be quiet!

be quiet! Pure Power 11 FM 550W

317L0500000093

Lab ID BQ55001797

Certification ID 251797

Test Result Report ID: 21PS1797A

Certificate Issue Date: Feb 23, 2021

Scheme: ETA-EMI PSU

115V



230V



115V



230V



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	be quiet!
Model	Pure Power 11 FM 550W
OEM/ODM	Channel Well Technology
Serial Number	317L0500000093
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	10-5
□□□□ (Hz)	50-60

□□□□ (W)	550
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Rifle Bearing Fan (BQ QF2-12025-MS)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	BQ55001797
Date of receipt	Feb 10, 2021
Testing Date	Feb 23, 2021
Report Issued Date	Feb 23, 2021
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (550mm)	1	1	16-18AWG	□
4+4 pin EPS 12V □□ (600mm)	1	1	16AWG	□
6+2pin PCIe□□ (500mm)	2	2	16AWG	□
SATA□□ (500mm+150mm+150mm)	1	3	18AWG	□
SATA□□ (500mm+150mm+150mm+150mm)	1	4	18AWG	□
SATA□□ (500mm+150mm) / 4-pin Molex (+150mm+150mm) / FDD (+150mm)	1	2 / 2 / 1	18-20AWG	□
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V(1)	12V(2)	5VSB	-12V
□□□□	□□	20	20	28	24	3	0.3
	□	120		550		15	3.6
□□□□□ (W)		550					

Parts Description

General Data	-
Manufacturer (OEM)	CWT
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK-075 (7Ohm) & Relay
Bridge Rectifier(s)	1x GBJ1506 (600V, 15A @ 100°C)
APFC MOSFETs	1x Infineon IPA60R125P6 (650V, 19A @ 100°C, Rds(on): 0.125Ohm)
APFC Boost Diode	1x ON Semiconductor FFSP0665A (650V, 6A @ 153°C)
Bulk Cap(s)	2x Teapo (400V, 220uF & 270uF each or 490uF combined, 2,000h @ 85°C, LH)
Main Switchers	2x ON Semiconductor FCPF190N60E (600V, 13.1A @ 100°C, Rds(on): 0.19Ohm)
No Load Consumption FET	1x Sync Power SPN5003 (500V, 20mA @ 70°C, Rds(on): 250Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CU6901VAC
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x SG40N01Q (40V, 131A @ 100°C, Rds(on): 1.7mOhm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm) & 2x UBIQ QN3107M6N (30V, 70A @ 100°C, Rds(on): 2.6mOhm) PWM Controller(s): uPI-Semi uP3861P
Change Over Switch	1x Sync Power SPN3006 MOSFET (30V, 57A @ 100°C, Rds(on): 5.5mOhm)
Filtering Capacitors	Electrolytic: 4x Teapo (1-3,000h @ 105°C, SC), 4x Elite (2-5,000h @ 105°C, ED), 6x Elite (4-10,000h @ 105°C, EY), 1x Teapo (1-5,000h @ 105°C, SJ) Polymer: 18x APAQ
Supervisor IC	Weltrend WT7527RT (OCP, OVP, UVP, SCP, PG)

Fan Model	be quiet! BQ QF2-12025-MS (120mm, 12V, 0.20A, Rifle Bearing Fan)
5VSB Circuit	-
Rectifier	1x Silan Microelectronics SVF4N65RDTR FET (650V, 2.5A @ 100°C, Rds(on): 2.7Ohm) & 1x PS1045L SBR (45V, 10A)
Standby PWM Controller	On-Bright OB5282

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓
ALPM (Alternative Low Power Mode) compatible	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.895%
Average Noise Output (>1450 Load Combinations)	21.77dBA
PF□□□ (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	71.684%
□□□□□□	0.0392W
Non-Accredited	
12V Ripple (Full Load)	16.64mV
5V Ripple (Full Load)	9.95mV
3.3V Ripple (Full Load)	10.46mV
5VSB Ripple (Full Load)	10.82mV
12V Load Regulation	0.71%
5V Load Regulation	0.26%
3.3V Load Regulation	0.54%
5VSB Load Regulation	1.25%

Inrush Current	22.780A

230V

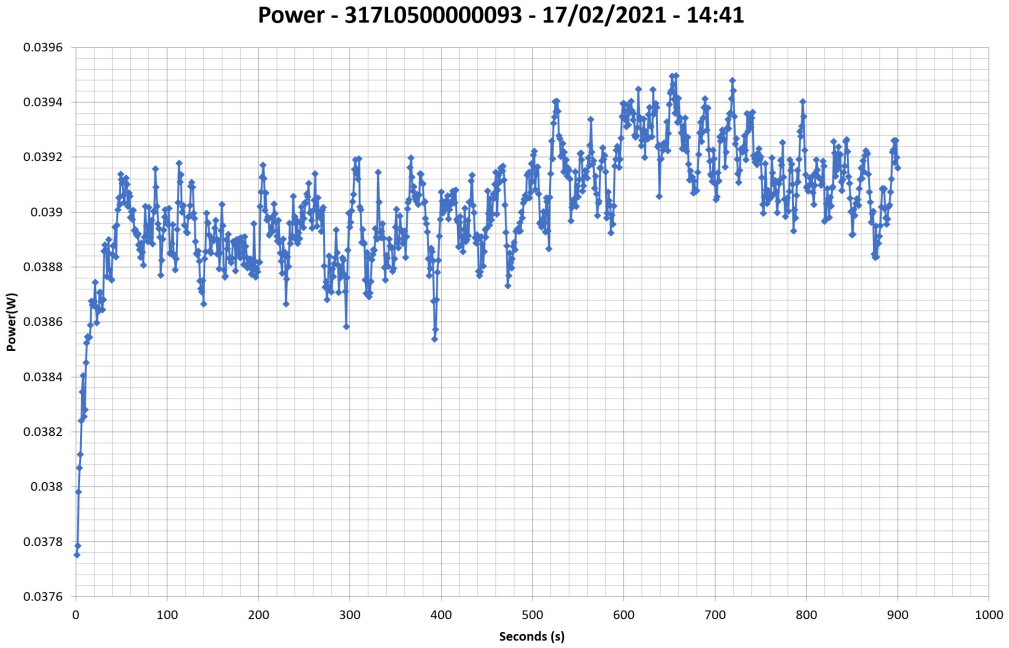
Accredited		
□□□□ (>1450 load combinations)		90.771%
Average Noise Output (>1450 Load Combinations)		20.18dBA
PF□□□ (>1450 Load Combinations)		0.960
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0567W
Non-Accredited		
12V Ripple (Full Load)		17.97mV
5V Ripple (Full Load)		9.54mV
3.3V Ripple (Full Load)		10.90mV
5VSB Ripple (Full Load)		11.17mV
12V Load Regulation		0.71%
5V Load Regulation		0.26%
3.3V Load Regulation		0.51%
5VSB Load Regulation		1.27%
Inrush Current		83.720A
□□□□ & PG□□		19.70ms
AC Loss to PWR_OK Hold Up Time		15.90ms
PWR_OK Inactive to DC Loss Delay		3.80ms
PSU Timings: T1 (20% / 100%)	52.0ms	52.0ms
PSU Timings: T3 (20% / 100%)	132.0ms	132.0ms
OPP (22.06°C / 45.60°C)	126.08%	126.08%

□□□□ & PG□□

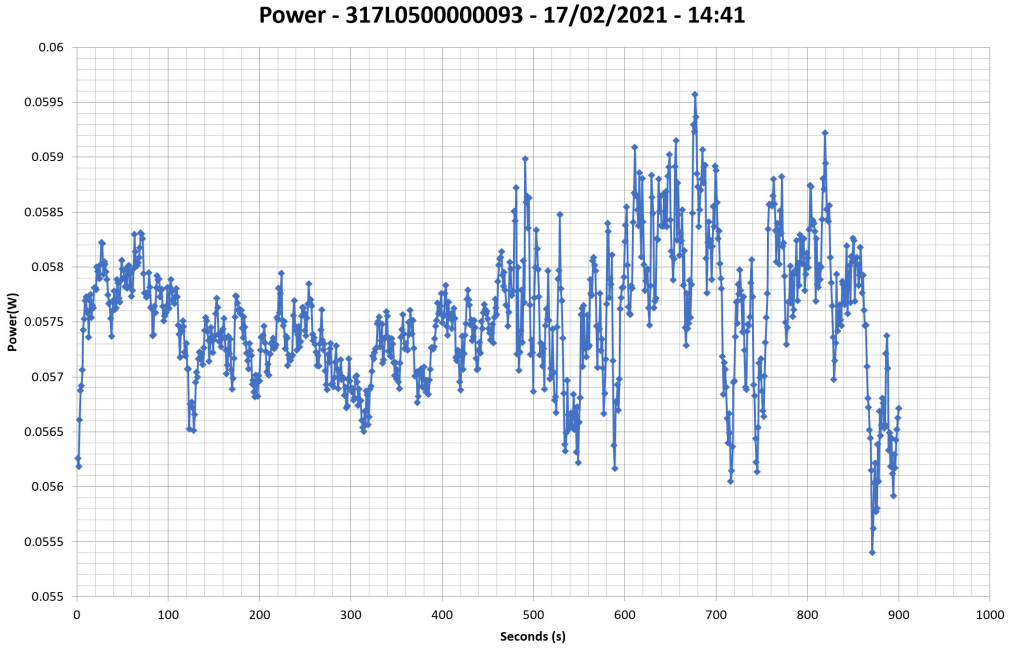
Hold-Up Time (ms)	19.7
AC Loss to PWR_OK Hold Up Time (ms)	15.9
PWR_OK Inactive to DC Loss Delay (ms)	3.8

Graphs

115V



230V



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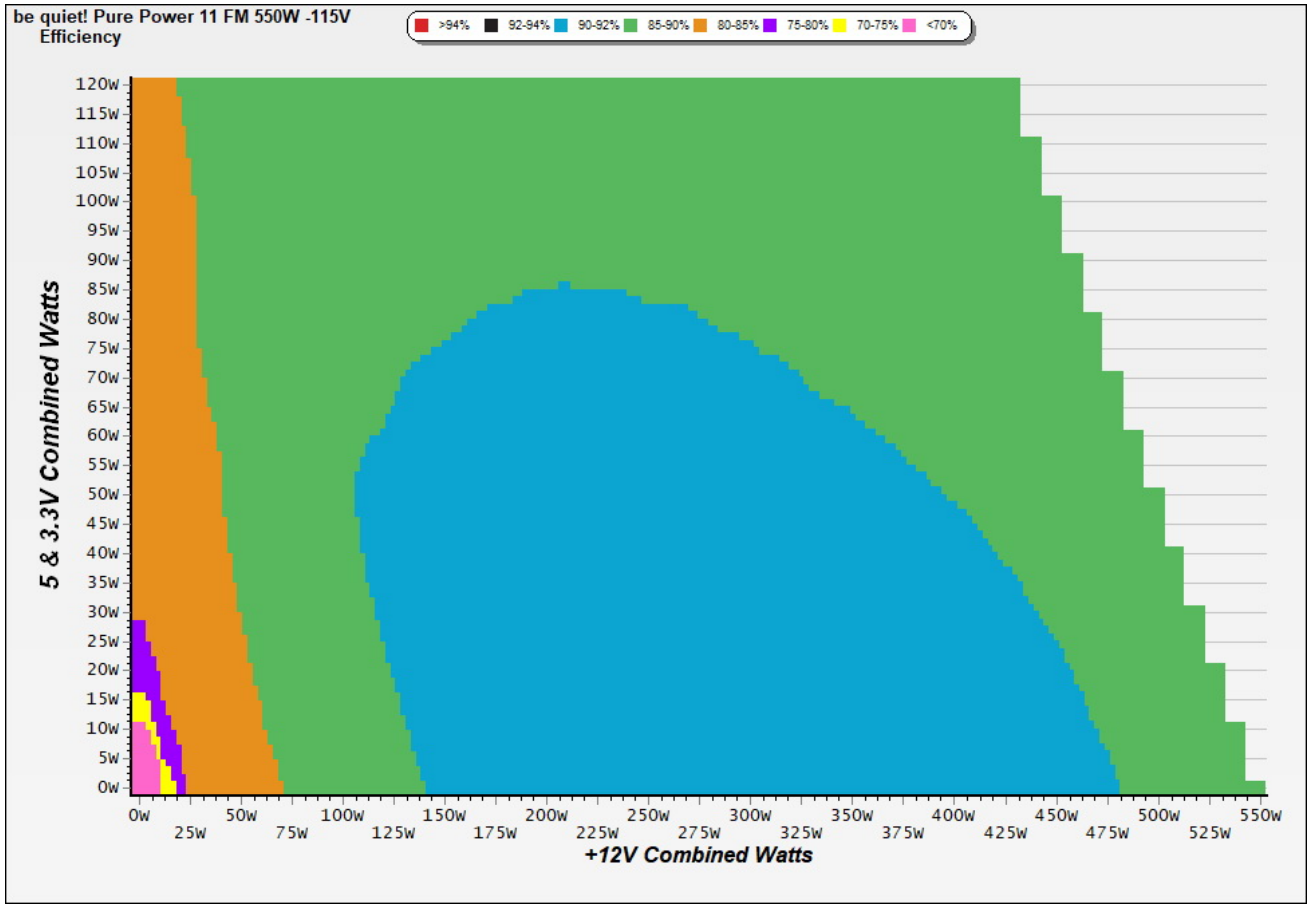
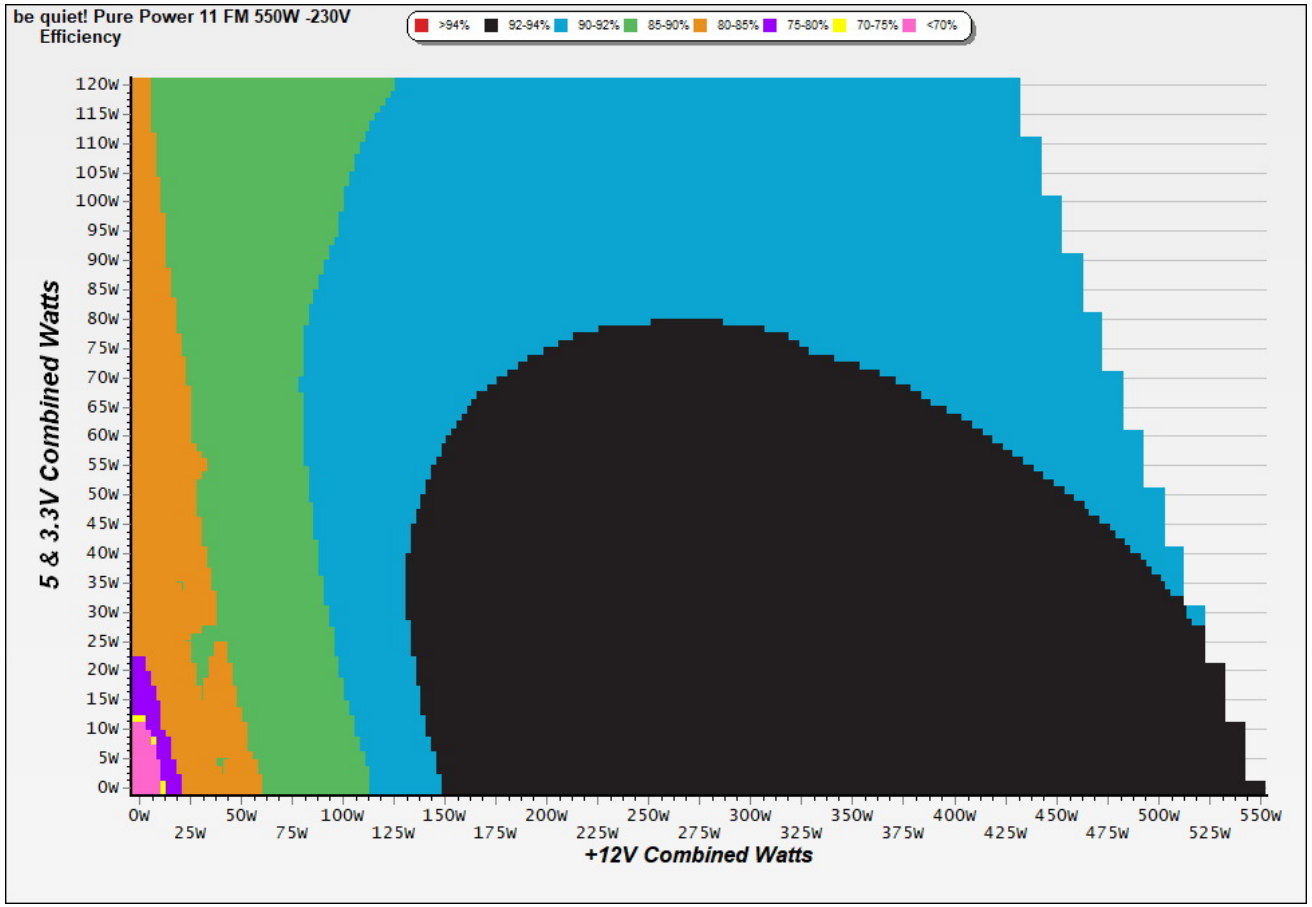
115V



□□

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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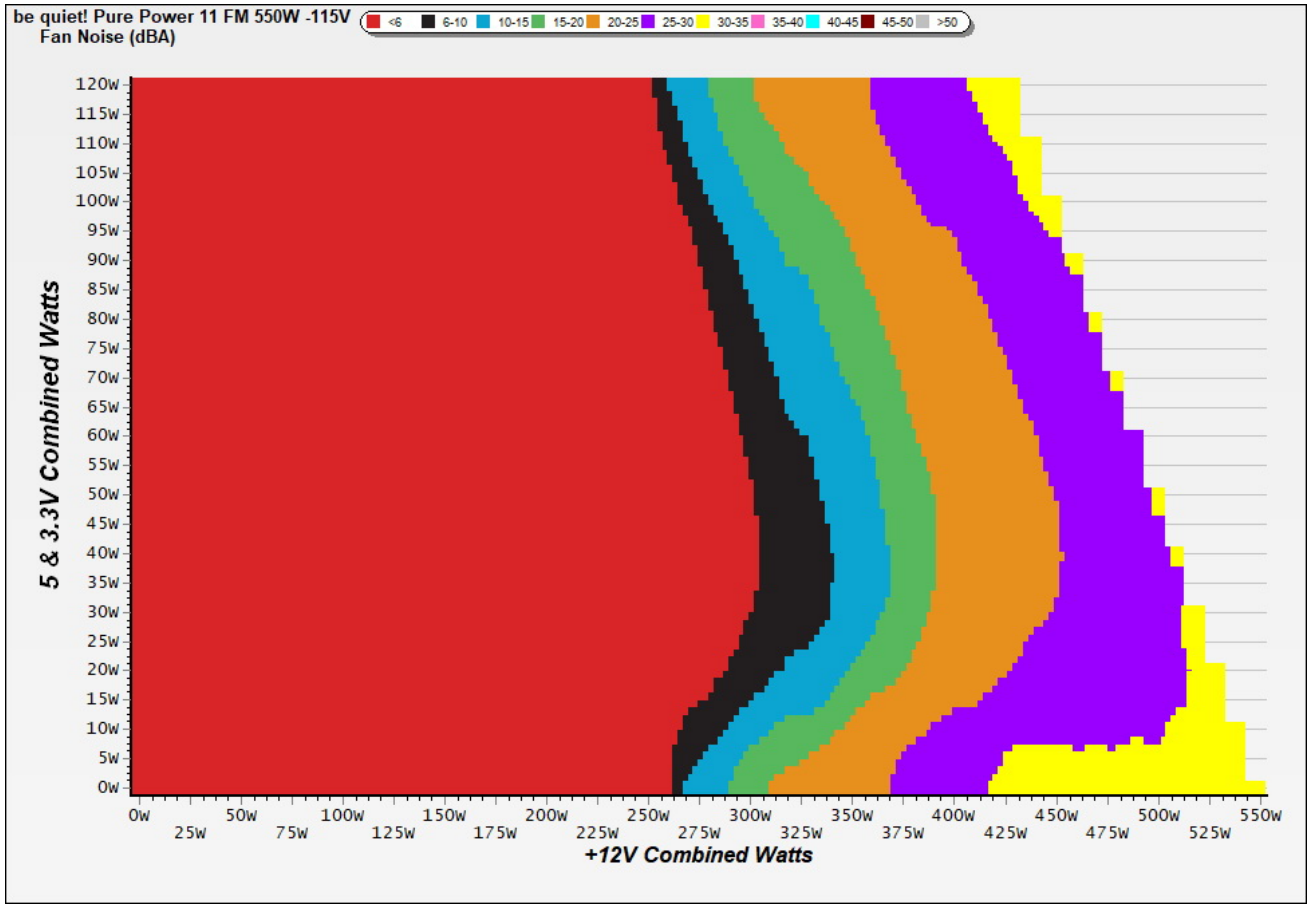
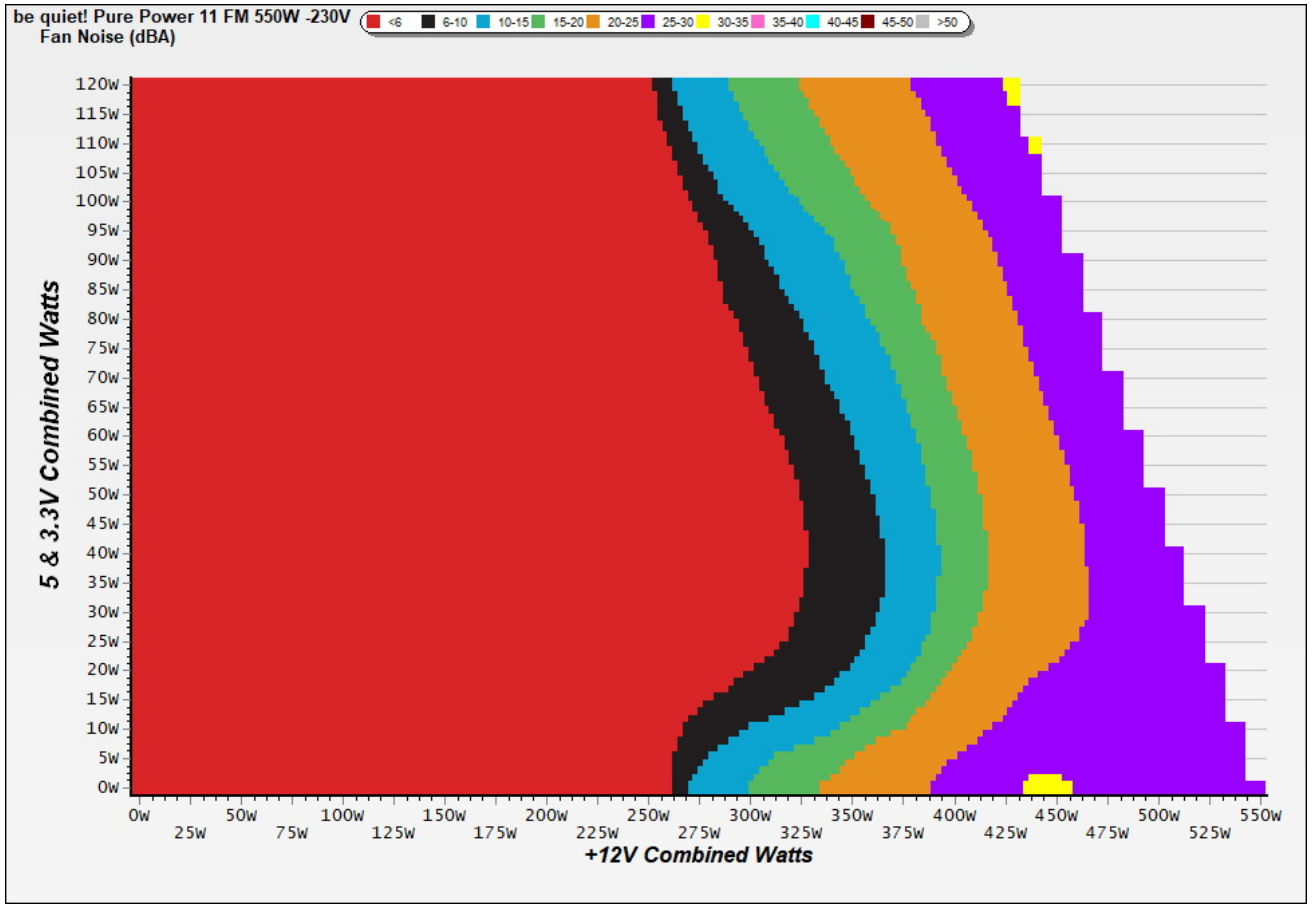
115V



□□

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

Noise under high ambient temperature (indicative)

115V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	510 RPM · <6.0 dB(A) · 40.2 °C	510 RPM · <6.0 dB(A) · 40.2 °C	fan off in both
20%	5137 RPM · <6.0 dB(A) · 41.1 °C	5137 RPM · <6.0 dB(A) · 41.1 °C	fan off in both
50%	994 RPM · 22.9 dB(A) · 42.7 °C	994 RPM · 22.9 dB(A) · 42.7 °C	**+0.0 dB(A)**
100%	1700 RPM · 38.6 dB(A) · 45.7 °C	1700 RPM · 38.6 dB(A) · 45.7 °C	**+0.0 dB(A)**

230V

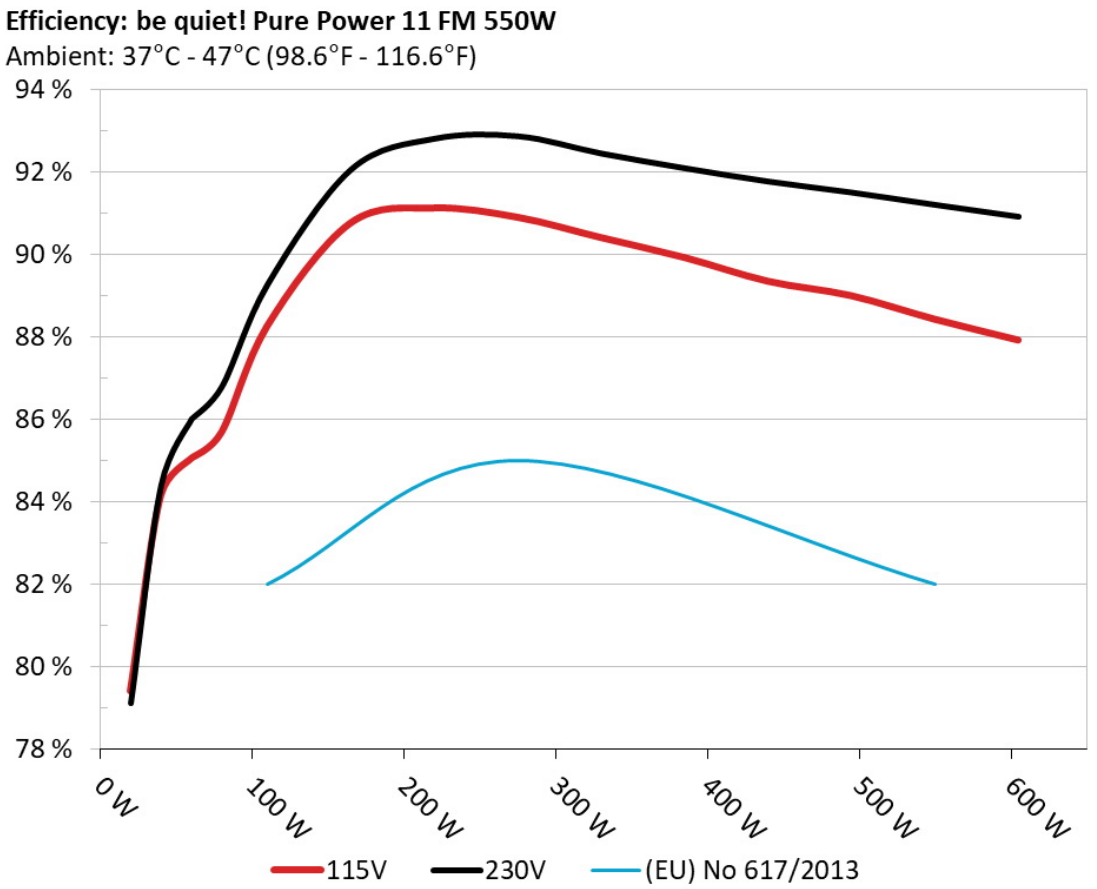
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	503 RPM · <6.0 dB(A) · 40.2 °C	503 RPM · <6.0 dB(A) · 40.2 °C	fan off in both
20%	506 RPM · <6.0 dB(A) · 40.7 °C	506 RPM · <6.0 dB(A) · 40.7 °C	fan off in both
50%	512 RPM · <6.0 dB(A) · 42.3 °C	512 RPM · <6.0 dB(A) · 42.3 °C	fan off in both
100%	1719 RPM · 38.9 dB(A) · 44.8 °C	1719 RPM · 38.9 dB(A) · 44.8 °C	**+0.0 dB(A)**

INFO

Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative of how the fan behaves when it is hot. "<6.0" is the floor of our sound meter, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

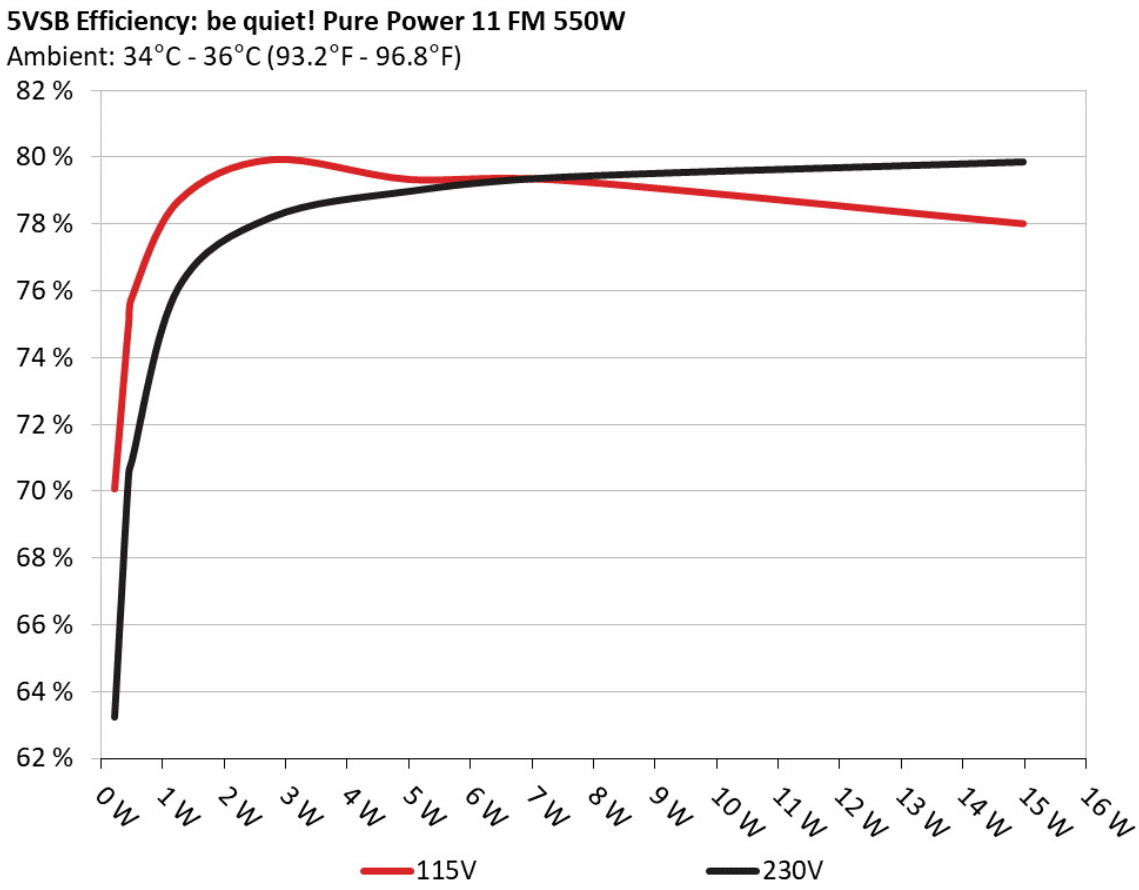
Informational. Not part of the ETA or LAMBDA rating.

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	0.045A	0.227	70.062%	0.037
	5.040V	0.324		115.15V
2	0.090A	0.453	75.000%	0.069
	5.039V	0.604		115.16V
3	0.550A	2.768	79.931%	0.289
	5.034V	3.463		115.15V
4	1.000A	5.026	79.337%	0.386
	5.027V	6.335		115.16V
5	1.500A	7.528	79.309%	0.442
	5.018V	9.492		115.16V
6	2.999A	14.985	78.014%	0.502
	4.996V	19.208		115.16V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.227	63.231%	0.012
	5.044V	0.359		230.31V
2	0.090A	0.454	70.497%	0.022
	5.041V	0.644		230.32V
3	0.550A	2.768	78.192%	0.114
	5.033V	3.540		230.31V
4	1.000A	5.027	78.979%	0.188
	5.026V	6.365		230.31V
5	1.500A	7.529	79.403%	0.250
	5.020V	9.482		230.31V
6	3.000A	14.986	79.853%	0.358
	4.995V	18.767		230.32V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	2.766A	1.982A	1.994A	0.995A	54.959	85.050%	510	<6.0	40.22°C	0.968
	12.058V	5.047V	3.311V	5.026V	64.620				44.77°C	115.17V
2	6.517A	2.972A	2.992A	1.195A	110.035	88.264%	5137	<6.0	41.10°C	0.988
	12.143V	5.046V	3.309V	5.022V	124.666				46.68°C	115.17V
3	10.632A	3.469A	3.492A	1.396A	165.030	90.776%	515	<6.0	41.79°C	0.992
	12.131V	5.045V	3.307V	5.017V	181.800				47.88°C	115.17V
4	14.768A	3.964A	3.994A	1.597A	220.035	91.141%	533	<6.0	42.33°C	0.994
	12.110V	5.043V	3.305V	5.012V	241.422				49.23°C	115.17V
5	18.563A	4.959A	4.997A	1.798A	275.030	90.916%	994	22.9	42.68°C	0.995
	12.095V	5.042V	3.303V	5.007V	302.511				50.60°C	115.16V
6	22.372A	5.954A	5.998A	2.000A	330.021	90.422%	1271	29.5	43.35°C	0.993
	12.078V	5.040V	3.301V	5.002V	364.979				51.54°C	115.17V
7	26.193A	6.948A	7.000A	2.201A	385.078	89.936%	1563	35.9	44.41°C	0.994
	12.063V	5.039V	3.300V	4.998V	428.171				53.18°C	115.16V
8	29.972A	7.944A	8.002A	2.403A	439.958	89.360%	1702	38.6	44.57°C	0.994
	12.063V	5.037V	3.298V	4.994V	492.341				53.83°C	115.15V
9	34.147A	8.438A	8.490A	2.403A	494.402	89.012%	1703	38.6	45.61°C	0.995
	12.063V	5.036V	3.297V	4.994V	555.434				55.32°C	115.13V
10	38.116A	8.938A	9.014A	3.013A	549.614	88.438%	1700	38.6	45.65°C	0.995
	12.066V	5.035V	3.295V	4.979V	621.467				55.98°C	115.13V
11	42.694A	8.940A	9.016A	3.013A	604.838	87.930%	1698	38.4	46.57°C	0.996
	12.066V	5.033V	3.294V	4.978V	687.860				57.33°C	115.12V
CL1	0.114A	14.002A	13.998A	0.000A	118.189	82.908%	1214	28.2	42.56°C	0.990
	12.138V	5.044V	3.299V	5.063V	142.555				50.46°C	115.15V

CL2	45.820A	1.000A	1.002A	1.000A	566.499	89.128%	1699	38.4	45.12°C	0.995
	12.072V	5.038V	3.299V	5.016V	635.602				55.75°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	2.766A	1.981A	1.994A	0.994A	54.945	86.010%	503	<6.0	40.16°C	0.794
	12.057V	5.048V	3.309V	5.028V	63.882				45.01°C	230.28V
2	6.516A	2.972A	2.993A	1.194A	109.994	89.272%	506	<6.0	40.65°C	0.917
	12.139V	5.046V	3.308V	5.024V	123.212				46.18°C	230.28V
3	10.630A	3.468A	3.494A	1.395A	164.980	92.063%	509	<6.0	41.61°C	0.952
	12.129V	5.045V	3.306V	5.019V	179.204				47.61°C	230.27V
4	14.767A	3.964A	3.995A	1.595A	219.975	92.814%	510	<6.0	41.73°C	0.968
	12.107V	5.044V	3.304V	5.014V	237.007				48.53°C	230.27V
5	18.562A	4.958A	4.995A	1.797A	274.968	92.875%	512	<6.0	42.33°C	0.976
	12.093V	5.043V	3.302V	5.009V	296.062				50.09°C	230.27V
6	22.364A	5.952A	6.000A	1.998A	329.961	92.456%	1333	31.6	42.75°C	0.981
	12.080V	5.041V	3.300V	5.005V	356.885				51.14°C	230.28V
7	26.176A	6.947A	7.008A	2.200A	385.034	92.098%	1704	38.6	43.28°C	0.984
	12.069V	5.040V	3.297V	4.999V	418.070				52.24°C	230.30V
8	29.957A	7.943A	8.010A	2.402A	439.869	91.776%	1696	38.4	43.85°C	0.986
	12.066V	5.038V	3.295V	4.995V	479.287				53.35°C	230.30V
9	34.143A	8.437A	8.498A	2.403A	494.383	91.512%	1700	38.6	44.08°C	0.988
	12.064V	5.036V	3.294V	4.994V	540.239				54.18°C	230.31V
10	38.121A	8.938A	9.018A	3.013A	549.594	91.212%	1719	38.9	44.75°C	0.989
	12.064V	5.035V	3.293V	4.979V	602.543				55.29°C	230.31V
11	42.680A	8.940A	9.023A	3.014A	604.829	90.922%	1722	38.9	46.57°C	0.990
	12.070V	5.033V	3.290V	4.977V	665.218				57.35°C	230.31V
CL1	0.116A	14.000A	13.997A	0.000A	118.144	83.978%	1461	34.1	41.93°C	0.933
	12.141V	5.043V	3.296V	5.063V	140.684				50.29°C	230.33V

CL2	45.825A	1.000A	1.000A	1.000A	566.644	91.903%	1714	38.8	44.60°C	0.989
	12.074V	5.038V	3.298V	5.016V	616.565				55.57°C	230.32V

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	1.232A	0.495A	0.497A	0.198A	19.986	79.395%	503	<6.0	0.861
	12.047V	5.048V	3.313V	5.042V	25.173				115.15V
2	2.461A	0.991A	0.996A	0.397A	39.976	84.149%	504	<6.0	0.948
	12.057V	5.048V	3.313V	5.039V	47.506				115.15V
3	3.688A	1.486A	1.494A	0.596A	60.006	83.563%	504	<6.0	0.972
	12.082V	5.047V	3.312V	5.034V	71.809				115.15V
4	4.893A	1.980A	1.993A	0.795A	79.955	85.681%	506	<6.0	0.982
	12.132V	5.047V	3.312V	5.030V	93.317				115.15V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.231A	0.495A	0.498A	0.198A	19.977	79.111%	502	<6.0	0.493
	12.047V	5.048V	3.310V	5.043V	25.252				230.27V
2	2.461A	0.990A	0.996A	0.397A	39.965	84.405%	496	<6.0	0.702
	12.055V	5.048V	3.311V	5.040V	47.349				230.27V
3	3.687A	1.487A	1.495A	0.596A	59.997	84.371%	499	<6.0	0.820
	12.080V	5.048V	3.311V	5.036V	71.111				230.27V
4	4.892A	1.980A	1.995A	0.795A	79.949	86.796%	503	<6.0	0.872
	12.133V	5.047V	3.309V	5.032V	92.111				230.27V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.90mV	5.40mV	4.90mV	6.10mV	Pass
20% Load	6.50mV	5.00mV	4.50mV	5.90mV	Pass
30% Load	13.90mV	5.80mV	5.90mV	6.60mV	Pass
40% Load	9.70mV	5.40mV	5.10mV	6.90mV	Pass
50% Load	8.80mV	5.90mV	5.40mV	7.20mV	Pass
60% Load	8.90mV	6.40mV	5.80mV	7.80mV	Pass
70% Load	9.20mV	8.90mV	11.70mV	10.20mV	Pass
80% Load	10.70mV	9.00mV	16.10mV	10.50mV	Pass
90% Load	10.50mV	8.10mV	10.00mV	9.80mV	Pass
100% Load	16.60mV	10.00mV	10.50mV	10.80mV	Pass
110% Load	18.70mV	10.10mV	11.00mV	11.30mV	Pass
Crossload1	8.30mV	8.50mV	9.60mV	7.90mV	Pass
Crossload2	16.30mV	7.90mV	7.10mV	9.90mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.80mV	5.40mV	5.70mV	7.20mV	Pass
20% Load	7.30mV	6.00mV	4.70mV	6.90mV	Pass
30% Load	15.80mV	5.90mV	5.90mV	7.80mV	Pass
40% Load	10.50mV	5.90mV	5.90mV	7.90mV	Pass
50% Load	9.60mV	6.40mV	5.90mV	8.10mV	Pass
60% Load	9.40mV	6.80mV	6.10mV	8.70mV	Pass
70% Load	9.40mV	8.60mV	12.50mV	10.70mV	Pass
80% Load	10.30mV	9.80mV	14.30mV	11.30mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	11.20mV	9.00mV	10.50mV	10.10mV	Pass
100% Load	18.00mV	9.50mV	10.90mV	11.20mV	Pass
110% Load	19.20mV	10.60mV	10.90mV	11.60mV	Pass
Crossload1	8.00mV	8.70mV	10.10mV	8.10mV	Pass
Crossload2	17.60mV	7.70mV	7.40mV	10.20mV	Pass

The results above are not used in the certification process

be quiet! Pure Power 11 FM 550W

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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