# Duex Pulse 850W

Serial Number

Lab ID  DX85002501

Certification ID  252501

Test Result Report ID: 24PS2501A

Certificate Issue Date: Jul 12, 2024

115V 230V

Scheme: ETA-EMI PSU

CYBENETICS PLATINUM

115V 230V

CYBENETICS STANDARD++

Scheme: LAMBDA PSU

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 | Duex |
| Model | Pulse 850W |
| OEM/ODM | Kinpower |
| Serial Number | |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 16 |
| 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 | 120mm Rifle Bearing Fan<br>(EFS-12E12H) |
| Semi-Passive Operation | ✓ |
| Cybenetics Testing Information | |
| Lab ID | DX85002501 |
| Date of receipt | Jul 1, 2024 |
| Testing Date | Jul 8, 2024 |
| Report Issued Date | Jul 12, 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 (600mm) | 1 | 1 | 18-22AWG | No |
| 4+4 pin EPS12V (700mm) | 2 | 2 | 18AWG | No |
| 6+2 pin PCIe (600mm+150mm) | 2 | 4 | 18AWG | No |
| 12+4 pin PCIe (600mm) (600W) | 1 | 1 | 16-24AWG | No |
| SATA (450mm+150mm+150mm) | 2 | 6 | 18AWG | No |
| 4-pin Molex (450mm+150mm+150mm) | 1 | 3 | 18AWG | No |

## Protection Features(Manufacturer)

| | |
|---|---|
| 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 | 70.8 | 3 | 0.3 |
| | Watts | 103 | | 850 | 15 | 3.6 |
| Total Max. Power (W) | | 850 | | | | |

## Parts Description

| | |
|---|---|
| **General Data** | |
| Manufacturer (OEM) | Kinpower |
| PCB Type | Double-Sided |
| **Primary Side** | |
| Transient Filter | 2x Y caps, 1x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | 1x NTC Thermistor M72 5D-15 (5 Ohm @25°C) & Relay |
| Bridge Rectifier(s) | 2x HY Electronic GBU2506L (600V, 25A @ 150°C) |
| APFC MOSFETs | 2x Sanrise Tech SRC60R140B (600V, 11.2A @ 125°C, Rds(on): 140mOhm) |
| APFC Boost Diode | 1x Global Power Technology G3S06510A (650V, 10A @ 153.5°C) |
| Bulk Cap(s) | 1x Nippon Chemi-Con (400V, 680uF, 2000h @ 105°C,KMW) |

| | |
|---|---|
| Main Switchers | 2x Sanrise Tech SRC60R140B (600V, 11.2A @ 125°C, Rds(on): 140mOhm) |
| APFC Controller | Champion CM6500UNX |
| Resonant Controller | Champion CM6901X |
| Topology | Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters |
| **Secondary Side** | |
| +12V MOSFETs | 6x Alkaidsemi Technologies AKG40N025G (40V, 74A @ 100°C, Rds(on): 2.5mOhm) |
| 5V & 3.3V | DC-DC Converters: 4x Excelliance EMB06N03R (20V, 45A @ 100°C, Rds(on): 6mOhm PWM Controller(s): 2x Aplustek AT8853ZSPC |
| Filtering Capacitors | Electrolytic: 3x TK (105°C, SZ) Polymer: 34x Chengx (PC), 2x TK (SZ) |
| Supervisor IC | IN1S4291-SCG |
| Fan Model | DWPH EFS-12E12H (120mm, 12V, 0.50A, Rifle Bearing Fan) |
| **5VSB Circuit** | |
| Low Side Rectifier | Dongke DK5V45R15S (45V, Rds(on): 15mOhm) |
| Standby PWM Controller | FuXin Semiconductor FXI8252S |

# 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) | 89.455% |
| Average Noise Output (>1450 Load Combinations) | 31.41dBA |

| | |
|---|---|
| Average PF (>1450 Load Combinations) | 0.981 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load | 49.686% |
| Standby Power Consumption | 0.0371W |
| Non-Accredited | |
| 12V Ripple (Full Load) | 38.15mV |
| 5V Ripple (Full Load) | 28.37mV |
| 3.3V Ripple (Full Load) | 27.42mV |
| 5VSB Ripple (Full Load) | 44.62mV |
| 12V Load Regulation | 0.90% |
| 5V Load Regulation | 1.04% |
| 3.3V Load Regulation | 1.64% |
| 5VSB Load Regulation | 4.53% |
| Inrush Current | 32.120A |

## Hold-Up Time & PWR_OK Signal

| | |
|---|---|
| Hold-Up Time (ms) | 20 |
| AC Loss to PWR_OK Hold Up Time (ms) | 16.9 |
| PWR_OK Inactive to DC Loss Delay (ms) | 3.1 |

## Vampire Power

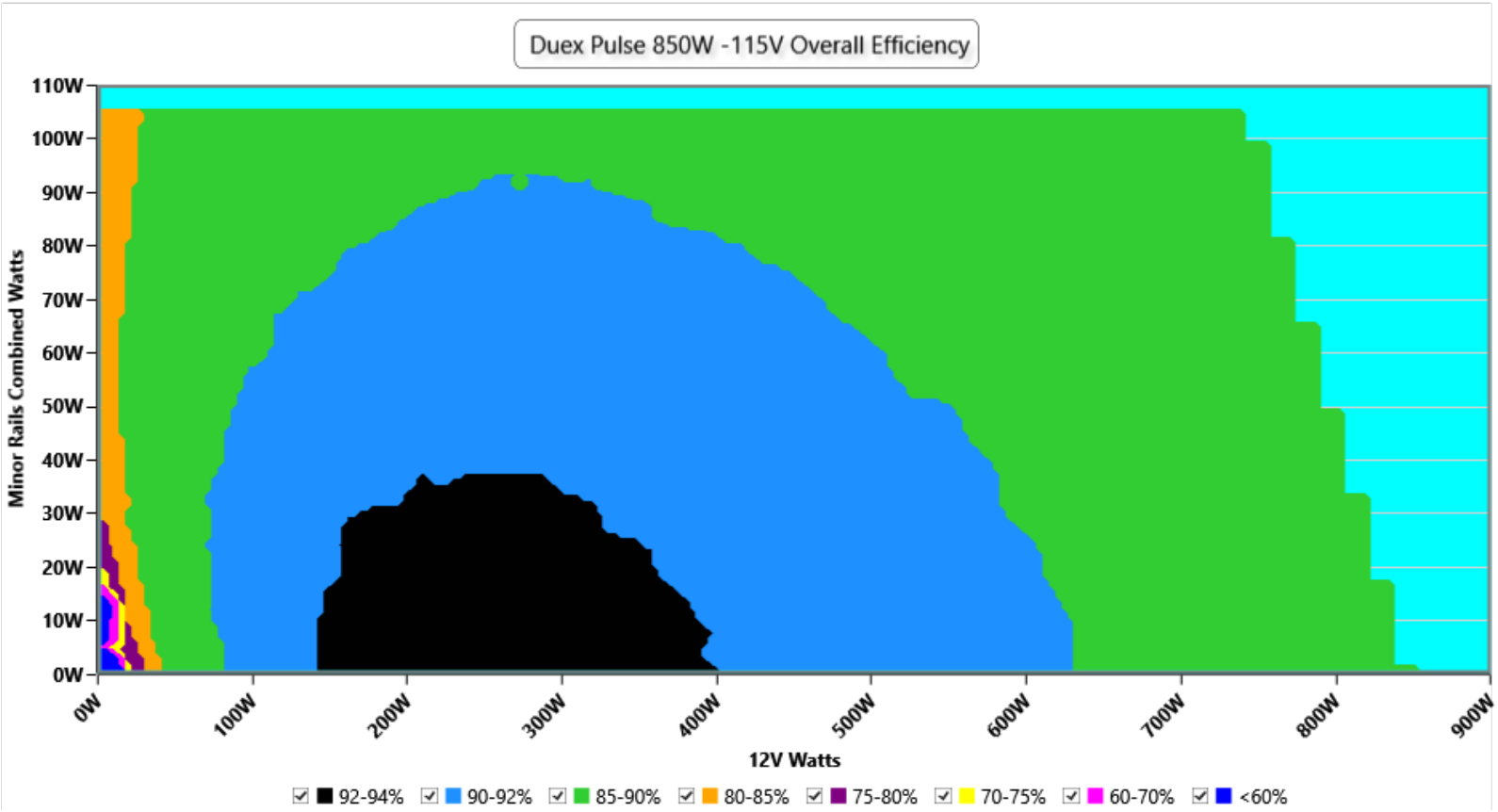
### Tables 115V

| 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 % | 0.08 % | N/A | 0.18 % | 2.00 % | PASS |
| Real Power: | 0.037 W | -0.001 W | N/A | 0.065 W | N/A | N/A |
| Apparent Power: | 2.385 W | 2.317 W | N/A | 2.468 W | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| Power Factor: | 0.021 | N/A | N/A | N/A | N/A | N/A |

## Efficiency Graph

### 115V

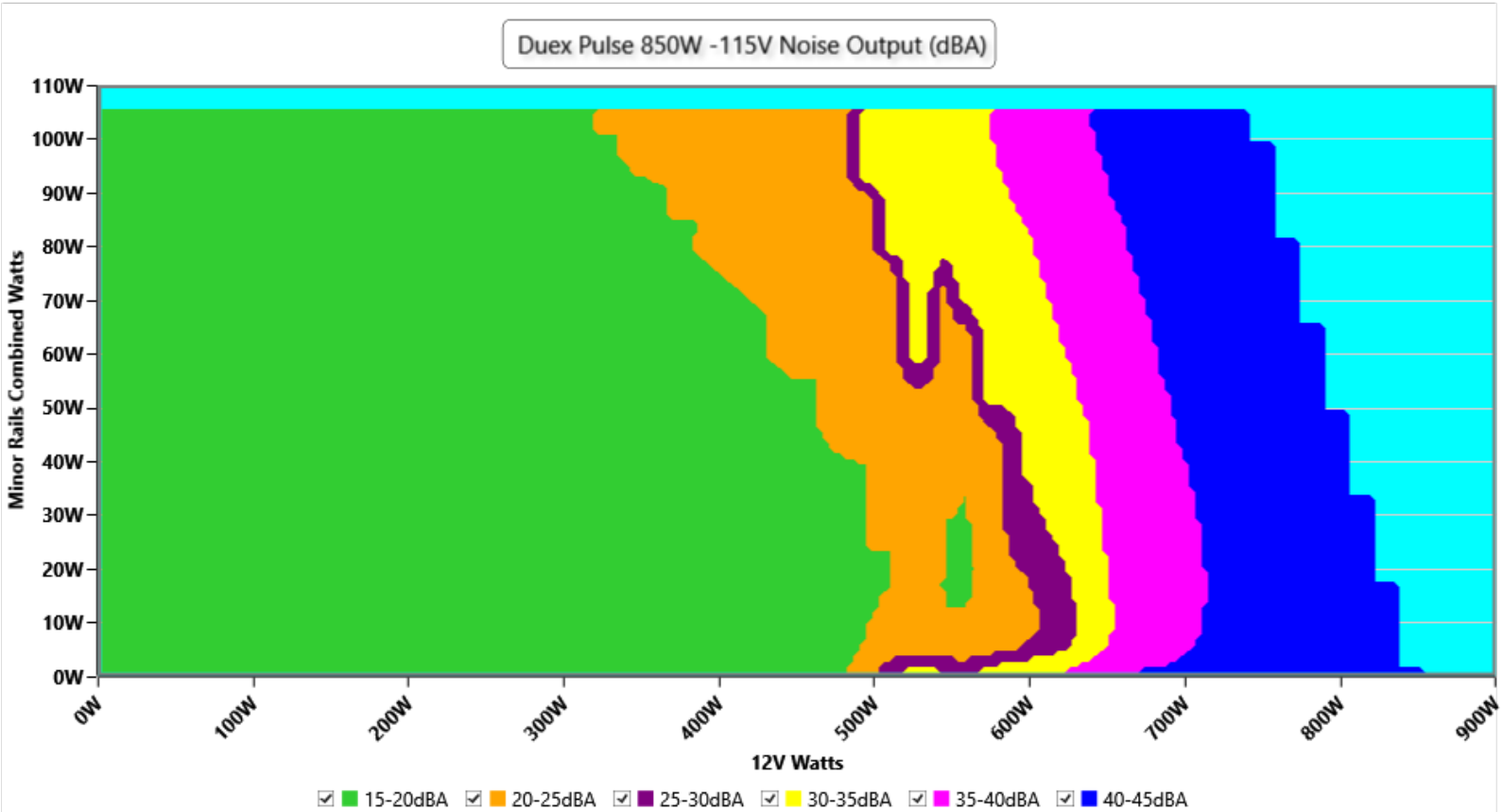



### INFO

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

## Noise Graph

### 115V

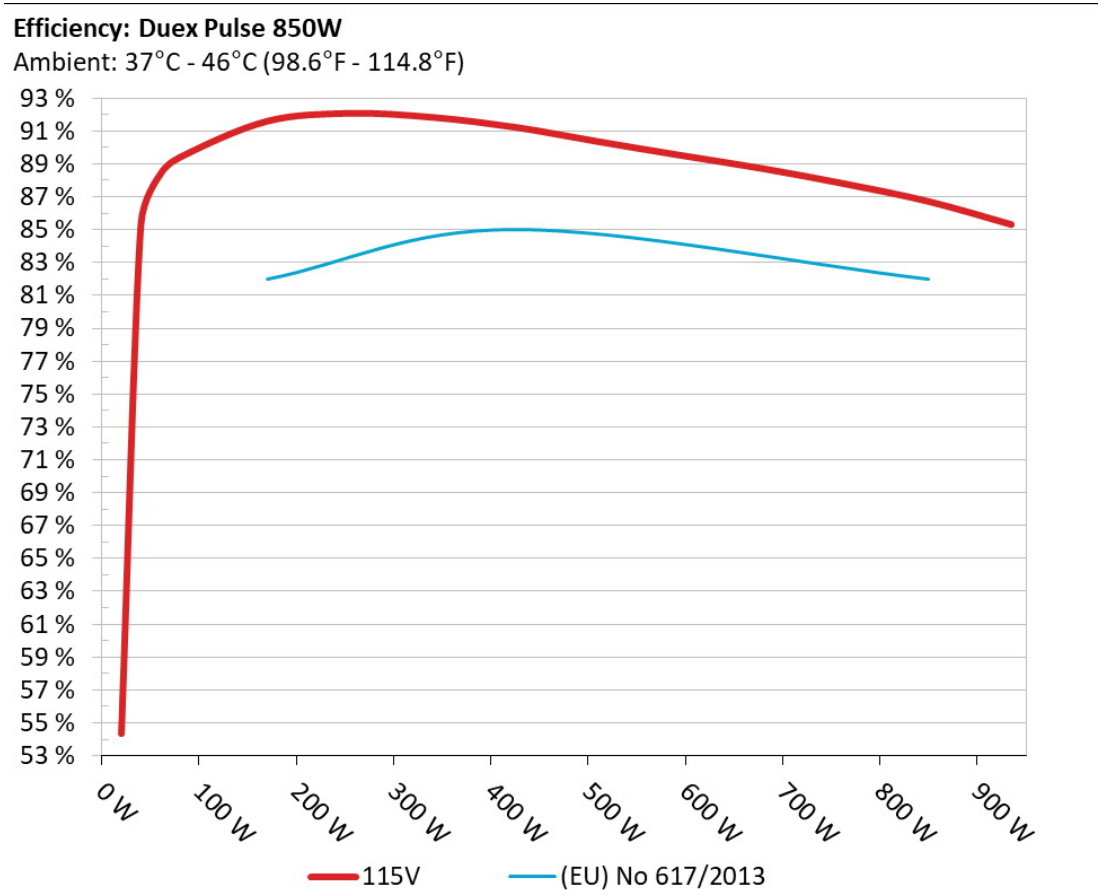



### INFO

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

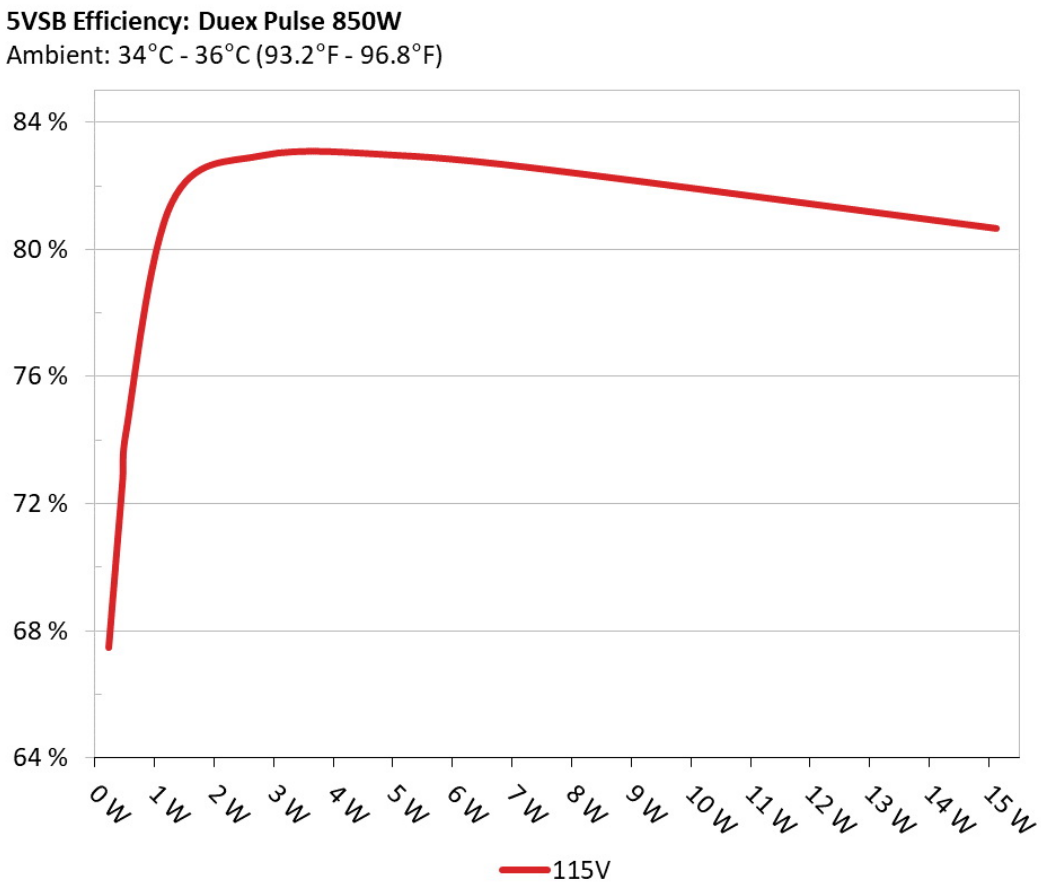
### Efficiency under high ambient temperature




**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** | 0.232W | 67.485% | 0.119 |
| | 5.152V | 0.344W | | 114.86V |

| | | | | |
|---|---|---|---|---|
| **2** | **0.09A** | 0.464W | 72.752% | 0.192 |
| | 5.151V | 0.638W | | 114.86V |
| **3** | **0.55A** | 2.823W | 82.955% | 0.386 |
| | 5.133V | 3.403W | | 114.84V |
| **4** | **1A** | 5.116W | 82.953% | 0.43 |
| | 5.116V | 6.168W | | 114.84V |
| **5** | **1.5A** | 7.647W | 82.493% | 0.447 |
| | 5.098V | 9.27W | | 114.84V |
| **6** | **3A** | 15.122W | 80.66% | 0.475 |
| | 5.041V | 18.747W | | 114.84V |

## Protection Features

| | |
|---|---|
| OCP (Cold @ 26.8°C) | 12V: 93.00A (131.36%), 12.059V<br>5V: 25.7A (128.50%), 4.986V<br>3.3V: 27A (135.00%), 3.261V<br>5VSB: 4.4A (146.67%), 4.947V |
| OCP (Hot) @ 41.1°C) | 12V: 90.00A (127.12%), 12.079V<br>5V: 25.6A (128.00%), 4.965V<br>3.3V: 27.2A (136.00%), 3.241V<br>5VSB: 4.3A (143.33%), 4.96V |
| OPP (Cold @ 27.7°C) | 1035.11W (121.78%) |
| OPP (Hot @ 41.1°C) | 995.10W (117.07%) |
| OTP | ✓ (140°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)

### 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%** | **5.194A** | **1.98A** | **1.982A** | **0.979A** | 84.997 | 89.525% | 877 | 20.5 | 40.29°C | 0.94 |
| | 12.206V | 5.049V | 3.33V | 5.106V | 94.94 | | | | 42.5°C | 114.81V |
| **20%** | **11.400A** | **2.974A** | **2.978A** | **1.179A** | 169.916 | 91.578% | 880 | 20.6 | 40.6°C | 0.965 |
| | 12.195V | 5.044V | 3.324V | 5.087V | 185.539 | | | | 44.12°C | 114.79V |
| **30%** | **17.963A** | **3.471A** | **3.478A** | **1.381A** | 254.915 | 92.055% | 882 | 20.6 | 41.05°C | 0.977 |
| | 12.184V | 5.04V | 3.321V | 5.069V | 276.914 | | | | 45.85°C | 114.76V |
| **40%** | **24.545A** | **3.97A** | **3.979A** | **1.584A** | 339.996 | 91.81% | 884 | 20.6 | 41.53°C | 0.984 |
| | 12.173V | 5.037V | 3.317V | 5.05V | 370.322 | | | | 47.42°C | 114.73V |
| **50%** | **30.770A** | **4.969A** | **4.983A** | **1.79A** | 424.756 | 91.208% | 890 | 20.7 | 42.26°C | 0.988 |
| | 12.163V | 5.031V | 3.311V | 5.03V | 465.703 | | | | 50.46°C | 114.71V |
| **60%** | **36.990A** | **5.967A** | **5.989A** | **1.996A** | 509.281 | 90.342% | 1450 | 36.1 | 42.73°C | 0.99 |
| | 12.151V | 5.027V | 3.306V | 5.009V | 563.723 | | | | 51.16°C | 114.67V |
| **70%** | **43.296A** | **6.969A** | **6.997A** | **2.205A** | 594.595 | 89.501% | 1752 | 41.6 | 43.09°C | 0.992 |
| | 12.137V | 5.023V | 3.302V | 4.989V | 664.35 | | | | 52.14°C | 114.64V |
| **80%** | **49.617A** | **7.97A** | **8.008A** | **2.313A** | 679.439 | 88.694% | 1865 | 44.2 | 43.58°C | 0.993 |
| | 12.124V | 5.018V | 3.297V | 4.972V | 766.044 | | | | 54.17°C | 114.62V |
| **90%** | **56.337A** | **8.477A** | **8.506A** | **2.422A** | 764.886 | 87.752% | 1863 | 44.2 | 44.14°C | 0.994 |
| | 12.113V | 5.013V | 3.291V | 4.955V | 871.633 | | | | 56.36°C | 114.61V |
| **100%** | **62.803A** | **8.983A** | **9.035A** | **3.05A** | 849.703 | 86.694% | 1865 | 44.2 | 45°C | 0.995 |
| | 12.101V | 5.009V | 3.287V | 4.918V | 980.109 | | | | 59.43°C | 114.54V |
| **110%** | **69.152A** | **9.998A** | **10.157A** | **3.06A** | 934.293 | 85.304% | 1866 | 44.2 | 46.42°C | 0.995 |
| | 12.090V | 5.001V | 3.278V | 4.903V | 1095.267 | | | | 63.51°C | 114.52V |
| **CL1** | **0.114A** | **12.386A** | **12.45A** | **0.001A** | 104.292 | 82.87% | 885 | 20.6 | 40.36°C | 0.952 |
| | 12.199V | 5.006V | 3.285V | 5.128V | 125.849 | | | | 53.74°C | 114.81V |
| **CL2** | **0.113A** | **20.048A** | **0A** | **0.001A** | 101.33 | 81.382% | 891 | 20.7 | 40.53°C | 0.952 |
| | 12.198V | 4.985V | 3.306V | 5.134V | 124.514 | | | | 50°C | 114.82V |

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC Volts |
|---|---|---|---|---|---|---|---|---|---|---|
| **CL3** | **0.113A** | **0A** | **20.195A** | **0A** | 67.381 | 74.863% | 875 | 20.5 | 40.22°C | 0.938 |
| | 12.197V | 5.016V | 3.268V | 5.134V | 90.007 | | | | 47.35°C | 114.82V |
| **CL4** | **70.141A** | **0A** | **0A** | **0.007A** | 849.496 | 87.866% | 1880 | 44.5 | 46.85°C | 0.995 |
| | 12.111V | 5.031V | 3.309V | 5.053V | 966.806 | | | | 56.11°C | 114.56V |

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** | **1.216A** | **0.494A** | **0.494A** | **0.195A** | 19.996 | 54.375% | 869 | 20.4 | 36.59°C | 0.87 |
| | 12.201V | 5.061V | 3.341V | 5.141V | 36.776 | | | | 41.94°C | 114.83V |
| **40W** | **2.677A** | **0.692A** | **0.692A** | **0.292A** | 39.994 | 85.299% | 870 | 20.4 | 37.07°C | 0.891 |
| | 12.210V | 5.055V | 3.337V | 5.139V | 46.886 | | | | 40.3°C | 114.83V |
| **60W** | **4.138A** | **0.89A** | **0.891A** | **0.39A** | 59.993 | 88.354% | 874 | 20.5 | 38.37°C | 0.921 |
| | 12.209V | 5.053V | 3.334V | 5.133V | 67.9 | | | | 41.53°C | 114.82V |
| **80W** | **5.596A** | **1.088A** | **1.088A** | **0.488A** | 79.924 | 89.995% | 874 | 20.5 | 39.48°C | 0.937 |
| | 12.203V | 5.053V | 3.335V | 5.126V | 88.811 | | | | 41.05°C | 114.81V |

The results above are not used in the certification process

## Ripple Measurements 115V

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 19.13mV | 16.93mV | 15.49mV | 14.06mV | Pass |
| 20% Load | 21.53mV | 16.78mV | 15.80mV | 17.86mV | Pass |
| 30% Load | 21.48mV | 17.60mV | 15.85mV | 20.47mV | Pass |
| 40% Load | 23.58mV | 17.30mV | 16.83mV | 23.71mV | Pass |
| 50% Load | 23.43mV | 16.89mV | 15.08mV | 24.12mV | Pass |
| 60% Load | 26.60mV | 18.73mV | 17.60mV | 29.40mV | Pass |
| 70% Load | 26.80mV | 19.91mV | 17.50mV | 32.43mV | Pass |
| 80% Load | 28.39mV | 27.81mV | 27.50mV | 35.10mV | Pass |
| 90% Load | 28.13mV | 22.17mV | 23.55mV | 39.35mV | Pass |

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 100% Load | 38.15mV | 28.37mV | 27.42mV | 44.62mV | Pass |
| 110% Load | 40.22mV | 29.78mV | 26.66mV | 48.64mV | Pass |
| Crossload1 | 26.88mV | 26.63mV | 25.37mV | 15.36mV | Pass |
| Crossload2 | 21.18mV | 22.79mV | 16.72mV | 13.24mV | Pass |
| Crossload3 | 18.97mV | 43.47mV | 20.42mV | 12.47mV | Pass |
| Crossload4 | 38.18mV | 22.21mV | 18.52mV | 42.08mV | Pass |

The results above are not used in the certification process

## Duex Pulse 850W

Top side

Power specifications label

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 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

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com