

Anex

MSI MPG A850G

Lab ID#: MS85001978
 Receipt Date: Feb 9, 2022
 Test Date: Feb 16, 2022

Report: 22PS1978A
 Report Date: Feb 16, 2022

DUT INFORMATION	
Brand	MSI
Manufacturer (OEM)	CWT
Series	MPG
Model Number	
Serial Number	
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z)
Semi-Passive Operation	✓ (selectable)
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	88.245%
Efficiency With 10W (≤500W) or 2% (>500W)	57.556
Average Efficiency 5VSB	79.458%
Standby Power Consumption (W)	0.0265449
Average PF	0.990
Avg Noise Output	31.95 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

230V

Average Efficiency	90.503%
Average Efficiency 5VSB	77.882%
Standby Power Consumption (W)	0.0467405
Average PF	0.968
Avg Noise Output	31.87 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	70.8	3	0.3
	Watts	120		850	15	3.6
Total Max. Power (W)		850				

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

Hold-Up Time (ms)	17.5
AC Loss to PWR_OK Hold Up Time (ms)	15.1
PWR_OK Inactive to DC Loss Delay (ms)	2.4

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18AWG	No
4+4 pin EPS12V (700mm)	2	2	18AWG	No
6+2 pin PCIe (600mm)	3	3	18AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	18AWG	No
SATA (500mm+150mm+150mm)	2	6	18AWG	No
SATA (500mm+150mm)	1	2	18AWG	No
4 pin Molex (500mm+150mm+150mm+150mm) / FDD (+150mm)	1	4 / 1	18-20AWG	No

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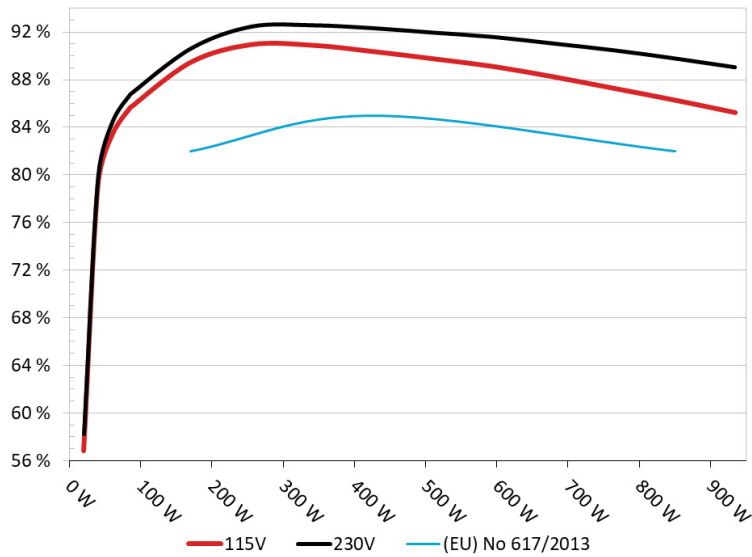
General Data	
Manufacturer (OEM)	CWT
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor SCK-037 (3 Ohm) & Relay
Bridge Rectifier(s)	2x GBU1506 (800V, 15A @ 100°C)
APFC MOSFETs	2x STMicroelectronics STF33N60M2 (600V, 16A @ 100°C, Rds(on): 0.125Ohm)
APFC Boost Diode	1x On Semiconductor FFSP0865B (650V, 8A @ 147°C)
Bulk Cap(s)	1x Nippon Chemi-Con (400V, 680uF, 2,000h @ 105°C, KMR)
Main Switchers	2x On Semiconductor FCPF190N60E (600V, 13.1A @ 100°C, Rds(on): 0.19Ohm)
APFC Controller	Champion CM6500UNX & CM03X
Resonant Controller	Champion CU6901VA
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETs	6x Infineon BSC014N04LS (40V, 125A @ 100°C, Rds(on): 1.4mOhm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm) & 2x UBIQ QN3107M6N (30V, 70A @ 100°C, Rds(on): 2.6mOhm) PWM Controller(s): uPI-Semi uP3861P
Filtering Capacitors	Electrolytic: 3x Nichicon (2-5,000h @ 105°C, HD), 2x Nippon Chemi-Con (1-5,000h @ 105°C, KZE), 2x Nichicon (4-10,000h @ 105°C, HE), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 1x Rubycon (4-10,000h @ 105°C, YXJ), 1x Rubycon (2-10,000h @ 105°C, YXF) Polymer: 20x United Chemi-Con, 8x FPCAP
Supervisor IC	Weltrend WT7502R (OVP, UVP, SCP, PG)
Fan Controller	Microchip PIC16F1503
Fan Model	Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan)
5VSB Circuit	
Rectifier	1x PS1045L SBR (45V, 10A)
Standby PWM Controller	On Bright OB2365T

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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: MSI MPG A850G
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

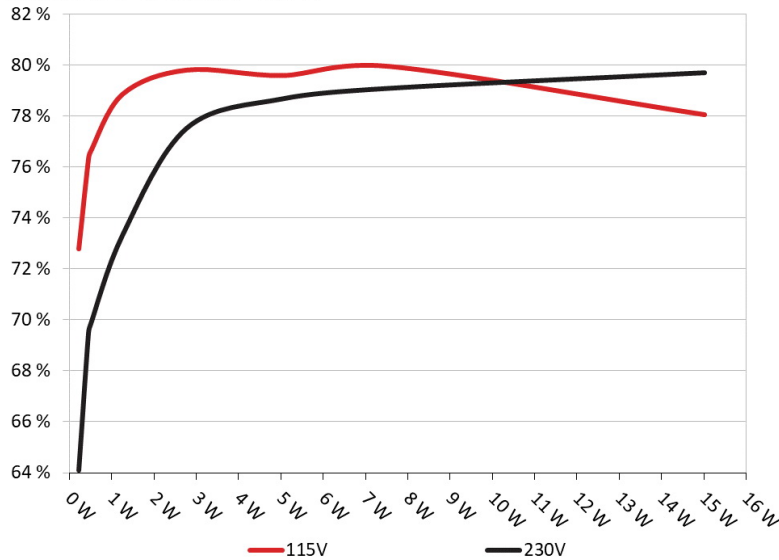


INFO

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: MSI MPG A850G
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

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	72.776%	0.031
	5.072V	0.313W		115.15V
2	0.09A	0.456W	76.31%	0.059
	5.071V	0.598W		115.15V
3	0.55A	2.785W	79.802%	0.257
	5.062V	3.49W		115.14V
4	1A	5.053W	79.586%	0.344
	5.052V	6.349W		115.14V
5	1.5A	7.563W	79.948%	0.392
	5.041V	9.46W		115.14V
6	3A	15.026W	78.049%	0.455
	5.008V	19.252W		115.14V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	64.091%	0.011
	5.072V	0.356W		230.37V
2	0.09A	0.457W	69.481%	0.02
	5.072V	0.658W		230.37V
3	0.55A	2.785W	77.527%	0.102
	5.062V	3.592W		230.37V
4	1A	5.053W	78.675%	0.168
	5.052V	6.423W		230.38V
5	1.5A	7.564W	79.085%	0.224
	5.041V	9.564W		230.37V
6	3A	15.024W	79.697%	0.32
	5.008V	18.852W		230.37V

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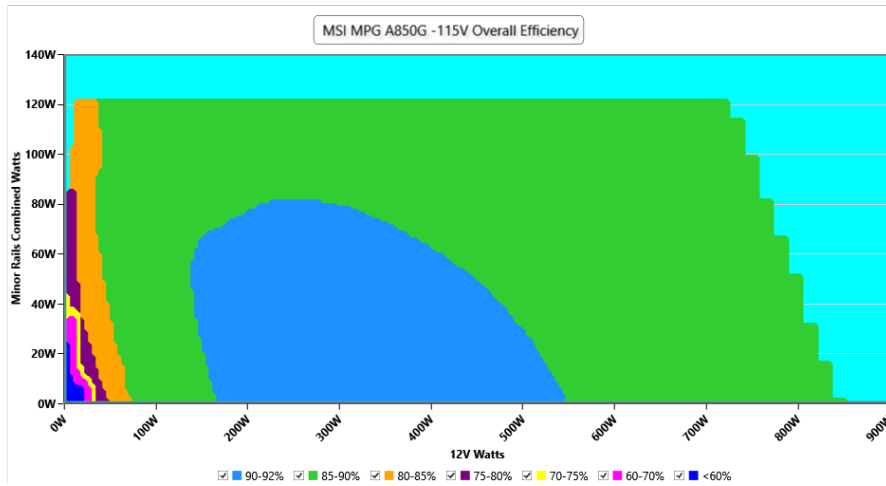
115V

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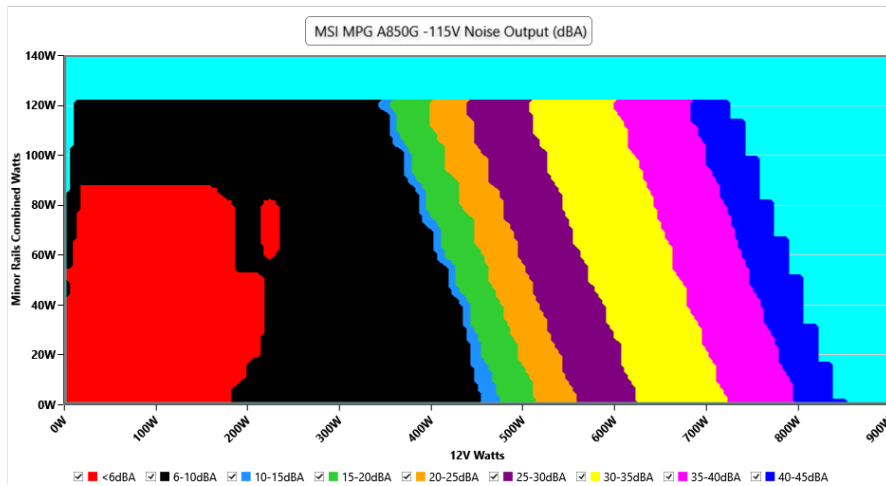
EFFICIENCY GRAPH 115V



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

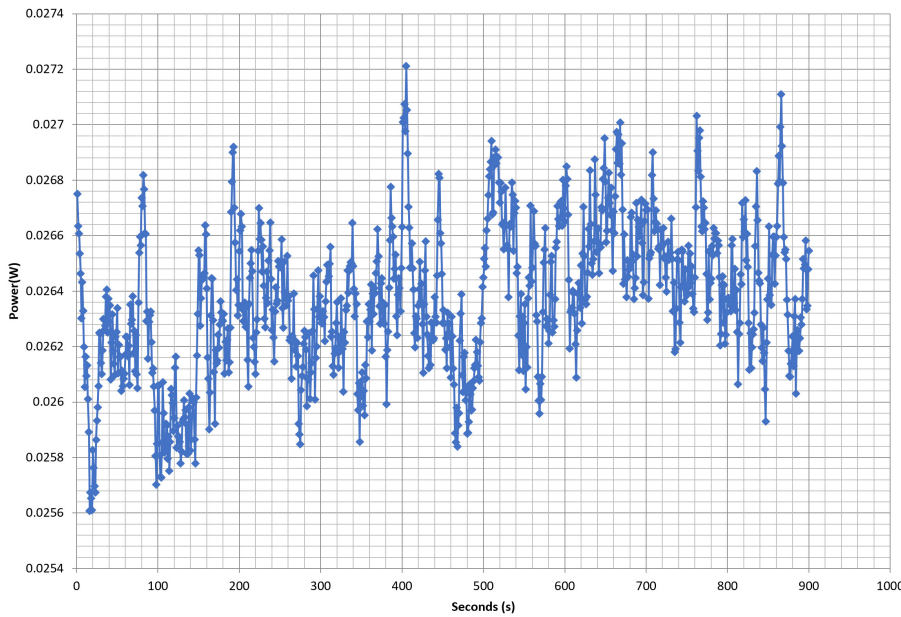
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - 10/02/2022 - 12:31



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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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%	5.218A	1.99A	2.01A	0.992A	85.002	85.205%	0	<6.0	45.38°C	0.979
	12.151V	5.026V	3.283V	5.04V	99.762				40.22°C	115.16V
20%	11.452A	2.988A	3.019A	1.194A	169.962	89.44%	0	<6.0	46.25°C	0.99
	12.142V	5.021V	3.28V	5.027V	190.03				40.51°C	115.15V
30%	18.068A	3.489A	3.525A	1.374A	254.978	90.936%	0	<6.0	47.37°C	0.992
	12.117V	5.016V	3.277V	5.096V	280.392				41.21°C	115.15V
40%	24.683A	3.992A	4.033A	1.573A	340.071	90.887%	0	<6.0	48.56°C	0.992
	12.108V	5.012V	3.274V	5.088V	374.171				41.97°C	115.15V
50%	30.962A	4.994A	5.046A	1.774A	425.089	90.366%	411	7.7	42.02°C	0.991
	12.098V	5.007V	3.27V	5.076V	470.408				49.1°C	115.15V
60%	37.217A	5.998A	6.061A	1.976A	509.643	89.753%	621	16.8	42.11°C	0.992
	12.087V	5.004V	3.267V	5.063V	567.826				49.66°C	115.15V
70%	43.544A	7.002A	7.078A	2.179A	594.928	89.1%	825	24.0	43.03°C	0.993
	12.075V	5V	3.264V	5.05V	667.712				51.06°C	115.14V
80%	49.880A	8.003A	8.096A	2.283A	679.782	88.229%	1014	32.6	43.46°C	0.994
	12.067V	4.996V	3.26V	5.039V	770.472				52.17°C	115.14V
90%	56.624A	8.517A	8.596A	2.387A	765.283	87.255%	1187	37.1	44.21°C	0.995
	12.058V	4.991V	3.257V	5.028V	877.062				53.45°C	115.15V
100%	63.113A	9.027A	9.128A	2.997A	850.105	86.272%	1464	43.0	45.9°C	0.996
	12.048V	4.986V	3.254V	5.005V	985.378				55.93°C	115.15V
110%	69.484A	10.039A	10.247A	3.003A	934.699	85.227%	1758	47.9	46.79°C	0.996
	12.037V	4.981V	3.25V	4.995V	1096.72				57.52°C	115.15V
CL1	0.116A	14.409A	14.587A	0A	121.315	83.234%	512	10.5	42.31°C	0.986
	12.141V	5.011V	3.27V	5.035V	145.753				49.58°C	115.18V
CL2	0.115A	21.862A	0A	0A	111.403	81.889%	882	28.4	43.49°C	0.985
	12.147V	5.032V	3.276V	5.051V	136.041				52°C	115.18V
CL3	0.115A	0A	22.152A	0A	73.998	75.984%	880	28.3	44.96°C	0.979
	12.142V	5.009V	3.277V	5.038V	97.386				54.32°C	115.18V
CL4	70.538A	0A	0A	0A	849.821	87.293%	1378	41.3	45.51°C	0.995
	12.048V	5.006V	3.268V	5.088V	973.534				56.11°C	115.15V

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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	1.222A	0.495A	0.501A	0.197A	20.001	56.825%	0	<6.0	40.15°C	0.927
	12.156V	5.048V	3.296V	5.066V	35.197				36.92°C	115.15V
40W	2.690A	0.694A	0.701A	0.296A	40	79.169%	0	<6.0	41.67°C	0.956
	12.154V	5.046V	3.295V	5.061V	50.524				37.68°C	115.15V
60W	4.158A	0.894A	0.903A	0.396A	59.999	83.363%	0	<6.0	43.21°C	0.969
	12.152V	5.034V	3.288V	5.057V	71.973				38.9°C	115.15V
80W	5.623A	1.094A	1.105A	0.495A	79.957	85.62%	0	<6.0	44.8°C	0.978
	12.151V	5.028V	3.285V	5.053V	93.386				39.95°C	115.15V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.60mV	5.63mV	4.45mV	5.71mV	Pass
20% Load	5.11mV	5.98mV	4.91mV	6.07mV	Pass
30% Load	13.98mV	6.34mV	5.22mV	6.37mV	Pass
40% Load	12.40mV	6.39mV	5.42mV	6.83mV	Pass
50% Load	12.55mV	8.64mV	8.86mV	7.50mV	Pass
60% Load	12.60mV	6.90mV	5.84mV	8.36mV	Pass
70% Load	12.45mV	7.31mV	5.73mV	9.13mV	Pass
80% Load	13.06mV	7.36mV	9.98mV	9.18mV	Pass
90% Load	12.19mV	7.67mV	11.11mV	9.74mV	Pass
100% Load	20.57mV	9.19mV	10.78mV	14.19mV	Pass
110% Load	20.49mV	9.64mV	11.75mV	14.79mV	Pass
Crossload1	9.10mV	8.69mV	11.92mV	10.43mV	Pass
Crossload2	7.05mV	11.40mV	5.43mV	9.89mV	Pass
Crossload3	6.13mV	5.47mV	14.23mV	9.69mV	Pass
Crossload4	16.77mV	8.18mV	6.34mV	14.65mV	Pass

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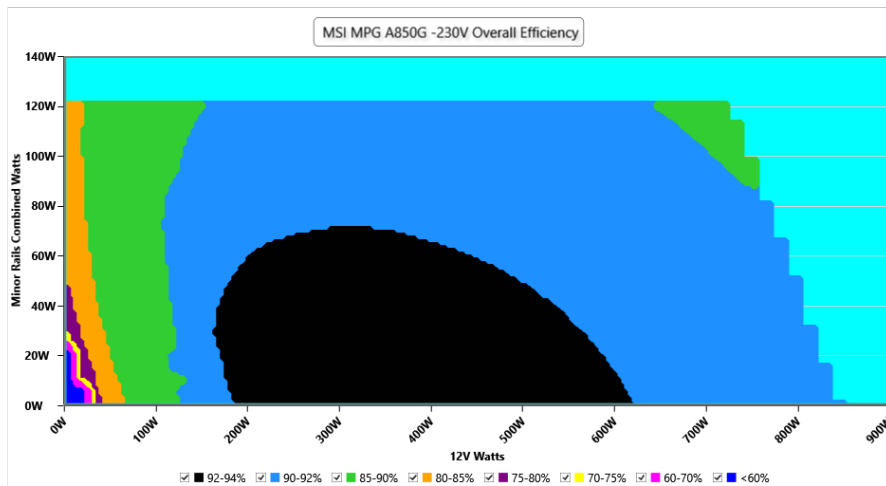
230V

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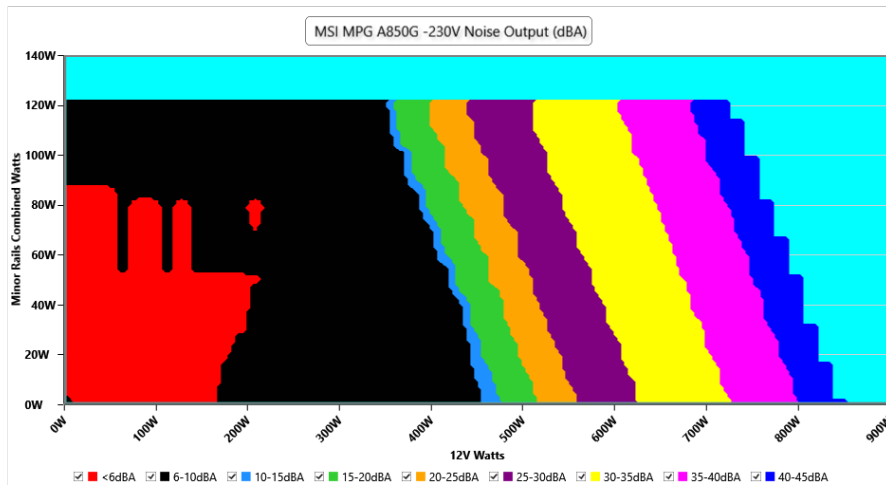
EFFICIENCY GRAPH 230V



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NOISE GRAPH 230V



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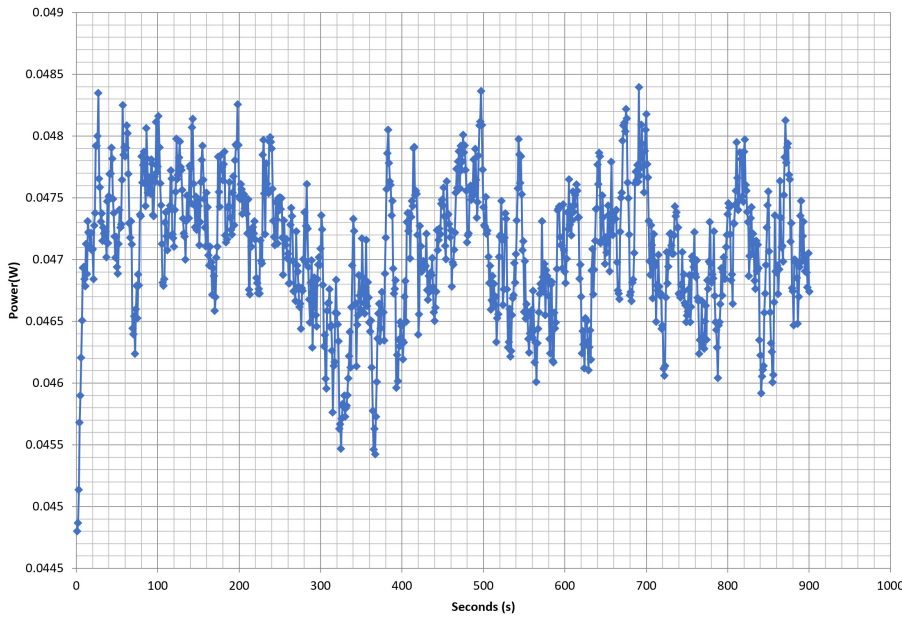
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VAMPIRE POWER -230V

Power - 10/02/2022 - 12:31



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10-110% LOAD TESTS 230V

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10%	5.216A	1.99A	2.01A	0.992A	85	86.485%	0	<6.0	45.85°C	0.882
	12.153V	5.026V	3.284V	5.039V	98.283				40.52°C	230.37V
20%	11.451A	2.988A	3.018A	1.194A	169.954	90.618%	0	<6.0	46.77°C	0.949
	12.143V	5.02V	3.28V	5.026V	187.551				40.89°C	230.37V
30%	18.073A	3.49A	3.525A	1.374A	254.963	92.466%	0	<6.0	47.55°C	0.969
	12.112V	5.016V	3.277V	5.096V	275.737				41.29°C	230.37V
40%	24.685A	3.992A	4.032A	1.573A	340.049	92.58%	0	<6.0	48.35°C	0.978
	12.106V	5.011V	3.274V	5.087V	367.302				41.51°C	230.38V
50%	30.958A	4.994A	5.045A	1.774A	424.983	92.342%	412	7.7	42.34°C	0.982
	12.097V	5.007V	3.27V	5.075V	460.228				49.58°C	230.38V
60%	37.210A	5.998A	6.06A	1.976A	509.521	91.969%	621	16.8	42.72°C	0.985
	12.086V	5.003V	3.267V	5.063V	554.014				50.44°C	230.38V
70%	43.550A	7.002A	7.077A	2.178A	594.794	91.597%	824	26.2	43.1°C	0.987
	12.070V	5V	3.264V	5.051V	649.358				51.39°C	230.37V
80%	49.883A	8.002A	8.095A	2.282A	679.628	91.047%	1015	32.6	43.24°C	0.988
	12.063V	4.996V	3.261V	5.039V	746.462				52.07°C	230.37V
90%	56.640A	8.516A	8.595A	2.387A	765.151	90.477%	1186	37.1	44.2°C	0.989
	12.052V	4.991V	3.257V	5.028V	845.69				53.62°C	230.38V
100%	63.122A	9.027A	9.127A	2.997A	849.972	89.796%	1473	43.1	45.75°C	0.99
	12.044V	4.986V	3.254V	5.006V	946.555				55.8°C	230.38V
110%	69.507A	10.039A	10.246A	3.003A	934.594	89.06%	1758	47.9	46.68°C	0.99
	12.032V	4.981V	3.25V	4.996V	1049.4				57.56°C	230.38V
CL1	0.115A	14.407A	14.583A	0A	121.304	84.526%	511	10.4	42.71°C	0.929
	12.141V	5.012V	3.271V	5.036V	143.51				49.47°C	230.39V
CL2	0.115A	21.863A	0A	0A	111.398	82.916%	880	28.3	43.37°C	0.923
	12.147V	5.031V	3.276V	5.052V	134.35				51.23°C	230.38V
CL3	0.115A	0A	22.148A	0A	73.99	77.035%	879	28.2	44.05°C	0.878
	12.142V	5.01V	3.278V	5.038V	96.048				53.54°C	230.38V
CL4	70.535A	0A	0A	0A	849.676	90.753%	1371	41.2	45.15°C	0.99
	12.047V	5.006V	3.268V	5.088V	936.252				55.24°C	230.37V

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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	0.501A	0.197A	20.001	58.253%	0	<6.0	39.84°C	0.623
	12.158V	5.047V	3.296V	5.065V	34.335				36.56°C	230.39V
40W	2.690A	0.694A	0.701A	0.296A	39.999	79.923%	0	<6.0	41.42°C	0.74
	12.155V	5.045V	3.295V	5.061V	50.046				37.78°C	230.38V
60W	4.158A	0.894A	0.903A	0.396A	59.998	84.468%	0	<6.0	42.06°C	0.826
	12.154V	5.034V	3.288V	5.057V	71.031				37.93°C	230.38V
80W	5.622A	1.094A	1.105A	0.495A	79.954	86.786%	0	<6.0	43.89°C	0.871
	12.152V	5.028V	3.286V	5.053V	92.128				39.4°C	230.37V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.21mV	5.73mV	4.61mV	5.97mV	Pass
20% Load	5.37mV	6.24mV	4.97mV	5.97mV	Pass
30% Load	14.95mV	6.44mV	5.17mV	6.07mV	Pass
40% Load	13.37mV	6.29mV	5.32mV	6.99mV	Pass
50% Load	13.01mV	8.18mV	9.27mV	6.78mV	Pass
60% Load	12.39mV	7.36mV	5.68mV	7.80mV	Pass
70% Load	13.47mV	7.57mV	5.78mV	8.41mV	Pass
80% Load	13.62mV	7.67mV	10.39mV	8.97mV	Pass
90% Load	13.21mV	8.69mV	10.70mV	9.38mV	Pass
100% Load	19.91mV	9.00mV	11.94mV	13.28mV	Pass
110% Load	21.29mV	9.89mV	12.32mV	14.48mV	Pass
Crossload1	6.80mV	8.86mV	11.65mV	10.43mV	Pass
Crossload2	7.35mV	11.61mV	5.37mV	10.14mV	Pass
Crossload3	5.98mV	5.52mV	14.38mV	9.38mV	Pass
Crossload4	17.85mV	7.77mV	6.50mV	12.27mV	Pass

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

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Anex

MSI MPG A850G

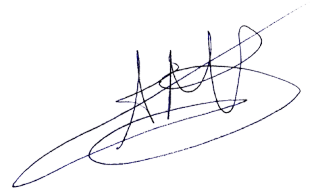


Top side



Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

CERTIFICATIONS 230V



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