

#### **Anex**

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

DUT SPECIFICATI	ons
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	11-5.5
Rated Frequency (Hz)	47-63
Rated Power (W)	850
Туре	ATX12V
Cooling	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	Х
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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**PAGE 1/17** 



#### **Anex**

#### Enermax MarbleBron RGB 850

RESULTS	
Temperature Range (°C/°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	<b>/</b>

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

HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	11.4
AC Loss to PWR_OK Hold Up Time (ms)	8.6
PWR_OK Inactive to DC Loss Delay (ms)	2.8

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**PAGE 2/17** 



Anex

Enermax MarbleBron RGB 850

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 PCle (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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**PAGE 3/17** 

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#### **Anex**

#### 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): 0.190hm)
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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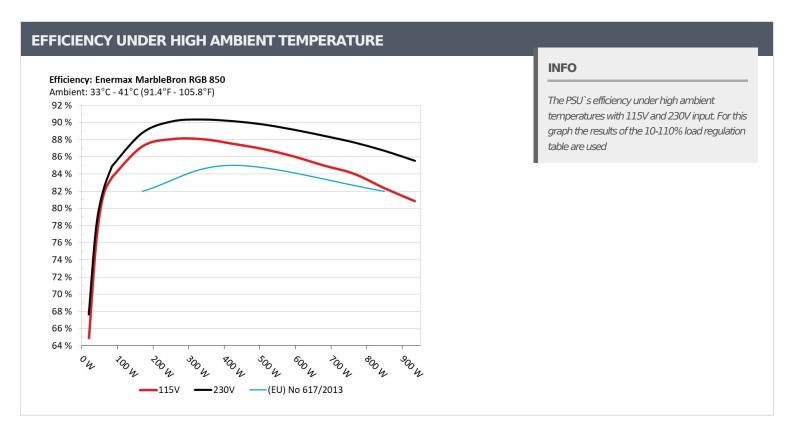
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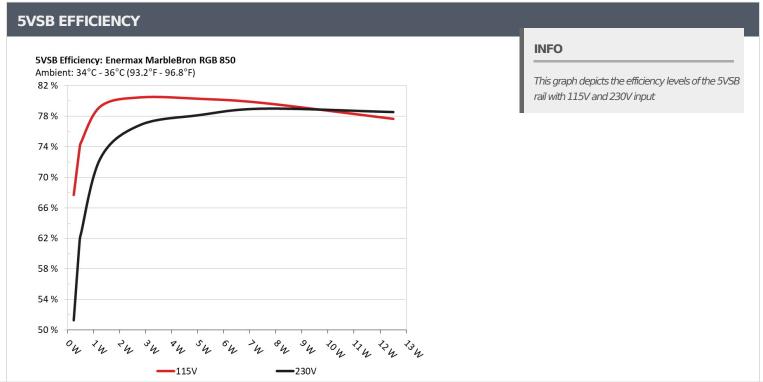
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**PAGE 4/17** 

Anex

#### Enermax MarbleBron RGB 850





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PAGE 5/17



**Anex** 

Enermax MarbleBron RGB 850

5VSB EFFICIEN	CY -115V (ERP LOT	3/6 & CEC)		
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	67.7040/	0.038
	5.049V	0.335W	67.704%	115.16V
2	0.09A	0.454W	72.040/	0.068
2	5.046V	0.615W	73.84%	115.16V
2	0.55A	2.77W	00.4500/	0.274
3	5.038V	3.443W	80.459%	115.16V
4	1A	5.03W	00.2007	0.358
4	5.031V	6.266W	80.28%	115.16V
_	1.5A	7.533W	70 7150/	0.405
5	5.023V	9.45W	79.715%	115.16V
C	2.499A	12.507W	77.0540/	0.453
6	5.005V	16.106W	77.654%	115.16V

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

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**PAGE 6/17** 

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Anex

Enermax MarbleBron RGB 850

# 115V

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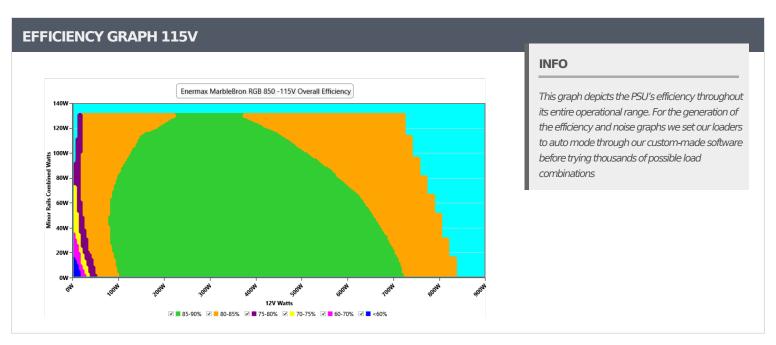
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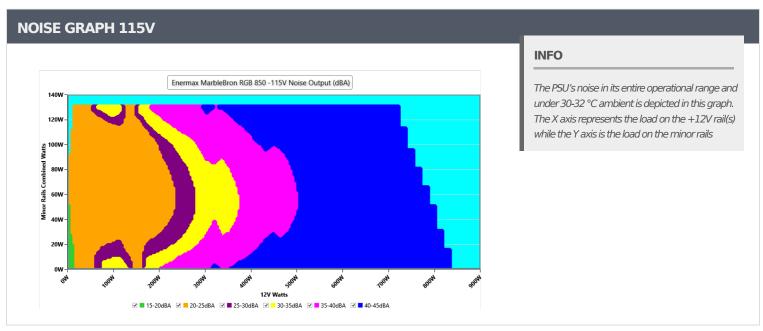
**PAGE 7/17** 



Anex

#### Enermax MarbleBron RGB 850





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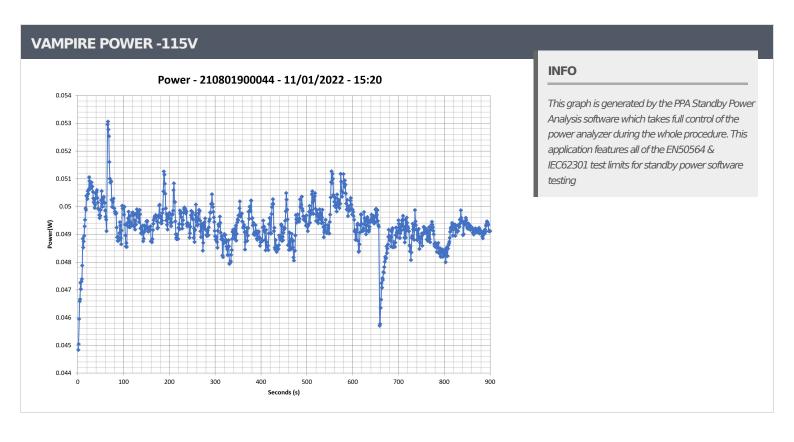
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**PAGE 8/17** 



**Anex** 

Enermax MarbleBron RGB 850



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**PAGE 9/17** 



Anex

Enermax MarbleBron RGB 850

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100/	5.224A	1.962A	1.931A	0.992A	84.99	02.4000/	884	21.7	34.54°C	0.955
10%	12.134V	5.097V	3.417V	5.038V	101.899	83.406%			38.7°C	115.16
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			25.4	39.79°C	115.16
30%	18.080A	3.439A	3.388A	1.39A	254.923	00.0400/	1246	20.7	35.8°C	0.977
	12.106V	5.089V	3.409V	5.034V	289.528	88.048%	1246	30.7	40.34°C	115.16
400/	24.713A	3.933A	3.876A	1.59A	340.003	88.033%	1774	41.0	36.11°C	0.986
40%	12.091V	5.086V	3.406V	5.032V	386.224				40.9°C	115.16
E00/	30.992A	4.918A	4.849A	1.789A	424.747	87.495%	1850	43.0	36.87°C	0.991
50%	12.076V	5.084V	3.403V	5.031V	485.452			41.9	42.01°C	115.15
2001	37.265A	5.907A	5.832A	1.988A	509.262	86.886%	1849	41.0	37.43°C	0.993
60%	12.061V	5.08V	3.395V	5.03V	586.129			41.9	43.63°C	115.15
700/	43.626A	6.902A	6.804A	2.188A	594.582	86.033%	1850	41.0	37.88°C	0.995
70%	12.045V	5.072V	3.395V	5.025V	691.107			41.9	44.98°C	115.14
000/	50.007A	7.893A	7.78A	2.288A	679.407	0.1.07.407	1050	41.9	38.21°C	0.996
80%	12.028V	5.069V	3.392V	5.025V	799.545	84.974%	1850		46.42°C	115.14
000/	56.810A	8.386A	8.257A	2.388A	764.782	84.007%	1852	42.0	39.13°C	0.997
90%	12.010V	5.067V	3.389V	5.024V	910.383				48.25°C	115.13
1000/	63.575A	8.887A	8.768A	2.488A	849.515	02.2410/	1046		39.76°C	0.997
100%	11.991V	5.063V	3.386V	5.022V	1031.706	82.341%	1846	41.8	49.89°C	115.13
1100/	70.099A	9.88A	9.839A	2.489A	934.918	00.0320/	1040	41.0	40.62°C	0.998
110%	11.971V	5.06V	3.383V	5.021V	1156.621	80.832%	1848	41.8	51.52°C	115.12
CL 1	0.114A	15.393A	15.137A	0A	131.275	77.05.40/	1024	41.7	36.69°C	0.955
CL1	12.157V	5.087V	3.408V	5.062V	169.051	77.654%	1834	41.7	41.86°C	115.18
CI 2	0.113A	19.644A	0A	0.001A	101.385	77.1.400/	1501	26.0	36.83°C	0.948
CL2	12.157V	5.091V	3.41V	5.059V	131.419	77.146%	1501	36.0	44.06°C	115.18
CI 2	0.113A	0A	19.315A	0A	67.367	71.0722/	1575	27.2	36.11°C	0.959
CL3	12.150V	5.095V	3.416V	5.056V	94.786	71.073%	1575	37.3	45.22°C	115.18
Cl 4	70.966A	0A	0A	0A	849.402	02.05.527	1060	40.1	40.34°C	0.998
CL4	11.969V	5.073V	3.393V	5.067V	1013.437	83.815%	1860	42.1	51.41°C	115.13\

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**PAGE 10/17** 

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**Anex** 

Enermax MarbleBron RGB 850

20-80W LOAD TESTS 115V										
Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20147	1.222A	0.49A	0.482A	0.198A	19.987	C4.0000/			33.05°C	0.941
20W	12.143V	5.1V	3.42V	5.049V	30.794	64.906%	878	21.3	36.24°C	115.16V
4014	2.692A	0.686A	0.675A	0.297A	39.987	75.925%	878	21.3	33.67°C	0.965
40W	12.139V	5.099V	3.42V	5.048V	52.667				37.05°C	115.16V
COM	4.162A	0.883A	0.869A	0.396A	59.986	01.4420/			34.32°C	0.981
60W	12.136V	5.098V	3.418V	5.047V	73.655	81.443%	880	21.3	38.01°C	115.16V
00147	5.630A	1.079A	1.062A	0.495A	79.935	02.6250/	001		34.47°C	0.959
80W	12.133V	5.098V	3.418V	5.046V	95.588	83.625%	881	21.3	38.58°C	115.16V

RIPPLE MEA	SUREMENTS 115V				
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.73mV	5.29mV	8.80mV	9.92mV	Pass
20% Load	10.68mV	5.28mV	9.25mV	9.51mV	Pass
30% Load	10.83mV	5.23mV	11.58mV	9.82mV	Pass
40% Load	11.34mV	5.29mV	11.78mV	10.22mV	Pass
50% Load	16.61mV	5.69mV	12.54mV	10.17mV	Pass
60% Load	12.60mV	5.95mV	13.50mV	11.08mV	Pass
70% Load	15.24mV	7.01mV	14.81mV	11.44mV	Pass
80% Load	19.69mV	7.93mV	19.77mV	12.09mV	Pass
90% Load	20.35mV	10.11mV	21.94mV	12.75mV	Pass
100% Load	23.81mV	10.98mV	26.80mV	14.94mV	Pass
110% Load	26.34mV	11.34mV	28.84mV	16.55mV	Pass
Crossload1	16.15mV	9.17mV	20.44mV	14.74mV	Pass
Crossload2	13.11mV	8.94mV	16.63mV	14.12mV	Pass
Crossload3	11.59mV	5.13mV	20.93mV	10.12mV	Pass
Crossload4	23.79mV	8.24mV	20.71mV	11.68mV	Pass

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**PAGE 11/17** 

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Anex

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# 230V

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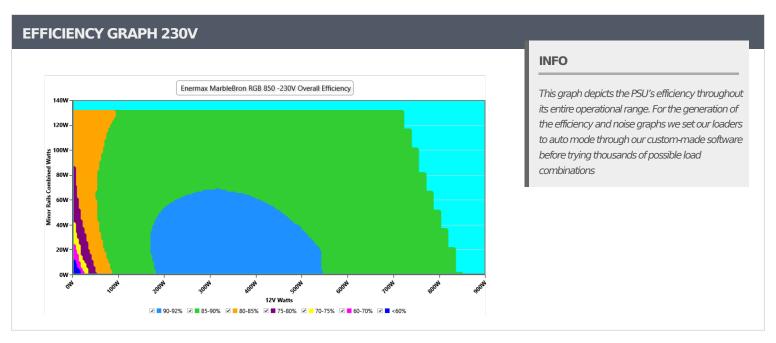
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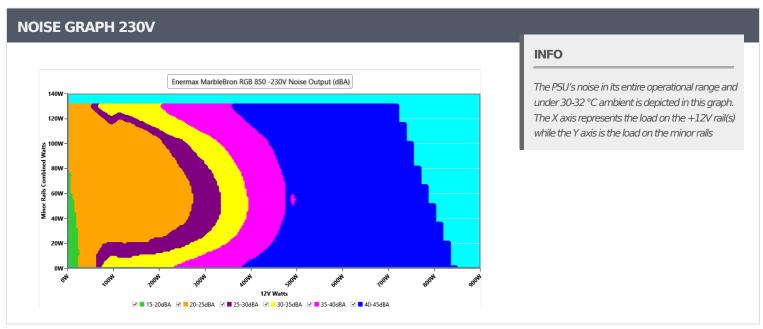
**PAGE 12/17** 



Anex

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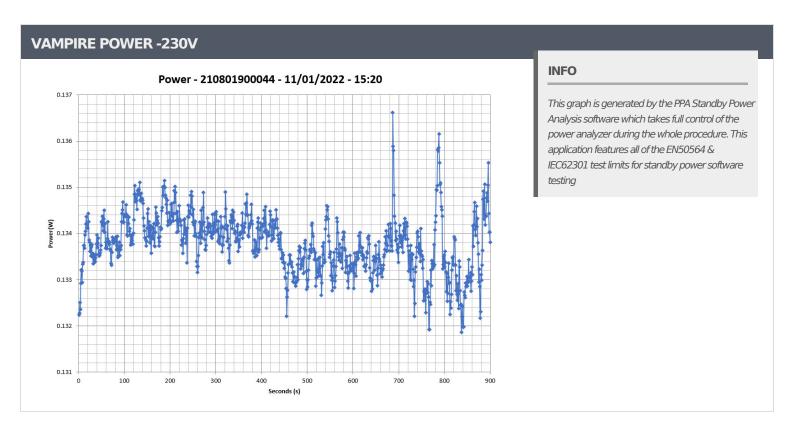
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**PAGE 13/17** 



Anex

Enermax MarbleBron RGB 850



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**PAGE 14/17** 



Anex

Enermax MarbleBron RGB 850

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100/	5.224A	1.962A	1.931A	0.992A	84.99	04.010/	870	21.2	36.26°C	0.857
10%	12.135V	5.095V	3.417V	5.038V	100.212	84.81%			40.5°C	230.24
20%	11.469A	2.946A	2.9A	1.191A	169.912	88.766%	1344	22.1	36.32°C	0.902
	12.121V	5.092V	3.414V	5.036V	191.416			33.1	40.79°C	230.24
30%	18.079A	3.44A	3.387A	1.39A	254.906	90.121%	1.422	25.2	36.96°C	0.921
	12.106V	5.088V	3.41V	5.034V	282.85		1423	35.2	41.74°C	230.25
4007	24.712A	3.934A	3.875A	1.59A 339.989	00.2240/	1707		37.41°C	0.939	
40%	12.091V	5.085V	3.407V	5.031V	376.41	90.324%	1727	39.9	42.61°C	230.25
E00/	30.992A	4.921A	4.849A	1.789A	424.753	90.138%	1834	41.7	37.79°C	0.949
50%	12.076V	5.081V	3.403V	5.03V	471.226			41.7	43.38°C	230.26
500/	37.267A	5.911A	5.826A	1.989A	509.285	89.754%	1838	41.7	38.01°C	0.955
60%	12.061V	5.076V	3.399V	5.028V	567.421				44.66°C	230.26
700/	43.623A	6.902A	6.804A	2.188A	594.584	89.149%	1027	41.7	38.95°C	0.961
70%	12.046V	5.072V	3.395V	5.026V	666.957		1837	41.7	46.14°C	230.26
000/	50.009A	7.892A	7.778A	2.287A	679.42	00.4200/	1022	41.7	39.08°C	0.966
80%	12.028V	5.07V	3.393V	5.026V	768.244	88.438%	1833	41.7	47.34°C	230.26
000/	56.822A	8.386A	8.256A	2.387A	764.833	07.6570/	1045	41.0	40.03°C	0.969
90%	12.009V	5.067V	3.39V	5.026V	872.525	87.657%	1845	41.8	49.44°C	230.27
1000/	63.588A	8.886A	8.766A	2.487A	849.564	06.6000/	1020	41.7	40.18°C	0.972
100%	11.990V	5.064V	3.387V	5.024V	980.017	86.689%	1839	41.7	50.53°C	230.27
1100/	70.104A	9.881A	9.839A	2.487A	934.931	OF F270/	1020	41.6	40.57°C	0.979
110%	11.971V	5.06V	3.383V	5.025V	1093.141	85.527%	1829	41.6	51.38°C	230.27
Cl 1	0.114A	15.394A	15.136A	0A	131.277	70.4070/	1022	41 F	36.81°C	0.898
CL1	12.158V	5.086V	3.408V	5.062V	165.281	79.427%	1823	41.5	42.38°C	230.28
CI 2	0.113A	19.649A	0A	0.001A	101.383	70 6010/	1405	2F 0	34.77°C	0.878
CL2	12.157V	5.089V	3.41V	5.059V	128.836	78.691%	1405	35.0	42.28°C	230.29
CI 2	0.113A	0A	19.315A	0A	67.368	72 2170/	1644	20.7	36.14°C	0.85
CL3	12.150V	5.095V	3.417V	5.056V	93.286	72.217%	1644	38.7	45.42°C	230.3V
CL 4	70.985A	0A	0A	0A	849.428	07.7020/	1042	41.0	39.99°C	0.974
CL4	11.967V	5.074V	3.394V	5.068V	968.526	87.703%	1842	41.8	50.58°C	230.3V

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**PAGE 15/17** 

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20-80W LOAD TESTS 230V										
Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20144	1.222A	0.49A	0.482A	0.198A	19.988	67.664%			33.34°C	0.624
20W	12.144V	5.1V	3.421V	5.049V	29.539		870	21.2	36.37°C	230.23V
40144	2.692A	0.686A	0.675A	0.297A	39.988	77.574%	004	20.4	33.46°C	0.767
40W	12.140V	5.1V	3.42V	5.048V	51.549		864		36.65°C	230.24V
COM	4.162A	0.883A	0.869A	0.396A	59.986	01.0760/		20.0	34.74°C	0.826
60W	12.138V	5.096V	3.418V	5.046V	73.174	81.976%	860	20.0	38.26°C	230.23V
00147	5.628A	1.079A	1.062A	0.495A	79.925	04.0010/	000		34.81°C	0.851
80W	12.134V	5.095V	3.417V	5.045V	94.151	84.891%	860	20.0	38.6°C	230.24V

RIPPLE MEA	SUREMENTS 230V					
Test	12V	5V	3.3V	5VSB	Pass/Fail	
10% Load	12.71mV	5.08mV	8.19mV	9.16mV	Pass	
20% Load	11.80mV	5.44mV	9.05mV	10.02mV	Pass	
30% Load	12.00mV	5.29mV	10.82mV	9.72mV	Pass	
40% Load	11.95mV	4.62mV	9.96mV	9.36mV	Pass	
50% Load	17.01mV	5.44mV	11.33mV	10.12mV	Pass	
60% Load	15.39mV	5.89mV	13.04mV	10.73mV	Pass	
70% Load	17.67mV	7.47mV	16.38mV	11.64mV	Pass	
80% Load	20.86mV	7.67mV	20.27mV	13.00mV	Pass	
90% Load	23.04mV	8.99mV	23.36mV	13.00mV	Pass	
100% Load	31.53mV	10.66mV	27.38mV	14.71mV	Pass	
110% Load	31.04mV	12.07mV	28.95mV	16.23mV	Pass	
Crossload1	16.30mV	9.40mV	21.19mV	14.86mV	Pass	
Crossload2	11.75mV	9.20mV	16.08mV	15.38mV	Pass	
Crossload3	10.93mV	5.23mV	20.63mV	9.61mV	Pass	
Crossload4	28.51mV	8.26mV	20.76mV	11.01mV	Pass	

All data and graphs included in this test report can be used by any individual on the following conditions:

**PAGE 16/17** 

<sup>&</sup>gt; It should be mentioned that the test results are provided by Cybenetics

<sup>&</sup>gt; The link to the original test results document should be provided in any case



#### **Anex**

#### Enermax MarbleBron RGB 850





#### **CERTIFICATIONS 115V**







Aristeidis Bitziopoulos Lab Director

#### **CERTIFICATIONS 230V**





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**PAGE 17/17**