Anex

MSI MPG A750GF

Lab ID#: MS75001951
Receipt Date: Dec 9, 2021
Test Date: Dec 17, 2021

Report: 21PS1951A
Report Date: Dec 21, 2021

DUT INFORMATION

Brand	MSI
Manufacturer (OEM)	CWT
Series	MPG
Model Number	
Serial Number	3067ZP0B17CE010117001150
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	47-63
Rated Power (W)	750
Type	ATX12V
Cooling	140mm Double Ball Bearing Fan (HA1425M12B-Z)
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	✓

115V

Average Efficiency	89.180%
Efficiency With 10W (≤500W) or 2% (>500W)	66.033
Average Efficiency 5VSB	77.384%
Standby Power Consumption (W)	0.0462483
Average PF	0.977
Avg Noise Output	32.15 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard++

230V

Average Efficiency	90.805%
Average Efficiency 5VSB	77.340%
Standby Power Consumption (W)	0.0669612
Average PF	0.930
Avg Noise Output	32.07 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V(1)	12V(2)	12V(3)	12V(4)	5VSB	-12V
Max. Power	Amps	22	22	25	25	35	35	2.5	0.3
	Watts	120		750				12.5	3.6
Total Max. Power (W)		750							

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

Hold-Up Time (ms)	11.8
AC Loss to PWR_OK Hold Up Time (ms)	12
PWR_OK Inactive to DC Loss Delay (ms)	-0.2

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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 (500mm)	2	2	18AWG	No
6+2 pin PCIe (500mm+150mm)	2	4	18AWG	No
SATA (500mm+150mm+150mm+150mm)	2	8	18AWG	No
4 pin Molex (500mm+150mm+150mm+150mm) / FDD (+150mm)	1	4 / 1	18-20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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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, 1x Power Integrations CAP200DG (Discharge IC)
Inrush Protection	NTC Thermistor SCK-055 (5 Ohm) & Relay
Bridge Rectifier(s)	2x GBU1506 (800V, 15A @ 120°C)
APFC MOSFETs	2x Infineon IPA60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm)
APFC Boost Diode	1x On Semiconductor FFSP0665A (650V, 6A @ 153°C)
Bulk Cap(s)	1x Nippon Chemi-Con (420V, 560uF, 2,000h @ 105°C, KMR)
Main Switchers	2x Infineon IPA60R125P6 (600V, 19A @ 100°C, Rds(on): 0.125Ohm)
APFC Controller	Champion CM6502UHH & CM03X
Resonant Controller	Champion CM6901X
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 QM3006D (30V, 57A @ 100°C, Rds(on): 5.5mOhm) 2x UBIQ QM3016D (30V, 68A @ 100°C, Rds(on): 4mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 6x Nichicon (4-10,000h @ 105°C, HE), 3x Rubycon (4-10,000h @ 105°C, YXF), 2x Rubycon (6-10,000h @ 105°C, ZLH), 5x Nichicon (4-10,000h @ 105°C, KY), 2x Nippon Chemi-Con (4-10,000h @ 105°C, KYA) Polymer: 17x FPCAP, 1x Nippon Chemi-Con
Supervisor IC	Sitronix ST9S429-PG14 (OCP, OVP, UVP, SCP, PG) & EST EST7618 (OCP, SC)
Fan Model	Hong Hua HA1425M12B-Z (140mm, 12V, 0.36A, Ball Bearing Fan)
5VSB Circuit	-
Standby PWM Controller	Power Integrations TNY177PN

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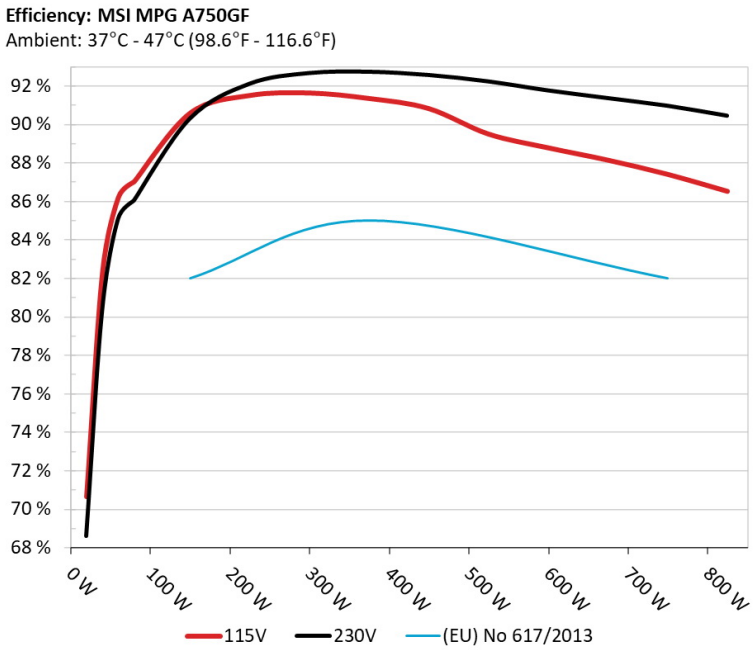
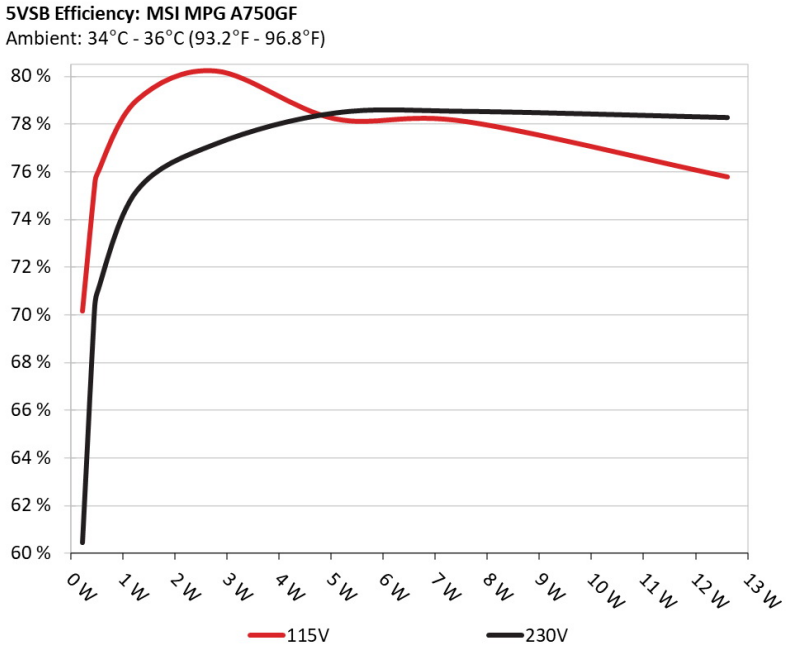
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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	70.143%	0.033
	5.101V	0.328W		115.18V
2	0.09A	0.459W	75.309%	0.06
	5.1V	0.609W		115.18V
3	0.55A	2.801W	80.232%	0.253
	5.091V	3.491W		115.18V
4	1A	5.083W	78.224%	0.353
	5.081V	6.498W		115.18V
5	1.5A	7.607W	78.107%	0.407
	5.07V	9.739W		115.18V
6	2.501A	12.625W	75.781%	0.464
	5.049V	16.66W		115.18V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	60.426%	0.011
	5.101V	0.381W		230.38V
2	0.09A	0.459W	70.128%	0.019
	5.1V	0.655W		230.37V
3	0.55A	2.801W	77.182%	0.103
	5.091V	3.629W		230.38V
4	1A	5.083W	78.472%	0.167
	5.081V	6.478W		230.38V
5	1.5A	7.607W	78.542%	0.226
	5.07V	9.685W		230.37V
6	2.501A	12.626W	78.281%	0.304
	5.049V	16.129W		230.37V

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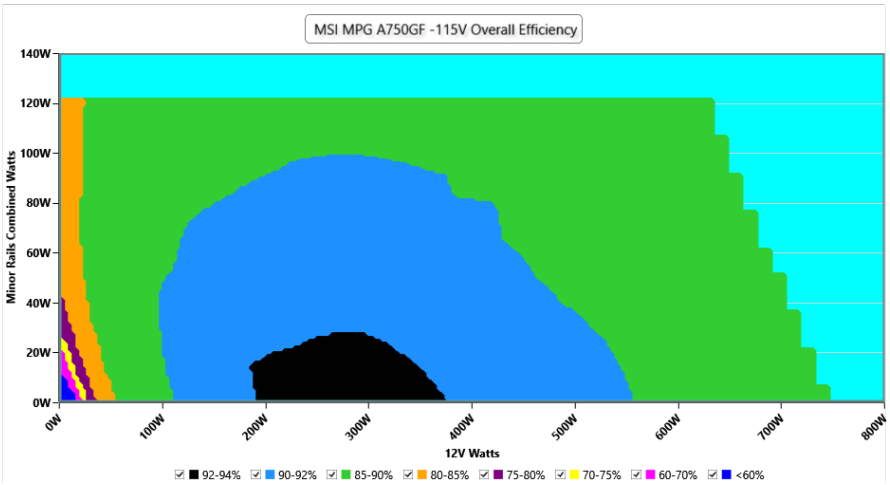
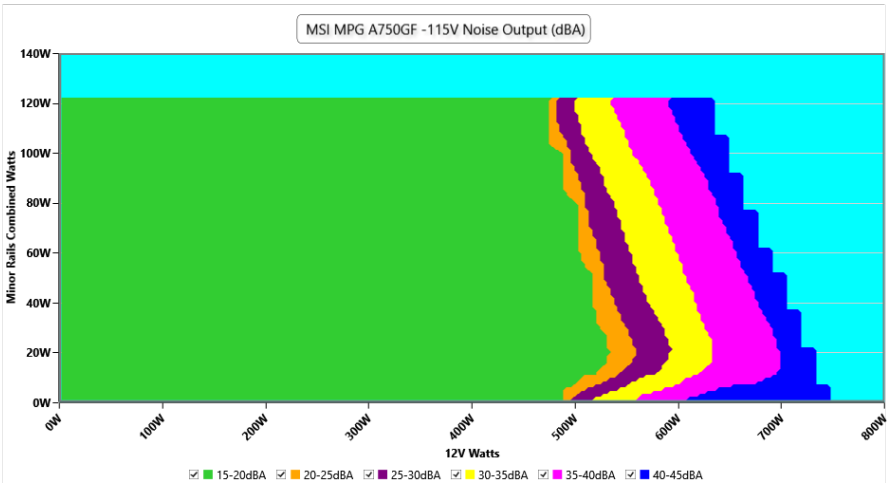
EFFICIENCY GRAPH 115V



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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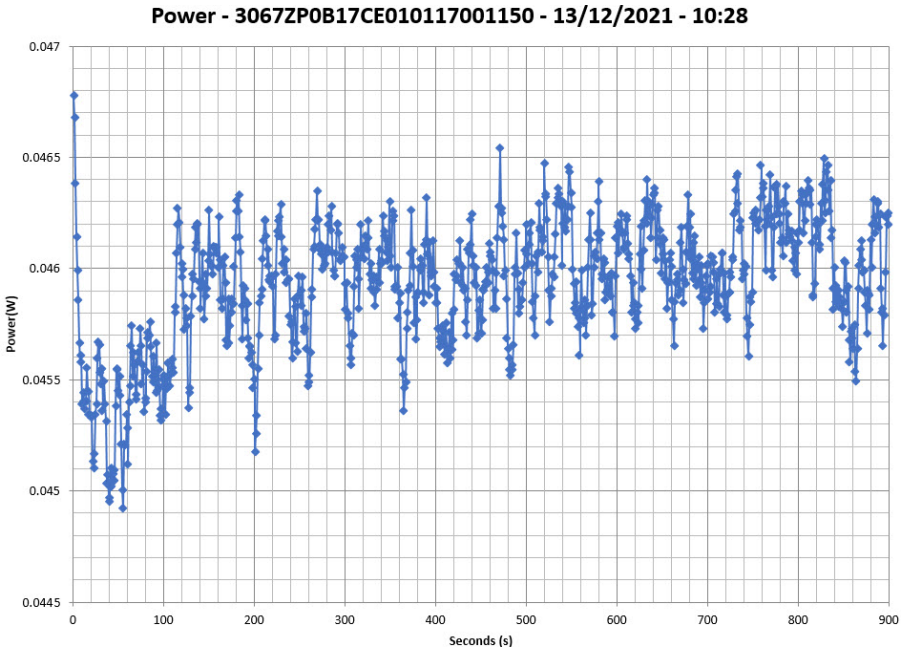
VAMPIRE POWER -115V



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

Anex

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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%	4.424A	1.99A	1.975A	0.985A	75.005	87.034%	711	20.1	40.72°C	0.959
	12.069V	5.027V	3.341V	5.077V	86.179				45.45°C	115.18V
20%	9.870A	2.987A	2.965A	1.184A	149.969	90.585%	713	20.2	41.09°C	0.978
	12.063V	5.024V	3.339V	5.07V	165.557				46.21°C	115.18V
30%	15.671A	3.486A	3.461A	1.383A	224.979	91.509%	714	20.2	41.49°C	0.981
	12.056V	5.021V	3.338V	5.063V	245.855				47.28°C	115.18V
40%	21.486A	3.986A	3.957A	1.583A	300.074	91.637%	715	20.2	41.77°C	0.982
	12.048V	5.019V	3.336V	5.056V	327.459				48.02°C	115.18V
50%	26.925A	4.985A	4.949A	1.783A	374.703	91.352%	718	20.3	42.72°C	0.979
	12.041V	5.017V	3.335V	5.049V	410.173				49.25°C	115.18V
60%	32.393A	5.985A	5.941A	1.984A	449.636	90.83%	721	20.4	43.1°C	0.978
	12.034V	5.014V	3.333V	5.041V	495.029				50.1°C	115.18V
70%	37.869A	6.987A	6.935A	2.186A	524.577	89.506%	1106	33.4	43.18°C	0.978
	12.027V	5.011V	3.331V	5.033V	586.078				50.67°C	115.18V
80%	43.422A	7.991A	7.93A	2.288A	599.791	88.787%	1382	39.7	43.83°C	0.98
	12.018V	5.008V	3.329V	5.028V	675.542				51.99°C	115.18V
90%	49.316A	8.494A	8.415A	2.39A	674.807	88.147%	1722	45.0	44.97°C	0.981
	12.011V	5.005V	3.327V	5.023V	765.547				54.56°C	115.18V
100%	55.209A	8.998A	8.93A	2.492A	749.944	87.409%	1723	45.0	46°C	0.983
	12.004V	5.002V	3.326V	5.016V	857.974				56.21°C	115.18V
110%	60.780A	10.003A	10.018A	2.494A	824.98	86.526%	1724	45.0	46.8°C	0.984
	11.997V	4.999V	3.324V	5.012V	953.45				57.68°C	115.18V
CL1	0.116A	14.393A	14.314A	0A	121.31	84.282%	726	20.7	44.31°C	0.973
	12.069V	5.017V	3.332V	5.085V	143.933				49.69°C	115.2V
CL2	0.116A	21.911A	0A	0A	111.399	82.263%	731	20.9	43.1°C	0.974
	12.078V	5.02V	3.337V	5.094V	135.418				50.19°C	115.19V
CL3	0.116A	0A	21.749A	0A	73.996	76.773%	715	20.2	41.98°C	0.96
	12.073V	5.027V	3.338V	5.082V	96.383				51.43°C	115.19V
CL4	62.424A	0A	0A	0.001A	749.86	88.203%	1723	45.0	44.02°C	0.983
	12.012V	5.013V	3.335V	5.078V	850.154				55.27°C	115.18V

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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	1.231A	0.497A	0.493A	0.196A	20.004	70.649%	709	20.0	37°C	0.825
	12.066V	5.032V	3.345V	5.097V	28.315				40.28°C	115.19V
40W	2.708A	0.696A	0.691A	0.295A	40.002	82.313%	706	19.8	37.94°C	0.919
	12.070V	5.03V	3.343V	5.094V	48.597				41.52°C	115.19V
60W	4.187A	0.895A	0.888A	0.393A	60.001	86.209%	708	20.0	38.38°C	0.947
	12.069V	5.028V	3.343V	5.091V	69.6				42.31°C	115.18V
80W	5.663A	1.094A	1.086A	0.491A	79.969	88.138%	708	20.0	39.51°C	0.96
	12.067V	5.028V	3.342V	5.088V	90.731				43.84°C	115.18V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.54mV	10.89mV	4.91mV	7.90mV	Pass
20% Load	13.04mV	11.61mV	5.53mV	9.53mV	Pass
30% Load	14.32mV	11.81mV	5.68mV	9.48mV	Pass
40% Load	12.43mV	12.78mV	5.78mV	9.79mV	Pass
50% Load	12.55mV	12.27mV	5.83mV	10.61mV	Pass
60% Load	13.35mV	12.84mV	5.99mV	15.40mV	Pass
70% Load	11.71mV	13.81mV	6.81mV	17.54mV	Pass
80% Load	12.26mV	15.04mV	12.34mV	19.47mV	Pass
90% Load	13.18mV	15.80mV	13.21mV	25.19mV	Pass
100% Load	20.77mV	18.21mV	13.79mV	28.69mV	Pass
110% Load	21.60mV	17.18mV	14.26mV	27.88mV	Pass
Crossload1	18.03mV	15.29mV	14.98mV	7.28mV	Pass
Crossload2	11.63mV	15.49mV	6.24mV	6.32mV	Pass
Crossload3	11.70mV	11.25mV	18.48mV	7.04mV	Pass
Crossload4	19.88mV	15.65mV	7.56mV	12.07mV	Pass

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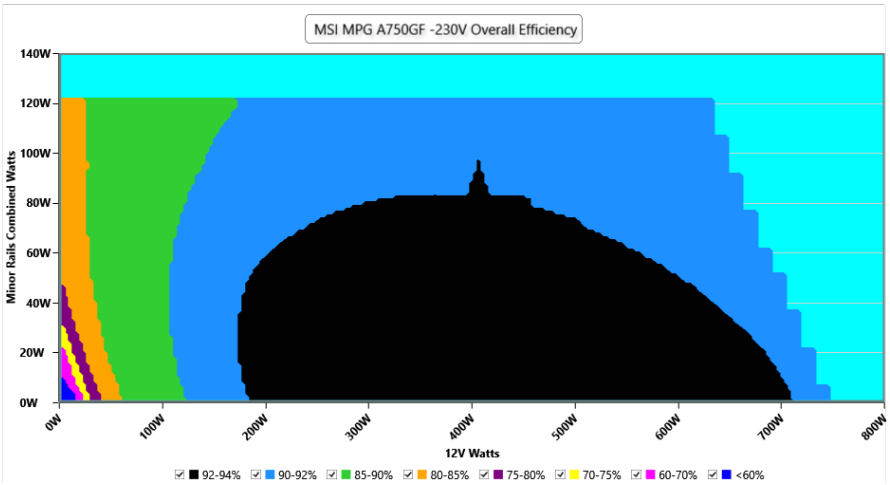
EFFICIENCY GRAPH 230V



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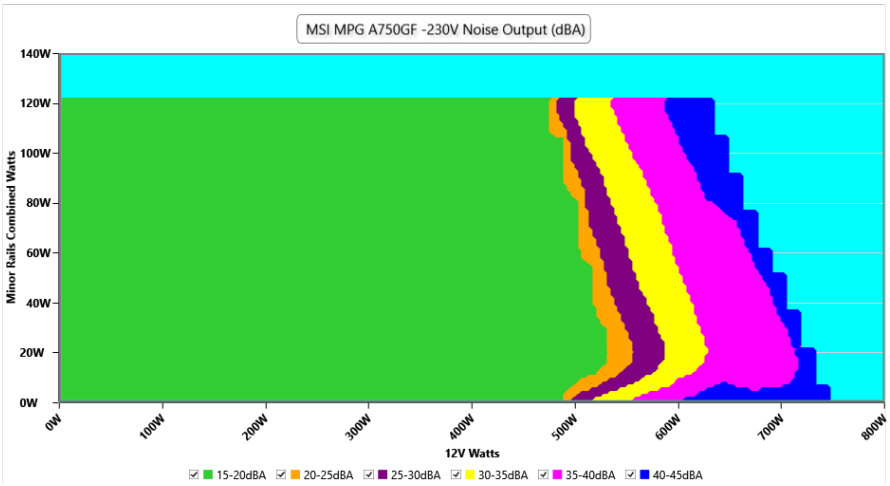
NOISE GRAPH 230V



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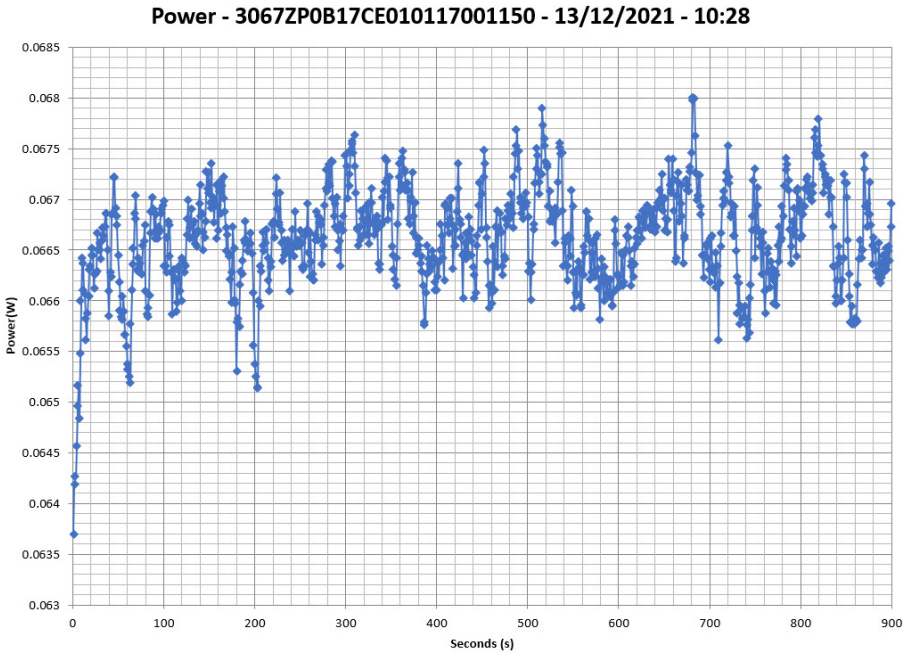
VAMPIRE POWER -230V



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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%	4.430A	1.99A	1.976A	0.985A	75	86.048%	707	19.9	40.13°C	0.789
	12.054V	5.026V	3.34V	5.077V	87.161				44.35°C	230.35V
20%	9.874A	2.987A	2.966A	1.184A	149.952	90.291%	712	20.1	40.45°C	0.893
	12.057V	5.023V	3.338V	5.07V	166.078				44.87°C	230.35V
30%	15.672A	3.487A	3.462A	1.383A	224.957	92.106%	714	20.2	41.37°C	0.926
	12.054V	5.02V	3.337V	5.063V	244.238				46.08°C	230.36V
40%	21.491A	3.987A	3.958A	1.583A	300.04	92.662%	715	20.2	41.69°C	0.94
	12.044V	5.017V	3.335V	5.056V	323.801				46.76°C	230.37V
50%	26.931A	4.987A	4.951A	1.783A	374.623	92.729%	717	20.3	42.26°C	0.948
	12.035V	5.014V	3.333V	5.048V	403.999				47.65°C	230.37V
60%	32.404A	5.988A	5.945A	1.985A	449.573	92.563%	720	20.4	43.14°C	0.952
	12.028V	5.011V	3.331V	5.04V	485.692				49.51°C	230.38V
70%	37.902A	6.993A	6.941A	2.186A	524.471	92.23%	720	20.4	43.28°C	0.956
	12.014V	5.007V	3.328V	5.032V	568.654				50.78°C	230.39V
80%	43.470A	7.999A	7.939A	2.289A	599.765	91.763%	1263	37.3	43.78°C	0.959
	12.005V	5.002V	3.325V	5.026V	653.599				52.3°C	230.4V
90%	49.368A	8.503A	8.424A	2.391A	674.789	91.363%	1719	45.0	44.48°C	0.961
	11.997V	4.999V	3.324V	5.021V	738.584				53.74°C	230.41V
100%	55.280A	9.009A	8.941A	2.493A	749.893	90.965%	1722	45.0	45.76°C	0.962
	11.988V	4.996V	3.321V	5.016V	824.377				56.09°C	230.41V
110%	60.874A	10.017A	10.033A	2.495A	824.93	90.449%	1718	45.0	46.63°C	0.963
	11.978V	4.992V	3.319V	5.011V	912.043				57.52°C	230.4V
CL1	0.116A	14.403A	14.319A	0A	121.305	83.835%	724	20.6	42.31°C	0.878
	12.060V	5.013V	3.331V	5.085V	144.696				47.8°C	230.39V
CL2	0.116A	21.939A	0A	0A	111.397	82.05%	727	20.8	40.85°C	0.87
	12.067V	5.014V	3.335V	5.096V	135.768				47.98°C	230.39V
CL3	0.116A	0A	21.758A	0A	73.992	76.011%	712	20.1	40.47°C	0.814
	12.061V	5.026V	3.337V	5.083V	97.344				49.55°C	230.38V
CL4	62.509A	0A	0A	0.001A	749.749	91.878%	1719	45.0	42.01°C	0.961
	11.994V	5.01V	3.332V	5.077V	816.032				53.21°C	230.39V

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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	1.231A	0.497A	0.493A	0.196A	19.997	68.626%	706	19.8	36.86°C	0.471
	12.060V	5.032V	3.344V	5.097V	29.139				40.05°C	230.32V
40W	2.710A	0.696A	0.691A	0.295A	39.996	80.344%	706	19.8	37.32°C	0.636
	12.062V	5.031V	3.344V	5.094V	49.781				40.84°C	230.33V
60W	4.190A	0.895A	0.888A	0.393A	59.995	85.093%	706	19.8	37.98°C	0.738
	12.059V	5.03V	3.343V	5.091V	70.506				41.72°C	230.34V
80W	5.666A	1.094A	1.086A	0.491A	79.95	87.208%	706	19.8	39.83°C	0.801
	12.056V	5.028V	3.342V	5.088V	91.677				43.86°C	230.34V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.82mV	11.46mV	5.22mV	8.57mV	Pass
20% Load	22.18mV	11.97mV	5.58mV	7.65mV	Pass
30% Load	21.57mV	13.04mV	5.99mV	9.28mV	Pass
40% Load	16.92mV	12.88mV	6.19mV	9.08mV	Pass
50% Load	14.11mV	13.75mV	6.60mV	10.40mV	Pass
60% Load	12.84mV	13.75mV	6.81mV	13.82mV	Pass
70% Load	11.91mV	14.01mV	6.86mV	18.45mV	Pass
80% Load	12.77mV	15.09mV	12.34mV	22.69mV	Pass
90% Load	12.62mV	15.96mV	12.64mV	26.00mV	Pass
100% Load	21.69mV	20.30mV	13.93mV	26.94mV	Pass
110% Load	21.52mV	17.72mV	14.40mV	30.30mV	Pass
Crossload1	24.61mV	16.42mV	15.60mV	7.28mV	Pass
Crossload2	14.47mV	16.06mV	6.91mV	7.03mV	Pass
Crossload3	8.84mV	11.66mV	18.48mV	7.19mV	Pass
Crossload4	20.18mV	17.14mV	8.72mV	11.87mV	Pass

Anex

MSI MPG A750GF

Top side

Power specifications label

CERTIFICATIONS 115V

CYBENETICS PLATINUM

CYBENETICS STANDARD++

CERTIFICATIONS 230V

CYBENETICS GOLD 230v

CYBENETICS STANDARD++ 230v