Evaluation Report

Gamemax GM800

DUT INFORMATION

Brand	Gamemax
Manufacturer (OEM)	Gamemax
Series	GM Series
Model Number	GM800
Serial Number	
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6.3
Rated Frequency (Hz)	50-60
Rated Power (W)	800
Type	ATX12V
Cooling	140mm Sleeve Bearing Fan (DF1402512SEM)
Semi-Passive Operation	✗
Cable Design	Semi Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	60	2.5	0.5
	Watts	130		720	12.5	6
Total Max. Power (W)		800				

CABLES AND CONNECTORS

Native Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Caps
ATX connector 20+4 pin (500mm)	1	1	18-22AWG	No
4+4 pin EPS12V (510mm)	2	2	18AWG	No
SATA (500mm+140mm+140mm)	1	3	18AWG	No

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	Gauge
8 pin PCIe (500mm)	1	1	18AWG	No
6+2 pin PCIe (500mm)	1	1	18AWG	No
SATA (500mm+150mm)	1	2	18AWG	No
SATA (500mm+150mm+150mm)	1	3	18AWG	No
4-pin Molex (500mm+150mm+150mm)	1	3	18AWG	No
4-pin Molex (500mm) / FDD (+150mm)	1	1 / 1	18AWG	No

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Evaluation Report

Gamemax GM800

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)	2x
APFC MOSFETS	2x Champion GP47S60X (600V, 47A @ 150°C, 0.081Ω)
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 CM6800
Topology	Primary side: Double Forward Secondary side: Independent Regulation & Passive Rectification
Secondary Side	
+12V MOSFETS	4x MOSPEC S60M60C SBR (60V, 60A)
5V & 3.3V	2x MOSPEC S40M45C SBR (45V, 40A)
Filtering Capacitors	Electrolytics: CapXon (2-5,000 @ 105°C, KF), 3x Rubycon (1-2,000h @ 105°C, PX), 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	Excelliance EM8569A

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Evaluation Report

Gamemax GM800

RESULTS

Test Date	01-05-2019
Cybenetics ID #	585
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	85.708
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	50.735
Average Efficiency 5VSB	71.301
Standby Power Consumption (W) -115V	0.1460490
Standby Power Consumption (W) -230V	0.3798460
Average PF	0.937
ErP Lot 3/6 Ready	ErP Lot 6 2010: Partially ErP Lot 6 2013: Partially ErP Lot 3 2014 & CEC: Partially
(EU) No 617/2013 Compliance	✓
Avg Noise Output	39.40
Efficiency Rating (ETA)	
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	

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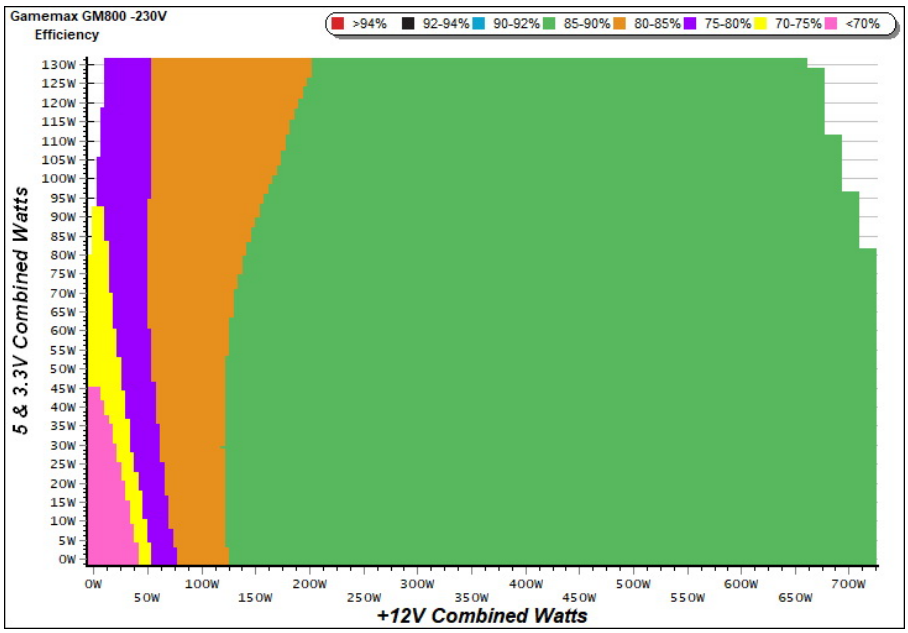
Evaluation Report

Gamemax GM800

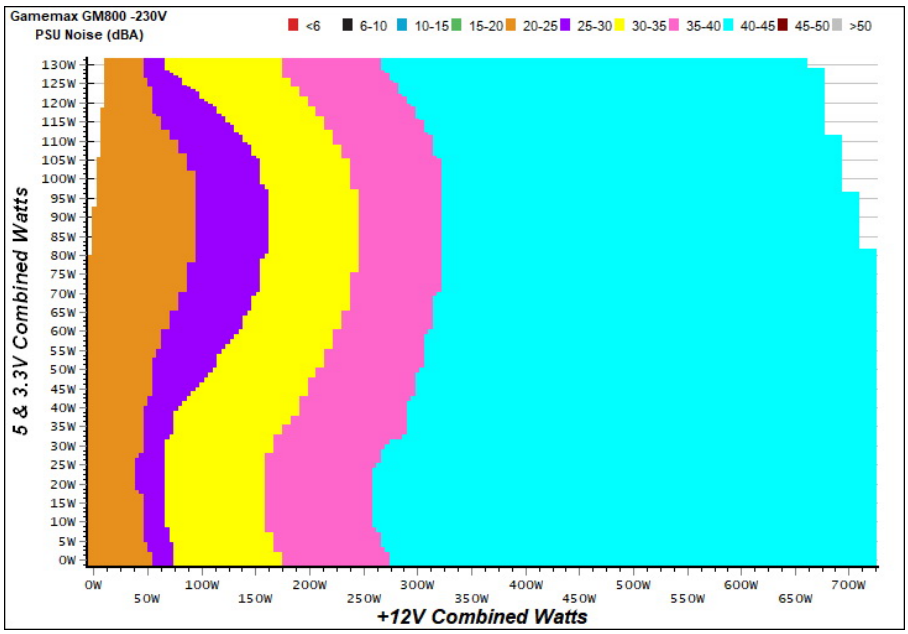
EFFICIENCY GRAPH



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

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Evaluation Report

Gamemax GM800

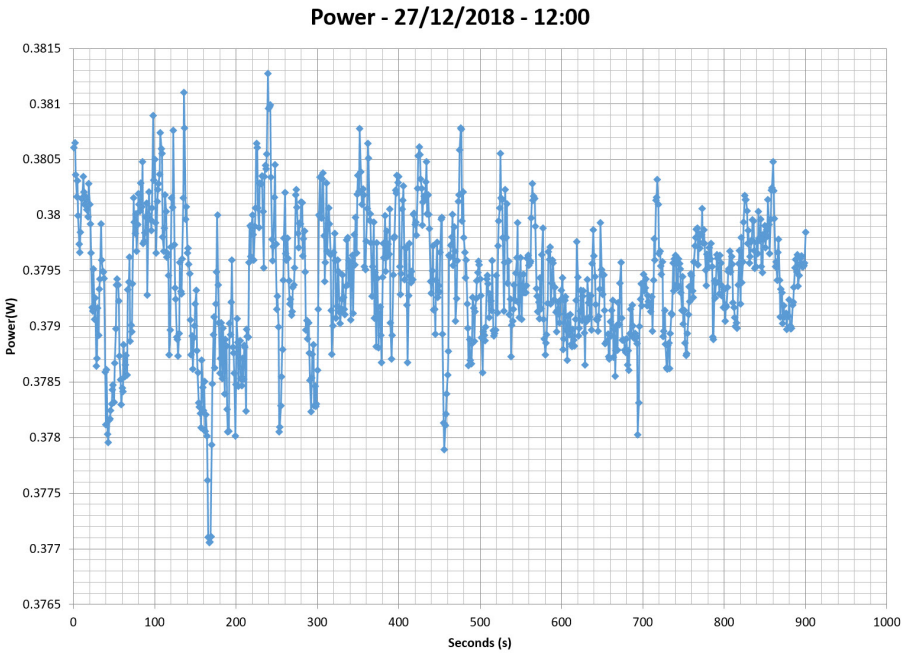
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	50.658%	0.060
	5.112V	0.456		115.11V
2	0.090A	0.460	59.585%	0.097
	5.110V	0.772		115.11V
3	0.550A	2.805	76.723%	0.258
	5.099V	3.656		115.12V
4	1.000A	5.088	77.349%	0.303
	5.087V	6.578		115.12V
5	1.500A	7.613	78.002%	0.326
	5.074V	9.760		115.12V
6	2.500A	12.621	77.056%	0.353
	5.048V	16.379		115.12V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	32.624%	0.029
	5.112V	0.705		230.24V
2	0.090A	0.460	43.315%	0.043
	5.111V	1.062		230.25V
3	0.550A	2.805	69.776%	0.140
	5.098V	4.020		230.23V
4	1.000A	5.088	73.622%	0.198
	5.087V	6.911		230.23V
5	1.500A	7.612	74.358%	0.236
	5.074V	10.237		230.24V
6	2.500A	12.620	76.052%	0.274
	5.048V	16.594		230.24V

VAMPIRE POWER -230V



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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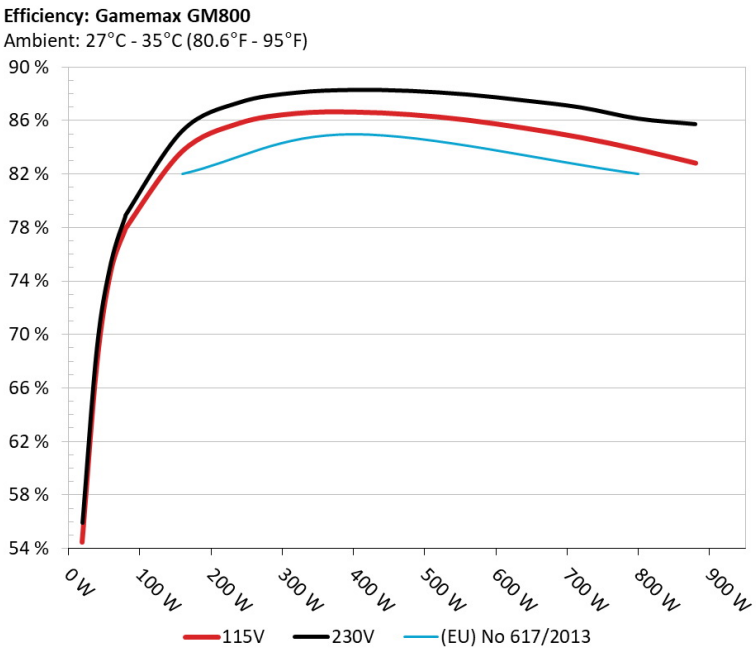
Evaluation Report

Gamemax GM800

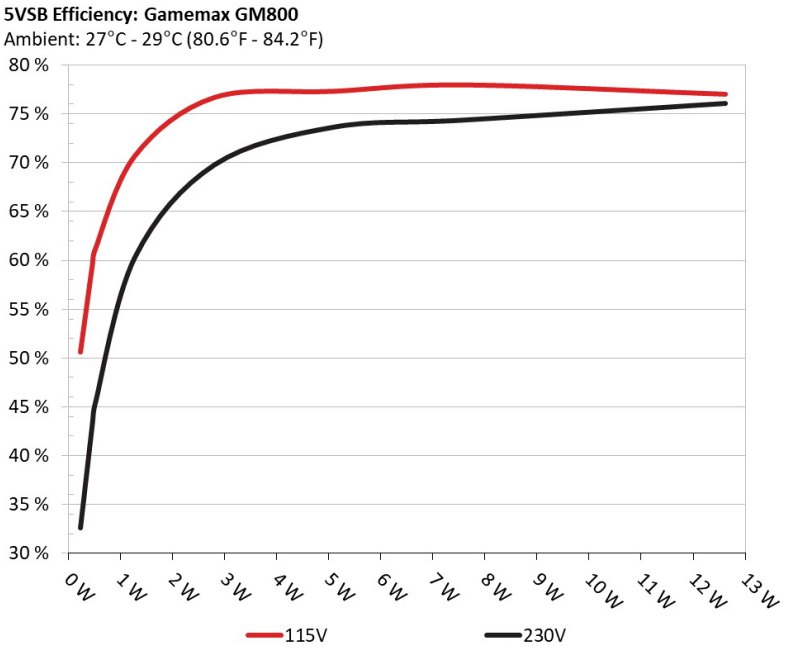
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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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Evaluation Report

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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	4.746A	1.950A	1.959A	0.984A	80.019	78.930%	890	21.7	28.82°C	0.848
	12.311V	5.126V	3.367V	5.080V	101.380				30.55°C	230.25V
2	10.480A	2.932A	2.940A	1.184A	159.740	85.240%	894	22.0	29.37°C	0.903
	12.295V	5.114V	3.365V	5.068V	187.401				31.33°C	230.25V
3	16.581A	3.428A	3.418A	1.384A	239.608	87.355%	1085	27.9	30.52°C	0.923
	12.280V	5.105V	3.363V	5.057V	274.293				32.79°C	230.25V
4	22.704A	3.925A	3.926A	1.586A	319.615	88.090%	1369	34.4	30.94°C	0.937
	12.263V	5.095V	3.361V	5.045V	362.829				33.57°C	230.25V
5	28.520A	4.918A	4.910A	1.788A	399.716	88.293%	1646	39.3	31.44°C	0.949
	12.245V	5.083V	3.359V	5.033V	452.715				34.56°C	230.25V
6	34.346A	5.915A	5.898A	1.992A	479.779	88.218%	1724	41.0	32.54°C	0.953
	12.228V	5.071V	3.357V	5.021V	543.856				35.96°C	230.25V
7	40.159A	6.917A	6.883A	2.196A	559.458	87.953%	1723	41.0	32.74°C	0.958
	12.211V	5.059V	3.354V	5.008V	636.091				36.47°C	230.24V
8	46.062A	7.926A	7.873A	2.402A	639.979	87.504%	1719	40.8	33.21°C	0.962
	12.192V	5.047V	3.352V	4.995V	731.368				37.64°C	230.24V
9	52.313A	8.438A	8.356A	2.406A	719.293	86.983%	1722	41.0	34.22°C	0.967
	12.173V	5.036V	3.350V	4.988V	826.936				38.78°C	230.23V
10	58.667A	8.955A	8.870A	2.512A	800.003	86.144%	1724	41.0	35.07°C	0.972
	12.150V	5.025V	3.348V	4.977V	928.678				39.88°C	230.22V
11	65.353A	8.970A	8.878A	2.515A	879.998	85.734%	1725	41.0	35.25°C	0.976
	12.131V	5.017V	3.345V	4.971V	1026.425				40.21°C	230.23V
CL1	0.130A	16.001A	16.000A	0.000A	136.564	75.963%	1716	40.8	31.31°C	0.899
	12.303V	5.067V	3.368V	5.087V	179.776				34.74°C	230.22V
CL2	59.997A	0.999A	0.998A	1.000A	743.239	87.231%	1725	41.0	35.28°C	0.968
	12.164V	5.065V	3.350V	5.032V	852.034				39.74°C	230.23V

Evaluation Report

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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	1.172A	0.486A	0.476A	0.196A	19.546	55.919%	886	21.4	0.598
	12.324V	5.139V	3.369V	5.106V	34.954				230.26V
2	2.409A	0.973A	0.980A	0.392A	39.969	69.088%	886	21.4	0.740
	12.318V	5.134V	3.368V	5.099V	57.852				230.26V
3	3.578A	1.460A	1.454A	5.092A	59.449	75.355%	888	21.5	0.811
	12.315V	5.130V	3.368V	5.092V	78.892				230.26V
4	4.811A	1.951A	1.958A	0.787A	79.821	78.855%	888	21.5	0.849
	12.311V	5.125V	3.367V	5.085V	101.225				230.26V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.6 mV	44.2 mV	25.6 mV	8.2 mV	Pass
20% Load	16.2 mV	37.8 mV	23.7 mV	9.3 mV	Pass
30% Load	16.9 mV	37.2 mV	23.8 mV	10.1 mV	Pass
40% Load	20.3 mV	34.8 mV	22.8 mV	11.1 mV	Pass
50% Load	25.3 mV	34.5 mV	23.9 mV	10.8 mV	Pass
60% Load	28.4 mV	37.3 mV	26.9 mV	12.6 mV	Pass
70% Load	33.2 mV	36.5 mV	27.2 mV	13.9 mV	Pass
80% Load	36.3 mV	34.2 mV	27.6 mV	15.7 mV	Pass
90% Load	42.9 mV	29.0 mV	26.5 mV	17.5 mV	Pass
100% Load	51.4 mV	27.4 mV	27.6 mV	20.9 mV	Pass
110% Load	68.1 mV	36.4 mV	35.6 mV	23.7 mV	Pass
Crossload 1	15.5 mV	81.5 mV	50.9 mV	6.7 mV	Fail
Crossload 2	50.5 mV	24.4 mV	26.7 mV	14.2 mV	Pass

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Evaluation Report

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

Hold-Up Time (ms)	11.4
AC Loss to PWR_OK Hold Up Time (ms)	93.0
PWR_OK Inactive to DC Loss Delay (ms)	-81.6

Top side

Power specifications label

CERTIFICATIONS

LAMBDA S+ 230V

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

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