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




115V 230V







Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

# General Information

## Test Equipment

| | |
|---|---|
| Electronic Loads | Chroma 63601-5 x2<br>Chroma 63600-2<br>Chroma 63640-80-80 x10<br>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<br>(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<br>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)<br>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)<br>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) | - | - |

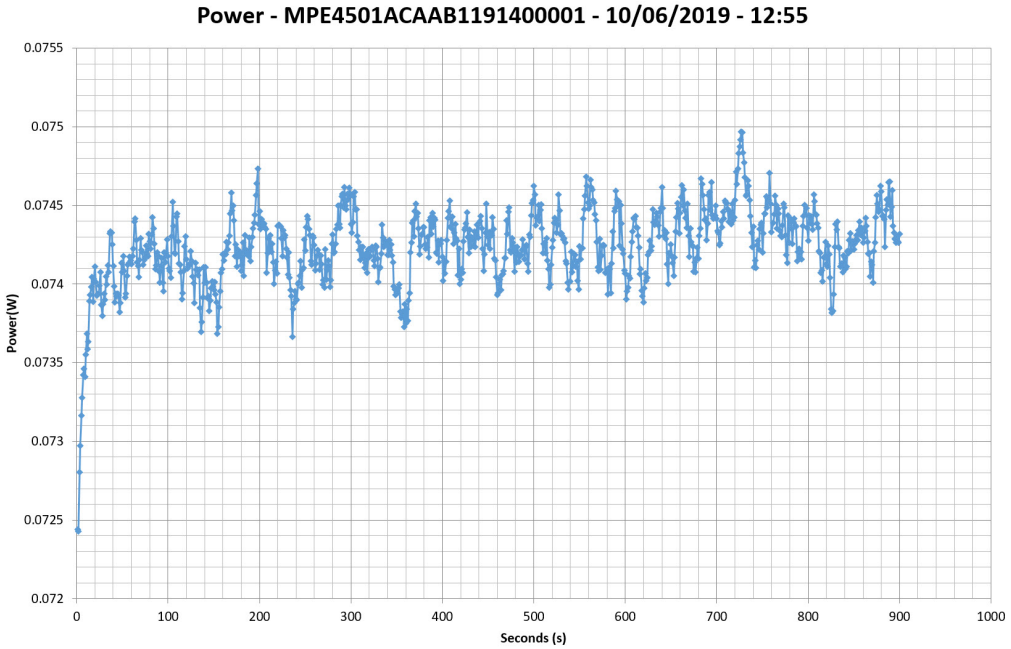
## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| 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 |

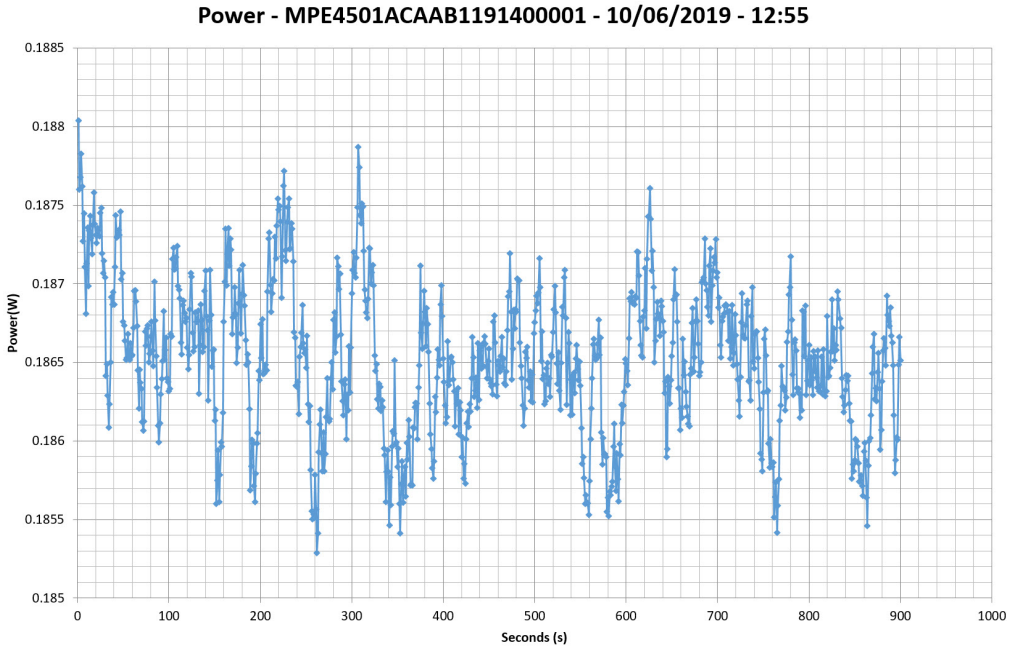
# Vampire Power

## Graphs

### 115V

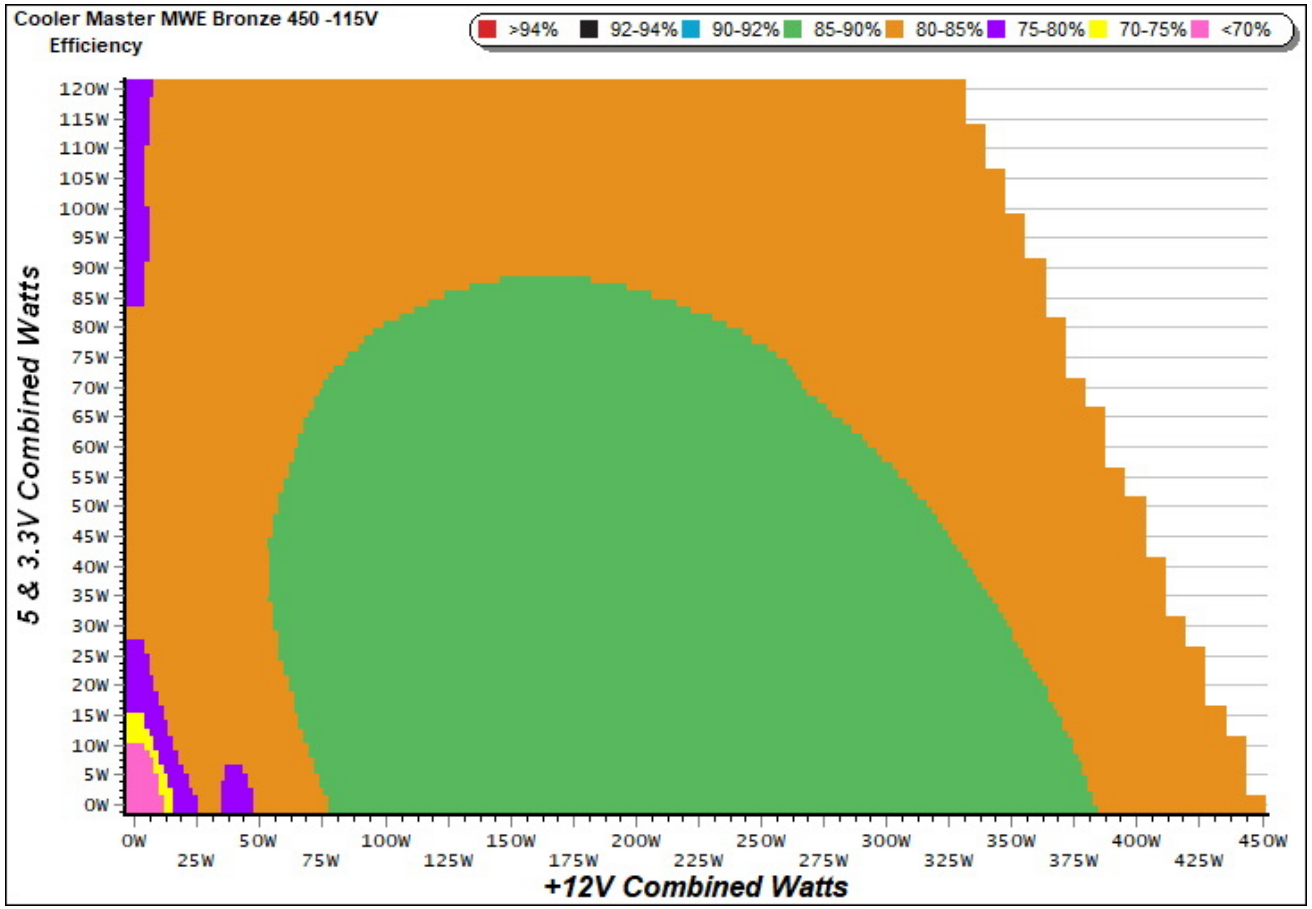



### 230V



## Efficiency Graph

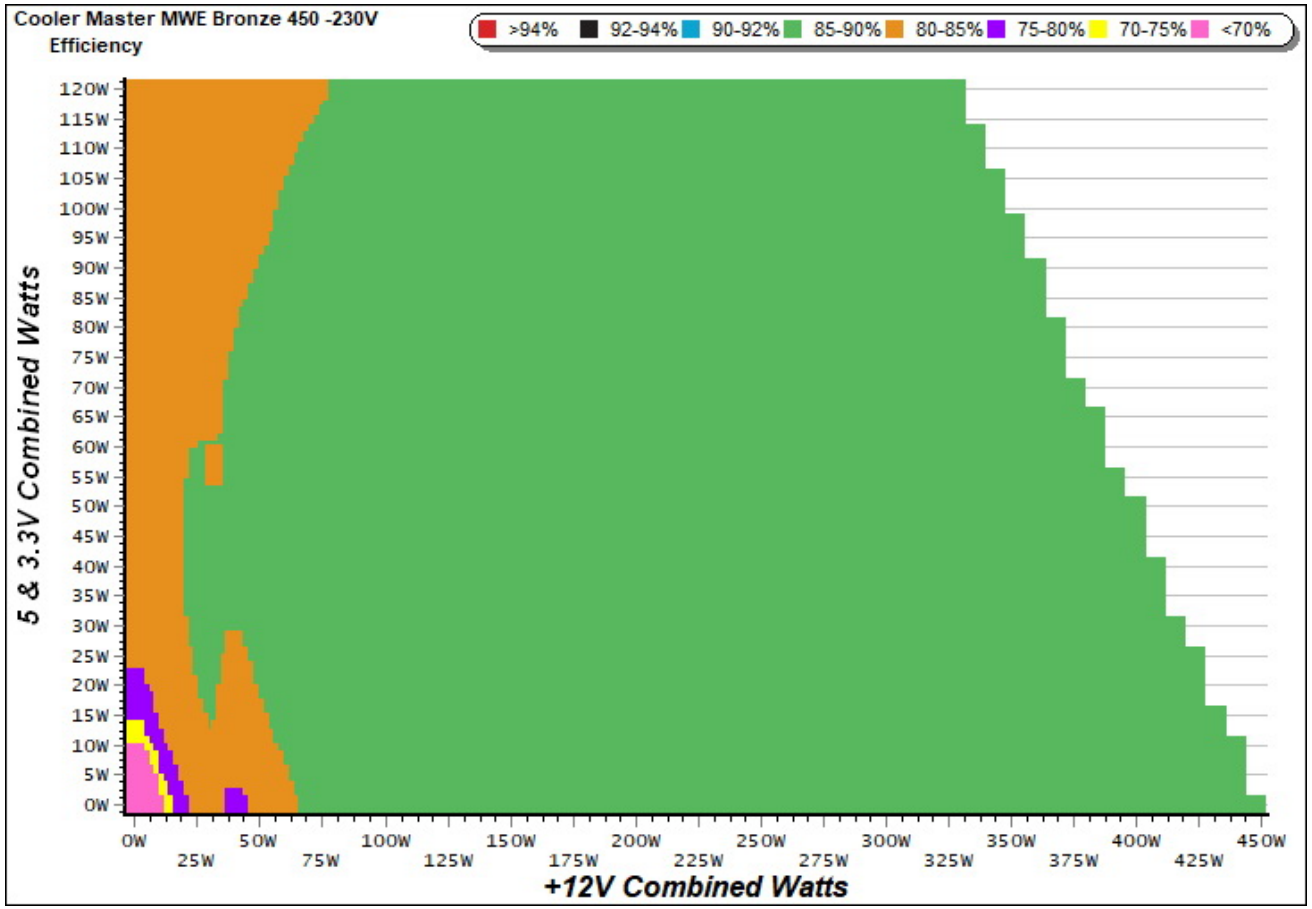
### 115V




### 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

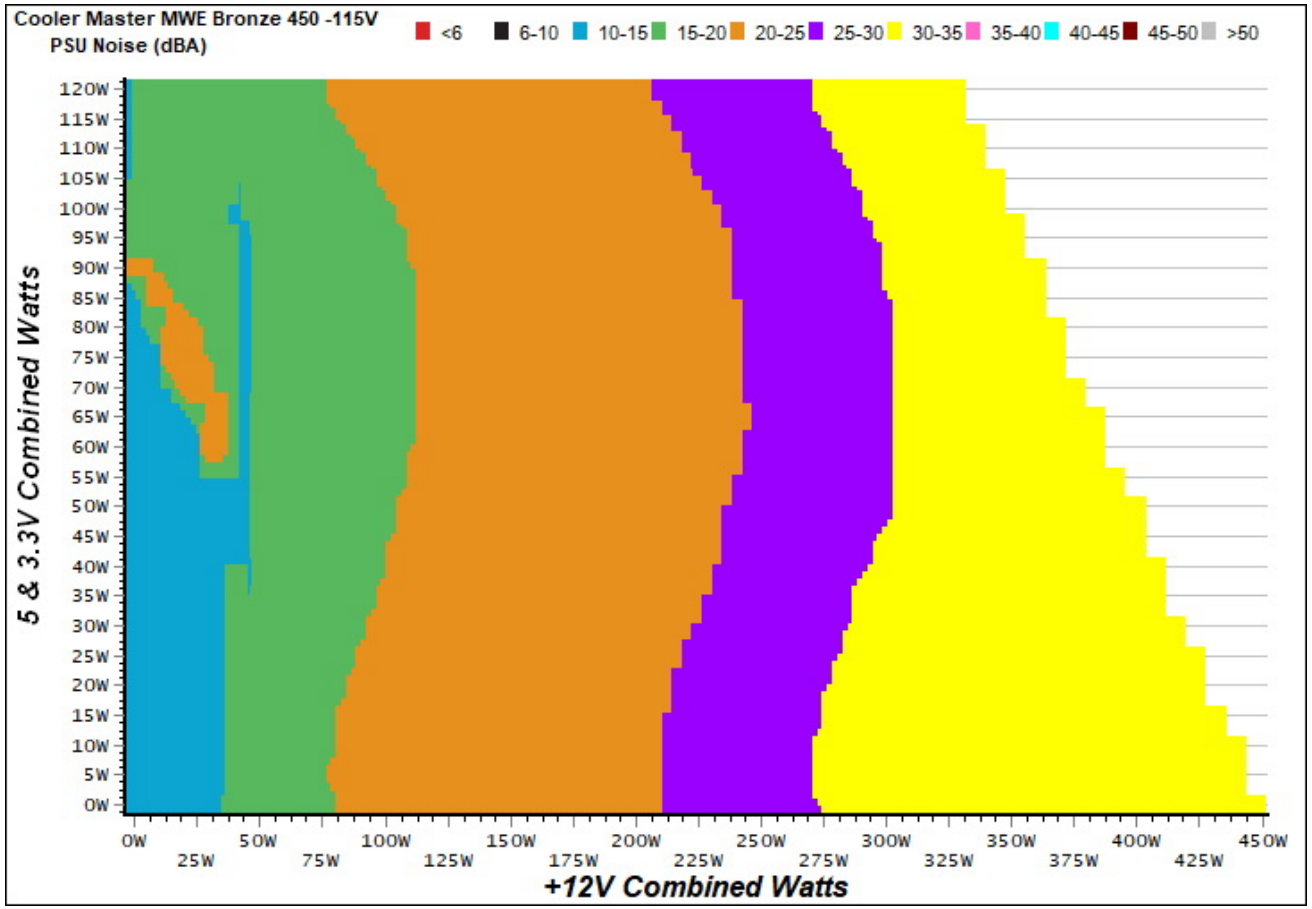



### INFO

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

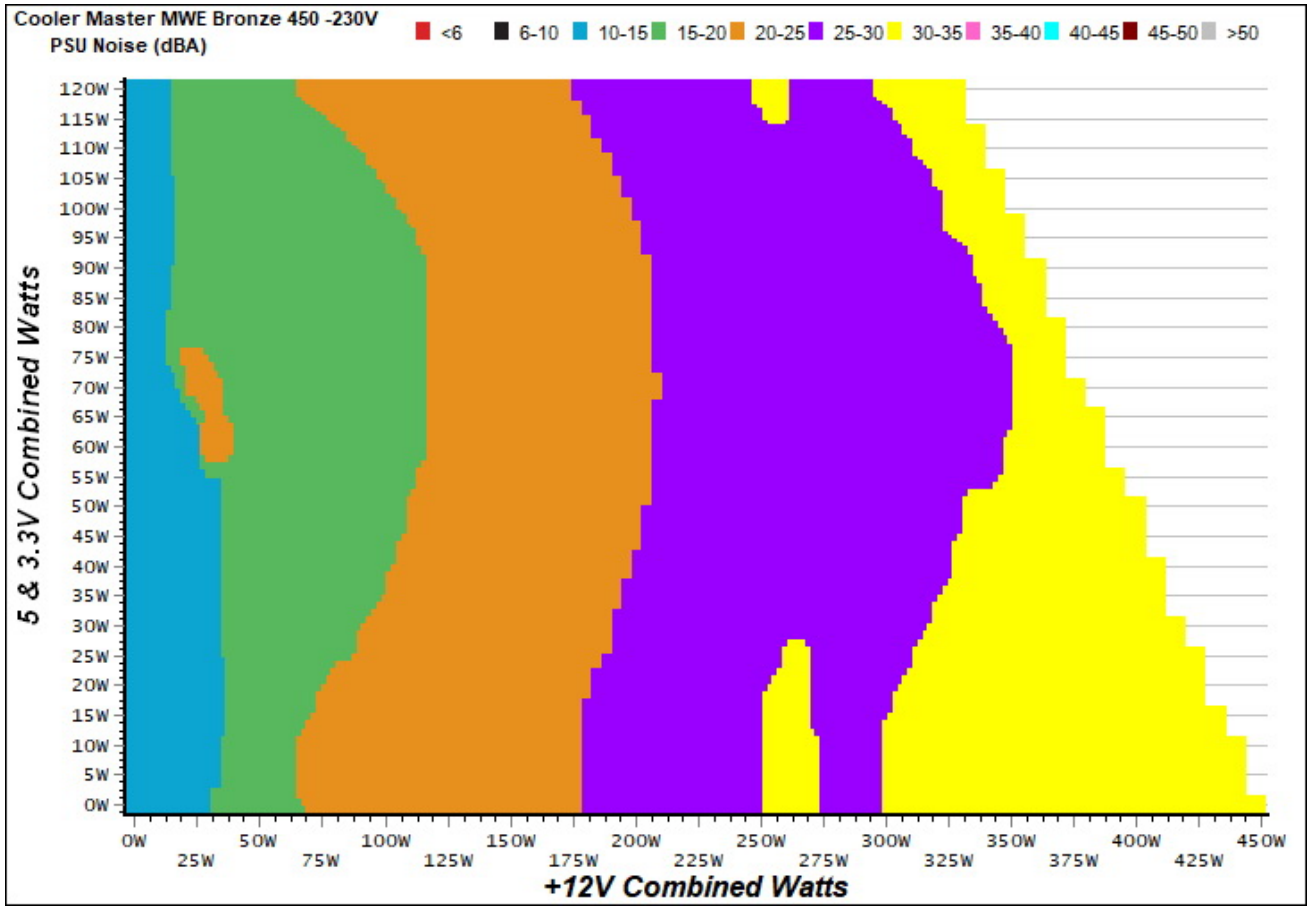
### 115V




### 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.

## 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.

## Noise under high ambient temperature (indicative)

### 115V

| Load | Normal ambient<br>fan · noise · intake | High ambient<br>fan · noise · intake | Noise change |
|---|---|---|---|
| 20% | 870 RPM · 18.5 dB(A) · 36.0 °C | 870 RPM · 18.5 dB(A) · 36.0 °C | **+0.0 dB(A)** |
| 50% | 1141 RPM · 27.4 dB(A) · 37.4 °C | 1141 RPM · 27.4 dB(A) · 37.4 °C | **+0.0 dB(A)** |
| 100% | 1481 RPM · 33.1 dB(A) · 39.9 °C | 1481 RPM · 33.1 dB(A) · 39.9 °C | **+0.0 dB(A)** |

### 230V

| Load | Normal ambient<br>fan · noise · intake | High ambient<br>fan · noise · intake | Noise change |
|---|---|---|---|
| 20% | 832 RPM · 17.7 dB(A) · 35.6 °C | 832 RPM · 17.7 dB(A) · 35.6 °C | **+0.0 dB(A)** |
| 50% | 1137 RPM · 26.9 dB(A) · 37.5 °C | 1137 RPM · 26.9 dB(A) · 37.5 °C | **+0.0 dB(A)** |
| 100% | 1476 RPM · 33.1 dB(A) · 39.7 °C | 1476 RPM · 33.1 dB(A) · 39.7 °C | **+0.0 dB(A)** |

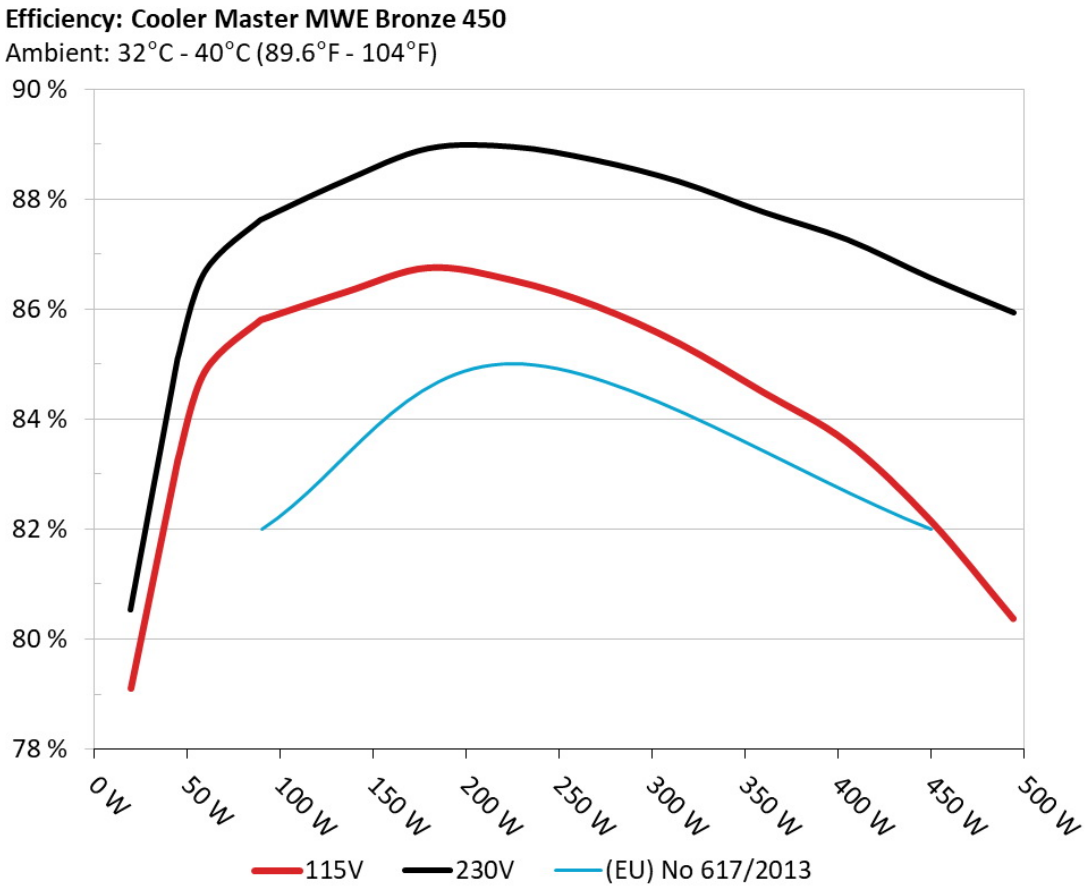
### INFO

Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative of how the fan behaves when it is hot. "<6.0" is the floor of our sound meter, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

*Informational. Not part of the ETA or LAMBDA rating.*

## Indicative Performance

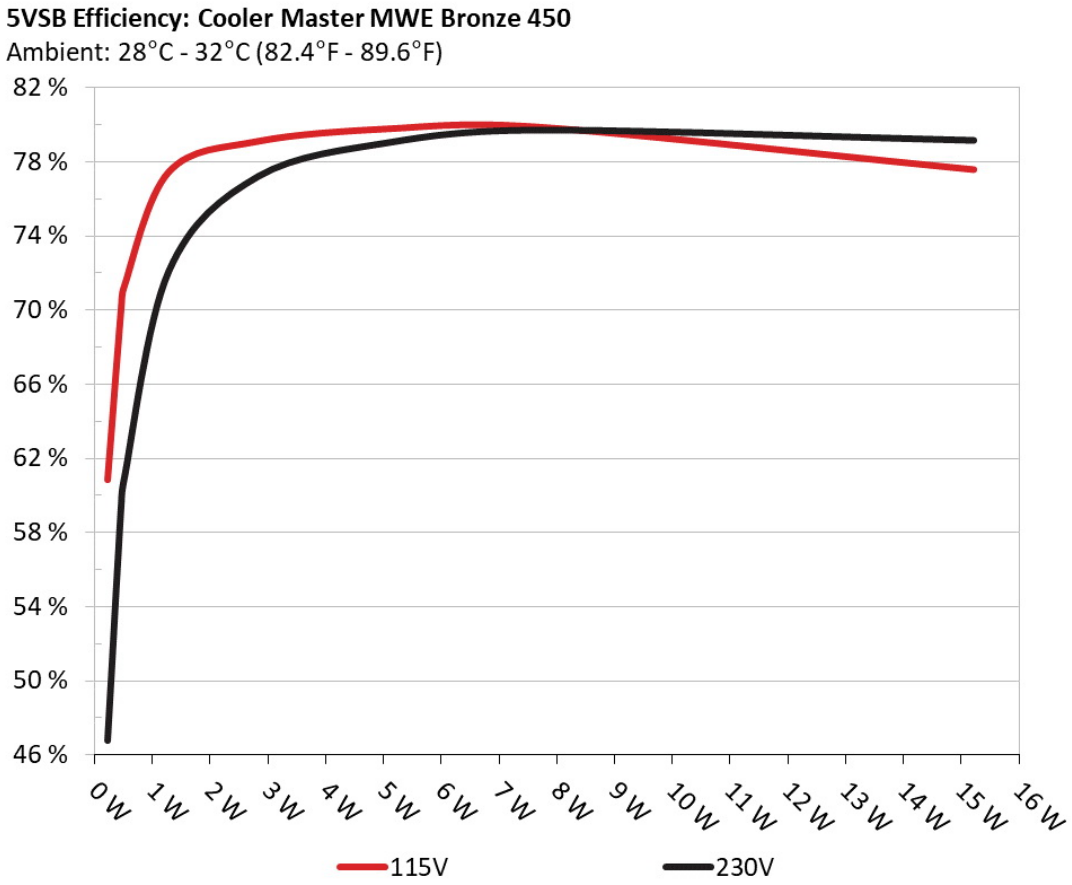
### Efficiency under high ambient temperature




**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

All data and graphs included in this test report can be used by any individual on the following conditions:
› It should be mentioned that the test results are provided by Cybenetics
› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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