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 Chroma 63600-2 Chroma 63640-80-80 x10 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 (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

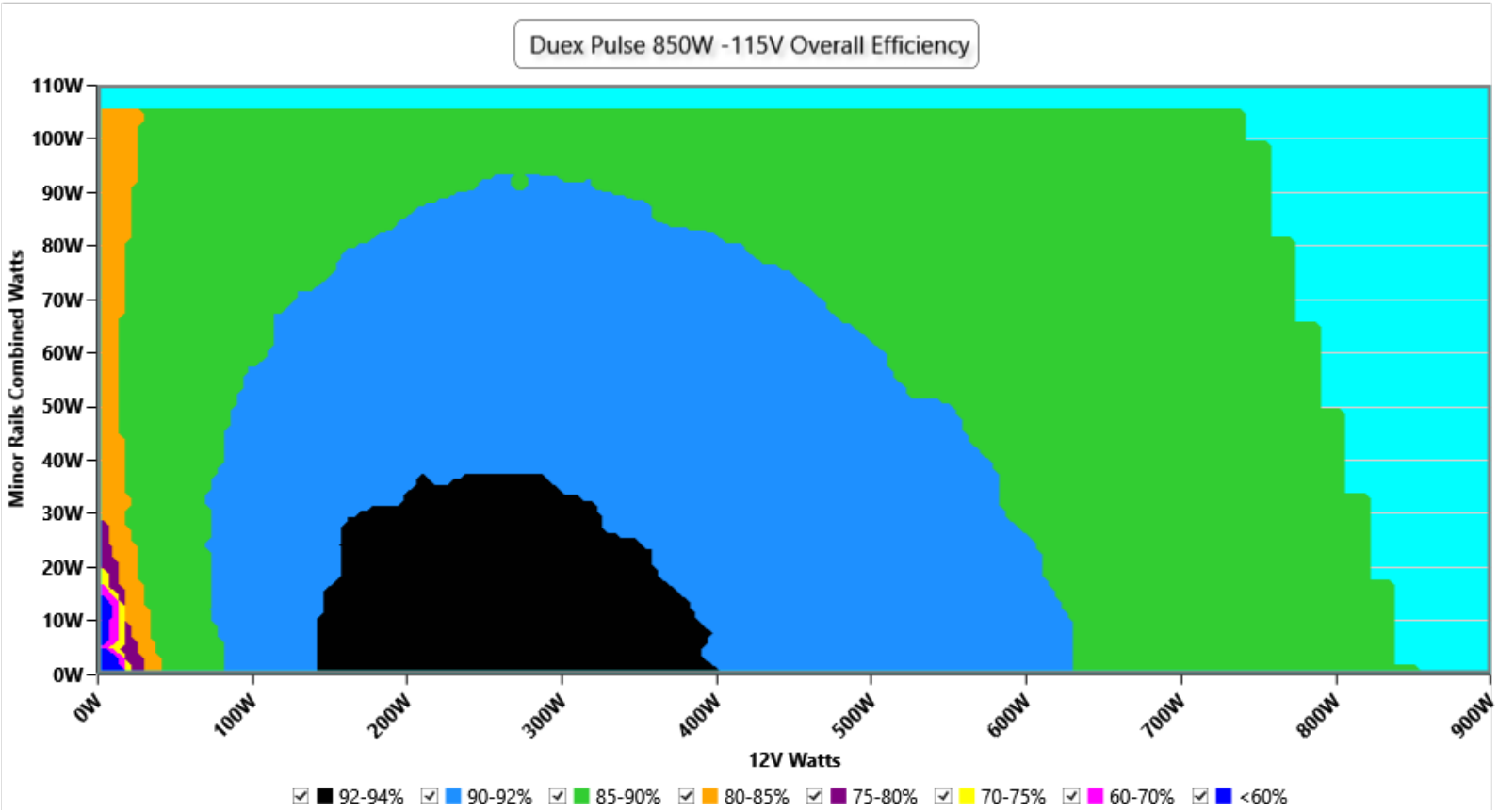
Tables 115V

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

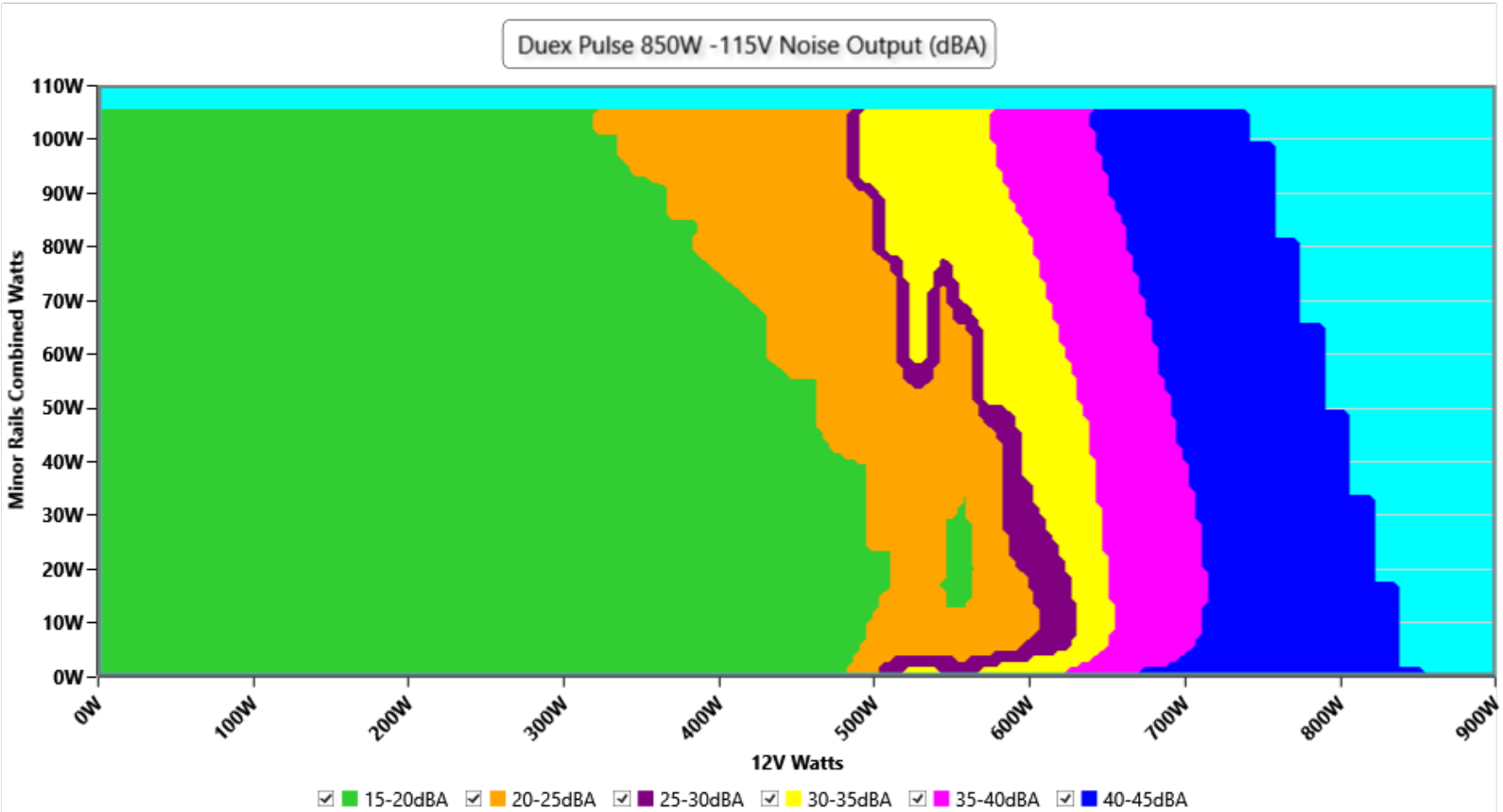


INFO

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

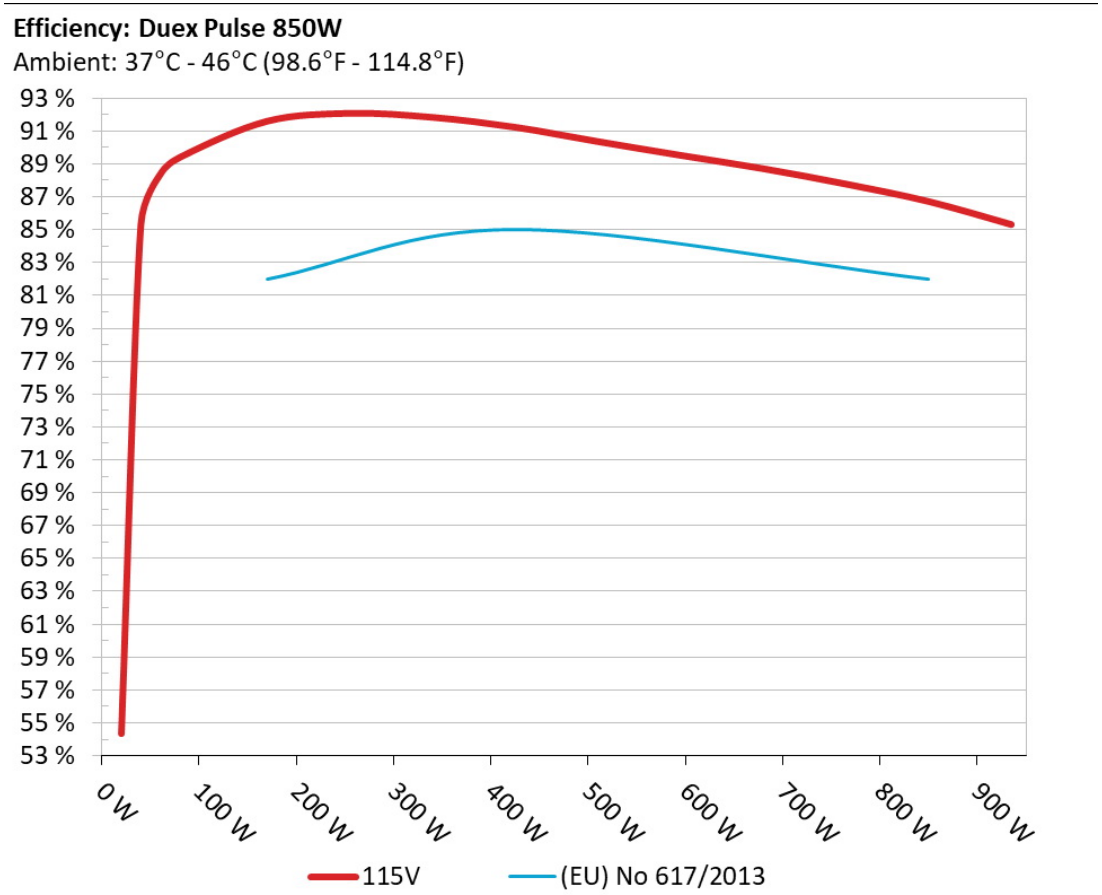


INFO

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

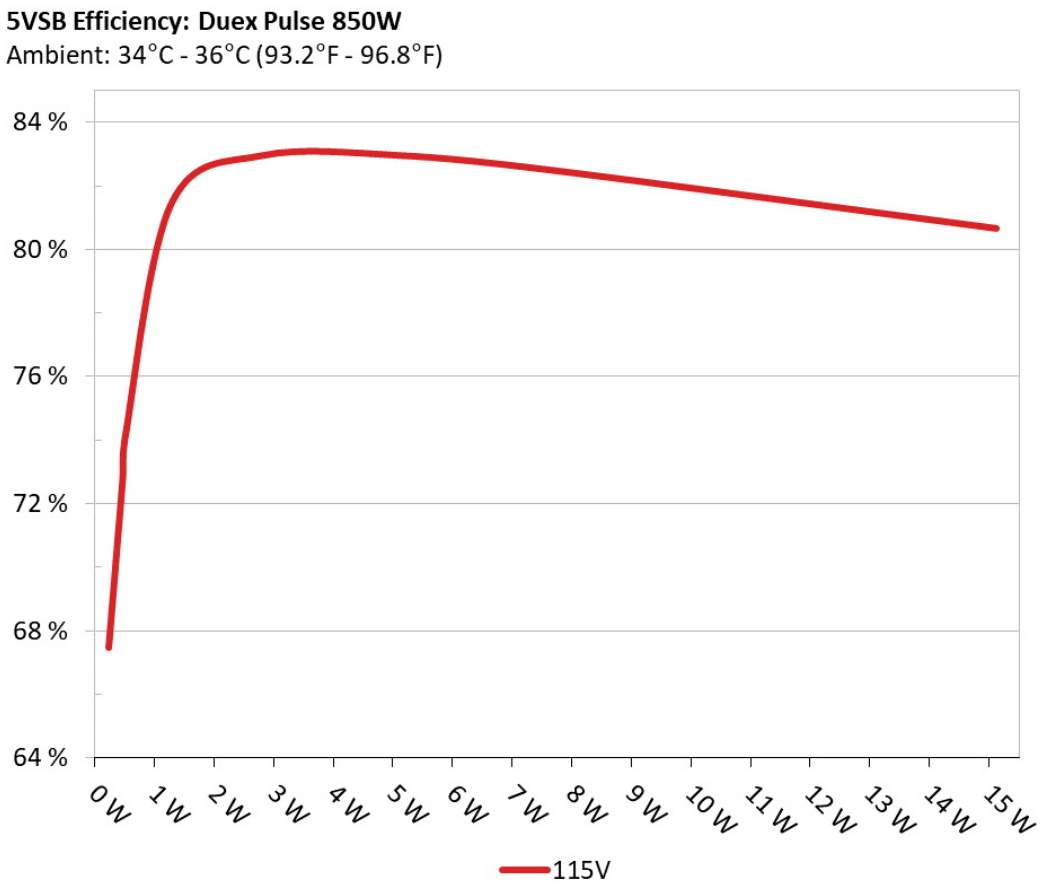
Efficiency under high ambient temperature



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 5V: 25.7A (128.50%), 4.986V 3.3V: 27A (135.00%), 3.261V 5VSB: 4.4A (146.67%), 4.947V
OCP (Hot) @ 41.1°C)	12V: 90.00A (127.12%), 12.079V 5V: 25.6A (128.00%), 4.965V 3.3V: 27.2A (136.00%), 3.241V 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: ✓ 5V to Earth: ✓ 3.3V to Earth: ✓ 5VSB to Earth: ✓ -12V to Earth: ✓
PWR_OK	Proper Operation
NLO	✓
Fan Failure Protection	✗
SIP	Surge: MOV 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