



**Make It Yours.**

## Cooler Master MWE 400

☐ MPE4001ACABW1191400003

Lab ID CM19400035

Certification ID 25695

Test Result Report ID: 20PS695A

Certificate Issue Date: Nov 6, 2019

115V 230V

Scheme: ETA-EMI PSU

115V

230V



Scheme: LAMBDA PSU

A handwritten signature in blue ink, appearing to be "Aristeidis Bitziopoulos".

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   | Cybernetics PSU Test Protocol                                                       |

### DUT Information(Non-accredited measurements)

|                                   |                        |
|-----------------------------------|------------------------|
| Product Identification Details    |                        |
| Brand                             | Cooler Master          |
| Model                             | MWE 400                |
| OEM/ODM                           | Gospower               |
| Serial Number                     | MPE4001ACABW1191400003 |
| Product Specifications            |                        |
| Manufacturer-Provided Information |                        |
| □□□□ (Vrms)                       | 200-240                |
| □□□□ (Arms)                       | 4                      |
| □□□□ (Hz)                         | 50-60                  |

|                                                   |                                                                                     |
|---------------------------------------------------|-------------------------------------------------------------------------------------|
| □□□□ (W)                                          | 400                                                                                 |
| Operating Temperature (Continuous Full Load) (°C) |                                                                                     |
| □□                                                | ATX12V                                                                              |
| □□□□                                              | Fixed cables                                                                        |
| Warranty                                          | -                                                                                   |
| Cybenetics Measurements                           |                                                                                     |
| Dimensions (W x H x D)                            |                                                                                     |
| Weight                                            |                                                                                     |
| □□                                                | 120mm Rifle Bearing Fan<br>(DF1202512SELN)                                          |
| □□□□                                              | ✓                                                                                   |
| Cybenetics Testing Information                    |                                                                                     |
| Lab ID                                            | CM19400035                                                                          |
| Date of receipt                                   | Jul 5, 2019                                                                         |
| Testing Date                                      | May 17, 2019                                                                        |
| Report Issued Date                                | Nov 6, 2019                                                                         |
| Engineer Name                                     | -                                                                                   |
| Authorized By the Laboratory Technical Manager    | Aristeidis Bitziopoulos                                                             |
| Signature                                         |  |

□□□□ (Non-accredited measurements)

| □□□□                                 |      |       |          |                     |
|--------------------------------------|------|-------|----------|---------------------|
| □□                                   | □□□□ | □□□□□ | Gauge    | In Cable Capacitors |
| ATX □□ 20+4 pin (510mm)              | 1    | 1     | 18-20AWG | □                   |
| 4+4 pin EPS 12V □□ (530mm)           | 1    | 1     | 18AWG    | □                   |
| 6+2pin PCIe□□ (490mm)                | 1    | 1     | 18AWG    | □                   |
| SATA□□ (420mm+150mm+150mm)           | 2    | 6     | 18-20AWG | □                   |
| 4-pin Molex (420mm+150mm+150mm)      | 1    | 3     | 18-20AWG | □                   |
| AC Power Cord (1400mm) - C13 coupler | 1    | 1     | 18AWG    | -                   |



|          |    |      |    |     |      |      |
|----------|----|------|----|-----|------|------|
| □        |    | 3.3V | 5V | 12V | 5VSB | -12V |
| □□□□     | □□ | 14   | 14 | 33  | 3    | 0.3  |
|          | □  | 100  |    | 396 | 15   | 3.6  |
| □□□□ (W) |    | 400  |    |     |      |      |

## 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 Diode Incorporated GBU608 (800V, 6A @ 100°C)                                                                                                                                                             |
| APFC MOSFETS         | 1x JILIN SINO-MICROELECTRONICS JCS13N50FC (500V, 8A @ 100°C, 0.490hm)                                                                                                                                       |
| APFC Boost Diode     | 1x JILIN SINO-MICROELECTRONICS 10F60UHF (600V, 10A @ 100°C)                                                                                                                                                 |
| Hold-up Cap(s)       | 1x Elite (420V, 180uF, 2000h @ 85°C, GM)                                                                                                                                                                    |
| Main Switchers       | 2x JILIN SINO-MICROELECTRONICS JCS13N50FC (500V, 8A @ 100°C, 0.490hm)                                                                                                                                       |
| 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         | 2x 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: 8x 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 Rubyxon (4-10,000h @ 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

|                       |                   |
|-----------------------|-------------------|
| □□□□ (°C / °F)        | 28-32 / 82.4-89.6 |
| □□ ErP Lot3/6□□       | ✓                 |
| □□ (EU) No 617/2013□□ | ✓                 |

### Performance Summary 230V

|                                                |          |   |
|------------------------------------------------|----------|---|
| Accredited                                     |          |   |
| THD (%) (>1450 load combinations)              | 86.735%  |   |
| Average Noise Output (>1450 Load Combinations) | 30.74dBA |   |
| PF (%) (>1450 Load Combinations)               | 0.884    |   |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | -        |   |
| THD (%)                                        | 0.1826W  |   |
| Non-Accredited                                 |          |   |
| 12V Ripple (Full Load)                         | 65.00mV  |   |
| 5V Ripple (Full Load)                          | 31.43mV  |   |
| 3.3V Ripple (Full Load)                        | 21.98mV  |   |
| 5VSB Ripple (Full Load)                        | 25.19mV  |   |
| 12V Load Regulation                            | 1.11%    |   |
| 5V Load Regulation                             | 2.28%    |   |
| 3.3V Load Regulation                           | 2.36%    |   |
| 5VSB Load Regulation                           | 3.11%    |   |
| Inrush Current                                 | 122.936A |   |
| THD (%) & PG (%)                               | 16.20ms  |   |
| AC Loss to PWR_OK Hold Up Time                 | 15.20ms  |   |
| PWR_OK Inactive to DC Loss Delay               | 1.00ms   |   |
| OPP (0.00°C / 0.00°C)                          | 130.77%  | - |

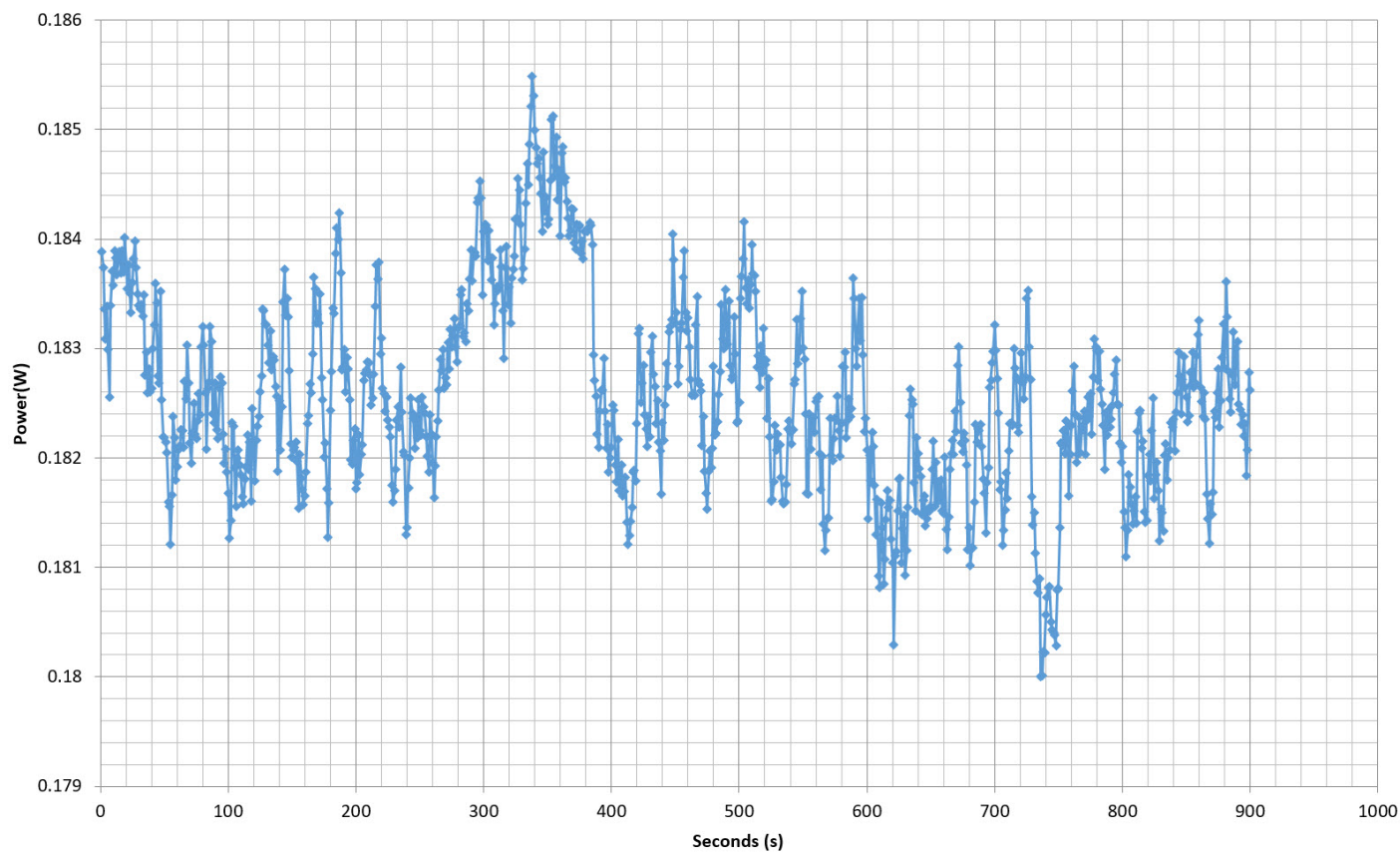
|||| & PG||

|                                       |      |
|---------------------------------------|------|
| Hold-Up Time (ms)                     | 16.2 |
| AC Loss to PWR_OK Hold Up Time (ms)   | 15.2 |
| PWR_OK Inactive to DC Loss Delay (ms) | 1.0  |



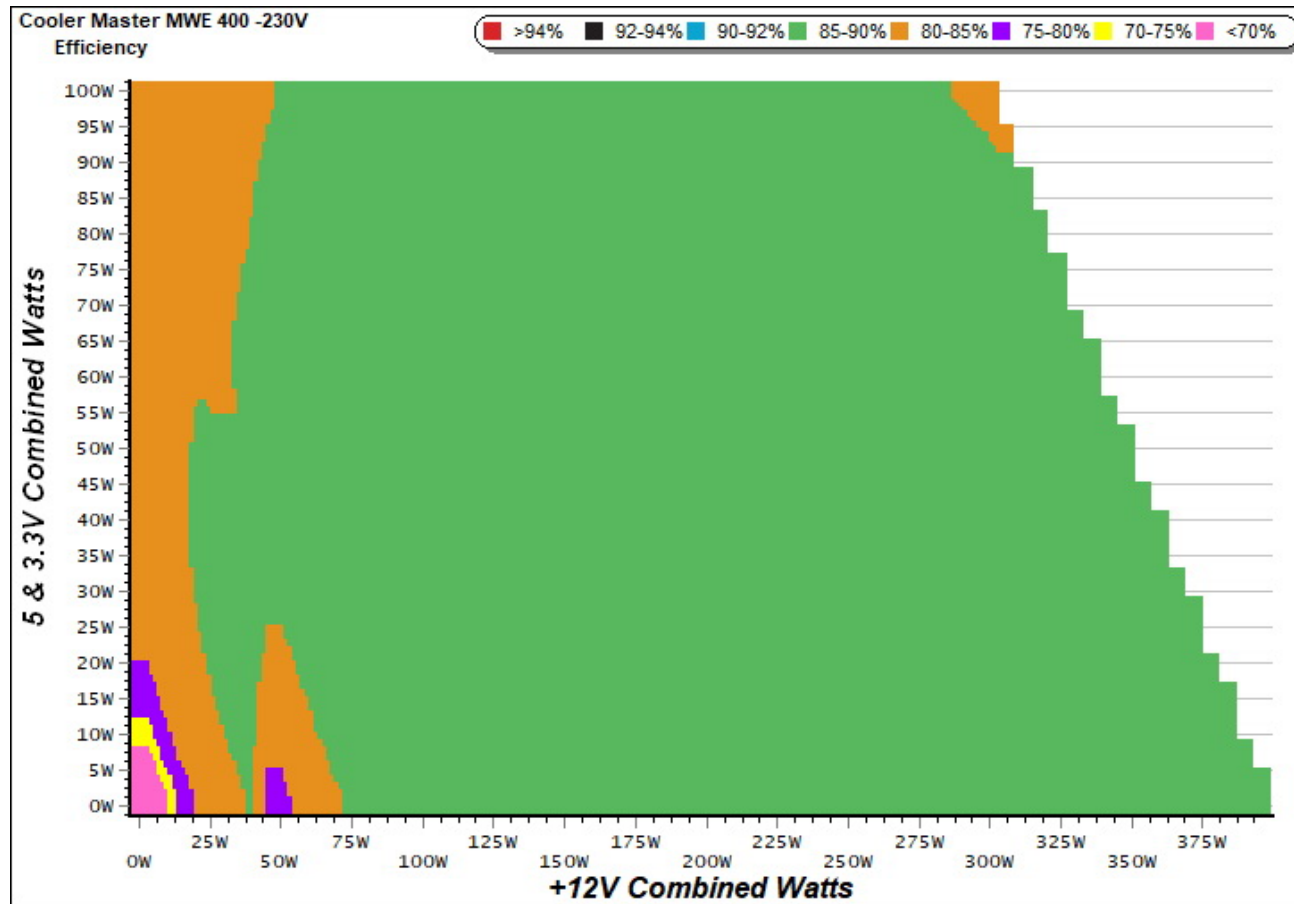
Graphs 230V

Power - MPE4001ACABW1191400003 - 15/05/2019 - 12:03





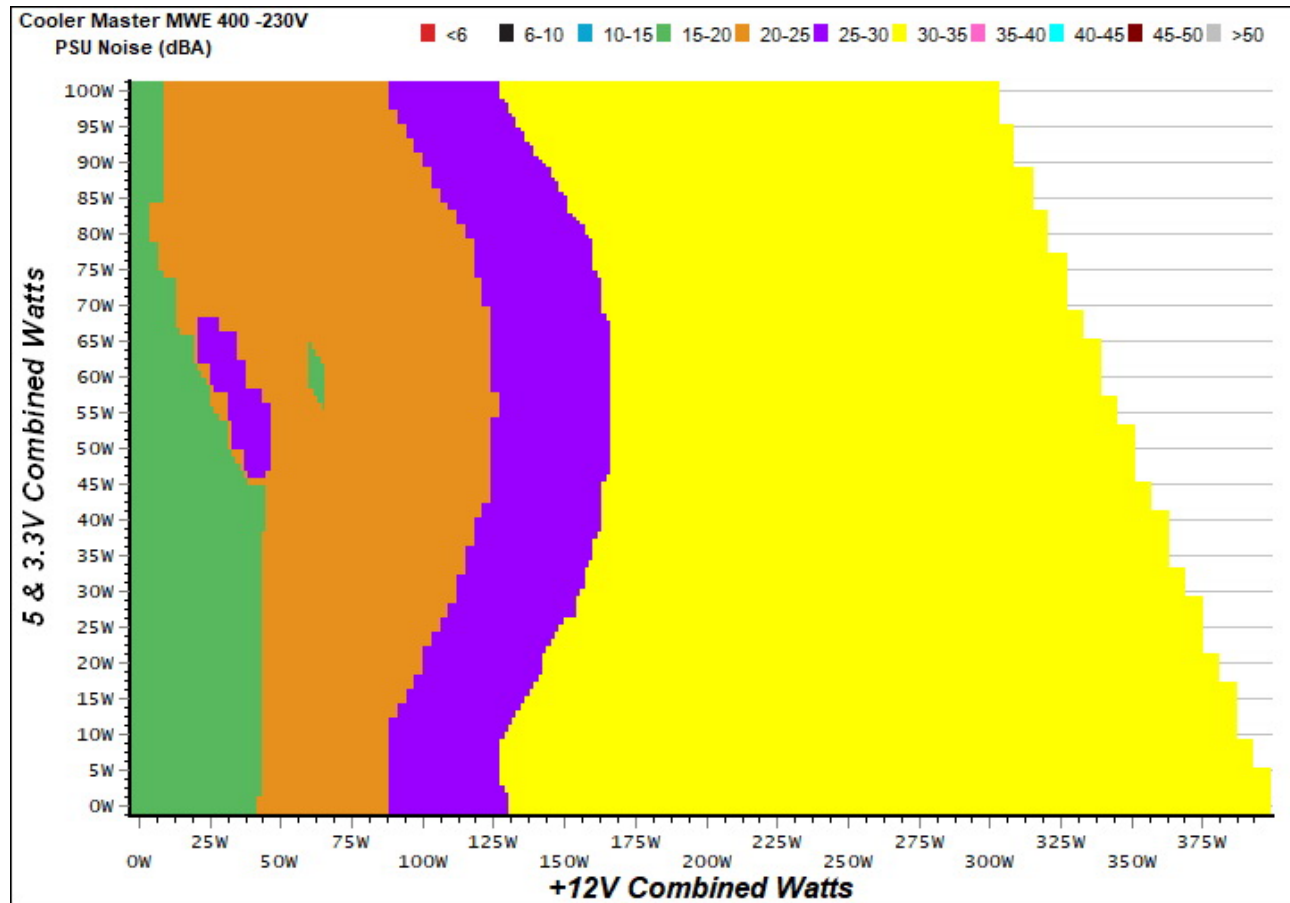
## 230V



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



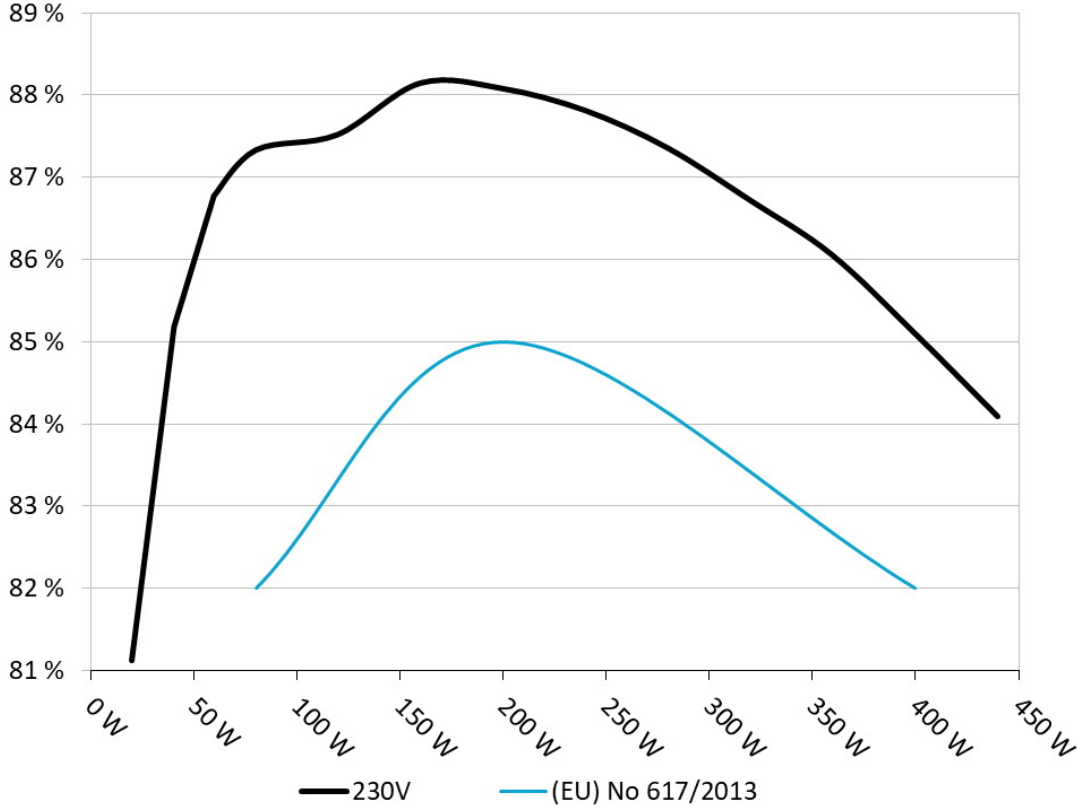
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

# Indicative Performance



## Efficiency: Cooler Master MWE 400

Ambient: 32°C - 40°C (89.6°F - 104°F)

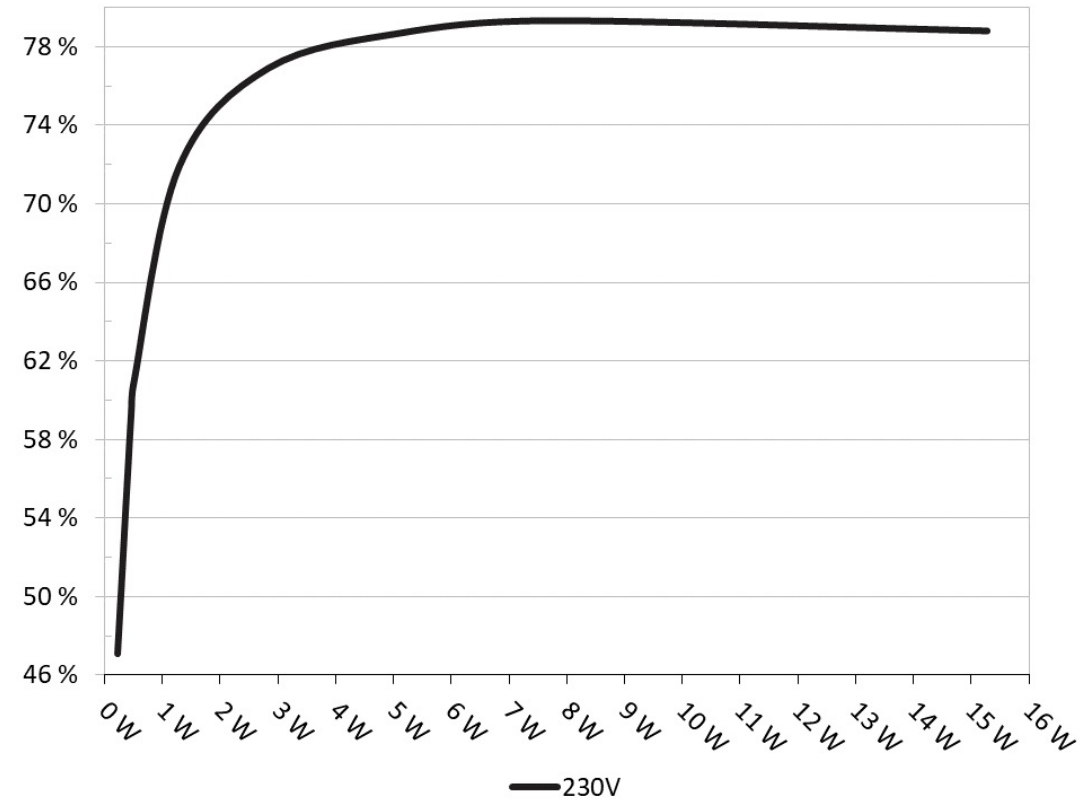


The PSU`s efficiency under high ambient temperatures with 115V and 230V input. For this graph the results of the 10-110% load regulation table are used.

# 5Vsb

## 5VSB Efficiency: Cooler Master MWE 400

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



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

## 5Vsb (ErP Lot3/6 & CEC) 230V

| # | 5VSB   | DC/AC ( ) |         | PF/AC   |
|---|--------|-----------|---------|---------|
| 1 | 0.045A | 0.234     | 47.082% | 0.009   |
|   | 5.180V | 0.497     |         | 230.31V |

|   |        |        |         |         |
|---|--------|--------|---------|---------|
| 2 | 0.090A | 0.467  | 59.264% | 0.015   |
|   | 5.179V | 0.788  |         | 230.31V |
| 3 | 0.550A | 2.842  | 76.894% | 0.067   |
|   | 5.165V | 3.696  |         | 230.31V |
| 4 | 1.000A | 5.152  | 78.693% | 0.115   |
|   | 5.151V | 6.547  |         | 230.31V |
| 5 | 1.500A | 7.705  | 79.310% | 0.160   |
|   | 5.136V | 9.715  |         | 230.32V |
| 6 | 3.000A | 15.271 | 78.790% | 0.261   |
|   | 5.090V | 19.382 |         | 230.32V |

### Supplementary Tests (For Reference)

10-110% 230V

| # | 12V     | 5V     | 3.3V   | 5VSB   | DC/AC ( ) |         | (RPM) | (dB[A]) | ( / )   | PF/AC   |
|---|---------|--------|--------|--------|-----------|---------|-------|---------|---------|---------|
| 1 | 1.532A  | 2.019A | 1.973A | 0.973A | 40.111    | 83.914% | 0     | <6.0    | 40.86°C | 0.552   |
|   | 12.084V | 4.953V | 3.343V | 5.142V | 47.800    |         |       |         | 34.01°C | 230.25V |
| 2 | 4.050A  | 3.037A | 2.969A | 1.170A | 79.751    | 86.772% | 0     | <6.0    | 42.08°C | 0.747   |
|   | 12.062V | 4.940V | 3.334V | 5.128V | 91.909    |         |       |         | 34.79°C | 230.24V |
| 3 | 6.910A  | 3.551A | 3.457A | 1.369A | 119.273   | 87.514% | 1085  | 24.8    | 35.02°C | 0.838   |
|   | 12.050V | 4.930V | 3.326V | 5.115V | 136.290   |         |       |         | 43.51°C | 230.25V |
| 4 | 9.846A  | 4.066A | 3.979A | 1.568A | 159.676   | 88.142% | 1266  | 27.9    | 35.57°C | 0.876   |
|   | 12.033V | 4.919V | 3.317V | 5.102V | 181.157   |         |       |         | 44.27°C | 230.24V |
| 5 | 12.421A | 5.097A | 4.988A | 1.769A | 199.776   | 88.074% | 1431  | 32.8    | 36.27°C | 0.906   |
|   | 12.018V | 4.906V | 3.307V | 5.088V | 226.828   |         |       |         | 45.51°C | 230.24V |
| 6 | 15.002A | 6.133A | 6.000A | 1.972A | 239.884   | 87.807% | 1433  | 32.8    | 36.60°C | 0.925   |
|   | 12.004V | 4.893V | 3.298V | 5.073V | 273.194   |         |       |         | 46.36°C | 230.24V |
| 7 | 17.553A | 7.174A | 7.022A | 2.175A | 279.576   | 87.354% | 1433  | 32.8    | 37.33°C | 0.939   |
|   | 11.991V | 4.879V | 3.289V | 5.058V | 320.049   |         |       |         | 47.58°C | 230.23V |
| 8 | 20.177A | 8.224A | 8.048A | 2.380A | 320.069   | 86.710% | 1432  | 32.8    | 37.55°C | 0.948   |
|   | 11.977V | 4.865V | 3.280V | 5.043V | 369.124   |         |       |         | 48.50°C | 230.24V |

|     |         |         |         |        |         |         |      |      |         |         |
|-----|---------|---------|---------|--------|---------|---------|------|------|---------|---------|
| 9   | 23.144A | 8.755A  | 8.554A  | 2.384A | 359.378 | 86.053% | 1433 | 32.8 | 38.11°C | 0.954   |
|     | 11.963V | 4.855V  | 3.273V  | 5.035V | 417.623 |         |      |      | 49.42°C | 230.24V |
| 10  | 25.947A | 9.291A  | 9.097A  | 2.996A | 399.786 | 85.093% | 1432 | 32.8 | 39.28°C | 0.959   |
|     | 11.950V | 4.845V  | 3.265V  | 5.008V | 469.821 |         |      |      | 50.98°C | 230.24V |
| 11  | 29.326A | 9.300A  | 9.113A  | 3.001A | 439.800 | 84.087% | 1437 | 32.8 | 40.38°C | 0.962   |
|     | 11.938V | 4.839V  | 3.259V  | 5.000V | 523.027 |         |      |      | 52.54°C | 230.23V |
| CL1 | 0.135A  | 12.002A | 11.999A | 0.000A | 99.661  | 82.097% | 1430 | 32.8 | 36.58°C | 0.817   |
|     | 12.049V | 4.868V  | 3.301V  | 5.140V | 121.394 |         |      |      | 45.41°C | 230.26V |
| CL2 | 33.007A | 1.001A  | 1.000A  | 1.000A | 407.863 | 85.918% | 1436 | 32.8 | 39.31°C | 0.959   |
|     | 11.954V | 4.910V  | 3.294V  | 5.088V | 474.713 |         |      |      | 50.69°C | 230.24V |

The results above are not used in the certification process

## 20-80 230V

| # | 12V     | 5V     | 3.3V   | 5VSB   | DC/AC ( ) |         | (RPM) | (dB[A]) | PF/AC   |
|---|---------|--------|--------|--------|-----------|---------|-------|---------|---------|
| 1 | 1.202A  | 0.504A | 0.478A | 0.193A | 19.609    | 81.119% | 0     | <6.0    | 0.345   |
|   | 12.069V | 4.967V | 3.351V | 5.172V | 24.173    |         |       |         | 230.27V |
| 2 | 2.459A  | 1.009A | 0.986A | 0.388A | 40.016    | 85.178% | 0     | <6.0    | 0.546   |
|   | 12.081V | 4.961V | 3.346V | 5.162V | 46.979    |         |       |         | 230.26V |
| 3 | 3.650A  | 1.514A | 1.467A | 0.582A | 59.468    | 86.499% | 0     | <6.0    | 0.666   |
|   | 12.073V | 4.954V | 3.342V | 5.152V | 68.750    |         |       |         | 230.26V |
| 4 | 4.918A  | 2.021A | 1.976A | 0.778A | 79.905    | 87.329% | 0     | <6.0    | 0.746   |
|   | 12.060V | 4.948V | 3.337V | 5.142V | 91.499    |         |       |         | 230.26V |

The results above are not used in the certification process

## 230V

| Test     | 12V     | 5V      | 3.3V    | 5VSB    | Pass/Fail |
|----------|---------|---------|---------|---------|-----------|
| 10% Load | 71.3 mV | 19.2 mV | 12.4 mV | 14.7 mV | Pass      |
| 20% Load | 54.0 mV | 19.5 mV | 12.2 mV | 14.9 mV | Pass      |
| 30% Load | 59.5 mV | 20.0 mV | 13.5 mV | 15.0 mV | Pass      |
| 40% Load | 57.1 mV | 19.6 mV | 13.6 mV | 16.6 mV | Pass      |

