SAMA先马

# SAMA GT650W

Lab ID SM65002570

Certification ID 252570

Test Result Report ID: 24PS2570A

Certificate Issue Date: Sep 17, 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 | SAMA |
| Model | GT650W |
| OEM/ODM | RSY |
| Serial Number | |
| Product Specifications | |
| Manufacturer-Provided Information | |
| □□□□ (Vrms) | 100-240 |
| □□□□ (Arms) | 10 |

| | |
|---|---|
| □□□□ (Hz) | 50-60 |
| □□□□ (W) | 650 |
| Operating Temperature (Continuous Full Load) (°C) | |
| □□ | ATX12V |
| □□□□ | Fully Modular |
| Warranty | - |
| Cybenetics Measurements | |
| Dimensions (W x H x D) | |
| Weight | |
| □□ | 120mm Fluid Dynamic Bearing Fan (S1202512L) |
| □□□□□ | ✗ |
| Cybenetics Testing Information | |
| Lab ID | SM65002570 |
| Date of receipt | Sep 4, 2024 |
| Testing Date | Sep 16, 2024 |
| Report Issued Date | Sep 17, 2024 |
| Engineer Name | - |
| Authorized By the Laboratory Technical Manager | Aristeidis Bitziopoulos |
| Signature |  |

## □□□□ (Non-accredited measurements)

| □□□□ | | | | |
|---|---|---|---|---|
| □□ | □□□□ | □□□□□□ | **Gauge** | In Cable Capacitors |
| ATX □□ 20+4 pin (550mm) | 1 | 1 | 16-24AWG | □ |
| 4+4 pin EPS 12V □□ (600mm+150mm) | 1 | 2 | 18AWG | □ |
| 6+2pin PCIe□□ (550mm+150mm) | 1 | 2 | 18AWG | □ |
| 12+2 pin PCIe (600mm) (450W) | 1 | 1 | 16-24AWG | □ |
| SATA□□ (460mm+150mm+150mm) / 4-pin Molex (+150mm) | 2 | 6 / 2 | 18AWG | □ |

## Protection Features(Manufacturer)

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

## □□□□

| □ | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| □□□□ | □□ | 20 | 20 | 54.1 | 2.5 | 0.4 |
| | □ | 100 | | 649.2 | 12.5 | 4.8 |
| □□□□□ (W) | | 650 | | | | |

## Parts Description

| | |
|---|---|
| **General Data** | |
| Manufacturer (OEM) | RSY |
| PCB Type | Double-Sided |
| **Primary Side** | |
| Transient Filter | 6x Y caps, 3x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | 1x NTC Thermistor MF72 2.5-D11 (2.5 ohm) & Relay |
| Bridge Rectifier(s) | 1x GBU1006 (600V, 10A @ 100°C) |
| APFC MOSFETs | 4x Shenzhen SIF13N50C (500V, 8A @ 100°C, Rds(on): 0.55Ohm) |
| APFC Boost Diode | 1x STMicronics STTH8R06FP (600V, 8A @ 85°C) |
| Bulk Cap(s) | 1x Rubycon (420V, 270uF, 3,000h @ 105°C, MXK) |

| | |
|---|---|
| Main Switchers | 2x Convert CS25N50FF (500V, 25A @ 25°C, Rds(on): 0.24Ohm) & 1x Sync Power Corp SPN5003 (For no load consumption) |
| Resonant Controller | Texas Instrument UCC25600 |
| APFC Controller | Texas Instrument UCC28180 |
| Topology | Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters |
| **Secondary Side** | |
| +12V MOSFETs | 4x Maplesemi SLP130N04T (40V, 84A @ 100°C, Rds(on): 3.0mOhm) |
| 5V & 3.3V | DC-DC Converters: 4x Infineon BSC0906NS (30V, 40A @ 100°C, Rds(on): 4.5mOhm) PWM Controller(s): 2x Anpec APW7164 |
| Filtering Capacitors | Electrolytic: 15x Teapo (2-6,000h @105°C, SY) 5x Teapo (2-6,000h @105°C, SJ) 1x Teapo (2,000h @105°C, SC) 1x Teapo (2,000h @105°C, H7) Polymer: 6x |
| Supervisor IC | IN1S313I-SAG |
| Fan Model | Globe Fan S1202512L (120mm, 12V, 0.18A, Fluid Dynamic Bearing Fan) |
| **5VSB** | |
| Rectifier | US1D |
| Standby PWM Controller | First Semiconductor FIR4N70L VDMOSFET (700V, 2.5A) |

## Test Results

### Temperature & Compliance Info

| | |
|---|---|
| □□□□ (°C /°F) | 28-32 / 82.4-89.6 |
| □□ ErP Lot3/6□□ | ✓ |
| □□ (EU) No 617/2013□□ | ✓ |
| ALPM (Alternative Low Power Mode) compatible | ✓ |
| ATX v3.1 PSU Power Excursion | ✓ |

## Performance Summary

### 115V

| | |
|---|---|
| Accredited | |
| □□□□ (>1450 load combinations) | 88.531% |
| Average Noise Output (>1450 Load Combinations) | 33.94dBA |
| PF□□□ (>1450 Load Combinations) | 0.989 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 64.681% |
| □□□□□□ | 0.0550W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 29.52mV |
| 5V Ripple (Full Load) | 16.98mV |
| 3.3V Ripple (Full Load) | 16.67mV |
| 5VSB Ripple (Full Load) | 19.15mV |
| 12V Load Regulation | 0.10% |
| 5V Load Regulation | 1.75% |
| 3.3V Load Regulation | 3.33% |
| 5VSB Load Regulation | 2.81% |
| Inrush Current | 53.690A |

### 230V

| | |
|---|---|
| Accredited | |
| □□□□ (>1450 load combinations) | 90.600% |
| Average Noise Output (>1450 Load Combinations) | 34.58dBA |
| PF□□□ (>1450 Load Combinations) | 0.960 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 62.376% |
| □□□□□□ | 0.1251W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 30.63mV |
| 5V Ripple (Full Load) | 16.41mV |
| 3.3V Ripple (Full Load) | 15.52mV |

| | | |
|---|---|---|
| 5VSB Ripple (Full Load) | | 18.46mV |
| 12V Load Regulation | | 0.09% |
| 5V Load Regulation | | 1.79% |
| 3.3V Load Regulation | | 3.36% |
| 5VSB Load Regulation | | 2.85% |
| Inrush Current | | 94.850A |
| 12V Transient Response (200%) | | 11.48V |
| 5V Transient Response (200%) | | 4.965V |
| 3.3V Transient Response (200%) | | 3.163V |
| 5VSB Transient Response (200%) | | 4.940V |
| □□□□ & PG□□ | | 16.60ms |
| AC Loss to PWR_OK Hold Up Time | | 14.50ms |
| PWR_OK Inactive to DC Loss Delay | | 2.10ms |
| PSU Timings: T1 (20% / 100%) | 123.0ms | 126.0ms |
| PSU Timings: T3 (20% / 100%) | 113.0ms | 114.0ms |
| 12V OCP (28.6°C / 44.2°C) | 85.60A (158.23%), 12.158V | 86.40A (159.70%), 12.168V |
| 5V OCP (28.6°C / 44.2°C) | 35.8A (179.00%), 5.046V | 35.3A (176.50%), 5.047V |
| 3.3V OCP (28.6°C / 44.2°C) | 35.5A (177.50%), 3.275V | 34.2A (171.00%), 3.274V |
| 5VSB OCP (28.6°C / 44.2°C) | 4A (160.00%), 5.019V | 3.9A (156.00%), 5.017V |
| OPP (26.65°C / 44.78°C) | 149.80% | 149.80% |

## □□□□ & PG□□

| | |
|---|---|
| Hold-Up Time (ms) | 16.6 |
| AC Loss to PWR_OK Hold Up Time (ms) | 14.5 |
| PWR_OK Inactive to DC Loss Delay (ms) | 2.1 |

## Tables

### 115V

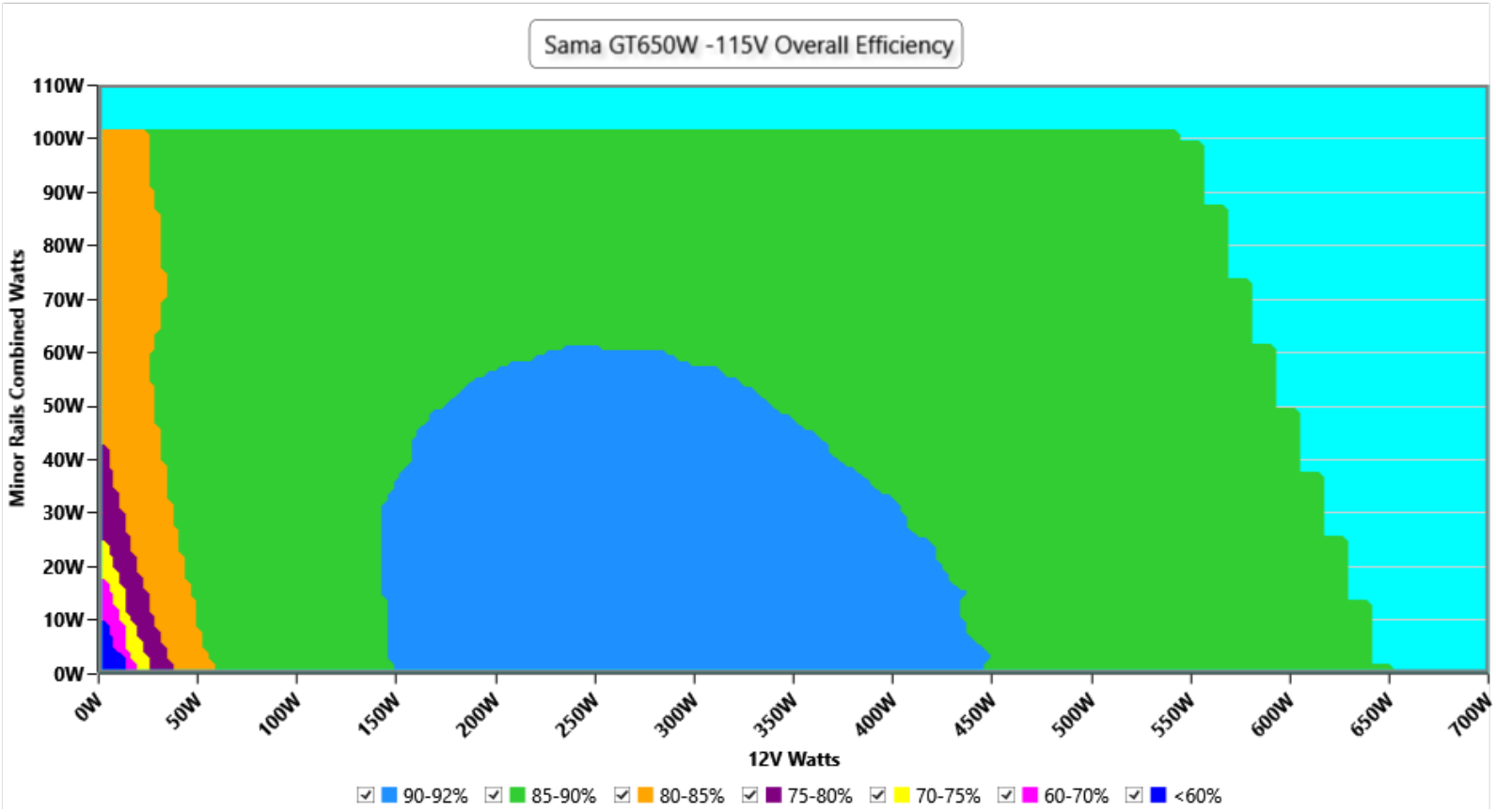
| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 115.08 V | 115.04 V | 113.85 V | 115.12 V | 116.15 V | PASS |
| Mains Frequency: | 60.00 Hz | 59.99 Hz | 59.40 Hz | 60.01 Hz | 60.60 Hz | PASS |
| Mains Voltage CF: | 1.416 | 1.415 | 1.340 | 1.418 | 1.490 | PASS |
| Mains Voltage THD: | 0.13 % | 0.09 % | N/A | 0.19 % | 2.00 % | PASS |
| Real Power: | 0.055 W | 0.004 W | N/A | 0.090 W | N/A | N/A |
| Apparent Power: | 3.739 W | 3.620 W | N/A | 3.844 W | N/A | N/A |
| Power Factor: | 0.019 | N/A | N/A | N/A | N/A | N/A |

### 230V

| Detailed Results | | | | | | |
|---|---|---|---|---|---|---|
| | Average | Min | Limit Min | Max | Limit Max | Result |
| Mains Voltage RMS: | 231.04 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 % | 0.15 % | N/A | 0.26 % | 2.00 % | PASS |
| Real Power: | 0.125 W | 0.086 W | N/A | 0.180 W | N/A | N/A |
| Apparent Power: | 12.405 W | 12.182 W | N/A | 12.588 W | N/A | N/A |
| Power Factor: | 0.011 | N/A | N/A | N/A | N/A | N/A |

## □□□□□□

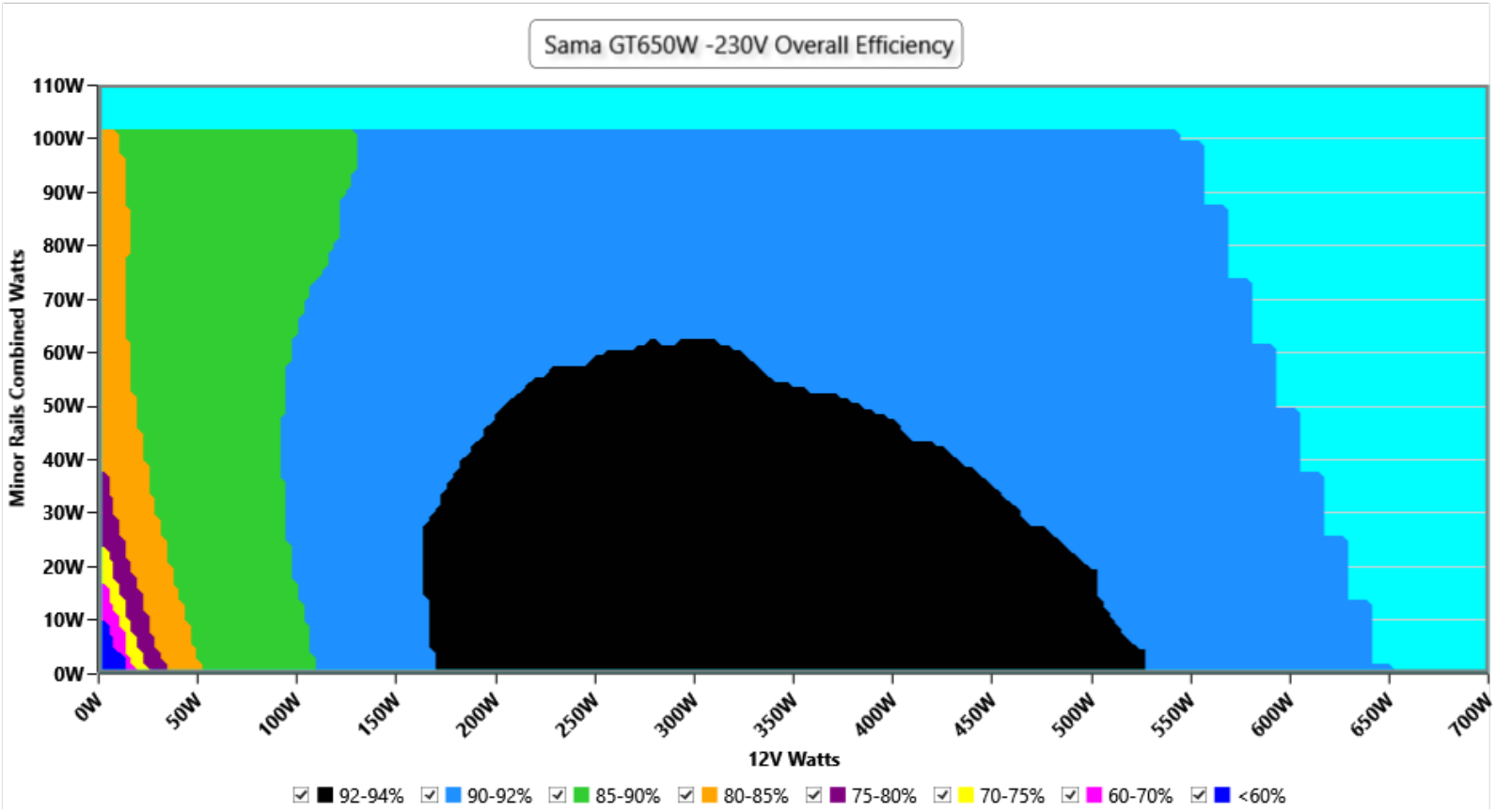
**115V**




□□

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

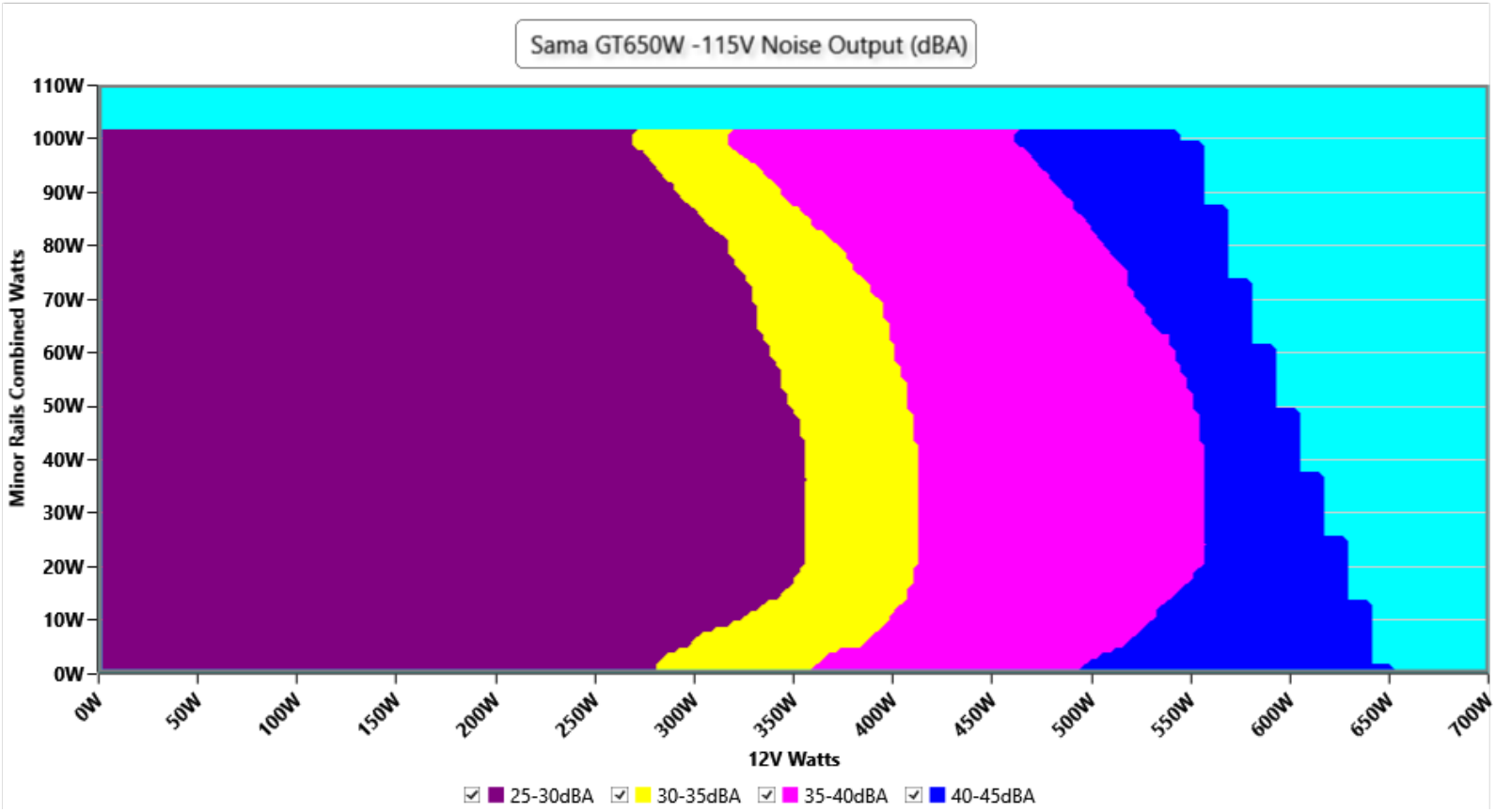
## 230V




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

## □□□□□

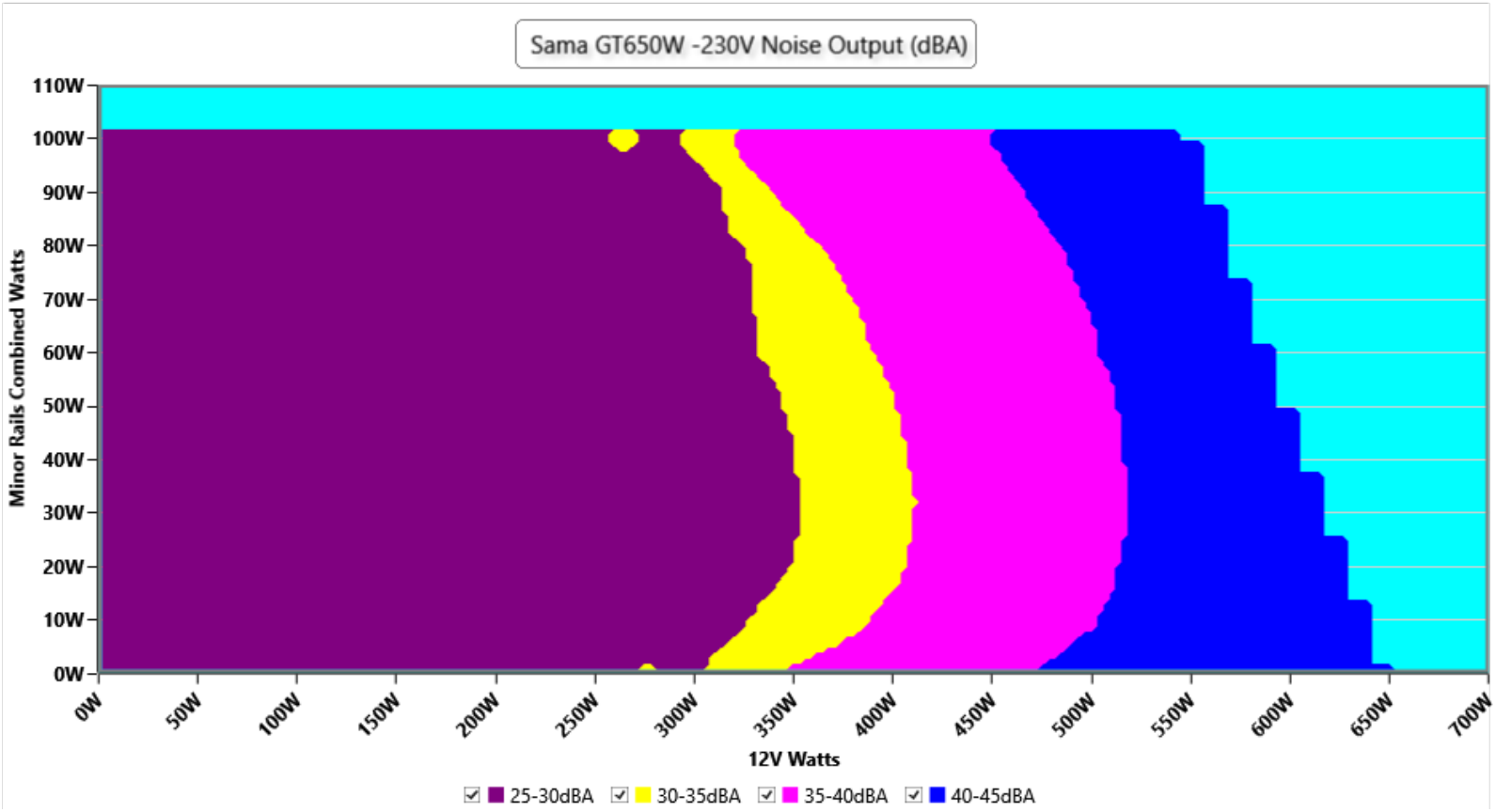
**115V**




□□

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




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% | 970 RPM · 26.3 dB(A) · 30.4 °C | 992 RPM · 26.3 dB(A) · 40.2 °C | **+0.0 dB(A)** |
| 20% | 974 RPM · 26.4 dB(A) · 30.5 °C | 996 RPM · 26.8 dB(A) · 40.8 °C | **+0.4 dB(A)** |
| 50% | 980 RPM · 26.2 dB(A) · 30.6 °C | 1571 RPM · 39.3 dB(A) · 42.2 °C | **+13.1 dB(A)** |
| 100% | 1936 RPM · 43.5 dB(A) · 30.5 °C | 2044 RPM · 44.9 dB(A) · 45.2 °C | **+1.4 dB(A)** |

### 230V

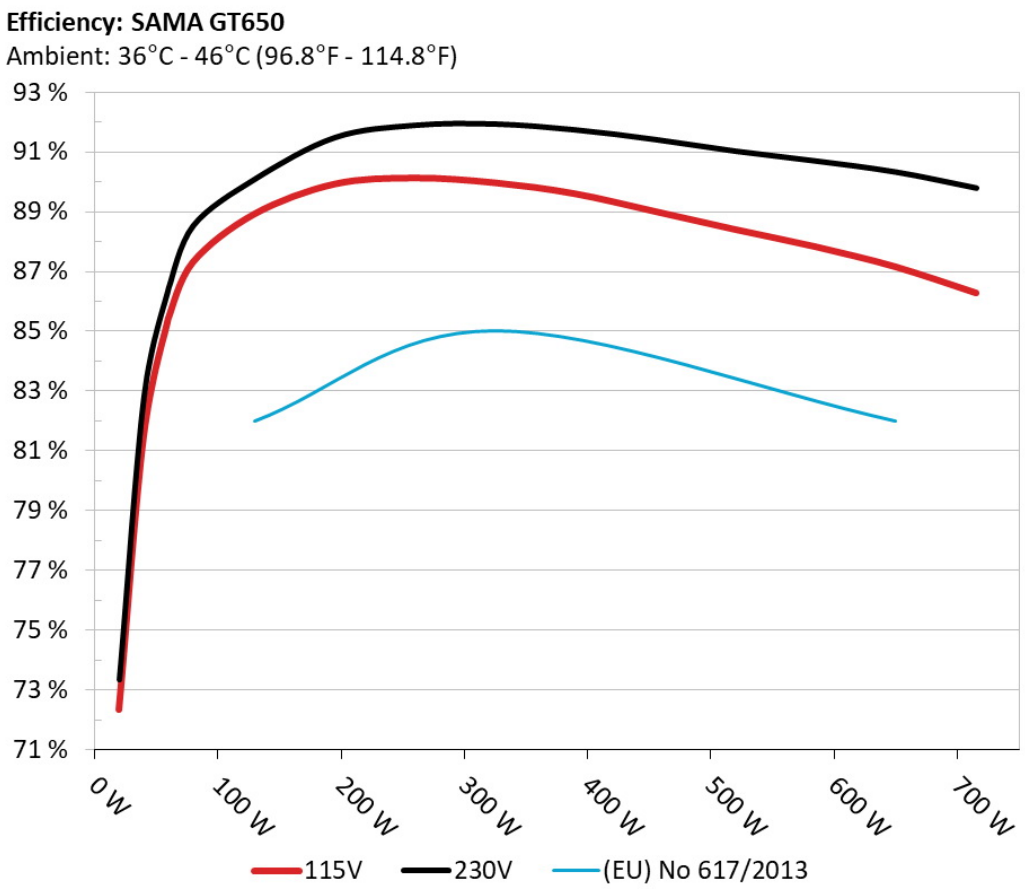
| Load | Normal ambient<br>fan · noise · intake | High ambient<br>fan · noise · intake | Noise change |
|---|---|---|---|
| 10% | 973 RPM · 26.4 dB(A) · 30.2 °C | 995 RPM · 26.4 dB(A) · 40.1 °C | **+0.0 dB(A)** |
| 20% | 976 RPM · 26.2 dB(A) · 30.4 °C | 998 RPM · 26.9 dB(A) · 41.0 °C | **+0.7 dB(A)** |
| 50% | 982 RPM · 26.0 dB(A) · 30.6 °C | 1636 RPM · 38.4 dB(A) · 42.5 °C | **+12.4 dB(A)** |
| 100% | 1927 RPM · 43.4 dB(A) · 30.1 °C | 2039 RPM · 44.8 dB(A) · 45.6 °C | **+1.4 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, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

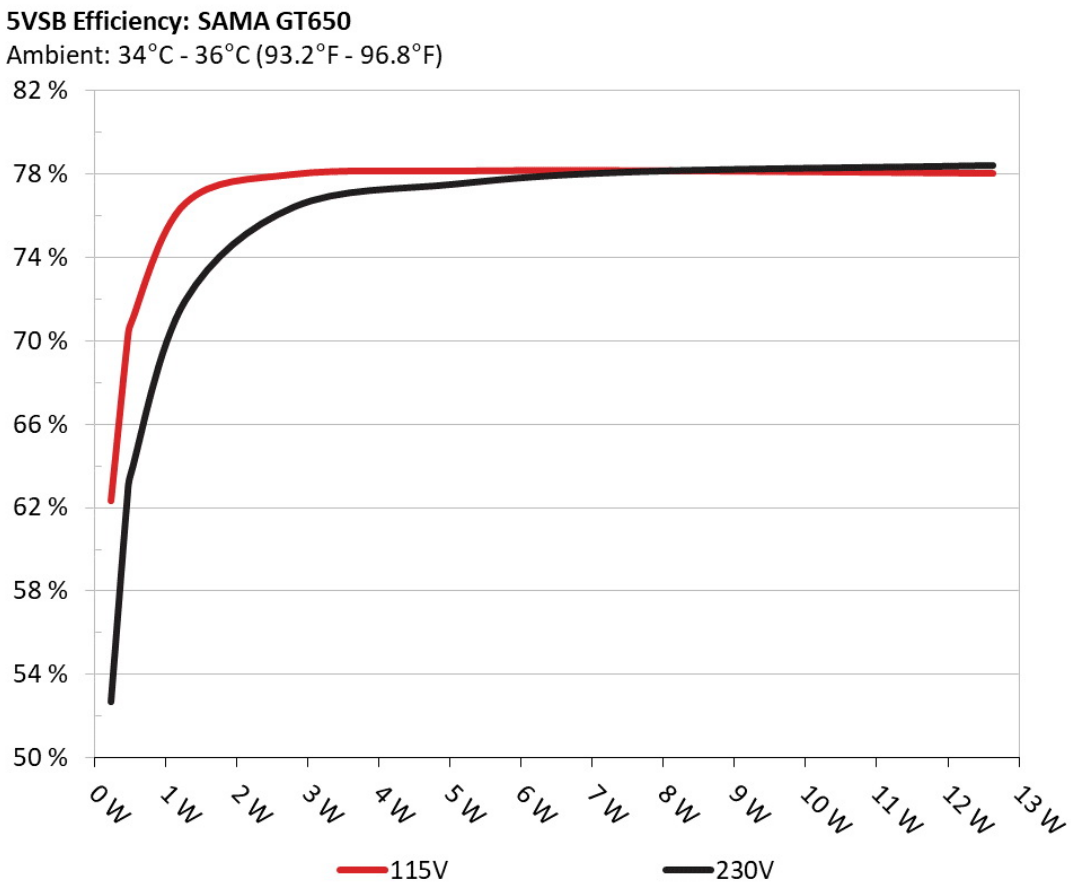
*Informational. Not part of the ETA or LAMBDA rating.*

## Indicative Performance




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□□□□**




□□

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

## □□□□ □□ 5Vsb □□ (ErP Lot3/6 & CEC)

### 115V

| □□ # | 5VSB | DC/AC (□ ) | □□ | PF/AC □□ |
|---|---|---|---|---|
| **1** | **0.045A** | 0.229W | 62.344% | 0.076 |
| | 5.097V | 0.322W | | 115.17V |
| **2** | **0.09A** | 0.459W | 69.968% | 0.145 |
| | 5.095V | 0.656W | | 115.17V |
| **3** | **0.55A** | 2.799W | 78.002% | 0.365 |
| | 5.087V | 3.589W | | 115.17V |
| **4** | **1A** | 5.081W | 78.155% | 0.418 |
| | 5.079V | 6.5W | | 115.17V |
| **5** | **1.5A** | 7.608W | 78.178% | 0.438 |
| | 5.071V | 9.731W | | 115.17V |
| **6** | **2.501A** | 12.633W | 78.046% | 0.47 |
| | 5.052V | 16.186W | | 115.16V |

### 230V

| □□ # | 5VSB | DC/AC (□ ) | □□ | PF/AC □□ |
|---|---|---|---|---|
| **1** | **0.045A** | 0.229W | 52.689% | 0.033 |
| | 5.096V | 0.435W | | 230.39V |
| **2** | **0.09A** | 0.459W | 62.484% | 0.055 |
| | 5.095V | 0.735W | | 230.39V |
| **3** | **0.55A** | 2.8W | 76.39% | 0.213 |
| | 5.089V | 3.669W | | 230.41V |
| **4** | **1A** | 5.081W | 77.495% | 0.289 |
| | 5.08V | 6.556W | | 230.39V |
| **5** | **1.5A** | 7.609W | 78.08% | 0.325 |
| | 5.071V | 9.744W | | 230.41V |
| **6** | **2.501A** | 12.635W | 78.382% | 0.367 |
| | 5.053V | 16.121W | | 230.4V |

## Protection Features

| | |
|---|---|
| OCP (Normal @ 28.6°C) | 12V: 85.60A (158.23%), 12.158V<br>5V: 35.8A (179.00%), 5.046V<br>3.3V: 35.5A (177.50%), 3.275V<br>5VSB: 4A (160.00%), 5.019V |
| OCP (Hot @ 44.2°C) | 12V: 86.40A (159.70%), 12.168V<br>5V: 35.3A (176.50%), 5.047V<br>3.3V: 34.2A (171.00%), 3.274V<br>5VSB: 3.9A (156.00%), 5.017V |
| OPP (Normal @ 26.6°C) | 973.70W (149.80%) |
| OPP (Hot @ 44.8°C) | 973.72W (149.80%) |
| OTP | ✓ (153°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 |
| NLO | ✓ |
| Fan Failure Protection | ✗ |
| SIP | Surge: MOV<br>Inrush: NTC & Bypass Relay |

## Supplementary Tests (For Reference)

### 10-110%□□□□

**115V**

| □□ | **12V** | **5V** | **3.3V** | **5VSB** | **DC/AC (□ )** | □□ | □□□□ **(RPM)** | □□□□□□□ **(dB[A])** | □□ **(□□ /□□ )** | **PF/AC □□** |
|---|---|---|---|---|---|---|---|---|---|---|
| **10%** | **3.570A** | **1.957A** | **1.973A** | **0.987A** | 65.005 | 84.96% | 992 | 26.3 | 40.16°C | 0.957 |
| | 12.157V | 5.11V | 3.345V | 5.069V | 76.513 | | | | 41.91°C | 115.14V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **20%** | **8.147A** | **2.941A** | **2.97A** | **1.187A** | 129.95 | 88.94% | 996 | 26.8 | 40.8°C | 0.987 |
| | 12.157V | 5.102V | 3.334V | 5.056V | 146.109 | | | | 42.67°C | 115.11V |
| **30%** | **13.070A** | **3.437A** | **3.475A** | **1.388A** | 194.96 | 89.942% | 1001 | 27.1 | 41.06°C | 0.988 |
| | 12.158V | 5.094V | 3.324V | 5.043V | 216.757 | | | | 43.75°C | 115.1V |
| **40%** | **17.999A** | **3.934A** | **3.984A** | **1.591A** | 260.045 | 90.144% | 1342 | 33.8 | 41.89°C | 0.991 |
| | 12.158V | 5.085V | 3.314V | 5.031V | 288.477 | | | | 44.4°C | 115.08V |
| **50%** | **22.578A** | **4.927A** | **4.997A** | **1.794A** | 325.041 | 89.984% | 1571 | 39.3 | 42.21°C | 0.993 |
| | 12.160V | 5.076V | 3.302V | 5.017V | 361.222 | | | | 44.36°C | 115.06V |
| **60%** | **27.116A** | **5.923A** | **6.017A** | **1.999A** | 389.566 | 89.62% | 1799 | 40.7 | 42.71°C | 0.994 |
| | 12.160V | 5.067V | 3.291V | 5.003V | 434.69 | | | | 45.78°C | 115.04V |
| **70%** | **31.717A** | **6.924A** | **7.047A** | **2.206A** | 454.881 | 89.024% | 1984 | 44.5 | 43.26°C | 0.995 |
| | 12.163V | 5.057V | 3.278V | 4.988V | 510.967 | | | | 46.45°C | 115.02V |
| **80%** | **36.319A** | **7.927A** | **8.082A** | **2.312A** | 519.678 | 88.422% | 2031 | 44.8 | 43.96°C | 0.995 |
| | 12.164V | 5.047V | 3.266V | 4.976V | 587.727 | | | | 47.72°C | 115V |
| **90%** | **41.319A** | **8.438A** | **8.601A** | **2.418A** | 585.122 | 87.843% | 2037 | 44.8 | 44.37°C | 0.995 |
| | 12.165V | 5.038V | 3.255V | 4.964V | 666.098 | | | | 48.85°C | 114.98V |
| **100%** | **46.252A** | **8.949A** | **9.154A** | **2.525A** | 649.861 | 87.172% | 2044 | 44.9 | 45.15°C | 0.995 |
| | 12.165V | 5.029V | 3.244V | 4.952V | 745.496 | | | | 50.49°C | 114.96V |
| **110%** | **50.918A** | **9.963A** | **10.306A** | **2.531A** | 715.291 | 86.297% | 2048 | 45 | 46.32°C | 0.995 |
| | 12.166V | 5.019V | 3.231V | 4.94V | 828.878 | | | | 52.13°C | 114.95V |
| **CL1** | **0.115A** | **11.84A** | **11.98A** | **0A** | 101.307 | 81.949% | 1726 | 39.9 | 40.57°C | 0.979 |
| | 12.166V | 5.085V | 3.314V | 5.065V | 123.62 | | | | 44.1°C | 115.13V |
| **CL2** | **0.115A** | **19.671A** | **0A** | **0A** | 101.396 | 81.615% | 1546 | 37.9 | 40.65°C | 0.979 |
| | 12.165V | 5.084V | 3.33V | 5.073V | 124.236 | | | | 42.7°C | 115.13V |
| **CL3** | **0.115A** | **0A** | **19.931A** | **0A** | 67.39 | 74.9% | 1441 | 35.2 | 40.83°C | 0.968 |
| | 12.161V | 5.099V | 3.311V | 5.069V | 89.973 | | | | 42.79°C | 115.13V |
| **CL4** | **53.466A** | **0A** | **0A** | **0A** | 649.724 | 88.278% | 2042 | 44.9 | 45.55°C | 0.995 |
| | 12.152V | 5.054V | 3.271V | 5.015V | 735.994 | | | | 49.8°C | 114.96V |

The results above are not used in the certification process

## 230V

| □□ | 12V | 5V | 3.3V | 5VSB | DC/AC (□ ) | □□ | □□□□ (RPM) | □□□□□□□ (dB[A]) | □□ (□□ /□□ ) | PF/AC □□ |
|---|---|---|---|---|---|---|---|---|---|---|
| **10%** | **3.570A** | **1.957A** | **1.974A** | **0.987A** | 65.01 | 86.212% | 995 | 26.4 | 40.07°C | 0.83 |
| | 12.156V | 5.111V | 3.344V | 5.069V | 75.408 | | | | 41.71°C | 230.39V |
| **20%** | **8.149A** | **2.941A** | **2.971A** | **1.187A** | 129.969 | 90.084% | 998 | 26.9 | 40.96°C | 0.917 |
| | 12.157V | 5.102V | 3.333V | 5.055V | 144.279 | | | | 42.76°C | 230.39V |
| **30%** | **13.072A** | **3.437A** | **3.476A** | **1.389A** | 194.977 | 91.476% | 1243 | 32.1 | 41.14°C | 0.952 |
| | 12.157V | 5.094V | 3.323V | 5.043V | 213.145 | | | | 43.09°C | 230.38V |
| **40%** | **18.002A** | **3.934A** | **3.985A** | **1.591A** | 260.069 | 91.884% | 1442 | 35.5 | 41.5°C | 0.97 |
| | 12.157V | 5.085V | 3.313V | 5.03V | 283.039 | | | | 43.61°C | 230.37V |
| **50%** | **22.581A** | **4.927A** | **4.998A** | **1.795A** | 325.067 | 91.925% | 1636 | 38.4 | 42.49°C | 0.979 |
| | 12.159V | 5.076V | 3.302V | 5.016V | 353.621 | | | | 44.71°C | 230.36V |
| **60%** | **27.121A** | **5.924A** | **6.019A** | **2A** | 389.612 | 91.732% | 1833 | 42.5 | 42.61°C | 0.983 |
| | 12.160V | 5.066V | 3.29V | 5.002V | 424.727 | | | | 45.04°C | 230.35V |
| **70%** | **31.723A** | **6.925A** | **7.048A** | **2.206A** | 454.929 | 91.406% | 1993 | 44.7 | 43.51°C | 0.986 |
| | 12.161V | 5.056V | 3.278V | 4.988V | 497.7 | | | | 46.01°C | 230.33V |
| **80%** | **36.322A** | **7.928A** | **8.084A** | **2.312A** | 519.71 | 91.018% | 2036 | 44.8 | 43.76°C | 0.988 |
| | 12.163V | 5.047V | 3.265V | 4.975V | 570.995 | | | | 47.03°C | 230.32V |
| **90%** | **41.321A** | **8.437A** | **8.602A** | **2.419A** | 585.141 | 90.689% | 2034 | 44.9 | 44.3°C | 0.988 |
| | 12.164V | 5.038V | 3.254V | 4.963V | 645.215 | | | | 48.59°C | 230.3V |
| **100%** | **46.256A** | **8.95A** | **9.156A** | **2.525A** | 649.872 | 90.321% | 2039 | 44.8 | 45.57°C | 0.987 |
| | 12.164V | 5.029V | 3.243V | 4.95V | 719.515 | | | | 50.17°C | 230.29V |
| **110%** | **50.921A** | **9.965A** | **10.307A** | **2.532A** | 715.299 | 89.785% | 2039 | 44.8 | 46.39°C | 0.986 |
| | 12.166V | 5.018V | 3.23V | 4.938V | 796.679 | | | | 51.58°C | 230.28V |
| **CL1** | **0.115A** | **11.84A** | **11.981A** | **0A** | 101.306 | 83.473% | 1712 | 39.2 | 40.8°C | 0.898 |
| | 12.165V | 5.085V | 3.313V | 5.065V | 121.364 | | | | 44.25°C | 230.38V |
| **CL2** | **0.115A** | **19.672A** | **0A** | **0A** | 101.398 | 82.904% | 1590 | 39.5 | 40.16°C | 0.899 |
| | 12.165V | 5.083V | 3.33V | 5.072V | 122.306 | | | | 42.64°C | 230.38V |
| **CL3** | **0.115A** | **0A** | **19.931A** | **0A** | 67.39 | 76.004% | 1418 | 35.4 | 40.62°C | 0.857 |
| | 12.160V | 5.098V | 3.311V | 5.069V | 88.668 | | | | 42.41°C | 230.38V |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CL4** | **53.473A** | **0A** | **0A** | **0A** | 649.736 | 91.423% | 2037 | 44.8 | 45.83°C | 0.987 |
| | 12.151V | 5.054V | 3.271V | 5.015V | 710.691 | | | | 49.18°C | 230.3V |

The results above are not used in the certification process

## 20-80□□□□□

### 115V

| □□ | 12V | 5V | 3.3V | 5VSB | DC/AC (□ ) | □□ | □□□□ (RPM) | □□□□□□□ (dB[A]) | □□ (□□ /□□ ) | PF/AC □□ |
|---|---|---|---|---|---|---|---|---|---|---|
| **20W** | **1.222A** | **0.489A** | **0.492A** | **0.196A** | 20.004 | 72.346% | 980 | 26.2 | 36.41°C | 0.885 |
| | 12.154V | 5.117V | 3.352V | 5.091V | 27.65 | | | | 38.12°C | 115.14V |
| **40W** | **2.690A** | **0.684A** | **0.69A** | **0.295A** | 40.002 | 81.486% | 985 | 26.4 | 37.11°C | 0.927 |
| | 12.153V | 5.116V | 3.35V | 5.087V | 49.09 | | | | 39.13°C | 115.14V |
| **60W** | **4.157A** | **0.88A** | **0.887A** | **0.394A** | 60.001 | 85.445% | 987 | 26.4 | 38.41°C | 0.951 |
| | 12.155V | 5.113V | 3.348V | 5.082V | 70.221 | | | | 40.06°C | 115.14V |
| **80W** | **5.622A** | **1.076A** | **1.085A** | **0.493A** | 79.958 | 87.322% | 988 | 26.4 | 39.51°C | 0.969 |
| | 12.155V | 5.111V | 3.345V | 5.077V | 91.566 | | | | 41.2°C | 115.13V |

The results above are not used in the certification process

### 230V

| □□ | 12V | 5V | 3.3V | 5VSB | DC/AC (□ ) | □□ | □□□□ (RPM) | □□□□□□□ (dB[A]) | □□ (□□ /□□ ) | PF/AC □□ |
|---|---|---|---|---|---|---|---|---|---|---|
| **20W** | **1.222A** | **0.488A** | **0.492A** | **0.196A** | 20.007 | 73.346% | 984 | 26.5 | 36.82°C | 0.712 |
| | 12.154V | 5.119V | 3.352V | 5.091V | 27.279 | | | | 37.65°C | 230.37V |
| **40W** | **2.690A** | **0.684A** | **0.69A** | **0.295A** | 40.007 | 82.819% | 987 | 26.4 | 37.44°C | 0.797 |
| | 12.153V | 5.117V | 3.349V | 5.086V | 48.306 | | | | 38.86°C | 230.39V |
| **60W** | **4.158A** | **0.88A** | **0.887A** | **0.394A** | 60.007 | 86.459% | 988 | 26.4 | 38.72°C | 0.819 |
| | 12.154V | 5.114V | 3.348V | 5.082V | 69.407 | | | | 39.82°C | 230.41V |
| **80W** | **5.623A** | **1.076A** | **1.085A** | **0.493A** | 79.977 | 88.53% | 992 | 26.3 | 39.22°C | 0.86 |
| | 12.154V | 5.112V | 3.345V | 5.077V | 90.341 | | | | 40.19°C | 230.4V |

The results above are not used in the certification process

## □□□□

### 115V

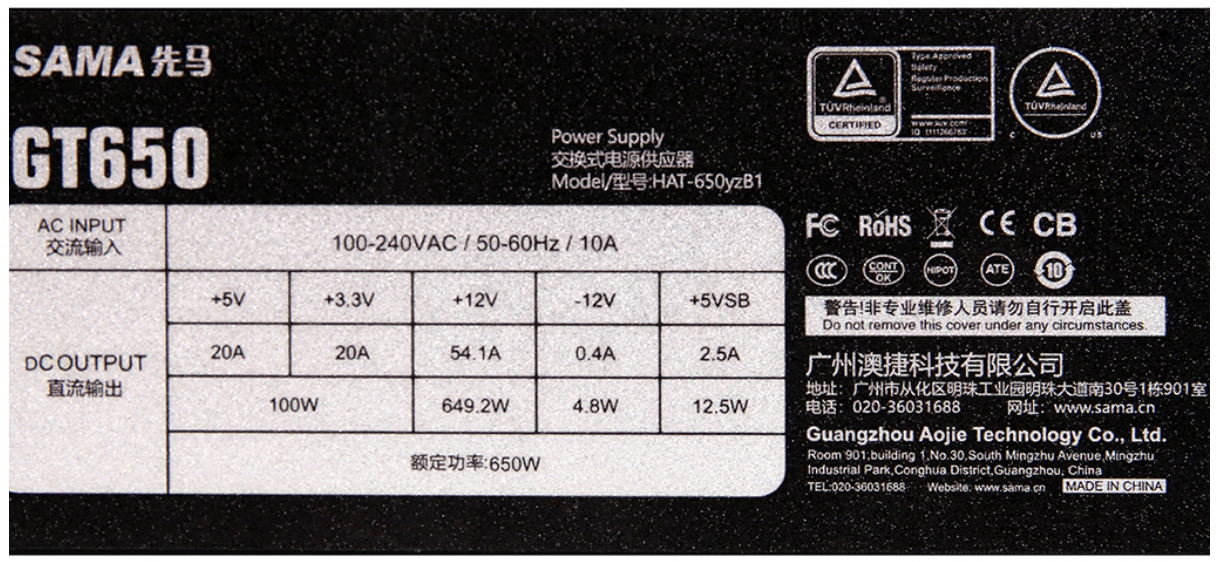
| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 8.04mV | 9.34mV | 5.70mV | 8.66mV | Pass |
| 20% Load | 9.16mV | 10.97mV | 7.17mV | 9.93mV | Pass |
| 30% Load | 11.54mV | 10.15mV | 6.20mV | 10.50mV | Pass |
| 40% Load | 14.32mV | 11.12mV | 7.38mV | 12.84mV | Pass |
| 50% Load | 14.89mV | 11.43mV | 8.04mV | 13.14mV | Pass |
| 60% Load | 14.94mV | 12.04mV | 8.60mV | 13.86mV | Pass |
| 70% Load | 17.27mV | 13.21mV | 9.51mV | 15.08mV | Pass |
| 80% Load | 18.64mV | 14.28mV | 12.61mV | 16.05mV | Pass |
| 90% Load | 17.26mV | 15.05mV | 13.32mV | 16.66mV | Pass |
| 100% Load | 29.52mV | 16.98mV | 16.67mV | 19.15mV | Pass |
| 110% Load | 33.30mV | 18.14mV | 16.77mV | 18.99mV | Pass |
| Crossload1 | 14.52mV | 10.06mV | 11.19mV | 10.62mV | Pass |
| Crossload2 | 11.50mV | 10.66mV | 8.39mV | 9.99mV | Pass |
| Crossload3 | 10.53mV | 6.63mV | 10.22mV | 9.53mV | Pass |
| Crossload4 | 26.97mV | 10.56mV | 11.68mV | 15.30mV | Pass |

The results above are not used in the certification process

### 230V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 7.22mV | 9.03mV | 5.49mV | 8.71mV | Pass |
| 20% Load | 8.29mV | 11.37mV | 7.17mV | 9.53mV | Pass |
| 30% Load | 11.48mV | 10.35mV | 6.51mV | 10.45mV | Pass |
| 40% Load | 14.08mV | 11.07mV | 7.22mV | 12.33mV | Pass |
| 50% Load | 14.28mV | 11.32mV | 7.88mV | 12.79mV | Pass |
| 60% Load | 15.33mV | 13.93mV | 8.90mV | 13.96mV | Pass |





| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 70% Load | 16.96mV | 13.26mV | 9.00mV | 13.81mV | Pass |
| 80% Load | 19.25mV | 14.13mV | 12.16mV | 15.23mV | Pass |
| 90% Load | 17.77mV | 14.79mV | 12.66mV | 15.74mV | Pass |
| 100% Load | 30.63mV | 16.41mV | 15.52mV | 18.46mV | Pass |
| 110% Load | 34.16mV | 18.32mV | 17.71mV | 18.63mV | Pass |
| Crossload1 | 14.24mV | 10.07mV | 11.00mV | 10.50mV | Pass |
| Crossload2 | 10.58mV | 11.22mV | 8.09mV | 9.83mV | Pass |
| Crossload3 | 10.82mV | 6.63mV | 9.92mV | 9.32mV | Pass |
| Crossload4 | 27.32mV | 11.45mV | 11.94mV | 15.68mV | Pass |

The results above are not used in the certification process

## SAMA GT650W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

Cybenetics 提供自愿性认证计划：电源方面有 ETA (效率)、 LAMBDA (噪声) 与 SAFE (安全与正确运行)；散热产品方面有 DELTA (机箱隔音) 与 PHI (风扇风量与静压)