# be quiet! Power Zone 2 750W

Serial Number 006EUS4341000003

Lab ID BQ75002681

Certification ID 252681

Test Result Report ID: 24PS2681A

Certificate Issue Date: Dec 20, 2024

Scheme: ETA-EMI PSU

115V 230V

Scheme: LAMBDA PSU

115V 230V

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 | Power Zone 2 750W |
| OEM/ODM | FSP |
| Serial Number | 006EUS4341000003 |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |

| | |
|---|---|
| Rated Current (Arms) | 5-10 |
| Rated Frequency (Hz) | 50-60 |
| Rated Power (W) | 750 |
| Operating Temperature (Continuous Full Load) (°C) | |
| Type | ATX12V |
| Cable Design | Fully Modular |
| Warranty | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| Weight | |
| Cooling | 140mm Rifle Bearing Fan (Pure Wings 3, BQ PUW3-14025-HR) |
| Semi-Passive Operation | ✓ |
| Cybenetics Testing Information | |
| Lab ID | BQ75002681 |
| Date of receipt | Dec 6, 2024 |
| Testing Date | Dec 18, 2024 |
| Report Issued Date | Dec 20, 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 20+4 pin (590mm) | 1 | 1 | 16-22AWG | No |
| 4+4 pin EPS12V (700mm) | 1 | 1 | 16AWG | No |
| 8 pin EPS12V (700mm) | 1 | 1 | 16AWG | No |
| 2x 6+2 pin PCIe (600mm) | 1 | 2 | 16-18AWG | No |
| 6+2 pin PCIe (600mm) | 1 | 1 | 16AWG | No |

| | | | | |
|---|---|---|---|---|
| 12+4 pin PCIe (600mm) (600W) | 1 | 1 | 16-26AWG | No |
| SATA (550mm+150mm+150mm+155mm) | 1 | 4 | 18AWG | No |
| SATA (500mm+150mm+150) / 4-pin Molex (+150mm) | 1 | 3/1 | 18AWG | No |
| AC Power Cord (1350mm) - C13 coupler | 1 | 1 | 18AWG | - |

## Protection Features

| | |
|---|---|
| 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 | 62.5 | 3 | 0.3 |
| | Watts | 120 | | 750 | 15 | 3.6 |
| Total Max. Power (W) | | 750 | | | | |

## Parts Description

| | |
|---|---|
| **General Data** | |
| Manufacturer (OEM) | FSP |
| PCB Type | Single-Sided |
| **Primary Side** | |
| Transient Filter | 4x Y caps, 2x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | 1x NTC Thermistor SCK 202R0 (2 ohm) & Relay |
| Bridge Rectifier(s) | 2x GBJ25V08 (800V, 25A @ 25°C) |

| | |
|---|---|
| APFC MOSFETs | 2x Magnachip MMFT65R090RTH (650V, 22A @ 100°C, Rds(on): 0.090Ohm) |
| APFC Boost Diode | 1x ROHM SCS306AM (650V, 6A @ 120°C) |
| Bulk Cap(s) | 2x Elite (420V, 270uF or 540uF combined, 3,000h @ 105°C, PK) |
| Main Switchers | 2x Infineon IPA60R180P7 (650V, 11A @ 100°C, Rds(on): 0.180Ohm) |
| IC Driver | Novosense NSi6602 |
| Resonant Controller | Champion CM6901X |
| APFC Controller | Champion CM6500UNX |
| Topology | Primary side: APFC, Half-Bridge & LLC Resonant converter Secondary side: Synchronous Rectification & DC-DC converters |
| **Secondary Side** | |
| +12V MOSFETs | 4x Nexperia PSMN1R4-40YLD (40V, 240A @ 25°C, Rds(on): 1.4mOhm) |
| 5V & 3.3V | DC-DC Converters: 4x Magnachip MDU1513 (30V, 70.4A @ 70°C, Rds(on): 4.6mOhm) PWM Controller(s): UPI-semiuP3861P |
| Filtering Capacitors | Electrolytic: 5x Elite (3-5,000h @105°C, EJ) 5x Elite (2-5,000h @105°C, ED) 4x Elite (3-6,000h @105°C, EV) Polymer: 8x Apaq, 7x Elite (CS), 5x CapXon |
| Supervisor IC | Weltrend WT7527RA (OCP, OVP, UVP, SCP,PG) |
| Fan Controller | Grenergy GR8031 |
| Fan Model | Pure Wings 3, BQPUW3-14025-HR (140mm, 12V, 0.42A, Rifle Bearing Fan) |
| **5VSB** | |
| Rectifier | MPS MP9989 & 1x CET CEF03N8 (800V, 2A @ 100°C, Rds(on): 4.8Ohm) |
| Standby PWM Controller | MPS MP9989 |

# 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) | 90.237% |
| Average Noise Output (>1450 Load Combinations) | 11.29dBA |
| Average PF (>1450 Load Combinations) | 0.981 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 66.866% |
| Standby Power Consumption | 0.0540W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 56.30mV |
| 5V Ripple (Full Load) | 15.99mV |
| 3.3V Ripple (Full Load) | 16.64mV |
| 5VSB Ripple (Full Load) | 14.80mV |
| 12V Load Regulation | 0.62% |
| 5V Load Regulation | 0.91% |
| 3.3V Load Regulation | 1.39% |
| 5VSB Load Regulation | 2.62% |
| Inrush Current | 74.520A |

## 230V

| | | |
|---|---|---|
| Accredited | | |
| Average Efficiency (>1450 load combinations) | | 92.261% |
| Average Noise Output (>1450 Load Combinations) | | 10.54dBA |
| Average PF (>1450 Load Combinations) | | 0.955 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | | 65.827% |
| Standby Power Consumption | | 0.0939W |
| Non-Accredited | | |
| 12V Ripple (Full Load) | | 61.69mV |
| 5V Ripple (Full Load) | | 15.26mV |
| 3.3V Ripple (Full Load) | | 16.66mV |
| 5VSB Ripple (Full Load) | | 15.23mV |
| 12V Load Regulation | | 0.64% |
| 5V Load Regulation | | 0.93% |
| 3.3V Load Regulation | | 1.36% |
| 5VSB Load Regulation | | 2.64% |
| Inrush Current | | 152.100A |
| 12V Transient Response (200%) | | 11.66V |
| 5V Transient Response (200%) | | 5.002V |
| 3.3V Transient Response (200%) | | 3.234V |
| 5VSB Transient Response (200%) | | 4.903V |
| Hold-Up Time & PWR_OK Signal | | 17.90ms |
| AC Loss to PWR_OK Hold Up Time | | 13.40ms |
| PWR_OK Inactive to DC Loss Delay | | 4.50ms |
| PSU Timings: T1 (20% / 100%) | 69.0ms | 68.0ms |
| PSU Timings: T3 (20% / 100%) | 124.0ms | 123.0ms |
| 12V OCP (28.7°C / 41.8°C) | 83.20A (133.12%), 12.150V | 77.60A (124.16%), 12.153V |
| 5V OCP (28.7°C / 41.8°C) | 27.7A (138.50%), 5.06V | 28A (140.00%), 5.057V |
| 3.3V OCP (28.7°C / 41.8°C) | 26.8A (134.00%), 3.315V | 26.7A (133.50%), 3.314V |
| 5VSB OCP (28.7°C / 41.8°C) | 4.5A (150.00%), 4.947V | 4.5A (150.00%), 4.946V |
| OPP (29.01°C / 42.05°C) | 148.36% | 139.83% |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 17.9 |
| AC Loss to PWR_OK Hold Up Time (ms) | 13.4 |
| PWR_OK Inactive to DC Loss Delay (ms) | 4.5 |



### Tables

#### 115V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 115.06 V | 115.01 V | 113.85 V | 115.09 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: | 0.054 W | -0.008 W | N/A | 0.087 W | N/A | N/A |
| Apparent Power: | 9.034 W | 8.822 W | N/A | 9.267 W | N/A | N/A |
| Power Factor: | 0.006 | N/A | N/A | N/A | N/A | N/A |

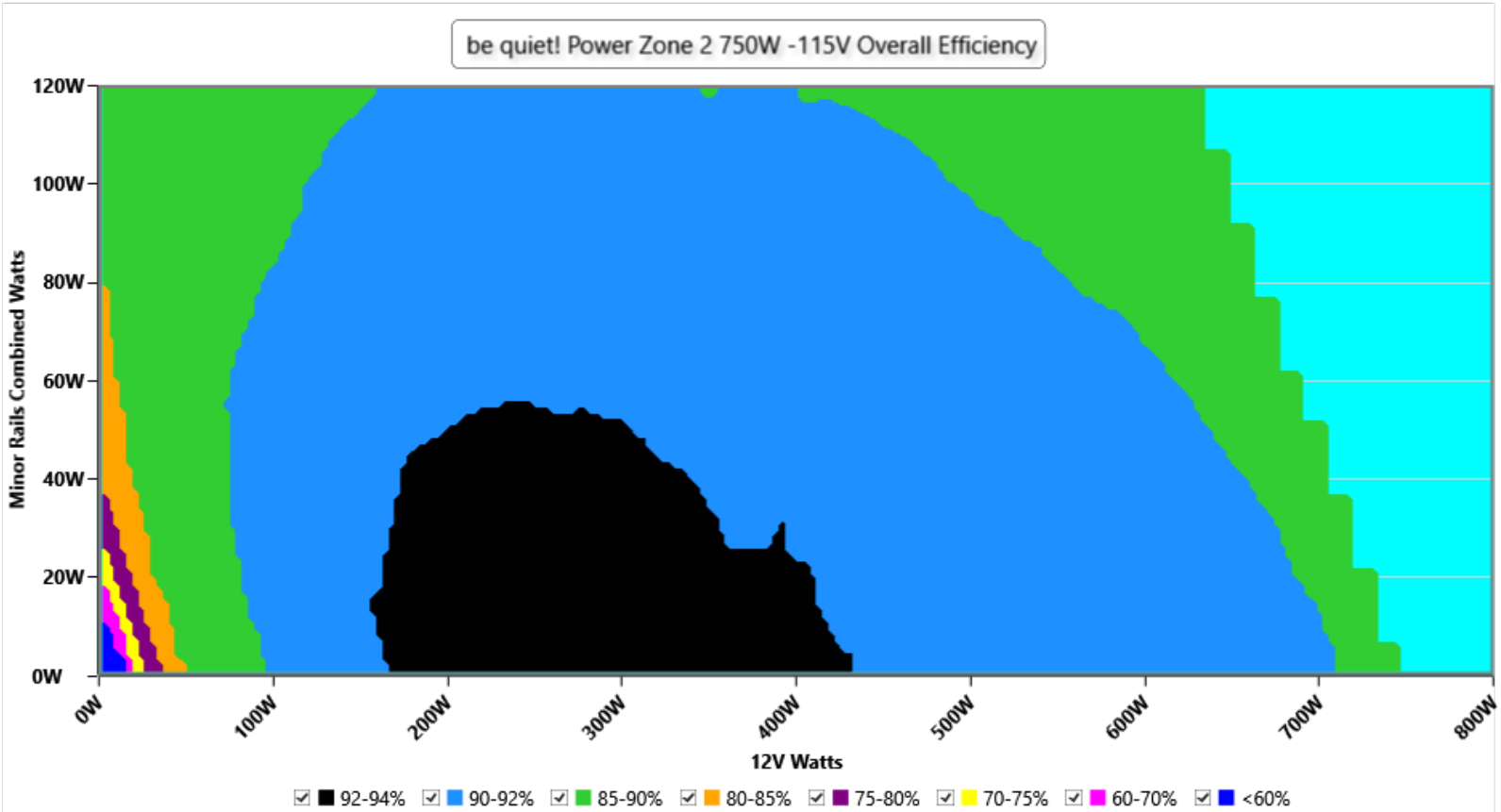
#### 230V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 231.00 V | 230.89 V | 227.70 V | 231.06 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 | 0.26 % | 2.00 % | PASS |
| Real Power: | 0.094 W | 0.047 W | N/A | 0.175 W | N/A | N/A |
| Apparent Power: | 30.386 W | 29.913 W | N/A | 30.904 W | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| Power Factor: | 0.003 | N/A | N/A | N/A | N/A | N/A |

## Efficiency Graph

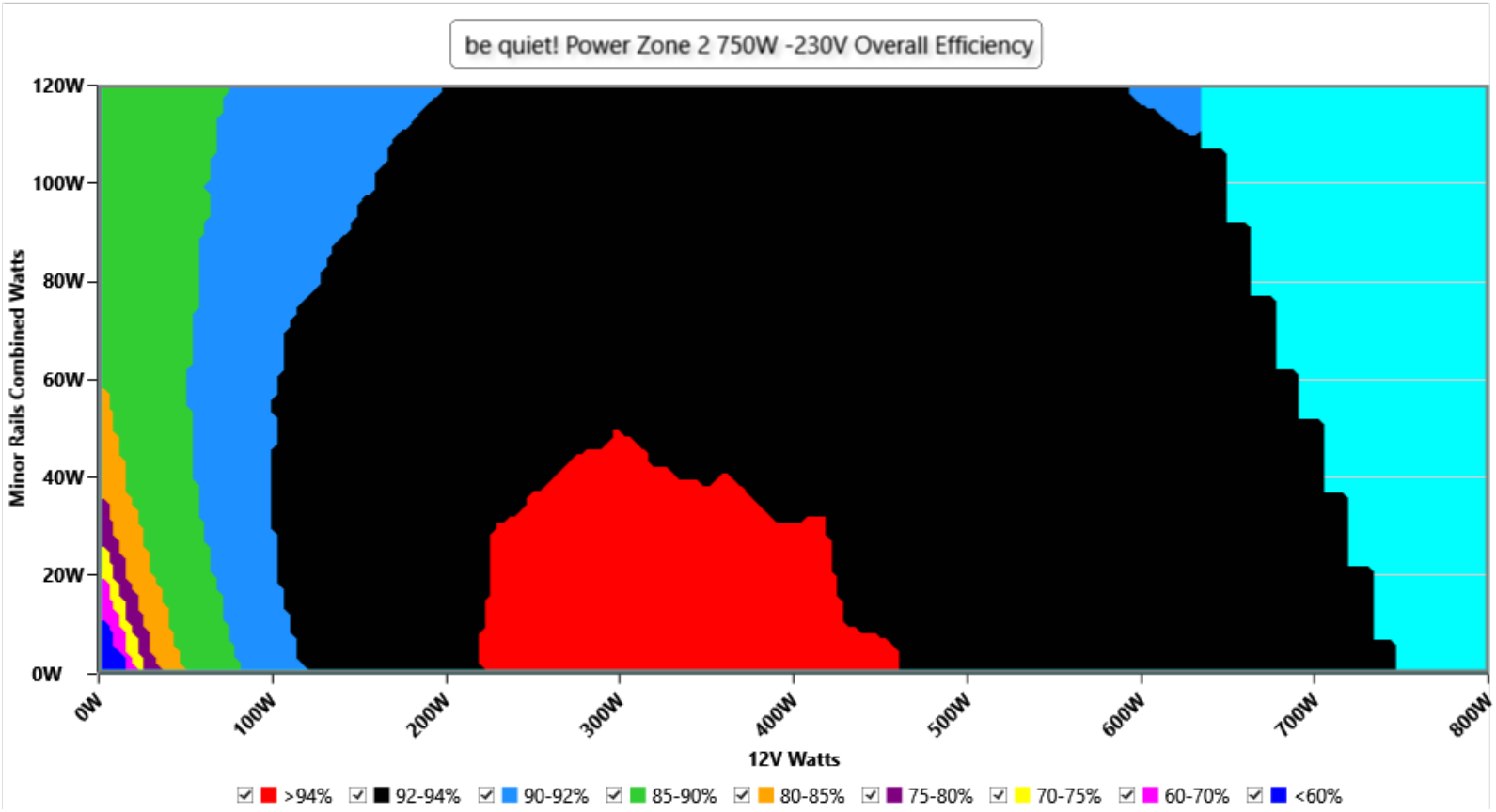
**115V**




**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

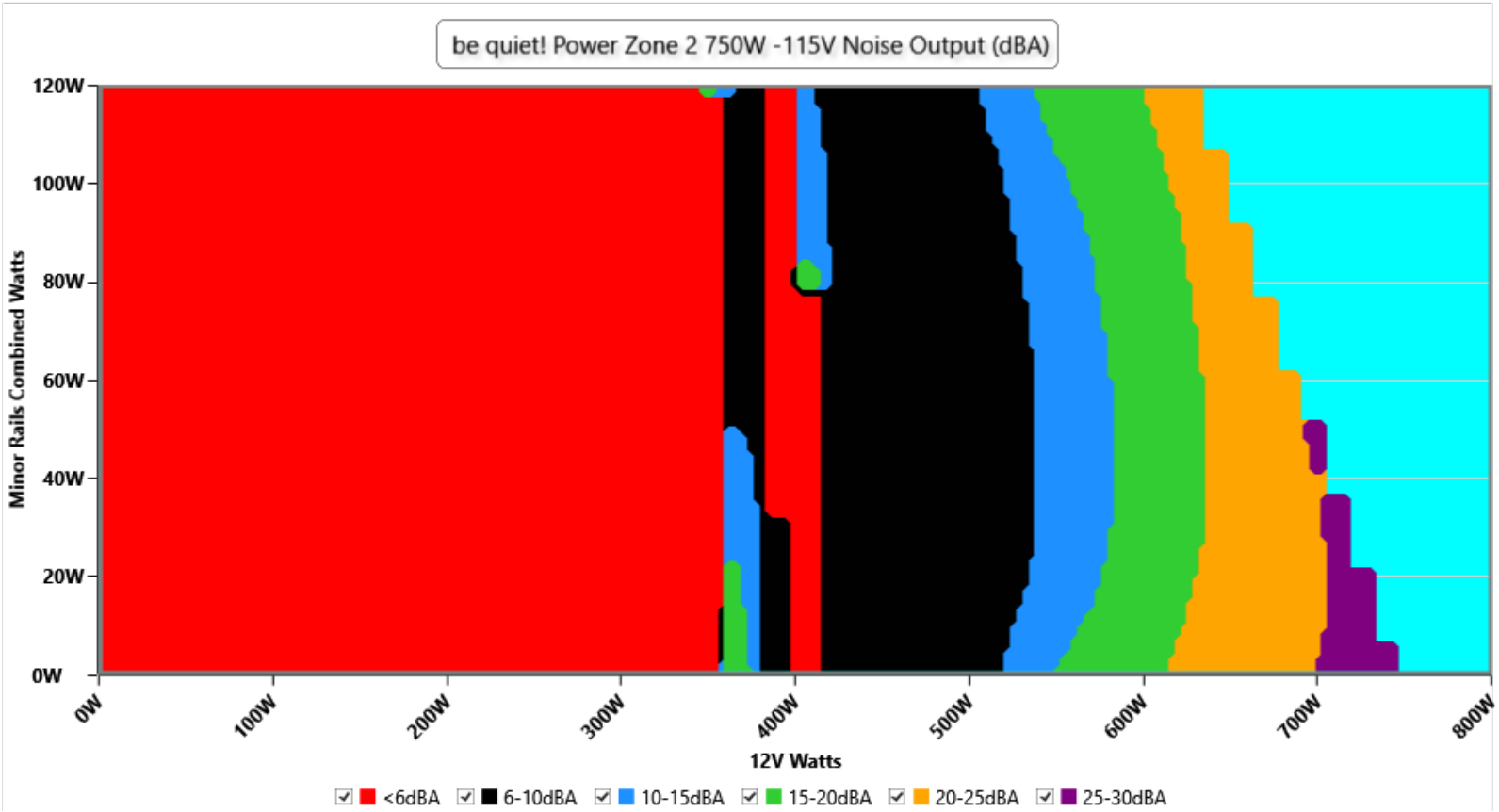



### INFO

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

## Noise Graph

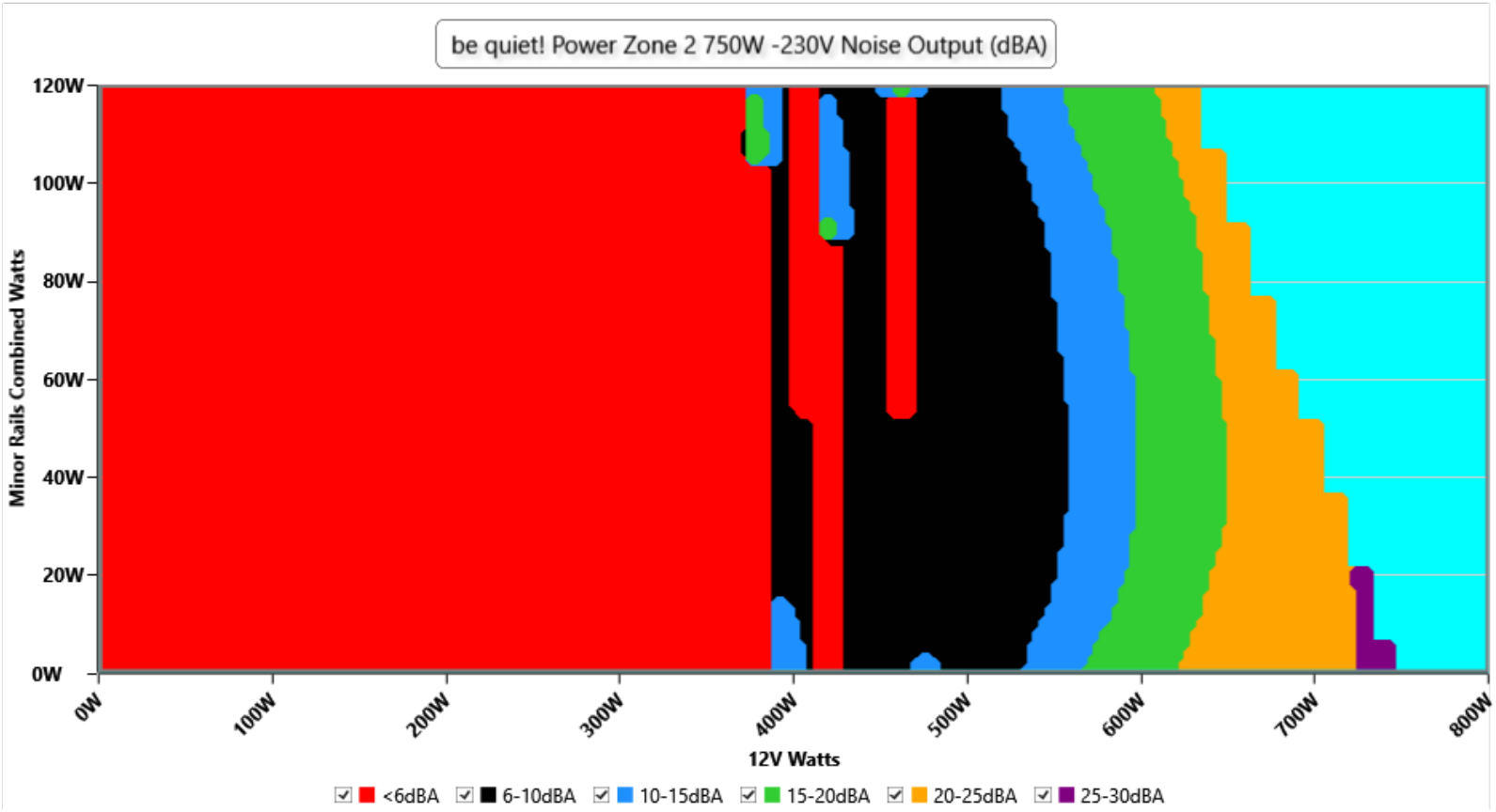
### 115V




### 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 |
|---|---|---|---|
| 10% | 0 RPM · <6.0 dB(A) · 32.1 °C | 0 RPM · <6.0 dB(A) · 50.0 °C | fan off in both |
| 20% | 0 RPM · <6.0 dB(A) · 35.2 °C | 0 RPM · <6.0 dB(A) · 52.3 °C | fan off in both |
| 50% | 0 RPM · <6.0 dB(A) · 39.3 °C | 0 RPM · <6.0 dB(A) · 56.6 °C | fan off in both |
| 100% | 807 RPM · 18.2 dB(A) · 30.3 °C | 1223 RPM · 31.4 dB(A) · 45.0 °C | **+13.2 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) · 35.5 °C | 0 RPM · <6.0 dB(A) · 47.1 °C | fan off in both |
| 20% | 0 RPM · <6.0 dB(A) · 36.7 °C | 0 RPM · <6.0 dB(A) · 48.2 °C | fan off in both |
| 50% | 0 RPM · <6.0 dB(A) · 37.5 °C | 0 RPM · <6.0 dB(A) · 53.3 °C | fan off in both |
| 100% | 852 RPM · 19.9 dB(A) · 30.4 °C | 1235 RPM · 31.7 dB(A) · 45.6 °C | **+11.8 dB(A)** |

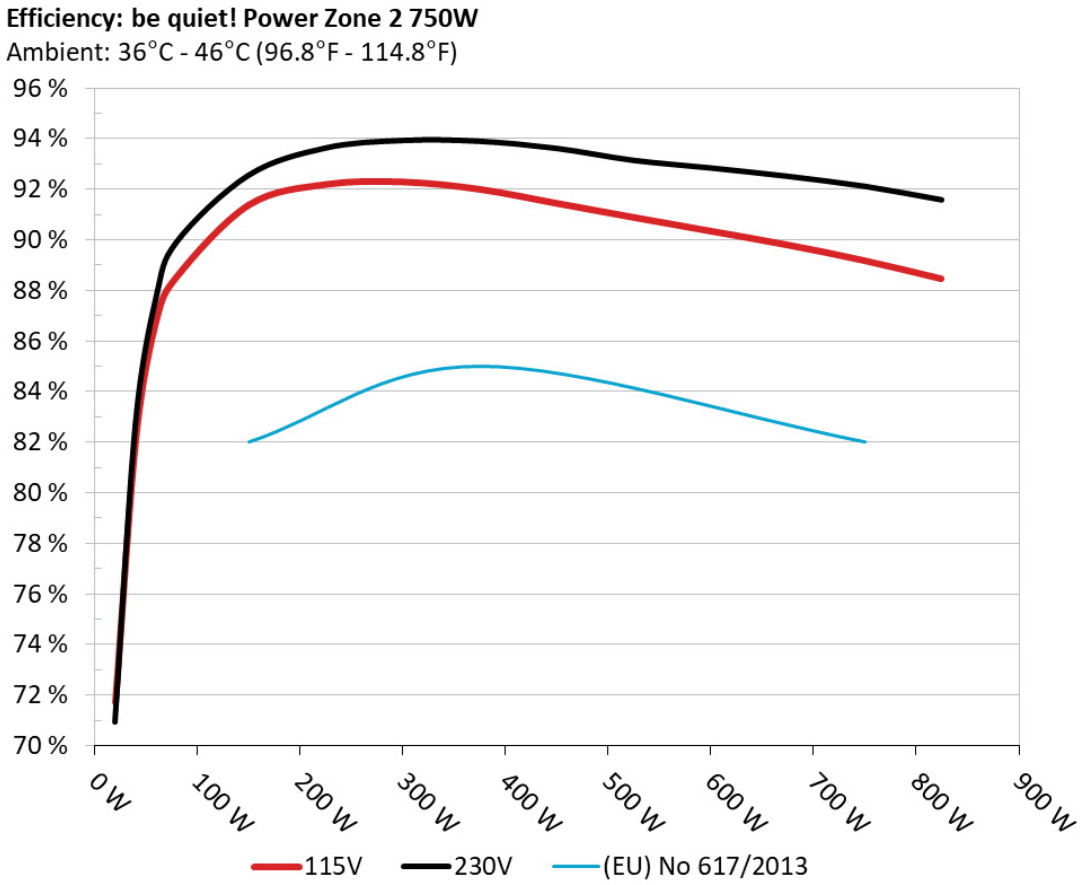
### INFO

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.*

## Indicative Performance

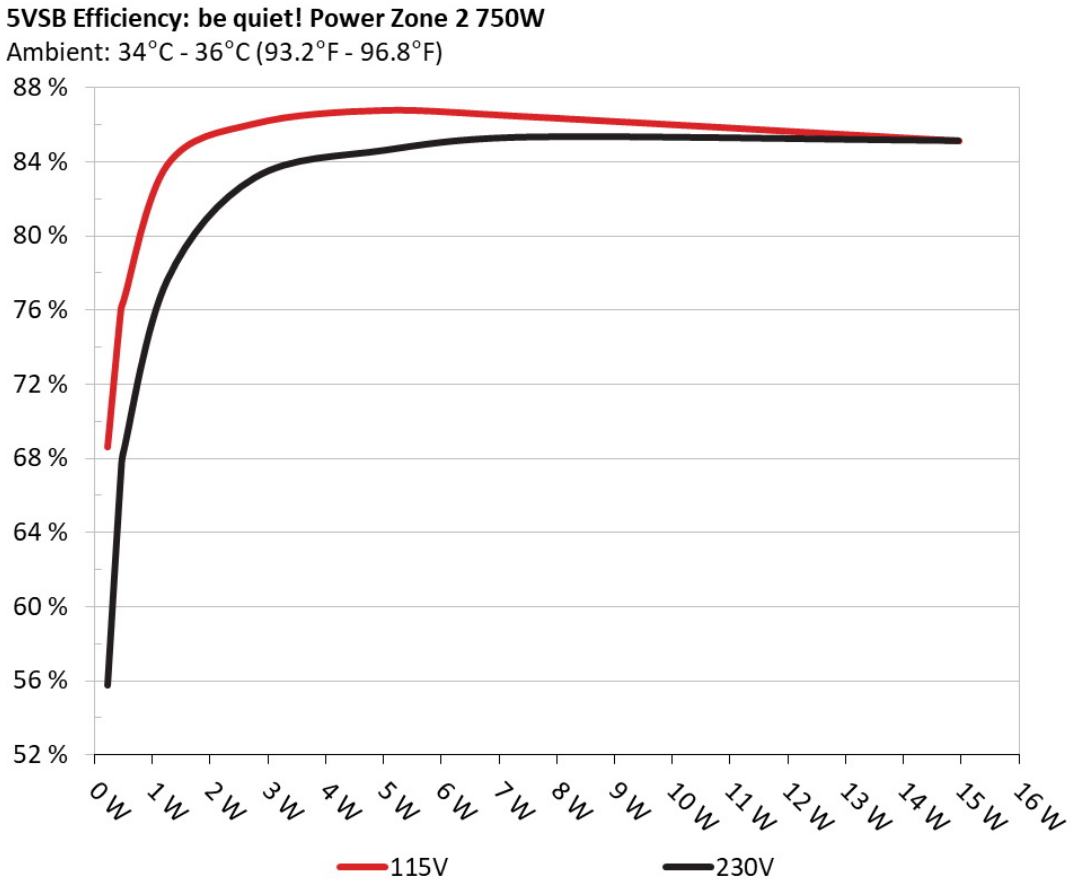
### Efficiency under high ambient temperature




**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** | 0.228W | 68.632% | 0.037 |
| | 5.062V | 0.333W | | 114.91V |
| **2** | **0.09A** | 0.455W | 75.963% | 0.065 |
| | 5.06V | 0.6W | | 114.91V |
| **3** | **0.55A** | 2.776W | 86.068% | 0.258 |
| | 5.049V | 3.225W | | 114.91V |
| **4** | **1A** | 5.037W | 86.784% | 0.324 |
| | 5.037V | 5.804W | | 114.91V |
| **5** | **1.5A** | 7.538W | 86.433% | 0.372 |
| | 5.025V | 8.72W | | 114.91V |
| **6** | **3A** | 14.959W | 85.132% | 0.437 |
| | 4.987V | 17.572W | | 114.9V |

### 230V

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| **1** | **0.045A** | 0.228W | 55.736% | 0.013 |
| | 5.062V | 0.41W | | 229.91V |
| **2** | **0.09A** | 0.455W | 66.998% | 0.022 |
| | 5.061V | 0.682W | | 229.9V |
| **3** | **0.55A** | 2.776W | 83.116% | 0.104 |
| | 5.048V | 3.34W | | 229.89V |
| **4** | **1A** | 5.036W | 84.597% | 0.17 |
| | 5.036V | 5.952W | | 229.88V |
| **5** | **1.5A** | 7.535W | 85.306% | 0.204 |
| | 5.023V | 8.833W | | 229.89V |
| **6** | **3A** | 14.949W | 85.114% | 0.303 |
| | 4.984V | 17.565W | | 229.88V |

## Protection Features

| | |
|---|---|
| OCP (Normal @ 28.7°C) | 12V: 83.2A (133.12%), 12.15V<br>5V: 27.7A (138.5%), 5.06V<br>3.3V: 26.8A (134%), 3.315V<br>5VSB: 4.5A (150%), 4.947V |
| OCP (Hot @ 41.8°C) | 12V: 77.6A (124.16%), 12.153V<br>5V: 28A (140%), 5.057V<br>3.3V: 26.7A (133.5%), 3.314V<br>5VSB: 4.5A (150%), 4.946V |
| OPP (Normal @ 29°C) | 1112.73W (148.36%) |
| OPP (Hot @ 42°C) | 1048.74W (139.83%) |
| OTP | ✓ (128°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 | ✓ |
| 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%** | **4.368A** | **1.963A** | **1.969A** | **0.993A** | 74.996 | 87.536% | 0 | <6.0 | 49.95°C | 0.948 |
| | 12.227V | 5.094V | 3.352V | 5.035V | 85.675 | | | | 40.01°C | 114.89V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **20%** | **9.742A** | **2.948A** | **2.958A** | **1.194A** | 149.925 | 91.372% | 0 | <6.0 | 52.27°C | 0.968 |
| | 12.219V | 5.089V | 3.347V | 5.024V | 164.082 | | | | 40.57°C | 114.86V |
| **30%** | **15.468A** | **3.442A** | **3.455A** | **1.396A** | 224.922 | 92.184% | 0 | <6.0 | 53.69°C | 0.975 |
| | 12.211V | 5.085V | 3.343V | 5.014V | 243.991 | | | | 41.34°C | 114.84V |
| **40%** | **21.208A** | **3.937A** | **3.953A** | **1.599A** | 300.006 | 92.282% | 0 | <6.0 | 55.36°C | 0.981 |
| | 12.203V | 5.08V | 3.339V | 5.004V | 325.099 | | | | 41.81°C | 114.81V |
| **50%** | **26.561A** | **4.926A** | **4.95A** | **1.803A** | 374.408 | 91.995% | 0 | <6.0 | 56.61°C | 0.985 |
| | 12.194V | 5.075V | 3.334V | 4.992V | 406.982 | | | | 42.12°C | 114.78V |
| **60%** | **31.965A** | **5.918A** | **5.95A** | **2A** | 449.291 | 91.441% | 0 | <6.0 | 58.77°C | 0.988 |
| | 12.186V | 5.07V | 3.328V | 4.983V | 491.345 | | | | 42.85°C | 114.76V |
| **70%** | **37.371A** | **6.91A** | **6.951A** | **2.213A** | 524.251 | 90.885% | 738 | 14.9 | 43.32°C | 0.99 |
| | 12.179V | 5.066V | 3.324V | 4.971V | 576.83 | | | | 47.34°C | 114.73V |
| **80%** | **42.849A** | **7.902A** | **7.955A** | **2.317A** | 599.44 | 90.342% | 903 | 21.8 | 43.92°C | 0.992 |
| | 12.172V | 5.061V | 3.318V | 4.962V | 663.525 | | | | 47.35°C | 114.7V |
| **90%** | **48.663A** | **8.402A** | **8.447A** | **2.422A** | 674.453 | 89.796% | 1068 | 27.4 | 44.47°C | 0.992 |
| | 12.164V | 5.057V | 3.314V | 4.953V | 751.094 | | | | 47.31°C | 114.67V |
| **100%** | **54.289A** | **8.904A** | **8.973A** | **3.042A** | 749.654 | 89.172% | 1223 | 31.4 | 45°C | 0.993 |
| | 12.157V | 5.053V | 3.31V | 4.931V | 840.692 | | | | 47.5°C | 114.64V |
| **110%** | **59.792A** | **9.904A** | **10.077A** | **3.045A** | 824.675 | 88.455% | 1405 | 35.2 | 46.1°C | 0.994 |
| | 12.149V | 5.048V | 3.304V | 4.925V | 932.312 | | | | 49.08°C | 114.61V |
| **CL1** | **0.113A** | **14.252A** | **14.365A** | **0A** | 121.282 | 85.504% | 0 | <6.0 | 46.66°C | 0.966 |
| | 12.214V | 5.065V | 3.321V | 5.048V | 141.844 | | | | 40°C | 114.86V |
| **CL2** | **0.113A** | **19.728A** | **0A** | **0A** | 101.342 | 84.028% | 0 | <6.0 | 49.11°C | 0.962 |
| | 12.220V | 5.067V | 3.334V | 5.055V | 120.604 | | | | 40.37°C | 114.87V |
| **CL3** | **0.113A** | **0A** | **19.874A** | **0A** | 67.391 | 78.723% | 0 | <6.0 | 50.95°C | 0.948 |
| | 12.218V | 5.072V | 3.321V | 5.055V | 85.606 | | | | 40.69°C | 114.88V |
| **CL4** | **61.623A** | **0A** | **0A** | **0A** | 749.496 | 89.763% | 1237 | 31.7 | 45°C | 0.993 |
| | 12.163V | 5.069V | 3.328V | 5.019V | 834.975 | | | | 48.22°C | 114.66V |

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%** | **4.368A** | **1.963A** | **1.969A** | **0.993A** | 74.996 | 88.932% | 0 | <6.0 | 47.06°C | 0.849 |
| | 12.227V | 5.094V | 3.352V | 5.035V | 84.329 | | | | 40.37°C | 229.87V |
| **20%** | **9.742A** | **2.948A** | **2.958A** | **1.194A** | 149.927 | 92.556% | 0 | <6.0 | 48.2°C | 0.926 |
| | 12.219V | 5.089V | 3.347V | 5.024V | 161.986 | | | | 40.5°C | 229.86V |
| **30%** | **15.468A** | **3.442A** | **3.455A** | **1.396A** | 224.926 | 93.637% | 0 | <6.0 | 50.11°C | 0.949 |
| | 12.211V | 5.085V | 3.343V | 5.013V | 240.211 | | | | 41°C | 229.85V |
| **40%** | **21.209A** | **3.937A** | **3.954A** | **1.599A** | 300.013 | 93.933% | 0 | <6.0 | 51.6°C | 0.962 |
| | 12.203V | 5.08V | 3.339V | 5.003V | 319.39 | | | | 41.55°C | 229.84V |
| **50%** | **26.563A** | **4.926A** | **4.95A** | **1.803A** | 374.42 | 93.905% | 0 | <6.0 | 53.26°C | 0.969 |
| | 12.195V | 5.075V | 3.333V | 4.992V | 398.723 | | | | 42.11°C | 229.82V |
| **60%** | **31.966A** | **5.918A** | **5.95A** | **2A** | 449.306 | 93.624% | 0 | <6.0 | 55.52°C | 0.972 |
| | 12.186V | 5.07V | 3.328V | 4.982V | 479.908 | | | | 42.9°C | 229.81V |
| **70%** | **37.377A** | **6.911A** | **6.953A** | **2.213A** | 524.273 | 93.151% | 718 | 13.9 | 43.35°C | 0.976 |
| | 12.177V | 5.065V | 3.323V | 4.97V | 562.818 | | | | 45.86°C | 229.8V |
| **80%** | **42.857A** | **7.903A** | **7.958A** | **2.318A** | 599.486 | 92.848% | 882 | 21 | 42.7°C | 0.979 |
| | 12.170V | 5.06V | 3.318V | 4.961V | 645.666 | | | | 45.51°C | 229.78V |
| **90%** | **48.675A** | **8.404A** | **8.45A** | **2.423A** | 674.51 | 92.52% | 1064 | 27.1 | 44.17°C | 0.981 |
| | 12.163V | 5.056V | 3.313V | 4.952V | 729.041 | | | | 46.55°C | 229.77V |
| **100%** | **54.304A** | **8.907A** | **8.972A** | **3.043A** | 749.725 | 92.122% | 1235 | 31.7 | 45.62°C | 0.982 |
| | 12.154V | 5.052V | 3.311V | 4.929V | 813.839 | | | | 47.79°C | 229.76V |
| **110%** | **59.813A** | **9.907A** | **10.082A** | **3.047A** | 824.756 | 91.586% | 1417 | 35.6 | 46.22°C | 0.983 |
| | 12.145V | 5.046V | 3.303V | 4.922V | 900.527 | | | | 48.28°C | 229.74V |
| **CL1** | **0.115A** | **14.255A** | **14.369A** | **0A** | 121.29 | 86.596% | 0 | <6.0 | 45.48°C | 0.916 |
| | 12.212V | 5.064V | 3.32V | 5.047V | 140.064 | | | | 40.84°C | 229.86V |
| **CL2** | **0.113A** | **19.732A** | **0A** | **0A** | 101.355 | 85.001% | 0 | <6.0 | 47.91°C | 0.9 |
| | 12.218V | 5.066V | 3.334V | 5.054V | 119.241 | | | | 40.5°C | 229.87V |
| **CL3** | **0.113A** | **0A** | **19.878A** | **0A** | 67.398 | 80.031% | 0 | <6.0 | 49.3°C | 0.85 |
| | 12.217V | 5.071V | 3.321V | 5.054V | 84.215 | | | | 40.04°C | 229.87V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **CL4** | **61.645A** | **0A** | **0A** | **0A** | 749.577 | 92.692% | 1242 | 31.9 | 45.57°C | 0.982 |
| | 12.160V | 5.068V | 3.327V | 5.017V | 808.67 | | | | 47.54°C | 229.76V |

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** | **1.214A** | **0.49A** | **0.492A** | **0.198A** | 19.993 | 71.708% | 0 | <6.0 | 43.49°C | 0.897 |
| | 12.225V | 5.099V | 3.356V | 5.06V | 27.882 | | | | 36.05°C | 114.9V |
| **40W** | **2.672A** | **0.687A** | **0.689A** | **0.297A** | 39.994 | 82.209% | 0 | <6.0 | 45.02°C | 0.916 |
| | 12.232V | 5.098V | 3.355V | 5.056V | 48.649 | | | | 37.14°C | 114.89V |
| **60W** | **4.132A** | **0.883A** | **0.885A** | **0.396A** | 59.993 | 86.846% | 0 | <6.0 | 46.63°C | 0.936 |
| | 12.230V | 5.097V | 3.354V | 5.052V | 69.079 | | | | 38.13°C | 114.9V |
| **80W** | **5.586A** | **1.079A** | **1.083A** | **0.495A** | 79.932 | 88.545% | 0 | <6.0 | 48.12°C | 0.95 |
| | 12.227V | 5.096V | 3.352V | 5.048V | 90.274 | | | | 39.04°C | 114.89V |

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** | **1.214A** | **0.49A** | **0.492A** | **0.198A** | 19.994 | 70.935% | 0 | <6.0 | 42.19°C | 0.548 |
| | 12.225V | 5.099V | 3.356V | 5.059V | 28.186 | | | | 36.02°C | 229.89V |
| **40W** | **2.672A** | **0.686A** | **0.689A** | **0.297A** | 39.993 | 82.766% | 0 | <6.0 | 43.21°C | 0.726 |
| | 12.232V | 5.098V | 3.355V | 5.055V | 48.321 | | | | 37.19°C | 229.88V |
| **60W** | **4.132A** | **0.883A** | **0.885A** | **0.396A** | 59.993 | 87.716% | 0 | <6.0 | 44.21°C | 0.811 |
| | 12.230V | 5.097V | 3.354V | 5.052V | 68.393 | | | | 38.01°C | 229.88V |
| **80W** | **5.586A** | **1.079A** | **1.083A** | **0.495A** | 79.932 | 89.919% | 0 | <6.0 | 45.31°C | 0.858 |
| | 12.227V | 5.096V | 3.353V | 5.048V | 88.895 | | | | 39.14°C | 229.87V |

The results above are not used in the certification process

## Ripple Measurements

### 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 21.37mV | 13.90mV | 12.99mV | 12.12mV | Pass |
| 20% Load | 28.68mV | 13.39mV | 13.05mV | 12.17mV | Pass |
| 30% Load | 27.46mV | 13.23mV | 13.91mV | 11.81mV | Pass |
| 40% Load | 27.81mV | 13.49mV | 13.15mV | 12.17mV | Pass |
| 50% Load | 30.83mV | 13.69mV | 13.56mV | 12.38mV | Pass |
| 60% Load | 31.91mV | 14.15mV | 13.97mV | 13.25mV | Pass |
| 70% Load | 33.85mV | 14.81mV | 14.32mV | 13.45mV | Pass |
| 80% Load | 35.80mV | 14.10mV | 14.27mV | 13.35mV | Pass |
| 90% Load | 37.64mV | 14.56mV | 14.73mV | 13.40mV | Pass |
| 100% Load | 56.30mV | 15.99mV | 16.64mV | 14.80mV | Pass |
| 110% Load | 65.74mV | 16.97mV | 17.58mV | 15.60mV | Pass |
| Crossload1 | 40.42mV | 15.65mV | 18.51mV | 13.98mV | Pass |
| Crossload2 | 26.59mV | 17.88mV | 15.65mV | 13.20mV | Pass |
| Crossload3 | 23.52mV | 14.36mV | 20.46mV | 13.30mV | Pass |
| Crossload4 | 57.87mV | 14.50mV | 14.60mV | 13.12mV | Pass |

The results above are not used in the certification process

### 230V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 22.29mV | 13.49mV | 13.10mV | 12.23mV | Pass |
| 20% Load | 30.94mV | 13.03mV | 12.89mV | 12.02mV | Pass |
| 30% Load | 30.48mV | 12.72mV | 12.74mV | 12.17mV | Pass |
| 40% Load | 30.94mV | 13.39mV | 13.30mV | 12.12mV | Pass |
| 50% Load | 33.49mV | 12.87mV | 13.04mV | 11.66mV | Pass |
| 60% Load | 37.89mV | 13.18mV | 13.91mV | 12.28mV | Pass |

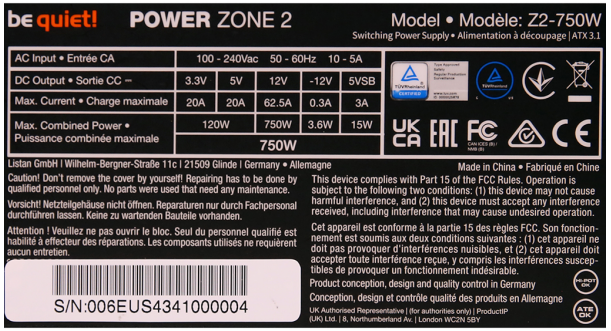
| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 70% Load | 36.82mV | 13.49mV | 14.07mV | 13.15mV | Pass |
| 80% Load | 39.02mV | 13.13mV | 14.07mV | 12.38mV | Pass |
| 90% Load | 40.96mV | 14.81mV | 15.81mV | 12.99mV | Pass |
| 100% Load | 61.69mV | 15.26mV | 16.66mV | 15.23mV | Pass |
| 110% Load | 71.50mV | 15.37mV | 18.22mV | 15.55mV | Pass |
| Crossload1 | 42.83mV | 16.03mV | 19.67mV | 15.03mV | Pass |
| Crossload2 | 31.45mV | 17.22mV | 14.73mV | 13.97mV | Pass |
| Crossload3 | 24.74mV | 13.64mV | 18.26mV | 13.25mV | Pass |
| Crossload4 | 61.02mV | 14.45mV | 15.25mV | 14.20mV | Pass |

The results above are not used in the certification process

## be quiet! Power Zone 2 750W




Top side




Power specifications label

Cybenetics [redacted] ETA[redacted] LAMBDA[redacted] SAFE[redacted] DELTA[redacted] PHI[redacted]

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