Enermax RevoBron 700W

1857020124006TR

Lab ID 505

Certification ID 25505

Test Result Report ID: 20PS505A

Certificate Issue Date: Oct 19, 2018

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

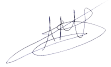
General Information

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	RevoBron 700W
OEM/ODM	Channel Well Technology
Serial Number	1857020124006TR
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	10-5
□□□□ (Hz)	47-63

□□□□ (W)	700
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Semi Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Twister Bearing Fan (ED122512H-FD)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	505
Date of receipt	Oct 8, 2018
Testing Date	Oct 15, 2018
Report Issued Date	Oct 19, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□ (Non-accredited measurements)

□□□□□				
□□	□□□□	□□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (600mm)	1	1	18AWG	□
4+4 pin EPS 12V □□ (710mm)	1	1	18AWG	□
Native Cables				
6+2pin PCIe□□ (500mm+150mm)	2	4	18AWG	□
SATA□□ (450mm+150mm+150mm+150mm)	2	8	18AWG	□
4-pin Molex (450mm+150mm+150mm+150mm)	1	4	18AWG	□
□ 4pin □□ (+105mm)	1	1	20AWG	□
AC Power Cord (1400mm) - C13 coupler	1	1	16AWG	-

		3.3V	5V	12V1	12V2	5VSB	-12V
		22	18	35	35	2.5	0.3
		130		696 (58A)		12.5	3.6
(W)		700					

Parts Description

General Data	
Manufacturer (OEM)	CWT
Platform Model	CSB
PCB	PCB Single Layer
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Bridge Rectifier(s)	1x GBU1506 (600V, 15A @ 100°C)
Inrush Current Protection	NTC Thermistor
APFC Mosfets	2x Champion [URL=http://www.kediman.com/attaches/2017/04/918-BgnNFE.pdf]GP28S50G[/URL] (500 V, 28 A @ 150 °C, 0.125 Ohm)
APFC Boost Diode	1x CREE [URL=https://www.wolfspeed.com/media/downloads/844/C3D06060A.pdf]C3D06060A[/URL] (600V, 6A @ 154°C)
Hold-up Cap(s)	2x Nichicon (400V, 470uF & 220uF or 690uF combined, 2000h @ 105°C, [URL=http://www.nichicon.co.jp/english/products/pdf/e-gg.pdf]GG[/URL] series)
Main Switchers	2x Champion [URL=http://www.kediman.com/attaches/2017/04/918-BgnNFE.pdf]GP28S50G[/URL] (500 V, 28 A @ 150 °C, 0.125 Ohm)
Combo APFC/PWM Controller	Champion [URL=http://www.champion-micro.com/datasheet/Analog%20Device/CM6800T.pdf]CM6800TX[/URL] & CM03X Green PFC controller
Topology	Primary side: Double Forward Secondary side: Semi-Synchronous Rectification & DC-DC converters
Secondary Side	
+12V	2x PFC PFR30L60CT (60V, 30A @ 50% duty cycle) 2x SG65N02P FETs
Driver for +12V FETs	Syncpower [URL=http://www.syncpower.com/datasheet/SP6019.pdf]SP6019[/URL]
5V & 3.3V	DC-DC Converters: 4x UBIQ [URL=http://www.efreewind.cn/data2/pdf_data/QM3006D(20110513).pdf]QM3006D[/URL] FETs (30V, 57A @ 100°C, 5.5mΩ) PWM Controllers: 1x APW7159C

Filtering Capacitors	Electrolytics: Chemi-Con (4,000-10,000h @ 105°C, [http://www.chemi-con.com/upload/files/5/1/74811667552d6c4d41a84c.pdf]KY series[/URL]), Chemi-Con (1,000-5,000h @ 105°C, [URL=http://www.chemi-con.com/upload/files/7/5/32389236352d6c56e8f45b.pdf]KZE series[/URL]) Polymers: Chemi-Con
Supervisor IC	Sytronix [URL=http://www.infinno.com.tw/products/SMPS_Supervisor.html]ST9S429-PG14[/URL] (OCP [2x 12V channels, OVP, UVP, PG)
Fan Model	ED122512H-FD (120 mm, 12 V, 0.35 A, Twister Bearing Fan)
5VSB Circuit	
Rectifying Diode	Plain Diode
Standby PWM Controller	TinySwitch-LT [URL=http://dalincom.ru/datasheet/TNY176PN.pdf]TNY177PN[/URL] (18W Peak)

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)	85.342%
Average Noise Output (>1450 Load Combinations)	33.60dBA
PF□□□ (>1450 Load Combinations)	0.986
Efficiency With 10W (≤500W) or 2% (>500W) Load	64.421%
□□□□□□	0.0375W
Non-Accredited	
12V Ripple (Full Load)	47.25mV
5V Ripple (Full Load)	15.92mV
3.3V Ripple (Full Load)	29.10mV
5VSB Ripple (Full Load)	17.07mV
12V Load Regulation	1.84%

5V Load Regulation	0.64%
3.3V Load Regulation	0.76%
5VSB Load Regulation	3.11%
Inrush Current	47.313A

230V

Accredited		
□□□□ (>1450 load combinations)	87.632%	
Average Noise Output (>1450 Load Combinations)	33.33dBA	
PF□□□ (>1450 Load Combinations)	0.963	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
□□□□□□	0.0777W	
Non-Accredited		
12V Ripple (Full Load)	43.29mV	
5V Ripple (Full Load)	17.62mV	
3.3V Ripple (Full Load)	30.16mV	
5VSB Ripple (Full Load)	15.19mV	
12V Load Regulation	1.84%	
5V Load Regulation	0.64%	
3.3V Load Regulation	0.79%	
5VSB Load Regulation	3.11%	
Inrush Current	48.029A	
□□□□ & PG□□	15.20ms	
AC Loss to PWR_OK Hold Up Time	12.20ms	
PWR_OK Inactive to DC Loss Delay	3.00ms	
OPP (0.00°C / 0.00°C)	-	-

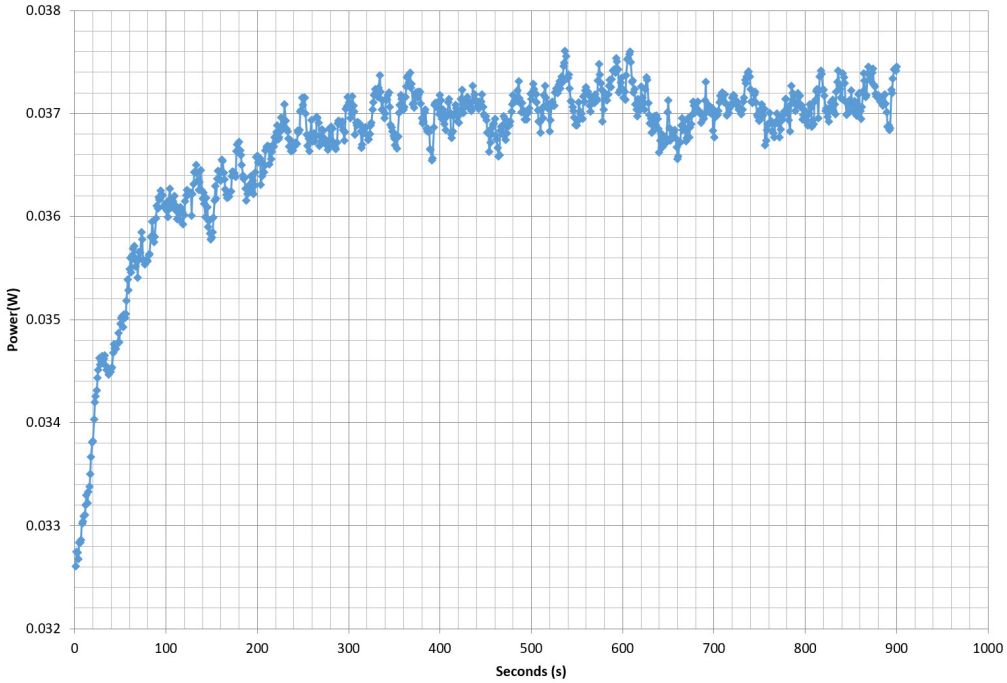
□□□□ & PG□□

Hold-Up Time (ms)	15.2
AC Loss to PWR_OK Hold Up Time (ms)	12.2

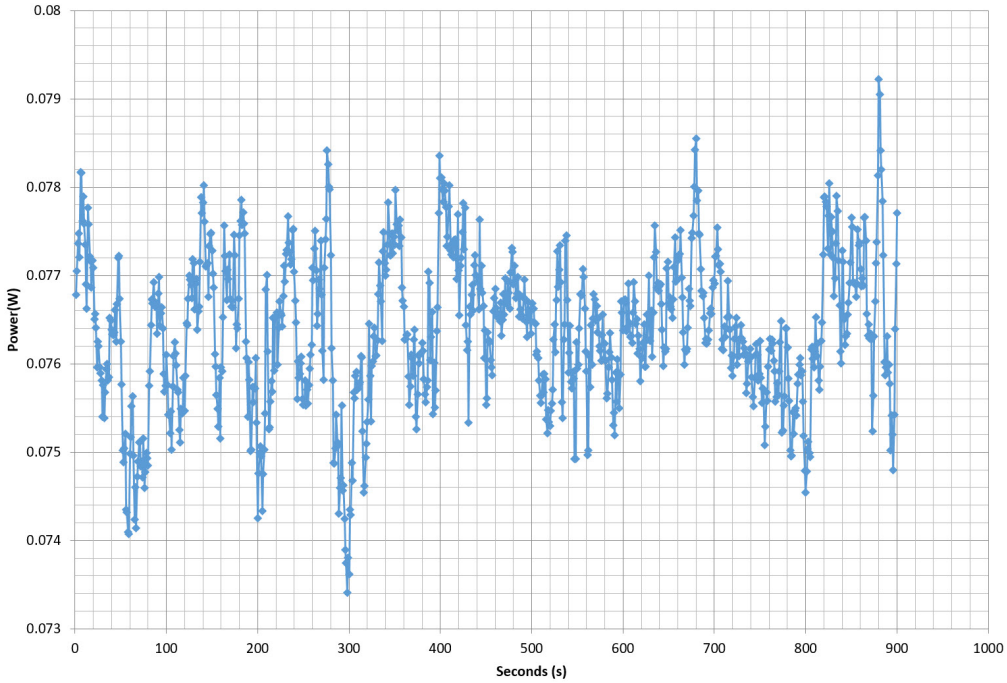
PWR_OK Inactive to DC Loss Delay (ms)	3

Graphs

115V



230V



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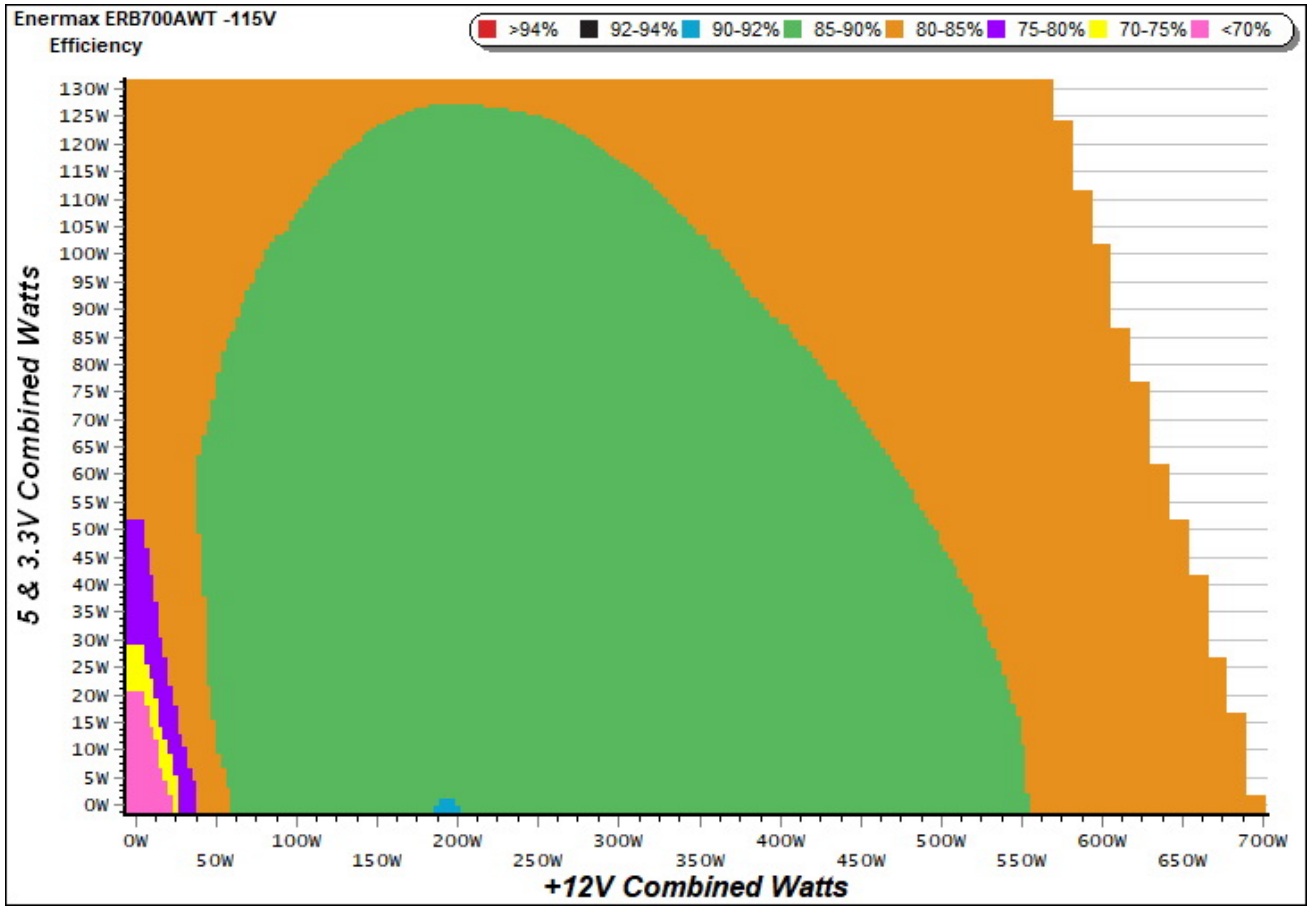
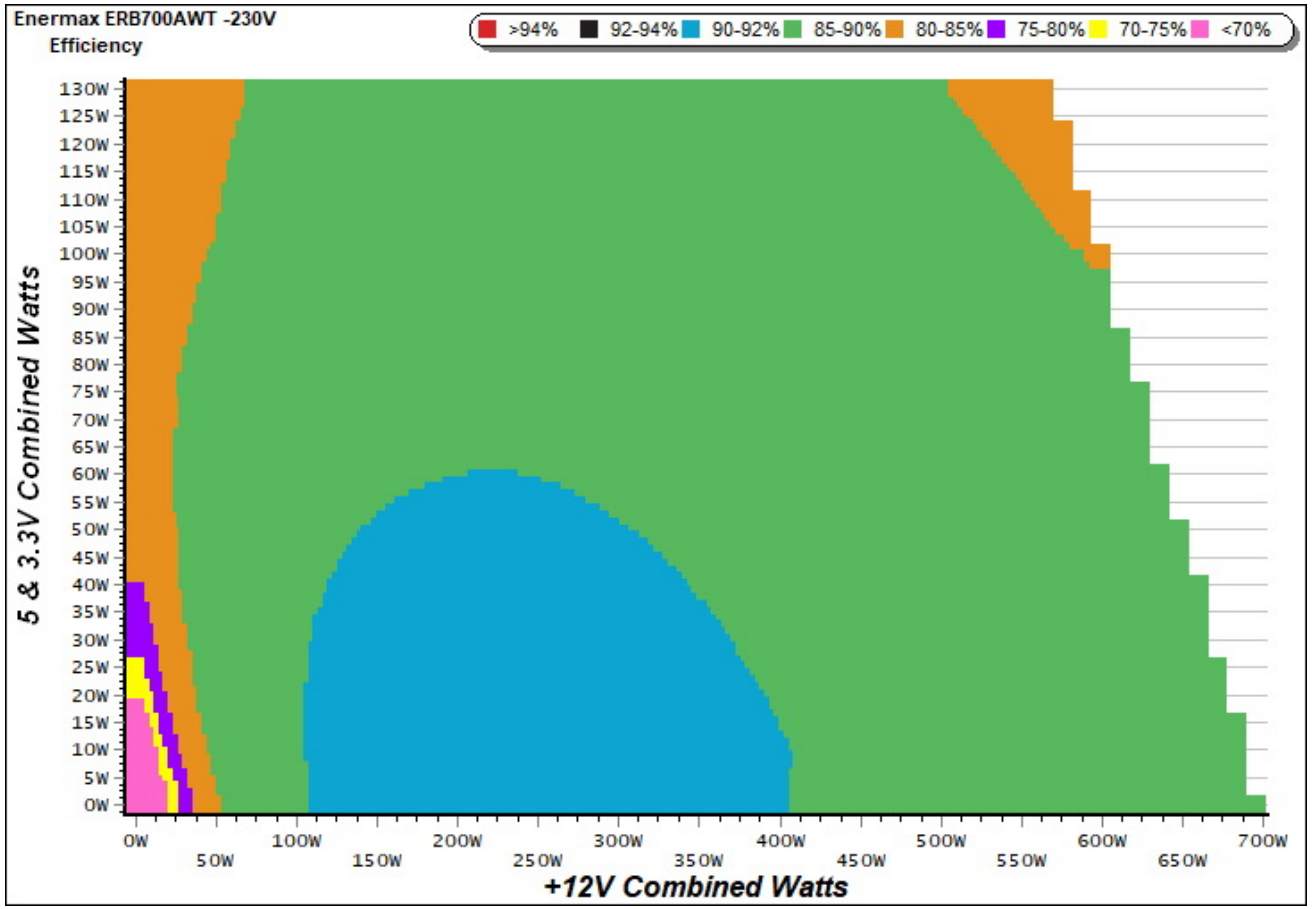
115V



□□

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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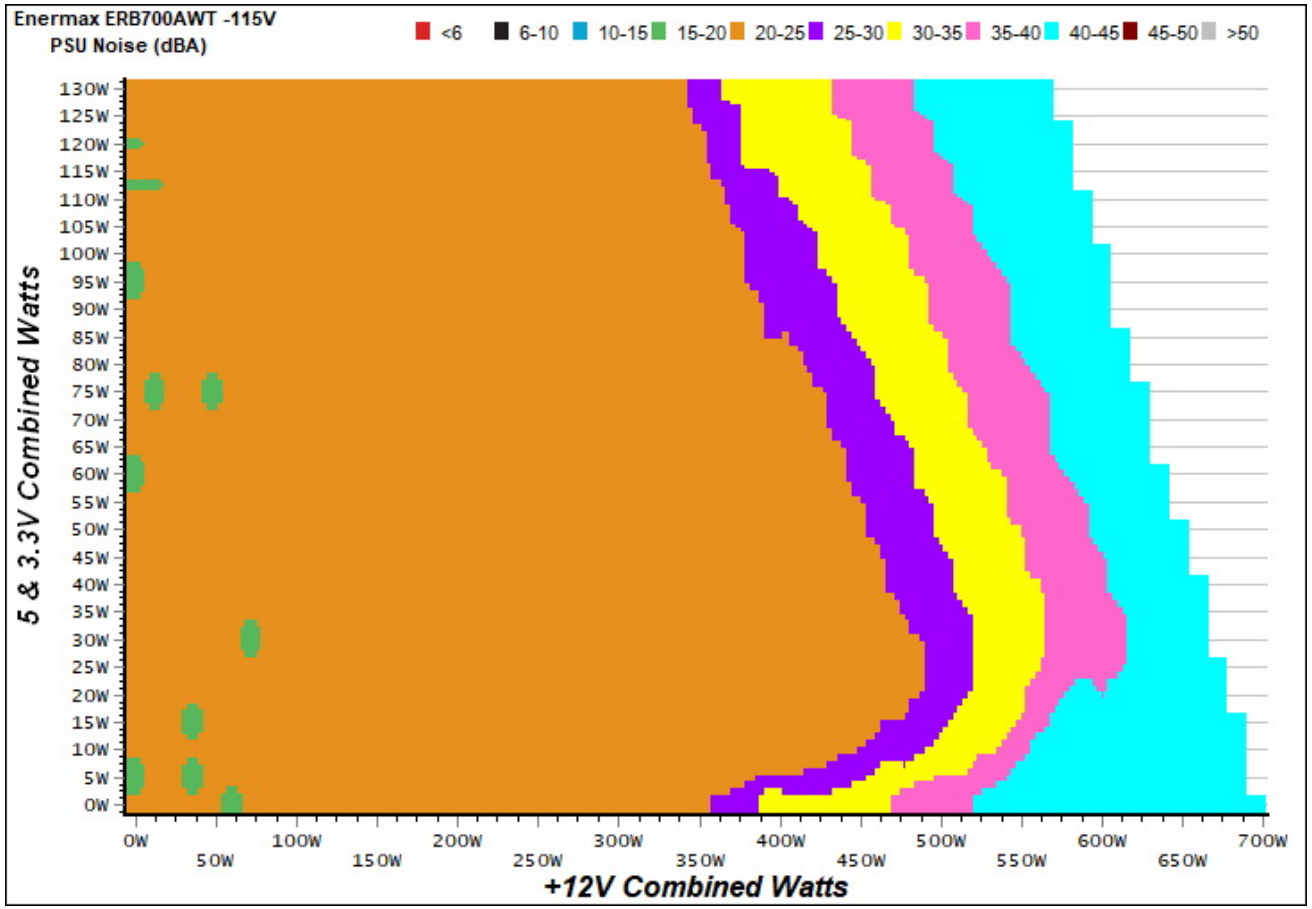
□□□□□

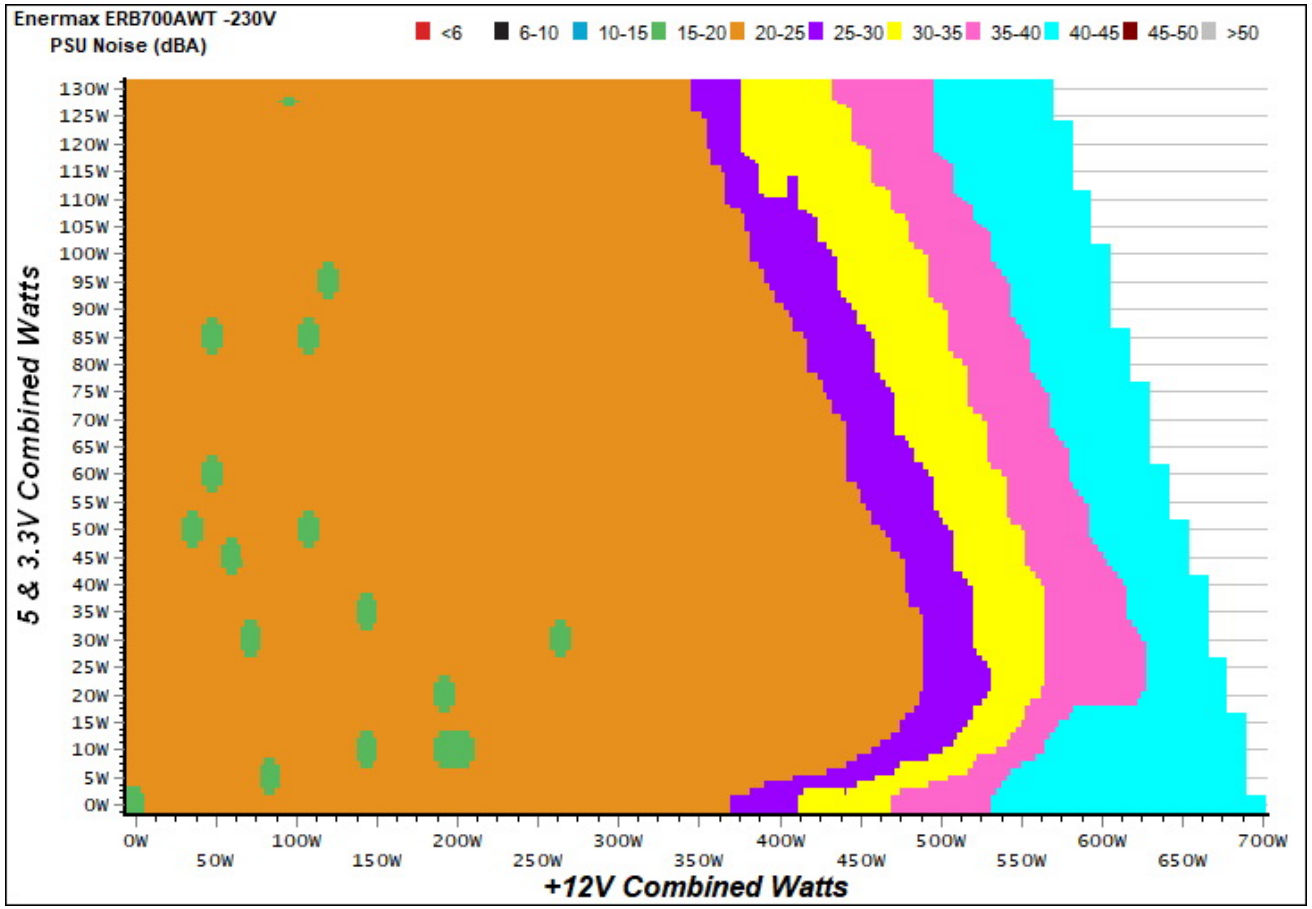
115V



□□

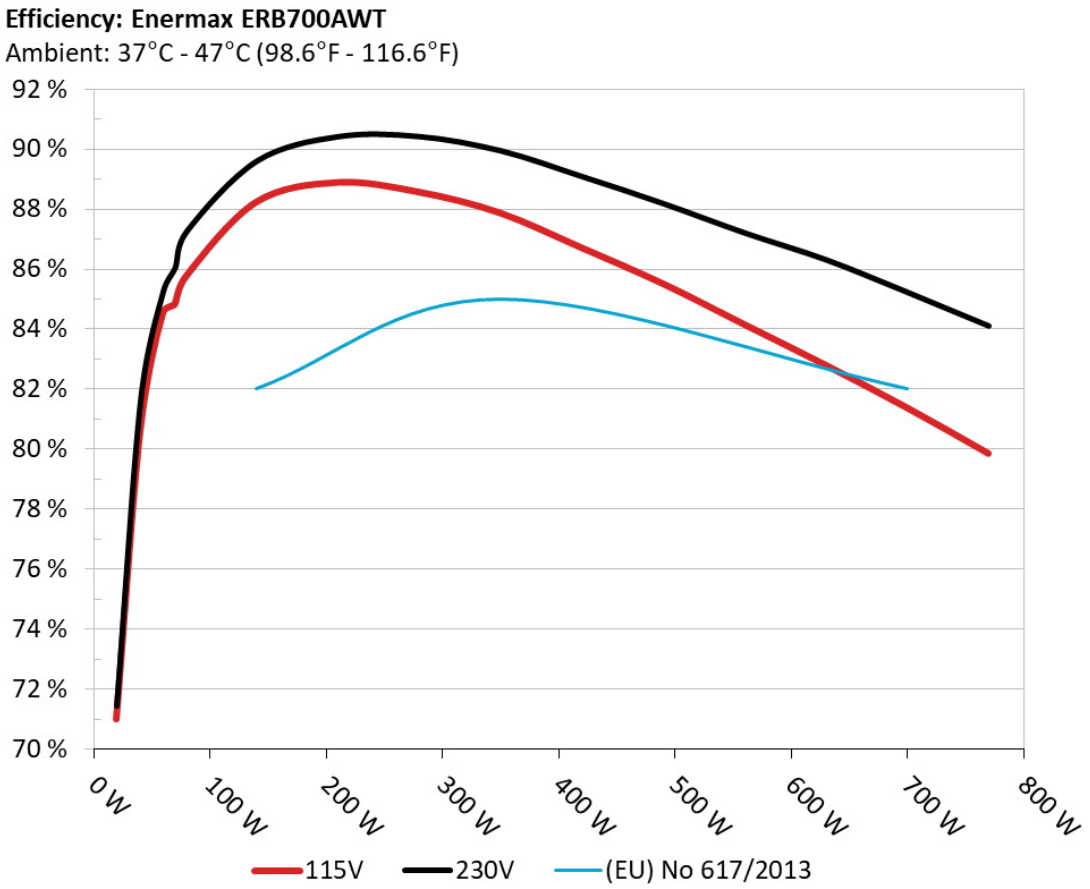
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



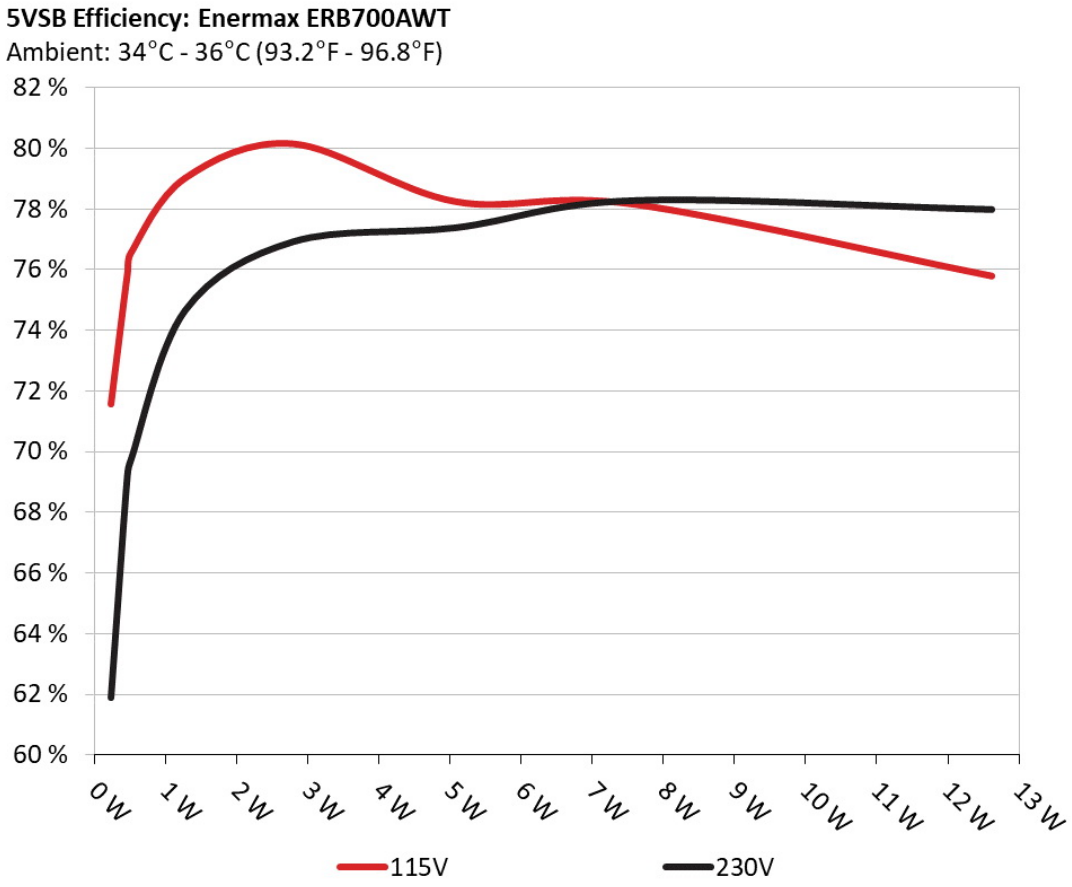
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

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	0.229	71.563%	0.037
	5.091V	0.320		115.10V
2	0.090A	0.458	75.828%	0.069
	5.090V	0.604		115.10V
3	0.550A	2.795	80.132%	0.274
	5.082V	3.488		115.10V
4	1.000A	5.074	78.230%	0.355
	5.073V	6.486		115.10V
5	1.500A	7.596	78.140%	0.397
	5.063V	9.721		115.10V
6	2.500A	12.612	75.780%	0.441
	5.044V	16.643		115.10V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.229	61.892%	0.013
	5.092V	0.370		230.26V
2	0.090A	0.458	69.184%	0.023
	5.091V	0.662		230.26V
3	0.550A	2.795	76.912%	0.117
	5.082V	3.634		230.26V
4	1.000A	5.074	77.371%	0.189
	5.073V	6.558		230.26V
5	1.500A	7.595	78.267%	0.244
	5.063V	9.704		230.26V
6	2.500A	12.614	77.970%	0.314
	5.045V	16.178		230.26V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.994A	1.994A	1.996A	0.989A	69.627	84.827%	834	18.2	40.23°C	0.961
	12.025V	5.016V	3.304V	5.059V	82.081				45.64°C	115.10V
2	9.064A	2.994A	2.998A	1.190A	139.711	88.239%	833	18.2	40.44°C	0.976
	12.004V	5.013V	3.301V	5.043V	158.333				46.66°C	115.10V
3	14.490A	3.494A	3.483A	1.392A	209.628	88.894%	830	18.2	41.03°C	0.984
	11.983V	5.010V	3.299V	5.028V	235.819				48.80°C	115.09V
4	19.934A	3.995A	4.002A	1.596A	279.651	88.577%	846	18.4	41.61°C	0.988
	11.962V	5.007V	3.297V	5.015V	315.716				50.92°C	115.09V
5	25.067A	4.998A	5.006A	1.801A	349.773	87.876%	840	18.3	42.34°C	0.990
	11.939V	5.003V	3.294V	4.999V	398.030				52.77°C	115.09V
6	30.224A	6.002A	6.014A	2.007A	419.894	86.716%	1153	27.8	43.38°C	0.992
	11.914V	5.000V	3.291V	4.984V	484.215				54.42°C	115.09V
7	35.398A	7.007A	7.025A	2.215A	490.027	85.516%	1612	37.1	43.34°C	0.993
	11.891V	4.996V	3.288V	4.968V	573.026				55.63°C	115.09V
8	40.590A	8.013A	8.035A	2.424A	560.176	84.153%	2028	42.0	43.89°C	0.993
	11.869V	4.993V	3.286V	4.951V	665.660				57.57°C	115.08V
9	46.213A	8.518A	8.526A	2.430A	629.901	82.803%	2027	42.0	44.95°C	0.994
	11.845V	4.990V	3.284V	4.940V	760.725				59.52°C	115.08V
10	51.874A	9.027A	9.052A	2.538A	700.215	81.376%	2024	42.0	45.55°C	0.995
	11.817V	4.987V	3.281V	4.926V	860.468				61.26°C	115.08V
11	57.931A	9.032A	9.059A	2.546A	769.876	79.858%	2020	42.0	47.18°C	0.996
	11.784V	4.984V	3.278V	4.912V	964.051				63.45°C	115.09V
CL1	0.145A	16.003A	15.999A	0.000A	134.435	79.233%	844	18.3	42.46°C	0.980
	11.967V	5.004V	3.289V	5.032V	169.671				52.79°C	115.11V

CL2	58.005A	1.003A	0.998A	1.000A	699.347	82.321%	2026	42.0	45.37°C	0.995
	11.828V	4.993V	3.287V	4.976V	849.541				61.28°C	115.09V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.994A	1.993A	1.996A	0.989A	69.613	86.040%	838	18.3	40.09°C	0.851
	12.023V	5.016V	3.303V	5.059V	80.908				45.36°C	230.25V
2	9.066A	2.993A	2.998A	1.190A	139.712	89.611%	842	18.3	40.43°C	0.929
	12.002V	5.013V	3.301V	5.043V	155.909				46.72°C	230.25V
3	14.493A	3.493A	3.486A	1.393A	209.645	90.432%	844	18.3	41.19°C	0.956
	11.981V	5.010V	3.299V	5.028V	231.827				48.44°C	230.26V
4	19.938A	3.996A	4.002A	1.596A	279.660	90.435%	834	18.2	41.95°C	0.969
	11.960V	5.007V	3.296V	5.014V	309.238				50.20°C	230.26V
5	25.072A	4.998A	5.009A	1.801A	349.786	89.961%	844	18.3	42.18°C	0.976
	11.937V	5.003V	3.293V	4.998V	388.818				52.22°C	230.26V
6	30.236A	6.003A	6.016A	2.008A	419.917	89.100%	1160	28.1	43.05°C	0.981
	11.910V	4.999V	3.290V	4.982V	471.289				53.79°C	230.27V
7	35.410A	7.008A	7.026A	2.216A	490.057	88.195%	1584	35.9	43.18°C	0.984
	11.888V	4.995V	3.287V	4.966V	555.654				54.62°C	230.27V
8	40.599A	8.014A	8.036A	2.425A	560.196	87.212%	2027	42.0	43.94°C	0.986
	11.867V	4.992V	3.285V	4.950V	642.341				55.99°C	230.27V
9	46.229A	8.520A	8.531A	2.431A	629.923	86.320%	2024	42.0	44.40°C	0.988
	11.841V	4.990V	3.283V	4.938V	729.755				57.38°C	230.27V
10	51.895A	9.027A	9.055A	2.539A	700.246	85.229%	2023	42.0	45.86°C	0.989
	11.813V	4.986V	3.280V	4.924V	821.609				60.34°C	230.28V
11	57.926A	9.033A	9.060A	2.546A	769.874	84.113%	2020	42.0	47.00°C	0.990
	11.785V	4.983V	3.278V	4.912V	915.284				63.56°C	230.28V
CL1	0.150A	16.001A	15.999A	0.000A	134.452	80.544%	862	20.3	42.41°C	0.935
	11.962V	5.003V	3.288V	5.030V	166.929				53.08°C	230.31V

CL2	58.016A	1.003A	1.002A	1.000A	699.256	86.126%	2026	42.0	45.46°C	0.989
	11.824V	4.993V	3.286V	4.975V	811.898				60.95°C	230.30V

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	1.196A	0.498A	0.483A	0.197A	19.504	71.001%	844	18.3	0.875
	12.044V	5.021V	3.308V	5.084V	27.470				115.10V
2	2.463A	0.997A	0.996A	0.394A	39.947	80.607%	852	18.8	0.925
	12.038V	5.019V	3.306V	5.076V	49.558				115.10V
3	3.658A	1.495A	1.479A	0.592A	59.393	84.532%	831	18.2	0.947
	12.030V	5.016V	3.305V	5.069V	70.261				115.10V
4	4.927A	1.994A	1.997A	0.790A	79.835	85.785%	845	18.4	0.964
	12.024V	5.015V	3.303V	5.061V	93.064				115.10V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.194A	0.498A	0.481A	0.197A	19.472	71.425%	830	18.2	0.588
	12.043V	5.021V	3.308V	5.084V	27.262				230.24V
2	2.462A	0.995A	0.997A	0.394A	39.925	81.608%	834	18.2	0.750
	12.037V	5.019V	3.306V	5.077V	48.923				230.24V
3	3.656A	1.495A	1.481A	0.592A	59.374	85.252%	844	18.3	0.825
	12.030V	5.016V	3.304V	5.069V	69.645				230.25V
4	4.926A	1.994A	1.997A	0.790A	79.820	87.276%	845	18.4	0.871
	12.023V	5.015V	3.303V	5.061V	91.457				230.24V

The results above are not used in the certification process

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.1 mV	15.6 mV	15.8 mV	8.4 mV	Pass
20% Load	10.0 mV	11.6 mV	15.5 mV	9.5 mV	Pass
30% Load	10.0 mV	8.3 mV	15.3 mV	9.2 mV	Pass
40% Load	12.2 mV	8.9 mV	15.9 mV	12.0 mV	Pass
50% Load	12.4 mV	9.2 mV	17.5 mV	10.6 mV	Pass
60% Load	25.2 mV	10.2 mV	20.5 mV	12.3 mV	Pass
70% Load	27.9 mV	11.1 mV	21.9 mV	15.5 mV	Pass
80% Load	22.5 mV	11.4 mV	24.2 mV	22.5 mV	Pass
90% Load	37.3 mV	13.5 mV	26.2 mV	22.6 mV	Pass
100% Load	47.3 mV	15.9 mV	29.1 mV	17.1 mV	Pass
110% Load	56.8 mV	15.8 mV	29.7 mV	17.3 mV	Pass
Crossload 1	13.5 mV	16.0 mV	27.5 mV	10.8 mV	Pass
Crossload 2	55.8 mV	11.8 mV	22.4 mV	13.6 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.6 mV	15.5 mV	14.5 mV	8.7 mV	Pass
20% Load	9.7 mV	11.6 mV	15.4 mV	10.2 mV	Pass
30% Load	9.5 mV	8.2 mV	14.2 mV	9.5 mV	Pass
40% Load	11.6 mV	8.6 mV	15.5 mV	11.5 mV	Pass
50% Load	12.5 mV	9.1 mV	17.6 mV	10.2 mV	Pass
60% Load	23.7 mV	9.1 mV	19.1 mV	11.8 mV	Pass
70% Load	25.5 mV	10.5 mV	21.0 mV	13.7 mV	Pass
80% Load	29.6 mV	11.6 mV	27.1 mV	22.4 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	35.0 mV	13.4 mV	25.6 mV	20.5 mV	Pass
100% Load	43.3 mV	17.6 mV	30.2 mV	15.2 mV	Pass
110% Load	51.9 mV	16.6 mV	29.0 mV	15.6 mV	Pass
Crossload 1	14.3 mV	15.8 mV	27.1 mV	10.4 mV	Pass
Crossload 2	42.9 mV	11.2 mV	19.3 mV	11.7 mV	Pass

The results above are not used in the certification process

Enermax RevoBron 700W

Top side

Power specifications label

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