be quiet!

be quiet! Dark Power 13 1000W

Serial Number 335S2481000081

Lab ID BQ10002156

Certification ID 252156

Test Result Report ID: 23PS2156A

Certificate Issue Date: Mar 27, 2022

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





Outside Validation Scope



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 13 1000W
OEM/ODM	FSP
Serial Number	335S2481000081
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	13-6

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	135mm Fluid Dynamic Bearing Fan (BQ SIW3-13525-HF)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	BQ10002156
Date of receipt	Feb 17, 2023
Testing Date	Mar 22, 2023
Report Issued Date	Mar 27, 2022
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)	1	1	16AWG	No
8 pin EPS12V (700mm)	1	1	16AWG	No
2x 6+2 pin PCIe (600mm)	2	4	16-18AWG	No
12+4 pin PCIe (600mm) (600W)	1	1	16-28AWG	No
SATA (600mm+150mm+150mm+150mm)	2	8	18AWG	No
SATA (600mm+150mm+150mm)	1	3	18AWG	No

SATA (600mm+150mm) / 4-pin Molex (+150mm+150mm)	1	2 / 2	18AWG	No
AC Power Cord (1360mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V(1)	12V(2)	12V(3)	12V(4)	5VSB	-12V
Max. Power	Amps	25	25	32	32	40	40	3	0.5
	Watts	125		996				15	6
Total Max. Power (W)		1000							

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	✓
ATX v3.0 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	91.342%
Average Noise Output (>1450 Load Combinations)	17.93dBA
Average PF (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	74.720%
Standby Power Consumption	0.0680W
Non-Accredited	
12V Ripple (Full Load)	26.37mV
5V Ripple (Full Load)	16.68mV

3.3V Ripple (Full Load)	21.25mV
5VSB Ripple (Full Load)	18.50mV
12V Load Regulation	1.00%
5V Load Regulation	1.01%
3.3V Load Regulation	1.73%
5VSB Load Regulation	4.51%
Inrush Current	34.200A

230V

Accredited	
Average Efficiency (>1450 load combinations)	93.436%
Average Noise Output (>1450 Load Combinations)	18.03dBA
Average PF (>1450 Load Combinations)	0.962
Efficiency With 10W (≤500W) or 2% (>500W) Load	75.315%
Standby Power Consumption	0.1628W
Non-Accredited	
12V Ripple (Full Load)	24.00mV
5V Ripple (Full Load)	17.64mV
3.3V Ripple (Full Load)	20.07mV
5VSB Ripple (Full Load)	18.12mV
12V Load Regulation	2.00%
5V Load Regulation	0.89%
3.3V Load Regulation	1.61%
5VSB Load Regulation	4.36%
Inrush Current	65.440A
12V Transient Response (200%)	11.44V
5V Transient Response (200%)	4.928V
3.3V Transient Response (200%)	3.220V
5VSB Transient Response (200%)	4.967V
Hold-Up Time & PWR_OK Signal	25.70ms
AC Loss to PWR_OK Hold Up Time	20.50ms
PWR_OK Inactive to DC Loss Delay	5.20ms

PSU Timings: T1 (20% / 100%)	55.0ms	53.0ms
PSU Timings: T3 (20% / 100%)	124.0ms	123.0ms
OPP (28.45°C / 36.91°C)	142.51%	131.71%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	25.7
AC Loss to PWR_OK Hold Up Time (ms)	20.5
PWR_OK Inactive to DC Loss Delay (ms)	5.2

Vampire Power

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.88 V	114.82 V	113.85 V	114.94 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.98 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.418	1.417	1.340	1.421	1.490	PASS
Mains Voltage THD:	0.16 %	0.10 %	N/A	0.27 %	2.00 %	PASS
Real Power:	0.068 W	0.006 W	N/A	0.124 W	N/A	N/A
Apparent Power:	12.259 W	11.998 W	N/A	12.604 W	N/A	N/A
Power Factor:	0.008	N/A	N/A	N/A	N/A	N/A

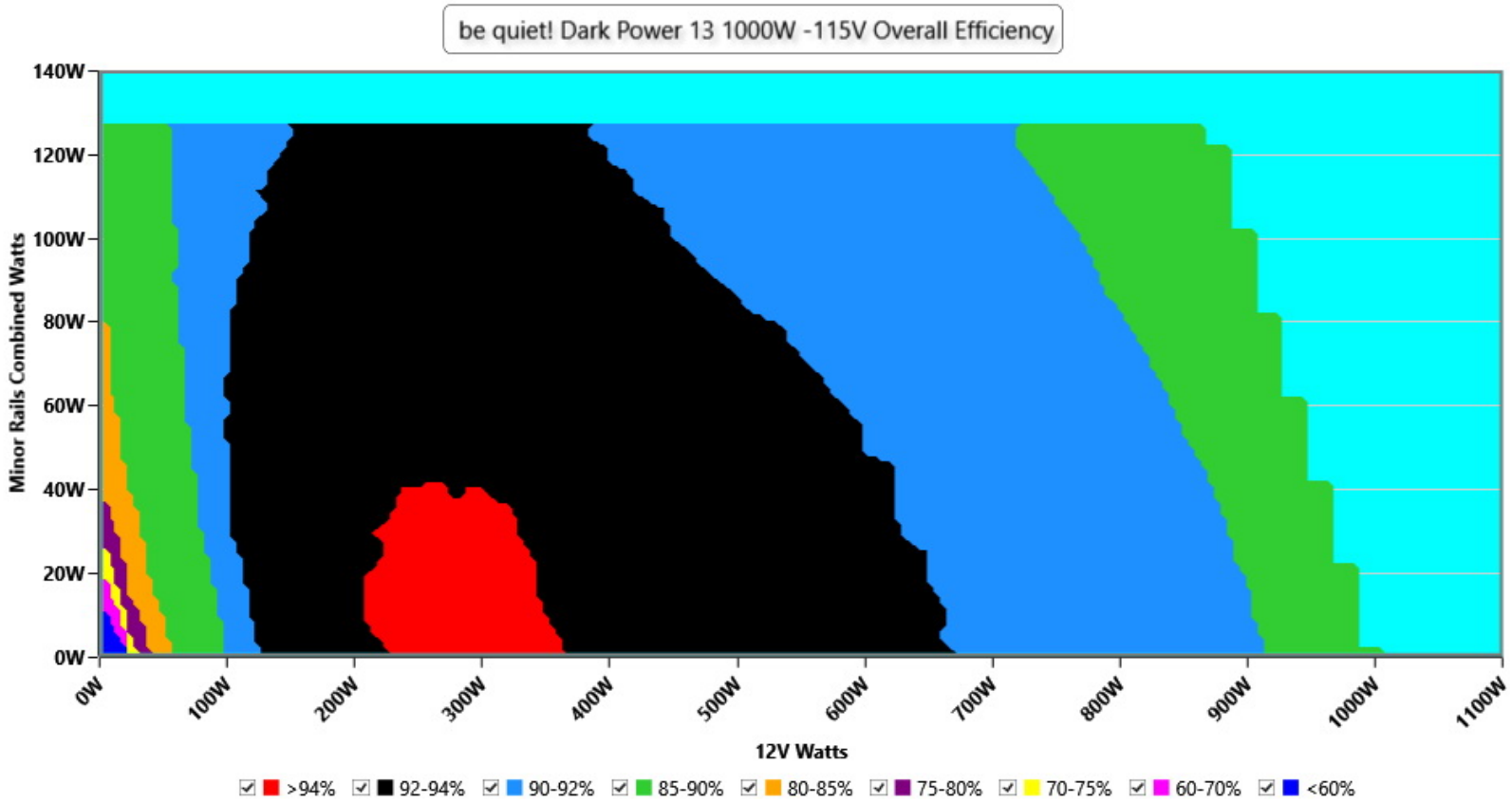
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.95 V	229.88 V	227.70 V	230.01 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.99 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS

Mains Voltage CF:	1.417	1.415	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.16 %	0.13 %	N/A	0.24 %	2.00 %	PASS
Real Power:	0.163 W	0.075 W	N/A	0.248 W	N/A	N/A
Apparent Power:	41.420 W	41.090 W	N/A	41.732 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

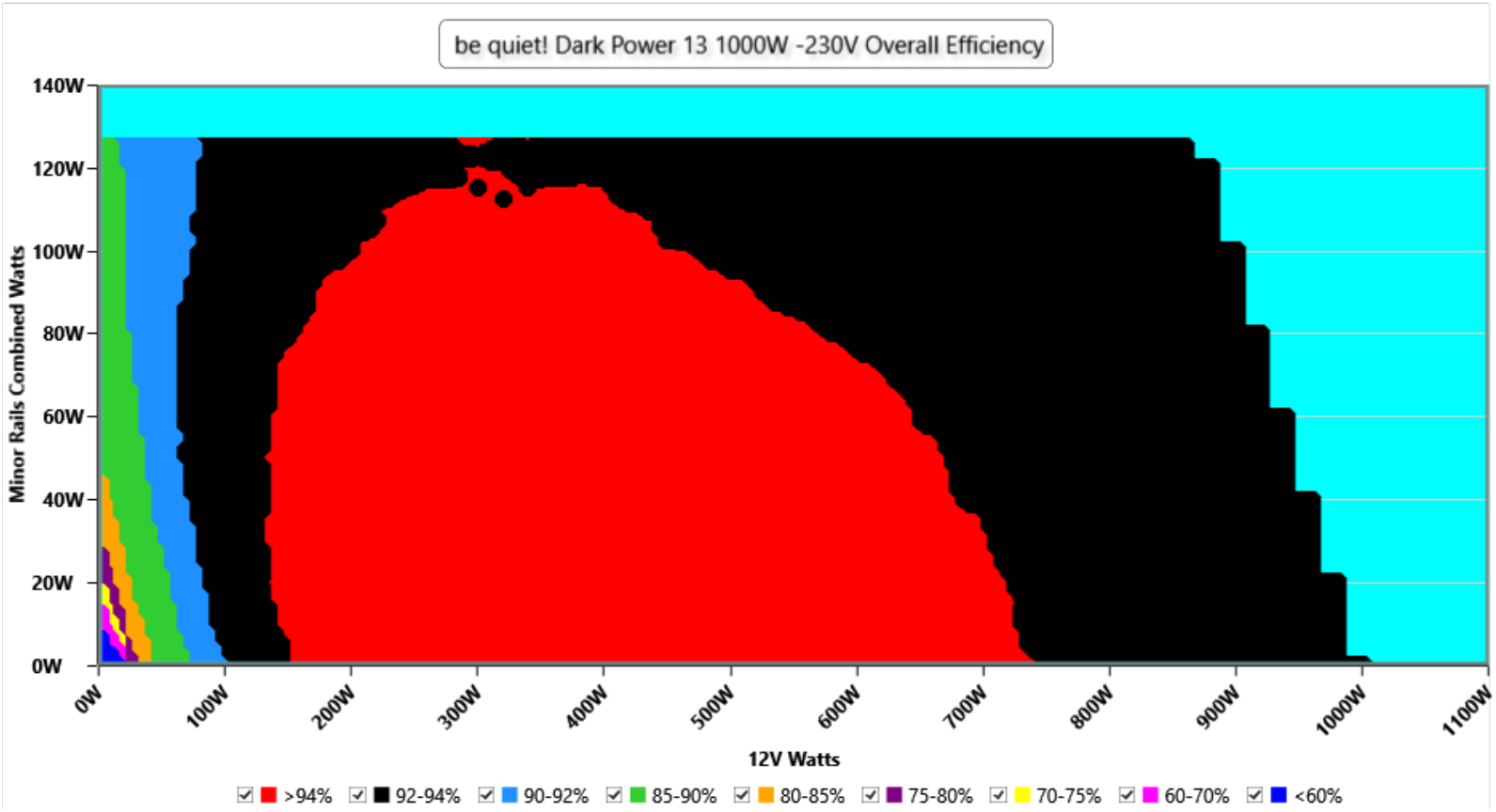
115V



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

230V

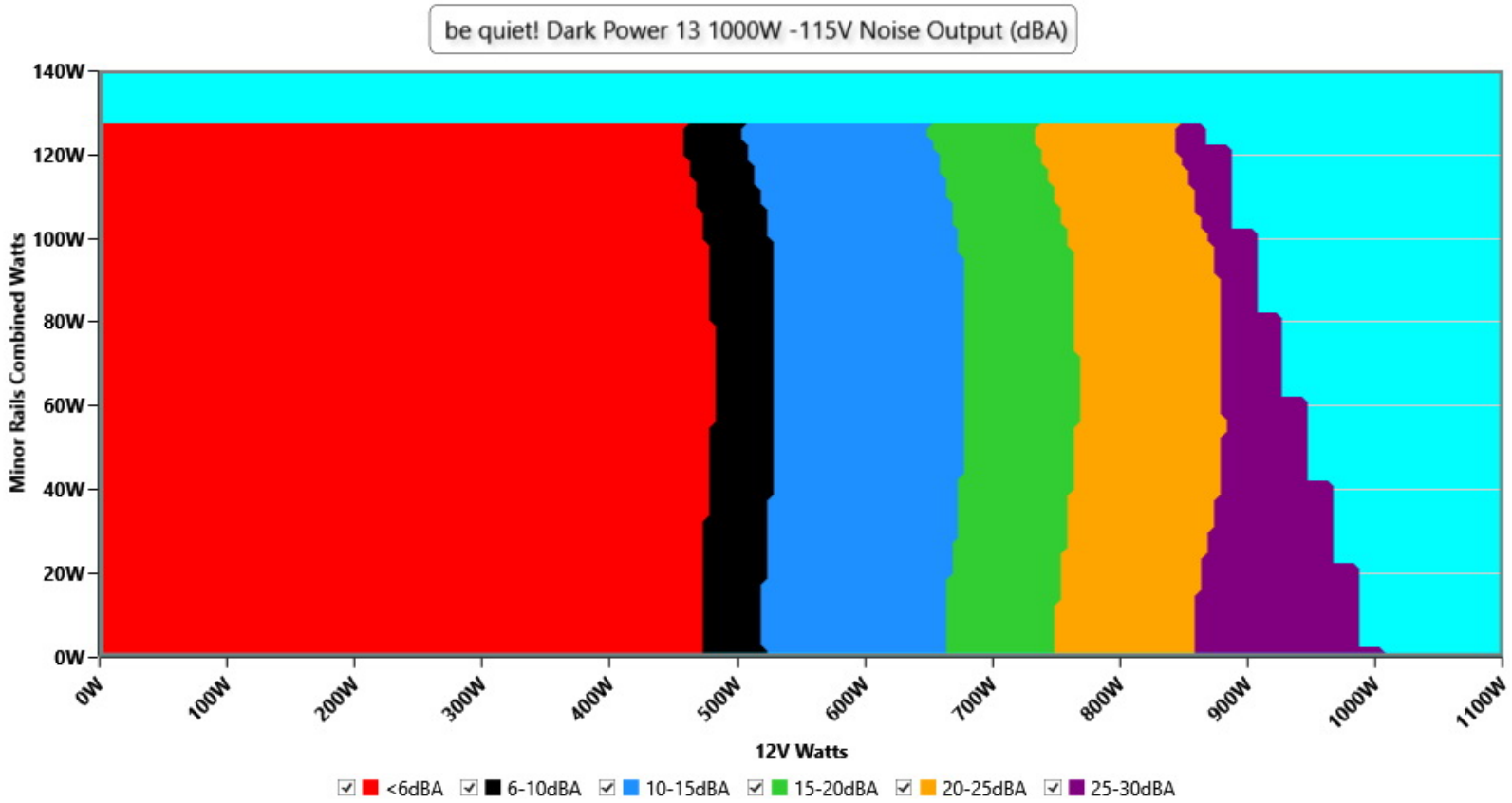


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This graph depicts the PSU`s efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

Noise Graph

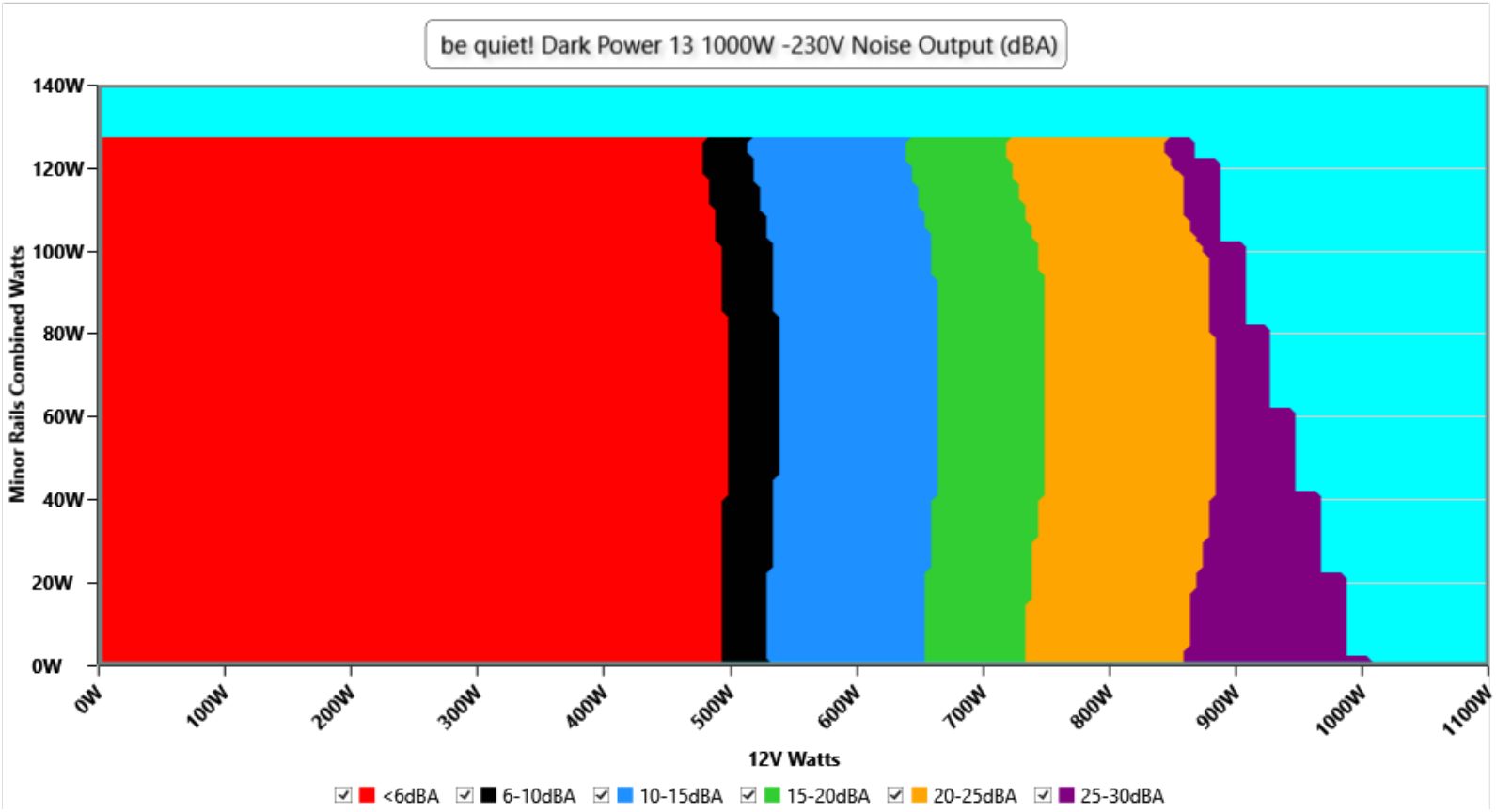
115V



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

230V

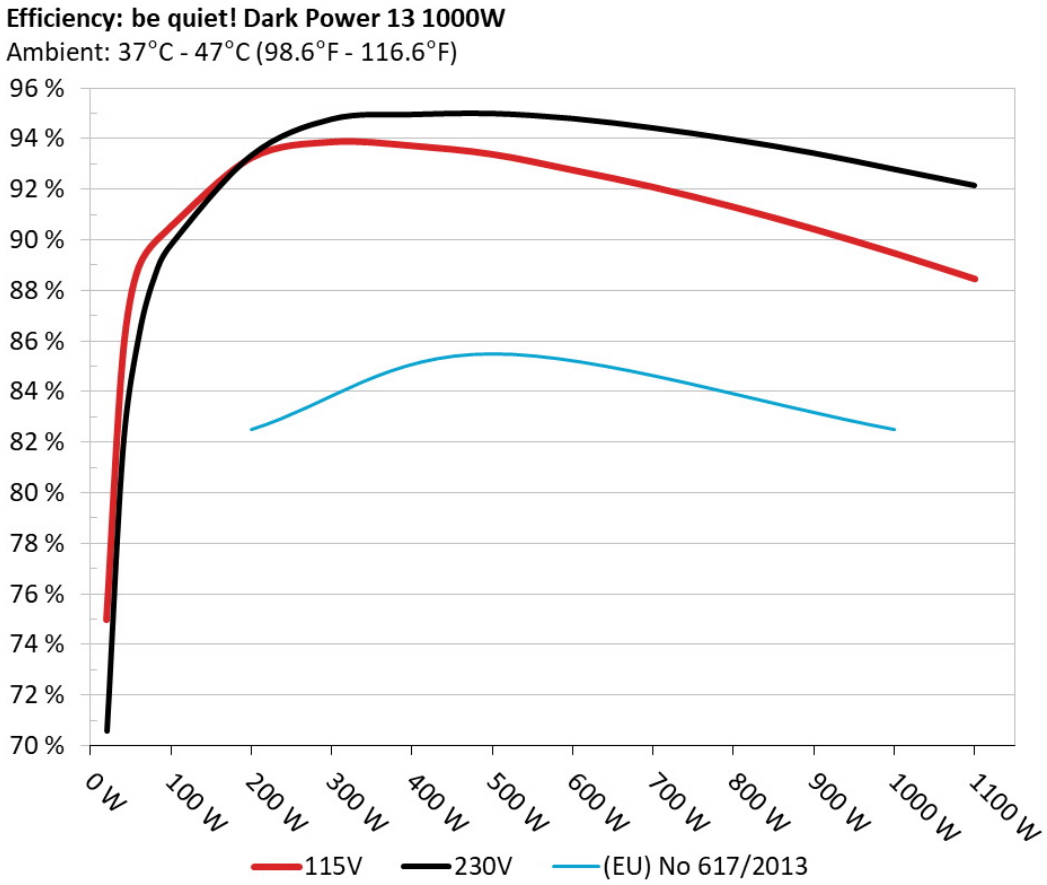


INFO

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

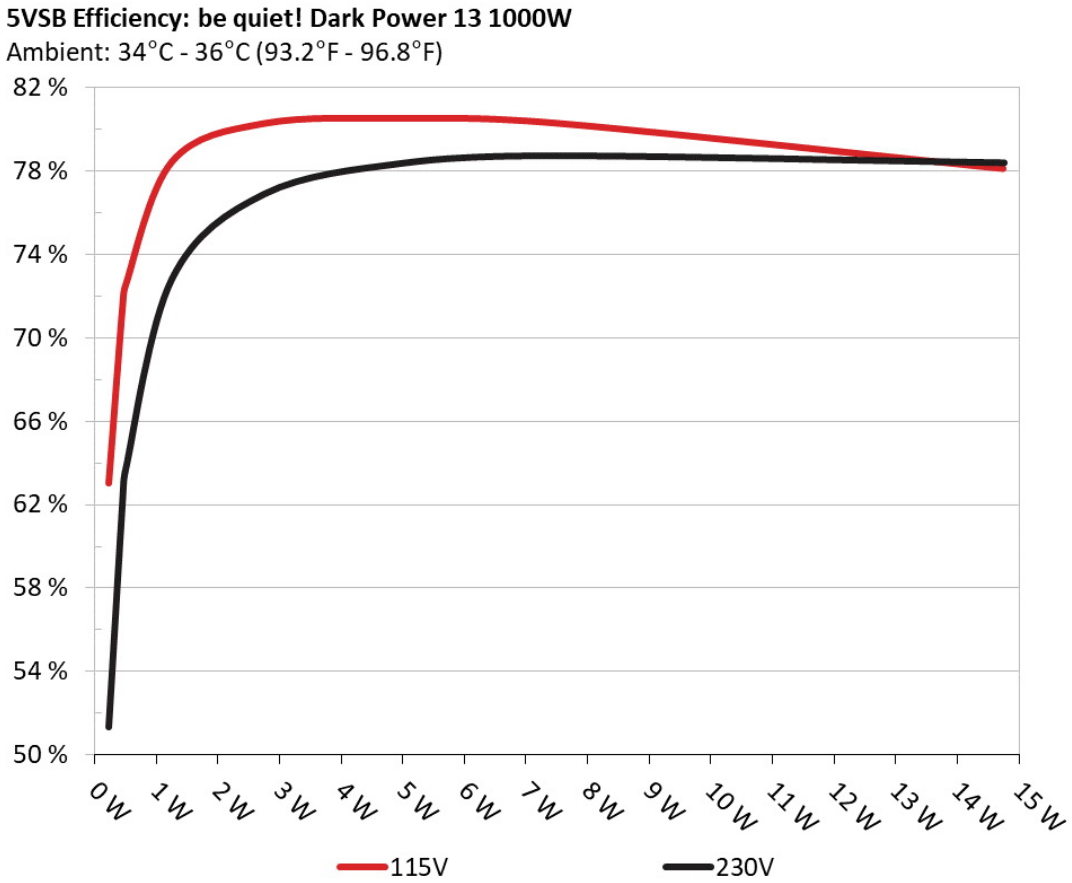
Efficiency under high ambient temperature



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	0.226W	63.016%	0.029
	5.032V	0.359W		114.87V
2	0.09A	0.453W	71.628%	0.051
	5.03V	0.634W		114.86V
3	0.55A	2.757W	80.303%	0.228
	5.013V	3.433W		114.87V
4	1A	4.996W	80.54%	0.329
	4.996V	6.203W		114.86V
5	1.5A	7.466W	80.319%	0.392
	4.977V	9.295W		114.86V
6	3A	14.747W	78.128%	0.473
	4.916V	18.875W		114.86V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.226W	51.343%	0.011
	5.032V	0.444W		229.94V
2	0.09A	0.453W	62.334%	0.018
	5.031V	0.728W		229.95V
3	0.55A	2.756W	76.912%	0.084
	5.013V	3.585W		229.95V
4	1A	4.994W	78.382%	0.141
	4.995V	6.372W		229.95V
5	1.5A	7.464W	78.738%	0.196
	4.976V	9.479W		229.94V
6	3A	14.758W	78.402%	0.307
	4.92V	18.825W		229.95V

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%	6.508A	1.969A	1.97A	0.995A	99.969	89.893%	384	<6.0	40.34°C	0.967
	12.044V	5.078V	3.35V	5.025V	111.215				44.44°C	114.85V
20%	14.046A	2.955A	2.957A	1.197A	199.909	92.743%	385	<6.0	40.77°C	0.987
	12.033V	5.076V	3.348V	5.012V	215.561				44.99°C	114.8V
30%	21.940A	3.451A	3.455A	1.401A	299.952	93.374%	388	<6.0	41.37°C	0.993
	12.029V	5.071V	3.343V	4.995V	321.238				45.99°C	114.78V
40%	29.807A	3.947A	3.955A	1.607A	399.461	93.223%	392	<6.0	41.63°C	0.995
	12.019V	5.067V	3.337V	4.978V	428.499				46.66°C	114.74V
50%	37.368A	4.939A	4.953A	1.814A	499.195	92.889%	417	10.4	42.37°C	0.996
	12.007V	5.062V	3.332V	4.962V	537.405				47.87°C	114.7V
60%	45.018A	5.934A	5.955A	2A	599.642	92.262%	536	11.3	42.8°C	0.996
	11.994V	5.056V	3.325V	4.945V	649.927				48.81°C	114.68V
70%	52.606A	6.931A	6.961A	2.233A	699.473	91.59%	671	16.2	43.29°C	0.996
	11.983V	5.051V	3.319V	4.927V	763.708				50.31°C	114.63V
80%	60.283A	7.93A	7.97A	2.34A	799.517	90.804%	807	20.6	43.87°C	0.995
	11.970V	5.045V	3.312V	4.915V	880.501				52.12°C	114.59V
90%	68.305A	8.432A	8.469A	2.448A	899.303	89.931%	1067	28	44.21°C	0.995
	11.958V	5.04V	3.306V	4.903V	1000				53.26°C	114.55V
100%	76.144A	8.936A	8.998A	3.088A	999.319	88.98%	1485	39.6	45.3°C	0.994
	11.947V	5.036V	3.301V	4.858V	1123.091				55.34°C	114.51V
110%	83.931A	9.939A	10.108A	3.091A	1099.943	87.955%	1864	44.2	46.52°C	0.993
	11.934V	5.031V	3.294V	4.854V	1250.572				57.43°C	114.46V
CL1	0.116A	14.912A	14.884A	0A	126.3	85.406%	775	22	41.74°C	0.978
	12.086V	5.05V	3.332V	5.096V	147.881				47.23°C	114.83V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.115A	24.793A	0A	0A	126.252	83.805%	743	23	40.4°C	0.978
	12.083V	5.036V	3.342V	5.119V	150.65				47.46°C	114.83V
CL3	0.113A	0A	24.853A	0A	83.883	79.666%	652	15.8	40.01°C	0.965
	12.204V	5.062V	3.32V	5.057V	105.293				49.05°C	114.84V
CL4	83.630A	0A	0A	0A	999.912	89.631%	1201	31.7	45.7°C	0.994
	11.956V	5.049V	3.305V	5.03V	1115.597				56.64°C	114.52V

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	6.432A	1.967A	1.97A	0.994A	99.972	89.323%	419	6.6	40.28°C	0.861
	12.185V	5.083V	3.349V	5.029V	111.923				44.47°C	229.94V
20%	14.047A	2.953A	2.957A	1.196A	199.912	92.842%	391	<6.0	40.87°C	0.946
	12.032V	5.08V	3.347V	5.016V	215.325				45.48°C	229.92V
30%	21.956A	3.447A	3.455A	1.4A	299.952	94.273%	392	<6.0	41.08°C	0.969
	12.019V	5.076V	3.343V	5V	318.174				46.2°C	229.9V
40%	29.813A	3.943A	3.954A	1.605A	399.456	94.454%	406	<6.0	41.5°C	0.976
	12.017V	5.073V	3.338V	4.984V	422.911				47.17°C	229.88V
50%	37.373A	4.933A	4.951A	1.812A	499.183	94.492%	477	11.0	42.08°C	0.981
	12.006V	5.068V	3.332V	4.968V	528.278				48.22°C	229.87V
60%	45.014A	5.926A	5.952A	2A	599.62	94.295%	578	12.8	42.57°C	0.983
	11.994V	5.063V	3.327V	4.953V	635.901				49.23°C	229.85V
70%	52.607A	6.921A	6.957A	2.229A	699.447	93.925%	695	16.9	43.14°C	0.984
	11.982V	5.057V	3.32V	4.934V	744.685				50.21°C	229.83V
80%	60.282A	7.918A	7.965A	2.336A	799.484	93.466%	819	21.7	43.67°C	0.984
	11.970V	5.052V	3.314V	4.923V	855.376				51.68°C	229.82V
90%	68.306A	8.42A	8.464A	2.443A	899.255	92.932%	1095	28.9	44.39°C	0.984
	11.958V	5.047V	3.308V	4.911V	967.647				53.43°C	229.8V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	76.142A	8.923A	8.993A	3.082A	999.3	92.296%	1513	40.4	45.35°C	0.984
	11.946V	5.043V	3.302V	4.867V	1082.713				55.43°C	229.79V
110%	83.926A	9.924A	10.101A	3.085A	1099.911	91.651%	1880	44.4	46.54°C	0.983
	11.935V	5.038V	3.296V	4.862V	1200.105				57.47°C	229.77V
CL1	0.114A	14.891A	14.875A	0A	126.292	86.367%	769	22.5	41.37°C	0.906
	12.099V	5.057V	3.334V	5.103V	146.226				46.84°C	229.93V
CL2	0.114A	24.758A	0A	0A	126.249	84.695%	743	23.0	40.81°C	0.909
	12.095V	5.044V	3.344V	5.125V	149.063				48.01°C	229.93V
CL3	0.113A	0A	24.839A	0A	83.879	80.457%	659	15.9	40.79°C	0.85
	12.228V	5.07V	3.321V	5.065V	104.252				49.85°C	229.94V
CL4	83.633A	0A	0A	0A	999.884	92.886%	1189	31.5	45.48°C	0.984
	11.955V	5.056V	3.307V	5.037V	1076.471				56.45°C	229.78V

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	1.230A	0.491A	0.491A	0.197A	19.983	74.48%	374	<6.0	36.59°C	0.812
	12.067V	5.087V	3.358V	5.077V	26.829				39.67°C	114.87V
40W	2.708A	0.688A	0.688A	0.296A	39.985	84.834%	377	<6.0	37.24°C	0.893
	12.063V	5.085V	3.356V	5.07V	47.134				40.56°C	114.87V
60W	4.190A	0.885A	0.885A	0.395A	59.985	88.425%	379	<6.0	38.55°C	0.927
	12.059V	5.083V	3.354V	5.062V	67.838				42.32°C	114.07V
80W	5.666A	1.082A	1.083A	0.494A	79.917	90.035%	379	<6.0	39.16°C	0.954
	12.054V	5.081V	3.352V	5.055V	88.767				43.09°C	114.85V

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20W	1.220A	0.491A	0.492A	0.197A	19.992	70.091%	412	<6.0	36.54°C	0.478
	12.167V	5.088V	3.355V	5.079V	28.522				39.62°C	229.94V
40W	2.684A	0.688A	0.689A	0.296A	39.99	81.283%	414	6.2	37.25°C	0.655
	12.179V	5.087V	3.354V	5.072V	49.199				40.6°C	229.94V
60W	4.148A	0.885A	0.886A	0.395A	59.989	85.747%	416	6.3	38.16°C	0.756
	12.179V	5.086V	3.353V	5.066V	69.959				41.64°C	229.94V
80W	5.606A	1.081A	1.083A	0.494A	79.923	88.11%	418	6.5	39.35°C	0.821
	12.183V	5.085V	3.351V	5.059V	90.71				43.21°C	229.94V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	19.45mV	9.07mV	9.57mV	10.22mV	Pass
20% Load	38.34mV	9.94mV	10.39mV	10.58mV	Pass
30% Load	43.17mV	10.25mV	12.20mV	11.61mV	Pass
40% Load	34.56mV	20.04mV	29.99mV	20.03mV	Pass
50% Load	17.80mV	12.05mV	13.91mV	13.58mV	Pass
60% Load	14.28mV	11.90mV	14.53mV	11.92mV	Pass
70% Load	15.47mV	11.95mV	14.89mV	13.27mV	Pass
80% Load	17.27mV	13.03mV	16.80mV	14.40mV	Pass
90% Load	18.30mV	13.86mV	20.43mV	14.19mV	Pass
100% Load	26.37mV	16.68mV	21.25mV	18.50mV	Pass
110% Load	27.81mV	17.10mV	26.70mV	18.87mV	Pass
Crossload1	21.33mV	14.13mV	14.65mV	14.31mV	Pass
Crossload2	15.86mV	19.53mV	14.63mV	12.85mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	20.35mV	10.72mV	11.64mV	9.45mV	Pass
Crossload4	26.01mV	15.15mV	20.36mV	16.99mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	20.04mV	9.33mV	9.05mV	10.17mV	Pass
20% Load	7.53mV	9.84mV	10.14mV	10.89mV	Pass
30% Load	44.30mV	9.69mV	12.15mV	11.82mV	Pass
40% Load	35.13mV	17.57mV	30.30mV	19.15mV	Pass
50% Load	17.23mV	11.90mV	15.77mV	13.06mV	Pass
60% Load	15.00mV	12.16mV	14.07mV	13.16mV	Pass
70% Load	14.69mV	12.05mV	15.10mV	13.83mV	Pass
80% Load	16.03mV	14.06mV	17.37mV	13.83mV	Pass
90% Load	16.91mV	13.71mV	18.20mV	14.25mV	Pass
100% Load	24.00mV	17.64mV	20.07mV	18.12mV	Pass
110% Load	26.52mV	17.47mV	25.87mV	18.56mV	Pass
Crossload1	21.37mV	13.36mV	13.43mV	14.01mV	Pass
Crossload2	15.92mV	24.16mV	13.96mV	14.25mV	Pass
Crossload3	21.28mV	10.87mV	11.43mV	9.39mV	Pass
Crossload4	24.82mV	15.32mV	18.08mV	17.46mV	Pass

The results above are not used in the certification process

be quiet! Dark Power 13 1000W



Top side



Power specifications label

All data and graphs included in this test report can be used by any individual on the following conditions:
› It should be mentioned that the test results are provided by Cybenetics
› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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