

Anex

Cooler Master MWE Bronze 650

Lab ID#: CM19650039

Receipt Date: Jul 5, 2019

Test Date: May 21, 2019

Report: 20PS726A

Report Date: Jun 21, 2019

DUT INFORMATION

Brand	Cooler Master
Manufacturer (OEM)	Gospower
Series	MWE Bronze
Model Number	
Serial Number	MPE6501ACAAB1191400013
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✓
Cable Design	Fixed cables

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	3	0.3
	Watts	120		648	15	3.6
Total Max. Power (W)		650				

CABLES AND CONNECTORS

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	18-20AWG	No
8 pin EPS12V (630mm) / 4+4 pin EPS12V (120mm)	1	1 / 1	18AWG	No
6+2 pin PCIe (530mm+120mm)	2	4	16-18AWG	No
SATA (530mm+120mm+120mm+120mm)	2	8	18AWG	No
4-pin Molex (520mm+120mm+120mm+120mm)	1	4	18AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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General Data	
Manufacturer (OEM)	Gospower
PCB Type	Single Sided
Primary Side	
Transient Filter	3x Y caps, 2x X caps, 2x CM chokes
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x GBU2508 (800V, 25A @ 100°C)
APFC MOSFETS	2x Sanrise Tech SRC60R140B (630V, 11.2A @ 125°C, 0.14Ohm)
APFC Boost Diode	1x Jilin Sino Microelectronics 15F60UHF (600V, 15A @ 100°C)
Hold-up Cap(s)	1x Elite (420V, 560uF, 2000h @ 85°C, GM)
Main Switchers	2x Jilin Sino Microelectronics JCS18N50FH (500V, 11A @ 100°C, 0.27Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controllers	Champion CU6901V
Topology	Primary side: Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nce Power NCEP40T11K (40V, 85A @ 100°C, 2.8mOhm)
5V & 3.3V	DC-DC Converters: 4x IPS FTD05N03NA (30V, 75A @ 100°C, 6mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytics: 6x Elite (2-5,000h @ 105°C, ED), 4x Elite (2,000h @ 105°C, EL), 1x CapXon (2-5,000h @ 105°C, KF), 1x CapXon (3-10,000h @ 105°C, GH) Polymers: CapXon
Supervisor IC	IN1S313I-SAG
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, Fluid Dynamic Bearing Fan)
5VSB Circuit	
Rectifier	-
Standby PWM Controller	On-Bright OB2365SP

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RESULTS

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

115V

Average Efficiency	86.077%
Efficiency With 10W (≤500W) or 2% (>500W)	72.353
Average Efficiency 5VSB	78.233%
Standby Power Consumption (W)	0.0804244
Average PF	0.976
Avg Noise Output	38.27 dB(A)
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	S+

230V

Average Efficiency	88.392%
Average Efficiency 5VSB	77.298%
Standby Power Consumption (W)	0.2063370
Average PF	0.905
Avg Noise Output	38.95 dB(A)
Efficiency Rating (ETA)	
Noise Rating (LAMBDA)	S+

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	Brüel & Kjær 2270 G4
Microphone	Brüel & Kjær Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289
UPS	CyberPower OLS3000E 3kVA x2

HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	22.4
AC Loss to PWR_OK Hold Up Time (ms)	20.4
PWR_OK Inactive to DC Loss Delay (ms)	2.0

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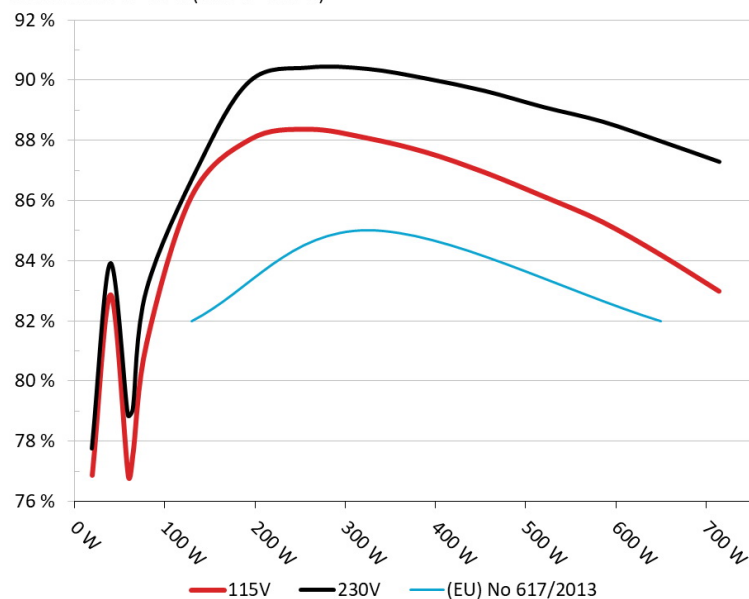
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Cooler Master MWE Bronze 650

Ambient: 32°C - 40°C (89.6°F - 104°F)



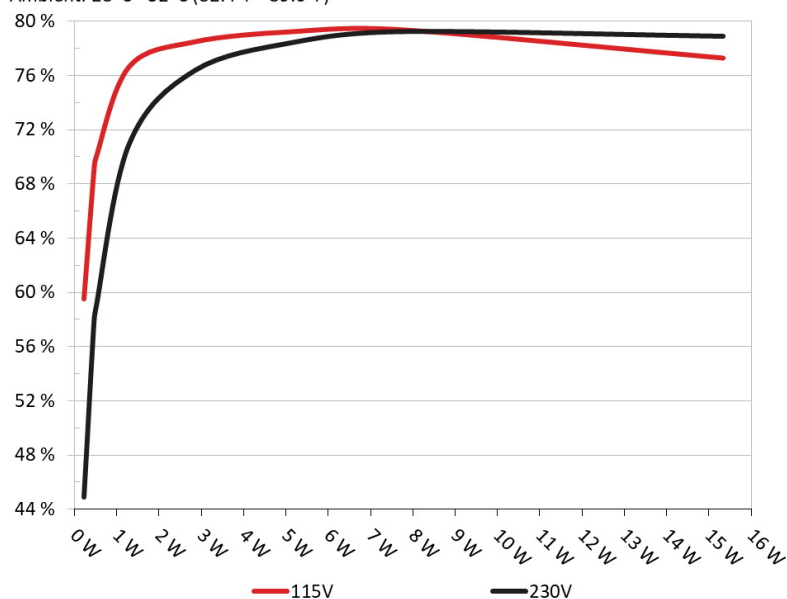
INFO

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: Cooler Master MWE Bronze 650

Ambient: 28°C - 32°C (82.4°F - 89.6°F)



INFO

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

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Cooler Master MWE Bronze 650

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.234	59.542%	0.025
	5.188V	0.393		115.15V
2	0.090A	0.468	68.925%	0.043
	5.187V	0.679		115.15V
3	0.550A	2.848	78.457%	0.203
	5.176V	3.630		115.15V
4	1.000A	5.166	79.209%	0.305
	5.165V	6.522		115.15V
5	1.500A	7.730	79.347%	0.372
	5.152V	9.742		115.16V
6	3.000A	15.343	77.267%	0.453
	5.114V	19.857		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.234	44.914%	0.010
	5.188V	0.521		230.29V
2	0.090A	0.468	57.707%	0.015
	5.187V	0.811		230.29V
3	0.550A	2.848	76.354%	0.069
	5.176V	3.730		230.33V
4	1.000A	5.166	78.427%	0.117
	5.165V	6.587		230.32V
5	1.500A	7.729	79.231%	0.165
	5.152V	9.755		230.33V
6	3.000A	15.343	78.888%	0.272
	5.114V	19.449		230.30V

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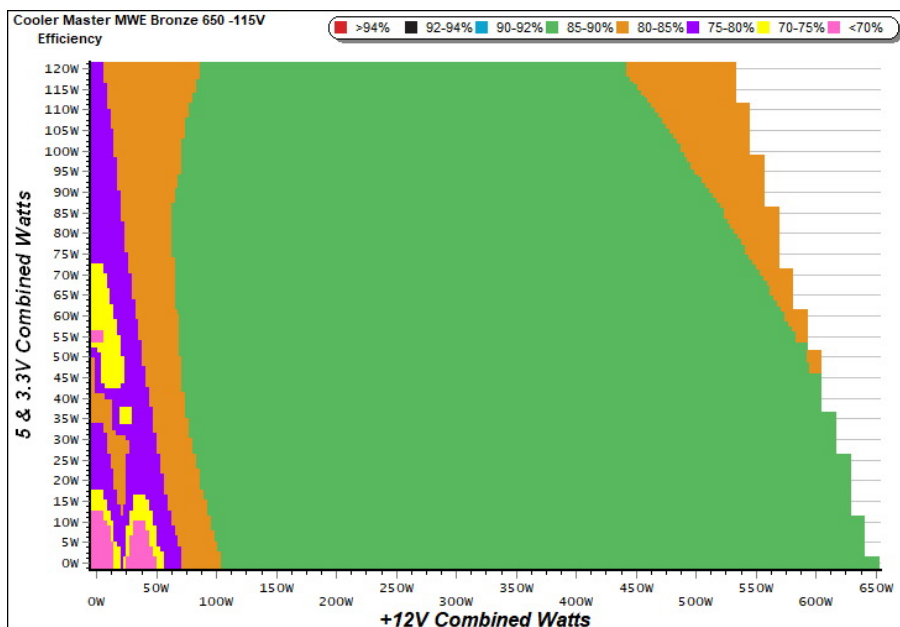
115V

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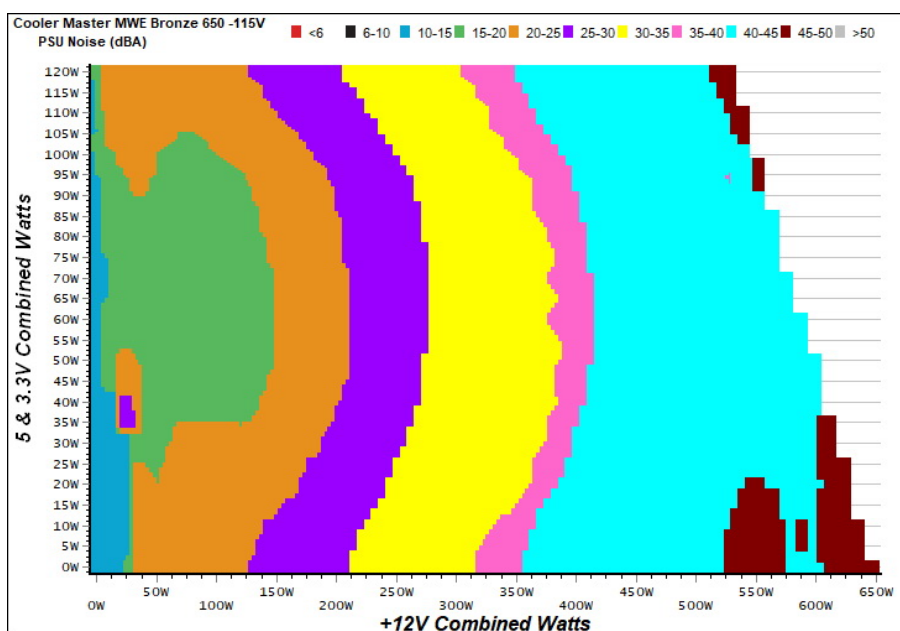
EFFICIENCY GRAPH 115V



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 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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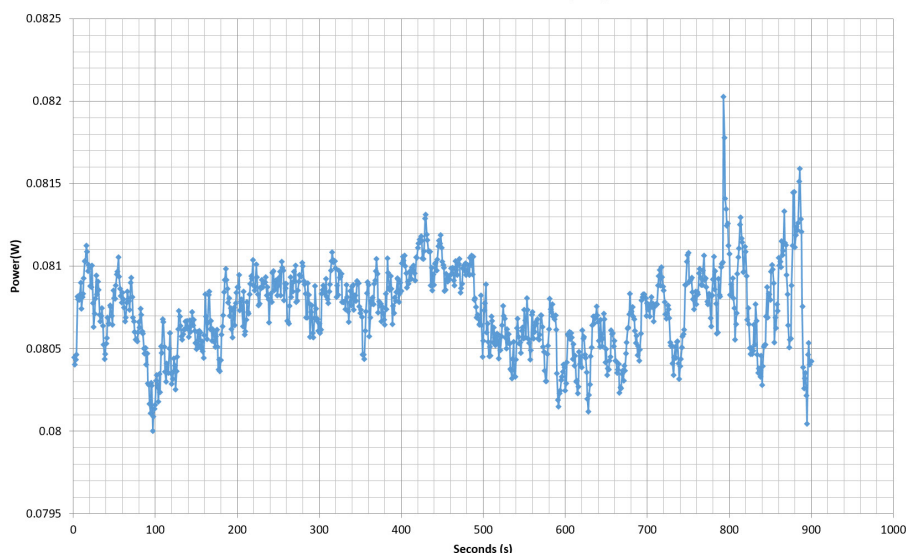
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VAMPIRE POWER -115V

Power - MPE6501ACAAB1191400013 - 20/05/2019 - 10:29



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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Cooler Master MWE Bronze 650

10-110% 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
1	3.569A	2.004A	1.955A	0.970A	64.893	77.606%	1115	24.1	35.08°C	0.912
	12.131V	4.991V	3.373V	5.156V	83.618				40.81°C	115.12V
2	8.126A	3.012A	2.939A	1.166A	129.381	86.115%	1225	27.2	35.86°C	0.958
	12.120V	4.981V	3.366V	5.145V	150.242				42.13°C	115.12V
3	13.105A	3.519A	3.425A	1.364A	194.475	88.026%	1297	28.7	36.49°C	0.965
	12.092V	4.973V	3.360V	5.133V	220.929				43.17°C	115.11V
4	18.086A	4.030A	3.938A	1.562A	259.692	88.363%	1443	32.1	36.80°C	0.974
	12.080V	4.965V	3.353V	5.122V	293.892				44.17°C	115.11V
5	22.742A	5.046A	4.932A	1.762A	324.972	88.067%	1887	38.4	37.40°C	0.983
	12.069V	4.954V	3.345V	5.110V	369.005				45.28°C	115.11V
6	27.342A	6.070A	5.932A	1.962A	389.495	87.601%	2095	41.2	37.86°C	0.987
	12.058V	4.944V	3.337V	5.097V	444.626				46.36°C	115.11V
7	32.018A	7.098A	6.938A	2.164A	454.804	86.931%	2406	45.1	38.51°C	0.989
	12.046V	4.933V	3.329V	5.085V	523.176				47.65°C	115.11V
8	36.698A	8.129A	7.948A	2.367A	520.110	86.131%	2455	45.9	38.88°C	0.991
	12.036V	4.922V	3.321V	5.072V	603.860				48.74°C	115.11V
9	41.788A	8.649A	8.444A	2.370A	585.014	85.290%	2454	45.9	39.46°C	0.992
	12.025V	4.915V	3.316V	5.065V	685.913				49.83°C	115.10V
10	46.624A	9.172A	8.977A	2.976A	649.858	84.194%	2453	45.9	39.85°C	0.993
	12.014V	4.907V	3.309V	5.042V	771.858				50.78°C	115.10V
11	52.067A	9.183A	8.991A	2.980A	714.680	82.981%	2452	45.9	40.28°C	0.993
	12.003V	4.902V	3.303V	5.036V	861.260				51.78°C	115.10V
CL1	0.139A	14.001A	13.999A	0.000A	117.437	78.674%	2185	42.8	37.01°C	0.956
	12.109V	4.924V	3.344V	5.159V	149.271				45.89°C	115.12V
CL2	54.005A	1.002A	1.002A	1.000A	662.490	84.869%	2457	45.9	39.70°C	0.993
	12.019V	4.955V	3.330V	5.103V	780.603				50.81°C	115.10V

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20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.197A	0.498A	0.473A	0.193A	19.588	76.864%	0	<6.0	0.693
	12.111V	5.004V	3.381V	5.182V	25.484				115.12V
2	2.447A	1.001A	0.975A	0.387A	39.965	82.862%	0	<6.0	0.868
	12.122V	5.000V	3.379V	5.175V	48.231				115.12V
3	3.634A	1.502A	1.450A	0.581A	59.489	76.855%	1018	21.2	0.919
	12.132V	4.996V	3.376V	5.167V	77.404				115.12V
4	4.887A	2.004A	1.957A	0.775A	79.867	81.256%	1091	23.9	0.948
	12.128V	4.990V	3.372V	5.160V	98.290				115.12V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.6 mV	15.7 mV	9.1 mV	18.2 mV	Pass
20% Load	9.0 mV	15.8 mV	9.7 mV	16.8 mV	Pass
30% Load	25.7 mV	15.5 mV	10.0 mV	17.4 mV	Pass
40% Load	24.5 mV	15.9 mV	10.9 mV	17.1 mV	Pass
50% Load	24.1 mV	16.0 mV	11.0 mV	18.1 mV	Pass
60% Load	21.9 mV	16.9 mV	13.4 mV	21.0 mV	Pass
70% Load	24.0 mV	16.7 mV	14.6 mV	21.7 mV	Pass
80% Load	23.2 mV	17.0 mV	16.6 mV	23.5 mV	Pass
90% Load	22.5 mV	18.3 mV	17.9 mV	24.2 mV	Pass
100% Load	33.4 mV	19.5 mV	17.2 mV	28.4 mV	Pass
110% Load	33.9 mV	19.7 mV	18.6 mV	30.6 mV	Pass
Crossload 1	21.7 mV	24.3 mV	18.2 mV	17.5 mV	Pass
Crossload 2	31.8 mV	18.5 mV	11.8 mV	25.7 mV	Pass

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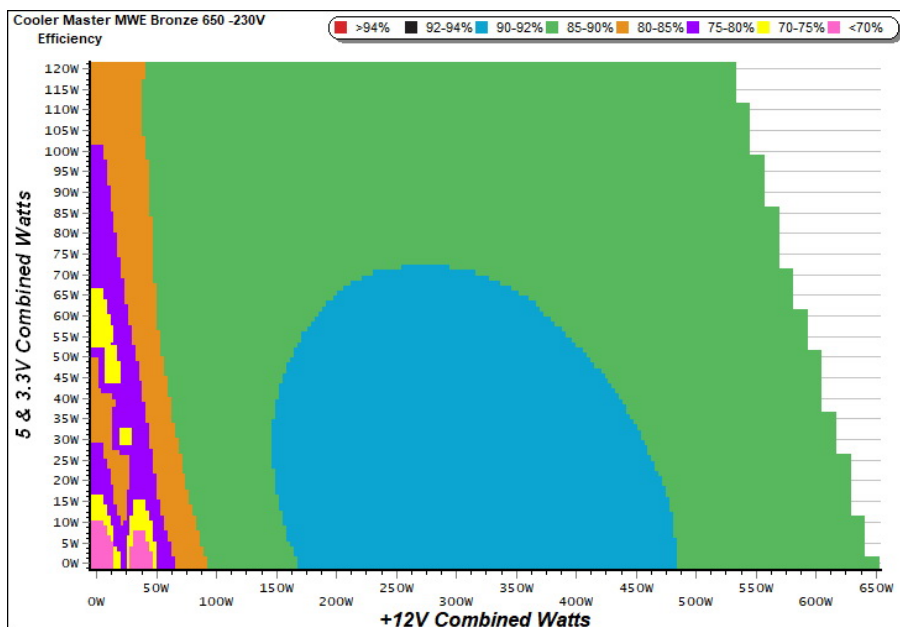
230V

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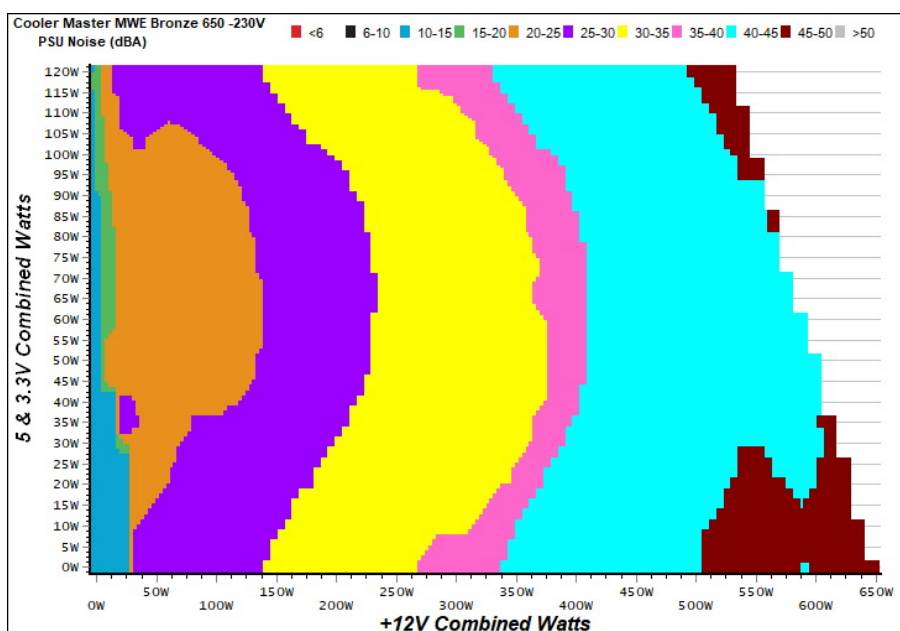
EFFICIENCY GRAPH 230V



INFO

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NOISE GRAPH 230V



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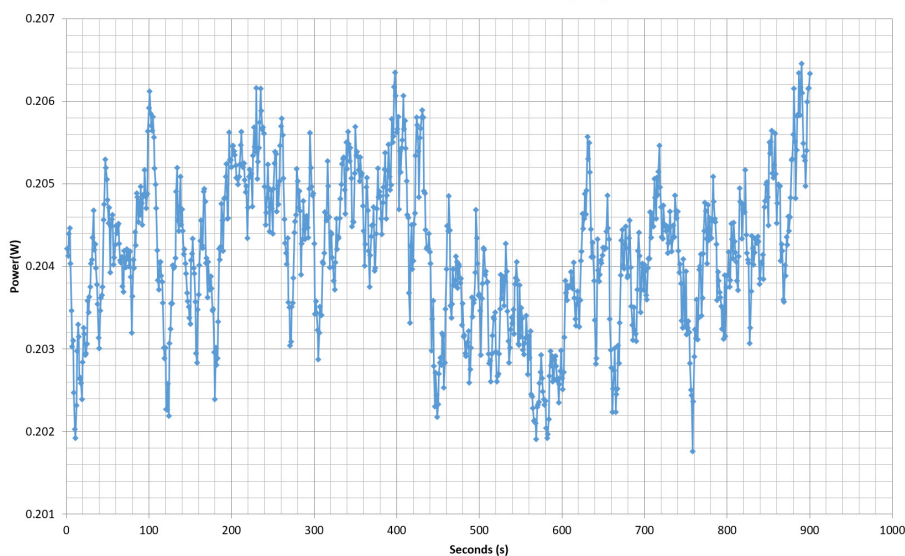
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VAMPIRE POWER -230V

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10-110% 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
1	3.565A	2.004A	1.955A	0.970A	64.841	79.060%	1047	22.1	34.01°C	0.649
	12.130V	4.991V	3.373V	5.156V	82.015				39.74°C	230.25V
2	8.122A	3.014A	2.943A	2.942A	138.335	87.198%	1064	22.8	34.41°C	0.832
	12.119V	4.978V	3.363V	5.100V	158.645				40.49°C	230.24V
3	13.103A	3.520A	3.422A	1.364A	194.429	89.978%	1131	24.9	35.24°C	0.870
	12.091V	4.973V	3.359V	5.133V	216.085				41.79°C	230.25V
4	18.085A	4.027A	3.937A	1.562A	259.662	90.432%	1340	29.9	35.71°C	0.907
	12.080V	4.965V	3.353V	5.122V	287.134				42.67°C	230.25V
5	22.742A	5.048A	4.931A	1.761A	324.951	90.386%	1609	33.1	36.04°C	0.935
	12.068V	4.954V	3.345V	5.110V	359.515				43.82°C	230.25V
6	27.344A	6.071A	5.933A	1.962A	389.468	90.067%	2007	41.2	36.98°C	0.945
	12.056V	4.943V	3.337V	5.098V	432.421				45.23°C	230.26V
7	32.020A	7.098A	6.940A	2.163A	454.792	89.653%	2212	42.8	37.16°C	0.953
	12.045V	4.932V	3.329V	5.086V	507.278				45.83°C	230.25V
8	36.703A	8.129A	7.948A	2.366A	520.084	89.114%	2456	45.9	37.80°C	0.960
	12.034V	4.921V	3.321V	5.073V	583.619				47.17°C	230.25V
9	41.795A	8.651A	8.447A	2.369A	585.014	88.635%	2452	45.9	38.34°C	0.964
	12.023V	4.914V	3.315V	5.066V	660.029				48.63°C	230.26V
10	46.628A	9.175A	8.977A	2.975A	649.854	87.979%	2452	45.9	39.66°C	0.967
	12.013V	4.906V	3.308V	5.043V	738.646				50.82°C	230.26V
11	52.066A	9.183A	8.993A	2.980A	714.675	87.296%	2448	45.9	40.30°C	0.969
	12.003V	4.902V	3.303V	5.036V	818.676				52.19°C	230.26V
CL1	0.144A	14.004A	13.998A	0.000A	117.481	80.031%	2226	42.9	35.99°C	0.811
	12.110V	4.923V	3.343V	5.158V	146.795				43.35°C	230.27V
CL2	54.016A	1.002A	1.000A	1.000A	662.507	88.503%	2455	45.9	39.91°C	0.967
	12.017V	4.954V	3.329V	5.103V	748.569				50.78°C	230.28V

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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])	PF/AC Volts
1	1.194A	0.500A	0.472A	0.193A	19.560	77.761%	0	<6.0	0.329
	12.112V	5.006V	3.383V	5.181V	25.154				230.25V
2	2.444A	0.999A	0.977A	0.387A	39.930	83.922%	0	<6.0	0.494
	12.123V	5.002V	3.380V	5.174V	47.580				230.25V
3	3.631A	1.502A	1.449A	0.581A	59.444	78.874%	972	20.1	0.627
	12.131V	4.995V	3.376V	5.167V	75.366				230.25V
4	4.884A	2.004A	1.954A	0.775A	79.817	83.021%	1077	23.3	0.699
	12.127V	4.990V	3.372V	5.160V	96.141				230.25V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.6 mV	16.3 mV	9.8 mV	18.8 mV	Pass
20% Load	7.9 mV	15.8 mV	9.4 mV	19.4 mV	Pass
30% Load	26.4 mV	15.9 mV	10.5 mV	17.3 mV	Pass
40% Load	24.1 mV	15.8 mV	10.7 mV	17.0 mV	Pass
50% Load	23.0 mV	16.5 mV	11.4 mV	17.9 mV	Pass
60% Load	21.8 mV	16.5 mV	13.2 mV	18.2 mV	Pass
70% Load	22.6 mV	16.4 mV	14.1 mV	21.0 mV	Pass
80% Load	22.6 mV	17.4 mV	16.4 mV	21.1 mV	Pass
90% Load	22.1 mV	18.5 mV	16.6 mV	23.4 mV	Pass
100% Load	33.3 mV	19.8 mV	16.8 mV	27.5 mV	Pass
110% Load	33.6 mV	20.7 mV	18.0 mV	26.8 mV	Pass
Crossload 1	24.6 mV	25.3 mV	18.3 mV	17.4 mV	Pass
Crossload 2	33.3 mV	18.3 mV	11.8 mV	22.2 mV	Pass

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Anex

Cooler Master MWE Bronze 650



Top side

650W		MODEL / 型			
		Switching Power S			
AC INPUT		100-240V~, 10-5A, 50-60Hz			
交流輸入/交流輸入					
DC OUTPUT		+5V	+3.3V	+12V	-12V +5VSB
直流輸出/直流輸出		20A	20A	54A	0.3A 3A
TOTAL POWER		120W 648W 3.6W 15W			
總功率/總功率		650W			



Power specifications label

CERTIFICATIONS 115V



CERTIFICATIONS 230V



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