# EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

## Anex

Thermaltake Toughpower SFX 750W

Lab ID#: TT75002128
Receipt Date: Dec 19, 2022
Test Date: Feb 8, 2023

Report: 23PS2128A
Report Date: Feb 8, 2023

## DUT INFORMATION

| | |
|---|---|
| Brand | Thermaltake |
| Manufacturer (OEM) | HKC |
| Series | Toughpower SFX |
| Model Number | PS-STP-0750FNFAGU-1 |
| Serial Number | PSSTP0750FNFAGU1SV000118 |
| DUT Notes | |

## DUT SPECIFICATIONS

| | |
|---|---|
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 10 |
| Rated Frequency (Hz) | 50-60 |
| Rated Power (W) | 750 |
| Type | SFX |
| Cooling | 92mm Fluid Dynamic Bearing Fan [TT-0925 (AV-F9215HS)] |
| Semi-Passive Operation | ✓ |
| Cable Design | Fully Modular |

## TEST EQUIPMENT

| | |
|---|---|
| Electronic Loads | Chroma 63601-5 x2<br>Chroma 63600-2<br>63640-80-80 x10<br>63610-80-20 |
| AC Sources | Chroma 6530, APM SP300VAC4000W-P |
| Power Analyzers | RS HMC8015, N4L PPA1530, N4L PPA5530 |
| Oscilloscopes | Picoscope 4444, Rigol DS7014, 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, Keithley 2015 - THD |
| UPS | FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA |
| Isolation Transformer | 4kVA |







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## RESULTS

| | |
|---|---|
| Temperature Range (°C /°F) | 30-32 / 86-89.6 |
| ErP Lot 3/6 Ready | ✓ |
| (EU) No 617/2013 Compliance | ✓ |
| ALPM (Alternative Low Power Mode) compatible | ✓ |
| ATX 3.0 Ready | ✓ |

## 115V

| | |
|---|---|
| Average Efficiency | 90.090% |
| Efficiency With 10W (≤500W) or 2% (>500W) | 72.127 |
| Average Efficiency 5VSB | 77.178% |
| Standby Power Consumption (W) | 0.0471000 |
| Average PF | 0.985 |
| Avg Noise Output | 34.30 dB(A) |
| Efficiency Rating (ETA) | PLATINUM |
| Noise Rating (LAMBDA) | Standard++ |

## POWER SPECIFICATIONS

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 20 | 20 | 62.5 | 3 | 0.3 |
| | Watts | 100 | | 750 | 15 | 3.6 |
| Total Max. Power (W) | | 750 | | | | |

## HOLD-UP TIME & POWER OK SIGNAL (230V)

| | |
|---|---|
| Hold-Up Time (ms) | 20.75 |
| AC Loss to PWR_OK Hold Up Time (ms) | 18.45 |
| PWR_OK Inactive to DC Loss Delay (ms) | 2.3 |







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### CABLES AND CONNECTORS

Modular Cables

| Description | Cable Count | Connector Count (Total) | Gauge | In Cable Capacitors |
|---|---|---|---|---|
| ATX connector 20+4 pin (300mm) | 1 | 1 | 16-18AWG | No |
| 4+4 pin EPS12V (400mm) | 2 | 2 | 16AWG | No |
| 6+2 pin PCIe (400mm+150mm) | 1 | 2 | 16-18AWG | No |
| 12+4 pin PCIe (400mm) (600W) | 1 | 1 | 16-26AWG | No |
| SATA (310mm+150mm+150mm+150mm) | 2 | 8 | 18AWG | No |
| 4-pin Molex (300mm+145mm+145mm+145mm) | 1 | 4 | 18AWG | No |
| FDD Adapter (150mm) | 1 | 1 | 22AWG | No |
| AC Power Cord (1380mm) - C13 coupler | 1 | 1 | 18AWG | - |

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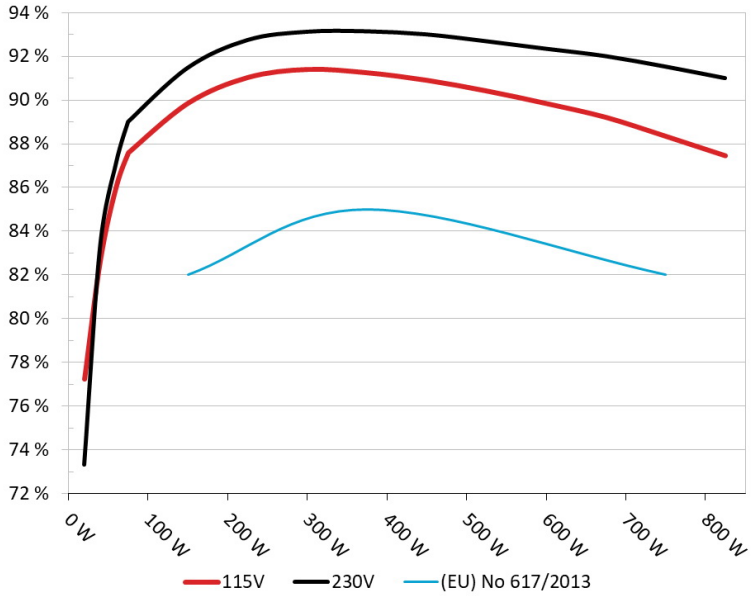
Thermaltake Toughpower SFX 750W

## EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

**Efficiency: Thermaltake Toughpower SFX 750W**
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

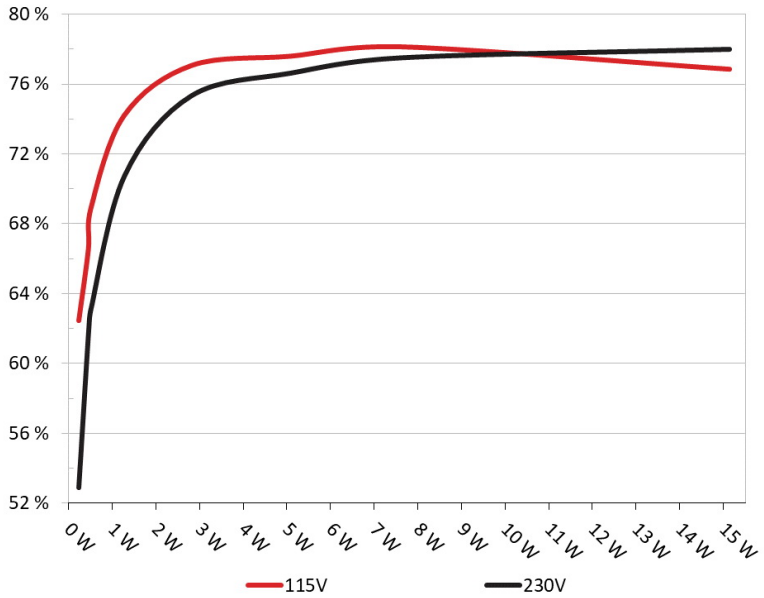



**INFO**

*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

**5VSB Efficiency: Thermaltake Toughpower SFX 750W**
Ambient: 34°C - 36°C (93.2°F - 96.8°F)




**INFO**

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

## Anex

Thermaltake Toughpower SFX 750W

### 5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.045A | 0.231W | 62.471% | 0.037 |
| | 5.127V | 0.37W | | 115.11V |
| 2 | 0.09A | 0.449W | 66.542% | 0.066 |
| | 4.99V | 0.675W | | 115.12V |
| 3 | 0.55A | 2.812W | 77.087% | 0.264 |
| | 5.113V | 3.649W | | 115.12V |
| 4 | 1A | 5.082W | 77.62% | 0.345 |
| | 5.081V | 6.548W | | 115.12V |
| 5 | 1.5A | 7.626W | 78.155% | 0.391 |
| | 5.083V | 9.758W | | 115.12V |
| 6 | 3A | 15.134W | 76.875% | 0.449 |
| | 5.044V | 19.685W | | 115.12V |

### 5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.045A | 0.231W | 52.878% | 0.013 |
| | 5.127V | 0.437W | | 230.33V |
| 2 | 0.09A | 0.461W | 62.028% | 0.022 |
| | 5.126V | 0.743W | | 230.33V |
| 3 | 0.55A | 2.813W | 75.316% | 0.105 |
| | 5.113V | 3.735W | | 230.34V |
| 4 | 1A | 5.102W | 76.617% | 0.172 |
| | 5.101V | 6.66W | | 230.34V |
| 5 | 1.5A | 7.632W | 77.489% | 0.225 |
| | 5.087V | 9.849W | | 230.34V |
| 6 | 3A | 15.136W | 77.973% | 0.318 |
| | 5.045V | 19.411W | | 230.34V |

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# 115V







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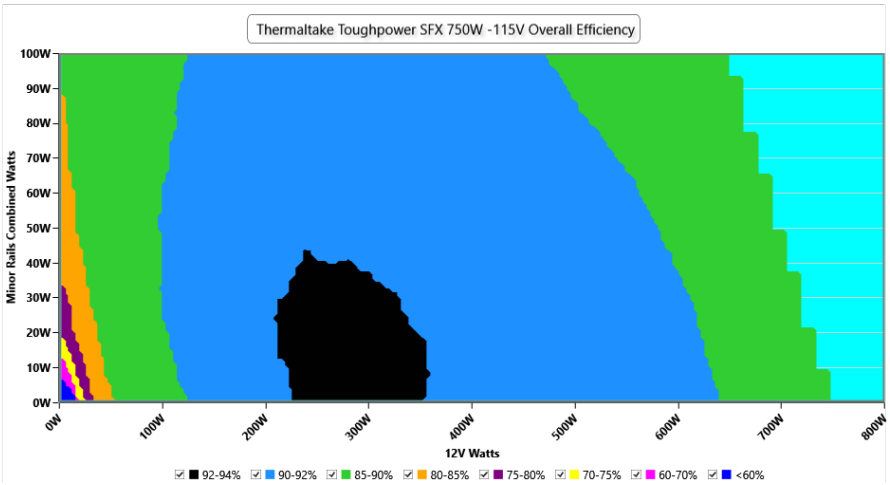
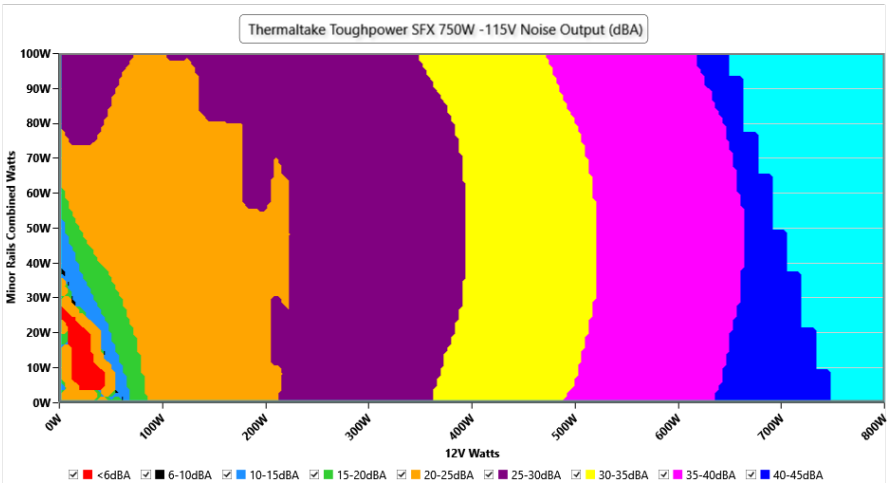
## EFFICIENCY GRAPH 115V




### 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*

## 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*

## Anex

Thermaltake Toughpower SFX 750W

### VAMPIRE POWER -115V

**Detailed Results**

| | Average | Min | Limit Min | Max | Limit Max | Result |
|---|---|---|---|---|---|---|
| Mains Voltage RMS: | 115.14 V | 115.13 V | 113.85 V | 115.16 V | 116.15 V | PASS |
| Mains Frequency: | 60.00 Hz | 60.00 Hz | 59.40 Hz | 60.01 Hz | 60.60 Hz | PASS |
| Mains Voltage CF: | 1.415 | 1.415 | 1.340 | 1.416 | 1.490 | PASS |
| Mains Voltage THD: | 0.13 % | 0.11 % | N/A | 0.15 % | 2.00 % | PASS |
| Real Power: | 0.047 W | 0.042 W | N/A | 0.051 W | N/A | N/A |
| Apparent Power: | 10.046 W | 10.042 W | N/A | 10.049 W | N/A | N/A |
| Power Factor: | 0.005 | N/A | N/A | N/A | N/A | N/A |

***INFO***

*This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing*

## Anex

Thermaltake Toughpower SFX 750W

### 10-110% 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% | 4.385A | 1.968A | 1.975A | 0.982A | 75.001 | 86.517% | 1442 | 26.4 | 39.42°C | 0.962 |
| | 12.178V | 5.082V | 3.343V | 5.093V | 86.689 | | | | 43.51°C | 115.14V |
| 20% | 9.789A | 2.957A | 2.967A | 1.181A | 149.965 | 89.85% | 2136 | 39.3 | 40.63°C | 0.98 |
| | 12.162V | 5.075V | 3.336V | 5.081V | 166.906 | | | | 44.99°C | 115.12V |
| 30% | 15.547A | 3.454A | 3.468A | 1.381A | 224.972 | 91.027% | 2311 | 40.3 | 41.71°C | 0.982 |
| | 12.150V | 5.068V | 3.331V | 5.069V | 247.147 | | | | 46.46°C | 115.09V |
| 40% | 21.335A | 3.953A | 3.97A | 1.582A | 300.062 | 91.396% | 2237 | 38.8 | 41.7°C | 0.984 |
| | 12.133V | 5.061V | 3.325V | 5.057V | 328.309 | | | | 46.77°C | 115.07V |
| 50% | 26.744A | 4.949A | 4.973A | 1.785A | 374.594 | 91.244% | 2400 | 42 | 42.36°C | 0.987 |
| | 12.118V | 5.053V | 3.318V | 5.045V | 410.545 | | | | 47.88°C | 115.05V |
| 60% | 32.196A | 5.948A | 5.98A | 1.988A | 449.512 | 90.901% | 2496 | 42 | 43°C | 0.99 |
| | 12.103V | 5.045V | 3.312V | 5.031V | 494.508 | | | | 49.11°C | 115.04V |
| 70% | 37.663A | 6.951A | 6.991A | 2.192A | 524.441 | 90.415% | 2592 | 43.2 | 43.1°C | 0.992 |
| | 12.089V | 5.037V | 3.305V | 5.018V | 580.045 | | | | 50.16°C | 115.01V |
| 80% | 43.212A | 7.957A | 8.004A | 2.297A | 599.656 | 89.839% | 2702 | 44 | 43.59°C | 0.993 |
| | 12.074V | 5.029V | 3.298V | 5.008V | 667.478 | | | | 51.64°C | 114.99V |
| 90% | 49.107A | 8.465A | 8.505A | 2.402A | 674.681 | 89.207% | 2814 | 45.4 | 44.56°C | 0.994 |
| | 12.059V | 5.021V | 3.291V | 4.997V | 756.317 | | | | 53.59°C | 114.97V |
| 100% | 54.808A | 8.977A | 9.04A | 3.019A | 749.912 | 88.34% | 2988 | 46.7 | 45.8°C | 0.995 |
| | 12.046V | 5.013V | 3.285V | 4.97V | 848.897 | | | | 55.89°C | 114.96V |
| 110% | 60.394A | 9.993A | 10.16A | 3.024A | 824.942 | 87.449% | 3008 | 47.2 | 46.54°C | 0.996 |
| | 12.032V | 5.004V | 3.277V | 4.961V | 943.338 | | | | 57.44°C | 114.94V |
| CL1 | 0.115A | 11.868A | 11.929A | 0A | 101.297 | 85.064% | 2421 | 42.2 | 44.02°C | 0.975 |
| | 12.195V | 5.072V | 3.327V | 5.105V | 119.077 | | | | 49.51°C | 115.13V |
| CL2 | 0.115A | 19.701A | 0A | 0A | 101.391 | 83.944% | 2306 | 40.3 | 41.42°C | 0.974 |
| | 12.187V | 5.076V | 3.328V | 5.117V | 120.788 | | | | 48.52°C | 115.13V |
| CL4 | 62.282A | 0A | 0A | 0A | 749.706 | 89.209% | 2631 | 44.3 | 47.63°C | 0.995 |
| | 12.037V | 5.024V | 3.3V | 5.078V | 840.393 | | | | 58.58°C | 114.96V |

## Anex

Thermaltake Toughpower SFX 750W

### 20-80W 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 | 1.226A | 0.491A | 0.493A | 0.195A | 20.001 | 77.229% | 404 | 21 | 36.51°C | 0.841 |
| | 12.113V | 5.089V | 3.349V | 5.121V | 25.898 | | | | 39.54°C | 115.15V |
| 40W | 2.682A | 0.688A | 0.69A | 0.293A | 39.998 | 82.7% | 804 | 9.3 | 37.01°C | 0.931 |
| | 12.184V | 5.087V | 3.347V | 5.116V | 48.368 | | | | 40.32°C | 115.15V |
| 60W | 4.148A | 0.885A | 0.888A | 0.391A | 59.998 | 86.047% | 1166 | 18.2 | 39.35°C | 0.953 |
| | 12.181V | 5.085V | 3.345V | 5.112V | 69.726 | | | | 43.07°C | 115.14V |
| 80W | 5.612A | 1.083A | 1.086A | 0.49A | 79.963 | 87.584% | 1493 | 26.7 | 39.08°C | 0.964 |
| | 12.176V | 5.083V | 3.344V | 5.108V | 91.299 | | | | 43.05°C | 115.13V |

### RIPPLE MEASUREMENTS 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 15.00mV | 6.14mV | 5.22mV | 12.03mV | Pass |
| 20% Load | 11.59mV | 7.62mV | 5.12mV | 12.90mV | Pass |
| 30% Load | 10.25mV | 11.45mV | 5.84mV | 14.94mV | Pass |
| 40% Load | 11.53mV | 11.96mV | 6.19mV | 15.81mV | Pass |
| 50% Load | 10.81mV | 11.61mV | 5.84mV | 16.06mV | Pass |
| 60% Load | 10.25mV | 12.63mV | 6.04mV | 18.96mV | Pass |
| 70% Load | 10.10mV | 17.95mV | 6.55mV | 20.08mV | Pass |
| 80% Load | 10.76mV | 17.90mV | 7.27mV | 20.14mV | Pass |
| 90% Load | 11.78mV | 15.90mV | 7.98mV | 20.90mV | Pass |
| 100% Load | 17.30mV | 11.19mV | 7.35mV | 28.66mV | Pass |
| 110% Load | 19.28mV | 11.56mV | 7.96mV | 28.87mV | Pass |
| Crossload1 | 17.17mV | 8.88mV | 9.75mV | 7.19mV | Pass |
| Crossload2 | 12.43mV | 10.13mV | 8.19mV | 6.78mV | Pass |
| Crossload3 | 0.00mV | 0.00mV | 0.00mV | 0.00mV | Pass |
| Crossload4 | 18.27mV | 8.93mV | 5.72mV | 11.76mV | Pass |

## Anex

Thermaltake Toughpower SFX 750W


*Top side*


*Power specifications label*

## CERTIFICATIONS 115V

CYBENETICS PLATINUM

CYBENETICS STANDARD++

**Aristeidis Bitziopoulos**
Lab Director