be quiet!

be quiet! Dark Power 12 850W

315S1011001600

Lab ID BQ85001819

Certification ID 251819

Test Result Report ID: 21PS1819A

Certificate Issue Date: Mar 30, 2021

115V 230V

Scheme: ETA-EMI PSU

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	Dark Power 12 850W
OEM/ODM	FSP
Serial Number	315S1011001600
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	10-5
□□□□ (Hz)	50-60

额定功率 (W)	850
Operating Temperature (Continuous Full Load) (°C)	
类别	ATX12V
线材设计	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
散热	135mm Fluid Dynamic Bearing Fan (BQ SIW3-13525-HF)
半被动运转	✗
Cybenetics Testing Information	
Lab ID	BQ85001819
Date of receipt	Mar 16, 2021
Testing Date	Mar 30, 2021
Report Issued Date	Mar 30, 2021
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

线材与接头 **(Non-accredited measurements)**

模组化线材				
描述	线材数量	总连接器数量	Gauge	In Cable Capacitors
ATX 接头 20+4 pin (600mm)	1	1	18-22AWG	否
8 pin EPS 12V 接头 (700mm)	1	1	16AWG	否
4+4 pin EPS 12V 接头 (700mm)	1	1	16AWG	否
2x (6+2) pin PCIe (600mm)	3	6	16-18AWG	否
SATA接头 (600mm+150mm+150mm+150mm)	1	4	18AWG	否
SATA接头 (600mm+150mm+150mm)	2	6	18AWG	否
SATA接头 (600mm+150mm) / 4-pin Molex (+150mm+150mm) / FDD (+150mm)	1	2 / 2 / 1	18-20AWG	否
4-pin Molex (600mm+150mm+150mm)	1	3	18AWG	否

Overclocking jumper (620mm)	1	1	24AWG	□
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V(1)	12V(2)	12V(3)	12V(4)	5VSB	-12V
□□□□	□□	24	24	30	30	35	35	3	0.5
	□	120		840				15	6
□□□□□ (W)		850							

Parts Description

General Data	-
Manufacturer (OEM)	FSP
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK-056 (5Ohm) & Relay
Rectifier(s) (Standby Mode)	4x Diodes Incorporated S3M (1000V, 3A @ 75°C)
Rectifier(s)	4x Infineon IPB60R060P7 (600V, 30A @ 100°C, Rds(on): 0.06Ohm)
APFC MOSFETs	2x Infineon IPA60R120P7 (600V, 16A @ 100°C, Rds(on): 0.12Ohm)
APFC Boost Diode	2x Cree C3D06060 (600V, 6A @ 154°C)
Bulk Cap(s)	1x Nippon Chemi-Con (420V, 470uF, 2,000h @ 105°C, KMZ) & 1x Nippon Chemi-Con (420V, 330uF, 2,000h @ 105°C, KMR)
Main Switchers	4x Alpha & Omega AOTF190A60CL (600V, 12A @ 100°C, Rds(on): 0.19Ohm)
IC Driver	2x Silicon Labs Si8233BD
APFC Controller	Infineon ICE2PCS02
Resonant Controller	Champion CM6901T2X
Topology	Primary side: Bridgeless APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Toshiba TPHR8504PL (40V, 150A, Rds(on): 0.85mOhm)
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0901NS (30V, 94A @ 100°C, Rds(on): 1.9mOhm) PWM Controller(s): ANPEC APW7159C

Filtering Capacitors	Electrolytic: 6x Nippon Chemi-Con (1-5,000h @ 105°C, KZE), 1x Rubycon (4-10,000h @ 105°C, YXF), 2x Rubycon (6-10,000h @ 105°C, ZLH), 1x Rubycon (1-5,000h @ 105°C, ZL), 1x Nippon Chemi-Con (6-10,000h @ 105°C, KZN) Polymer: 18x United Chemi-Con, 13x FPCAP, 4x no info
Supervisor IC	Weltrend WT7527RA (OCP, OVP, UVP, SCP, PG)
Fan Controller	APW9010
Fan Model	be quiet! Silent Wings BQSIW3-13525-HF (135mm, 12V, 0.56A, 1800rpm, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifier	1x Nexperia PSMN2R0-30YL (30V, 100A @ 100°C, Rds(on): 3.3mOhm) FET, 1x CET CEB04N7G (700V, 4A, Rds(on): 3.3Ohm) FET & 1x P15L50 SBR
Standby PWM Controller	Grenery GR8837C

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)	91.724%
Average Noise Output (>1450 Load Combinations)	18.49dBA
PF□□□ (>1450 Load Combinations)	0.981
Efficiency With 10W (≤500W) or 2% (>500W) Load	72.475%
□□□□□□	0.0806W
Non-Accredited	
12V Ripple (Full Load)	19.39mV
5V Ripple (Full Load)	21.67mV
3.3V Ripple (Full Load)	26.04mV
5VSB Ripple (Full Load)	7.88mV
12V Load Regulation	0.59%

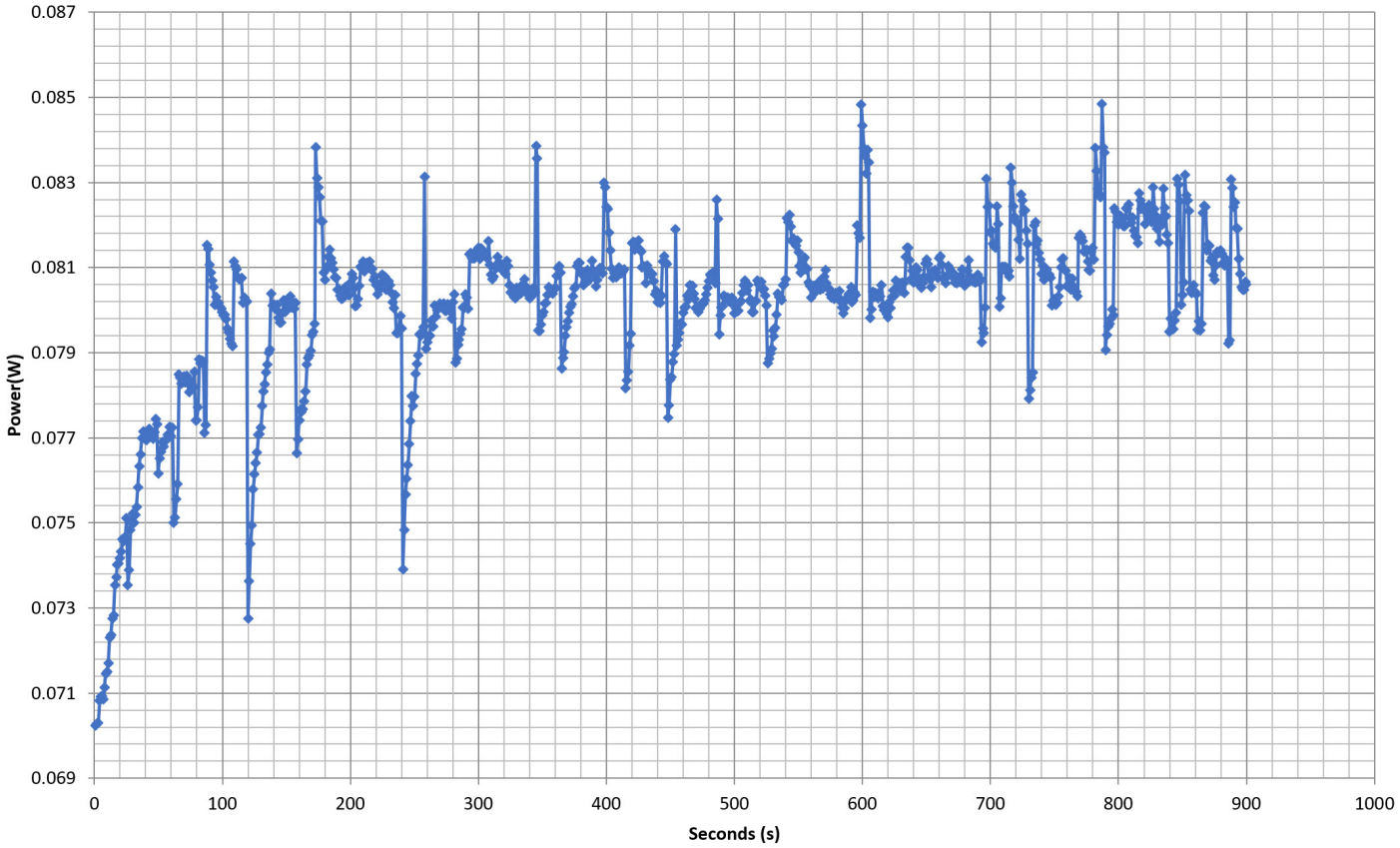
5V Load Regulation	0.71%
3.3V Load Regulation	1.25%
5VSB Load Regulation	3.50%
Inrush Current	34.880A

□□□□ & PG□□

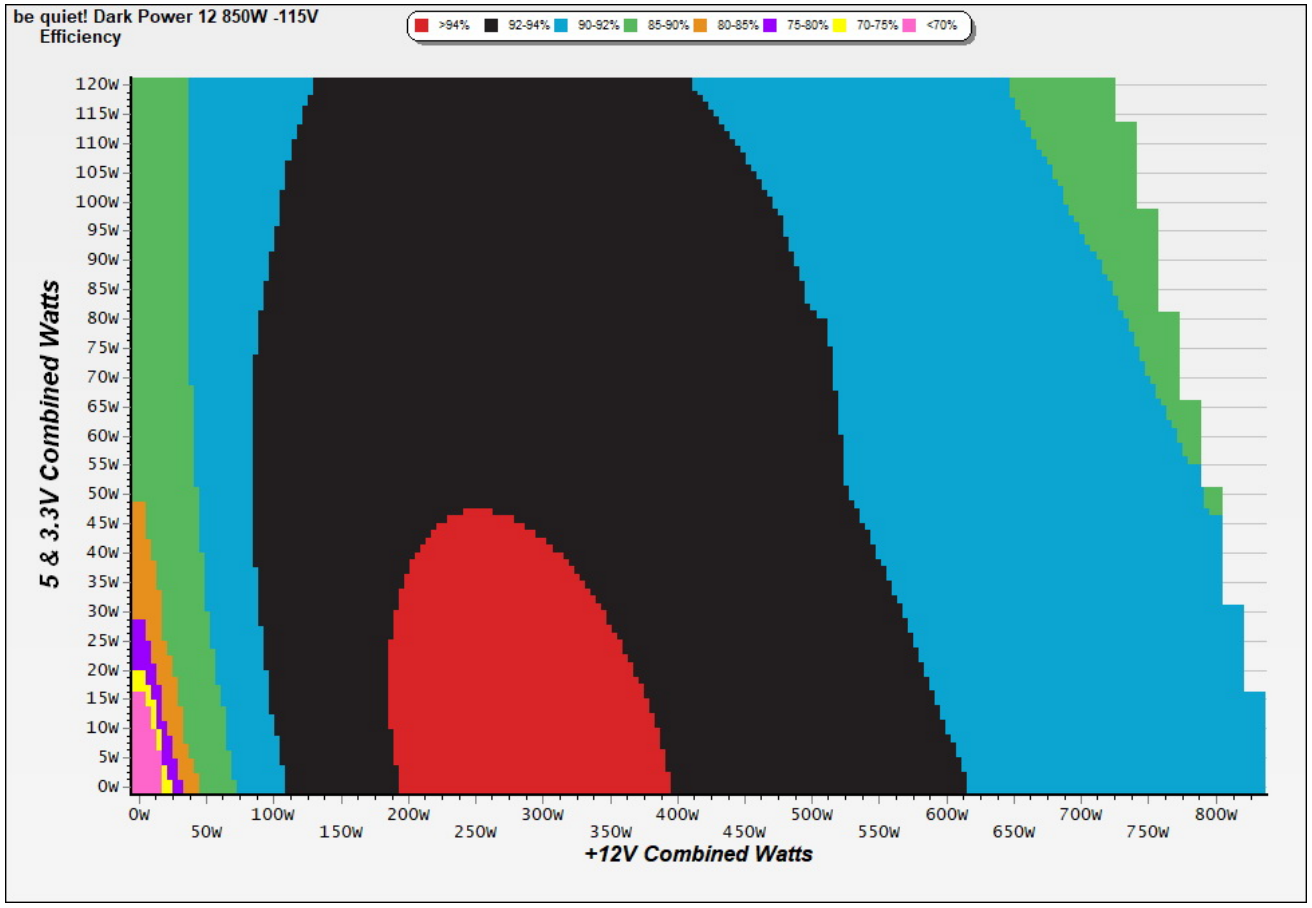
Hold-Up Time (ms)	18.4
AC Loss to PWR_OK Hold Up Time (ms)	17.6
PWR_OK Inactive to DC Loss Delay (ms)	0.8

Graphs 115V

Power - 315S1011001600 - 23/03/2021 - 11:37



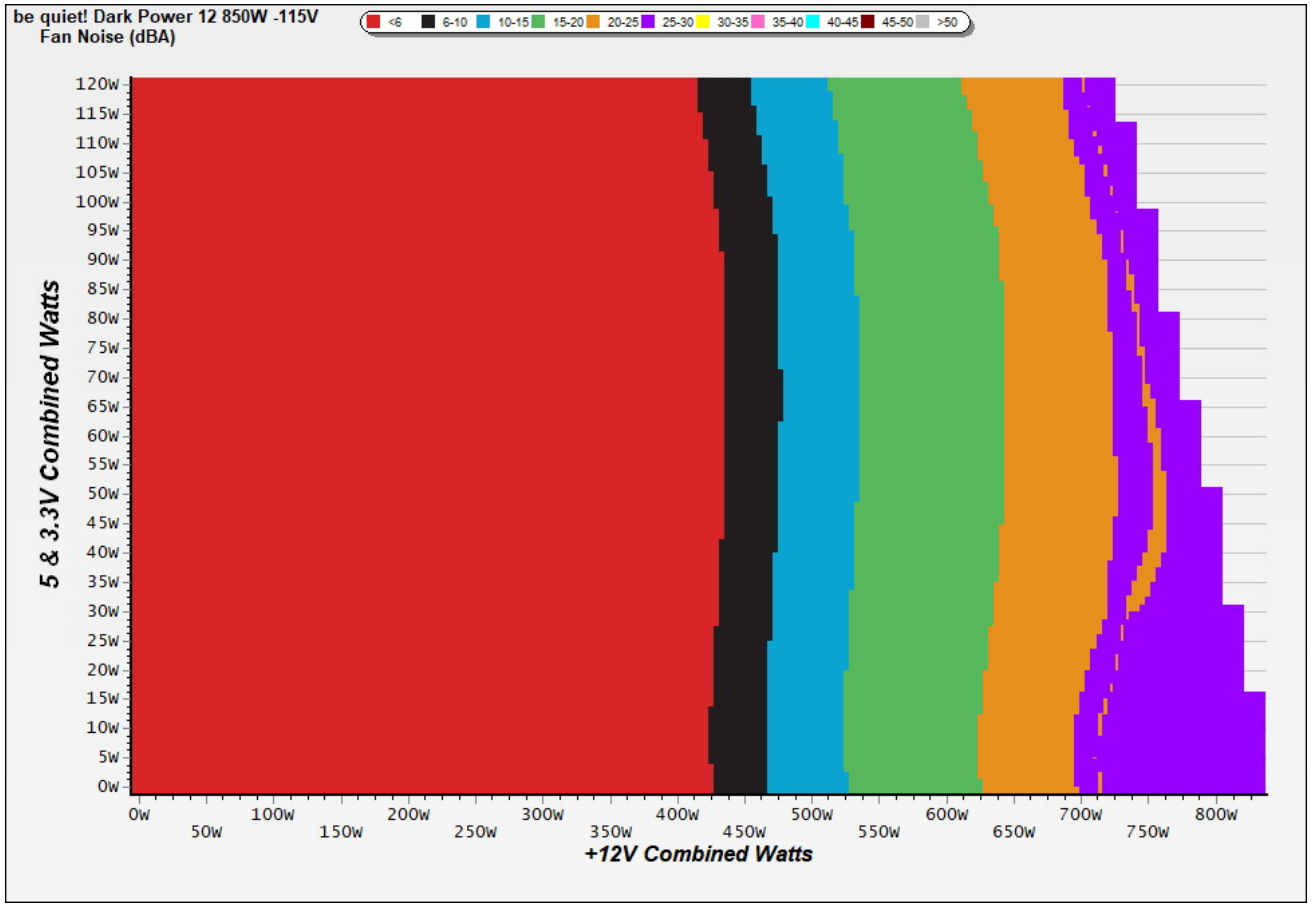
115V



□□

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

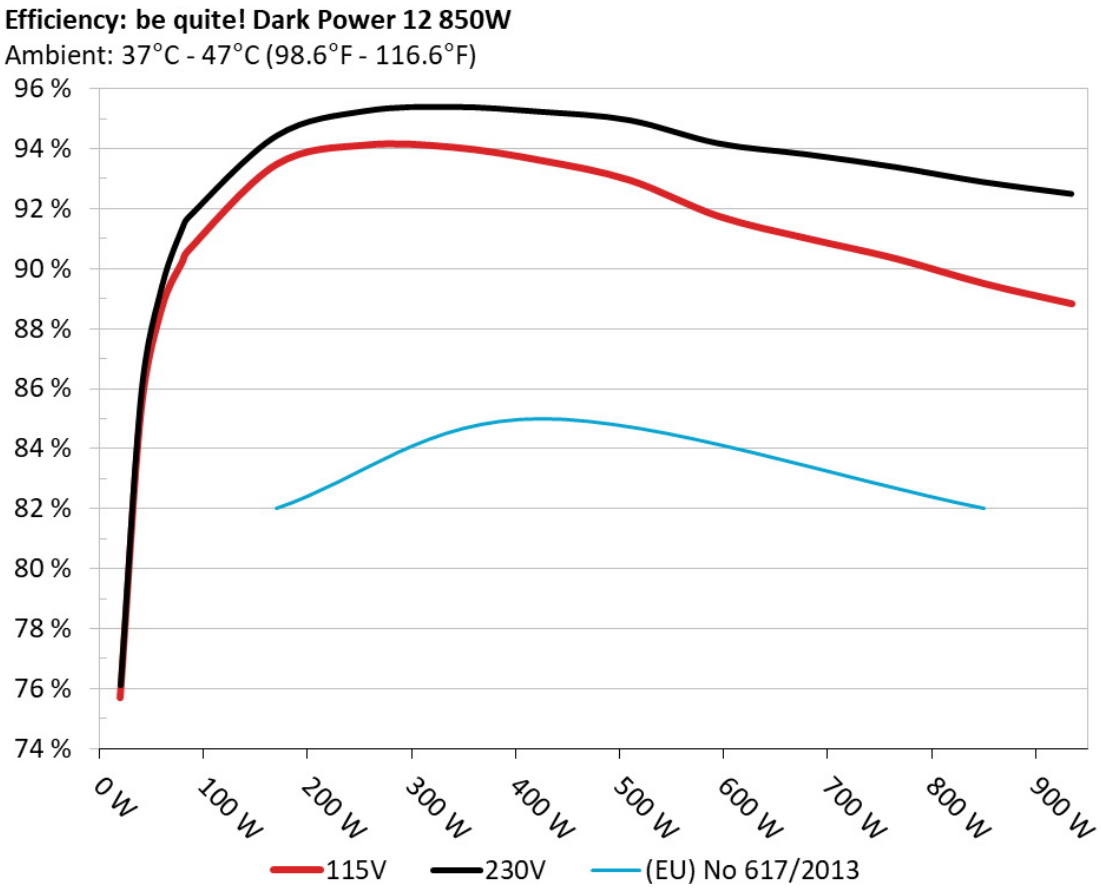
115V



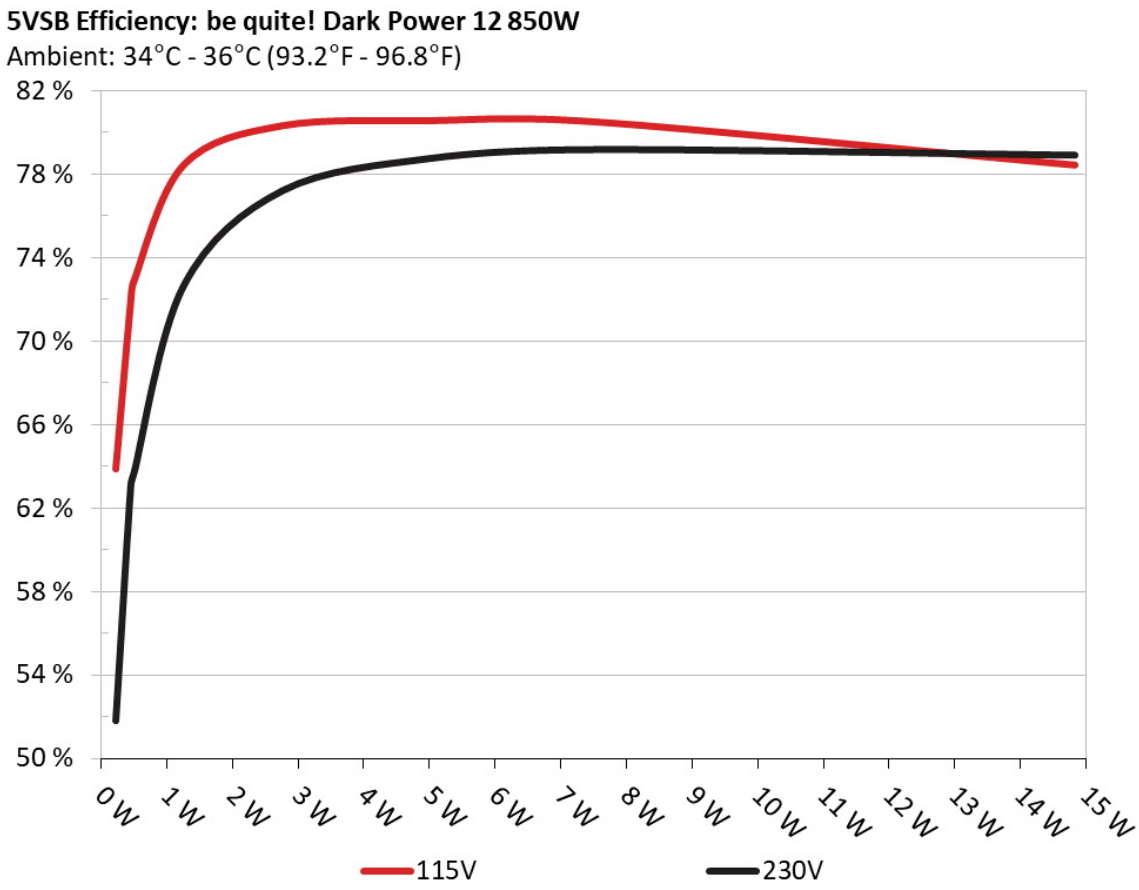
□□

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

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转换效率

资讯

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input

输入电压 时的 **5Vsb** 效率 **(ErP Lot3/6 & CEC) 115V**

测试 #	5VSB	DC/AC (瓦)	效率	PF/AC 电压
1	0.045A	0.228	63.866%	0.031
	5.056V	0.357		115.12V

2	0.090A	0.455	71.880%	0.055
	5.055V	0.633		115.12V
3	0.550A	2.769	80.307%	0.242
	5.035V	3.448		115.12V
4	1.000A	5.019	80.549%	0.342
	5.019V	6.231		115.11V
5	1.500A	7.503	80.496%	0.402
	5.002V	9.321		115.11V
6	3.000A	14.831	78.421%	0.474
	4.943V	18.912		115.12V

Supplementary Tests (For Reference)

10-110%□□□□ 115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	5.254A	1.963A	1.959A	0.991A	84.954	90.586%	360	<6.0	40.01°C	0.920
	12.058V	5.095V	3.369V	5.045V	93.783				42.71°C	115.09V
2	11.544A	2.944A	2.942A	1.192A	170.004	93.466%	363	<6.0	40.84°C	0.971
	12.051V	5.091V	3.365V	5.033V	181.889				44.01°C	115.09V
3	18.181A	3.438A	3.436A	1.395A	255.014	94.113%	369	<6.0	41.01°C	0.984
	12.044V	5.088V	3.361V	5.019V	270.965				44.76°C	115.09V
4	24.826A	3.933A	3.931A	1.598A	340.025	94.042%	420	<6.0	42.01°C	0.989
	12.037V	5.085V	3.357V	5.005V	361.569				46.26°C	115.09V
5	31.122A	4.921A	4.920A	1.803A	424.901	93.599%	522	10.2	42.58°C	0.991
	12.030V	5.081V	3.353V	4.993V	453.957				47.86°C	115.08V
6	37.404A	5.910A	5.915A	2.000A	509.440	92.948%	657	15.8	42.65°C	0.992
	12.022V	5.077V	3.348V	4.980V	548.093				48.92°C	115.08V
7	43.757A	6.900A	6.910A	2.215A	594.807	91.747%	767	20.8	43.11°C	0.993
	12.014V	5.073V	3.344V	4.966V	648.310				50.26°C	115.08V
8	50.121A	7.895A	7.905A	2.423A	680.111	91.006%	1002	28.0	43.52°C	0.993
	12.005V	5.068V	3.339V	4.953V	747.326				51.54°C	115.08V

9	56.883A	8.393A	8.395A	2.425A	764.997	90.338%	1405	36.6	44.86°C	0.993
	11.998V	5.065V	3.335V	4.951V	846.814				53.85°C	115.08V
10	63.398A	8.897A	8.916A	3.055A	849.869	89.505%	1770	42.6	45.79°C	0.992
	11.990V	5.061V	3.331V	4.910V	949.516				55.24°C	115.08V
11	70.513A	8.899A	8.926A	3.057A	934.604	88.830%	1827	43.3	46.77°C	0.992
	11.982V	5.058V	3.328V	4.907V	1052.122				56.64°C	115.08V
CL1	0.117A	14.002A	13.999A	0.000A	119.422	87.945%	700	19.4	42.77°C	0.948
	12.049V	5.078V	3.351V	5.131V	135.791				47.91°C	115.11V
CL2	70.006A	1.000A	1.001A	1.000A	853.228	90.011%	1720	42.1	46.05°C	0.992
	11.996V	5.075V	3.343V	5.015V	947.916				54.98°C	115.09V

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	1.229A	0.491A	0.490A	0.197A	19.983	75.716%	352	<6.0	0.749
	12.062V	5.098V	3.374V	5.088V	26.392				115.08V
2	2.460A	0.981A	0.978A	0.394A	39.971	85.273%	355	<6.0	0.841
	12.061V	5.097V	3.373V	5.078V	46.874				115.09V
3	3.694A	1.473A	1.468A	0.592A	60.001	88.693%	357	<6.0	0.889
	12.059V	5.096V	3.371V	5.068V	67.650				115.09V
4	4.922A	1.963A	1.959A	0.791A	79.952	90.244%	359	<6.0	0.913
	12.058V	5.095V	3.370V	5.057V	88.595				115.09V

The results above are not used in the certification process

□□□□ 115V

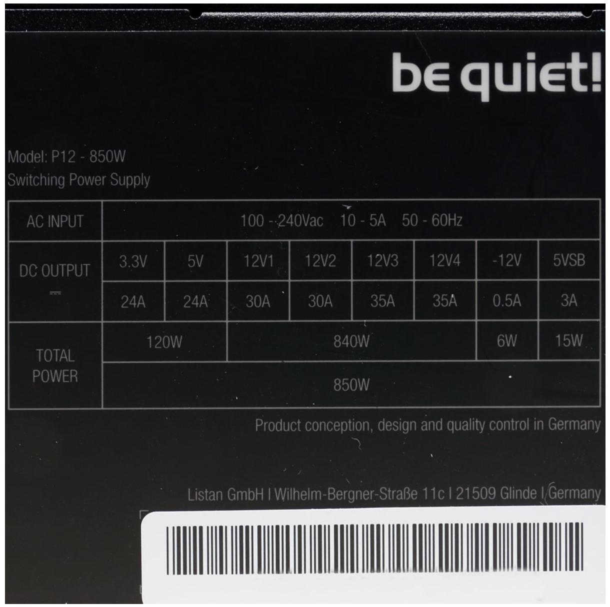
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.90mV	10.90mV	14.50mV	4.70mV	Pass
20% Load	10.30mV	11.10mV	14.30mV	5.00mV	Pass
30% Load	11.50mV	11.70mV	15.10mV	4.90mV	Pass
40% Load	12.50mV	12.40mV	16.50mV	5.30mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	14.20mV	13.20mV	17.70mV	5.60mV	Pass
60% Load	16.90mV	14.50mV	19.20mV	6.70mV	Pass
70% Load	13.40mV	16.40mV	19.70mV	6.60mV	Pass
80% Load	13.60mV	16.90mV	21.60mV	6.70mV	Pass
90% Load	14.20mV	18.10mV	22.80mV	7.20mV	Pass
100% Load	19.40mV	21.70mV	26.00mV	7.90mV	Pass
110% Load	21.20mV	22.80mV	28.60mV	8.30mV	Pass
Crossload1	14.60mV	14.80mV	15.90mV	5.60mV	Pass
Crossload2	19.10mV	19.40mV	25.80mV	7.20mV	Pass

The results above are not used in the certification process

be quiet! Dark Power 12 850W

Top side



Power specifications label

Cybenetics

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