Enermax MaxRevo 1800W

18A7100210018

Lab ID EM19180019

Certification ID 25654

Test Result Report ID:

Certificate Issue Date: Mar 26, 2019

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 Chroma 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500
Power Analyzers	Rohde & Schwarz HMC8015 & NPA701
Oscilloscopes	Picoscope 4444, Siglent SDS2104X PLUS
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Tachometer	UNI-T UT372
Multimeters	Keysight 34465A
EMI Analyzer	TekBox TBMR-110M-EU
Isolation Transformer	4kVA
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Testing Methodology	Cybenetics PSU Test Protocol

DUT Information(Non-accredited measurements)

Product Identification Details	
Brand	Enermax
Model	MaxRevo 1800W
OEM/ODM	Enermax
Serial Number	18A7100210018
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	115-240
□□□□ (Arms)	16-8
□□□□ (Hz)	50-60

□□□□ (W)	1800
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135mm Double Ball Bearing Fan (ADN512XB-A91)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	EM19180019
Date of receipt	Apr 4, 2019
Testing Date	Mar 26, 2019
Report Issued Date	Mar 26, 2019
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (600mm) / 8 pin EPS 12V □□ (650mm)	1	1 / 1	16-22AWG	□
8 pin EPS 12V □□ (600mm) / 4 pin ATX (600)	1	1 / 1	16AWG	□
2 x 6+2pin PCIe□□ (500mm)	6	12	16-18AWG	□
SATA□□ (450mm+150mm+150mm+150mm)	3	12	18AWG	□
SATA□□ (450mm+150mm) / □ 4pin Molex□□ (+150mm+150mm)	1	2 / 2	18AWG	□
□ 4pin Molex□□ (450mm+150mm+150mm+150mm) / FDD (+150mm)	2	8 / 2	18-20AWG	□
AC Power Cord (1444mm) - C14 coupler	1	1	14AWG	-

□□□□

□		3.3V	5V	12V(1)	12V(2)	12V(3)	12V(4)	12V(5)	12V(6)	5VSB	-12V
□□□□	□□	25	25	20	35	35	35	35	35	4	0.5
	□	140		1800						20	6
□□□□□ (W)		1800									

Parts Description

General Data	
Manufacturer (OEM)	Enermax
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 3x CM chokes,1x DM chokes,1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x Bridge
APFC MOSFETS	2x Infineon SPW35N60C3 (650V, 21.9A @ 100°C, 0.1Ohm)
APFC Boost Diode	1x CREE C3D10060A (600V, 14A @ 135°C)
Hold-up Cap(s)	3x Chemi-Con (420V, 390uF, 2000h @ 105°C, KMR)
Main Switchers	4x Toshiba TK18A60V (600V, 18A @ 150°C, 0.19Ohm)
IC Driver	Texas Instuments UCC27324
APFC Controller	Infineon 2PCS02 & CM03X Green PFC Controller
Main Controller	Texas Instuments UCC28950
Topology	Primary side: Interleaved PFC, Phase Shift ZVT Full-Bridge Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon IPP015N04N (40V, 120A @ 100°C, 1.5mOhm)
5V & 3.3V	DC-DC Converters: 8x Sinopower SM3116NAU (30V, 48A @ 100°C, 6.9mOhm @ 125°C) PWM Controllers: 2x ANPEC APW7073
Filtering Capacitors	Electrolytics: 8x Chemi-Con (4 - 10,000h @ 105°C, KY), 10x Rubycon (4 - 5,000h @ 105°C, ZLK) Polymers: 3x Elite (CS CAP), 8x Apaq
Supervisor IC	SITI PS238 (OCP, OVP, UVP, SCP, PG)
Fan Model	ADDA ADN512XB-A91 (135mm, 12V, 0.66A, Double Ball Bearing Fan)

5VSB Circuit	
Rectifier	TSF10U60C SBR (60V, 10A)
Standby PWM Controller	Power Integrations TOP265EG

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	87.991%
Average Noise Output (>1450 Load Combinations)	43.20dBA
PF□□□ (>1450 Load Combinations)	0.998
Efficiency With 10W (≤500W) or 2% (>500W) Load	57.397%
□□□□□□	0.0906W
Non-Accredited	
12V Ripple (Full Load)	30.69mV
5V Ripple (Full Load)	30.52mV
3.3V Ripple (Full Load)	41.44mV
5VSB Ripple (Full Load)	43.34mV
12V Load Regulation	2.13%
5V Load Regulation	1.41%
3.3V Load Regulation	1.65%
5VSB Load Regulation	3.18%
Inrush Current	21.327A

230V

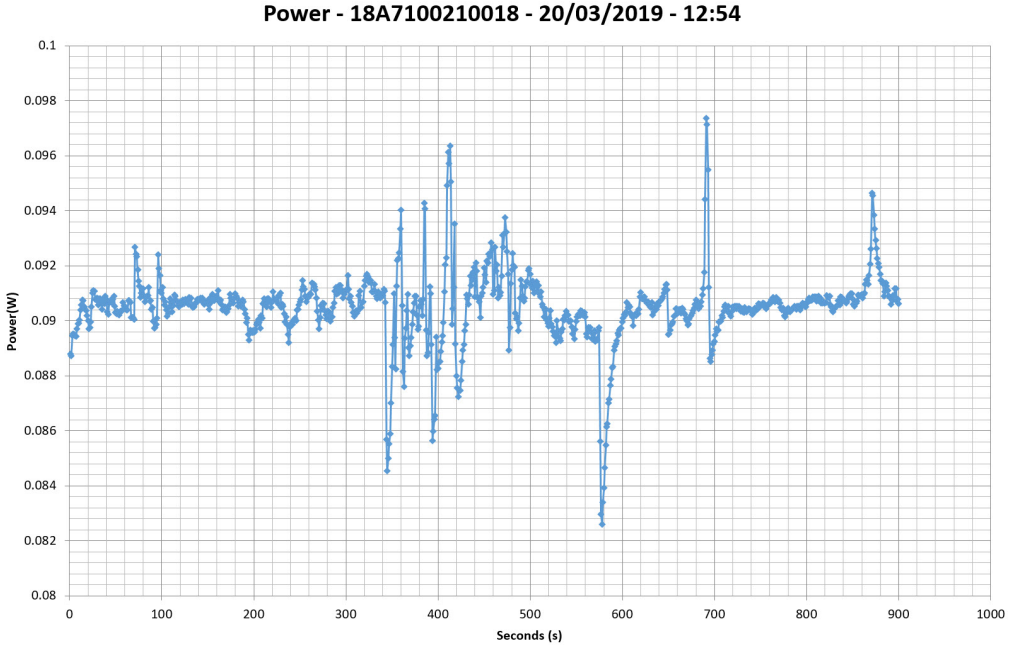
Accredited		
□□□□ (>1450 load combinations)	90.608%	
Average Noise Output (>1450 Load Combinations)	43.70dBA	
PF□□□ (>1450 Load Combinations)	0.988	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
□□□□□□	0.1147W	
Non-Accredited		
12V Ripple (Full Load)	19.65mV	
5V Ripple (Full Load)	22.08mV	
3.3V Ripple (Full Load)	20.13mV	
5VSB Ripple (Full Load)	34.14mV	
12V Load Regulation	2.41%	
5V Load Regulation	1.59%	
3.3V Load Regulation	1.86%	
5VSB Load Regulation	3.40%	
Inrush Current	46.774A	
□□□□ & PG□□	12.50ms	
AC Loss to PWR_OK Hold Up Time	14.90ms	
PWR_OK Inactive to DC Loss Delay	-2.40ms	
OPP (0.00°C / 0.00°C)	106.33%	-

□□□□ & PG□□

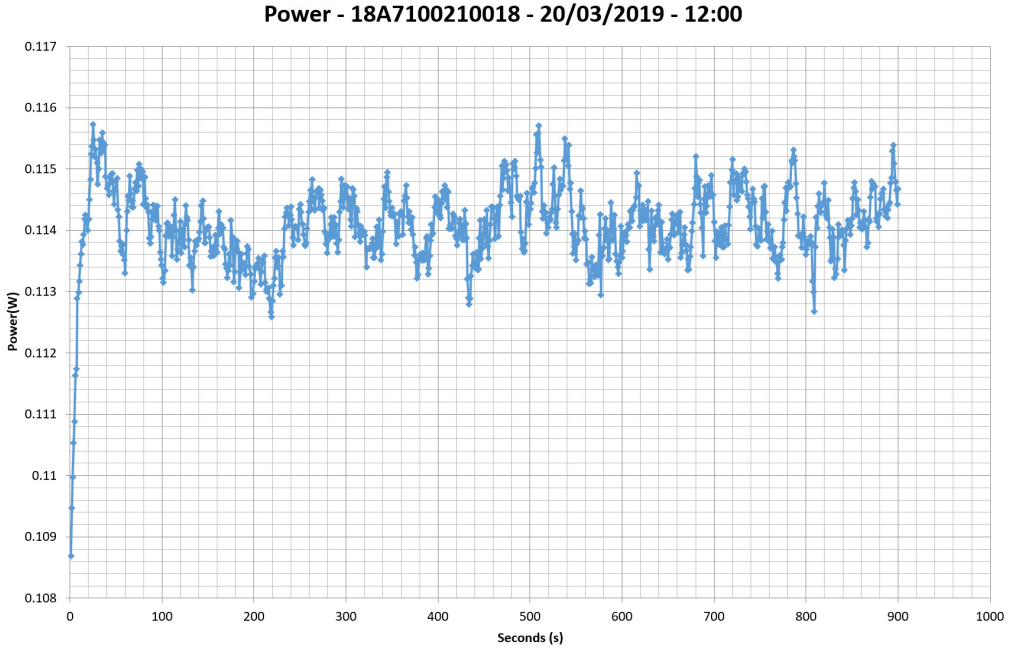
Hold-Up Time (ms)	12.5
AC Loss to PWR_OK Hold Up Time (ms)	14.9
PWR_OK Inactive to DC Loss Delay (ms)	-2.4

Graphs

115V



230V



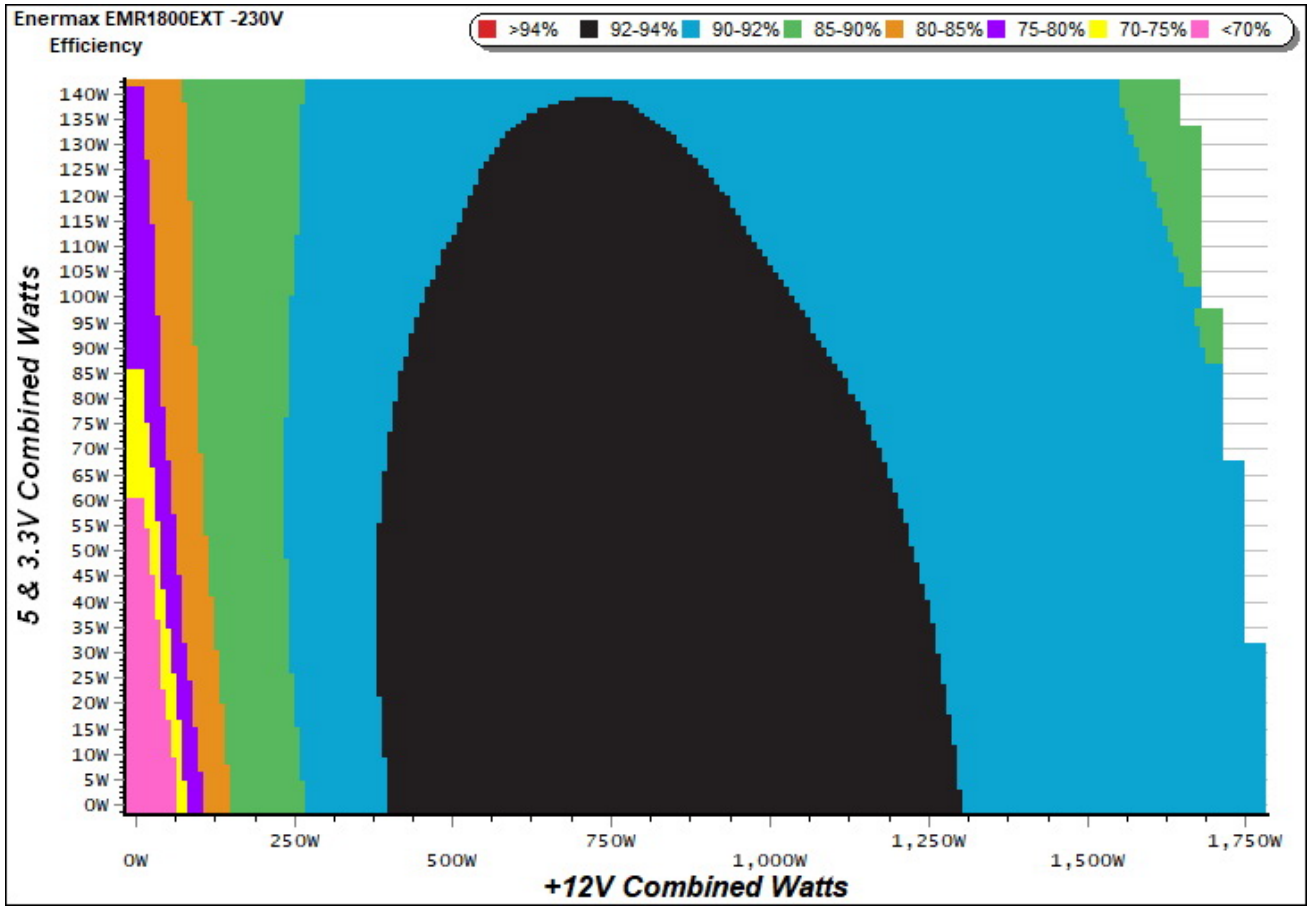
115V



□□

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.

230V



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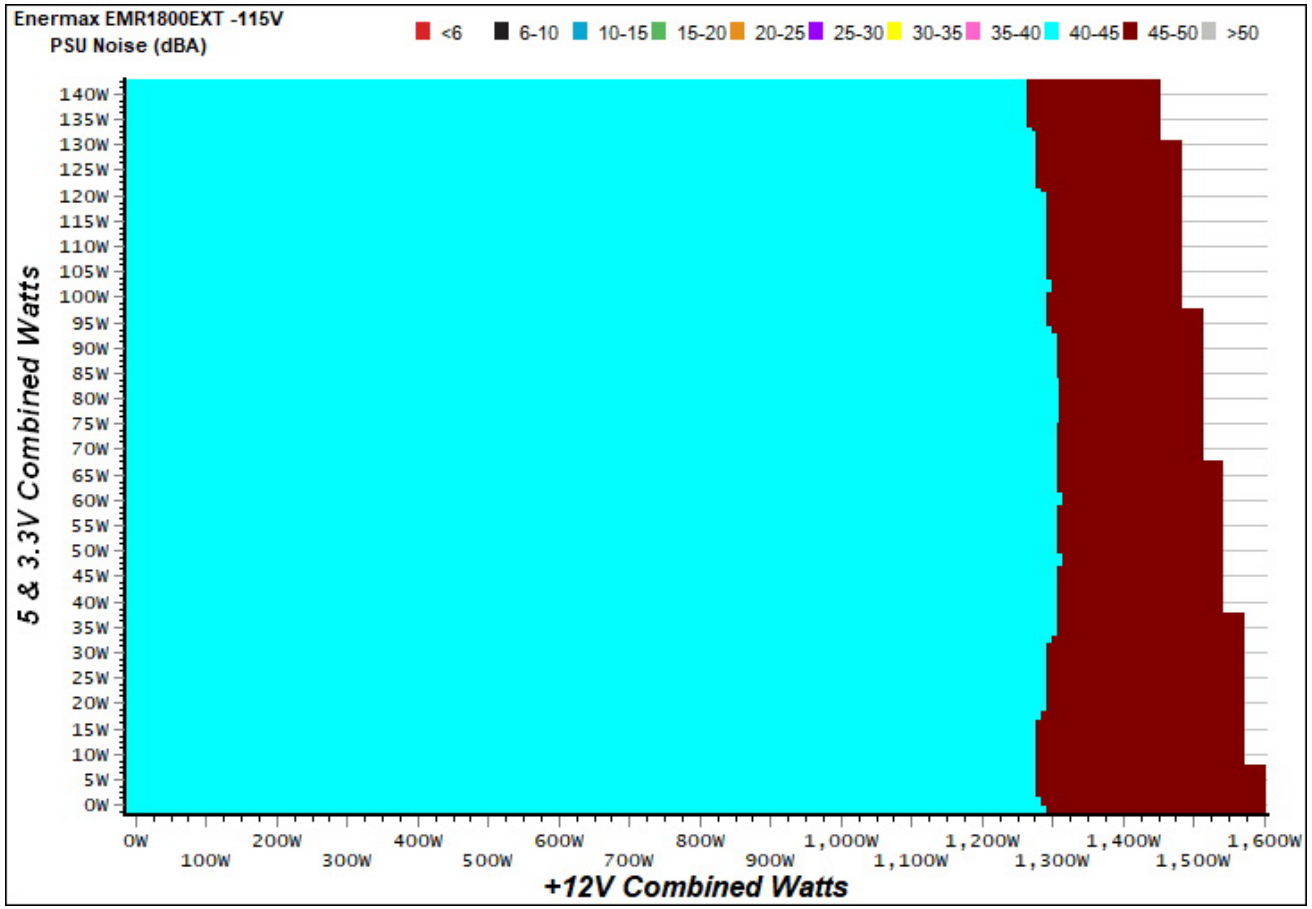
□□□□□

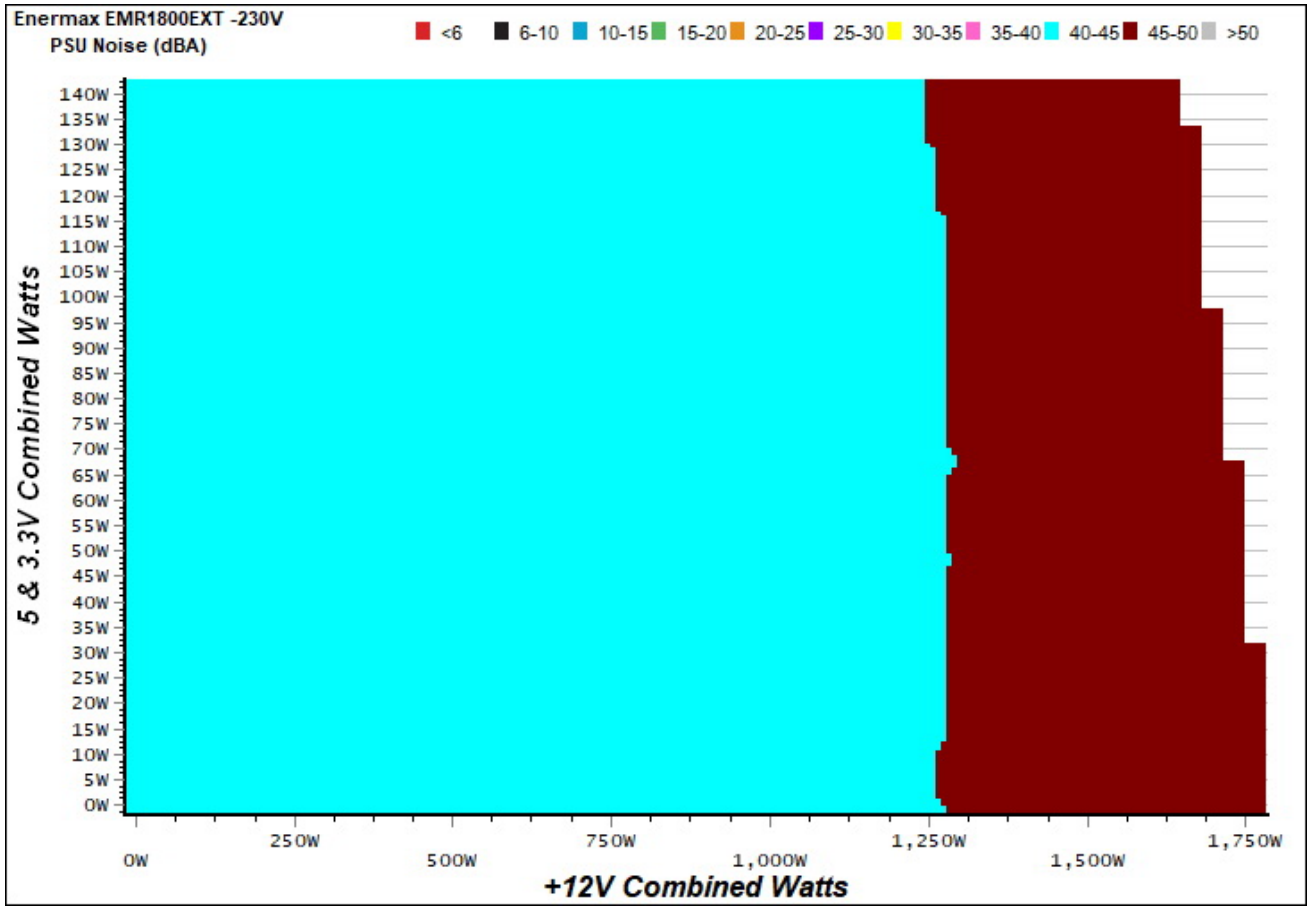
115V



□□

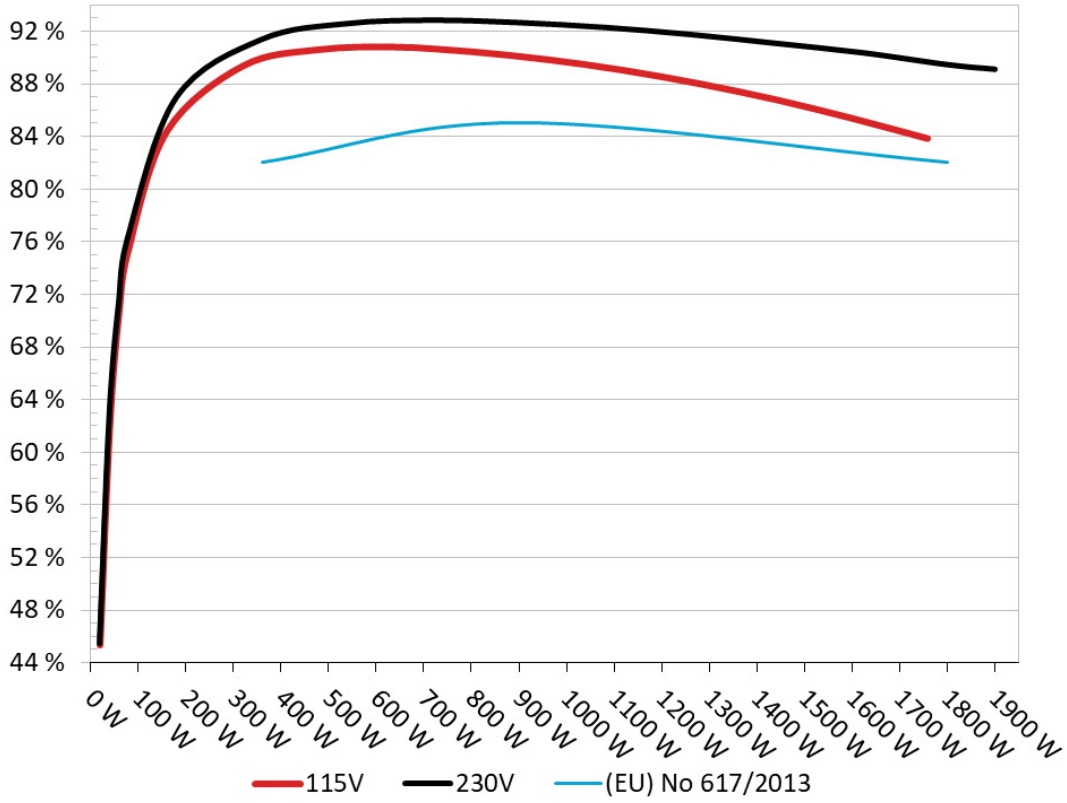
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



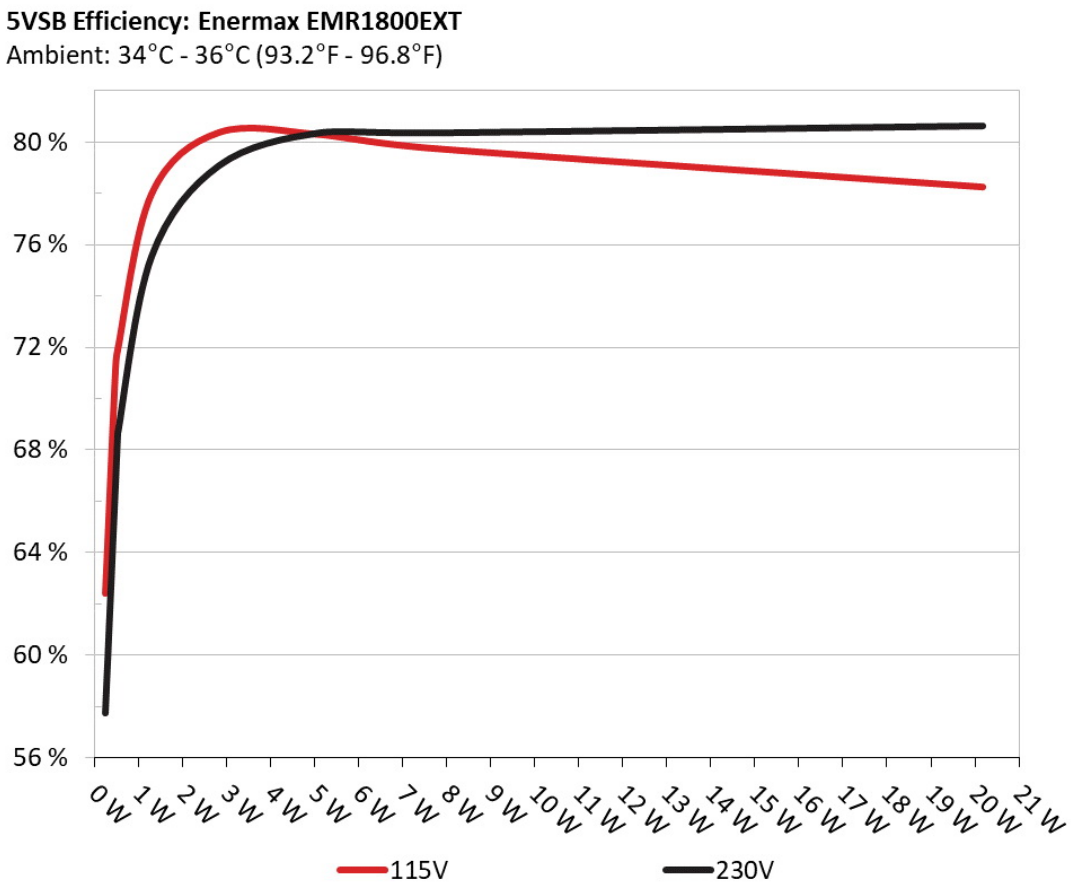
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance



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□□□□



□□

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

□□□□ □□ 5Vsb □□ (ErP Lot3/6 & CEC)

115V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.231	62.432%	0.059
	5.123V	0.370		115.09V
2	0.090A	0.461	71.142%	0.101
	5.122V	0.648		115.09V
3	0.550A	2.813	80.348%	0.340
	5.114V	3.501		115.08V
4	1.000A	5.106	80.270%	0.418
	5.106V	6.361		115.08V
5	1.500A	7.646	79.737%	0.459
	5.096V	9.589		115.08V
6	4.000A	20.186	78.231%	0.528
	5.047V	25.803		115.08V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.231	57.750%	0.017
	5.123V	0.400		230.25V
2	0.090A	0.462	68.648%	0.028
	5.122V	0.673		230.25V
3	0.550A	2.813	79.061%	0.141
	5.114V	3.558		230.25V
4	1.000A	5.106	80.346%	0.222
	5.105V	6.355		230.26V
5	1.500A	7.645	80.338%	0.285
	5.096V	9.516		230.26V
6	4.001A	20.188	80.610%	0.411
	5.046V	25.044		230.27V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	11.352A	1.963A	1.948A	0.981A	159.946	84.363%	1960	42.1	40.18°C	0.994
	12.188V	5.092V	3.385V	5.095V	189.592				42.36°C	115.10V
2	23.744A	2.950A	2.926A	1.181A	319.665	89.318%	1972	42.2	40.92°C	0.998
	12.162V	5.085V	3.379V	5.083V	357.896				43.50°C	115.11V
3	36.517A	3.446A	3.408A	1.381A	479.207	90.561%	1991	42.4	41.10°C	0.999
	12.137V	5.078V	3.374V	5.071V	529.152				44.20°C	115.11V
4	49.416A	3.943A	3.916A	1.581A	639.667	90.762%	2021	43.5	41.86°C	0.999
	12.111V	5.072V	3.369V	5.059V	704.777				45.55°C	115.11V
5	62.007A	4.937A	4.907A	1.784A	799.857	90.411%	2053	44.4	42.07°C	0.999
	12.085V	5.064V	3.362V	5.047V	884.694				46.28°C	115.12V
6	74.649A	5.934A	5.900A	1.987A	959.928	89.814%	2090	44.7	42.64°C	0.999
	12.058V	5.056V	3.357V	5.034V	1068.797				47.86°C	115.12V
7	87.322A	6.934A	6.896A	2.191A	1119.684	89.005%	2121	44.9	43.18°C	0.999
	12.031V	5.049V	3.350V	5.021V	1258.002				49.44°C	115.12V
8	100.116A	7.937A	7.896A	2.397A	1280.206	87.979%	2170	45.4	43.80°C	0.999
	12.004V	5.041V	3.343V	5.009V	1455.120				51.94°C	115.12V
9	113.317A	8.444A	8.386A	2.401A	1439.578	86.778%	2239	45.6	44.35°C	0.999
	11.976V	5.033V	3.338V	4.999V	1658.928				54.03°C	115.14V
10	125.985A	8.956A	8.911A	4.038A	1599.856	85.361%	2307	46.5	45.25°C	0.999
	11.947V	5.025V	3.333V	4.955V	1874.232				55.66°C	115.15V
11	139.724A	8.968A	8.923A	4.045A	1759.943	83.818%	2393	47.8	46.67°C	0.999
	11.918V	5.018V	3.329V	4.946V	2099.720				58.05°C	115.14V
CL1	0.157A	17.001A	16.998A	0.000A	144.981	79.019%	2109	44.8	42.22°C	0.994
	12.170V	5.069V	3.347V	5.100V	183.476				46.60°C	115.15V

CL2	133.357A	1.003A	1.000A	1.000A	1608.243	85.593%	2306	46.5	45.56°C	0.999
	11.959V	5.035V	3.353V	5.024V	1878.947				55.65°C	115.14V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	13.003A	1.965A	1.950A	0.982A	180.019	86.969%	1970	42.2	40.34°C	0.955
	12.183V	5.090V	3.384V	5.094V	206.991				42.41°C	230.31V
2	27.056A	2.952A	2.929A	1.181A	359.735	91.416%	1982	42.3	40.62°C	0.985
	12.154V	5.082V	3.378V	5.081V	393.516				43.20°C	230.33V
3	41.505A	3.449A	3.409A	1.381A	539.286	92.622%	2005	42.6	41.05°C	0.994
	12.126V	5.075V	3.372V	5.068V	582.244				44.20°C	230.33V
4	56.095A	3.947A	3.918A	1.583A	719.774	92.879%	2040	43.9	41.92°C	0.995
	12.097V	5.067V	3.367V	5.055V	774.959				45.13°C	230.33V
5	70.390A	4.942A	4.912A	1.786A	899.900	92.693%	2076	44.7	42.46°C	0.996
	12.067V	5.059V	3.359V	5.041V	970.844				46.40°C	230.33V
6	84.748A	5.940A	5.905A	1.990A	1079.993	92.331%	2111	44.8	42.72°C	0.997
	12.038V	5.050V	3.352V	5.028V	1169.694				46.86°C	230.33V
7	99.174A	6.944A	6.905A	2.195A	1259.790	91.793%	2182	45.5	43.31°C	0.998
	12.006V	5.041V	3.345V	5.013V	1372.428				48.99°C	230.33V
8	113.730A	7.949A	7.910A	2.401A	1440.330	91.117%	2249	46.0	43.81°C	0.998
	11.975V	5.033V	3.338V	4.999V	1580.741				50.77°C	230.33V
9	128.685A	8.460A	8.401A	2.406A	1619.658	90.413%	2321	46.7	44.93°C	0.998
	11.945V	5.025V	3.333V	4.989V	1791.409				52.96°C	230.33V
10	143.173A	8.975A	8.928A	4.047A	1799.899	89.498%	2406	47.9	45.69°C	0.998
	11.910V	5.015V	3.326V	4.943V	2011.114				54.91°C	230.33V
11	151.780A	8.980A	8.935A	4.051A	1899.831	89.144%	2384	47.8	46.84°C	0.998
	11.893V	5.012V	3.324V	4.938V	2131.195				57.11°C	230.33V
CL1	0.152A	17.000A	17.001A	0.000A	144.908	80.289%	2113	44.8	42.22°C	0.946
	12.169V	5.069V	3.346V	5.100V	180.482				46.22°C	230.34V

CL2	150.020A	1.003A	0.999A	1.000A	1802.390	89.788%	2380	47.7	45.53°C	0.998
	11.925V	5.028V	3.349V	5.014V	2007.393				54.57°C	230.33V

The results above are not used in the certification process

20-80□□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.186A	0.489A	0.470A	0.195A	19.565	45.347%	1945	42.0	0.935
	12.210V	5.097V	3.391V	5.118V	43.145				115.12V
2	2.425A	0.980A	0.971A	0.391A	39.887	61.926%	1939	42.0	0.961
	12.207V	5.097V	3.389V	5.113V	64.411				115.11V
3	3.598A	1.472A	1.445A	0.587A	59.306	70.587%	1942	42.0	0.976
	12.204V	5.096V	3.388V	5.108V	84.018				115.11V
4	4.847A	1.963A	1.947A	0.784A	79.727	75.434%	1953	42.1	0.979
	12.200V	5.094V	3.386V	5.103V	105.691				115.11V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.179A	0.489A	0.469A	0.196A	19.482	45.458%	1941	42.0	0.662
	12.210V	5.097V	3.391V	5.118V	42.857				230.29V
2	2.425A	0.980A	0.970A	0.391A	39.879	62.857%	1944	42.0	0.768
	12.206V	5.096V	3.389V	5.112V	63.444				230.29V
3	3.601A	1.472A	1.443A	0.588A	59.333	71.309%	1952	42.1	0.836
	12.203V	5.095V	3.387V	5.107V	83.205				230.30V
4	4.852A	1.962A	1.947A	0.784A	79.776	76.484%	1961	42.1	0.879
	12.199V	5.094V	3.386V	5.102V	104.304				230.31V

The results above are not used in the certification process

□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.1 mV	7.9 mV	12.1 mV	14.0 mV	Pass
20% Load	12.3 mV	9.8 mV	11.8 mV	16.0 mV	Pass
30% Load	13.0 mV	10.8 mV	12.3 mV	17.5 mV	Pass
40% Load	13.8 mV	12.3 mV	13.4 mV	17.8 mV	Pass
50% Load	14.5 mV	14.4 mV	14.2 mV	19.3 mV	Pass
60% Load	16.0 mV	15.7 mV	14.6 mV	20.4 mV	Pass
70% Load	15.9 mV	17.0 mV	15.1 mV	22.5 mV	Pass
80% Load	16.9 mV	18.9 mV	18.3 mV	25.1 mV	Pass
90% Load	30.6 mV	30.2 mV	43.8 mV	39.8 mV	Pass
100% Load	30.7 mV	30.5 mV	41.4 mV	43.3 mV	Pass
110% Load	31.6 mV	32.4 mV	42.9 mV	47.0 mV	Pass
Crossload 1	14.1 mV	19.5 mV	23.3 mV	13.5 mV	Pass
Crossload 2	27.9 mV	26.2 mV	35.9 mV	36.4 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.1 mV	7.6 mV	11.8 mV	13.6 mV	Pass
20% Load	12.7 mV	9.7 mV	11.5 mV	15.4 mV	Pass
30% Load	13.2 mV	11.5 mV	13.3 mV	17.0 mV	Pass
40% Load	13.8 mV	13.0 mV	13.6 mV	17.3 mV	Pass
50% Load	15.0 mV	14.8 mV	13.9 mV	19.1 mV	Pass
60% Load	15.5 mV	16.2 mV	15.0 mV	20.5 mV	Pass
70% Load	16.5 mV	17.9 mV	15.6 mV	22.8 mV	Pass
80% Load	17.7 mV	19.6 mV	18.0 mV	25.6 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	18.4 mV	20.5 mV	18.8 mV	27.1 mV	Pass
100% Load	19.7 mV	22.1 mV	20.1 mV	34.1 mV	Pass
110% Load	21.1 mV	22.8 mV	21.0 mV	35.3 mV	Pass
Crossload 1	14.8 mV	13.9 mV	23.5 mV	12.0 mV	Pass
Crossload 2	19.9 mV	18.3 mV	16.5 mV	30.2 mV	Pass

The results above are not used in the certification process

Enermax MaxRevo 1800W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

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