thermaltake

# Thermaltake Toughpower GF3 850W

Serial Number

Lab ID TT85002066

Certification ID 252066

Test Result Report ID: 22PS2066A

Certificate Issue Date: Sep 21, 2022

Scheme: ETA-EMI PSU

115V: CYBENETICS GOLD

230V: CYBENETICS GOLD 230v

Scheme: LAMBDA PSU

115V: CYBENETICS A-

230V: CYBENETICS A- 230v

CYBENETICS ATX 3.0 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 | Thermaltake |
| Model | Toughpower GF3 850W |
| OEM/ODM | CWT |
| Serial Number | |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 10-5 |

| | |
|---|---|
| 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 | 135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z) |
| Semi-Passive Operation | ✓ (selectable) |
| Cybenetics Testing Information | |
| Lab ID | TT85002066 |
| Date of receipt | Sep 1, 2022 |
| Testing Date | Sep 21, 2022 |
| Report Issued Date | Sep 21, 2022 |
| 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 (600mm) | 1 | 1 | 16AWG | No |
| 4+4 pin EPS12V (700mm) | 1 | 1 | 16AWG | No |
| 8 pin EPS12V (700mm) | 1 | 1 | 16AWG | No |
| 6+2 pin PCIe (500mm+150mm) | 2 | 4 | 16-18AWG | No |
| 12+4 pin PCIe (610mm) (300W) | 1 | 1 | 16-24AWG | No |
| SATA (500mm+150mm+150mm+150mm) | 3 | 12 | 18AWG | No |
| 4-pin Molex (500mm+150mm+150mm+150mm) | 1 | 4 | 18AWG | No |

| | | | | |
|---|---|---|---|---|
| FDD Adapter (100mm) | 1 | 1 | 22AWG | No |

## Power Specifications

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 22 | 22 | 70.8 | 3 | 0.3 |
| | Watts | 120 | | 849.6 | 15 | 3.6 |
| Total Max. Power (W) | | 850 | | | | |

## Parts Description

| | |
|---|---|
| General Data | - |
| Manufacturer (OEM) | CWT |
| Platform | CSZ |
| PCB Type | Double Sided |
| Primary Side | - |
| Transient Filter | 4x Y caps, 2x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | 1x NTC Thermistor SCK-075 (7 Ohm) & Relay |
| Bridge Rectifier(s) | 2x Yangjie Electronic GBU1506 (600V, 15A @ 100°C) |
| APFC MOSFETs | 2x STMicroelectronics STF33N60M2 (600V, 16A @ 100°C, Rds(on): 0.125Ohm) |
| APFC Boost Diode | 1x On Semiconductor FFSP0865A (650V, 8A @ 155°C) |
| Bulk Cap(s) | 1x Rubycon (420V, 680uF, 2,000h @ 105°C, MXE) |
| Main Switchers | 2x On Semiconductor |
| APFC Controller | Champion CM6500UNX & CM03X |
| Resonant Controller | Champion CU6901VAC |
| Topology | Primary side: APFC, Half-Bridge & LLC converter<br>Secondary side: Synchronous Rectification & DC-DC converters |
| Secondary Side | - |
| +12V MOSFETs | 6x International Rectifier IRFH7004PbF (40V, 164A @ 100°C, Rds(on): 1.4mOhm) |
| 5V & 3.3V | DC-DC Converters: 2x UBIQ QN3107M6N (30V, 70A @ 100°C, Rds(on): 2.6mOhm) &<br>2x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm)<br>PWM Controller(s): uPI-Semi uP3861P |
| Filtering Capacitors | Electrolytic: 3x Nichicon (2-5,000h @ 105°C, HD), 4x Nichicon (4-10,000h @ 105°C, HE), 1x Rubycon (2-10,000h @ 105°C, YXF), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KYA)<br>Polymer: 10x Elite, 6x APAQ, 8x CapXon, 4x NIC |

| | |
|---|---|
| Supervisor IC | Weltrend WT7502R |
| Fan Controller | Microchip PIC16F1503 |
| Fan Model | Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan) |
| 5VSB Circuit | - |
| Rectifier | 1x PS1045L SBR (45V, 10A) |
| Standby PWM Controller | On-Bright OB2365T |

# 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 v3.0 Compliance | ✓ |

## Performance Summary

### 115V

| | |
|---|---|
| Accredited | |
| Average Efficiency (>1450 load combinations) | 87.903% |
| Average Noise Output (>1450 Load Combinations) | 29.81dBA |
| Average PF (>1450 Load Combinations) | 0.990 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 74.570% |
| Standby Power Consumption | 0.0185W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 18.97mV |
| 5V Ripple (Full Load) | 11.14mV |
| 3.3V Ripple (Full Load) | 10.78mV |
| 5VSB Ripple (Full Load) | 8.29mV |

| | |
|---|---|
| 12V Load Regulation | 1.16% |
| 5V Load Regulation | 0.72% |
| 3.3V Load Regulation | 1.10% |
| 5VSB Load Regulation | 1.43% |
| Inrush Current | 24.440A |

## 230V

| | | |
|---|---|---|
| Accredited | | |
| Average Efficiency (>1450 load combinations) | 89.948% | |
| Average Noise Output (>1450 Load Combinations) | 29.87dBA | |
| Average PF (>1450 Load Combinations) | 0.963 | |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | - | |
| Standby Power Consumption | 0.0807W | |
| Non-Accredited | | |
| 12V Ripple (Full Load) | 20.48mV | |
| 5V Ripple (Full Load) | 11.32mV | |
| 3.3V Ripple (Full Load) | 10.31mV | |
| 5VSB Ripple (Full Load) | 7.59mV | |
| 12V Load Regulation | 1.23% | |
| 5V Load Regulation | 0.70% | |
| 3.3V Load Regulation | 1.11% | |
| 5VSB Load Regulation | 1.41% | |
| Inrush Current | 47.190A | |
| 12V Transient Response (200%) | 11.42V | |
| 5V Transient Response (200%) | 4.898V | |
| 3.3V Transient Response (200%) | 3.160V | |
| 5VSB Transient Response (200%) | 5.027V | |
| Hold-Up Time & PWR_OK Signal | 17.20ms | |
| AC Loss to PWR_OK Hold Up Time | 15.50ms | |
| PWR_OK Inactive to DC Loss Delay | 1.70ms | |
| PSU Timings: T1 (20% / 100%) | 62.0ms | 63.0ms |
| PSU Timings: T3 (20% / 100%) | 126.0ms | 126.0ms |

| | | |
|---|---|---|
| OPP (27.63°C / 42.72°C) | 124.81% | 124.81% |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 17.2 |
| AC Loss to PWR_OK Hold Up Time (ms) | 15.5 |
| PWR_OK Inactive to DC Loss Delay (ms) | 1.7 |

## Tables

### 115V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 114.93 V | 114.88 V | 113.85 V | 114.97 V | 116.15 V | PASS |
| Mains Frequency: | 60.00 Hz | 59.98 Hz | 59.40 Hz | 60.02 Hz | 60.60 Hz | PASS |
| Mains Voltage CF: | 1.417 | 1.416 | 1.340 | 1.418 | 1.490 | PASS |
| Mains Voltage THD: | 0.14 % | 0.12 % | N/A | 0.19 % | 2.00 % | PASS |
| Real Power: | 0.019 W | 0.016 W | N/A | 0.020 W | N/A | N/A |
| Apparent Power: | 10.144 W | 10.123 W | N/A | 10.163 W | N/A | N/A |
| Power Factor: | 0.002 | N/A | N/A | N/A | N/A | N/A |

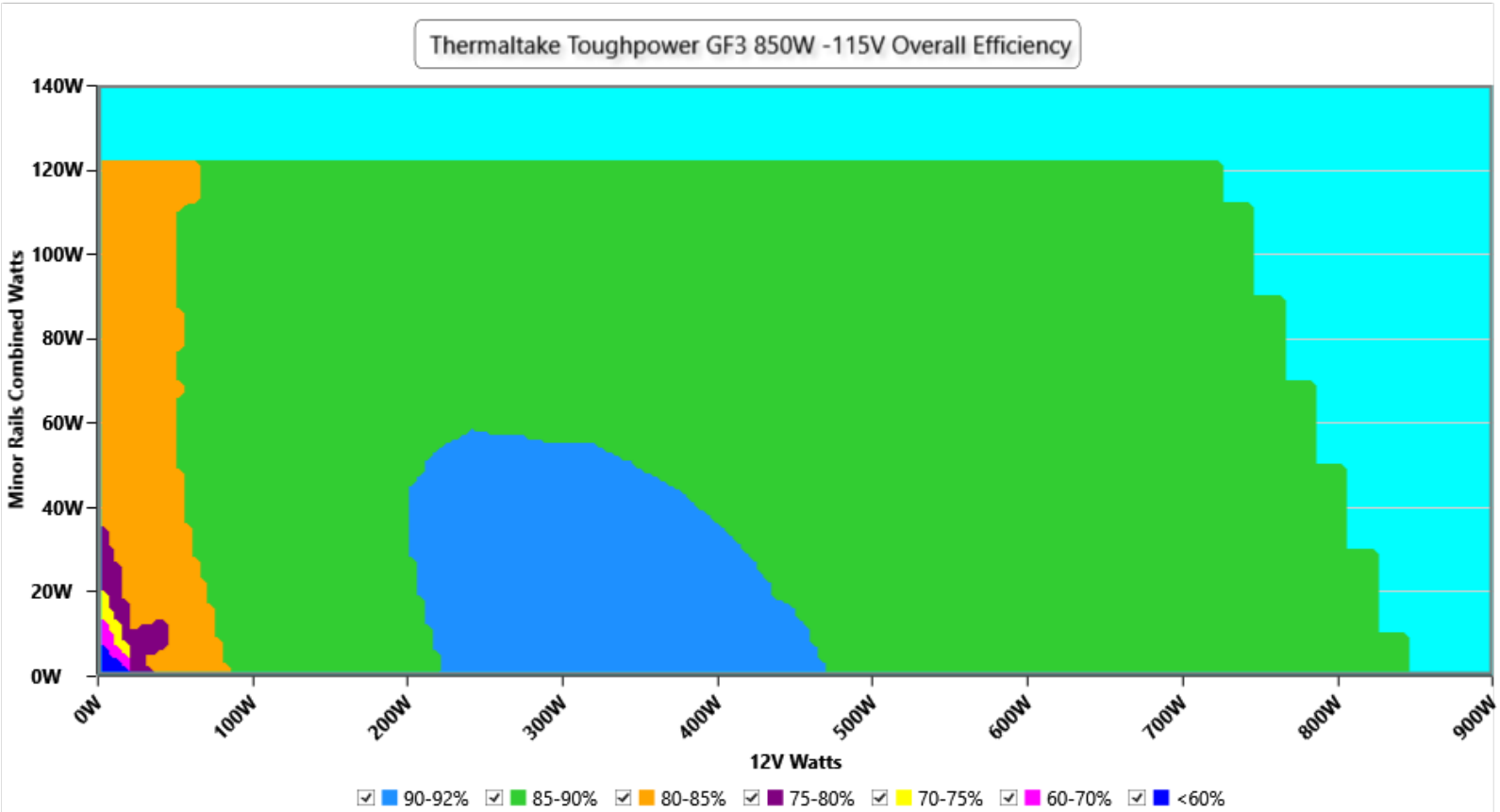
### 230V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 229.88 V | 229.83 V | 227.70 V | 229.94 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: | 1.416 | 1.415 | 1.340 | 1.417 | 1.490 | PASS |
| Mains Voltage THD: | 0.16 % | 0.15 % | N/A | 0.19 % | 2.00 % | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| Real Power: | 0.081 W | 0.071 W | N/A | 0.094 W | N/A | N/A |
| Apparent Power: | 34.177 W | 34.156 W | N/A | 34.199 W | N/A | N/A |
| Power Factor: | 0.002 | N/A | N/A | N/A | N/A | N/A |

## Efficiency Graph

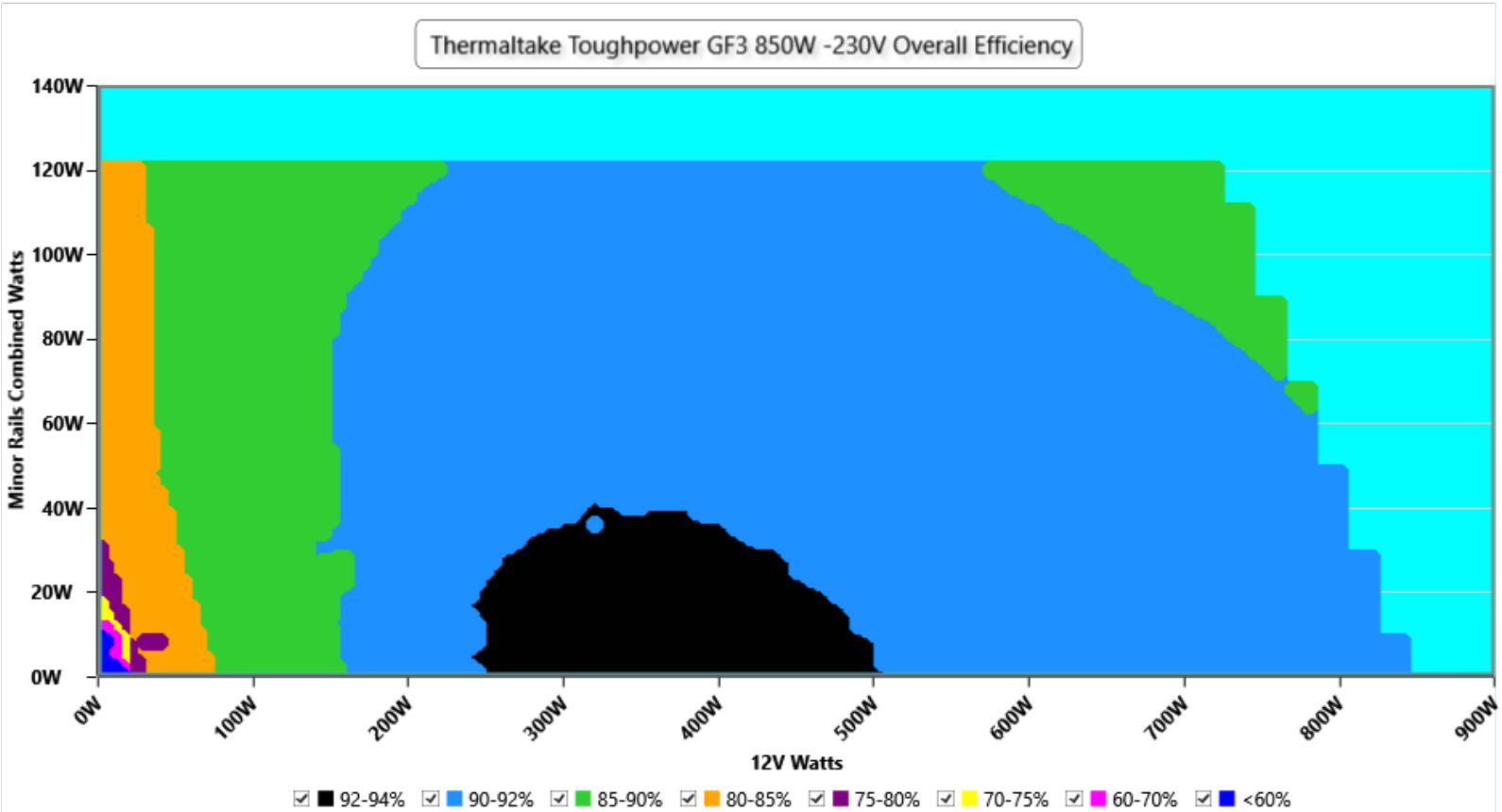
**115V**




**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

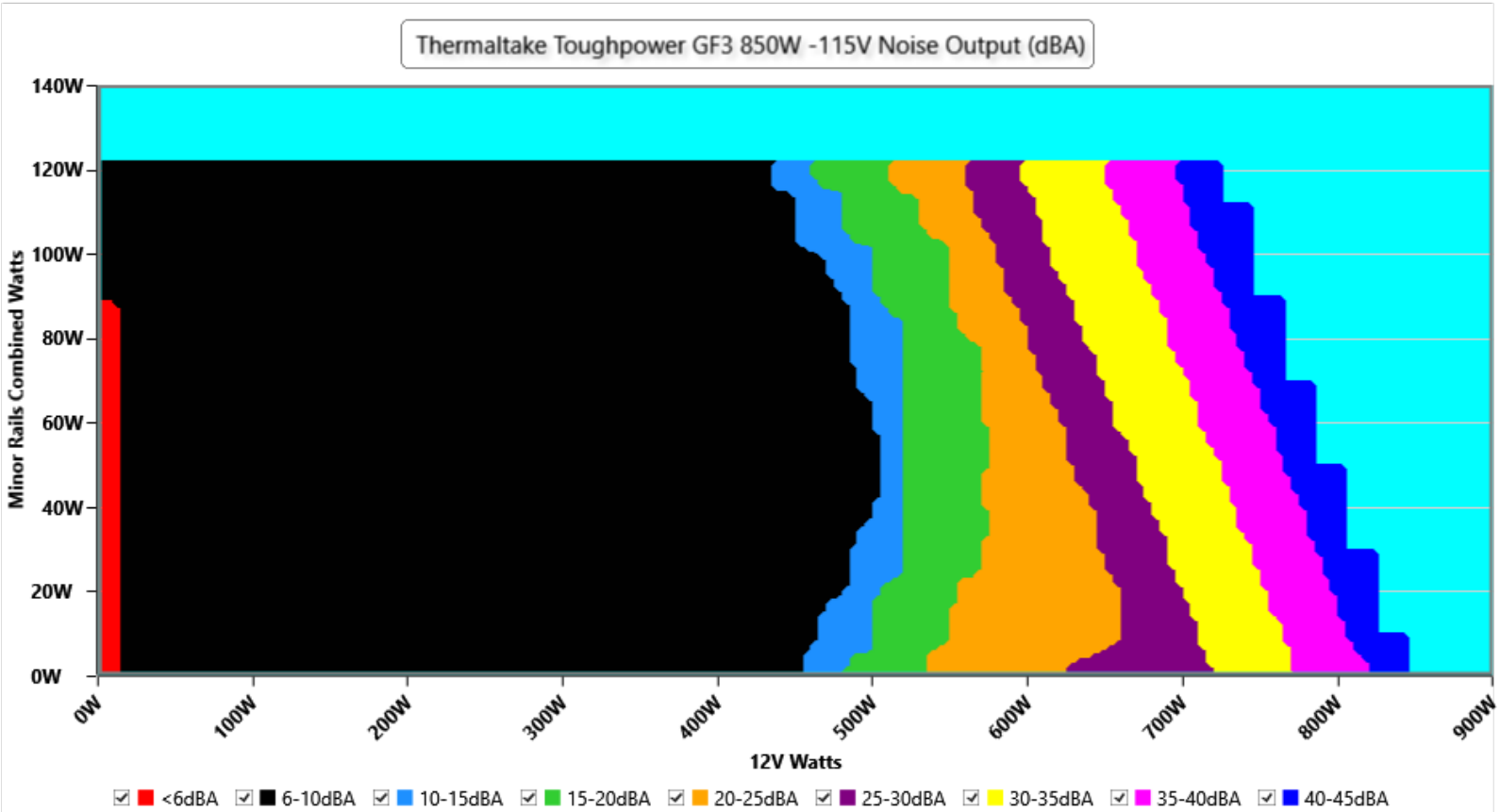



### INFO

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

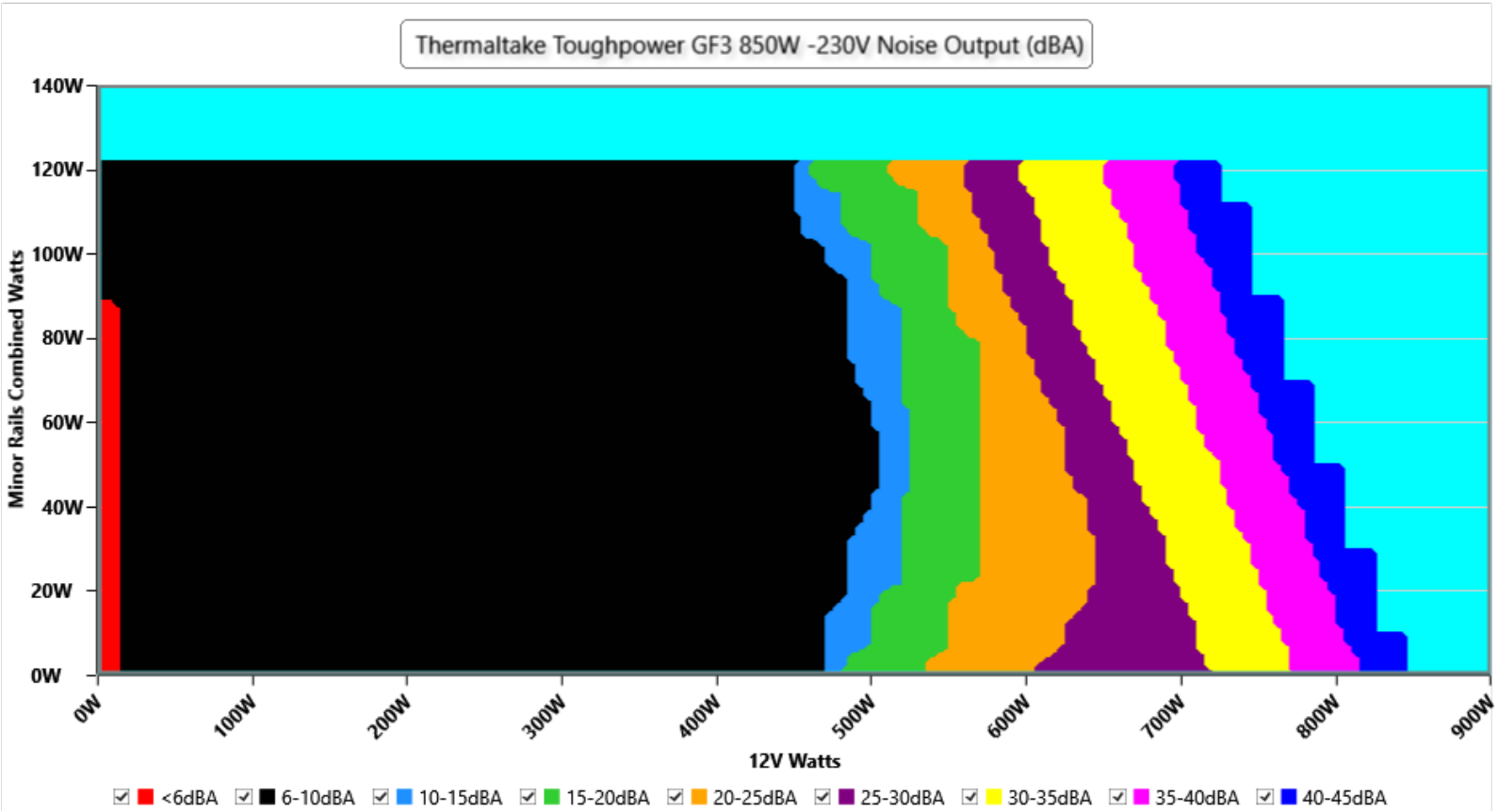
**115V**




**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

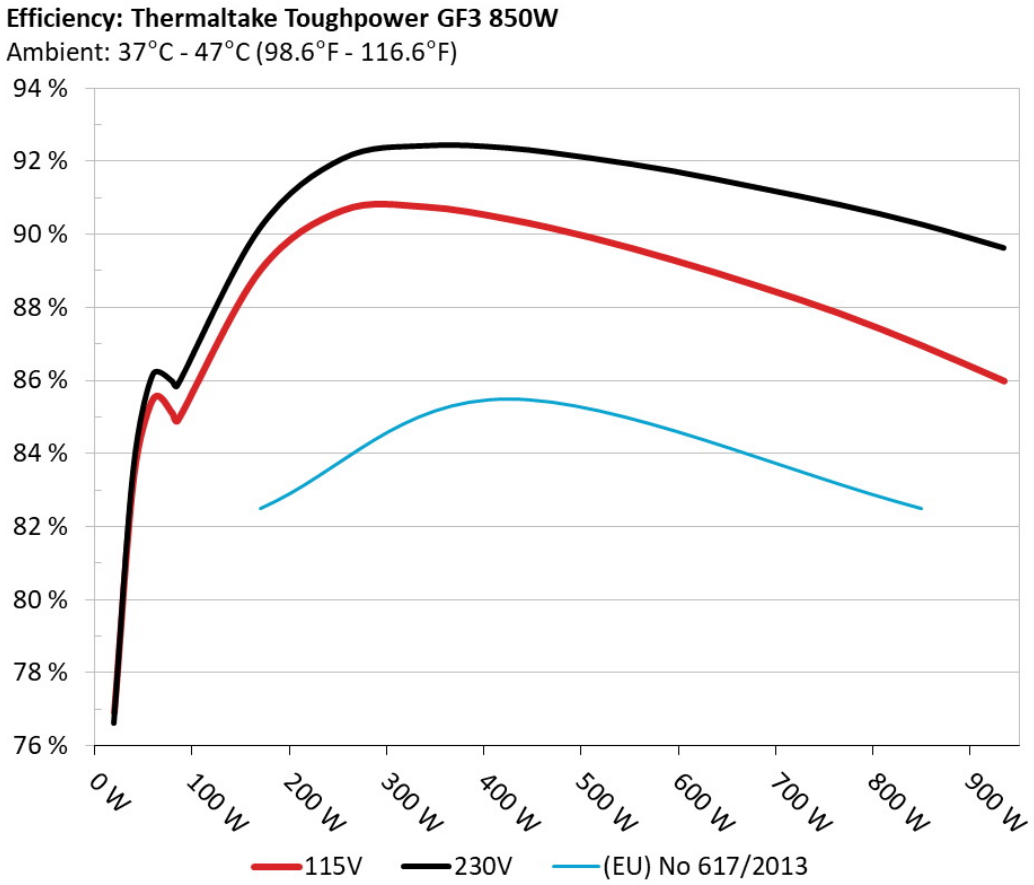



### INFO

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

## Indicative Performance

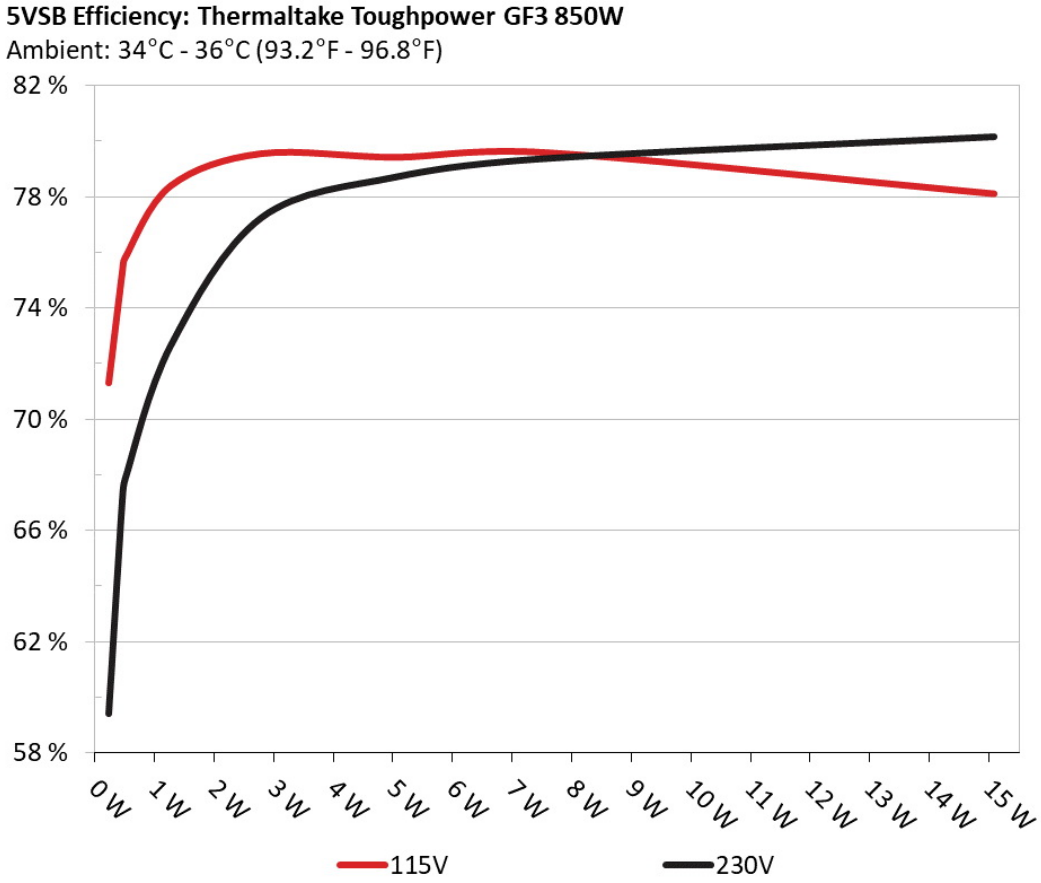
### Efficiency under high ambient temperature




**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 | 0.229W | 71.291% | 0.031 |
| | 5.081V | 0.321W | | 114.93V |
| 2 | 0.09A | 0.457W | 75.299% | 0.059 |
| | 5.081V | 0.607W | | 114.93V |
| 3 | 0.55A | 2.791W | 79.556% | 0.268 |
| | 5.073V | 3.508W | | 114.93V |
| 4 | 1A | 5.066W | 79.426% | 0.36 |
| | 5.065V | 6.378W | | 114.93V |
| 5 | 1.5A | 7.585W | 79.592% | 0.421 |
| | 5.056V | 9.53W | | 114.93V |
| 6 | 3.001A | 15.092W | 78.111% | 0.497 |
| | 5.03V | 19.321W | | 114.92V |

### 230V

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.045A | 0.229W | 59.403% | 0.011 |
| | 5.081V | 0.387W | | 229.89V |
| 2 | 0.09A | 0.457W | 67.116% | 0.02 |
| | 5.08V | 0.681W | | 229.89V |
| 3 | 0.55A | 2.791W | 77.245% | 0.101 |
| | 5.073V | 3.614W | | 229.88V |
| 4 | 1A | 5.065W | 78.719% | 0.168 |
| | 5.065V | 6.434W | | 229.88V |
| 5 | 1.5A | 7.585W | 79.379% | 0.228 |
| | 5.056V | 9.555W | | 229.88V |
| 6 | 3A | 15.092W | 80.159% | 0.328 |
| | 5.03V | 18.828W | | 229.88V |

## 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% | 5.244A | 1.99A | 2.01A | 0.989A | 85.015 | 84.401% | 0 | <6.0 | 44.77°C | 0.979 |
| | 12.094V | 5.025V | 3.284V | 5.056V | 100.724 | | | | 40.41°C | 114.91V |
| 20% | 11.498A | 2.987A | 3.019A | 1.189A | 169.975 | 88.519% | 0 | <6.0 | 45.58°C | 0.99 |
| | 12.095V | 5.022V | 3.28V | 5.047V | 192.023 | | | | 40.87°C | 114.89V |
| 30% | 18.096A | 3.487A | 3.525A | 1.368A | 254.994 | 90.163% | 0 | <6.0 | 46.89°C | 0.994 |
| | 12.100V | 5.02V | 3.277V | 5.119V | 282.819 | | | | 41.57°C | 114.87V |
| 40% | 24.744A | 3.987A | 4.032A | 1.564A | 340.096 | 90.256% | 418 | 7.8 | 41.84°C | 0.991 |
| | 12.079V | 5.017V | 3.274V | 5.115V | 376.812 | | | | 47.89°C | 114.85V |
| 50% | 31.025A | 4.986A | 5.045A | 1.762A | 425.107 | 89.92% | 418 | 7.8 | 42.18°C | 0.991 |
| | 12.074V | 5.015V | 3.271V | 5.108V | 472.757 | | | | 48.63°C | 114.83V |
| 60% | 37.269A | 5.985A | 6.059A | 1.961A | 509.623 | 89.419% | 624 | 17.0 | 42.96°C | 0.992 |
| | 12.069V | 5.013V | 3.268V | 5.1V | 569.925 | | | | 49.99°C | 114.8V |
| 70% | 43.582A | 6.986A | 7.075A | 2.161A | 594.932 | 88.797% | 829 | 26.4 | 43.15°C | 0.993 |
| | 12.065V | 5.011V | 3.266V | 5.092V | 669.985 | | | | 50.71°C | 114.79V |
| 80% | 49.903A | 7.987A | 8.091A | 2.262A | 679.78 | 88.103% | 1021 | 32.8 | 43.87°C | 0.994 |
| | 12.061V | 5.01V | 3.263V | 5.085V | 771.582 | | | | 52.06°C | 114.75V |
| 90% | 56.622A | 8.489A | 8.588A | 2.364A | 765.213 | 87.34% | 1394 | 41.6 | 44.68°C | 0.995 |
| | 12.056V | 5.008V | 3.26V | 5.078V | 876.131 | | | | 54.03°C | 114.74V |
| 100% | 63.069A | 8.992A | 9.117A | 2.963A | 850.026 | 86.454% | 1684 | 47.1 | 45.98°C | 0.995 |
| | 12.055V | 5.006V | 3.258V | 5.063V | 983.212 | | | | 55.99°C | 114.71V |
| 110% | 69.421A | 9.995A | 10.231A | 2.966A | 934.602 | 85.484% | 1928 | 50.1 | 46.91°C | 0.996 |
| | 12.047V | 5.004V | 3.255V | 5.058V | 1093.306 | | | | 57.82°C | 114.68V |
| CL1 | 0.116A | 14.412A | 14.57A | 0A | 121.33 | 82.161% | 442 | 8.3 | 42.08°C | 0.988 |
| | 12.107V | 5.011V | 3.274V | 5.061V | 147.672 | | | | 48.53°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 |
|---|---|---|---|---|---|---|---|---|---|---|
| CL2 | 0.116A | 21.944A | 0A | 0A | 111.428 | 80.589% | 445 | 8.3 | 43.01°C | 0.987 |
| | 12.109V | 5.014V | 3.289V | 5.068V | 138.267 | | | | 50.09°C | 114.9V |
| CL3 | 0.116A | 0A | 22.225A | 0A | 73.991 | 75.34% | 424 | 7.9 | 44.43°C | 0.978 |
| | 12.112V | 5.03V | 3.266V | 5.063V | 98.214 | | | | 52.47°C | 114.91V |
| CL4 | 70.572A | 0A | 0A | 0A | 849.791 | 87.157% | 1537 | 44.2 | 45.78°C | 0.995 |
| | 12.042V | 5.03V | 3.271V | 5.122V | 975.014 | | | | 55.73°C | 114.7V |

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% | 5.245A | 1.99A | 2.01A | 0.989A | 85.012 | 85.344% | 0 | <6.0 | 44.33°C | 0.853 |
| | 12.089V | 5.025V | 3.284V | 5.056V | 99.608 | | | | 40.02°C | 229.88V |
| 20% | 11.502A | 2.987A | 3.019A | 1.189A | 169.974 | 89.658% | 0 | <6.0 | 45.65°C | 0.942 |
| | 12.091V | 5.022V | 3.28V | 5.047V | 189.584 | | | | 40.67°C | 229.87V |
| 30% | 18.101A | 3.486A | 3.524A | 1.368A | 254.997 | 91.563% | 0 | <6.0 | 46.53°C | 0.965 |
| | 12.096V | 5.02V | 3.277V | 5.118V | 278.497 | | | | 41.23°C | 229.86V |
| 40% | 24.755A | 3.987A | 4.032A | 1.564A | 340.123 | 91.919% | 417 | 10.4 | 41.72°C | 0.976 |
| | 12.075V | 5.017V | 3.274V | 5.115V | 370.029 | | | | 47.74°C | 229.84V |
| 50% | 31.032A | 4.986A | 5.045A | 1.762A | 425.12 | 91.854% | 418 | 7.8 | 42.13°C | 0.981 |
| | 12.072V | 5.015V | 3.271V | 5.107V | 462.822 | | | | 48.58°C | 229.83V |
| 60% | 37.272A | 5.985A | 6.059A | 1.961A | 509.651 | 91.58% | 639 | 17.8 | 42.52°C | 0.984 |
| | 12.069V | 5.013V | 3.268V | 5.099V | 556.507 | | | | 49.55°C | 229.83V |
| 70% | 43.592A | 6.986A | 7.076A | 2.161A | 594.968 | 91.222% | 829 | 26.4 | 43.17°C | 0.985 |
| | 12.063V | 5.012V | 3.266V | 5.091V | 652.226 | | | | 50.86°C | 229.82V |
| 80% | 49.916A | 7.988A | 8.092A | 2.263A | 679.823 | 90.778% | 1026 | 32.9 | 43.93°C | 0.987 |
| | 12.058V | 5.01V | 3.263V | 5.084V | 748.887 | | | | 52.02°C | 229.81V |
| 90% | 56.639A | 8.489A | 8.589A | 2.364A | 765.256 | 90.308% | 1377 | 41.3 | 45.44°C | 0.988 |
| | 12.054V | 5.008V | 3.26V | 5.078V | 847.382 | | | | 54.54°C | 229.8V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| 100% | 63.101A | 8.992A | 9.119A | 2.964A | 850.065 | 89.766% | 1686 | 47.1 | 46.4°C | 0.988 |
| | 12.049V | 5.007V | 3.257V | 5.062V | 946.976 | | | | 56.57°C | 229.79V |
| 110% | 69.433A | 9.995A | 10.232A | 2.967A | 934.653 | 89.121% | 2002 | 51.1 | 47.41°C | 0.989 |
| | 12.045V | 5.004V | 3.254V | 5.057V | 1048.748 | | | | 58.31°C | 229.77V |
| CL1 | 0.116A | 14.41A | 14.571A | 0A | 121.334 | 83.218% | 453 | 8.5 | 42.16°C | 0.914 |
| | 12.109V | 5.012V | 3.274V | 5.061V | 145.803 | | | | 48.64°C | 229.87V |
| CL2 | 0.116A | 21.948A | 0A | 0A | 111.432 | 81.534% | 421 | 7.9 | 43.31°C | 0.905 |
| | 12.117V | 5.013V | 3.288V | 5.068V | 136.669 | | | | 50.41°C | 229.87V |
| CL3 | 0.115A | 0A | 22.23A | 0A | 73.988 | 75.97% | 420 | 7.9 | 44.83°C | 0.848 |
| | 12.114V | 5.026V | 3.265V | 5.062V | 97.39 | | | | 52.98°C | 229.88V |
| CL4 | 70.556A | 0A | 0A | 0A | 849.661 | 90.519% | 1392 | 41.6 | 45.97°C | 0.988 |
| | 12.043V | 5.029V | 3.271V | 5.122V | 938.649 | | | | 55.93°C | 229.79V |

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 | 1.242A | 0.496A | 0.501A | 0.197A | 20.01 | 76.407% | 0 | <6.0 | 40.12°C | 0.834 |
| | 11.961V | 5.042V | 3.294V | 5.075V | 26.191 | | | | 37.01°C | 114.93V |
| 40W | 2.732A | 0.694A | 0.701A | 0.296A | 40.01 | 82.884% | 0 | <6.0 | 41.07°C | 0.938 |
| | 11.967V | 5.041V | 3.293V | 5.072V | 48.272 | | | | 37.61°C | 114.93V |
| 60W | 4.220A | 0.894A | 0.904A | 0.395A | 60.011 | 85% | 0 | <6.0 | 42.32°C | 0.964 |
| | 11.974V | 5.031V | 3.287V | 5.069V | 70.601 | | | | 38.55°C | 114.92V |
| 80W | 5.653A | 1.094A | 1.105A | 0.494A | 79.974 | 84.591% | 0 | <6.0 | 43.07°C | 0.978 |
| | 12.090V | 5.028V | 3.285V | 5.066V | 94.546 | | | | 39.11°C | 114.92V |

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 | 1.243A | 0.496A | 0.501A | 0.197A | 20.002 | 76.113% | 0 | <6.0 | 40.19°C | 0.434 |
| | 11.948V | 5.042V | 3.293V | 5.076V | 26.278 | | | | 37.1°C | 229.9V |
| 40W | 2.735A | 0.694A | 0.702A | 0.296A | 40.003 | 83.082% | 0 | <6.0 | 40.81°C | 0.646 |
| | 11.954V | 5.041V | 3.292V | 5.073V | 48.149 | | | | 37.45°C | 229.89V |
| 60W | 4.224A | 0.895A | 0.904A | 0.395A | 60.004 | 85.653% | 0 | <6.0 | 41.74°C | 0.763 |
| | 11.961V | 5.03V | 3.286V | 5.069V | 70.055 | | | | 38.2°C | 229.89V |
| 80W | 5.657A | 1.094A | 1.105A | 0.494A | 79.963 | 85.475% | 0 | <6.0 | 42.19°C | 0.84 |
| | 12.078V | 5.027V | 3.284V | 5.066V | 93.554 | | | | 38.4°C | 229.89V |

The results above are not used in the certification process

## Ripple Measurements

### 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 4.91mV | 8.43mV | 6.19mV | 4.97mV | Pass |
| 20% Load | 5.58mV | 8.22mV | 6.09mV | 5.17mV | Pass |
| 30% Load | 17.83mV | 7.46mV | 6.39mV | 6.60mV | Pass |
| 40% Load | 14.30mV | 7.61mV | 6.54mV | 6.81mV | Pass |
| 50% Load | 13.53mV | 7.97mV | 7.01mV | 5.78mV | Pass |
| 60% Load | 12.81mV | 8.07mV | 7.31mV | 6.45mV | Pass |
| 70% Load | 12.56mV | 10.06mV | 12.88mV | 6.96mV | Pass |
| 80% Load | 12.35mV | 11.90mV | 14.37mV | 7.42mV | Pass |
| 90% Load | 12.41mV | 9.65mV | 9.41mV | 8.03mV | Pass |
| 100% Load | 18.97mV | 11.14mV | 10.78mV | 8.29mV | Pass |
| 110% Load | 19.91mV | 11.38mV | 11.01mV | 9.00mV | Pass |
| Crossload1 | 13.62mV | 10.39mV | 8.88mV | 9.53mV | Pass |
| Crossload2 | 13.41mV | 12.61mV | 7.21mV | 10.08mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| Crossload3 | 6.04mV | 6.23mV | 10.53mV | 8.85mV | Pass |
| Crossload4 | 16.68mV | 9.35mV | 8.77mV | 10.46mV | Pass |

The results above are not used in the certification process

**230V**

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 5.32mV | 8.33mV | 5.68mV | 4.50mV | Pass |
| 20% Load | 5.48mV | 7.82mV | 6.03mV | 4.61mV | Pass |
| 30% Load | 18.30mV | 7.86mV | 6.49mV | 6.34mV | Pass |
| 40% Load | 14.51mV | 7.51mV | 6.29mV | 5.37mV | Pass |
| 50% Load | 13.63mV | 7.81mV | 7.11mV | 5.27mV | Pass |
| 60% Load | 13.38mV | 7.97mV | 7.31mV | 6.04mV | Pass |
| 70% Load | 13.33mV | 11.59mV | 12.73mV | 6.65mV | Pass |
| 80% Load | 13.94mV | 11.75mV | 14.32mV | 6.76mV | Pass |
| 90% Load | 14.30mV | 9.55mV | 9.36mV | 7.27mV | Pass |
| 100% Load | 20.48mV | 11.32mV | 10.31mV | 7.59mV | Pass |
| 110% Load | 20.94mV | 11.96mV | 10.81mV | 8.13mV | Pass |
| Crossload1 | 14.60mV | 10.71mV | 9.72mV | 9.18mV | Pass |
| Crossload2 | 14.89mV | 12.26mV | 7.36mV | 9.52mV | Pass |
| Crossload3 | 5.78mV | 6.49mV | 11.15mV | 8.80mV | Pass |
| Crossload4 | 17.86mV | 9.83mV | 9.05mV | 9.74mV | Pass |

The results above are not used in the certification process

## Thermaltake Toughpower GF3 850W

Top side

Power specifications label

Cybenetics □□□□□□□□□□□□□□□□□□ ETA□□□□ LAMBDA□□□□ SAFE□□□□□□□□□□□□□□□□□□ DELTA□□□□□□□ PHI□□□□□□□□

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