be quiet!

be quiet! Pure Power 10 500W

277S7031000428

Lab ID 115

Certification ID 25115

Test Result Report ID: 20PS115A

Certificate Issue Date: May 27, 2018

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





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	be quiet!
Model	Pure Power 10 500W
OEM/ODM	FSP
Serial Number	277S7031000428
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	8-5
□□□□ (Hz)	50-60

□□□□ (W)	500
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Semi Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Rifle Bearing Fan (BQ QF1-12025-MS)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	115
Date of receipt	May 12, 2018
Testing Date	May 25, 2018
Report Issued Date	May 27, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

Native Cables			
□□	□□□□	□□□□□□	Gauge
ATX □□ 20+4 pin (560mm)	1	1	18-24AWG
4+4 pin EPS 12V □□ (610mm)	1	1	18AWG
□□□□□			
6+2pin PCIe□□ (500mm)	2	2	18AWG
SATA□□ (500mm+150mm+150mm)	1	3	18AWG
SATA□□ (500mm) / □ 4pin Molex□□ (+150mm+150mm)	1	1 / 2	18AWG
SATA□□ (500mm+150mm) / □ 4pin Molex□□ (+150mm) / FDD (+150mm)	1	2 / 1 / 1	18-22AWG

□□□□

□		3.3V	5V	12V1	12V2	5VSB	-12V
□□□□	□□	25	15	28	20	3	0.3
	□	120		480		15	3.6
□□□□□ (W)		500					

Parts Description

General Data	
Manufacturer (OEM)	CWT
Platform Model	-
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	2x GBU1006 (600V, 10A @ 100°C)
APFC MOSFETS	2x Infineon IPW50R280CE (550V, 11.4A @ 100°C, 0.28Ohm)
APFC Boost Diode	1x Power Integrations QH08TZ600 (600V, 8A @ 150°C)
Hold-up Cap(s)	1x Nichicon (400V, 390uF, 2000h @ 105 °C, GG)
Main Switchers	2x Vishay SiHG20N50C (560V, 11A @ 100°C, 0.27Ohm)
Combo APFC/PWM Controller	Champion CM6800TX & CM03X Green PFC controller
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x APEC AP9990GH-HF (60V, 100A @ 25°C, 6mOhm)
5V & 3.3V	DC-DC Converters: 6x APEC AP72T03GP (30V, 47A @ 100°C, 9.5mOhm) PWM Controller: APW7159C
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (1-5,000 @ 105°C, KZE), Su' scon (2-5,000h @ 105°C, MF), TAICON (105°C) Polymers: APAQ, EneSol
Supervisor IC	Weltrend WT7502 (OVP, UVP, SCP, PG)
Fan Model	Power Logic PLA13525S12M (12V, 0.40A, 111.1CFM, 41.6 dBA, Hydro Dynamic Bearing)
5VSB Circuit	
Rectifier	1x MBR2045CT SBR (45V, 20A) & CEF04N7G (700V, 4A, 3.3Ohm)

Standby PWM Controller	On-Bright OB5269CP
-12V Circuit	
Rectifier	UTC 2SB834L

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	87.174%
Average Noise Output (>1450 Load Combinations)	20.46dBA
PF□□□ (>1450 Load Combinations)	0.993
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.1006W
Non-Accredited	
12V Ripple (Full Load)	33.15mV
5V Ripple (Full Load)	24.21mV
3.3V Ripple (Full Load)	36.43mV
5VSB Ripple (Full Load)	25.93mV
12V Load Regulation	0.78%
5V Load Regulation	1.88%
3.3V Load Regulation	2.79%
5VSB Load Regulation	2.56%
Inrush Current	77.898A

230V

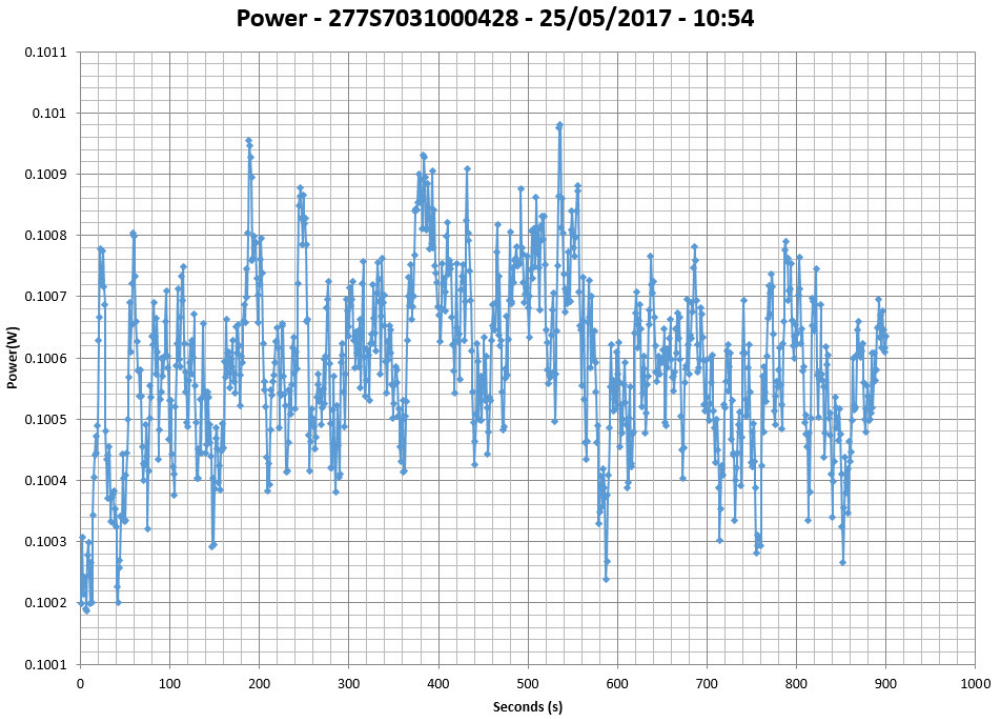
Accredited		
□□□□ (>1450 load combinations)		88.498%
Average Noise Output (>1450 Load Combinations)		19.66dBA
PF□□□ (>1450 Load Combinations)		0.970
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.1611W
Non-Accredited		
12V Ripple (Full Load)		25.75mV
5V Ripple (Full Load)		26.07mV
3.3V Ripple (Full Load)		37.52mV
5VSB Ripple (Full Load)		20.59mV
12V Load Regulation		0.56%
5V Load Regulation		1.57%
3.3V Load Regulation		2.32%
5VSB Load Regulation		2.39%
Inrush Current		62.069A
□□□□ & PG□□		22.80ms
AC Loss to PWR_OK Hold Up Time		24.60ms
PWR_OK Inactive to DC Loss Delay		-1.80ms
OPP (0.00°C / 0.00°C)	-	-

□□□□ & PG□□

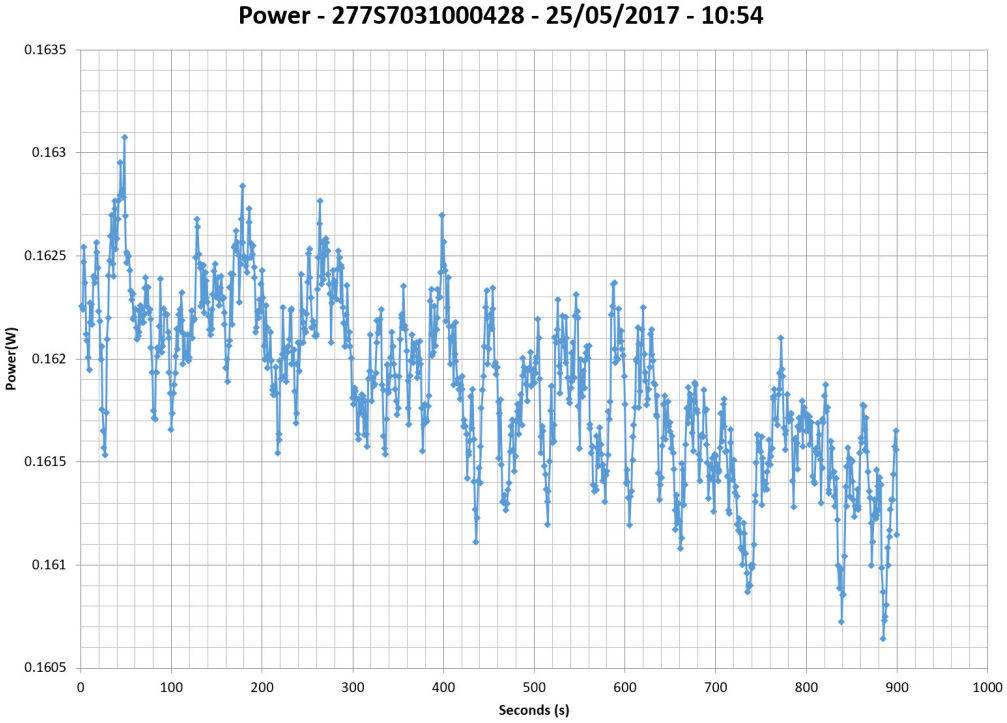
Hold-Up Time (ms)	22.8
AC Loss to PWR_OK Hold Up Time (ms)	24.6
PWR_OK Inactive to DC Loss Delay (ms)	-1.8

Graphs

115V



230V



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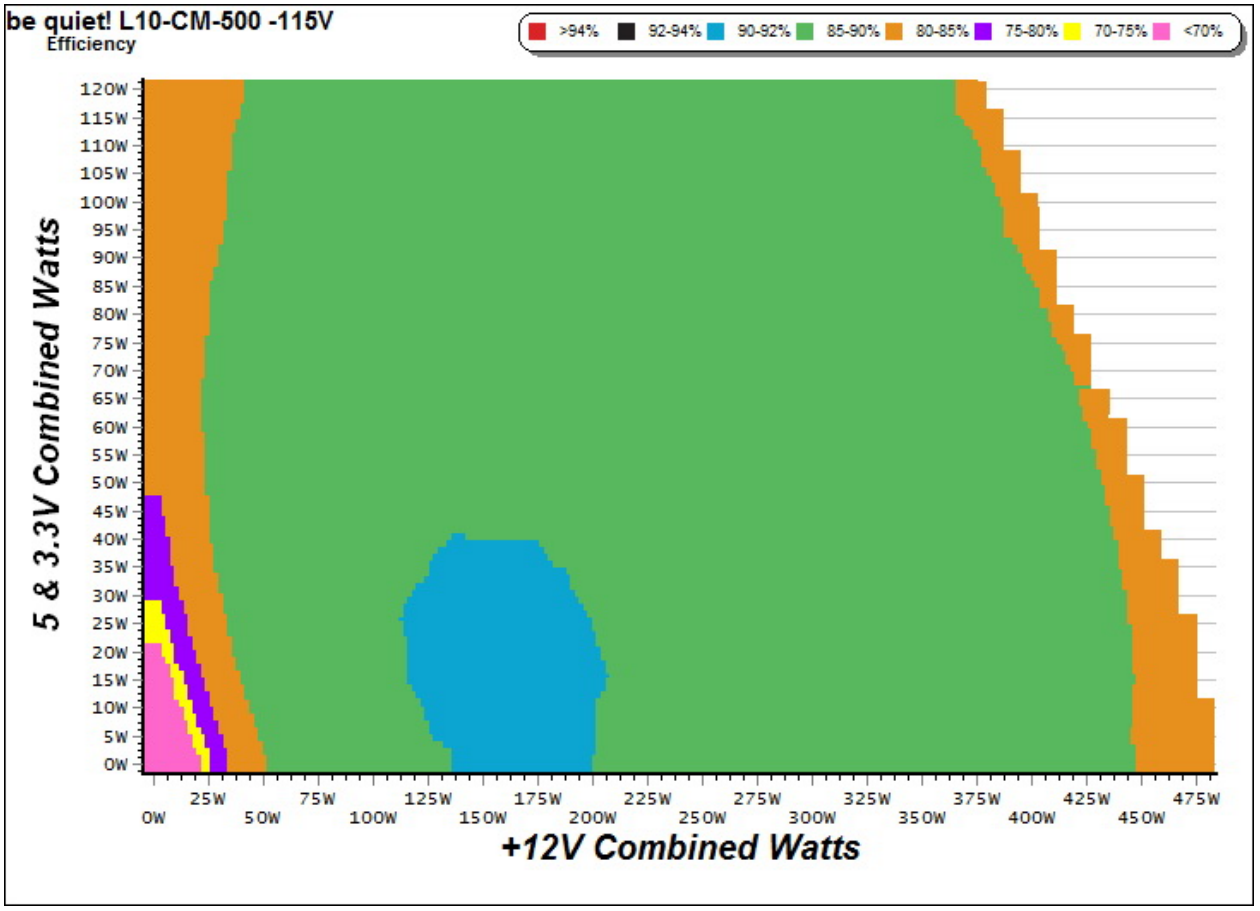
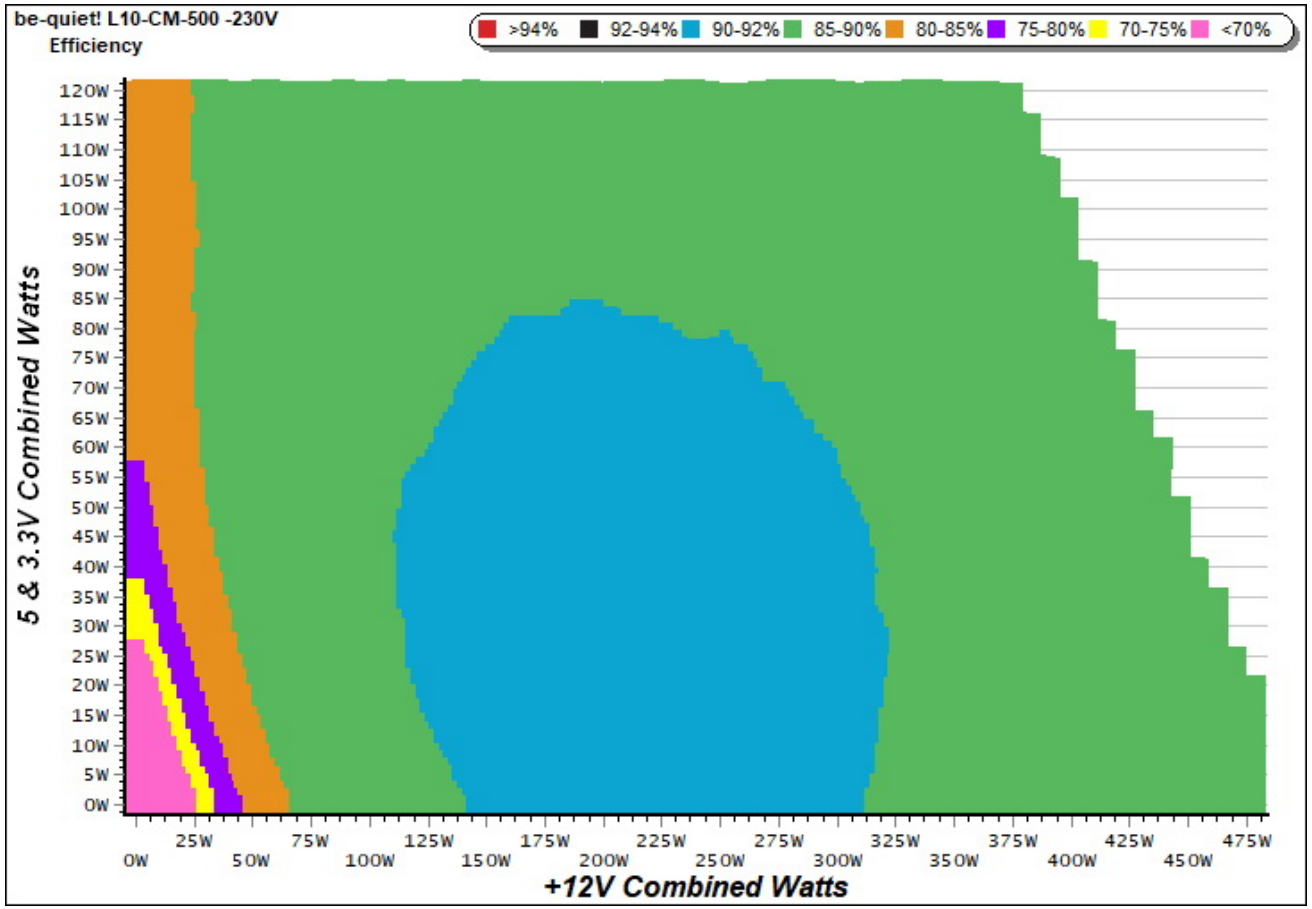
115V



□□

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



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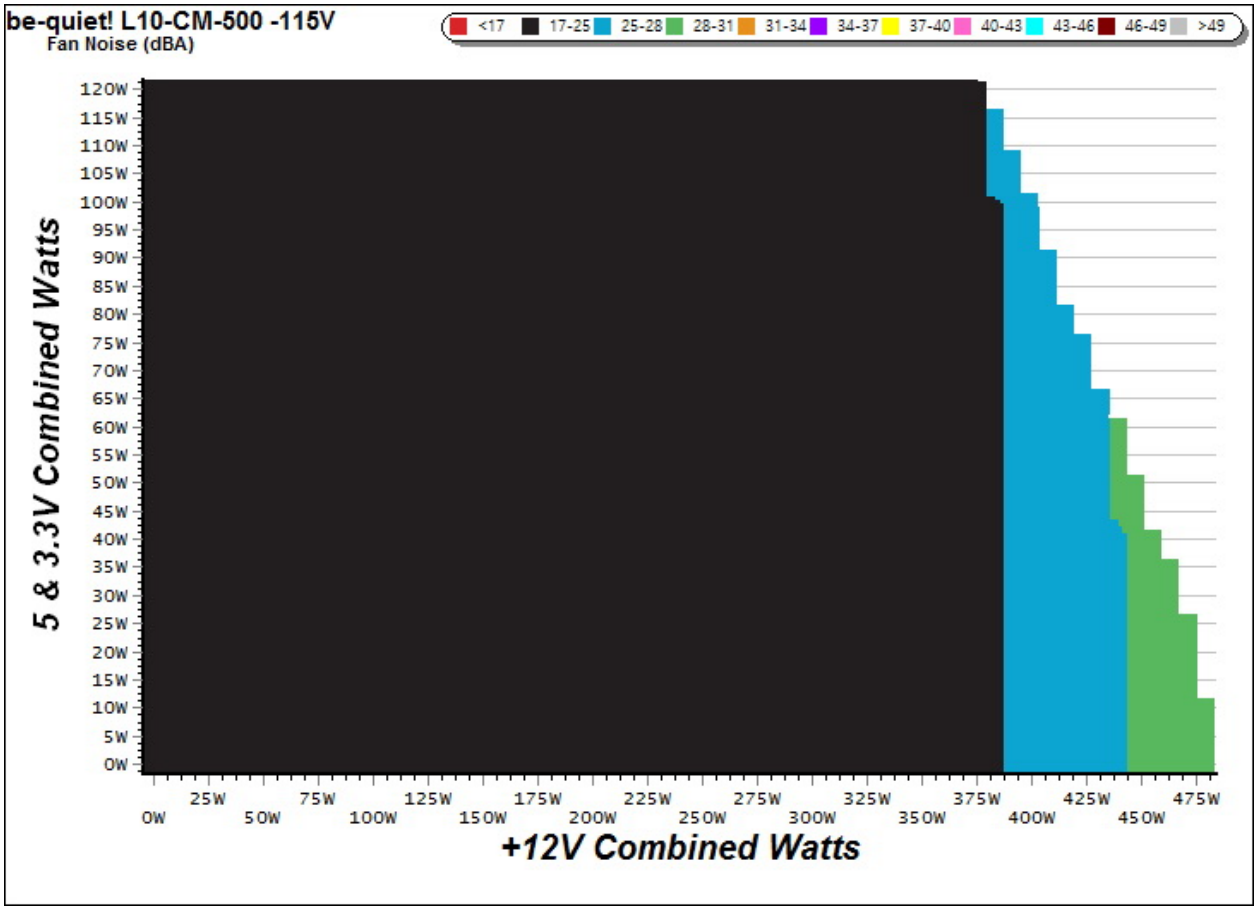
□□□□□

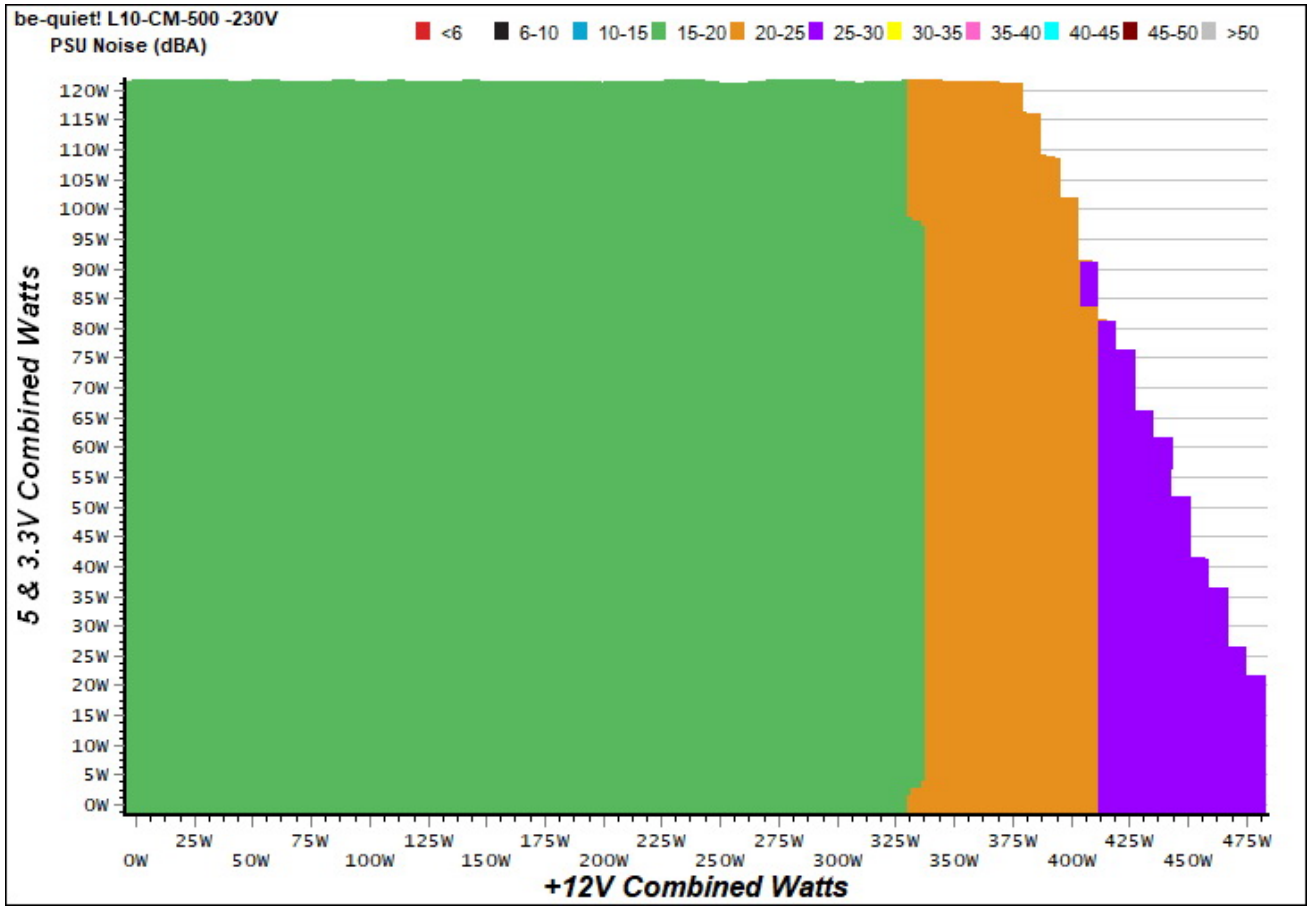
115V



□□

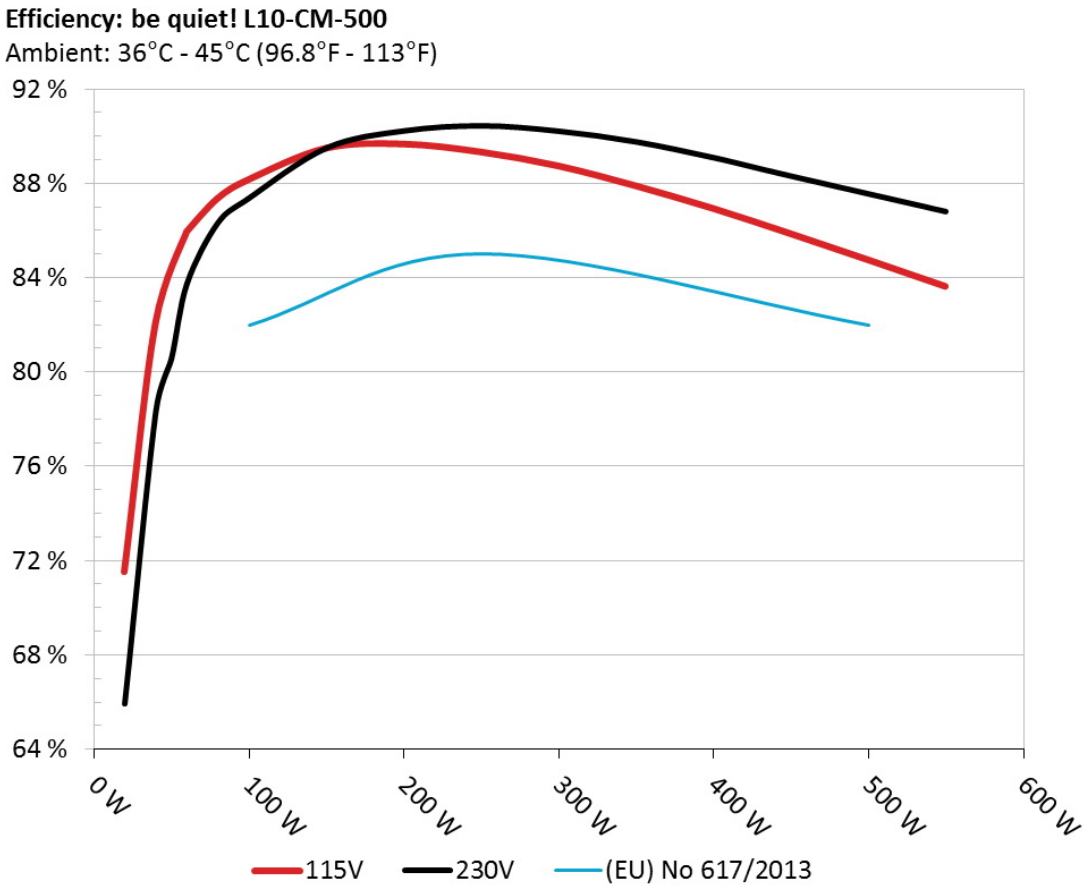
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

230V



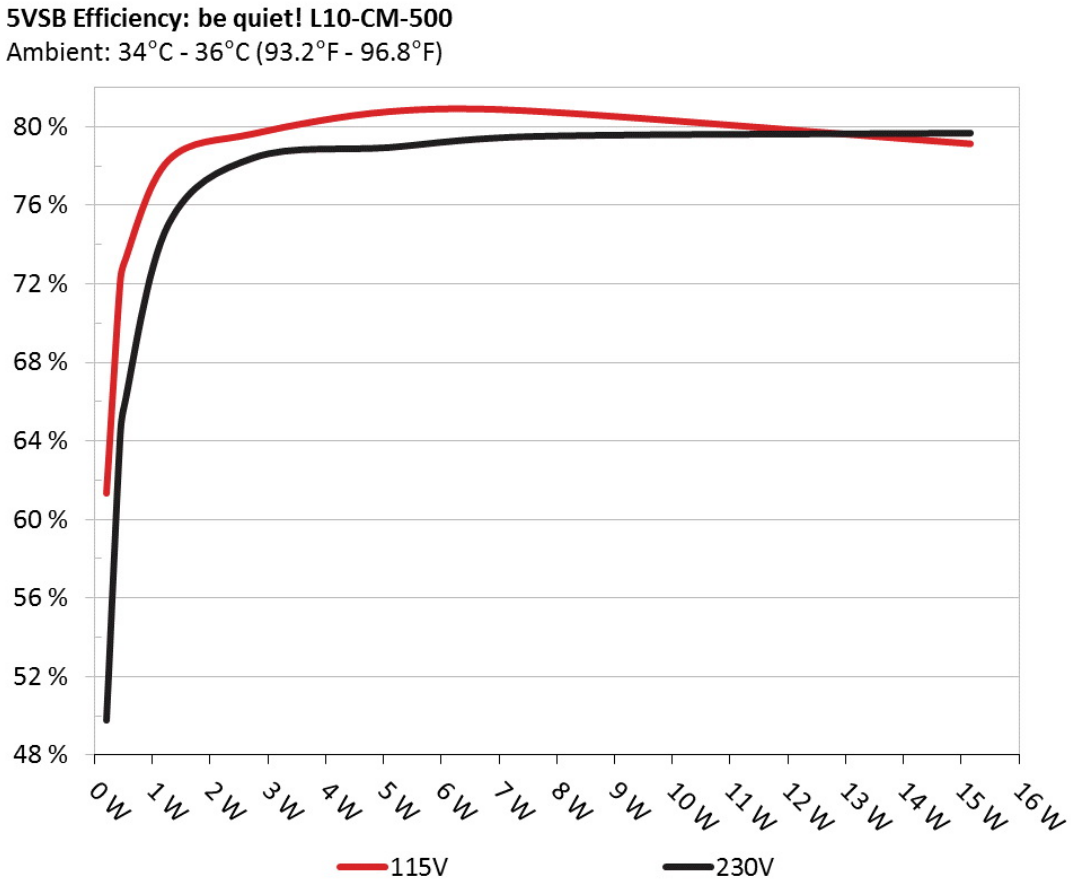
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

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	0.041A	0.211	61.337%	0.065
	5.115V	0.344		115.14V
2	0.087A	0.444	71.961%	0.112
	5.115V	0.617		115.14V
3	0.542A	2.765	79.660%	0.329
	5.104V	3.471		115.13V
4	1.002A	5.103	80.782%	0.382
	5.095V	6.317		115.13V
5	1.502A	7.634	80.800%	0.410
	5.084V	9.448		115.13V
6	3.001A	15.161	79.141%	0.455
	5.052V	19.157		115.13V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.042A	0.213	49.766%	0.025
	5.116V	0.428		230.31V
2	0.087A	0.445	64.029%	0.040
	5.115V	0.695		230.31V
3	0.542A	2.767	78.452%	0.171
	5.105V	3.527		230.32V
4	1.002A	5.104	78.973%	0.250
	5.095V	6.463		230.32V
5	1.502A	7.634	79.537%	0.297
	5.084V	9.598		230.31V
6	3.001A	15.162	79.704%	0.359
	5.052V	19.023		230.31V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	2.324A	1.978A	1.958A	0.981A	49.781	83.194%	568	17.4	38.03°C	0.966
	12.138V	5.051V	3.365V	5.089V	59.837				40.83°C	115.13V
2	5.683A	2.970A	2.943A	1.181A	99.764	88.156%	568	17.4	38.46°C	0.984
	12.126V	5.041V	3.358V	5.079V	113.168				41.58°C	115.12V
3	9.393A	3.476A	3.458A	1.379A	149.876	89.487%	568	17.4	38.50°C	0.990
	12.117V	5.033V	3.349V	5.066V	167.484				41.81°C	115.12V
4	13.098A	3.979A	3.945A	1.579A	199.758	89.663%	568	17.4	39.01°C	0.994
	12.109V	5.024V	3.341V	5.056V	222.788				42.67°C	115.12V
5	16.471A	4.980A	4.948A	1.783A	249.714	89.325%	568	17.4	39.96°C	0.997
	12.099V	5.013V	3.330V	5.042V	279.557				43.86°C	115.12V
6	19.852A	5.996A	5.957A	1.985A	299.734	88.735%	568	17.4	41.14°C	0.998
	12.089V	5.003V	3.317V	5.030V	337.787				45.53°C	115.12V
7	23.236A	7.010A	6.978A	2.190A	349.689	87.890%	765	17.7	41.64°C	0.998
	12.078V	4.991V	3.306V	5.018V	397.870				46.20°C	115.13V
8	26.630A	8.033A	8.004A	2.394A	399.674	86.930%	1040	20.2	42.65°C	0.998
	12.067V	4.978V	3.293V	5.006V	459.764				47.45°C	115.13V
9	30.452A	8.549A	8.539A	2.399A	449.672	85.864%	1235	24.3	43.02°C	0.999
	12.057V	4.969V	3.284V	4.998V	523.704				48.96°C	115.13V
10	34.028A	9.072A	9.059A	3.009A	499.521	84.760%	1280	24.7	44.13°C	0.999
	12.046V	4.959V	3.273V	4.979V	589.334				51.11°C	115.13V
11	38.198A	9.083A	9.075A	3.015A	549.423	83.635%	1300	25.0	44.70°C	0.999
	12.037V	4.953V	3.267V	4.974V	656.929				51.92°C	115.13V
CL1	0.102A	14.025A	14.004A	0.005A	117.794	81.997%	855	18.2	42.54°C	0.988
	12.111V	4.998V	3.316V	5.074V	143.657				45.64°C	115.13V

CL2	39.958A	1.003A	1.004A	1.001A	495.376	84.749%	1085	21.4	42.85°C	0.999
	12.063V	4.987V	3.300V	5.042V	584.522				47.20°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 □□
1	2.326A	1.984A	1.965A	0.981A	49.816	80.490%	568	17.4	40.29°C	0.858
	12.140V	5.039V	3.352V	5.092V	61.891				43.76°C	230.24V
2	5.682A	2.970A	2.954A	1.181A	99.761	87.447%	568	17.4	40.80°C	0.932
	12.131V	5.034V	3.345V	5.081V	114.082				44.60°C	230.24V
3	9.389A	3.488A	3.474A	1.376A	149.909	89.555%	568	17.4	41.23°C	0.958
	12.124V	5.017V	3.336V	5.079V	167.393				45.31°C	230.25V
4	13.090A	3.984A	3.956A	1.581A	199.794	90.284%	568	17.4	41.75°C	0.972
	12.118V	5.018V	3.331V	5.060V	221.295				46.28°C	230.24V
5	16.461A	4.983A	4.959A	1.781A	249.799	90.488%	568	17.4	42.22°C	0.979
	12.111V	5.010V	3.322V	5.054V	276.057				47.27°C	230.24V
6	19.828A	6.002A	5.972A	1.985A	299.797	90.230%	615	17.4	42.85°C	0.984
	12.105V	4.999V	3.312V	5.036V	332.257				48.75°C	230.24V
7	23.205A	7.015A	6.988A	2.186A	349.738	89.749%	855	18.2	43.39°C	0.987
	12.097V	4.987V	3.300V	5.024V	389.685				49.89°C	230.24V
8	26.584A	8.035A	8.010A	2.394A	399.708	89.229%	1040	20.2	43.90°C	0.990
	12.088V	4.978V	3.292V	5.010V	447.957				50.81°C	230.25V
9	30.392A	8.547A	8.541A	2.396A	449.716	88.601%	1165	22.3	44.02°C	0.990
	12.081V	4.972V	3.285V	5.007V	507.575				51.41°C	230.25V
10	33.952A	9.065A	9.048A	3.005A	499.583	87.879%	1380	26.6	45.04°C	0.991
	12.074V	4.965V	3.277V	4.988V	568.490				52.82°C	230.25V
11	38.111A	9.065A	9.052A	3.008A	549.574	87.096%	1440	27.9	46.01°C	0.993
	12.069V	4.963V	3.274V	4.982V	630.995				54.53°C	230.26V
CL1	0.102A	14.027A	14.004A	0.005A	117.861	83.080%	568	17.4	43.08°C	0.950
	12.115V	5.002V	3.316V	5.084V	141.864				50.47°C	230.26V

CL2	39.967A	1.003A	1.003A	1.002A	496.693	87.277%	1380	26.6	45.57°C	0.992
	12.093V	4.990V	3.302V	5.045V	569.099				53.71°C	230.27V

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 □□
1	1.200A	0.491A	0.472A	0.196A	19.651	71.544%	590	17.4	0.914
	12.146V	5.058V	3.370V	5.110V	27.467				115.12V
2	2.427A	0.980A	0.980A	0.391A	39.713	82.052%	590	17.4	0.951
	12.141V	5.054V	3.367V	5.102V	48.400				115.12V
3	3.660A	1.477A	1.484A	0.587A	59.858	85.953%	568	17.4	0.971
	12.136V	5.050V	3.363V	5.095V	69.640				115.12V
4	4.880A	1.983A	1.958A	0.785A	79.792	87.358%	568	17.4	0.977
	12.131V	5.048V	3.364V	5.089V	91.339				115.12V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.202A	0.491A	0.475A	0.196A	19.671	65.981%	590	17.4	0.703
	12.146V	5.044V	3.356V	5.112V	29.813				230.26V
2	2.430A	0.989A	0.982A	0.391A	39.781	78.428%	568	17.4	0.825
	12.143V	5.041V	3.353V	5.104V	50.723				230.26V
3	3.661A	1.475A	1.491A	0.586A	59.856	83.817%	568	17.4	0.878
	12.139V	5.039V	3.350V	5.099V	71.413				230.25V
4	4.880A	1.984A	1.968A	0.786A	79.813	86.431%	568	17.4	0.910
	12.137V	5.036V	3.349V	5.092V	92.343				250.00V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.2 mV	11.5 mV	11.4 mV	11.9 mV	Pass
20% Load	13.5 mV	16.2 mV	17.6 mV	15.7 mV	Pass
30% Load	14.0 mV	15.4 mV	18.0 mV	14.4 mV	Pass
40% Load	15.2 mV	16.7 mV	21.8 mV	15.4 mV	Pass
50% Load	16.3 mV	18.7 mV	23.4 mV	16.8 mV	Pass
60% Load	18.6 mV	19.1 mV	24.7 mV	18.0 mV	Pass
70% Load	21.2 mV	18.5 mV	27.0 mV	19.2 mV	Pass
80% Load	24.2 mV	20.0 mV	30.2 mV	22.1 mV	Pass
90% Load	28.2 mV	22.5 mV	32.4 mV	22.4 mV	Pass
100% Load	33.2 mV	24.2 mV	36.4 mV	25.9 mV	Pass
110% Load	39.9 mV	24.7 mV	38.4 mV	26.5 mV	Pass
Crossload 1	19.0 mV	18.3 mV	21.3 mV	16.7 mV	Pass
Crossload 2	30.0 mV	23.2 mV	37.2 mV	23.7 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.4 mV	13.3 mV	13.1 mV	13.1 mV	Pass
20% Load	10.0 mV	12.7 mV	17.4 mV	14.6 mV	Pass
30% Load	10.1 mV	15.6 mV	17.6 mV	14.6 mV	Pass
40% Load	9.7 mV	15.4 mV	18.9 mV	15.1 mV	Pass
50% Load	10.8 mV	15.8 mV	21.1 mV	15.9 mV	Pass
60% Load	11.3 mV	16.5 mV	48.0 mV	26.8 mV	Pass
70% Load	13.5 mV	19.1 mV	27.3 mV	18.4 mV	Pass
80% Load	14.2 mV	20.3 mV	28.0 mV	20.5 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	22.1 mV	23.0 mV	32.5 mV	20.7 mV	Pass
100% Load	25.8 mV	26.1 mV	37.5 mV	20.6 mV	Pass
110% Load	27.9 mV	26.0 mV	40.1 mV	20.5 mV	Pass
Crossload 1	10.6 mV	18.4 mV	19.7 mV	23.2 mV	Pass
Crossload 2	23.7 mV	24.5 mV	36.2 mV	20.8 mV	Pass

The results above are not used in the certification process

be quiet! Pure Power 10 500W

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

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