EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Enermax MarbleBron RGB 850

Lab ID#: EM85001963
Receipt Date: Jan 4, 2022
Test Date: Jan 18, 2022

Report: 22PS1963A
Report Date: Jan 19, 2022

DUT INFORMATION

Brand	Enermax
Manufacturer (OEM)	SANR Electronic Technology Co. Ltd
Series	MarbleBron RGB
Model Number	EMB850EWT-RGB
Serial Number	210801900044
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5.5
Rated Frequency (Hz)	47-63
Rated Power (W)	850
Type	ATX12V
Cooling	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✗
Cable Design	Semi Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

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Enermax MarbleBron RGB 850

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	84.927%
Efficiency With 10W (≤500W) or 2% (>500W)	62.319
Average Efficiency 5VSB	79.273%
Standby Power Consumption (W)	0.0491185
Average PF	0.985
Avg Noise Output	39.00 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	Standard+

230V

Average Efficiency	87.869%
Average Efficiency 5VSB	76.941%
Standby Power Consumption (W)	0.1338070
Average PF	0.938
Avg Noise Output	38.83 dB(A)
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	Standard+

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70	2.5	0.3
	Watts	130		840	12.5	3.6
Total Max. Power (W)		850				

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CABLES AND CONNECTORS

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (620mm)	1	1	18-22AWG	No
4+4 pin EPS12V (670mm)	2	2	18AWG	No
RGB Header Cable (720mm)	1	1	26AWG	No

Modular Cables

6+2 pin PCIe (500mm+150mm)	2	4	18AWG	No
SATA (450mm+150mm) / 4-pin Molex (+150mm)	3	6 / 3	18AWG	No
SATA (450mm+150mm) / 4-pin Molex (+150mm) / FDD (+150mm)	1	2 / 1 / 1	18-22AWG	No
AC Power Cord (1100mm) - C13 coupler	1	1	18AWG	-

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Enermax MarbleBron RGB 850

General Data	-
Manufacturer (OEM)	SANR Electronic Technology
PCB Type	Single Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 1x DM choke, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK203R0 (3 Ohm)
Bridge Rectifier(s)	1x GBU1506 (800V, 15A @ 100°C)
APFC MOSFETs	2x 65R099W
APFC Boost Diode	1x CRMicro CRXI08D065G1 (650V, 8A @ 159°C)
Bulk Cap(s)	2x TK (400V, 330uF each or 660uF combined, 105°C, LFW)
Main Switchers	2x CW CWS20N60AZ (600V, 13A @ 100°C, Rds(on): 0.19Ohm)
PFC/PWM Combo Controller	Champion CM6800UX
Topology	Primary side: APFC, Double Forward Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Potens PDD6974-5 (65V, 60A @ 100°C, Rds(on): 3.3mOhm)
5V & 3.3V	DC-DC Converters: 4x Maplesemi SLD80N03T (30V, 48A @ 100°C, Rds(on): 5.5mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 9x Asia'x (105°C, TMX) Polymer: 2x NJcon, 3x no info
Supervisor IC	Grenery GR8313 (OVP, UVP, SCP, PG)
Fan Model	Enermax PF19011225-1800-ARGB (120mm, 12V - 0.26A, 5V - 0.6A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Standby PWM Controller	SC2521Q

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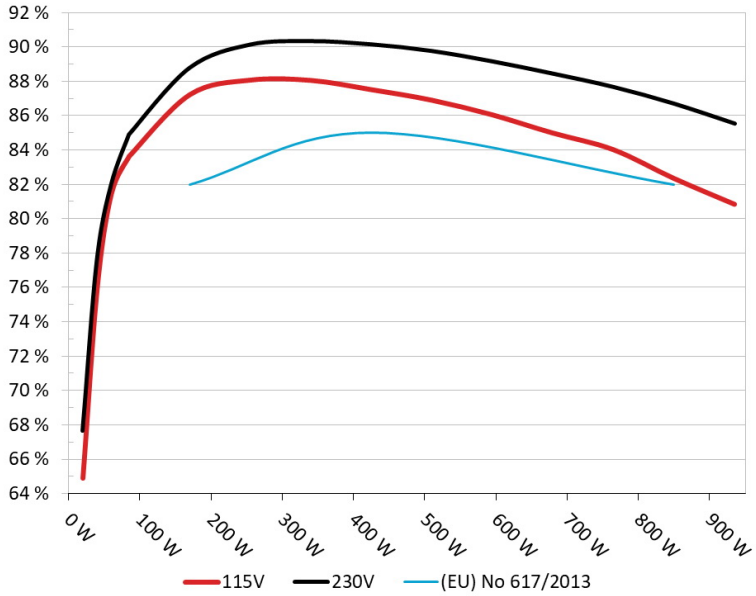
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Enermax MarbleBron RGB 850
Ambient: 33°C - 41°C (91.4°F - 105.8°F)

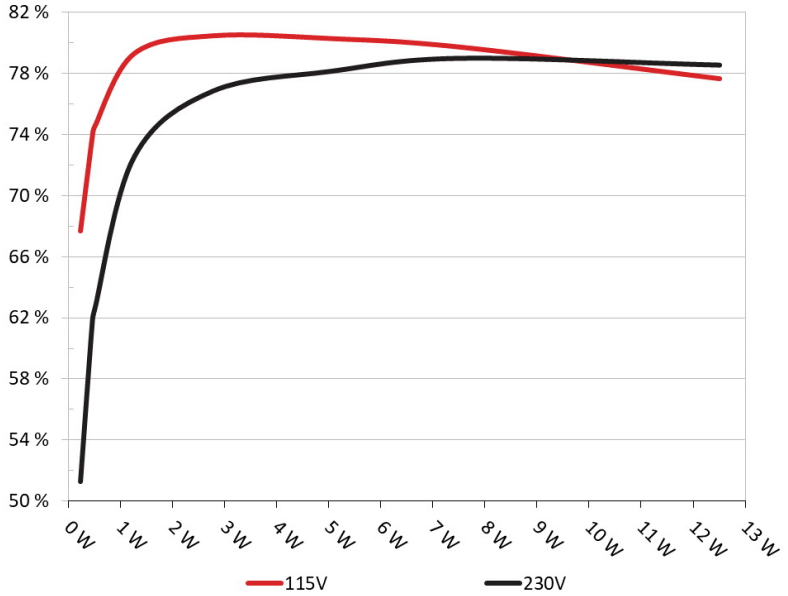


INFO

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: Enermax MarbleBron RGB 850
Ambient: 34°C - 36°C (93.2°F - 96.8°F)



INFO

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

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	67.704%	0.038
	5.049V	0.335W		115.16V
2	0.09A	0.454W	73.84%	0.068
	5.046V	0.615W		115.16V
3	0.55A	2.77W	80.459%	0.274
	5.038V	3.443W		115.16V
4	1A	5.03W	80.28%	0.358
	5.031V	6.266W		115.16V
5	1.5A	7.533W	79.715%	0.405
	5.023V	9.45W		115.16V
6	2.499A	12.507W	77.654%	0.453
	5.005V	16.106W		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	51.276%	0.015
	5.047V	0.443W		230.27V
2	0.09A	0.454W	61.685%	0.025
	5.047V	0.736W		230.27V
3	0.55A	2.769W	76.83%	0.113
	5.037V	3.604W		230.28V
4	1A	5.029W	78.125%	0.182
	5.03V	6.438W		230.28V
5	1.5A	7.533W	78.983%	0.239
	5.023V	9.538W		230.28V
6	2.499A	12.512W	78.537%	0.311
	5.007V	15.931W		230.27V

115V

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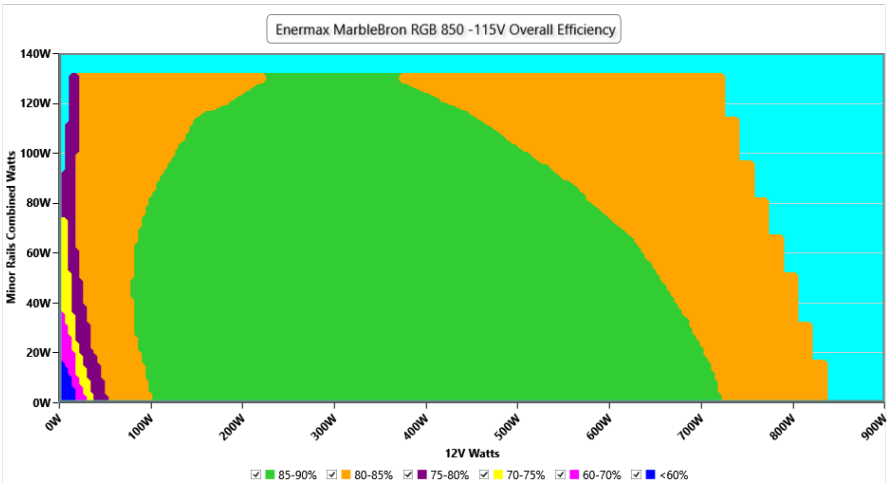
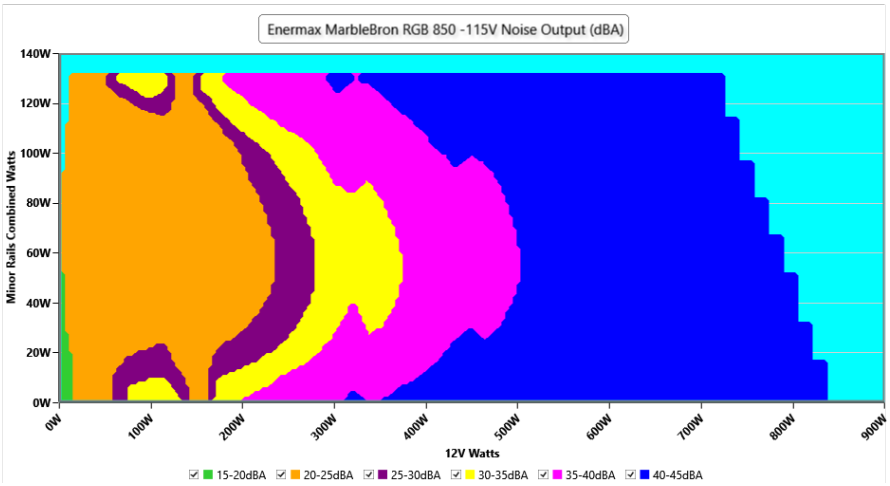
EFFICIENCY GRAPH 115V



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

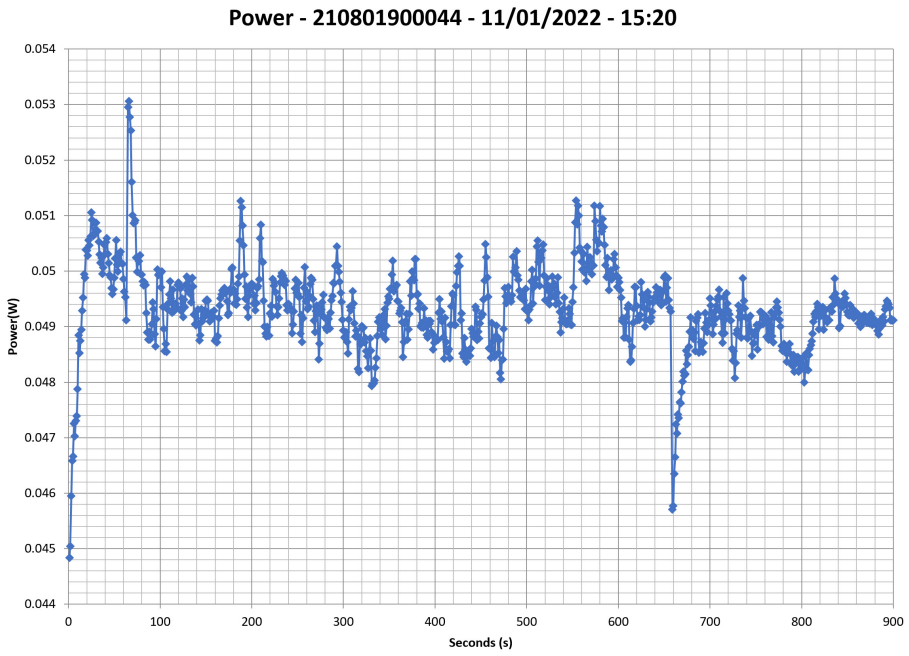
NOISE GRAPH 115V



INFO

The PSU's noise in its entire operational range and under 30-32 °C (+-2 °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

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

COMMISSION REGULATION (EU) NO 617/2013 TESTING 115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	5.224A	1.962A	1.931A	0.992A	84.99	83.406%	884	21.7	34.54°C	0.955
	12.134V	5.097V	3.417V	5.038V	101.899				38.7°C	115.16V
20%	11.470A	2.946A	2.901A	1.191A	169.923	87.199%	1011	25.4	35.49°C	0.959
	12.120V	5.093V	3.413V	5.036V	194.868				39.79°C	115.16V
50%	30.992A	4.918A	4.849A	1.789A	424.747	87.495%	1850	41.9	36.87°C	0.991
	12.076V	5.084V	3.403V	5.031V	485.452				42.01°C	115.15V
100%	63.575A	8.887A	8.768A	2.488A	849.515	82.341%	1846	41.8	39.76°C	0.997
	11.991V	5.063V	3.386V	5.022V	1031.706				49.89°C	115.13V

230V

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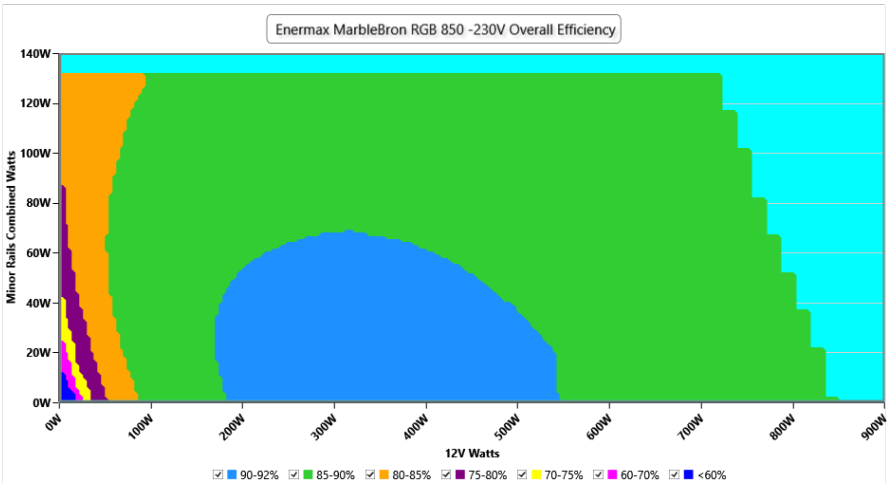
EFFICIENCY GRAPH 230V



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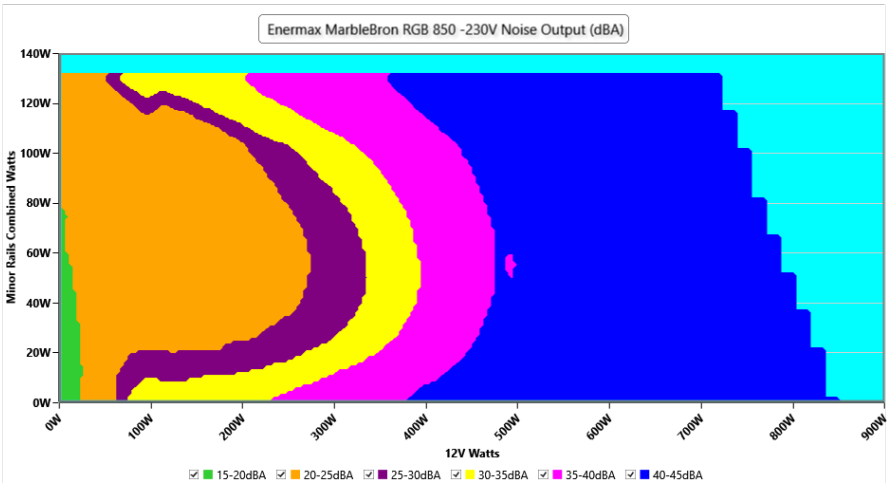
NOISE GRAPH 230V



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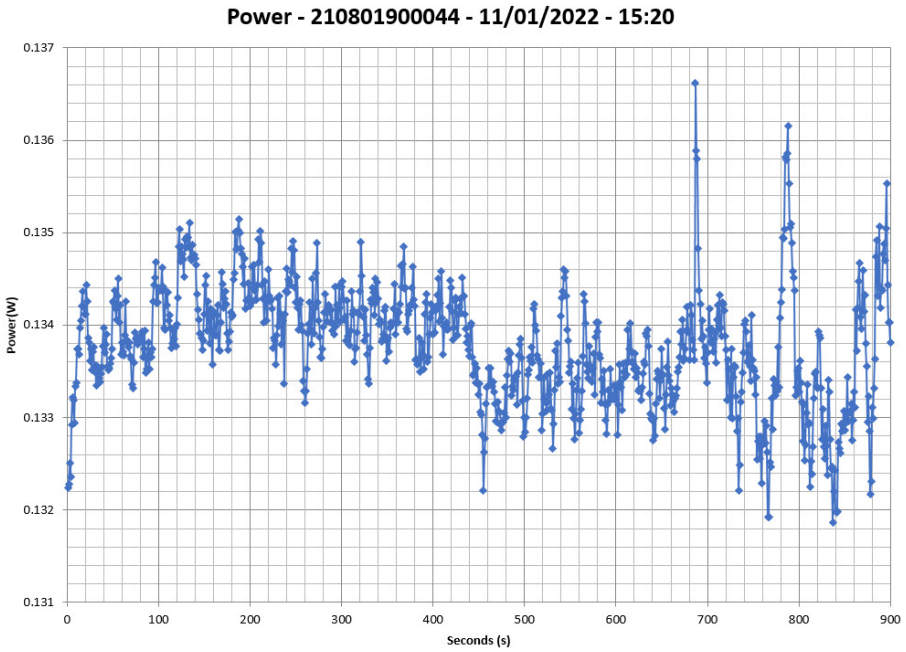
VAMPIRE POWER -230V



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COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	5.224A	1.962A	1.931A	0.992A	84.99	84.81%	870	21.2	36.26°C	0.857
	12.135V	5.095V	3.417V	5.038V	100.212				40.5°C	230.24V
20%	11.469A	2.946A	2.9A	1.191A	169.912	88.766%	1344	33.1	36.32°C	0.902
	12.121V	5.092V	3.414V	5.036V	191.416				40.79°C	230.24V
50%	30.992A	4.921A	4.849A	1.789A	424.753	90.138%	1834	41.7	37.79°C	0.949
	12.076V	5.081V	3.403V	5.03V	471.226				43.38°C	230.26V
100%	63.588A	8.886A	8.766A	2.487A	849.564	86.689%	1839	41.7	40.18°C	0.972
	11.990V	5.064V	3.387V	5.024V	980.017				50.53°C	230.27V

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Enermax MarbleBron RGB 850

Top side

Power specifications label

CERTIFICATIONS 115V

CYBENETICS BRONZE

CYBENETICS STANDARD+

Aristeidis Bitziopoulos
Lab Director

CERTIFICATIONS 230V

CYBENETICS SILVER 230v

CYBENETICS STANDARD+ 230v

Cybenetics offers the ETA and Lambda voluntary certification programs, through which the efficient and silent power supplies are promoted

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