

Evaluation Report

Gamemax GM500

DUT INFORMATION

Brand	Gamemax
Manufacturer (OEM)	Gamemax
Series	GM Series
Model Number	GM500
Serial Number	
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6
Rated Frequency (Hz)	50-60
Rated Power (W)	500
Type	ATX12V
Cooling	140mm Sleeve Bearing Fan (DF1402512SEM)
Semi-Passive Operation	X
Cable Design	Fixed cables

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	15	20	32	2.5	0.5
	Watts	100		384	12.5	6
Total Max. Power (W)		500				

CABLES AND CONNECTORS

Captive Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (490mm)	1	1	18-22AWG	No
4+4 pin EPS12V (510mm)	1	1	18AWG	No
6+2 pin PCIe (500mm)	1	1	18AWG	No
SATA (500mm+150mm+150mm)	1	3	18AWG	No
4-pin Molex (500mm) / SATA (+150mm+150mm)	1	1 / 2	18AWG	No
4-pin Molex (500mm+150mm) / FDD (+150mm)	1	2 / 1	18AWG	No

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

PAGE 1/9

Evaluation Report

Gamemax GM500

General Data	
Manufacturer (OEM)	Gamemax
PCB Type	Single Layer
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier(s)	1x GBU1506L (600V, 15A @ 100°C)
APFC MOSFETS	2x Champion GP18S50G (500V, 28A @ 150°C, 0.19Ω)
APFC Boost Diode	1x CREE C3D06060A (600V, 6A @ 154°C)
Hold-up Cap(s)	1x CapXon (400V, 270uF, 2000h @ 105 °C, HP)
Main Switchers	2x Champion GP18S50G (500V, 28A @ 150°C, 0.19Ω)
Combo APFC/PWM Controller	Champion CM6805BSX
Topology	Primary side: Double Forward Secondary side: Group Regulation & Passive Rectification
Secondary Side	
+12V MOSFETS	2x MOSPEC S60M60C SBR (60V, 60A)
5V & 3.3V	2x MOSPEC S40M45C SBR (45V, 40A)
Filtering Capacitors	Electrolytics: CapXon (2-5,000 @ 105°C, KF), ChengX (2-4,000h @ 105°C, GR)
Supervisor IC	Grenergy GR8313 (OVP, UVP, SCP, PG)
Fan Model	Xin Zheng Heng Electronic DF1402512SEM (140mm, 12V, 0.20A, 2.4W, Sleeve Bearing)
5VSB Circuit	
Standby PWM Controller	Sanken STR-A6059H

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

PAGE 2/9

Evaluation Report

Gamemax GM500

RESULTS

Test Date	01-05-2019
Cybenetics ID #	587
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	86.040
Efficiency With 10W ($\leq 500W$) or 2% ($> 500W$) Load -115V	55.120
Average Efficiency 5VSB	72.411
Standby Power Consumption (W) -115V	0.1072360
Standby Power Consumption (W) -230V	0.1889830
Average PF	0.945
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓ ErP Lot 6 2013: Partially ErP Lot 3 2014 & CEC: Partially
(EU) No 617/2013 Compliance	✓
Avg Noise Output	37.49
Efficiency Rating (ETA)	ETA-S
Noise Rating (LAMBDA)	LAMBDA-S+

TEST EQUIPMENT

Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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

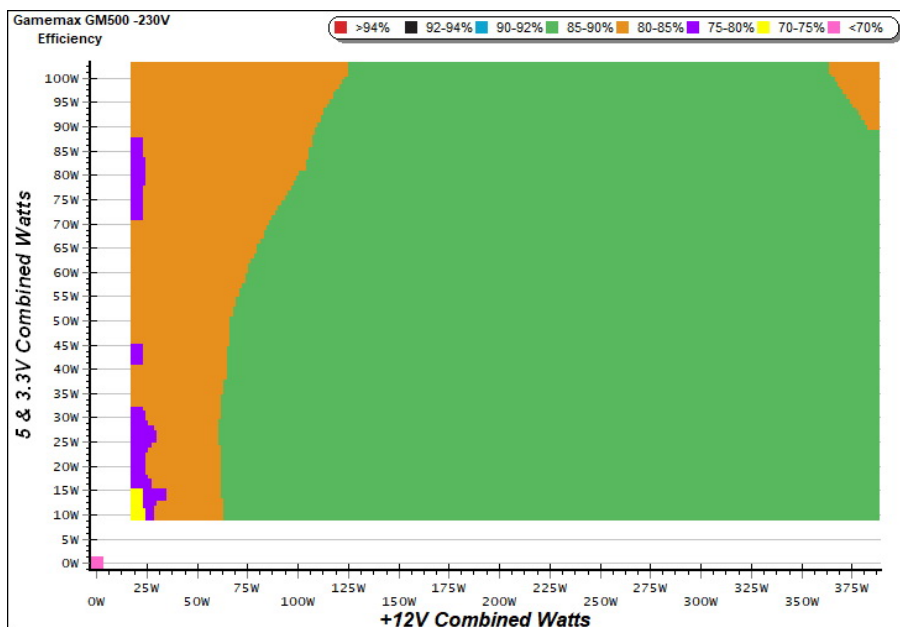
- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 3/9

Evaluation Report

Gamemax GM500

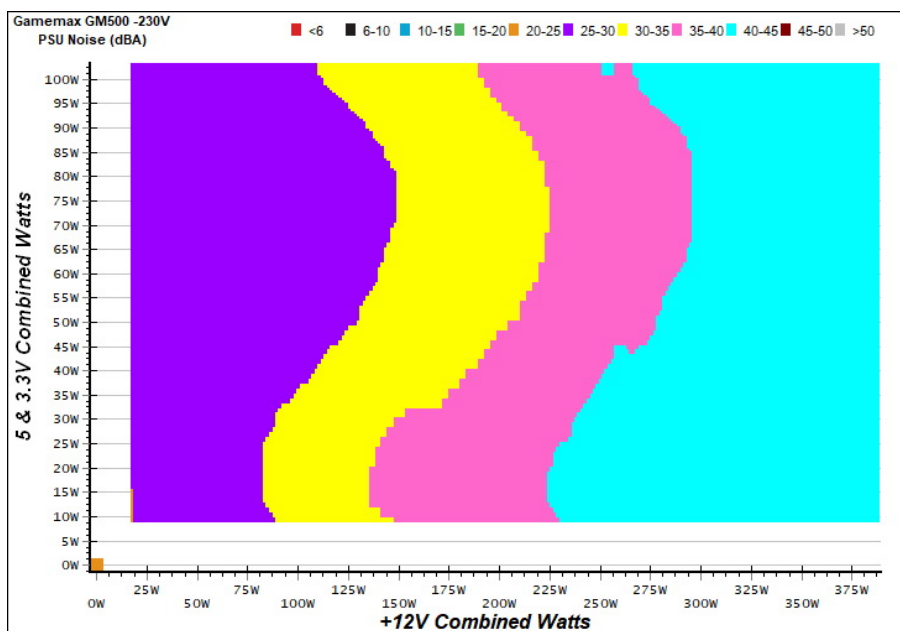
EFFICIENCY GRAPH



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



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

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

PAGE 4/9

Evaluation Report

Gamemax GM500

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

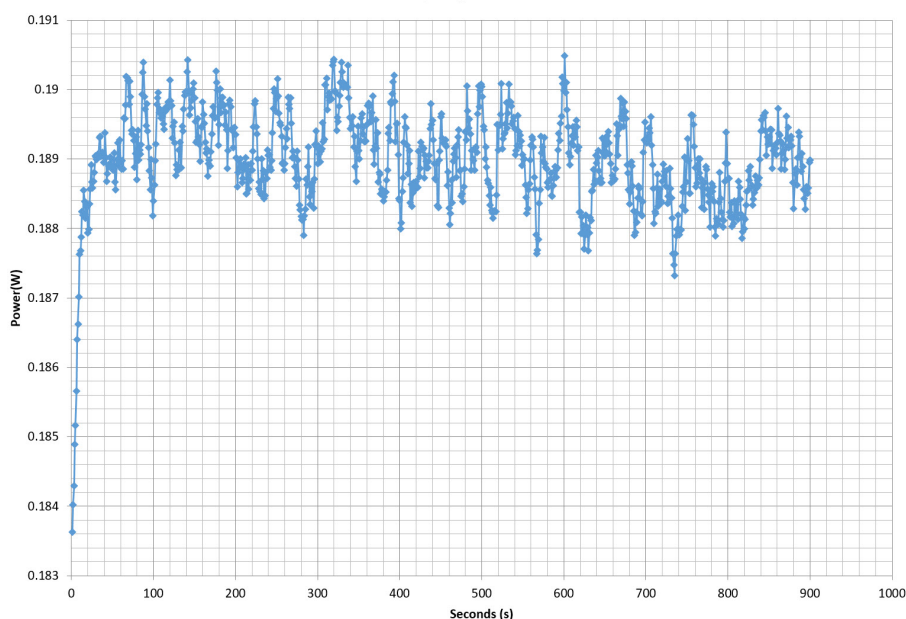
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	53.349%	0.068
	5.137V	0.433		115.10V
2	0.090A	0.462	61.682%	0.112
	5.134V	0.749		115.10V
3	0.550A	2.820	74.722%	0.290
	5.126V	3.774		115.10V
4	1.000A	5.120	76.190%	0.332
	5.120V	6.720		115.10V
5	1.500A	7.669	75.998%	0.356
	5.112V	10.091		115.10V
6	2.501A	12.743	74.420%	0.385
	5.096V	17.123		115.10V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	43.667%	0.026
	5.134V	0.529		230.28V
2	0.090A	0.462	53.534%	0.041
	5.133V	0.863		230.28V
3	0.550A	2.820	71.320%	0.160
	5.126V	3.954		230.26V
4	1.000A	5.121	74.390%	0.226
	5.120V	6.884		230.26V
5	1.500A	7.669	74.922%	0.269
	5.112V	10.236		230.26V
6	2.501A	12.744	75.377%	0.315
	5.096V	16.907		230.25V

VAMPIRE POWER -230V

Power - 28/12/2018 - 13:40



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.

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

PAGE 5/9

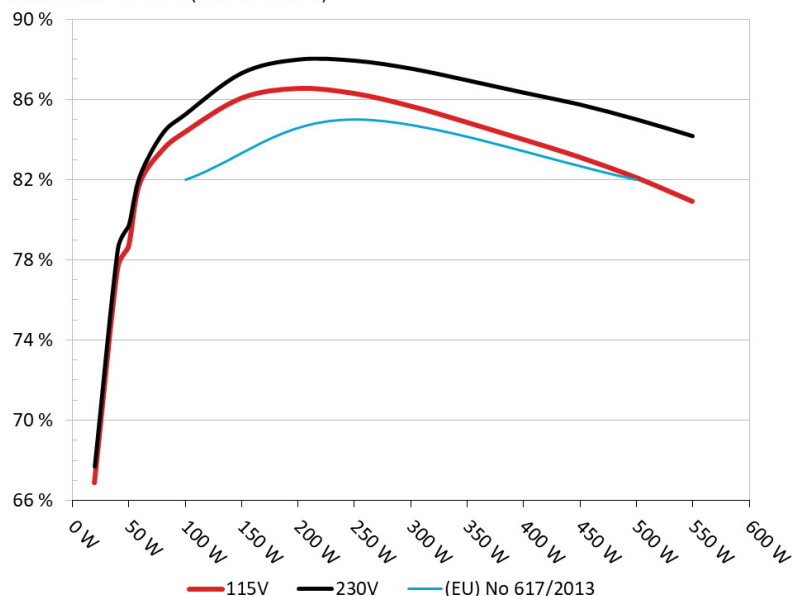
Evaluation Report

Gamemax GM500

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Gamemax GM500

Ambient: 27°C - 36°C (80.6°F - 96.8°F)



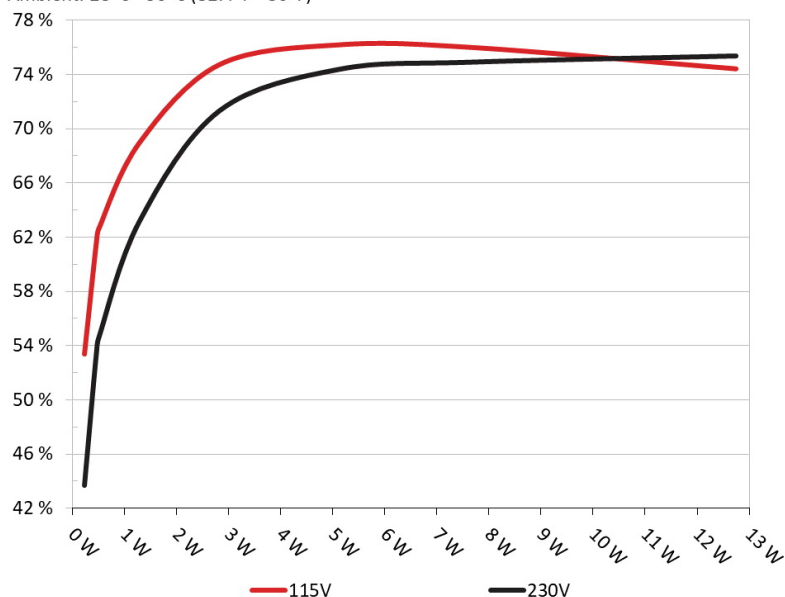
INFO

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: Gamemax GM500

Ambient: 28°C - 30°C (82.4°F - 86°F)



INFO

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input.

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

PAGE 6/9

Evaluation Report

Gamemax GM500

10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	2.268A	1.967A	1.981A	0.979A	49.608	79.695%	1014	25.3	28.90°C	0.595
	12.358V	5.076V	3.328V	5.110V	62.247				30.87°C	230.30V
2	5.569A	2.962A	2.980A	1.177A	99.702	85.237%	1016	25.5	29.55°C	0.817
	12.357V	5.061V	3.320V	5.099V	116.970				31.86°C	230.30V
3	9.210A	3.462A	3.469A	1.376A	149.601	87.290%	1019	25.7	30.21°C	0.912
	12.335V	5.056V	3.312V	5.089V	171.383				32.83°C	230.30V
4	12.869A	3.959A	3.989A	1.575A	199.607	87.971%	1025	25.9	30.87°C	0.942
	12.310V	5.052V	3.306V	5.080V	226.901				33.87°C	230.29V
5	16.188A	4.962A	4.997A	1.776A	249.700	87.916%	1255	32.1	31.07°C	0.965
	12.306V	5.038V	3.300V	5.069V	284.021				34.70°C	230.29V
6	19.516A	5.969A	6.010A	1.978A	299.795	87.522%	1487	36.6	31.79°C	0.978
	12.298V	5.024V	3.294V	5.057V	342.535				35.78°C	230.27V
7	22.836A	6.987A	7.027A	2.180A	349.888	86.936%	1721	40.9	32.38°C	0.984
	12.296V	5.009V	3.287V	5.046V	402.465				37.18°C	230.27V
8	26.157A	8.012A	8.042A	2.383A	400.007	86.320%	1725	41.0	33.36°C	0.985
	12.295V	4.994V	3.282V	5.036V	463.401				38.54°C	230.27V
9	29.933A	8.518A	8.543A	2.386A	449.720	85.725%	1724	41.0	33.62°C	0.986
	12.268V	4.990V	3.277V	5.030V	524.609				39.46°C	230.26V
10	33.739A	9.030A	9.089A	2.491A	500.041	84.984%	1722	41.0	34.41°C	0.987
	12.236V	4.985V	3.267V	5.019V	588.396				40.65°C	230.27V
11	37.970A	9.020A	9.104A	2.496A	549.674	84.156%	1716	40.8	35.79°C	0.988
	12.180V	4.989V	3.262V	5.009V	653.161				42.39°C	230.28V
CL1	0.134A	12.000A	12.001A	0.000A	99.176	77.618%	1389	34.7	31.23°C	0.850
	12.937V	4.817V	3.303V	5.105V	127.774				34.75°C	230.29V
CL2	32.005A	1.002A	0.997A	1.000A	393.919	86.870%	1689	40.2	34.14°C	0.985
	11.885V	5.169V	3.295V	5.075V	453.459				40.50°C	230.29V

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

PAGE 7/9

Evaluation Report

Gamemax GM500

20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.171A	0.487A	0.476A	0.195A	19.443	67.677%	1007	24.8	0.399
	12.265V	5.121V	3.334V	5.128V	28.729				230.29V
2	2.408A	0.980A	0.988A	0.391A	39.923	78.527%	1007	24.8	0.545
	12.305V	5.101V	3.331V	5.121V	50.840				230.29V
3	3.569A	1.473A	1.469A	5.115A	59.353	82.144%	1010	25.0	0.669
	12.319V	5.090V	3.327V	5.115V	72.255				230.30V
4	4.803A	1.968A	1.981A	0.783A	79.791	84.297%	1011	25.1	0.759
	12.327V	5.080V	3.324V	5.110V	94.655				230.29V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.0 mV	8.7 mV	13.5 mV	13.2 mV	Pass
20% Load	8.4 mV	8.2 mV	13.5 mV	14.6 mV	Pass
30% Load	9.4 mV	9.3 mV	13.1 mV	15.6 mV	Pass
40% Load	10.6 mV	9.5 mV	13.6 mV	15.9 mV	Pass
50% Load	11.2 mV	10.0 mV	15.1 mV	18.8 mV	Pass
60% Load	12.0 mV	11.3 mV	17.1 mV	23.2 mV	Pass
70% Load	13.6 mV	12.8 mV	17.1 mV	27.0 mV	Pass
80% Load	16.1 mV	13.6 mV	21.0 mV	30.3 mV	Pass
90% Load	18.0 mV	15.6 mV	20.8 mV	34.8 mV	Pass
100% Load	26.8 mV	20.9 mV	24.0 mV	38.5 mV	Pass
110% Load	30.5 mV	24.8 mV	24.4 mV	50.5 mV	Fail
Crossload 1	12.2 mV	61.8 mV	27.1 mV	28.2 mV	Fail
Crossload 2	18.1 mV	17.0 mV	15.3 mV	20.7 mV	Pass

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

PAGE 8/9

Evaluation Report

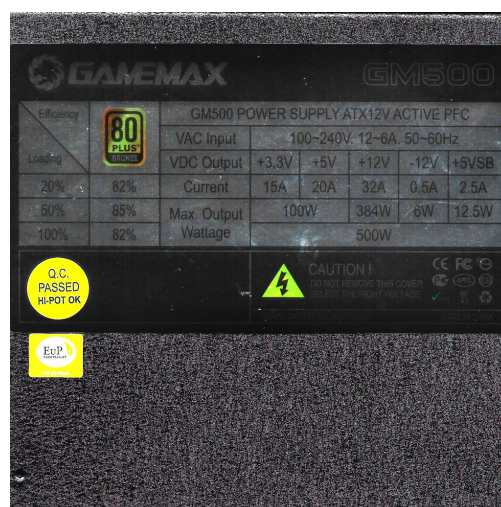
Gamemax GM500

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

Hold-Up Time (ms)	12.50
AC Loss to PWR_OK Hold Up Time (ms)	8.10
PWR_OK Inactive to DC Loss Delay (ms)	4.40



Top side



Power specifications label

CERTIFICATIONS



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

PAGE 9/9