be quiet!

# be quiet! Pure Power 13 M 850W

Serial Number 027EUS5161002004

Lab ID BQ85002841

Certification ID 252841

Test Result Report ID: 25PS2841A

Certificate Issue Date: Jun 10, 2025

Scheme: ETA-EMI PSU

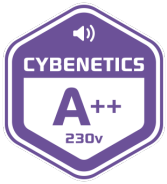






Scheme: LAMBDA PSU







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 | be quiet! |
| Model | Pure Power 13 M 850W |
| OEM/ODM | FSP |
| Serial Number | 027EUS5161002004 |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |

| | |
|---|---|
| Rated Current (Arms) | 6-12 |
| Rated Frequency (Hz) | 50-60 |
| Rated Power (W) | 850 |
| Operating Temperature (Continuous Full Load) (°C) | |
| Type | ATX12V |
| Cable Design | Fully Modular |
| Warranty | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| Weight | |
| Cooling | 120mm Rifle Bearing Fan (BQ QF2-12025-HS) |
| Semi-Passive Operation | ✓ |
| Cybenetics Testing Information | |
| Lab ID | BQ85002841 |
| Date of receipt | May 5, 2025 |
| Testing Date | Jun 3, 2025 |
| Report Issued Date | Jun 10, 2025 |
| 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 (550mm) | 1 | 1 | 18-22AWG | No |
| 4+4 pin EPS12V (650mm) | 1 | 1 | 16AWG | No |
| 8-pin EPS12V (650mm) | 1 | 1 | 16AWG | No |
| 2x 6+2 pin PCIe (600mm) | 2 | 2 | 16-18AWG | No |

| | | | | |
|---|---|---|---|---|
| 6+2 pin PCIe (500mm+150mm) | 1 | 2 | 16-18AWG | No |
| 12+4 pin PCIe (595mm) (600W) | 1 | 1 | 16-28AWG | No |
| SATA (500mm+150mm+150mm+150mm) | 1 | 4 | 18AWG | No |
| SATA (510mm+150mm) / 4-pin Molex (+150mm+150mm) | 1 | 2 / 2 | 18AWG | No |
| AC Power Cord (1350mm) - C13 Coupler | 1 | 1 | 18AWG | - |

## Protection Features

| | |
|---|---|
| Under Voltage Protection | ✓ |
| 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 | 22 | 22 | 70.9 | 3 | 0.3 |
| | Watts | 120 | | 850 | 15 | 3.6 |
| Total Max. Power (W) | | 850 | | | | |

## Parts Description

| | **General Data** |
|---|---|
| Manufacturer (OEM) | FSP |
| PCB Type | Double-Sided |
| | -**Primary Side** |
| Transient Filter | 4x Y caps, 2x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | NTC Thermistor & Relay |

| | |
|---|---|
| Bridge Rectifier(s) | 2x HY Electronic GBJ2508L (800V, 25A @ 100°C) |
| APFC MOSFETs | 2x GP36S60YERD |
| APFC Boost Diode | 1x DSC08C065 (650V, 8A @ 25°C) |
| Bulk Cap(s) | 2x Elite (420V, 390uF each or 940uF combined, 2000h @ 105°C,PL(M)) |
| Main Switchers | 2x ROHM Semiconductor R6035VNX3 (600V, 35A @ 25°C, Rds(on): 0.119Ohm) |
| IC Driver | Novosense NSI6602 |
| APFC Controller | Champion CM6500UNX |
| Resonant Controller | Champion CM6901X |
| Topology | Primary side: APFC, Half-Bridge & LLC Resonant Converter Secondary side: [12V] Synchronous Rectification & [Minor Rails] DC-DC converters |
| | **Secondary Side** |
| +12V MOSFETs | 6x Infineon BSC014N04LS (40V, 145A @ 100°C, Rds(on): 1.4mOhm) |
| 5V & 3.3V | DC-DC Converters: 4x Nexperia PSMN3RO-30YLD (30V, 100A @ 25°C, Rds(on): 3.1mOhm) PWM Controller(s): ANPECAPW7159C |
| Filtering Capacitors | Electrolytic: 1x Rubycon (6-10,000 @ 105°C, ZLH) 3x Elite (2,000 @ 105°C, EL) 2x Elite (2-5,000 @ 105°C, ED) 1x Elite (4-10,000 @ 105°C, EY) 1x Elite (3-6,000 @ 105°C, EV) Polymer: 19x Apaq, 8 Elite (CS), 9x Biostar |
| Supervisor IC | IN1S4241-SDG (OCP, OVP, UVP, SCP, PG) |
| Fan Controller | Grenergy GR8031 |
| Fan Model | BQ QF2-12025-HS (120mm, 12V, 0.30A, Rifle Bearing Fan) |
| | **5VSB Circuit** |
| Synchronous Rectification Driver | Leadtrend LD8926AA13 Synchronous Rectification IC |

# 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

### 115V

| | |
|---|---|
| Accredited | |
| Average Efficiency (>1450 load combinations) | 90.834% |
| Average Noise Output (>1450 Load Combinations) | 11.00dBA |
| Average PF (>1450 Load Combinations) | 0.992 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 72.605% |
| Standby Power Consumption | 0.0396W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 27.27mV |
| 5V Ripple (Full Load) | 13.67mV |
| 3.3V Ripple (Full Load) | 14.81mV |
| 5VSB Ripple (Full Load) | 23.24mV |
| 12V Load Regulation | 0.47% |
| 5V Load Regulation | 0.82% |
| 3.3V Load Regulation | 1.28% |
| 5VSB Load Regulation | 2.19% |
| Inrush Current | 36.960A |

## 230V

| | | |
|---|---|---|
| Accredited | | |
| Average Efficiency (>1450 load combinations) | | 92.732% |
| Average Noise Output (>1450 Load Combinations) | | 10.96dBA |
| Average PF (>1450 Load Combinations) | | 0.961 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | | 76.440% |
| Standby Power Consumption | | 0.1206W |
| Non-Accredited | | |
| 12V Ripple (Full Load) | | 27.94mV |
| 5V Ripple (Full Load) | | 14.18mV |
| 3.3V Ripple (Full Load) | | 14.59mV |
| 5VSB Ripple (Full Load) | | 23.59mV |
| 12V Load Regulation | | 0.48% |
| 5V Load Regulation | | 0.84% |
| 3.3V Load Regulation | | 1.31% |
| 5VSB Load Regulation | | 2.21% |
| Inrush Current | | 66.440A |
| 12V Transient Response (200%) | | 11.56V |
| 5V Transient Response (200%) | | 4.912V |
| 3.3V Transient Response (200%) | | 3.197V |
| 5VSB Transient Response (200%) | | 4.982V |
| Hold-Up Time & PWR_OK Signal | | 21.80ms |
| AC Loss to PWR_OK Hold Up Time | | 17.40ms |
| PWR_OK Inactive to DC Loss Delay | | 4.40ms |
| PSU Timings: T1 (20% / 100%) | 70.0ms | 69.0ms |
| PSU Timings: T3 (20% / 100%) | 142.0ms | 141.0ms |
| 12V OCP (29.0°C / 42.9°C) | 84.40A (119.04%), 12.075V | 82.20A (115.94%), 12.081V |
| 5V OCP (29.0°C / 42.9°C) | 28.8A (130.91%), 4.999V | 28.5A (129.55%), 4.998V |
| 3.3V OCP (29.0°C / 42.9°C) | 30.6A (139.09%), 3.285V | 30A (136.36%), 3.285V |
| 5VSB OCP (29.0°C / 42.9°C) | 3.9A (130.00%), 5.023V | 3.9A (130.00%), 5.019V |
| OPP (29.48°C / 41.62°C) | 121.14% | 118.78% |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 21.8 |
| AC Loss to PWR_OK Hold Up Time (ms) | 17.4 |
| PWR_OK Inactive to DC Loss Delay (ms) | 4.4 |



## Tables

### 115V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 115.08 V | 115.03 V | 113.85 V | 115.12 V | 116.15 V | PASS |
| Mains Frequency: | 60.00 Hz | 59.99 Hz | 59.40 Hz | 60.01 Hz | 60.60 Hz | PASS |
| Mains Voltage CF: | 1.416 | 1.415 | 1.340 | 1.418 | 1.490 | PASS |
| Mains Voltage THD: | 0.13 % | 0.09 % | N/A | 0.18 % | 2.00 % | PASS |
| Real Power: | 0.040 W | -0.001 W | N/A | 0.076 W | N/A | N/A |
| Apparent Power: | 9.912 W | 9.856 W | N/A | 9.971 W | N/A | N/A |
| Power Factor: | 0.005 | N/A | N/A | N/A | N/A | N/A |

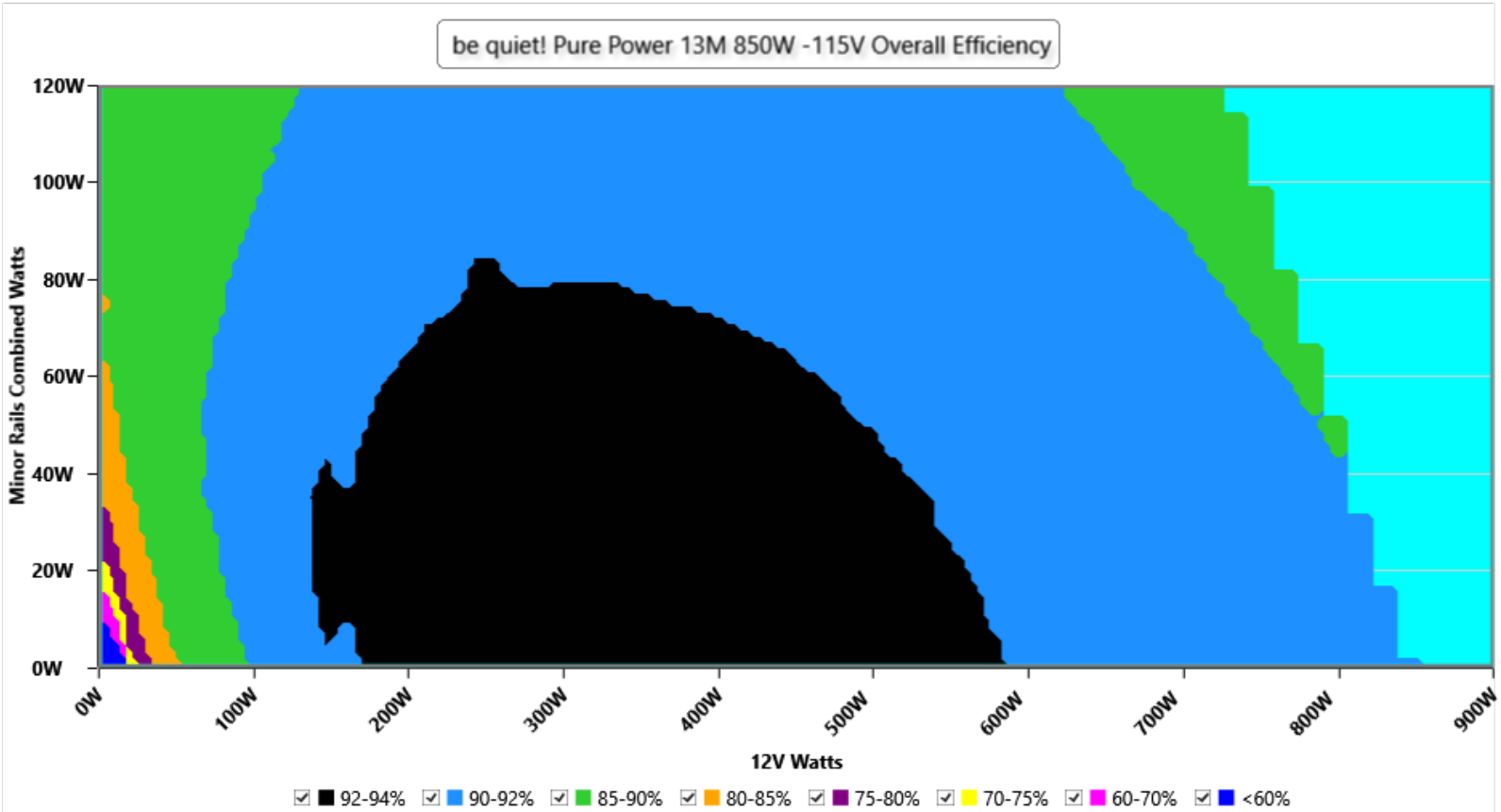
### 230V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 231.01 V | 230.92 V | 227.70 V | 231.09 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 % | 0.14 % | N/A | 0.27 % | 2.00 % | PASS |
| Real Power: | 0.121 W | 0.082 W | N/A | 0.183 W | N/A | N/A |
| Apparent Power: | 34.099 W | 33.880 W | N/A | 34.329 W | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| Power Factor: | 0.004 | N/A | N/A | N/A | N/A | N/A |

## Efficiency Graph

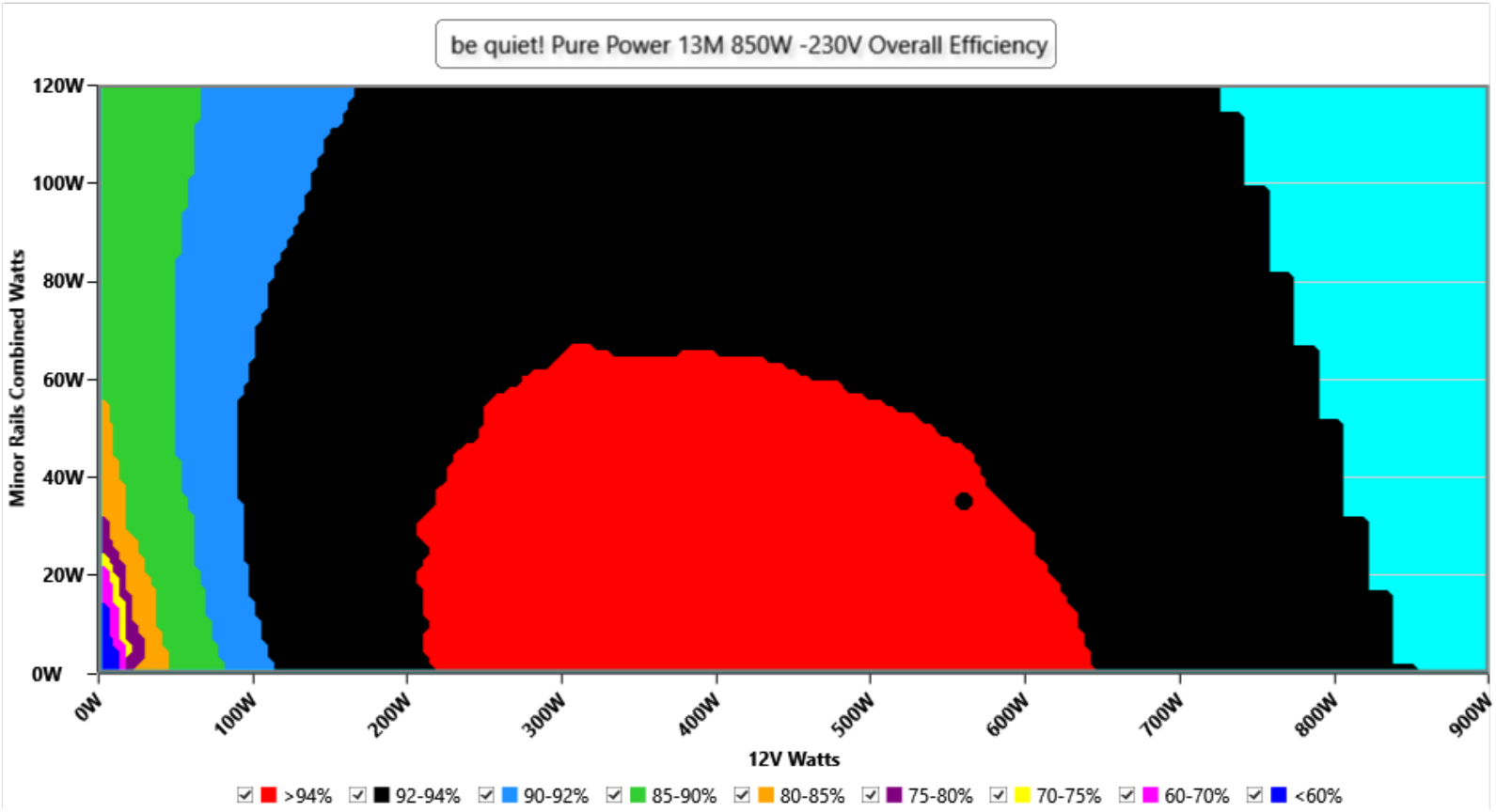
**115V**




**INFO**

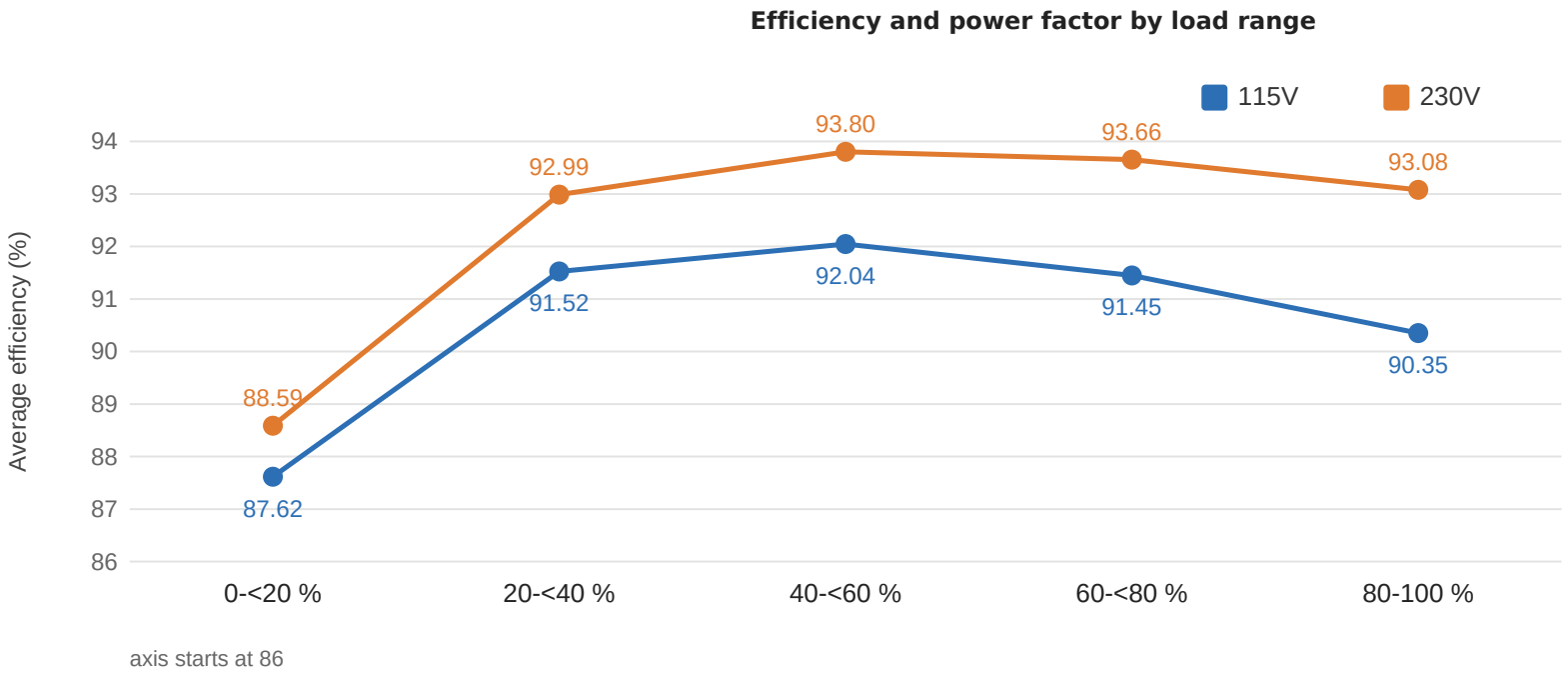
This graph depicts the PSU`s efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

## 230V

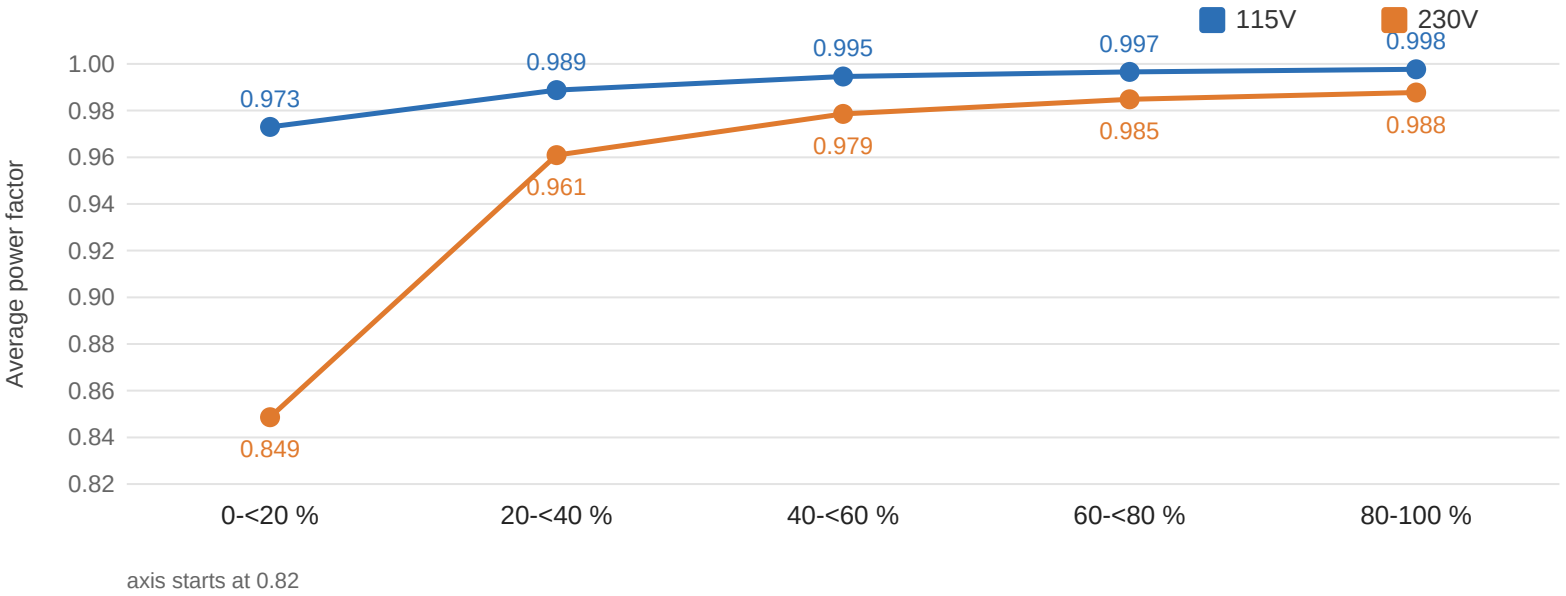



### INFO

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




axis starts at 86




axis starts at 0.82

| Load range | Points | Efficiency 115V | Efficiency 230V | PF 115V | PF 230V |
|---|---|---|---|---|---|
| 0-<20 % | 200 / 200 | 87.62% | 88.59% | 0.973 | 0.849 |
| 20-<40 % | 318 / 318 | 91.52% | 92.99% | 0.989 | 0.961 |
| 40-<60 % | 319 / 319 | 92.04% | 93.80% | 0.995 | 0.979 |
| 60-<80 % | 318 / 318 | 91.45% | 93.66% | 0.997 | 0.985 |
| 80-100 % | 326 / 326 | 90.35% | 93.08% | 0.998 | 0.988 |
| 70-100 % (High-Load) | 486 / 486 | 90.64% | 93.24% | 0.997 | 0.987 |
| All (published average) | 1481 / 1481 | 90.83% | 92.73% | 0.992 | 0.961 |

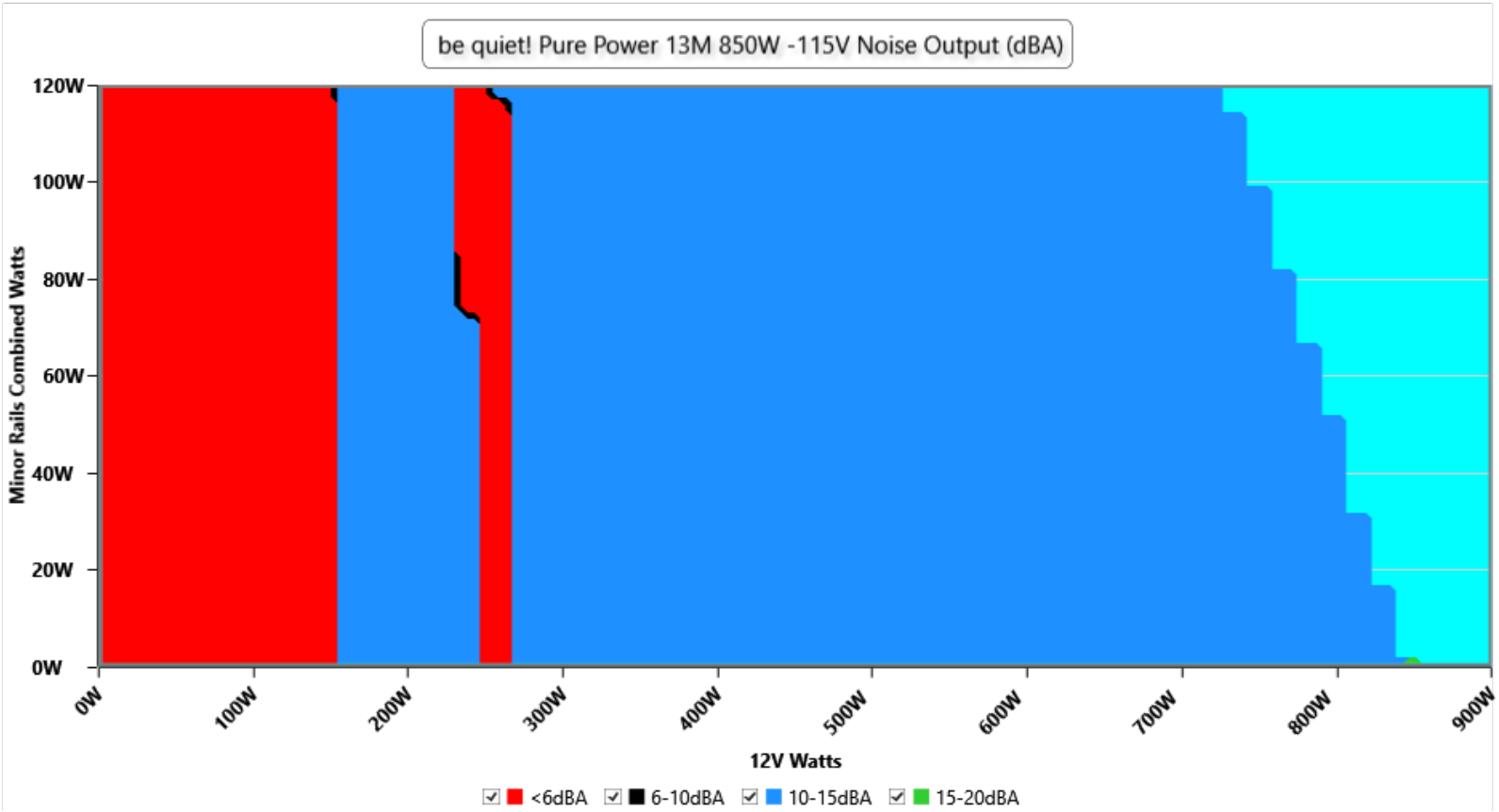
**INFO**

The average efficiency and power factor in five ranges of load. Calculated from the 1481 (115V) and 1481 (230V) load combinations of the certification sweep, the same data that ETA and LAMBDA use (test 0 excluded). Load is the total DC output as a share of the rated 850 W. These are plain averages of the valid readings, as for the ETA rating, so the ranges combined give back the published averages.

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

## Noise Graph

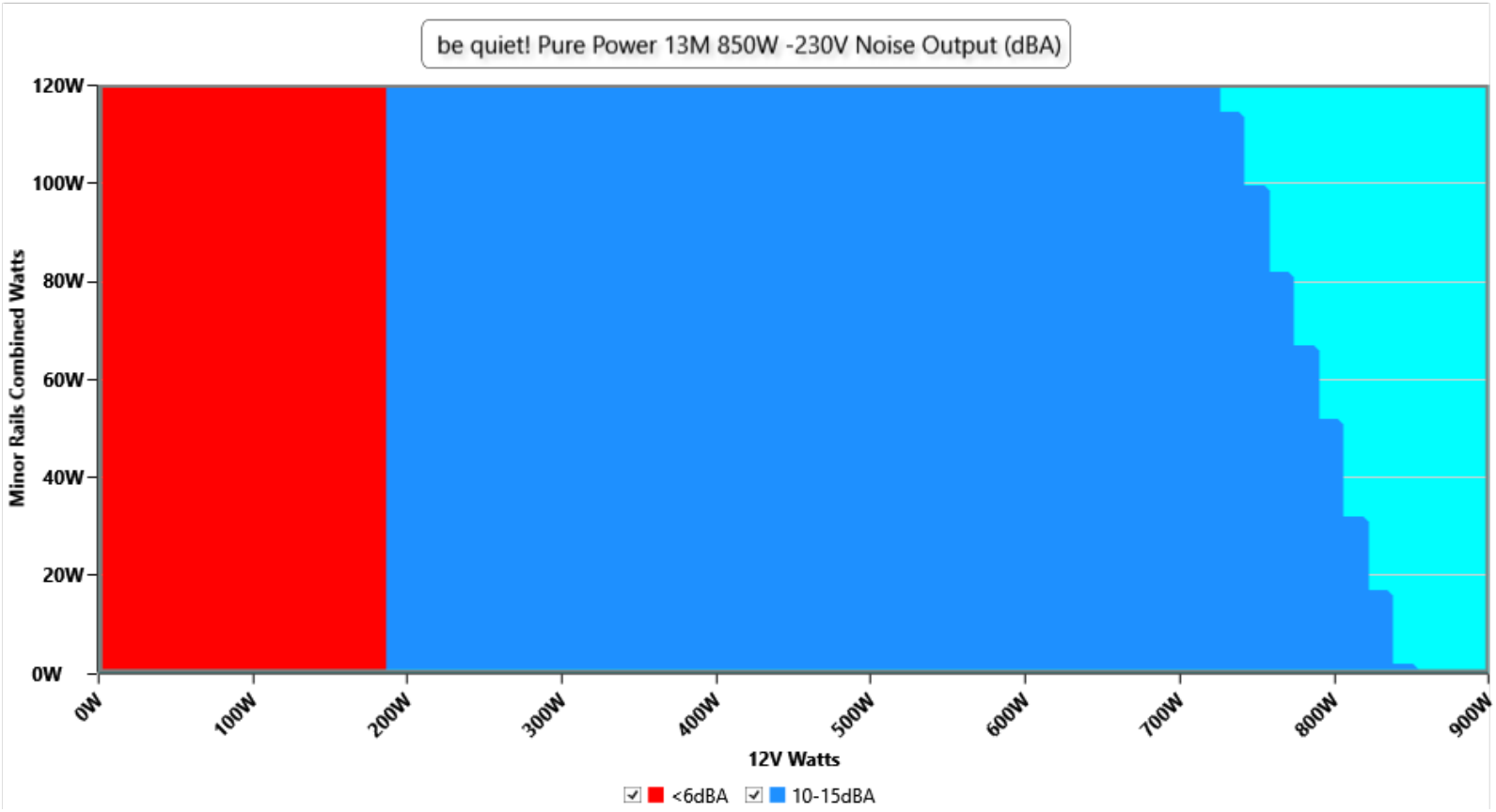
### 115V




### 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

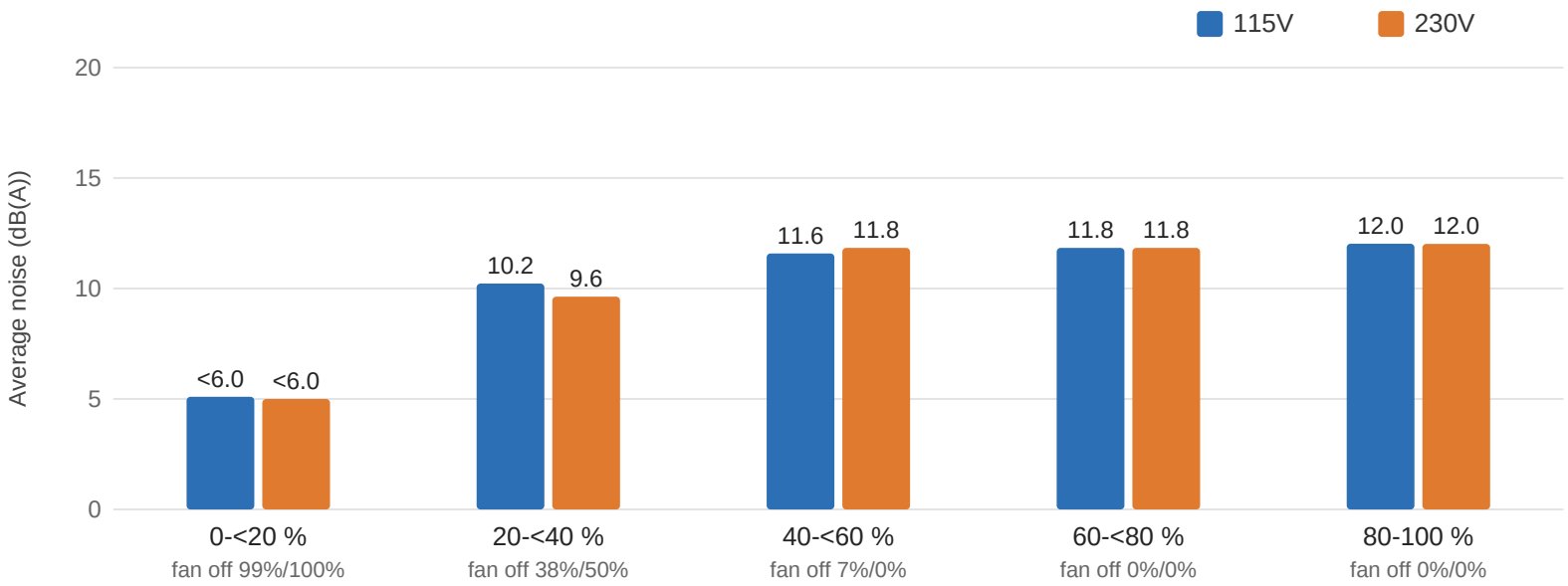
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

### Noise by load range

**High-Load Index (70-100 % load)**

Noise **12.0 dB(A)** at 115V and **12.0 dB(A)** at 230V · loudest point 15.5 dB(A)

Efficiency 90.64% / 93.24% · power factor 0.997 / 0.987 (115V / 230V)




| Load range | Noise 115V<br>avg (loudest) | Noise 230V<br>avg (loudest) | Fan off<br>115V / 230V |
|---|---|---|---|
| 0-<20 % | <6.0 (10.1) | <6.0 (<6.0) | 99% / 100% |
| 20-<40 % | 10.2 (11.8) | 9.6 (11.8) | 38% / 50% |
| 40-<60 % | 11.6 (11.8) | 11.8 (11.8) | 7% / 0% |
| 60-<80 % | 11.8 (11.8) | 11.8 (11.8) | 0% / 0% |
| 80-100 % | 12.0 (15.5) | 12.0 (13.9) | 0% / 0% |
| 70-100 % (High-Load) | 12.0 (15.5) | 12.0 (13.9) | 0% / 0% |
| All (published average) | 11.0 (15.5) | 11.0 (13.9) | 23% / 24% |

**INFO**

The average noise in five ranges of load, the share of points with the fan stopped (semi-passive operation), and the High-Load Index: the same figures for all points at 70 % of the rated output and above. Calculated from the 1481 (115V) and 1481 (230V) load combinations of the certification sweep, the same data that ETA and LAMBDA use (test 0 excluded). Load is the total DC output as a share of the rated 850 W. Noise is averaged on the energy scale, as for LAMBDA, so the ranges combined give back the published average noise. Each load combination is held for about five seconds; the stabilized readings at fixed loads are under "Noise under high ambient temperature". Below 6 dB(A), the floor of our sound meter, the table and the chart show <6.0. In the averages a stopped fan counts as 5 dB(A),

as in the published average.

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

## Noise under high ambient temperature (indicative)

### 115V

| Load | Normal ambient<br>fan · noise · intake | High ambient<br>fan · noise · intake | Noise change |
|---|---|---|---|
| 10% | 0 RPM · <6.0 dB(A) · 31.4 °C | 714 RPM · 11.4 dB(A) · 40.3 °C | fan starts (<6.0 → 11.4) |
| 20% | 0 RPM · <6.0 dB(A) · 34.4 °C | 716 RPM · 11.3 dB(A) · 40.7 °C | fan starts (<6.0 → 11.3) |
| 50% | 685 RPM · 10.5 dB(A) · 30.3 °C | 724 RPM · 12.2 dB(A) · 42.2 °C | **+1.7 dB(A)** |
| 100% | 698 RPM · 11.5 dB(A) · 31.0 °C | 1164 RPM · 26.6 dB(A) · 45.2 °C | **+15.1 dB(A)** |

### 230V

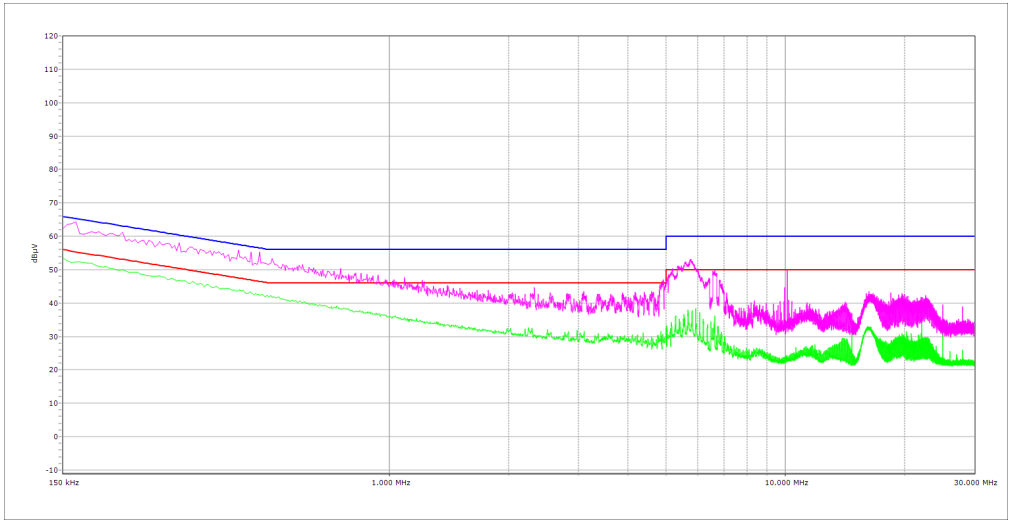
| Load | Normal ambient<br>fan · noise · intake | High ambient<br>fan · noise · intake | Noise change |
|---|---|---|---|
| 10% | 0 RPM · <6.0 dB(A) · 32.1 °C | 0 RPM · <6.0 dB(A) · 44.8 °C | fan off in both |
| 20% | 0 RPM · <6.0 dB(A) · 33.2 °C | 720 RPM · 11.8 dB(A) · 40.6 °C | fan starts (<6.0 → 11.8) |
| 50% | 683 RPM · 10.2 dB(A) · 30.1 °C | 726 RPM · 12.4 dB(A) · 42.4 °C | **+2.2 dB(A)** |
| 100% | 695 RPM · 11.4 dB(A) · 30.2 °C | 1157 RPM · 26.2 dB(A) · 45.4 °C | **+14.8 dB(A)** |

### INFO

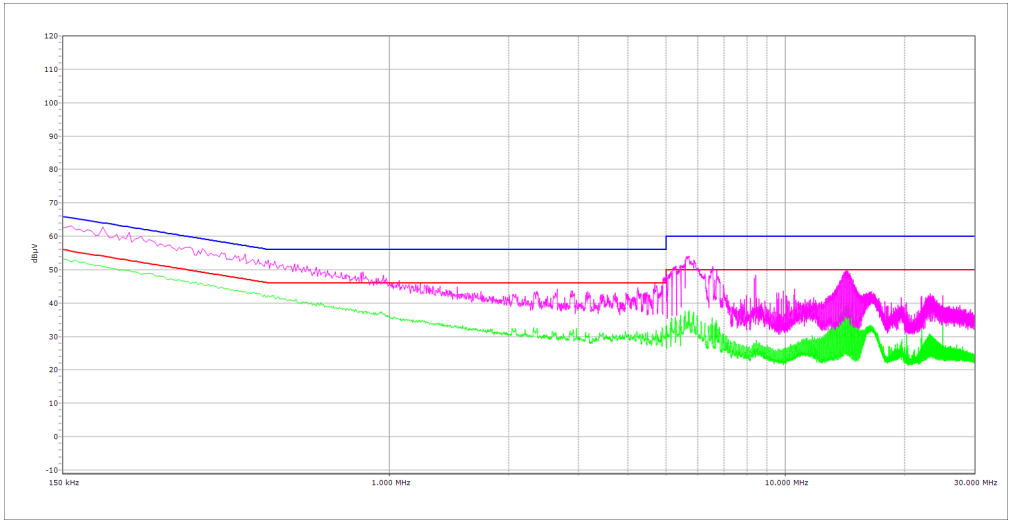
Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative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

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

## Conducted Emissions EN 55032 & CISPR 32



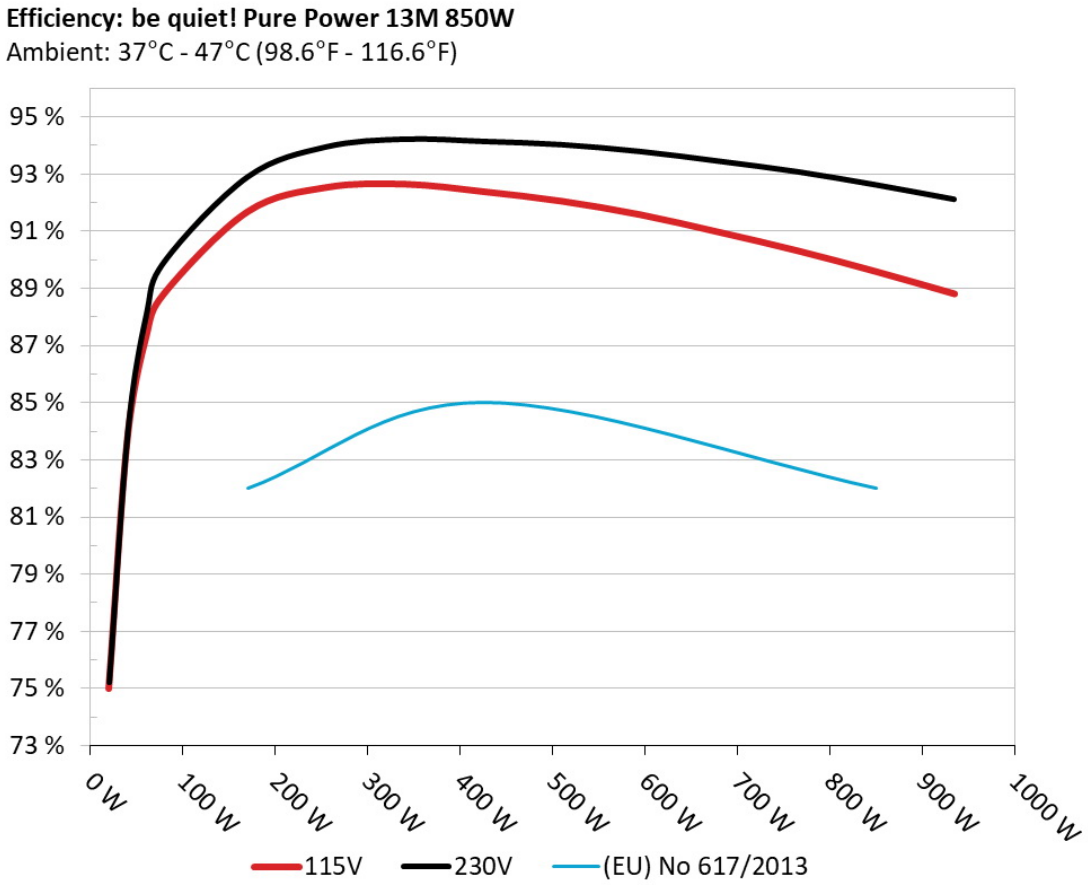

NEUTRAL




PHASE

## Indicative Performance

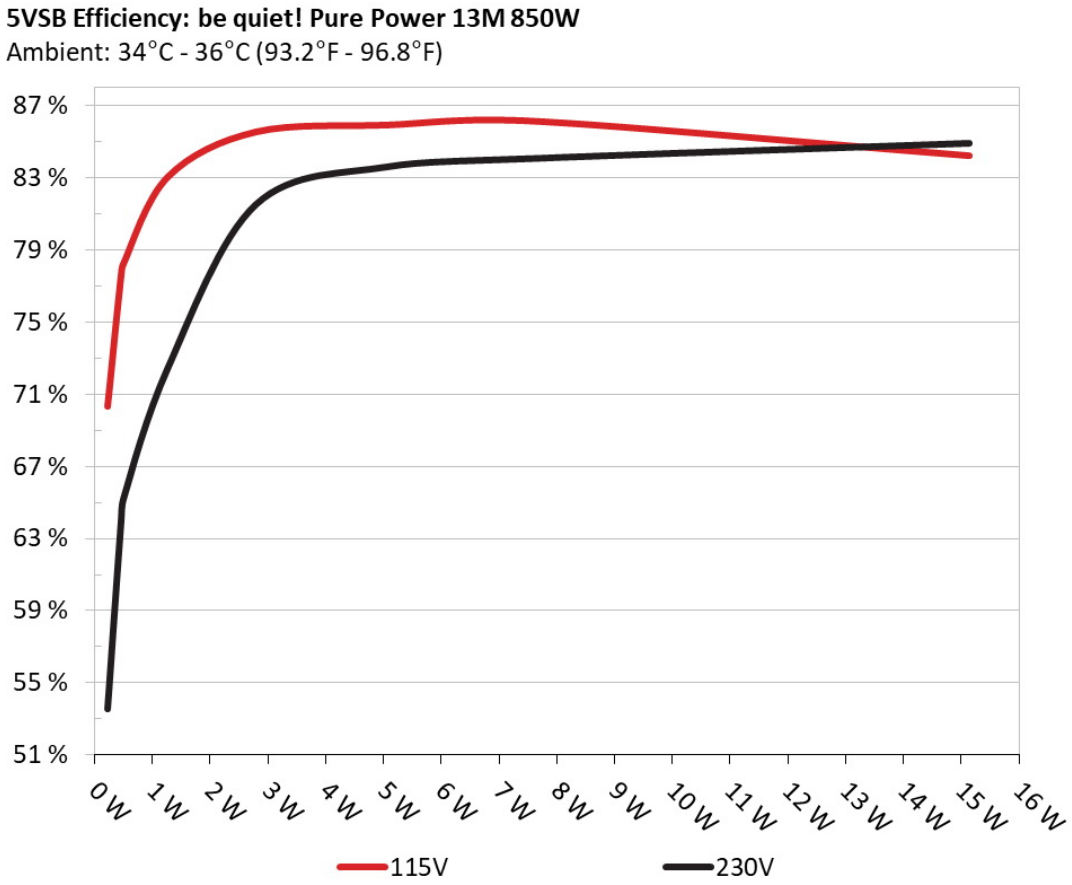
### Efficiency under high ambient temperature




**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** | 0.23W | 70.341% | 0.032 |
| | 5.099V | 0.327W | | 114.94V |
| **2** | **0.09A** | 0.459W | 77.479% | 0.057 |
| | 5.099V | 0.592W | | 114.93V |
| **3** | **0.55A** | 2.8W | 85.56% | 0.257 |
| | 5.09V | 3.273W | | 114.92V |
| **4** | **1A** | 5.082W | 85.941% | 0.363 |
| | 5.082V | 5.914W | | 114.92V |
| **5** | **1.5A** | 7.61W | 86.151% | 0.411 |
| | 5.073V | 8.833W | | 114.92V |
| **6** | **3A** | 15.136W | 84.239% | 0.488 |
| | 5.045V | 17.968W | | 114.91V |

### 230V

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| **1** | **0.045A** | 0.229W | 53.544% | 0.012 |
| | 5.097V | 0.428W | | 229.9V |
| **2** | **0.09A** | 0.459W | 63.801% | 0.021 |
| | 5.097V | 0.72W | | 229.9V |
| **3** | **0.55A** | 2.799W | 81.506% | 0.096 |
| | 5.089V | 3.434W | | 229.9V |
| **4** | **1A** | 5.082W | 83.585% | 0.16 |
| | 5.081V | 6.08W | | 229.91V |
| **5** | **1.5A** | 7.609W | 84.045% | 0.22 |
| | 5.072V | 9.054W | | 229.9V |
| **6** | **3A** | 15.133W | 84.882% | 0.314 |
| | 5.045V | 17.83W | | 229.9V |

## Protection Features

| | |
|---|---|
| OCP (Normal @ 29°C) | 12V: 84.4A (119.04%), 12.075V<br>5V: 28.8A (130.91%), 4.999V<br>3.3V: 30.6A (139.09%), 3.285V<br>5VSB: 3.9A (130%), 5.023V |
| OCP (Hot @ 42.9°C) | 12V: 82.2A (115.94%), 12.081V<br>5V: 28.5A (129.55%), 4.998V<br>3.3V: 30A (136.36%), 3.285V<br>5VSB: 3.9A (130%), 5.019V |
| OPP (Normal @ 29.5°C) | 1029.66W (121.14%) |
| OPP (Hot @ 41.6°C) | 1009.64W (118.78%) |
| OTP | ✓ (132°C @ Heat Sink) |
| 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 |
| UVP (Full Load @ 90V) | ✓ |
| UVP (No Damage @ 80V) | ✓ |
| Conducted Emissions EN55032 & CISPR 32 | ✓ |
| NLO | ✓ |
| Fan Failure Protection | ✗ |
| SIP | Surge: MOV<br>Inrush: NTC & Bypass Relay |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| **10%** | **5.231A** | **1.987A** | **1.982A** | **0.986A** | 85.008 | 88.051% | 714 | 11.4 | 40.3°C | 0.98 |
| | 12.121V | 5.034V | 3.331V | 5.071V | 96.544 | | | | 41.61°C | 114.89V |
| **20%** | **11.477A** | **2.984A** | **2.977A** | **1.185A** | 169.959 | 91.665% | 716 | 11.3 | 40.7°C | 0.983 |
| | 12.115V | 5.028V | 3.326V | 5.062V | 185.412 | | | | 41.7°C | 114.86V |
| **30%** | **18.075A** | **3.483A** | **3.477A** | **1.385A** | 254.967 | 92.514% | 718 | 11.4 | 41.03°C | 0.989 |
| | 12.111V | 5.025V | 3.322V | 5.053V | 275.597 | | | | 43.13°C | 114.83V |
| **40%** | **24.686A** | **3.983A** | **3.977A** | **1.586A** | 340.052 | 92.63% | 721 | 11.9 | 41.76°C | 0.993 |
| | 12.106V | 5.022V | 3.319V | 5.044V | 367.111 | | | | 44.5°C | 114.8V |
| **50%** | **30.937A** | **4.983A** | **4.978A** | **1.788A** | 424.869 | 92.369% | 724 | 12.2 | 42.21°C | 0.995 |
| | 12.101V | 5.018V | 3.315V | 5.034V | 459.965 | | | | 46.41°C | 114.77V |
| **60%** | **37.174A** | **5.985A** | **5.982A** | **1.99A** | 509.415 | 92.034% | 726 | 12.4 | 42.6°C | 0.996 |
| | 12.095V | 5.013V | 3.31V | 5.025V | 553.513 | | | | 47.68°C | 114.74V |
| **70%** | **43.477A** | **6.988A** | **6.989A** | **2.193A** | 594.734 | 91.562% | 729 | 12.9 | 43.15°C | 0.997 |
| | 12.089V | 5.009V | 3.306V | 5.016V | 649.545 | | | | 49.45°C | 114.7V |
| **80%** | **49.788A** | **7.99A** | **7.998A** | **2.297A** | 679.545 | 90.954% | 732 | 13.4 | 43.87°C | 0.997 |
| | 12.084V | 5.005V | 3.301V | 5.007V | 747.134 | | | | 52.73°C | 114.67V |
| **90%** | **56.500A** | **8.495A** | **8.492A** | **2.4A** | 764.967 | 90.3% | 961 | 20.2 | 44.7°C | 0.998 |
| | 12.079V | 5.002V | 3.297V | 4.999V | 847.145 | | | | 53.82°C | 114.65V |
| **100%** | **62.956A** | **9.002A** | **9.017A** | **3.01A** | 849.778 | 89.573% | 1164 | 26.6 | 45.16°C | 0.998 |
| | 12.073V | 4.998V | 3.294V | 4.983V | 948.694 | | | | 55.3°C | 114.6V |
| **110%** | **69.284A** | **10.012A** | **10.126A** | **3.014A** | 934.362 | 88.795% | 1363 | 31.7 | 46.14°C | 0.998 |
| | 12.068V | 4.993V | 3.289V | 4.976V | 1052.272 | | | | 57.49°C | 114.57V |
| **CL1** | **0.116A** | **14.422A** | **14.456A** | **0A** | 121.293 | 85.467% | 731 | 13.4 | 40.02°C | 0.986 |
| | 12.115V | 5.005V | 3.3V | 5.079V | 141.921 | | | | 45.18°C | 114.86V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **CL2** | **0.114A** | **21.941A** | **0A** | **0A** | 111.308 | 83.441% | 725 | 12.3 | 40.15°C | 0.988 |
| | 12.117V | 5.01V | 3.317V | 5.084V | 133.396 | | | | 44.46°C | 114.87V |
| **CL3** | **0.114A** | **0A** | **21.995A** | **0A** | 73.995 | 78.33% | 724 | 12.2 | 40.14°C | 0.98 |
| | 12.119V | 5.026V | 3.301V | 5.085V | 94.468 | | | | 44.49°C | 114.88V |
| **CL4** | **70.350A** | **0A** | **0A** | **0A** | 849.658 | 90.094% | 1016 | 22.3 | 45.21°C | 0.998 |
| | 12.078V | 5.021V | 3.316V | 5.04V | 943.072 | | | | 56.95°C | 114.61V |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| **10%** | **5.230A** | **1.986A** | **1.981A** | **0.986A** | 85.006 | 89.813% | 0 | <6.0 | 44.76°C | 0.832 |
| | 12.123V | 5.035V | 3.331V | 5.072V | 94.649 | | | | 40.08°C | 229.87V |
| **20%** | **11.476A** | **2.983A** | **2.977A** | **1.185A** | 169.953 | 92.906% | 720 | 11.8 | 40.57°C | 0.937 |
| | 12.117V | 5.029V | 3.326V | 5.062V | 182.932 | | | | 43.44°C | 229.86V |
| **30%** | **18.075A** | **3.483A** | **3.476A** | **1.386A** | 254.966 | 93.953% | 722 | 12 | 41.25°C | 0.963 |
| | 12.112V | 5.025V | 3.323V | 5.053V | 271.377 | | | | 42.59°C | 229.85V |
| **40%** | **24.687A** | **3.983A** | **3.977A** | **1.586A** | 340.058 | 94.222% | 724 | 12.2 | 41.89°C | 0.974 |
| | 12.106V | 5.022V | 3.319V | 5.044V | 360.913 | | | | 43.86°C | 229.83V |
| **50%** | **30.939A** | **4.983A** | **4.978A** | **1.788A** | 424.884 | 94.145% | 726 | 12.4 | 42.35°C | 0.979 |
| | 12.100V | 5.018V | 3.315V | 5.034V | 451.306 | | | | 45.02°C | 229.82V |
| **60%** | **37.175A** | **5.985A** | **5.983A** | **1.991A** | 509.424 | 94.031% | 727 | 12.4 | 42.76°C | 0.984 |
| | 12.094V | 5.013V | 3.31V | 5.025V | 541.765 | | | | 45.81°C | 229.8V |
| **70%** | **43.481A** | **6.989A** | **6.99A** | **2.193A** | 594.746 | 93.79% | 729 | 12.9 | 43.06°C | 0.985 |
| | 12.088V | 5.009V | 3.305V | 5.015V | 634.129 | | | | 46.54°C | 229.78V |
| **80%** | **49.795A** | **7.992A** | **7.999A** | **2.297A** | 679.561 | 93.452% | 730 | 13.1 | 43.56°C | 0.987 |
| | 12.083V | 5.004V | 3.301V | 5.008V | 727.181 | | | | 47.45°C | 229.77V |
| **90%** | **56.510A** | **8.496A** | **8.492A** | **2.4A** | 764.987 | 93.082% | 886 | 17.7 | 44.92°C | 0.988 |
| | 12.077V | 5.001V | 3.297V | 5V | 821.836 | | | | 49.2°C | 229.76V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **100%** | **62.963A** | **9.003A** | **9.018A** | **3.011A** | 849.798 | 92.623% | 1157 | 26.2 | 45.41°C | 0.989 |
| | 12.072V | 4.997V | 3.294V | 4.983V | 917.48 | | | | 51.69°C | 229.74V |
| **110%** | **69.293A** | **10.013A** | **10.126A** | **3.015A** | 934.376 | 92.119% | 1335 | 31 | 46.91°C | 0.991 |
| | 12.066V | 4.993V | 3.289V | 4.976V | 1014.313 | | | | 52.42°C | 229.72V |
| **CL1** | **0.116A** | **14.422A** | **14.456A** | **0A** | 121.3 | 86.562% | 732 | 13.4 | 41.73°C | 0.907 |
| | 12.115V | 5.005V | 3.3V | 5.078V | 140.131 | | | | 47.4°C | 228.28V |
| **CL2** | **0.116A** | **21.941A** | **0A** | **0A** | 111.314 | 84.353% | 727 | 12.4 | 39.16°C | 0.896 |
| | 12.118V | 5.01V | 3.317V | 5.082V | 131.96 | | | | 45.33°C | 229.96V |
| **CL3** | **0.114A** | **0A** | **21.998A** | **0A** | 74.003 | 79.299% | 727 | 12.4 | 40.4°C | 0.828 |
| | 12.119V | 5.026V | 3.301V | 5.084V | 93.32 | | | | 44.92°C | 229.99V |
| **CL4** | **70.354A** | **0A** | **0A** | **0A** | 849.571 | 93.26% | 735 | 13.9 | 45.19°C | 0.989 |
| | 12.076V | 5.023V | 3.316V | 5.042V | 910.978 | | | | 50.4°C | 229.72V |

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]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **20W** | **1.224A** | **0.496A** | **0.495A** | **0.196A** | 20.001 | 75.005% | 0 | <6.0 | 41.08°C | 0.819 |
| | 12.130V | 5.039V | 3.336V | 5.092V | 26.665 | | | | 36.69°C | 114.9V |
| **40W** | **2.696A** | **0.695A** | **0.693A** | **0.295A** | 40 | 83.707% | 0 | <6.0 | 42.16°C | 0.932 |
| | 12.125V | 5.039V | 3.336V | 5.089V | 47.786 | | | | 37.12°C | 114.89V |
| **60W** | **4.168A** | **0.893A** | **0.891A** | **0.393A** | 59.999 | 87.245% | 0 | <6.0 | 44.51°C | 0.964 |
| | 12.125V | 5.038V | 3.335V | 5.085V | 68.772 | | | | 38.53°C | 114.88V |
| **80W** | **5.635A** | **1.092A** | **1.089A** | **0.492A** | 79.951 | 88.812% | 0 | <6.0 | 47.24°C | 0.978 |
| | 12.124V | 5.037V | 3.333V | 5.082V | 90.025 | | | | 39.63°C | 114.88V |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| **20W** | **1.224A** | **0.496A** | **0.495A** | **0.196A** | 20 | 75.201% | 0 | <6.0 | 43°C | 0.419 |
| | 12.130V | 5.039V | 3.337V | 5.093V | 26.326 | | | | 36.79°C | 230.01V |
| **40W** | **2.696A** | **0.695A** | **0.693A** | **0.295A** | 40 | 83.944% | 0 | <6.0 | 43.66°C | 0.618 |
| | 12.124V | 5.039V | 3.336V | 5.09V | 47.651 | | | | 37.66°C | 229.9V |
| **60W** | **4.168A** | **0.893A** | **0.891A** | **0.393A** | 60 | 88.054% | 0 | <6.0 | 44.08°C | 0.738 |
| | 12.125V | 5.038V | 3.335V | 5.086V | 68.139 | | | | 38.82°C | 229.88V |
| **80W** | **5.635A** | **1.092A** | **1.089A** | **0.492A** | 79.949 | 89.948% | 0 | <6.0 | 44.19°C | 0.815 |
| | 12.124V | 5.037V | 3.334V | 5.083V | 88.884 | | | | 39.47°C | 229.88V |

The results above are not used in the certification process

## Ripple Measurements

### 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 28.39mV | 13.75mV | 14.68mV | 14.94mV | Pass |
| 20% Load | 27.01mV | 13.44mV | 14.58mV | 15.96mV | Pass |
| 30% Load | 31.00mV | 13.85mV | 22.20mV | 16.27mV | Pass |
| 40% Load | 24.05mV | 13.54mV | 13.97mV | 15.75mV | Pass |
| 50% Load | 24.51mV | 13.79mV | 14.68mV | 17.24mV | Pass |
| 60% Load | 25.73mV | 14.41mV | 15.29mV | 18.62mV | Pass |
| 70% Load | 25.89mV | 13.95mV | 15.04mV | 19.64mV | Pass |
| 80% Load | 26.86mV | 14.36mV | 15.96mV | 20.46mV | Pass |
| 90% Load | 27.27mV | 14.15mV | 14.94mV | 20.77mV | Pass |
| 100% Load | 27.27mV | 13.67mV | 14.81mV | 23.24mV | Pass |
| 110% Load | 28.08mV | 13.77mV | 14.75mV | 23.64mV | Pass |
| Crossload1 | 27.52mV | 14.80mV | 15.11mV | 18.49mV | Pass |
| Crossload2 | 29.83mV | 17.06mV | 15.65mV | 18.93mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| Crossload3 | 28.14mV | 13.84mV | 16.22mV | 18.82mV | Pass |
| Crossload4 | 27.42mV | 13.06mV | 13.68mV | 20.24mV | Pass |

The results above are not used in the certification process

**230V**

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 30.34mV | 13.39mV | 15.50mV | 14.94mV | Pass |
| 20% Load | 28.14mV | 13.95mV | 14.58mV | 18.05mV | Pass |
| 30% Load | 25.12mV | 14.10mV | 14.68mV | 16.11mV | Pass |
| 40% Load | 24.45mV | 13.54mV | 14.63mV | 15.81mV | Pass |
| 50% Load | 25.43mV | 15.48mV | 15.19mV | 16.88mV | Pass |
| 60% Load | 27.06mV | 14.81mV | 16.32mV | 19.64mV | Pass |
| 70% Load | 27.52mV | 15.27mV | 15.66mV | 20.15mV | Pass |
| 80% Load | 27.47mV | 14.46mV | 15.20mV | 20.15mV | Pass |
| 90% Load | 27.68mV | 14.66mV | 15.60mV | 21.48mV | Pass |
| 100% Load | 27.94mV | 14.18mV | 14.59mV | 23.59mV | Pass |
| 110% Load | 28.51mV | 13.98mV | 14.78mV | 25.10mV | Pass |
| Crossload1 | 28.16mV | 14.24mV | 15.46mV | 18.59mV | Pass |
| Crossload2 | 30.13mV | 17.17mV | 15.86mV | 20.10mV | Pass |
| Crossload3 | 29.06mV | 14.15mV | 15.40mV | 19.54mV | Pass |
| Crossload4 | 28.06mV | 13.10mV | 14.56mV | 18.81mV | Pass |

The results above are not used in the certification process

# be quiet! Pure Power 13 M 850W



Top side




Power specifications label

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