Make It Yours.

Cooler Master MWE Bronze 450

Serial Number MPE4501ACAAB1191400001

Lab ID CM19450054

Certification ID 25730

Test Result Report ID:

Certificate Issue Date: Jun 21, 2019

115V 230V

Scheme: ETA-EMI PSU

CYBENETICS BRONZE

115V 230V

CYBENETICS A- | CYBENETICS A- 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	Cooler Master
Model	MWE Bronze 450
OEM/ODM	Gospower
Serial Number	MPE4501ACAAB1191400001
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60

Rated Power (W)	450
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Rifle Bearing Fan (DF1202512SELN)
Semi-Passive Operation	✓
Cybenetics Testing Information	
Lab ID	CM19450054
Date of receipt	Jul 5, 2019
Testing Date	Dec 6, 2019
Report Issued Date	Jun 21, 2019
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Captive Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	18-20AWG	No
4+4 pin EPS12V (630mm)	1	1	18AWG	No
6+2 pin PCIe (530mm+120mm)	1	2	18AWG	No
SATA (520mm+120mm+120mm)	2	6	18-20AWG	No
4-pin Molex (510mm+120mm+120mm+120mm)	1	4	18-20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	37.5	3	0.3
	Watts	120		450	15	3.6
Total Max. Power (W)		450				

Parts Description

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
Bridge Rectifier(s)	1x GBU808 (800V, 8A @ 100°C)
APFC MOSFETS	1x Sanrise Tech SRC60R140B (630V, 11.2A @ 125°C, 0.140Ohm)
APFC Boost Diode	1x Jilin Sino Microelectronics 15F60UHF (600V, 15A @ 100°C)
Hold-up Cap(s)	1x Elite (420V, 330uF, 2000h @ 85°C, GM)
Main Switchers	2x Jilin Sino Microelectronics JCS13N50FC (500V, 8A @ 100°C, 0.49Ohm)
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 NCE4080 (40V, 56A @ 100°C, 6.5mOhm)
5V & 3.3V	DC-DC Converters: 4x IPS FTD05N03NA (30V, 75A @ 100°C, 6mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytics: 7x Elite (2-5,000h @ 105°C, ED), 4x Elite (2,000h @ 105°C, EL), 2x CapXon (2-5,000h @ 105°C, KF), 1x CapXon (3-10,000h @ 105°C, GH), 1x Rubycon (4-10,000 @ 105°C, YXJ) Polymers: CapXon
Supervisor IC	IN1S313I-SAG
Fan Model	Thermal Control DF1202512SELN (120mm, 12V, 0.25A, Rifle Bearing Fan)
5VSB Circuit	

Rectifier	-
Standby PWM Controller	On-Bright OB2365SP

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	84.602%
Average Noise Output (>1450 Load Combinations)	27.85dBA
Average PF (>1450 Load Combinations)	0.974
Efficiency With 10W (≤500W) or 2% (>500W) Load	71.924%
Standby Power Consumption	0.0743W
Non-Accredited	
12V Ripple (Full Load)	45.42mV
5V Ripple (Full Load)	23.01mV
3.3V Ripple (Full Load)	30.24mV
5VSB Ripple (Full Load)	26.42mV
12V Load Regulation	1.29%
5V Load Regulation	2.91%
3.3V Load Regulation	2.94%
5VSB Load Regulation	3.91%
Inrush Current	60.395A

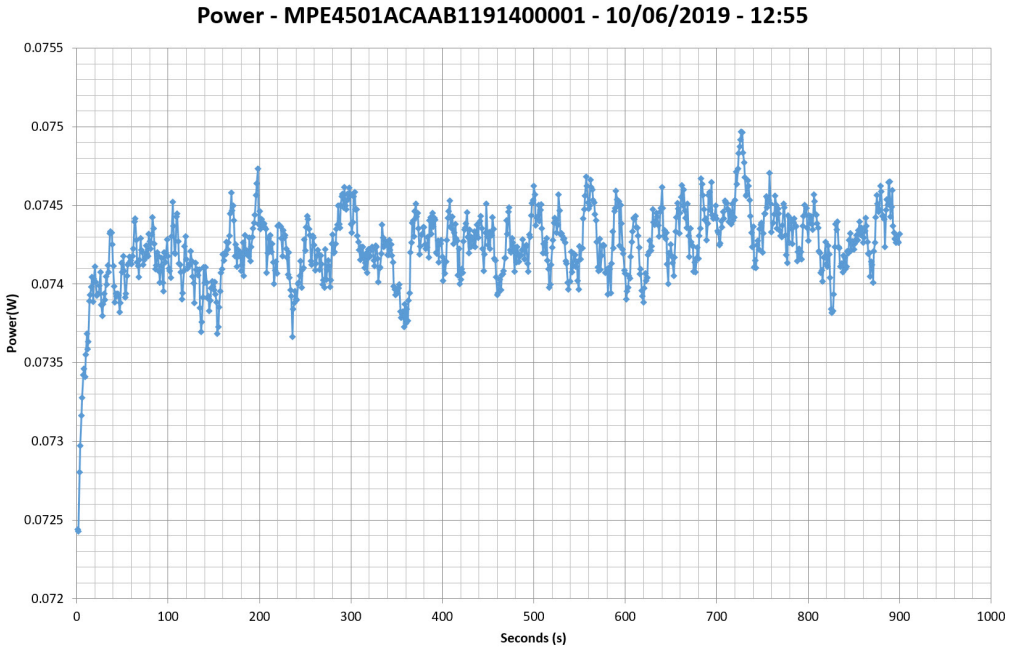
230V		
Accredited		
Average Efficiency (>1450 load combinations)	87.142%	
Average Noise Output (>1450 Load Combinations)	27.32dBA	
Average PF (>1450 Load Combinations)	0.892	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1865W	
Non-Accredited		
12V Ripple (Full Load)	44.34mV	
5V Ripple (Full Load)	23.05mV	
3.3V Ripple (Full Load)	30.02mV	
5VSB Ripple (Full Load)	25.61mV	
12V Load Regulation	1.32%	
5V Load Regulation	2.85%	
3.3V Load Regulation	2.85%	
5VSB Load Regulation	3.80%	
Inrush Current	59.320A	
Hold-Up Time & PWR_OK Signal	17.50ms	
AC Loss to PWR_OK Hold Up Time	15.80ms	
PWR_OK Inactive to DC Loss Delay	1.70ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

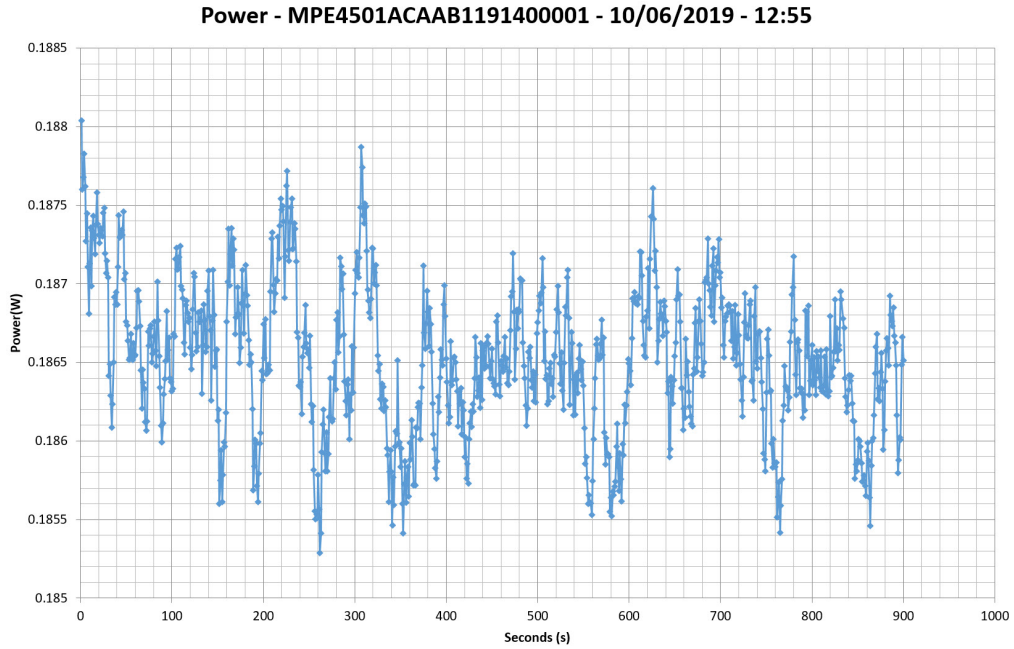
Hold-Up Time (ms)	17.5
AC Loss to PWR_OK Hold Up Time (ms)	15.8
PWR_OK Inactive to DC Loss Delay (ms)	1.7

Graphs

115V

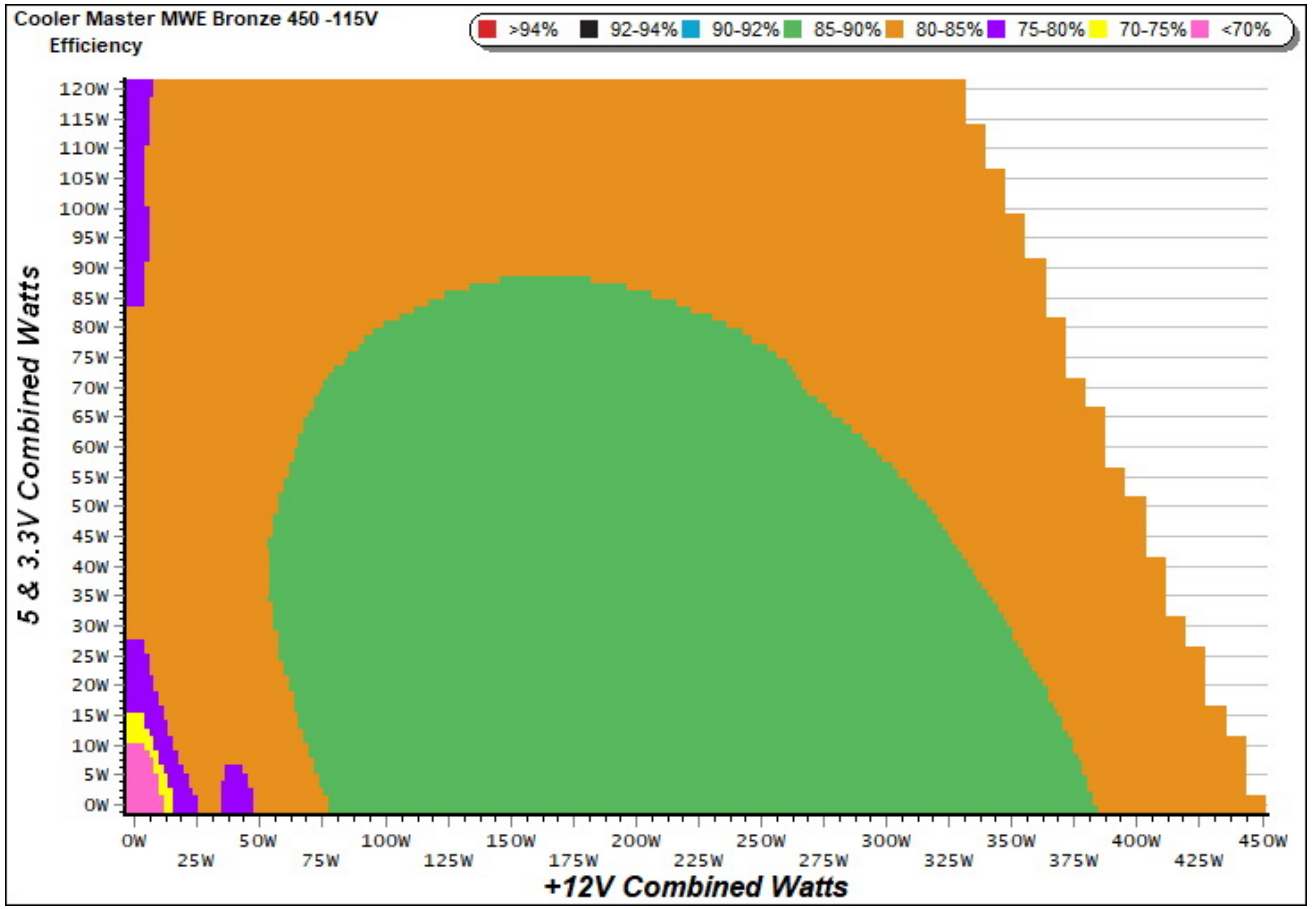


230V



Efficiency Graph

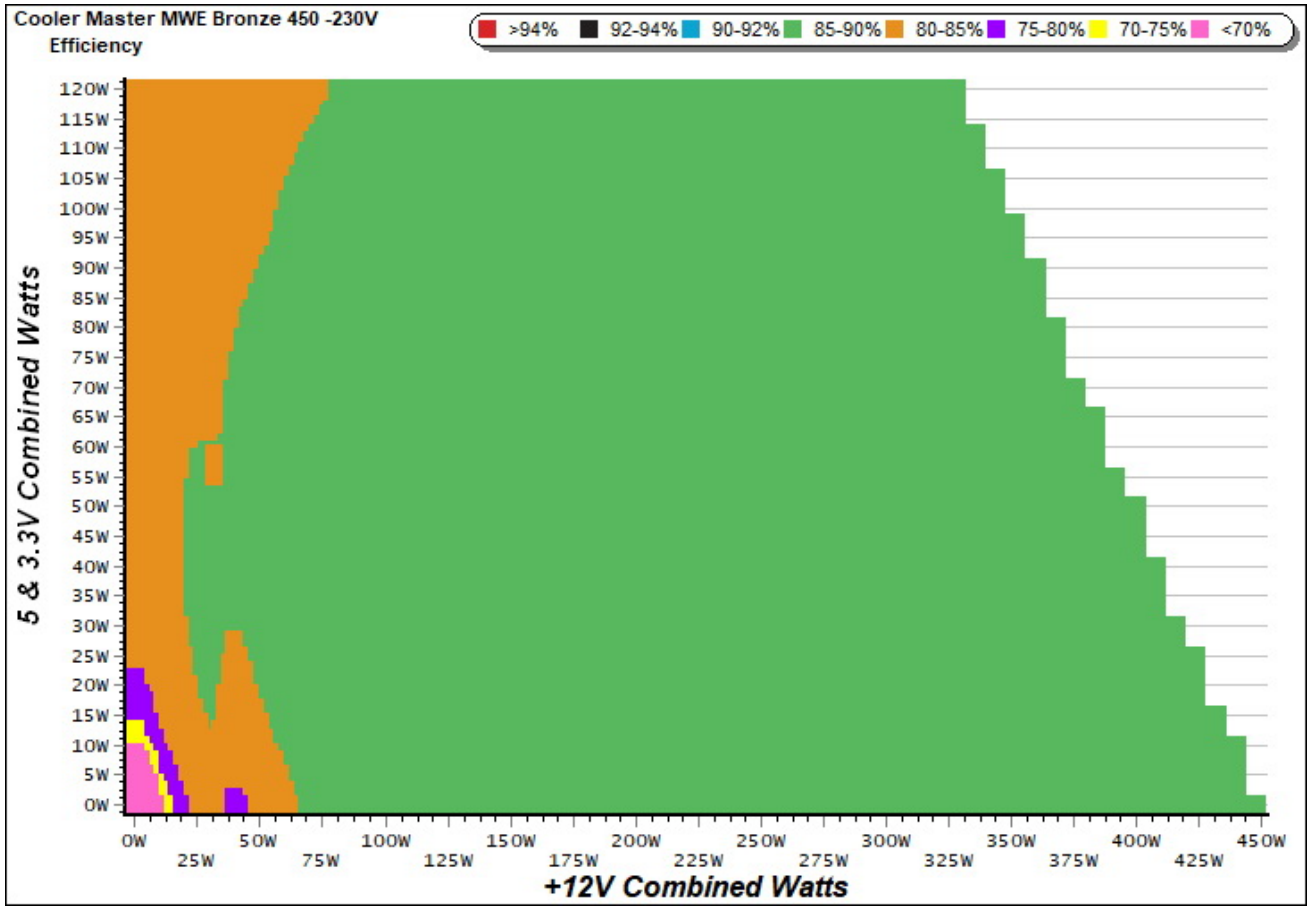
115V



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.

230V



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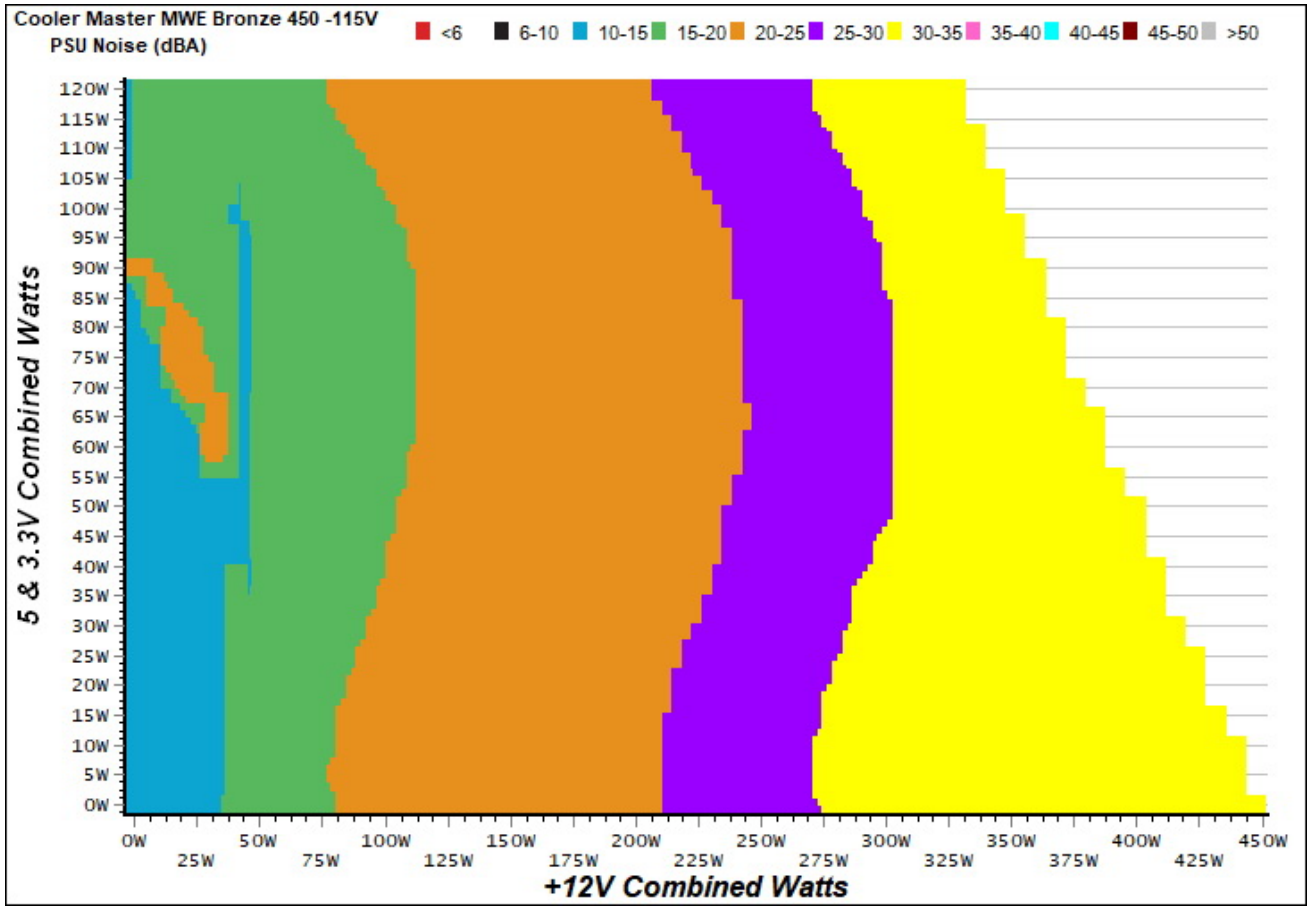
Noise Graph

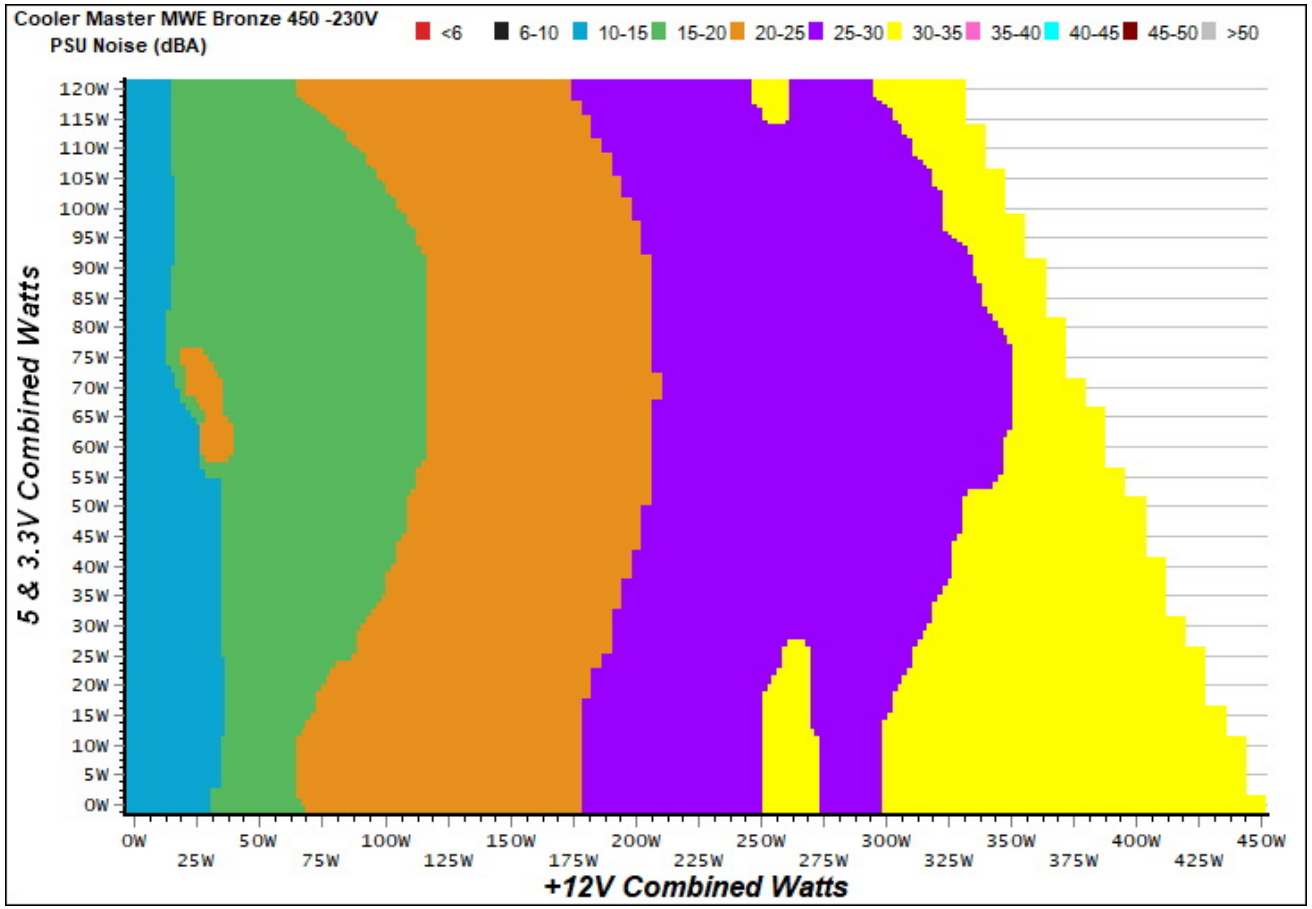
115V



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.

230V

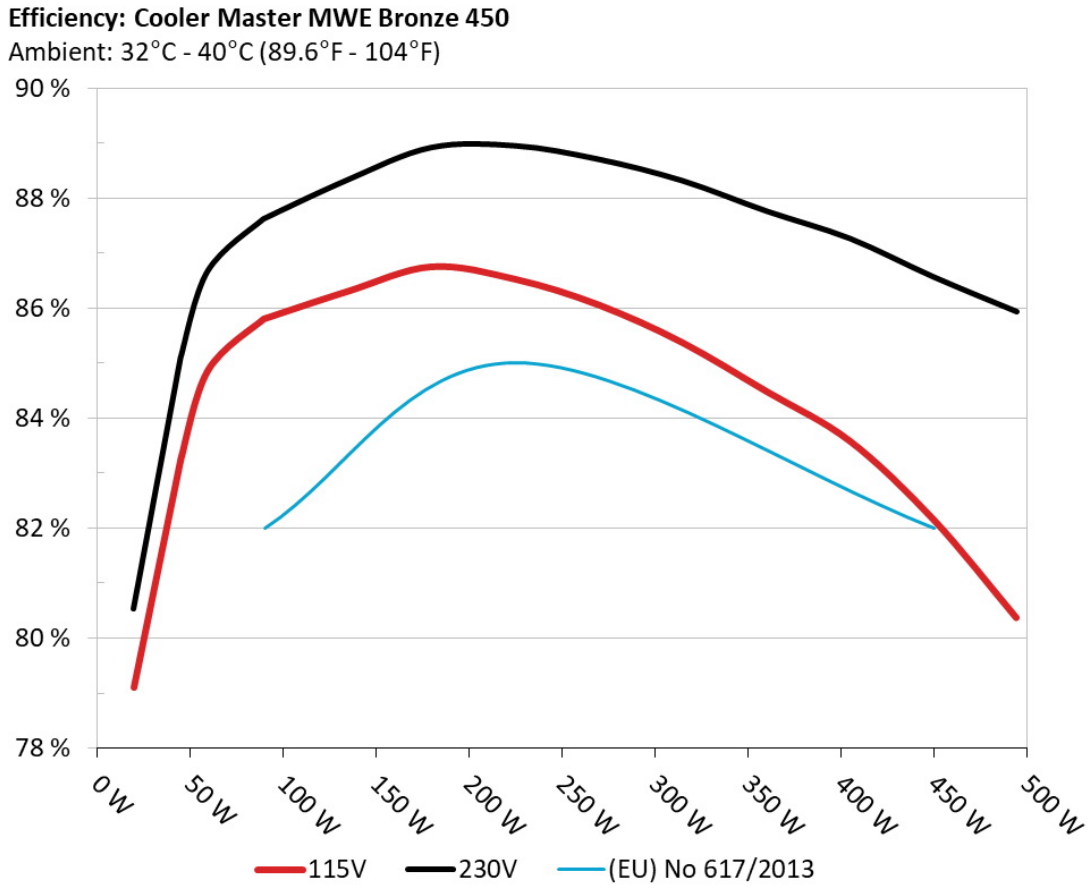


INFO

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.

Indicative Performance

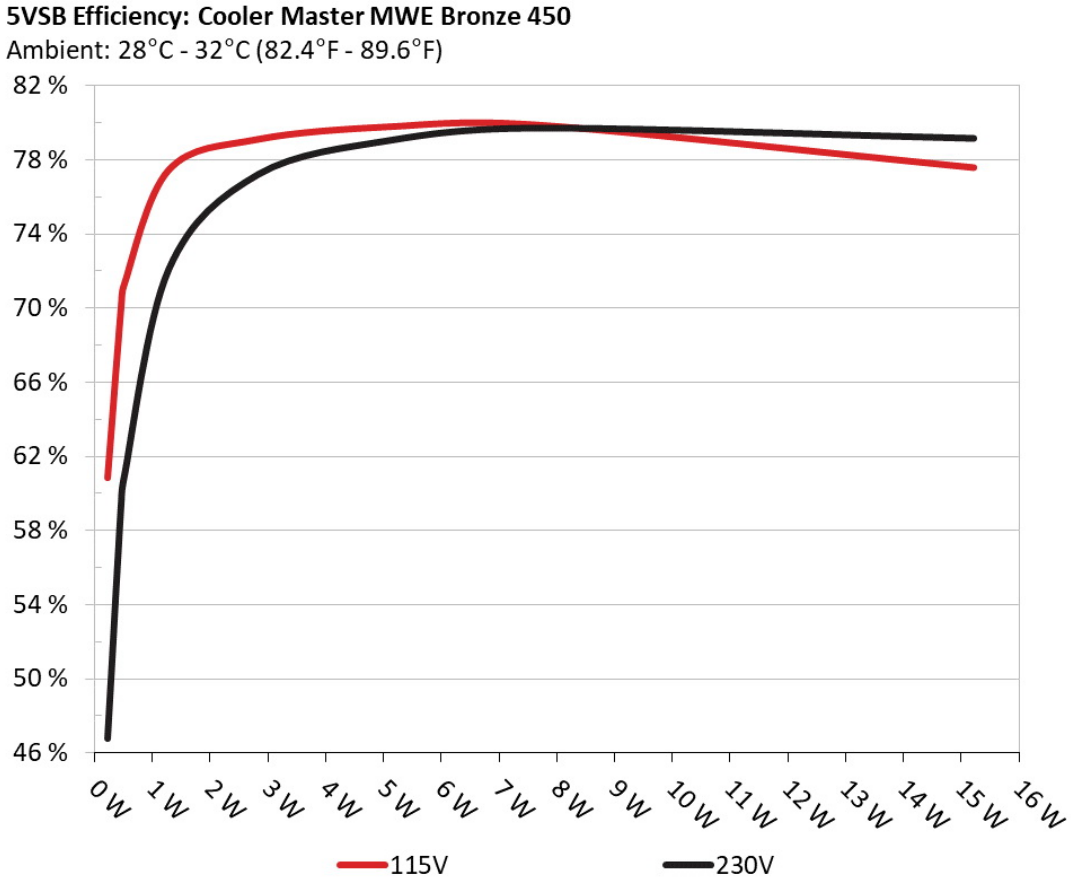
Efficiency under high ambient temperature



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



INFO

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

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.233	60.836%	0.025
	5.172V	0.383		115.13V
2	0.090A	0.466	70.075%	0.043
	5.171V	0.665		115.12V
3	0.550A	2.836	79.107%	0.197
	5.155V	3.585		115.13V
4	1.000A	5.142	79.795%	0.288
	5.140V	6.444		115.12V
5	1.500A	7.686	79.879%	0.347
	5.123V	9.622		115.12V
6	3.000A	15.217	77.582%	0.427
	5.072V	19.614		115.12V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.233	46.787%	0.010
	5.173V	0.498		230.30V
2	0.090A	0.466	59.439%	0.015
	5.171V	0.784		230.30V
3	0.550A	2.837	77.197%	0.069
	5.156V	3.675		230.30V
4	1.000A	5.142	79.047%	0.118
	5.141V	6.505		230.30V
5	1.500A	7.687	79.699%	0.164
	5.124V	9.645		230.30V
6	3.000A	15.218	79.141%	0.264
	5.072V	19.229		230.30V

Supplementary Tests (For Reference)

Typical 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	1.927A	2.014A	1.983A	0.976A	44.892	83.235%	0	<6.0	40.71°C	0.900
	12.084V	4.968V	3.327V	5.127V	53.934				35.00°C	115.13V
2	4.839A	3.031A	2.985A	1.175A	89.409	84.754%	870	18.5	35.99°C	0.958
	12.089V	4.951V	3.316V	5.110V	105.492				42.21°C	115.12V
3	8.167A	3.545A	3.477A	1.375A	134.501	86.311%	904	21.2	36.46°C	0.974
	12.060V	4.939V	3.306V	5.094V	155.833				43.38°C	115.12V
4	11.504A	4.062A	4.002A	1.576A	179.727	86.760%	987	23.1	36.65°C	0.972
	12.041V	4.926V	3.297V	5.078V	207.154				44.16°C	115.12V
5	14.517A	5.093A	5.021A	1.779A	225.026	86.532%	1141	27.4	37.35°C	0.977
	12.022V	4.909V	3.286V	5.060V	260.050				45.33°C	115.12V
6	17.472A	6.134A	6.046A	1.984A	269.545	86.070%	1292	29.0	37.93°C	0.981
	12.004V	4.892V	3.275V	5.042V	313.170				46.84°C	115.12V
7	20.503A	7.181A	7.078A	2.190A	314.851	85.381%	1473	33.0	38.40°C	0.984
	11.986V	4.875V	3.263V	5.023V	368.761				48.00°C	115.12V
8	23.543A	8.236A	8.117A	2.398A	360.171	84.492%	1480	33.1	38.64°C	0.986
	11.968V	4.858V	3.252V	5.005V	426.279				48.69°C	115.13V
9	26.992A	8.774A	8.633A	2.404A	405.067	83.590%	1481	33.1	39.34°C	0.988
	11.950V	4.845V	3.243V	4.994V	484.585				49.74°C	115.13V
10	30.182A	9.315A	9.187A	3.024A	449.876	82.170%	1481	33.1	39.93°C	0.989
	11.933V	4.832V	3.233V	4.961V	547.497				50.93°C	115.13V
11	33.991A	9.332A	9.209A	3.030A	494.681	80.377%	1480	33.1	40.05°C	0.990
	11.914V	4.823V	3.225V	4.952V	615.448				51.56°C	115.15V
CL1	0.142A	14.002A	14.000A	0.000A	115.472	79.624%	1408	32.1	37.64°C	0.972
	12.060V	4.853V	3.272V	5.110V	145.022				45.98°C	115.13V

CL2	37.512A	1.003A	0.998A	1.000A	461.016	83.187%	1482	33.1	39.69°C	0.990
	11.937V	4.906V	3.266V	5.056V	554.190				50.66°C	115.13V

The results above are not used in the certification process

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	1.928A	2.013A	1.984A	0.976A	44.906	84.717%	0	<6.0	41.00°C	0.576
	12.086V	4.968V	3.327V	5.126V	53.007				34.86°C	230.32V
2	4.839A	3.030A	2.986A	1.175A	89.404	86.442%	832	17.7	35.64°C	0.762
	12.089V	4.951V	3.316V	5.109V	103.427				42.15°C	230.32V
3	8.167A	3.543A	3.478A	1.375A	134.492	88.326%	874	18.9	36.01°C	0.845
	12.060V	4.938V	3.306V	5.094V	152.268				43.25°C	230.31V
4	11.503A	4.062A	4.002A	1.576A	179.714	88.917%	1034	24.2	36.75°C	0.888
	12.041V	4.926V	3.297V	5.078V	202.114				44.37°C	230.31V
5	14.515A	5.093A	5.021A	1.779A	225.002	88.948%	1137	26.9	37.50°C	0.913
	12.022V	4.909V	3.286V	5.060V	252.958				45.83°C	230.31V
6	17.472A	6.134A	6.044A	1.984A	269.521	88.705%	1272	29.1	37.84°C	0.929
	12.003V	4.892V	3.275V	5.042V	303.840				46.49°C	230.32V
7	20.503A	7.181A	7.077A	2.190A	314.831	88.314%	1428	32.5	38.09°C	0.940
	11.985V	4.875V	3.263V	5.024V	356.492				47.10°C	230.32V
8	23.544A	8.236A	8.119A	2.398A	360.144	87.761%	1480	33.1	38.92°C	0.948
	11.966V	4.858V	3.252V	5.005V	410.370				48.85°C	230.33V
9	26.996A	8.773A	8.633A	2.403A	405.051	87.263%	1475	33.1	39.37°C	0.955
	11.948V	4.845V	3.243V	4.994V	464.174				49.78°C	230.32V
10	30.188A	9.315A	9.186A	3.024A	449.856	86.568%	1476	33.1	39.71°C	0.959
	11.930V	4.832V	3.233V	4.962V	519.655				50.48°C	230.32V
11	33.995A	9.332A	9.209A	3.030A	494.664	85.936%	1476	33.1	40.39°C	0.962
	11.912V	4.823V	3.225V	4.953V	575.620				52.10°C	230.32V
CL1	0.144A	14.002A	13.999A	0.000A	115.478	81.503%	1449	32.9	37.81°C	0.832
	12.057V	4.852V	3.272V	5.109V	141.686				45.70°C	230.31V

CL2	37.514A	1.002A	0.999A	1.000A	460.927	87.572%	1475	33.1	39.95°C	0.959
	11.934V	4.906V	3.266V	5.056V	526.339				50.48°C	230.32V

The results above are not used in the certification process

Light Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.201A	0.501A	0.479A	0.194A	19.588	79.108%	0	<6.0	0.750
	12.066V	4.985V	3.336V	5.163V	24.761				115.13V
2	2.460A	1.005A	0.988A	0.388A	40.005	83.276%	0	<6.0	0.884
	12.079V	4.977V	3.331V	5.151V	48.039				115.13V
3	3.652A	1.510A	1.472A	0.584A	59.489	84.881%	0	<6.0	0.929
	12.072V	4.970V	3.326V	5.140V	70.085				115.13V
4	4.917A	2.016A	1.984A	0.780A	79.881	85.811%	0	<6.0	0.956
	12.058V	4.962V	3.321V	5.128V	93.090				115.12V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.203A	0.502A	0.479A	0.194A	19.627	80.544%	0	<6.0	0.353
	12.074V	4.986V	3.337V	5.162V	24.368				230.32V
2	2.462A	1.005A	0.990A	0.389A	40.055	85.100%	0	<6.0	0.540
	12.084V	4.978V	3.331V	5.150V	47.068				230.32V
3	3.654A	1.511A	1.472A	0.584A	59.526	86.674%	0	<6.0	0.654
	12.074V	4.970V	3.326V	5.139V	68.678				230.32V
4	4.919A	2.015A	1.986A	0.780A	79.906	87.620%	0	<6.0	0.732
	12.058V	4.962V	3.321V	5.127V	91.196				230.32V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	81.2 mV	18.2 mV	15.2 mV	18.6 mV	Pass
20% Load	38.5 mV	16.0 mV	17.4 mV	18.9 mV	Pass
30% Load	34.1 mV	16.7 mV	19.2 mV	20.2 mV	Pass
40% Load	32.4 mV	17.1 mV	18.3 mV	20.0 mV	Pass
50% Load	30.7 mV	16.7 mV	19.9 mV	19.6 mV	Pass
60% Load	32.0 mV	17.7 mV	20.6 mV	19.9 mV	Pass
70% Load	39.3 mV	18.0 mV	23.6 mV	20.0 mV	Pass
80% Load	32.6 mV	20.6 mV	26.8 mV	21.1 mV	Pass
90% Load	33.2 mV	20.9 mV	28.2 mV	23.2 mV	Pass
100% Load	45.4 mV	23.0 mV	30.2 mV	26.4 mV	Pass
110% Load	45.3 mV	22.4 mV	29.3 mV	25.6 mV	Pass
Crossload 1	41.9 mV	26.9 mV	34.9 mV	20.1 mV	Pass
Crossload 2	44.5 mV	17.6 mV	15.6 mV	23.2 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	75.1 mV	16.9 mV	15.4 mV	18.9 mV	Pass
20% Load	41.2 mV	15.7 mV	16.8 mV	19.2 mV	Pass
30% Load	35.9 mV	17.2 mV	17.0 mV	18.5 mV	Pass
40% Load	33.9 mV	17.1 mV	18.3 mV	19.4 mV	Pass
50% Load	32.0 mV	16.9 mV	18.0 mV	18.7 mV	Pass
60% Load	32.1 mV	17.6 mV	20.4 mV	19.3 mV	Pass
70% Load	37.6 mV	18.8 mV	23.1 mV	21.5 mV	Pass
80% Load	31.7 mV	20.1 mV	27.5 mV	21.2 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	31.3 mV	20.5 mV	28.0 mV	20.8 mV	Pass
100% Load	44.3 mV	23.1 mV	30.0 mV	25.6 mV	Pass
110% Load	45.5 mV	22.1 mV	29.8 mV	24.2 mV	Pass
Crossload 1	41.3 mV	26.5 mV	35.1 mV	19.5 mV	Pass
Crossload 2	44.7 mV	17.4 mV	15.8 mV	22.4 mV	Pass

The results above are not used in the certification process

Cooler Master MWE Bronze 450

Top side

Power specifications label