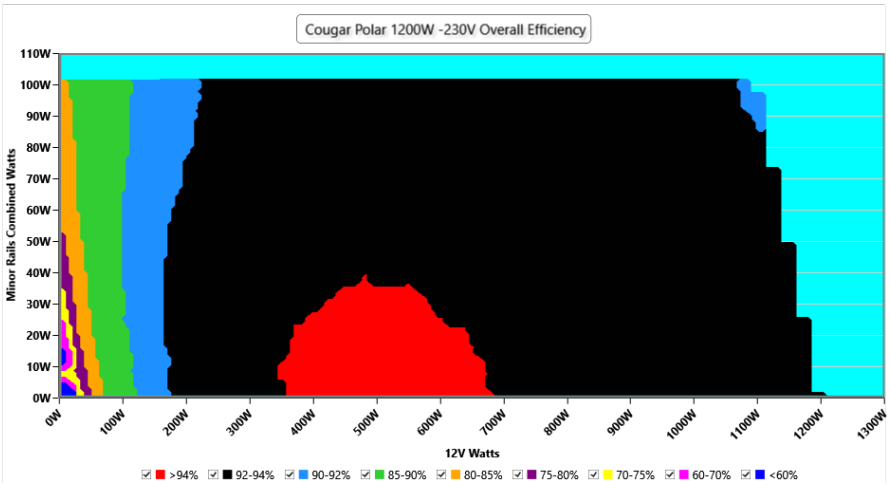
EFFICIENCY GRAPH 230V



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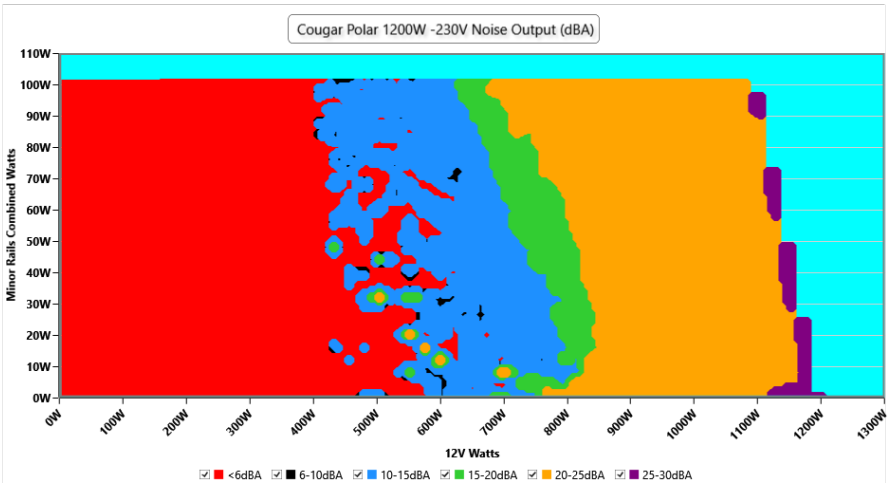
NOISE GRAPH 230V



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VAMPIRE POWER -230V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.27 V	230.17 V	227.70 V	230.34 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:	1.416	1.415	1.340	1.417	1.490	PASS
Mains Voltage THD:	0.13 %	0.10 %	N/A	0.22 %	2.00 %	PASS
Real Power:	0.090 W	0.075 W	N/A	0.116 W	N/A	N/A
Apparent Power:	21.232 W	21.093 W	N/A	21.365 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

INFO

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10-110% LOAD TESTS 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%	8.094A	1.981A	1.971A	0.981A	119.982	89.611%	0	<6.0	45.9°C	0.889
	12.155V	5.048V	3.348V	5.096V	133.891				40.9°C	230.3V
20%	17.204A	2.974A	2.958A	1.18A	239.925	92.754%	0	<6.0	46.76°C	0.931
	12.149V	5.045V	3.347V	5.086V	258.668				41.17°C	230.3V
30%	26.596A	3.471A	3.452A	1.379A	359.076	93.642%	0	<6.0	47.22°C	0.943
	12.145V	5.042V	3.345V	5.075V	383.455				41.29°C	230.31V
40%	36.096A	3.97A	3.948A	1.579A	479.479	93.901%	0	<6.0	48.02°C	0.95
	12.141V	5.038V	3.344V	5.065V	510.622				41.5°C	230.31V
50%	45.208A	4.964A	4.936A	1.781A	599.163	93.723%	709	22.6	42.13°C	0.956
	12.136V	5.037V	3.343V	5.054V	639.291				49.3°C	230.31V
60%	54.401A	5.96A	5.925A	1.982A	719.709	93.536%	716	22.8	42.6°C	0.959
	12.130V	5.034V	3.342V	5.044V	769.443				50.29°C	230.32V
70%	63.527A	6.956A	6.914A	2.183A	839.336	93.276%	717	22.9	43.25°C	0.963
	12.125V	5.032V	3.341V	5.036V	899.837				51.46°C	230.3V
80%	72.729A	7.955A	7.901A	2.286A	959.328	92.914%	727	23.1	43.72°C	0.967
	12.120V	5.029V	3.34V	5.027V	1032.496				52.73°C	230.28V
90%	82.271A	8.452A	8.383A	2.39A	1079.095	92.534%	1134	35.2	44.01°C	0.969
	12.114V	5.027V	3.338V	5.019V	1166.157				53.49°C	230.28V
100%	91.637A	8.954A	8.897A	2.998A	1199.18	91.935%	1693	45.8	45.57°C	0.971
	12.107V	5.024V	3.337V	5.001V	1304.376				55.62°C	230.27V
110%	100.939A	9.957A	9.98A	3.002A	1319.8	91.457%	1712	46.6	46.68°C	0.973
	12.101V	5.021V	3.335V	4.995V	1443.082				57.49°C	230.27V
CL1	0.113A	11.951A	11.839A	0A	101.263	84.061%	719	22.7	42°C	0.879
	12.159V	5.036V	3.352V	5.108V	120.464				49.17°C	230.29V
CL2	0.113A	19.959A	0A	0A	101.378	82.156%	709	22.6	43.73°C	0.881
	12.161V	5.01V	3.346V	5.111V	123.398				51.79°C	230.29V
CL3	0.113A	0A	19.687A	0A	67.362	76.196%	410	9.8	44.02°C	0.836
	12.162V	5.043V	3.352V	5.108V	88.41				53.02°C	230.28V
CL4	99.040A	0A	0A	0A	1199.842	92.474%	1450	41.8	45.67°C	0.971
	12.114V	5.031V	3.335V	5.067V	1297.491				55.53°C	230.28V

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Anex

Cougar Polar 1200W

20-80W LOAD TESTS 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	1.222A	0.495A	0.492A	0.195A	19.986	66.001%	0	<6.0	39.88°C	0.576
	12.146V	5.051V	3.351V	5.119V	30.281				36.77°C	230.26V
40W	2.688A	0.693A	0.689A	0.293A	39.987	78.546%	0	<6.0	41.29°C	0.728
	12.155V	5.051V	3.351V	5.115V	50.908				37.78°C	230.27V
60W	4.156A	0.891A	0.887A	0.391A	59.986	84.089%	0	<6.0	42.56°C	0.798
	12.155V	5.05V	3.349V	5.112V	71.336				38.74°C	230.28V
80W	5.619A	1.089A	1.084A	0.489A	79.932	86.843%	0	<6.0	43.62°C	0.839
	12.155V	5.05V	3.349V	5.109V	92.042				39.41°C	230.28V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	18.92mV	4.07mV	6.62mV	6.88mV	Pass
20% Load	20.89mV	4.52mV	7.54mV	7.39mV	Pass
30% Load	16.23mV	5.28mV	7.74mV	7.44mV	Pass
40% Load	16.38mV	5.29mV	7.79mV	7.19mV	Pass
50% Load	14.88mV	5.90mV	8.34mV	8.04mV	Pass
60% Load	14.78mV	6.40mV	9.05mV	8.45mV	Pass
70% Load	16.25mV	7.07mV	9.15mV	8.65mV	Pass
80% Load	16.84mV	7.57mV	12.34mV	8.76mV	Pass
90% Load	18.02mV	9.81mV	12.74mV	9.31mV	Pass
100% Load	30.55mV	11.31mV	16.16mV	10.76mV	Pass
110% Load	31.82mV	12.51mV	15.97mV	10.94mV	Pass
Crossload1	21.17mV	10.18mV	14.67mV	9.68mV	Pass
Crossload2	17.40mV	13.46mV	13.30mV	8.76mV	Pass
Crossload3	15.12mV	5.74mV	16.13mV	9.31mV	Pass
Crossload4	29.82mV	7.22mV	10.73mV	12.06mV	Pass

Anex

Cougar Polar 1200W

Top side

Power specifications label

CERTIFICATIONS 115V

CERTIFICATIONS 230V