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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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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RESULTS

Test Date	01-05-2019
Cybenetics ID #	584
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	83.878
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	50.735
Average Efficiency 5VSB	76.159
Standby Power Consumption (W) -115V	0.1460490
Standby Power Consumption (W) -230V	0.3798460
Average PF	0.982
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	39.22
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	

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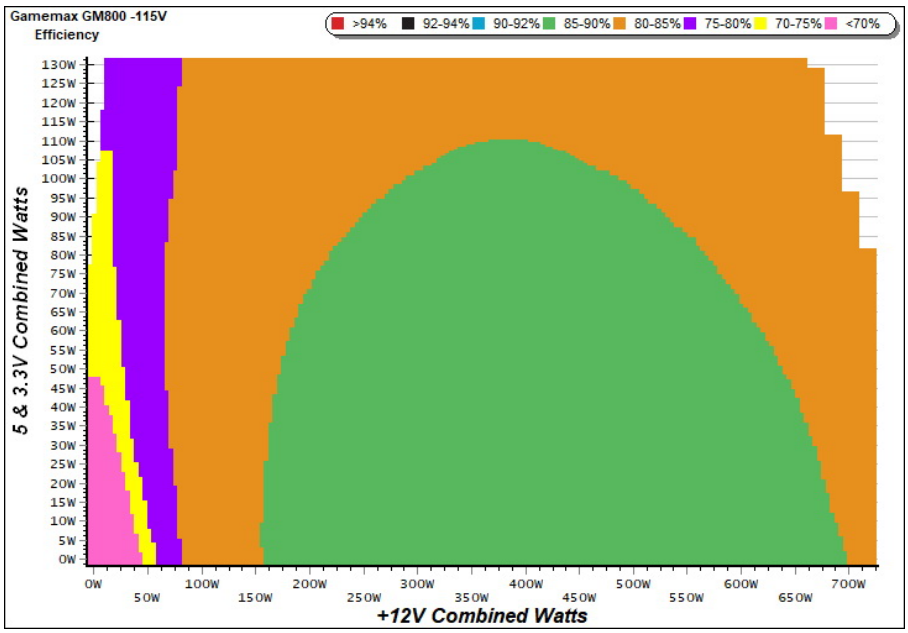
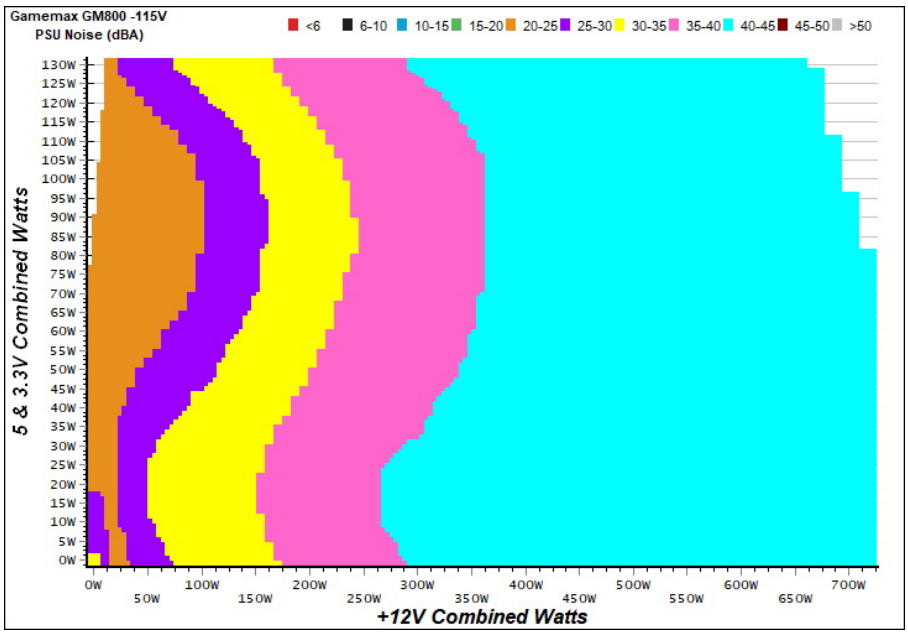
EFFICIENCY GRAPH



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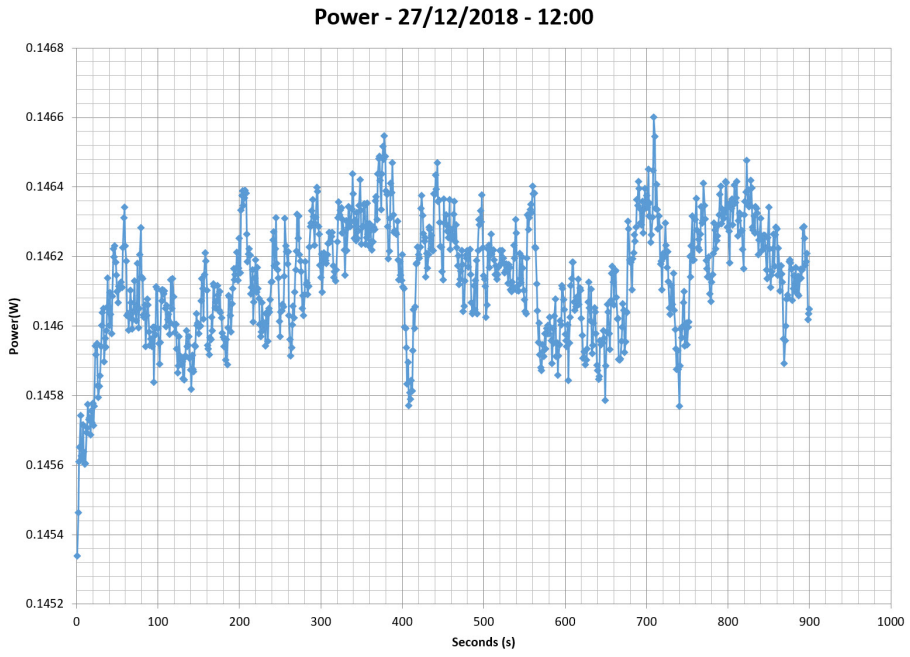
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

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 -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.

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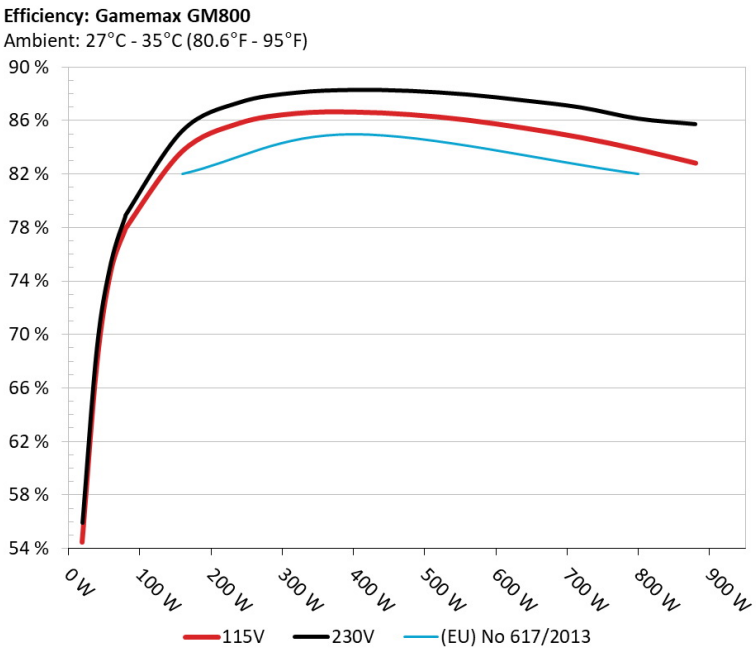
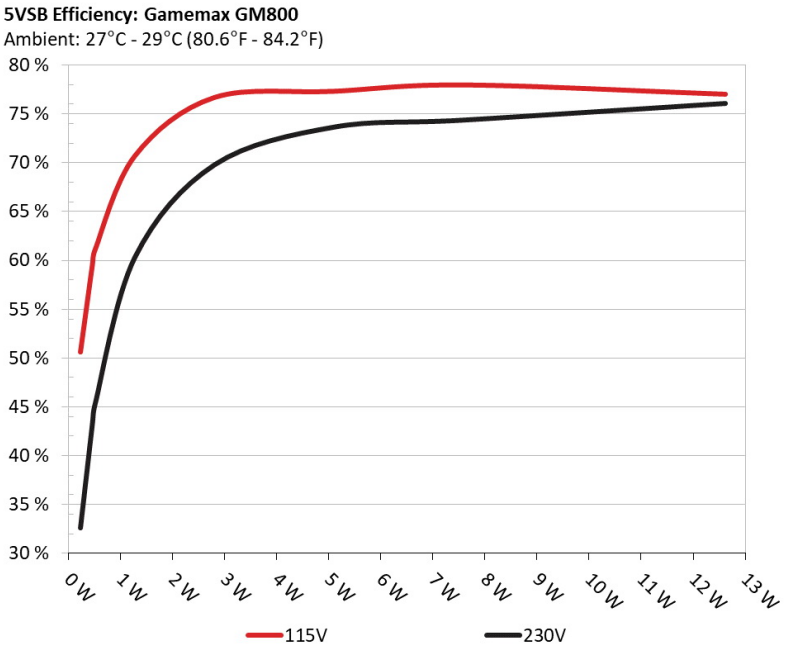
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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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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	4.742A	1.950A	1.958A	0.984A	79.976	77.893%	888	21.5	29.48°C	0.951
	12.313V	5.126V	3.367V	5.080V	102.674				31.10°C	115.11V
2	10.475A	2.932A	2.940A	1.184A	159.706	83.677%	892	21.9	29.85°C	0.959
	12.297V	5.115V	3.366V	5.068V	190.859				31.77°C	115.11V
3	16.578A	3.426A	3.417A	1.384A	239.581	85.786%	1027	25.9	30.36°C	0.976
	12.281V	5.106V	3.364V	5.057V	279.279				32.51°C	115.11V
4	22.699A	3.924A	3.925A	1.586A	319.570	86.523%	1363	34.3	30.86°C	0.984
	12.264V	5.096V	3.361V	5.045V	369.349				33.76°C	115.11V
5	28.514A	4.916A	4.907A	1.788A	399.690	86.627%	1636	39.2	31.16°C	0.988
	12.247V	5.084V	3.360V	5.033V	461.390				34.22°C	115.10V
6	34.345A	5.913A	5.896A	1.992A	479.796	86.434%	1719	40.8	31.43°C	0.990
	12.229V	5.073V	3.357V	5.021V	555.099				34.81°C	115.10V
7	40.168A	6.916A	6.884A	2.196A	559.506	86.027%	1722	41.0	32.20°C	0.992
	12.209V	5.061V	3.355V	5.008V	650.382				35.89°C	115.10V
8	46.065A	7.924A	7.874A	2.402A	640.025	85.423%	1724	41.0	33.38°C	0.993
	12.192V	5.048V	3.353V	4.995V	749.241				37.49°C	115.09V
9	52.317A	8.438A	8.354A	2.406A	719.361	84.717%	1719	40.8	33.88°C	0.993
	12.173V	5.038V	3.351V	4.988V	849.135				38.61°C	115.09V
10	58.666A	8.954A	8.868A	2.512A	800.057	83.819%	1718	40.8	34.79°C	0.994
	12.151V	5.027V	3.348V	4.978V	954.500				40.05°C	115.09V
11	65.363A	8.970A	8.876A	2.515A	880.056	82.806%	1723	41.0	35.08°C	0.992
	12.130V	5.017V	3.346V	4.971V	1062.794				41.05°C	115.08V
CL1	0.136A	16.002A	15.997A	0.000A	136.650	74.519%	1712	40.7	31.01°C	0.953
	12.303V	5.068V	3.368V	5.088V	183.377				34.72°C	115.11V
CL2	60.000A	1.000A	0.998A	1.000A	743.282	84.833%	1724	41.0	34.91°C	0.994
	12.164V	5.066V	3.350V	5.032V	876.166				40.53°C	115.08V

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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	1.169A	0.487A	0.474A	0.196A	19.507	54.457%	876	21.2	0.877
	12.324V	5.139V	3.369V	5.105V	35.821				115.12V
2	2.405A	0.973A	0.980A	0.392A	39.925	67.681%	880	21.3	0.928
	12.320V	5.134V	3.368V	5.099V	58.990				115.12V
3	3.576A	1.461A	1.451A	5.092A	59.406	74.660%	882	21.3	0.950
	12.311V	5.130V	3.368V	5.092V	79.569				115.12V
4	4.807A	1.950A	1.956A	0.787A	79.773	77.835%	886	21.4	0.952
	12.313V	5.126V	3.367V	5.085V	102.490				115.11V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	15.4 mV	42.7 mV	24.6 mV	8.6 mV	Pass
20% Load	14.8 mV	37.2 mV	24.1 mV	10.3 mV	Pass
30% Load	17.0 mV	37.7 mV	23.7 mV	11.1 mV	Pass
40% Load	20.7 mV	35.1 mV	23.6 mV	12.1 mV	Pass
50% Load	23.8 mV	33.9 mV	23.4 mV	12.0 mV	Pass
60% Load	28.6 mV	35.5 mV	25.2 mV	12.8 mV	Pass
70% Load	31.9 mV	36.8 mV	27.0 mV	13.8 mV	Pass
80% Load	36.5 mV	34.9 mV	29.6 mV	15.0 mV	Pass
90% Load	43.2 mV	30.7 mV	27.3 mV	17.9 mV	Pass
100% Load	52.6 mV	29.9 mV	29.9 mV	20.2 mV	Pass
110% Load	65.5 mV	30.0 mV	31.6 mV	24.6 mV	Pass
Crossload 1	14.9 mV	79.1 mV	51.7 mV	6.6 mV	Fail
Crossload 2	52.3 mV	25.6 mV	28.5 mV	15.0 mV	Pass

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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

ETA S

LAMBDA S+

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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