



## SilverStone HELA 2050 Platinum (1650W)

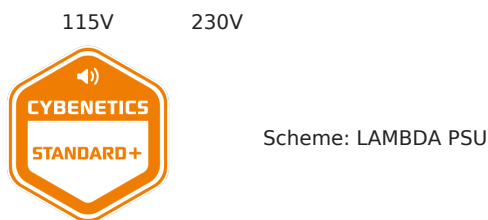
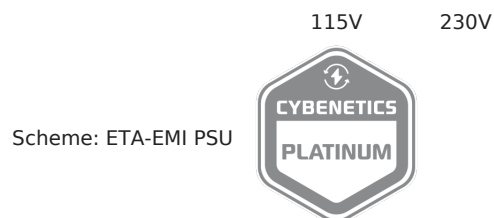
Serial Number DBHA2K50PT21390099

Lab ID SL16501930

Certification ID 251930

Test Result Report ID: 21PS1930A

Certificate Issue Date: Nov 3, 2021



A handwritten signature in blue ink, appearing to read "A. Bitziopoulos", is positioned above the name of the Certification Body General Manager.

Aristeidis Bitziopoulos, Certification Body General Manager

## 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                             | SilverStone                |
| Model                             | HELA 2050 Platinum (1650W) |
| OEM/ODM                           | Enhance Electronics        |
| Serial Number                     | DBHA2K50PT21390099         |
| Product Specifications            |                            |
| Manufacturer-Provided Information |                            |
| Rated Voltage (Vrms)              | 115-240                    |
| Rated Current (Arms)              | 16-9                       |
| Rated Frequency (Hz)              | 60-50                      |

|                                                   |                                                                                     |
|---------------------------------------------------|-------------------------------------------------------------------------------------|
| Rated Power (W)                                   | 1650                                                                                |
| Operating Temperature (Continuous Full Load) (°C) |                                                                                     |
| Type                                              | ATX12V                                                                              |
| Cable Design                                      | Fully Modular                                                                       |
| Warranty                                          | -                                                                                   |
| Cybenetics Measurements                           |                                                                                     |
| Dimensions (W x H x D)                            |                                                                                     |
| Weight                                            |                                                                                     |
| Cooling                                           | 135mm Double Ball Bearing Fan<br>(RL4Z B1352512EH-3M)                               |
| Semi-Passive Operation                            | ✓ (selectable)                                                                      |
| Cybenetics Testing Information                    |                                                                                     |
| Lab ID                                            | SL16501930                                                                          |
| Date of receipt                                   | Oct 26, 2021                                                                        |
| Testing Date                                      | Nov 1, 2021                                                                         |
| Report Issued Date                                | Nov 3, 2021                                                                         |
| 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                       | 16-22AWG | No                  |
| 4+4 pin EPS12V (700mm)                         | 2           | 2                       | 16AWG    | No                  |
| 12 pin PCIe (560mm)                            | 1           | 1                       | 16AWG    | No                  |
| 6+2 pin PCIe (560mm)                           | 4           | 4                       | 16AWG    | No                  |
| 6+2 pin PCIe (560mm+150mm)                     | 7           | 14                      | 16-18AWG | No                  |
| SATA (500mm+125mm+125mm+125mm)                 | 3           | 12                      | 18AWG    | No                  |
| 4-pin Molex (500mm+125mm+125mm) / FDD (+120mm) | 1           | 3 / 1                   | 18-22AWG | No                  |

## Power Specifications

|                      |       |      |    |      |      |      |
|----------------------|-------|------|----|------|------|------|
| Rail                 |       | 3.3V | 5V | 12V  | 5VSB | -12V |
| Max. Power           | Amps  | 25   | 22 | 137  | 3    | 0.3  |
|                      | Watts | 120  |    | 1644 | 15   | 3.6  |
| Total Max. Power (W) |       | 1650 |    |      |      |      |

## Parts Description

|                      |                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| General Data         | -                                                                                                                                             |
| Manufacturer (OEM)   | Enhance Electronics                                                                                                                           |
| PCB Type             | Double Sided                                                                                                                                  |
| Primary Side         | -                                                                                                                                             |
| Transient Filter     | 6x Y caps, 4x X caps, 2x CM chokes, 1x MOV                                                                                                    |
| Inrush Protection    | NTC Thermistor MF72-12D20 (12 Ohm) & Relay                                                                                                    |
| Bridge Rectifier(s)  | 2x                                                                                                                                            |
| APFC MOSFETs         | 2x Oriental Semiconductor OSG55R070HF (550V, 30A @ 100°C, Rds(on): 0.070hm)                                                                   |
| APFC Boost Diode     | 2x CREE C3D10060A (600V, 10A @ 153°C)                                                                                                         |
| Bulk Cap(s)          | 3x Nippon Chemi-Con (450V, 680uF each or 2,040uF, 2,000h @ 105°C, KMZ)                                                                        |
| Main Switchers       | 4x Oriental Semiconductor OSG60R074FSZF (600V, 30A @ 100°C, Rds(on): 0.0740hm)                                                                |
| IC Driver(s)         | 2x Silicon Labs Si8230BD                                                                                                                      |
| APFC Controller      | ATK AT6201ZSPF                                                                                                                                |
| Resonant Controller  | ATK AT6301ZTSF                                                                                                                                |
| Topology             | Primary side: Interleaved PFC, Full-Bridge & LLC converter<br>Secondary side: Synchronous Rectification & DC-DC converters                    |
| Secondary Side       | -                                                                                                                                             |
| +12V MOSFETs         | no info                                                                                                                                       |
| 5V & 3.3V            | DC-DC Converters                                                                                                                              |
| Filtering Capacitors | Electrolytic: 5x Unicon (2,000h @ 125°C, UPL), 1x Rubycon (3-6,000h @ 105°C, YXG), 2x Rubycon (4-10,000h @ 105°C, YXF)<br>Polymer: 21x Unicon |
| Supervisor IC        | Weltrend WT7527RA (OCP, OVP, UVP, SCP, PG)                                                                                                    |
| Fan Controller       | ATK AT1051ZSP8                                                                                                                                |
| Fan Model            | Globe Fan RL4Z B1352512EH-3M (135mm, 12V, 0.50A, Double Ball Bearing Fan)                                                                     |

|                        |               |
|------------------------|---------------|
| 5VSB Circuit           | -             |
| Rectifier              | 1x 45R10S SBR |
| Standby PWM Controller | ATK AT6002H   |

## 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 | ✓                 |

### Performance Summary 115V

|                                                |          |
|------------------------------------------------|----------|
| Accredited                                     |          |
| Average Efficiency (>1450 load combinations)   | 90.000%  |
| Average Noise Output (>1450 Load Combinations) | 37.99dBA |
| Average PF (>1450 Load Combinations)           | 0.989    |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 63.876%  |
| Standby Power Consumption                      | 0.1210W  |
| Non-Accredited                                 |          |
| 12V Ripple (Full Load)                         | 40.72mV  |
| 5V Ripple (Full Load)                          | 29.07mV  |
| 3.3V Ripple (Full Load)                        | 29.85mV  |
| 5VSB Ripple (Full Load)                        | 10.86mV  |
| 12V Load Regulation                            | 1.42%    |
| 5V Load Regulation                             | 2.02%    |
| 3.3V Load Regulation                           | 2.99%    |
| 5VSB Load Regulation                           | 4.37%    |
| Inrush Current                                 | 13.440A  |

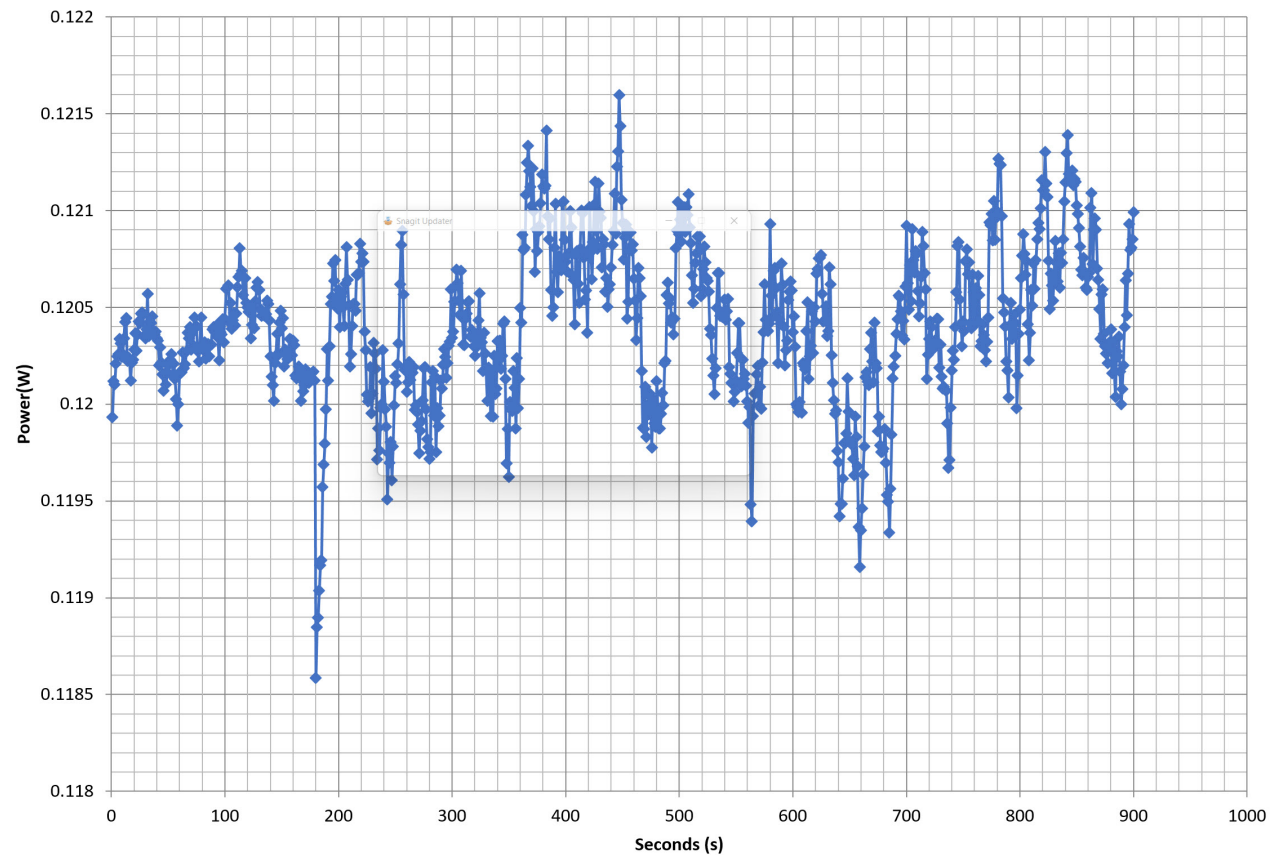
## Hold-Up Time & PWR\_OK Signal

|                                       |      |
|---------------------------------------|------|
| Hold-Up Time (ms)                     | 11.4 |
| AC Loss to PWR_OK Hold Up Time (ms)   | 10.2 |
| PWR_OK Inactive to DC Loss Delay (ms) | 1.2  |

## Vampire Power

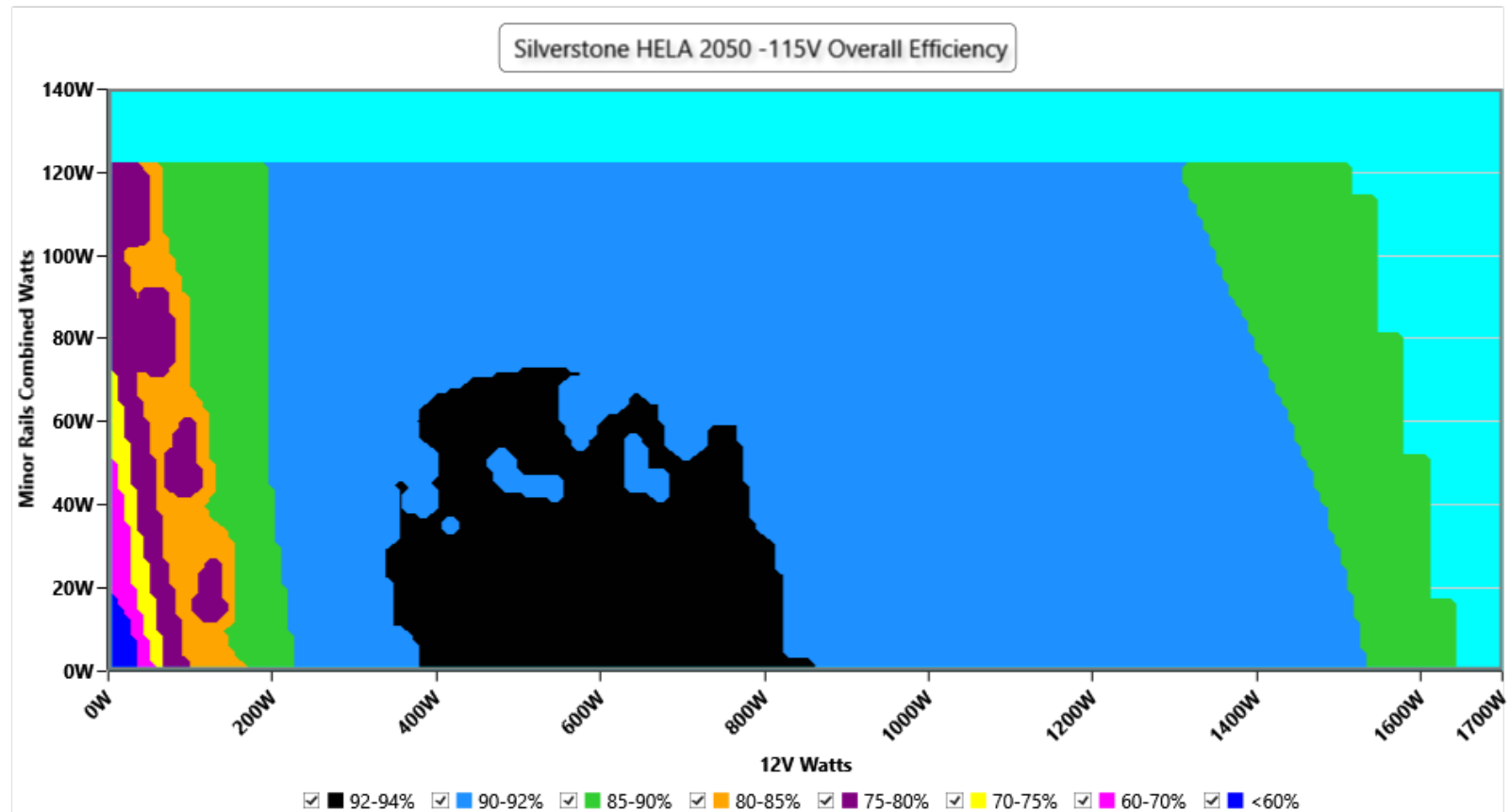
### Graphs 115V

#### Power - DBHA2K50PT21390099 - 29/10/2021 - 13:42



## Efficiency Graph

115V

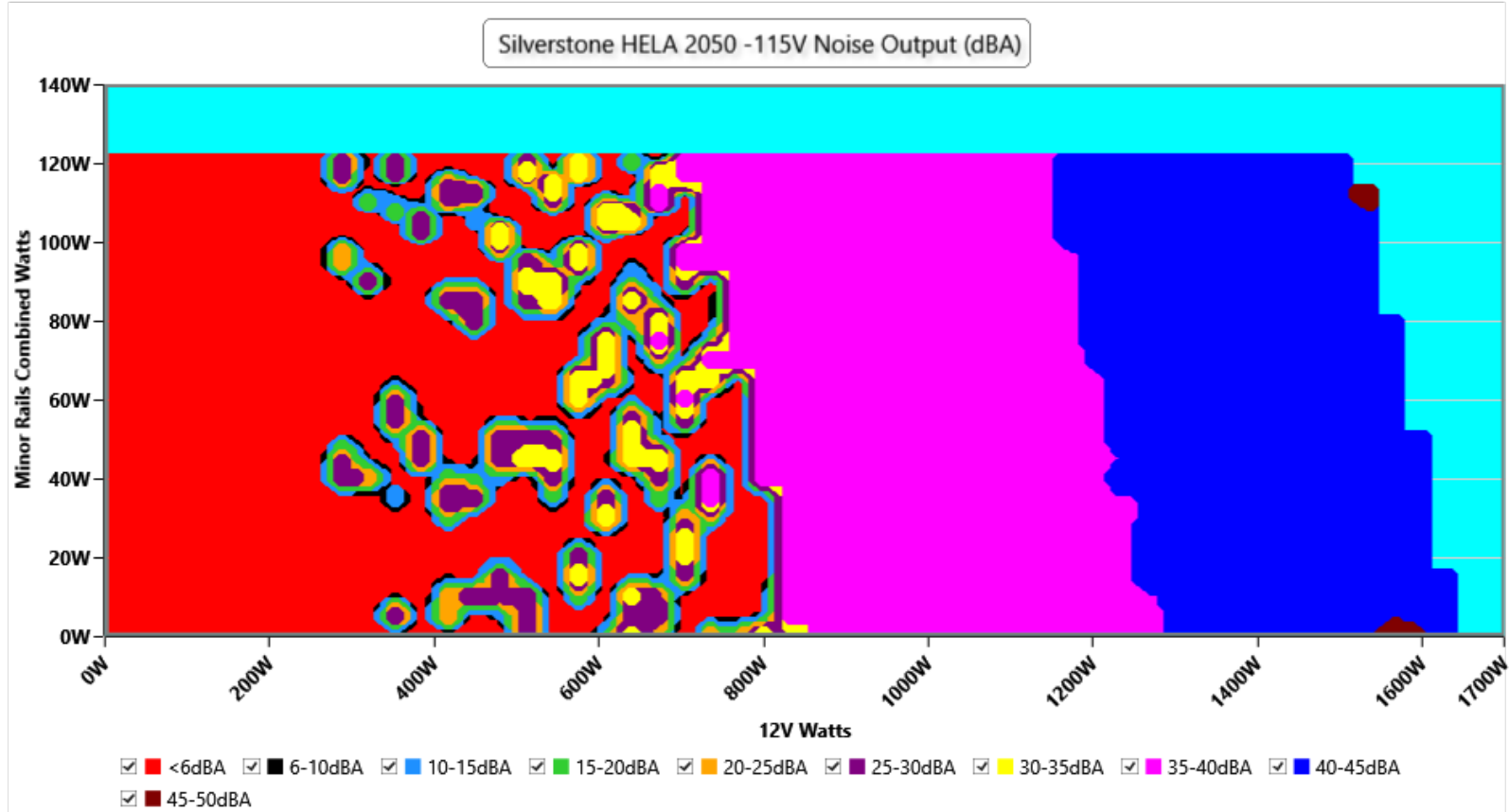


### INFO

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

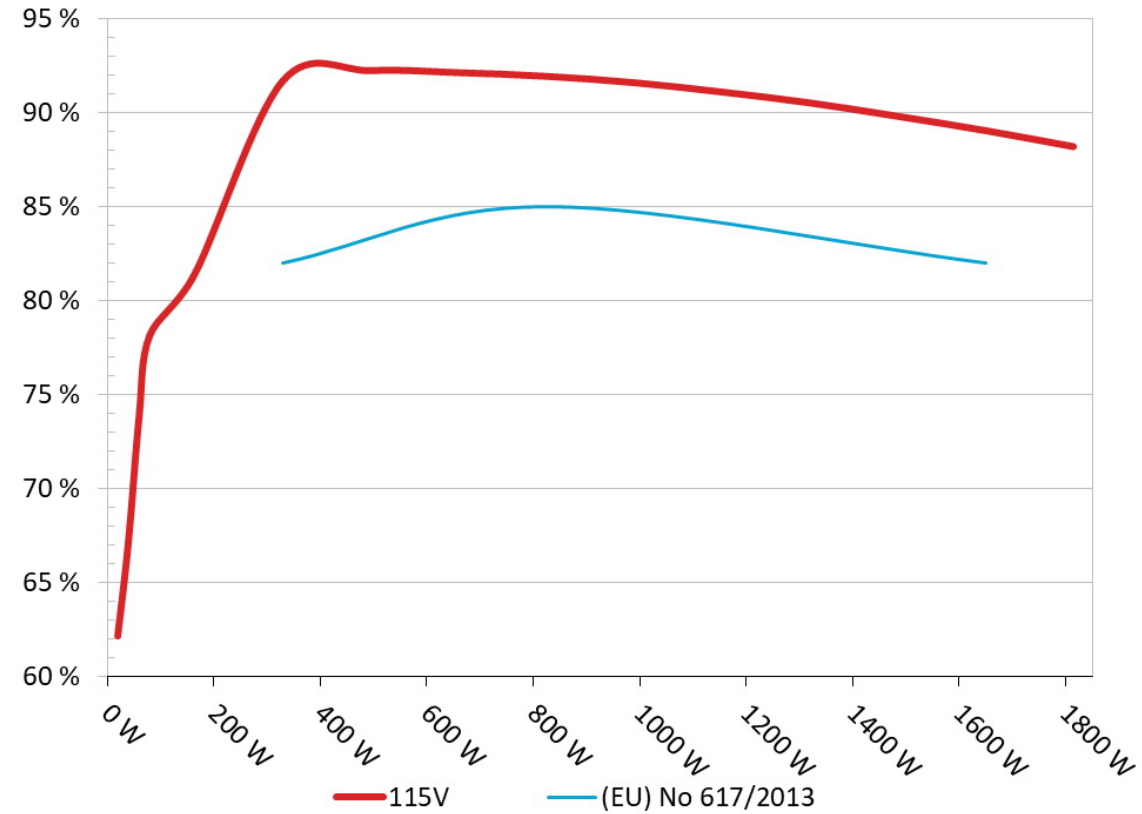
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

## Indicative Performance

### Efficiency under high ambient temperature

Efficiency: SilverStone HELA 2050W

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



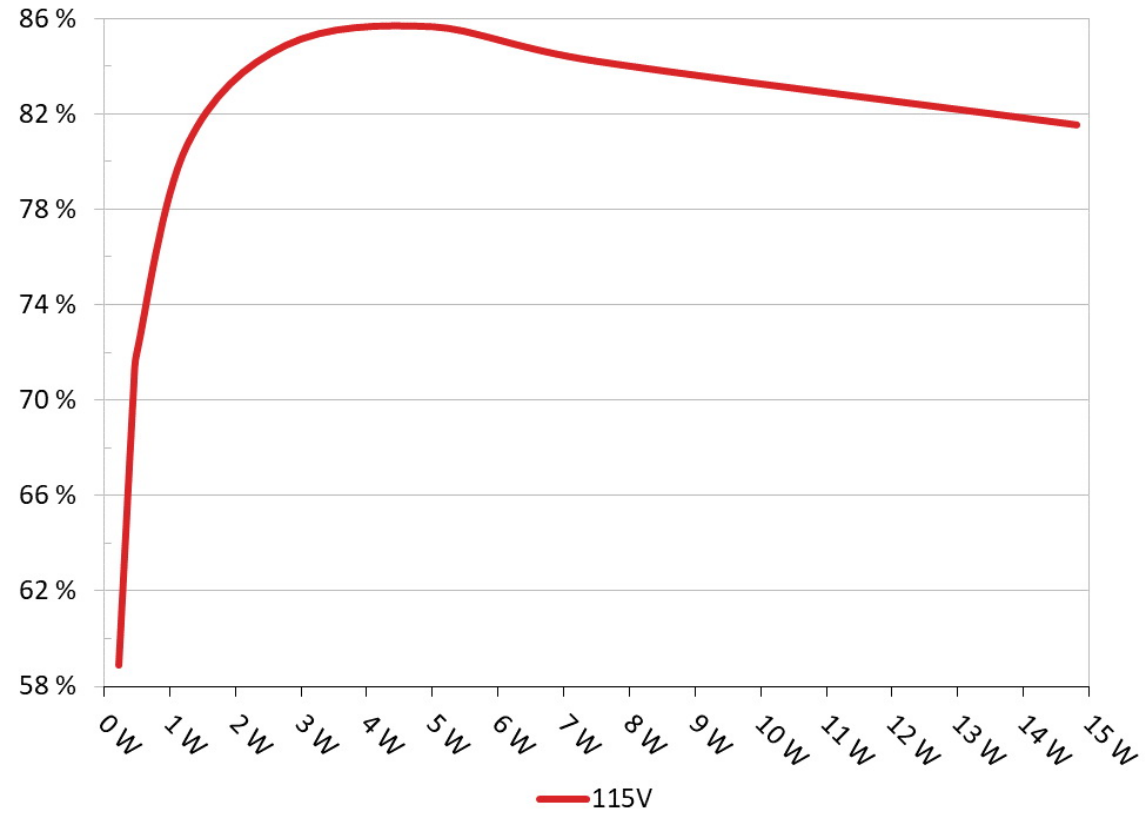
### INFO

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: SilverStone HELA 2050W

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

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

| Test # | 5VSB   | DC/AC (Watts) | Efficiency | PF/AC Volts |
|--------|--------|---------------|------------|-------------|
| 1      | 0.045A | 0.227W        | 58.872%    | 0.023       |
|        | 5.05V  | 0.386W        |            | 115.11V     |

|   |        |         |         |         |
|---|--------|---------|---------|---------|
| 2 | 0.09A  | 0.454W  | 70.539% | 0.038   |
|   | 5.048V | 0.644W  |         | 115.11V |
| 3 | 0.55A  | 2.767W  | 84.849% | 0.177   |
|   | 5.03V  | 3.261W  |         | 115.11V |
| 4 | 1A     | 5.014W  | 85.632% | 0.281   |
|   | 5.013V | 5.855W  |         | 115.11V |
| 5 | 1.5A   | 7.493W  | 84.191% | 0.366   |
|   | 4.994V | 8.9W    |         | 115.11V |
| 6 | 3A     | 14.816W | 81.519% | 0.492   |
|   | 4.938V | 18.174W |         | 115.11V |

## 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%  | 11.960A  | 2A     | 1.962A | 0.999A | 164.992       | 81.43%     | 612             | 16.3              | 40.21°C        | 0.978       |
|      | 11.989V  | 4.999V | 3.363V | 5.003V | 202.616       |            |                 |                   | 45.21°C        | 115.12V     |
| 20%  | 24.971A  | 3.007A | 2.952A | 1.203A | 330.014       | 91.673%    | 848             | 26.3              | 40.87°C        | 0.992       |
|      | 11.978V  | 4.988V | 3.354V | 4.986V | 359.991       |            |                 |                   | 46.58°C        | 115.12V     |
| 30%  | 38.323A  | 3.515A | 3.453A | 1.409A | 494.575       | 92.227%    | 979             | 30.4              | 41.38°C        | 0.991       |
|      | 11.964V  | 4.979V | 3.345V | 4.969V | 536.257       |            |                 |                   | 47.46°C        | 115.11V     |
| 40%  | 51.756A  | 4.024A | 3.957A | 1.616A | 659.767       | 92.113%    | 1010            | 31.1              | 41.92°C        | 0.985       |
|      | 11.951V  | 4.97V  | 3.336V | 4.952V | 716.256       |            |                 |                   | 48.87°C        | 115.11V     |
| 50%  | 64.883A  | 5.042A | 4.961A | 1.824A | 825.105       | 91.918%    | 1141            | 35.1              | 42.41°C        | 0.989       |
|      | 11.938V  | 4.959V | 3.326V | 4.934V | 897.655       |            |                 |                   | 49.83°C        | 115.11V     |
| 60%  | 77.964A  | 6.064A | 5.972A | 2A     | 989.432       | 91.581%    | 1259            | 37.9              | 42.82°C        | 0.994       |
|      | 11.926V  | 4.948V | 3.316V | 4.918V | 1080.387      |            |                 |                   | 50.79°C        | 115.1V      |
| 70%  | 91.159A  | 7.091A | 6.99A  | 2.246A | 1154.95       | 91.081%    | 1364            | 39.8              | 43.07°C        | 0.996       |
|      | 11.912V  | 4.937V | 3.305V | 4.898V | 1268.051      |            |                 |                   | 51.28°C        | 115.08V     |
| 80%  | 104.401A | 8.003A | 8.012A | 2.355A | 1319.207      | 90.508%    | 1465            | 41.7              | 43.71°C        | 0.998       |
|      | 11.895V  | 4.927V | 3.295V | 4.884V | 1457.561      |            |                 |                   | 52.48°C        | 115.07V     |

| Test | 12V      | 5V      | 3.3V    | 5VSB   | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|------|----------|---------|---------|--------|---------------|------------|-----------------|-------------------|----------------|-------------|
| 90%  | 118.108A | 8.644A  | 8.523A  | 2.465A | 1485.206      | 89.79%     | 1561            | 43.8              | 44.6°C         | 0.999       |
|      | 11.876V  | 4.918V  | 3.285V  | 4.869V | 1654.084      |            |                 |                   | 53.8°C         | 115.06V     |
| 100% | 131.623A | 9.168A  | 9.069A  | 3.104A | 1650.038      | 89.031%    | 1559            | 43.8              | 45.7°C         | 0.999       |
|      | 11.855V  | 4.91V   | 3.275V  | 4.833V | 1853.32       |            |                 |                   | 55.85°C        | 115.05V     |
| 110% | 144.949A | 10.209A | 10.203A | 3.111A | 1814.669      | 88.184%    | 2160            | 52.6              | 46.91°C        | 1           |
|      | 11.841V  | 4.899V  | 3.263V  | 4.822V | 2057.816      |            |                 |                   | 57.77°C        | 115.03V     |
| CL1  | 0.118A   | 14.555A | 14.275A | 0A     | 121.331       | 79.118%    | 896             | 27.7              | 42.41°C        | 0.966       |
|      | 11.969V  | 4.962V  | 3.341V  | 5.035V | 153.354       |            |                 |                   | 49.46°C        | 115.13V     |
| CL2  | 0.117A   | 22.226A | 0A      | 0A     | 111.431       | 77.494%    | 744             | 21.6              | 43.09°C        | 0.962       |
|      | 11.987V  | 4.951V  | 3.36V   | 5.041V | 143.792       |            |                 |                   | 50.81°C        | 115.13V     |
| CL3  | 0.117A   | 0A      | 24.737A | 0A     | 83.887        | 72.847%    | 330             | <6.0              | 44.12°C        | 0.948       |
|      | 11.987V  | 4.999V  | 3.335V  | 5.036V | 115.16        |            |                 |                   | 53.67°C        | 115.12V     |
| CL4  | 138.858A | 0A      | 0A      | 0A     | 1649.577      | 89.698%    | 1557            | 43.6              | 45.33°C        | 0.999       |
|      | 11.880V  | 4.943V  | 3.296V  | 4.965V | 1839.032      |            |                 |                   | 55.64°C        | 115.04V     |

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  | 1.236A  | 0.499A | 0.489A | 0.198A | 20.008        | 62.169%    | 0               | <6.0              | 40.21°C        | 0.644       |
|      | 12.023V | 5.009V | 3.373V | 5.044V | 32.35         |            |                 |                   | 36.87°C        | 115.13V     |
| 40W  | 2.722A  | 0.699A | 0.685A | 0.298A | 40.008        | 67.177%    | 0               | <6.0              | 41.4°C         | 0.841       |
|      | 12.013V | 5.007V | 3.372V | 5.039V | 59.556        |            |                 |                   | 37.65°C        | 115.13V     |
| 60W  | 4.208A  | 0.899A | 0.881A | 0.397A | 60.01         | 73.797%    | 0               | <6.0              | 42.01°C        | 0.902       |
|      | 12.008V | 5.006V | 3.371V | 5.033V | 81.317        |            |                 |                   | 38.01°C        | 115.13V     |
| 80W  | 5.694A  | 1.099A | 1.077A | 0.497A | 79.972        | 78.142%    | 0               | <6.0              | 44.59°C        | 0.939       |
|      | 12.003V | 5.005V | 3.369V | 5.028V | 102.342       |            |                 |                   | 39.97°C        | 115.13V     |

The results above are not used in the certification process

### Ripple Measurements 115V

| Test       | 12V     | 5V      | 3.3V    | 5VSB    | Pass/Fail |
|------------|---------|---------|---------|---------|-----------|
| 10% Load   | 19.58mV | 13.48mV | 14.78mV | 4.91mV  | Pass      |
| 20% Load   | 12.49mV | 14.30mV | 14.67mV | 5.12mV  | Pass      |
| 30% Load   | 13.72mV | 13.64mV | 14.98mV | 5.42mV  | Pass      |
| 40% Load   | 15.45mV | 14.51mV | 14.42mV | 5.78mV  | Pass      |
| 50% Load   | 17.55mV | 14.71mV | 15.09mV | 6.14mV  | Pass      |
| 60% Load   | 18.93mV | 15.22mV | 14.73mV | 5.94mV  | Pass      |
| 70% Load   | 21.49mV | 15.63mV | 15.96mV | 6.70mV  | Pass      |
| 80% Load   | 24.97mV | 15.99mV | 16.16mV | 6.70mV  | Pass      |
| 90% Load   | 37.97mV | 31.97mV | 30.88mV | 10.70mV | Pass      |
| 100% Load  | 40.72mV | 29.07mV | 29.85mV | 10.86mV | Pass      |
| 110% Load  | 44.06mV | 33.30mV | 34.01mV | 11.74mV | Pass      |
| Crossload1 | 9.88mV  | 16.58mV | 17.43mV | 4.99mV  | Pass      |
| Crossload2 | 14.48mV | 17.77mV | 14.17mV | 5.84mV  | Pass      |
| Crossload3 | 11.92mV | 13.84mV | 18.00mV | 4.15mV  | Pass      |
| Crossload4 | 35.57mV | 24.89mV | 26.48mV | 8.90mV  | Pass      |

The results above are not used in the certification process

SilverStone HELA 2050 Platinum (1650W)



Top side

All data and graphs included in this test report can be used by any individual on the following conditions:

- › It should be mentioned that the test results are provided by Cybenetics
- › The link to the original test results document should be provided in any case

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

POWER SUPPLY / 電源供應器 / 开关电源供应器

ATTENTION ! ZONE DANGEREUSE

Cet appareil n'est pas conçu pour être utilisable par l'utilisateur et contient une haute tension à l'intérieur qui peut être dangereux lorsqu'il est ouvert.

En cas de dysfonctionnement, veuillez en informer votre revendeur ou distributeur local pour le service.

|                               |                               |            |              |              |               |
|-------------------------------|-------------------------------|------------|--------------|--------------|---------------|
| AC INPUT<br>(交流輸入) (交流输入)     | 200-240V~ / 13A / 50Hz (用于中国) |            |              |              |               |
| DC OUTPUT<br>(直流輸出) (直流输出)    | +3.3V<br>25A                  | +5V<br>22A | +12V<br>170A | -12V<br>0.3A | +5VSB<br>3.0A |
| MAX. POWER<br>(最大總功率) (最大总功率) | 120W 2040W 3.6W 15W<br>2050W  |            |              |              |               |

RoHS

|                               |                                         |            |              |              |               |
|-------------------------------|-----------------------------------------|------------|--------------|--------------|---------------|
| AC INPUT<br>(交流輸入) (交流输入)     | 115-240V~ / 16A-9A / 60-50Hz (用于中国以外国家) |            |              |              |               |
| DC OUTPUT<br>(直流輸出) (直流输出)    | +3.3V<br>25A                            | +5V<br>22A | +12V<br>137A | -12V<br>0.3A | +5VSB<br>3.0A |
| MAX. POWER<br>(最大總功率) (最大总功率) | 120W 1644W 3.6W 15W<br>1650W            |            |              |              |               |

Power specifications label

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

www.cybenetics.com - info@cybenetics.com