Duex Pulse 1000W

Serial Number

Lab ID DX10002497

Certification ID 252497

Test Result Report ID: 24PS2497A

Certificate Issue Date: Jul 12, 2024

115V 230V

Scheme: ETA-EMI PSU

CYBENETICS GOLD

115V 230V

CYBENETICS STANDARD++

Scheme: LAMBDA PSU

Aristeidis Bitziopoulos, Certification Body General Manager

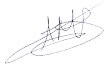
General Information

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 1000W
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)	1000
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	DX10002497
Date of receipt	Jul 1, 2024
Testing Date	Jul 4, 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	83.5	3	0.3
	Watts	103		1000	15	3.6
Total Max. Power (W)		1000				

Parts Description

General Data	
Manufacturer (OEM)	Kinpower
PCB Type	Double-Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor M72 5D-20 (5 Ohm @25°C) & Relay
Bridge Rectifier(s)	2x HY Electronic GBU2506L (600V, 25A @ 150°C)
APFC MOSFETs	2x Way-On WMJ90N65SR (650V, 99A @ 25°C, Rds(on): 0.033Ohm)
APFC Boost Diode	1x Global Power Technology G3S06510A (650V, 10A @ 153.5°C)
Bulk Cap(s)	2x Nippon Chemi-Con (400V, 560uF each or 1120uF combined, 2000h @ 105°C,KMR)

Main Switchers	2x FuXin Semiconductor FXN65S55TF
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	8x Alkaidsemi Technologies AKG60N023G (60V, 84A @ 100°C, Rds(on): 2.3mOhm)
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: 33x Chengx (PC), 1x 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)	87.838%
Average Noise Output (>1450 Load Combinations)	34.20dBA

Average PF (>1450 Load Combinations)	0.981
Efficiency With 10W (≤500W) or 2% (>500W) Load	58.480%
Standby Power Consumption	0.0371W
Non-Accredited	
12V Ripple (Full Load)	36.12mV
5V Ripple (Full Load)	23.14mV
3.3V Ripple (Full Load)	26.50mV
5VSB Ripple (Full Load)	32.73mV
12V Load Regulation	1.23%
5V Load Regulation	0.62%
3.3V Load Regulation	1.21%
5VSB Load Regulation	5.02%
Inrush Current	35.380A

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	32.2
AC Loss to PWR_OK Hold Up Time (ms)	29.2
PWR_OK Inactive to DC Loss Delay (ms)	3

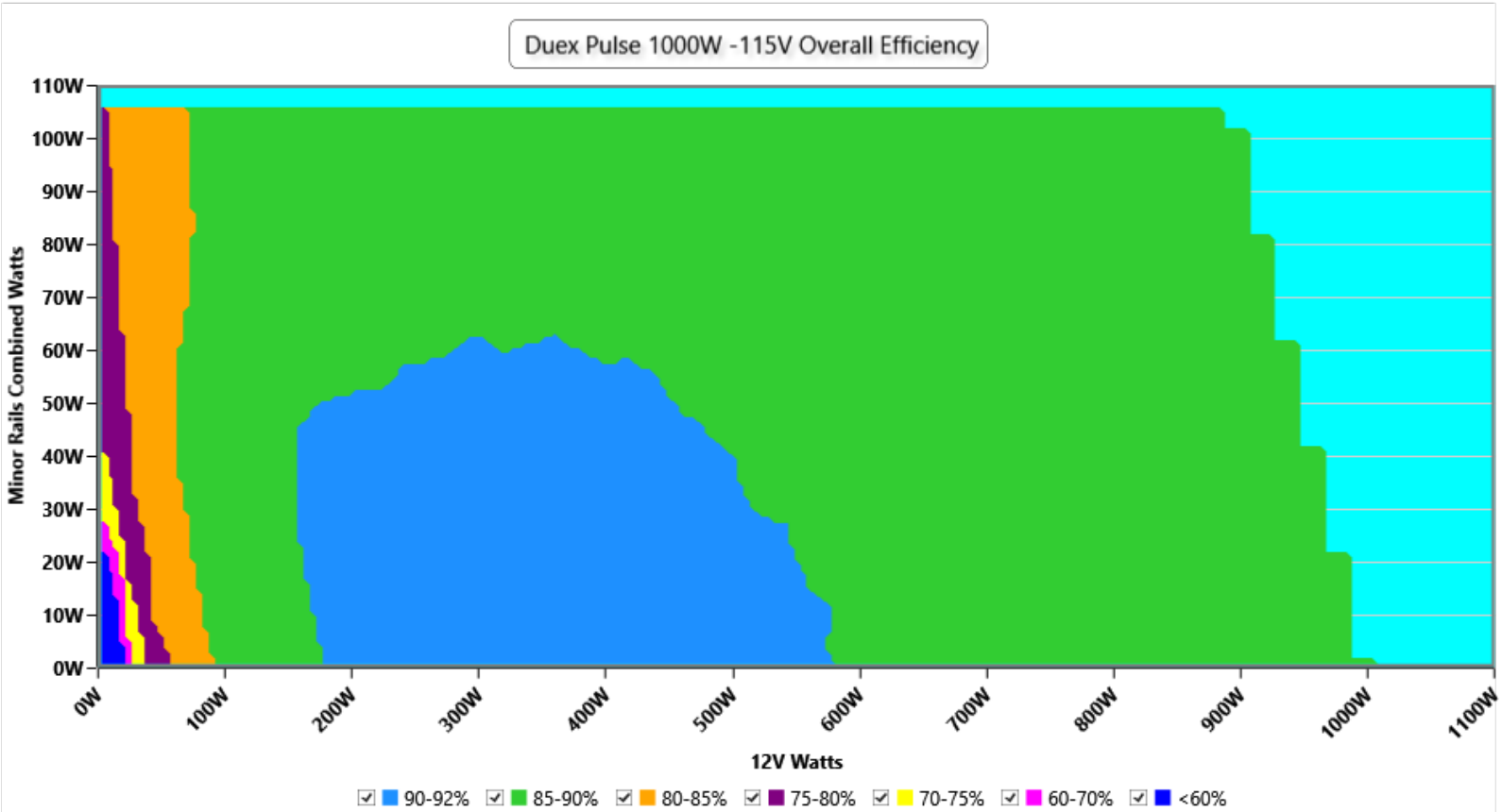
Tables 115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.08 V	115.04 V	113.85 V	115.11 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:	0.037 W	-0.000 W	N/A	0.068 W	N/A	N/A
Apparent Power:	2.368 W	2.298 W	N/A	2.453 W	N/A	N/A

Power Factor:	0.025	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

115V

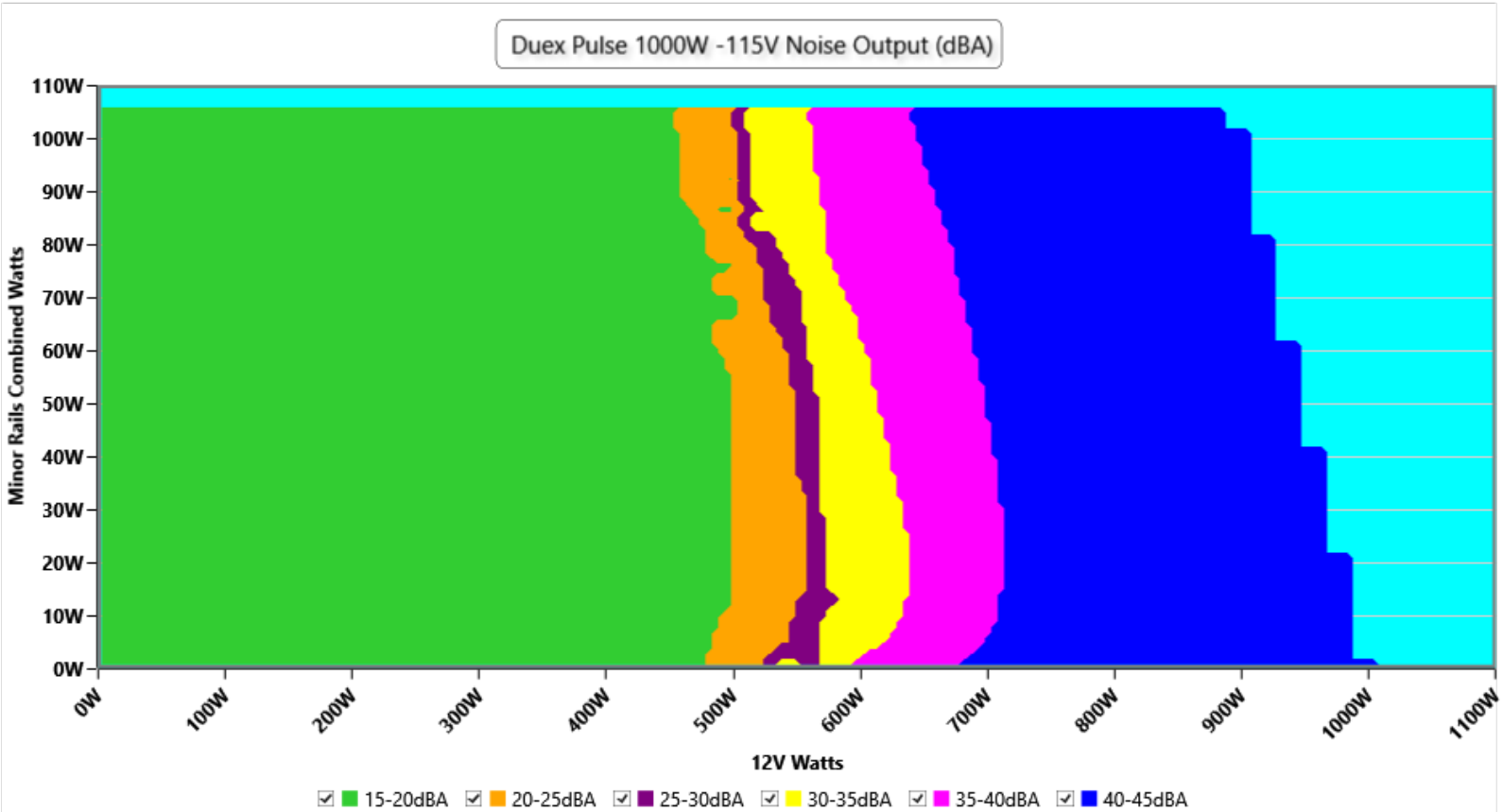


INFO

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

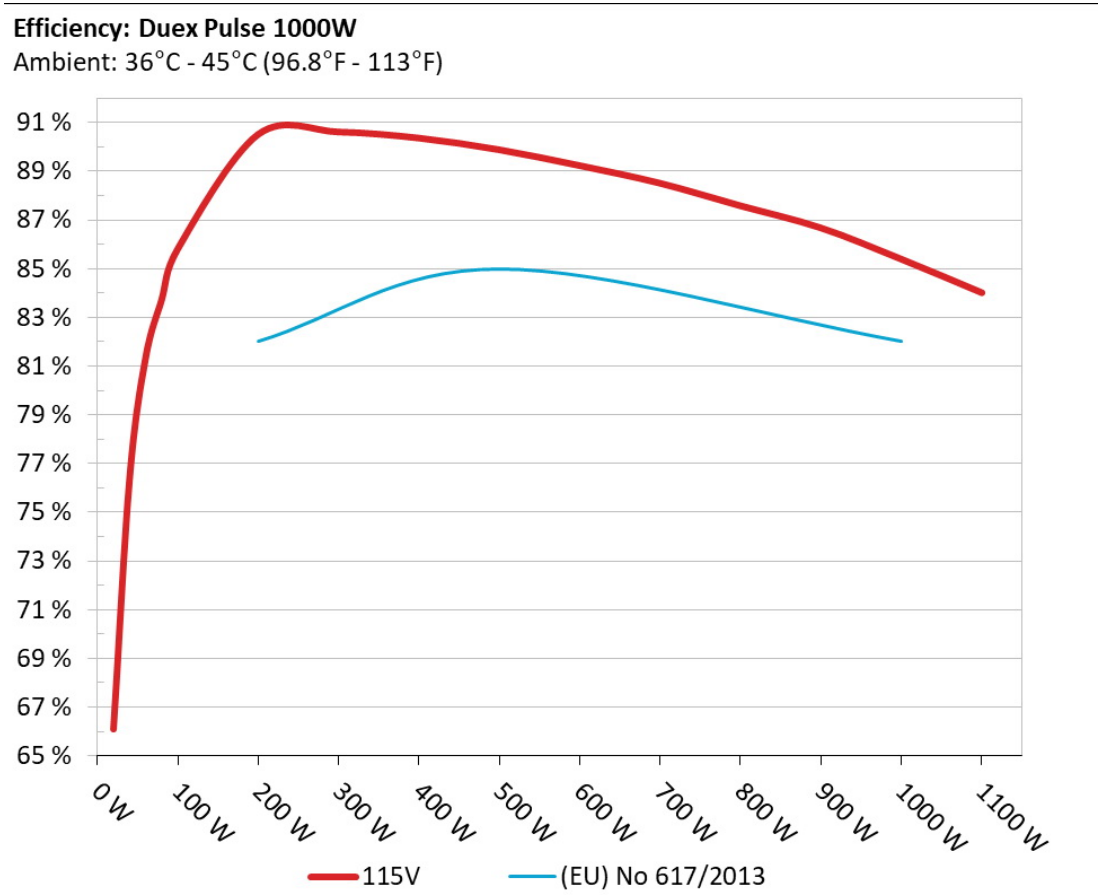


INFO

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

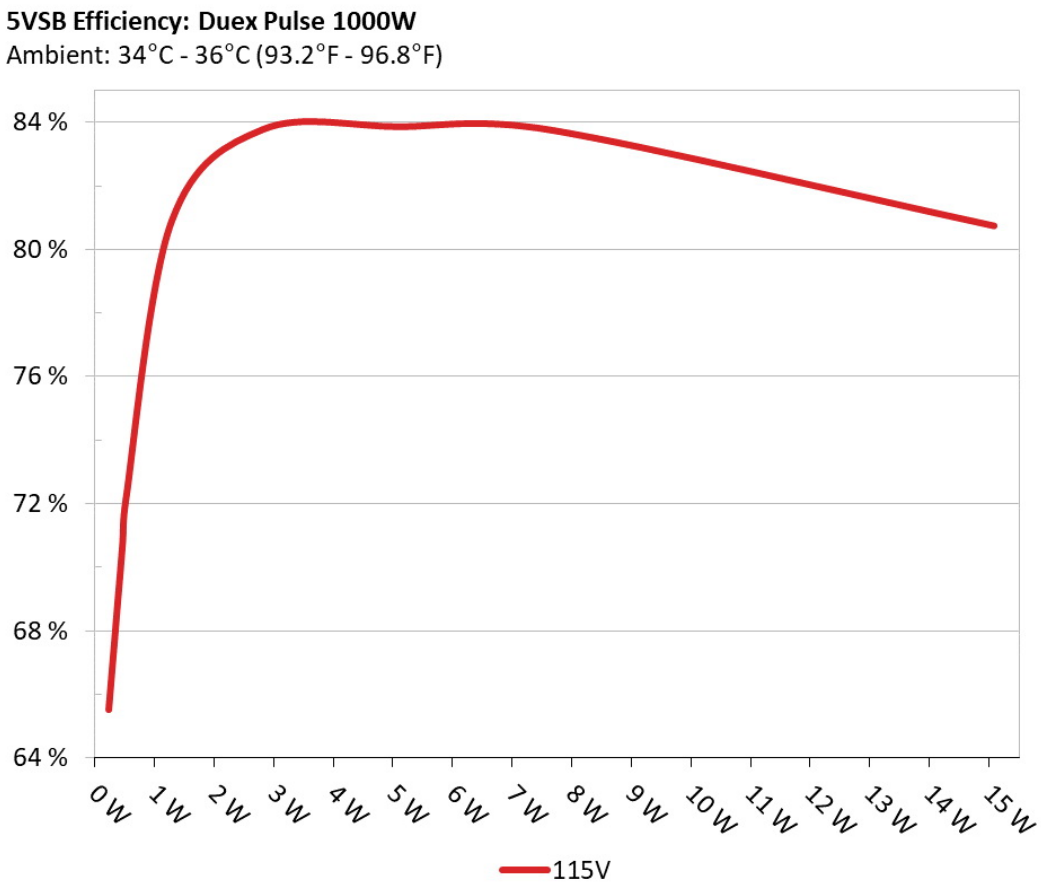
Efficiency under high ambient temperature



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	65.518%	0.121
	5.159V	0.354W		114.86V

2	**0.09A**	0.464W	70.756%	0.192
	5.157V	0.656W		114.86V
3	**0.55A**	2.826W	83.785%	0.361
	5.137V	3.373W		114.85V
4	**1A**	5.118W	83.866%	0.393
	5.118V	6.102W		114.85V
5	**1.5A**	7.645W	83.764%	0.417
	5.096V	9.127W		114.85V
6	**3A**	15.089W	80.746%	0.46
	5.03V	18.687W		114.84V

Protection Features

OCP (Cold @ 26.5°C)	12V: 100.00A (119.76%), 11.960V 5V: 25A (125.00%), 5.072V 3.3V: 25A (125.00%), 3.298V 5VSB: 4.7A (156.67%), 4.938V
OCP (Hot) @ 40.5°C)	12V: 98.00A (117.37%), 11.967V 5V: 25A (125.00%), 5.064V 3.3V: 25.2A (126.00%), 3.275V 5VSB: 4.7A (156.67%), 4.936V
OPP (Cold @ 26.7°C)	1105.38W (110.54%)
OPP (Hot @ 43.0°C)	1100.44W (110.04%)
OTP	✓ (120°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%	**6.467A**	**1.979A**	**1.98A**	**0.98A**	99.981	85.835%	870	20.4	40.28°C	0.952
	12.120V	5.051V	3.333V	5.102V	116.472				44.12°C	114.82V
20%	**13.958A**	**2.972A**	**2.974A**	**1.182A**	199.928	90.532%	872	20.5	40.54°C	0.978
	12.110V	5.047V	3.328V	5.078V	220.827				45.61°C	114.77V
30%	**21.823A**	**3.469A**	**3.474A**	**1.385A**	299.966	90.633%	875	20.5	41.42°C	0.773
	12.094V	5.044V	3.325V	5.055V	100.715				48.02°C	45.99V
40%	**29.662A**	**3.967A**	**3.975A**	**1.59A**	399.464	90.381%	1176	29.8	41.88°C	0.989
	12.078V	5.041V	3.321V	5.03V	441.911				50.03°C	114.71V
50%	**37.203A**	**4.962A**	**4.975A**	**1.798A**	499.185	89.903%	1677	40.4	42.48°C	0.993
	12.060V	5.038V	3.317V	5.005V	555.246				52.43°C	114.68V
60%	**44.846A**	**5.958A**	**5.977A**	**2A**	599.683	89.248%	1810	43.5	42.71°C	0.995
	12.040V	5.036V	3.313V	4.979V	671.936				51.86°C	114.64V
70%	**52.421A**	**6.956A**	**6.985A**	**2.221A**	699.452	88.528%	1820	43.9	43.45°C	0.996
	12.025V	5.032V	3.307V	4.953V	790.08				55.73°C	114.61V
80%	**60.100A**	**7.957A**	**7.997A**	**2.333A**	799.487	87.6%	1820	43.9	43.71°C	0.997
	12.007V	5.026V	3.301V	4.929V	912.671				58.71°C	114.57V
90%	**68.129A**	**8.46A**	**8.49A**	**2.445A**	899.278	86.697%	1818	43.9	44.19°C	0.997
	11.990V	5.023V	3.297V	4.908V	1037.273				62.01°C	114.53V
100%	**75.981A**	**8.964A**	**9.019A**	**3.087A**	999.318	85.412%	1819	43.9	45.02°C	0.997
	11.972V	5.02V	3.293V	4.858V	1170.003				66.85°C	114.49V
110%	**83.775A**	**9.964A**	**10.123A**	**3.098A**	1099.831	84.029%	1827	44.1	44°C	0.997
	11.955V	5.017V	3.289V	4.842V	1308.922				64.51°C	114.43V
CL1	**0.114A**	**12.329A**	**12.398A**	**0A**	104.281	79.396%	878	20.5	42.65°C	0.959
	12.113V	5.029V	3.298V	5.13V	131.345				54.25°C	114.8V
CL2	**0.114A**	**19.927A**	**0A**	**0A**	101.328	78.424%	878	20.5	41.41°C	0.958
	12.119V	5.016V	3.312V	5.137V	129.205				49.55°C	114.8V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL3	**0.114A**	**0A**	**20.174A**	**0A**	67.38	69.15%	865	20.2	41°C	0.946
	12.110V	5.02V	3.271V	5.136V	97.428				47.44°C	114.83V
CL4	**83.370A**	**0A**	**0A**	**0.003A**	999.919	86.371%	1837	44.1	45.19°C	0.997
	11.994V	5.03V	3.315V	5.027V	1157.717				61.72°C	114.49V

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	**1.224A**	**0.494A**	**0.494A**	**0.194A**	19.991	66.106%	861	20.1	36.02°C	0.87
	12.128V	5.057V	3.342V	5.151V	30.239				37.08°C	114.84V
40W	**2.695A**	**0.692A**	**0.692A**	**0.292A**	39.994	76.405%	864	20.2	37.4°C	0.909
	12.128V	5.056V	3.34V	5.144V	52.346				39.46°C	114.84V
60W	**4.167A**	**0.89A**	**0.889A**	**0.389A**	59.994	81.37%	865	20.2	38.29°C	0.936
	12.126V	5.054V	3.338V	5.137V	73.731				41.22°C	114.83V
80W	**5.634A**	**1.088A**	**1.088A**	**0.487A**	79.93	83.747%	866	20.3	39.1°C	0.946
	12.124V	5.053V	3.337V	5.129V	95.448				42.51°C	114.82V

The results above are not used in the certification process

Ripple Measurements 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	35.34mV	16.99mV	17.13mV	11.29mV	Pass
20% Load	19.74mV	15.81mV	15.34mV	11.90mV	Pass
30% Load	20.71mV	17.71mV	15.65mV	15.24mV	Pass
40% Load	18.52mV	14.63mV	13.34mV	13.75mV	Pass
50% Load	22.91mV	18.73mV	16.78mV	18.06mV	Pass
60% Load	21.63mV	21.81mV	15.85mV	17.60mV	Pass
70% Load	25.32mV	22.63mV	20.21mV	20.99mV	Pass
80% Load	26.80mV	21.40mV	23.24mV	22.63mV	Pass
90% Load	28.03mV	21.50mV	23.24mV	24.53mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
100% Load	36.12mV	23.14mV	26.50mV	32.73mV	Pass
110% Load	35.13mV	26.34mV	27.55mV	35.72mV	Pass
Crossload1	28.13mV	26.23mV	29.34mV	13.34mV	Pass
Crossload2	20.82mV	23.56mV	21.70mV	11.44mV	Pass
Crossload3	39.02mV	26.84mV	20.62mV	9.23mV	Pass
Crossload4	33.13mV	18.12mV	14.88mV	24.57mV	Pass

The results above are not used in the certification process

Duex Pulse 1000W

Top side

Power specifications label

Cybenetics □□□□□□□□□□□□□□□□□□ ETA□□□□ LAMBDA□□□□ SAFE□□□□□□□□□□□□□□□□□ DELTA□□□□□□ PHI□□□□□□□□

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com