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# Cooler Master X SILENT EDGE PLATINUM 1100 230V

Serial Number

Lab ID CM11002485

Certification ID 252485

Test Result Report ID: 24PS2485A

Certificate Issue Date: Jun 25, 2024

115V 230V

Scheme: ETA-EMI PSU

CYBENETICS PLATINUM 230v

115V 230V

CYBENETICS A++ 230v

Scheme: LAMBDA PSU

CYBENETICS ATX 3.1 PASS

Outside Validation Scope

# 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 | X SILENT EDGE PLATINUM 1100 230V |
| OEM/ODM | Cooler Master |
| Serial Number | |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 200-240 |
| Rated Current (Arms) | 6.1 |

| | |
|---|---|
| Rated Frequency (Hz) | 50-60 |
| Rated Power (W) | 1100 |
| Operating Temperature (Continuous Full Load) (°C) | |
| Type | ATX12V |
| Cable Design | Fully Modular |
| Warranty | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| Weight | |
| Cooling | Passive |
| Semi-Passive Operation | ✓ |
| Cybenetics Testing Information | |
| Lab ID | CM11002485 |
| Date of receipt | May 29, 2024 |
| Testing Date | Jun 21, 2024 |
| Report Issued Date | Jun 25, 2024 |
| Engineer Name | - |
| Authorized By the Laboratory Technical Manager | Aristeidis Bitziopoulos |
| Signature | |

## Cables and Connectors(Non-accredited measurements)

| **Modular Cables** | | | | |
|---|---|---|---|---|
| **Description** | **Cable Count** | **Connector Count (Total)** | **Gauge** | In Cable Capacitors |
| ATX connector 24 pin (645mm) | 1 | 1 | 18-22AWG | No |
| 4+4 pin EPS12V (645mm) | 1 | 1 | 16AWG | No |
| 8 pin EPS12V (645mm) | 1 | 1 | 16AWG | No |
| 6+2 pin PCIe (550mm) | 4 | 4 | 16-18AWG | No |
| 12+4 pin PCIe (650mm) (600W) | 1 | 1 | 16-28AWG | No |
| SATA (500mm+140mm+140mm+140mm) | 3 | 12 | 18AWG | No |
| 4-pin Molex (500mm+120mm+120mm+120mm) | 1 | 4 | 18AWG | No |

| | | | | |
|---|---|---|---|---|
| 4-pin PWM Fan Connector (400mm) | 1 | 1 | 28AWG | No |
| USB M/B Connector (790mm) | 1 | 1 | 24AWG | No |
| AC Power Cord (1360mm) - C13 coupler | 1 | 1 | 17AWG | - |

## Protection Features(Manufacturer)

| | |
|---|---|
| Over Power Protection | ✗ |
| Over Current (+12V) Protection | ✗ |
| Over Temperature Protection | ✓ |
| Short Circuit Protection | ✗ |
| Surge Protection | ✓ |
| Inrush Current Protection | ✓ |
| Fan Failure Protection | ✗ |

## Power Specifications

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 20 | 20 | 91.6 | 3 | 0.3 |
| | Watts | 120 | | 1099.2 | 15 | 3.6 |
| Total Max. Power (W) | | 1100 | | | | |

## Parts Description

| | |
|---|---|
| **General Data** | |
| Manufacturer (OEM) | Cooler Master |
| Platform | MPS-D001-AFAP |
| PCB Type | Double-Sided (Four-layer board) |
| **Primary Side** | |
| Transient Filter | 2x Y caps, 1x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | 1x NTC Thermistor SCK20100 (10 Ohm @25°C) & Relay |
| Rectifier MOSFETs | 4x Infineon IPT60R022S7 (600V, 23A @ 140°C, Rds(on): 0.0.22Ohm) |
| APFC MOSFETs | 2x Infineon IMW65R072M1H (650V, 18A @ 100°C, Rds(on): 0.094Ohm) |
| APFC Driver | Infineon 2EDN7524F |
| APFC Boost Diode | 1x Infineon IDW10G65C5 (650V, 10A @ 130°C) |

| | |
|---|---|
| Bulk Cap(s) | 2x TDK B43641 (450V, 560uF each or 1120uF combined, 2000h @ 105°C) |
| Main Switchers | 4x Infineon IPW60R070CFD7 (650V, 31A @ 25°C, Rds(on): 0.07Ohm) |
| Driver ICs | 2x Infineon 2ED21814S06J (650V, 31A @ 25°C, Rds(on): 0.07Ohm) |
| APFC Controller | Infineon ICE3PCS01G |
| Resonant Controller | Infineon ICE2HS01G |
| Primary Side MCU | NXP MC9S08SH8CWJ |
| Topology | Primary side: Bridgeless PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters |
| **Secondary Side** | |
| +12V MOSFETs | 12x Infineon ISC010N04NM6 (40V, 201A @ 100°C, Rds(on): 1.0mOhm) |
| 5V & 3.3V | DC-DC Converters: 6x Infineon ISC011N03L5S (30V, 100A @ 100°C, Rds(on): 1.1mOhm) PWM Controller(s): 1x |
| Filtering Capacitors | Electrolytic: 2x Rubycon (6-10,000 @ 105°C, ZLH), Polymer: 42x Nippon Chemi-Con, 7x |
| Supervisor IC | Weltrend WT7502 |
| Secondary Side MCU | Silicon Labs C8051F380-GQ |
| **5VSB** | |
| TVS Diode | 1x SMBJ150A |
| Low Side Rectifier | DK DK5V45R05M (45V, Rds(on): 5mOh) |
| Standby PWM Controller | Infineon ICE5QR1680BG |

# 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 | ✓ |
| ALPM (Alternative Low Power Mode) compatible | ✓ |
| ATX v3.1 PSU Power Excursion | ✓ |

## Performance Summary 230V

| | |
|---|---|
| Accredited | |
| Average Efficiency (>1450 load combinations) | 92.611% |
| Average Noise Output (>1450 Load Combinations) | 6.00dBA |

| | | |
|---|---|---|
| Average PF (>1450 Load Combinations) | 0.964 | |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | - | |
| Standby Power Consumption | 0.1643W | |
| Non-Accredited | | |
| 12V Ripple (Full Load) | 29.97mV | |
| 5V Ripple (Full Load) | 15.59mV | |
| 3.3V Ripple (Full Load) | 13.97mV | |
| 5VSB Ripple (Full Load) | 9.58mV | |
| 12V Load Regulation | 0.51% | |
| 5V Load Regulation | 0.96% | |
| 3.3V Load Regulation | 2.05% | |
| 5VSB Load Regulation | 2.82% | |
| Inrush Current | 38.190A | |
| 12V Transient Response (200%) | 11.12V | |
| 5V Transient Response (200%) | 4.900V | |
| 3.3V Transient Response (200%) | 3.265V | |
| 5VSB Transient Response (200%) | 4.866V | |
| Hold-Up Time & PWR_OK Signal | 26.40ms | |
| AC Loss to PWR_OK Hold Up Time | 19.30ms | |
| PWR_OK Inactive to DC Loss Delay | 7.10ms | |
| PSU Timings: T1 (20% / 100%) | 84.0ms | 83.0ms |
| PSU Timings: T3 (20% / 100%) | 125.0ms | 126.0ms |
| 12V OCP (27.3°C / 42.1°C) | 111.40A (121.62%), 11.937V | 110.20A (120.31%), 11.949V |
| 5V OCP (27.3°C / 42.1°C) | 25.0A (125.00%), 5.004V | 24.0A (120.00%), 5.018V |
| 3.3V OCP (27.3°C / 42.1°C) | 25.1A (125.50%), 3.354V | 24.0A (120.00%), 3.361V |
| 5VSB OCP (27.3°C / 42.1°C) | 4.4A (146.67%), 4.965V | 4.1A (136.67%), 4.973V |
| OPP (26.99°C / 41.85°C) | 120.52% | 120.25% |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 26.4 |
| AC Loss to PWR_OK Hold Up Time (ms) | 19.3 |

| | |
|---|---|
| PWR_OK Inactive to DC Loss Delay (ms) | 7.1 |

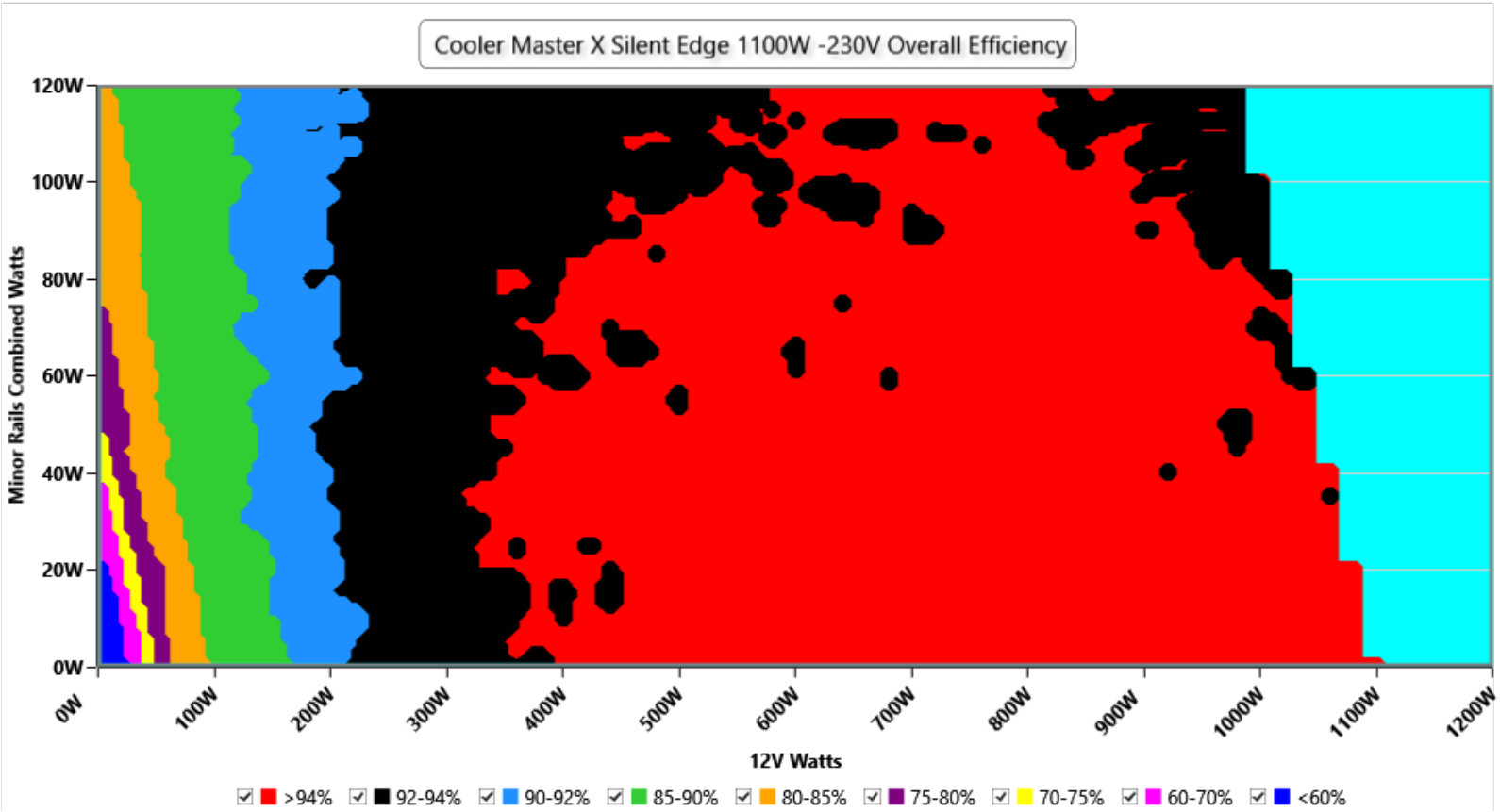
# Vampire Power

## Tables 230V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 231.02 V | 230.93 V | 227.70 V | 231.10 V | 232.30 V | PASS |
| Mains Frequency: | 50.00 Hz | 49.99 Hz | 49.50 Hz | 50.01 Hz | 50.50 Hz | PASS |
| Mains Voltage CF: | 1.417 | 1.416 | 1.340 | 1.419 | 1.490 | PASS |
| Mains Voltage THD: | 0.17 % | 0.15 % | N/A | 0.27 % | 2.00 % | PASS |
| Real Power: | 0.164 W | 0.123 W | N/A | 0.211 W | N/A | N/A |
| Apparent Power: | 46.789 W | 46.075 W | N/A | 47.582 W | N/A | N/A |
| Power Factor: | 0.003 | N/A | N/A | N/A | N/A | N/A |

## Efficiency Graph

### 230V

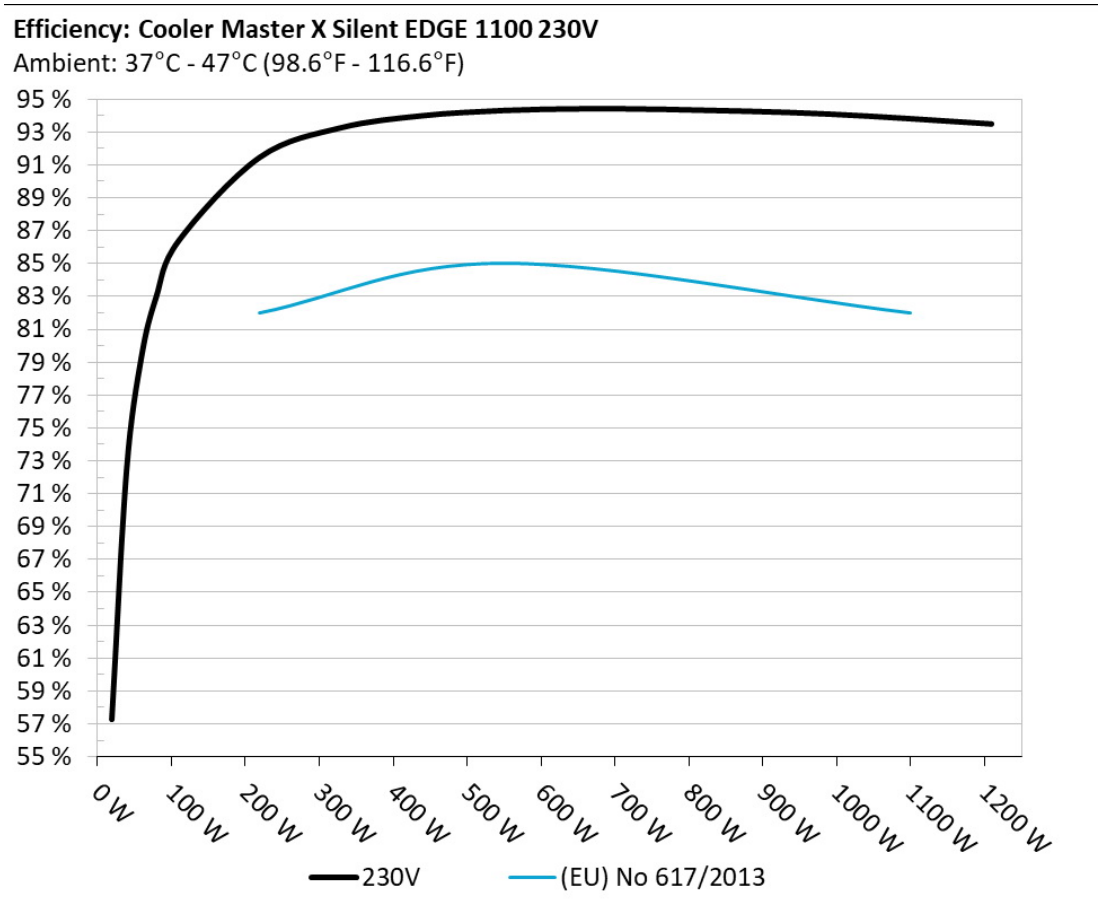



### INFO

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

## Indicative Performance

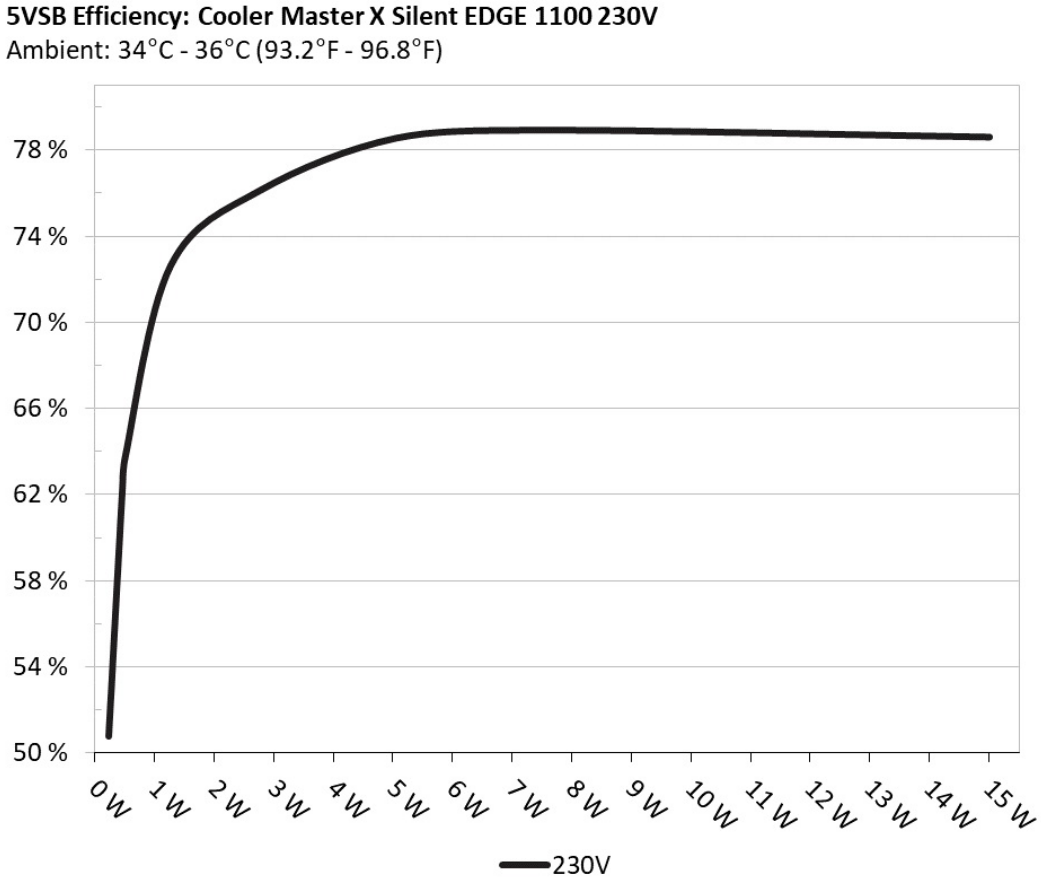
### Efficiency under high ambient temperature




**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) 230V

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| **1** | **0.045A** | 0.228W | 50.779% | 0.01 |
| | 5.069V | 0.449W | | 230.36V |

| | | | | |
|---|---|---|---|---|
| **2** | **0.09A** | 0.456W | 62.194% | 0.017 |
| | 5.068V | 0.733W | | 230.35V |
| **3** | **0.55A** | 2.782W | 76.134% | 0.081 |
| | 5.057V | 3.654W | | 230.37V |
| **4** | **1A** | 5.048W | 78.536% | 0.137 |
| | 5.047V | 6.428W | | 230.37V |
| **5** | **1.5A** | 7.554W | 78.906% | 0.192 |
| | 5.035V | 9.574W | | 230.37V |
| **6** | **3A** | 14.998W | 78.586% | 0.312 |
| | 4.999V | 19.085W | | 230.37V |

## Protection Features

| | |
|---|---|
| OCP (Cold @ 27.3°C) | 12V: 111.40A (121.62%), 11.937V<br>5V: 25.0A (125.00%), 5.004V<br>3.3V: 25.1A (125.50%), 3.354V<br>5VSB: 4.4A (146.67%), 4.965V |
| OCP (Hot) @ 42.1°C) | 12V: 110.20A (120.31%), 11.949V<br>5V: 24.0A (120.00%), 5.018V<br>3.3V: 24.0A (120.00%), 3.361V<br>5VSB: 4.1A (136.67%), 4.973V |
| OCP (Cold @ 27.0°C) | 1325.72W (120.52%) |
| OCP (Hot @ 41.9°C) | 1322.72W (120.25%) |
| OTP | ✓ (140°C @ Secondary Side) |
| SCP | 12V to Earth: ✓<br>5V to Earth: ✓<br>3.3V to Earth: ✓<br>5VSB to Earth: ✓<br>-12V to Earth: ✓ |
| PWR_OK | Proper Operation |
| NLO | ✓ |
| SIP | Surge: MOV<br>Inrush: NTC & Bypass Relay |

## Supplementary Tests (For Reference)

### Typical Load Tests 230V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|
| **10%** | **7.367A** | **1.985A** | **1.951A** | **0.992A** | 110.014 | 86.352% | 44.56°C | 0.841 |
| | 12.001V | 5.04V | 3.382V | 5.043V | 127.399 | | 40.35°C | 230.36V |
| **20%** | **15.762A** | **2.98A** | **2.933A** | **1.193A** | 219.977 | 91.448% | 44.53°C | 0.934 |
| | 11.995V | 5.034V | 3.375V | 5.031V | 240.56 | | 40.54°C | 230.34V |
| **30%** | **24.521A** | **3.48A** | **3.429A** | **1.395A** | 330.031 | 93.249% | 45.84°C | 0.966 |
| | 11.989V | 5.03V | 3.369V | 5.02V | 353.914 | | 41.18°C | 230.32V |
| **40%** | **33.258A** | **3.981A** | **3.926A** | **1.598A** | 439.721 | 93.979% | 46.72°C | 0.978 |
| | 11.982V | 5.025V | 3.362V | 5.008V | 467.883 | | 41.82°C | 230.3V |
| **50%** | **41.695A** | **4.982A** | **4.918A** | **1.802A** | 549.848 | 94.299% | 47.48°C | 0.984 |
| | 11.976V | 5.02V | 3.355V | 4.996V | 583.105 | | 42.22°C | 230.29V |
| **60%** | **50.146A** | **5.984A** | **5.914A** | **2.001A** | 659.985 | 94.403% | 48.6°C | 0.988 |
| | 11.969V | 5.015V | 3.348V | 4.984V | 699.122 | | 42.56°C | 230.28V |
| **70%** | **58.603A** | **6.988A** | **6.914A** | **2.213A** | 770.157 | 94.364% | 50.03°C | 0.991 |
| | 11.962V | 5.01V | 3.341V | 4.971V | 816.174 | | 43.21°C | 230.27V |
| **80%** | **67.070A** | **7.993A** | **7.917A** | **2.318A** | 879.74 | 94.254% | 51.52°C | 0.992 |
| | 11.956V | 5.005V | 3.334V | 4.961V | 933.429 | | 43.71°C | 230.25V |
| **90%** | **75.952A** | **8.499A** | **8.413A** | **2.424A** | 989.952 | 94.083% | 53.34°C | 0.994 |
| | 11.948V | 5.001V | 3.328V | 4.951V | 1052.251 | | 44.34°C | 230.24V |
| **100%** | **84.558A** | **9.006A** | **8.941A** | **3.044A** | 1099.578 | 93.804% | 56.47°C | 0.995 |
| | 11.943V | 4.997V | 3.321V | 4.928V | 1172.157 | | 45.88°C | 230.22V |
| **110%** | **93.121A** | **10.016A** | **10.047A** | **3.05A** | 1209.855 | 93.482% | 58.66°C | 0.995 |
| | 11.936V | 4.992V | 3.314V | 4.919V | 1294.201 | | 46.74°C | 230.21V |
| **CL1** | **0.117A** | **14.348A** | **14.16A** | **0A** | 121.308 | 85.177% | 51.42°C | 0.861 |
| | 12.000V | 5.032V | 3.368V | 5.06V | 142.433 | | 40.06°C | 230.37V |
| **CL2** | **0.117A** | **19.858A** | **0A** | **0A** | 101.4 | 83.6% | 55.11°C | 0.833 |
| | 12.006V | 5.036V | 3.387V | 5.068V | 121.303 | | 40.3°C | 230.38V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|
| **CL3** | **0.116A** | **0A** | **19.586A** | **0A** | 67.393 | 77.156% | 54.08°C | 0.775 |
| | 12.003V | 5.049V | 3.369V | 5.063V | 87.341 | | 39.96°C | 230.38V |
| **CL4** | **92.048A** | **0A** | **0A** | **0A** | 1100.137 | 94.246% | 57.19°C | 0.995 |
| | 11.952V | 5.017V | 3.338V | 5.01V | 1167.231 | | 45.02°C | 230.24V |

The results above are not used in the certification process

## Light Load Tests 230V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|
| **20W** | **1.238A** | **0.496A** | **0.487A** | **0.197A** | 20.004 | 57.277% | 42.65°C | 0.551 |
| | 12.004V | 5.045V | 3.389V | 5.067V | 34.968 | | 36.77°C | 230.37V |
| **40W** | **2.724A** | **0.694A** | **0.682A** | **0.296A** | 40.003 | 72.441% | 41.37°C | 0.673 |
| | 12.003V | 5.045V | 3.389V | 5.064V | 55.217 | | 37.32°C | 230.37V |
| **60W** | **4.210A** | **0.892A** | **0.877A** | **0.395A** | 60.002 | 79.302% | 42.46°C | 0.746 |
| | 12.003V | 5.044V | 3.387V | 5.061V | 75.663 | | 38.11°C | 230.37V |
| **80W** | **5.693A** | **1.091A** | **1.072A** | **0.495A** | 79.965 | 82.943% | 43.19°C | 0.789 |
| | 12.002V | 5.044V | 3.386V | 5.057V | 96.403 | | 39.07°C | 230.37V |

The results above are not used in the certification process

## Ripple Measurements 230V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 6.77mV | 9.08mV | 6.10mV | 5.20mV | Pass |
| 20% Load | 7.53mV | 9.74mV | 6.10mV | 5.20mV | Pass |
| 30% Load | 8.44mV | 10.35mV | 6.56mV | 5.45mV | Pass |
| 40% Load | 9.77mV | 10.35mV | 6.71mV | 5.55mV | Pass |
| 50% Load | 11.48mV | 10.25mV | 6.92mV | 5.71mV | Pass |
| 60% Load | 13.42mV | 10.86mV | 7.17mV | 6.06mV | Pass |
| 70% Load | 15.91mV | 12.14mV | 7.83mV | 6.32mV | Pass |
| 80% Load | 17.80mV | 13.62mV | 12.41mV | 6.93mV | Pass |
| 90% Load | 19.42mV | 13.77mV | 13.17mV | 6.72mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 100% Load | 29.97mV | 15.59mV | 13.97mV | 9.58mV | Pass |
| 110% Load | 31.73mV | 18.41mV | 14.91mV | 9.94mV | Pass |
| Crossload1 | 10.03mV | 14.67mV | 13.86mV | 19.83mV | Pass |
| Crossload2 | 7.17mV | 12.65mV | 5.59mV | 15.03mV | Pass |
| Crossload3 | 7.02mV | 13.01mV | 19.38mV | 14.32mV | Pass |
| Crossload4 | 28.32mV | 11.27mV | 7.53mV | 9.41mV | Pass |

The results above are not used in the certification process

## Cooler Master X SILENT EDGE PLATINUM 1100 230V

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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