be quiet! System Power 9 600W

247H0140008828

Lab ID BQ60001687

Certification ID 251687

Test Result Report ID: 20PS1687A

Certificate Issue Date: Jul 20, 2020

230V

Scheme: ETA-EMI PSU



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	System Power 9 600W
OEM/ODM	HEC
Serial Number	247H0140008828
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	200-240
□□□□ (Arms)	6
□□□□ (Hz)	50

□□□□ (W)	600
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Sleeve Bearing Fan (D12SH-12)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	BQ60001687
Date of receipt	Jul 16, 2020
Testing Date	Jul 20, 2020
Report Issued Date	Jul 20, 2020
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□ (Non-accredited measurements)

Native Cables				
□□	□□□□	□□□□□□	Gauge	In Cable Caps
ATX □□ 20+4 pin (540mm)	1	1	18-20AWG	□
4+4 pin EPS 12V □□ (580mm)	1	1	18AWG	□
6+2pin PCIe□□ (480mm+150mm)	2	4	18AWG	□
SATA□□ (350mm+120mm+120mm) / 4-pin Molex (+120mm)	1	3 / 1	18AWG	□
SATA□□ (540mm+120mm+120mm) / 4-pin Molex (+120mm)	1	3 / 1	18AWG	□
□□□□□				
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	24	15	28	3	0.3
	□	120		576	15	3.6
□□□□□ (W)		600				

Parts Description

General Data	-
Manufacturer (OEM)	HEC
PCB Type	Single Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CAP200DG (Discharge IC)
Inrush Protection	NTC Thermistor SCK-1R55
Bridge Rectifier(s)	1x GBU606 (600V, 2.9A @ 100°C (without heatsink))
APFC MOSFETs	2x Great Power GPT13N50D (500V, 13A, Rds(on): 0.49Ohm)
APFC Boost Diode	1x WeEn BYC8X-600 (600V, 8A)
Bulk Cap(s)	1x Teapo (400V, 470uF, 2,000h @ 85°C, LH)
Main Switchers	2x Infineon IPA50R280CE (500V, 11.4A @ 100°C, Rds(on): 0.28Ohm)
Combo PFC/PWM Controller	Champion CM6800TX
Topology	Primary side: APFC, Double-Forward Secondary side: Passive Rectification & DC-DC converters
Secondary Side	-
+12V SBRs	4x PSM40U60CTR
5V & 3.3V	DC-DC Converters: 6x Potens PDD3906 (30V, 51A @ 100°C, Rds(on): 6mOhm) PWM Controllers: 2x ANPEC APW7164
Filtering Capacitors	Electrolytic: 15x Teapo (1-3,000h @ 105°C, SC), 2x Nichicon (4-10,000h @ 105°C, HE), 2x Teapo (1,000h @ 105°C, SEK) Polymer: 2x Teapo
Supervisor IC	Weltrend WT7527V (OCP, OVP, UVP, SCP, PG)
Fan Model	Yate Loon D12SH-12 (120mm, 12V, 0.30A, Sleeve Bearing Fan)
5VSB Circuit	-
Rectifier	1x MOSPEC S10M60C SBR (60V, 10A)

Standby PWM Controller	Power Integrations TNY289PG

Test Results

Temperature & Compliance Info

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

Performance Summary 230V

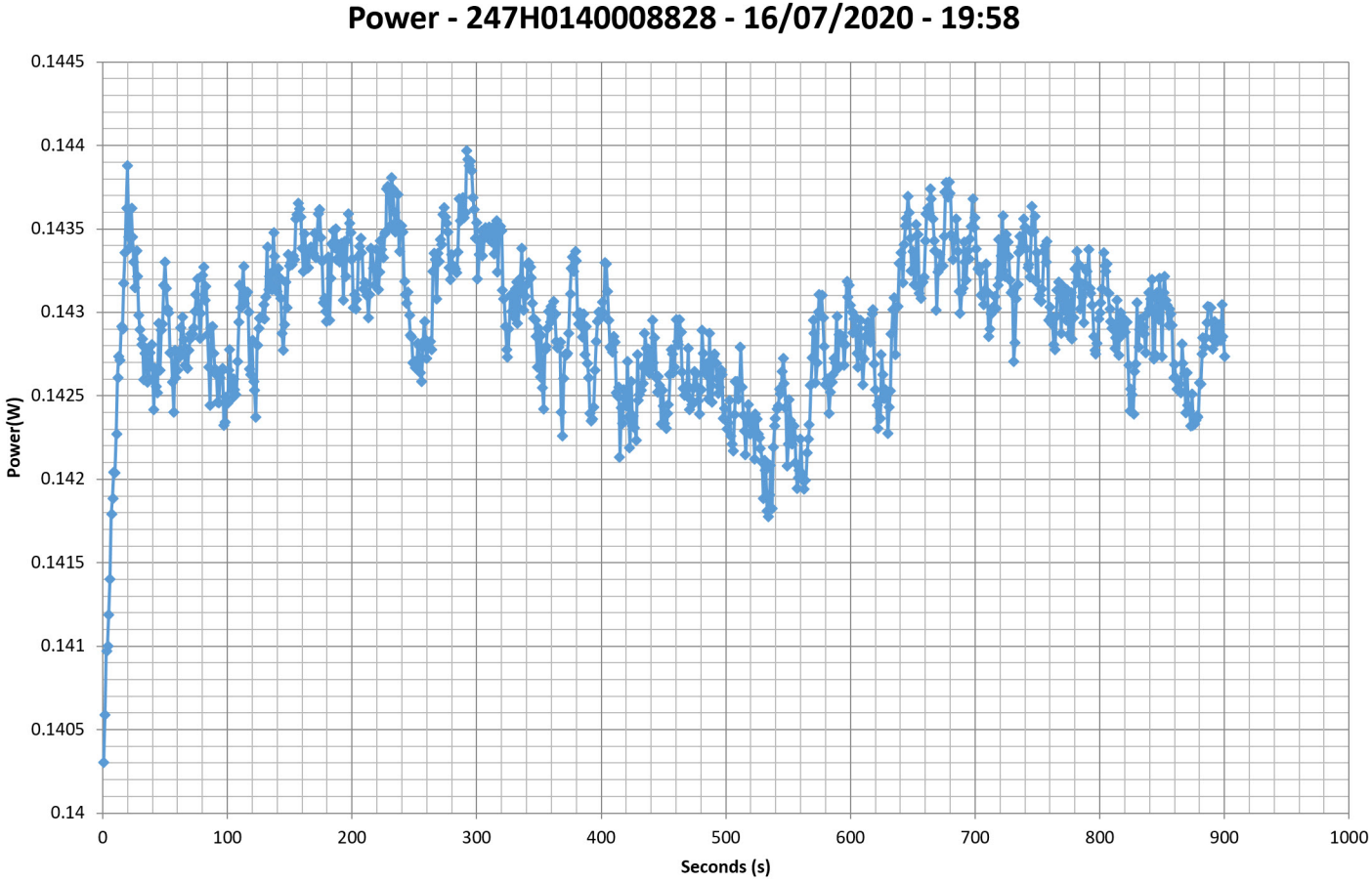
Accredited		
□□□□ (>1450 load combinations)		87.019%
Average Noise Output (>1450 Load Combinations)		27.70dBA
PF□□□ (>1450 Load Combinations)		0.973
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.1427W
Non-Accredited		
12V Ripple (Full Load)		63.89mV
5V Ripple (Full Load)		38.41mV
3.3V Ripple (Full Load)		24.71mV
5VSB Ripple (Full Load)		18.09mV
12V Load Regulation		1.74%
5V Load Regulation		2.72%
3.3V Load Regulation		2.99%
5VSB Load Regulation		2.93%
Inrush Current		79.650A
□□□□ & PG□□		18.60ms
AC Loss to PWR_OK Hold Up Time		16.30ms
PWR_OK Inactive to DC Loss Delay		2.30ms
PSU Timings: T1 (20% / 100%)	56.0ms	56.0ms
PSU Timings: T3 (20% / 100%)	324.0ms	324.0ms

OPP (0.00°C / 0.00°C)	126.66%	-

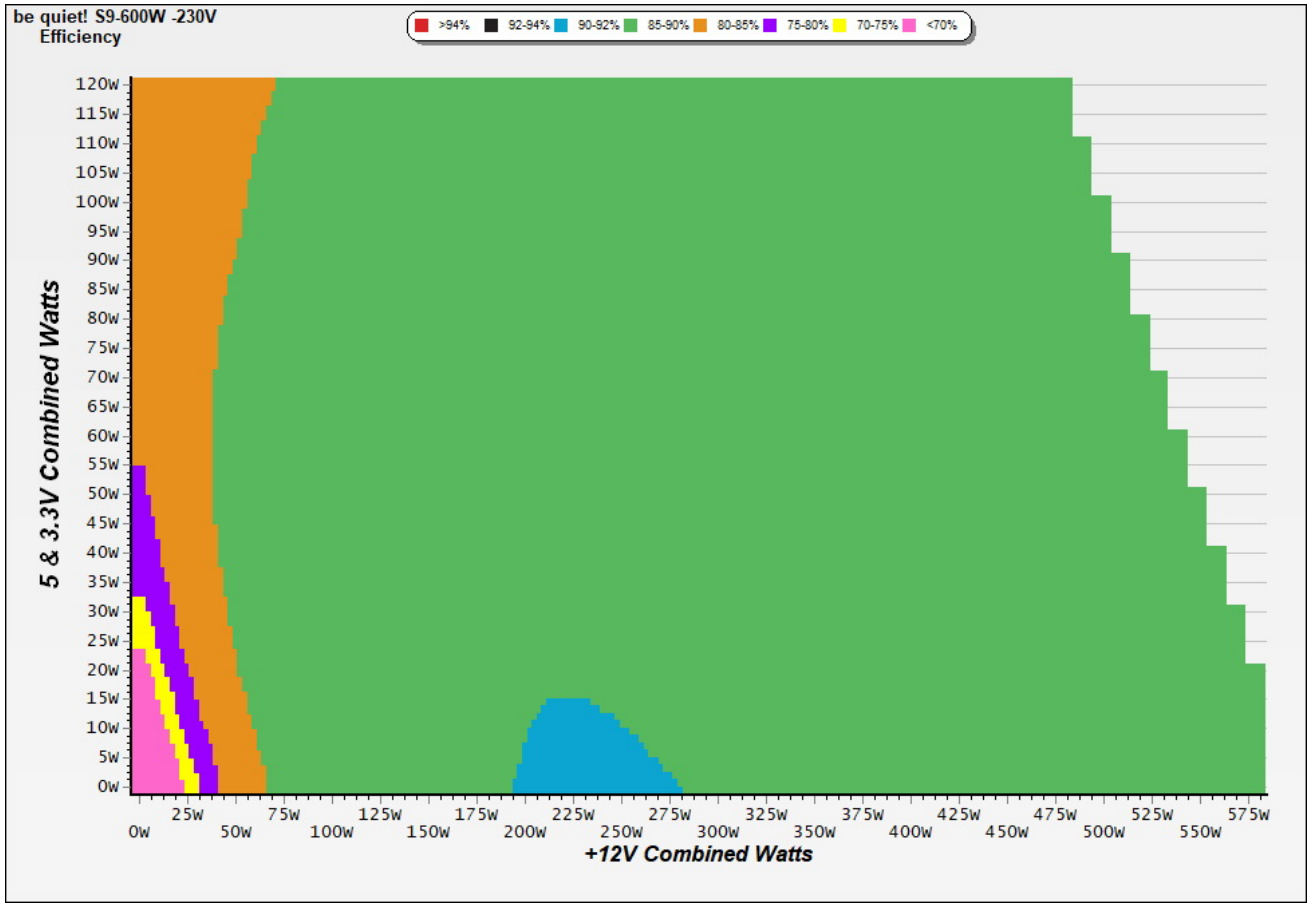
□□□□ & PG□□

Hold-Up Time (ms)	18.6
AC Loss to PWR_OK Hold Up Time (ms)	16.3
PWR_OK Inactive to DC Loss Delay (ms)	2.3

Graphs 230V


Power - 247H0140008828 - 16/07/2020 - 19:58
Power(W)
0.1445
0.144
0.1435
0.143
0.1425
0.142
0.1415
0.141
0.1405
0.14
0
100
200
300
400
500
600
700
800
900
1000
Seconds (s)

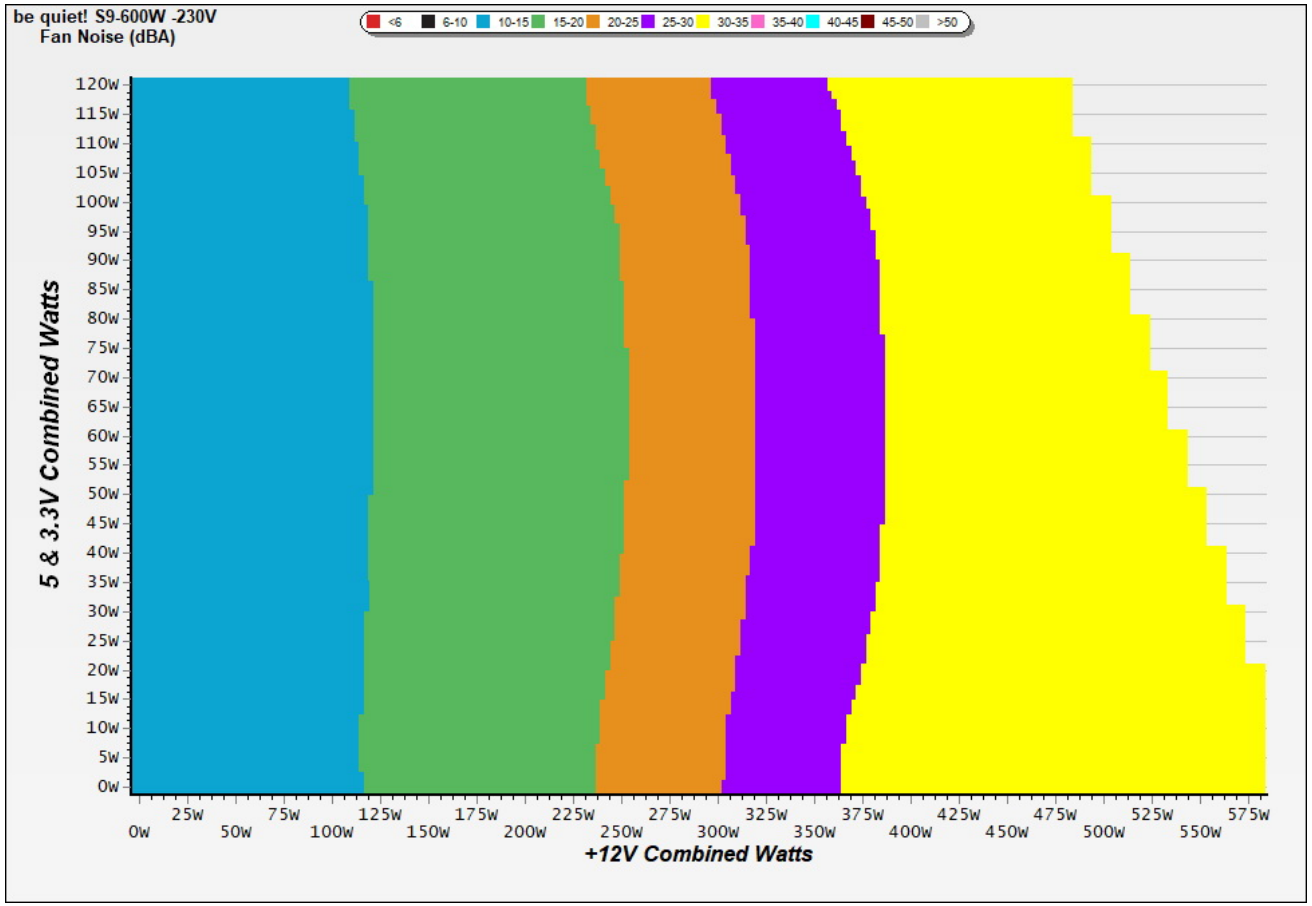
230V



□□

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



□□

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)

230V

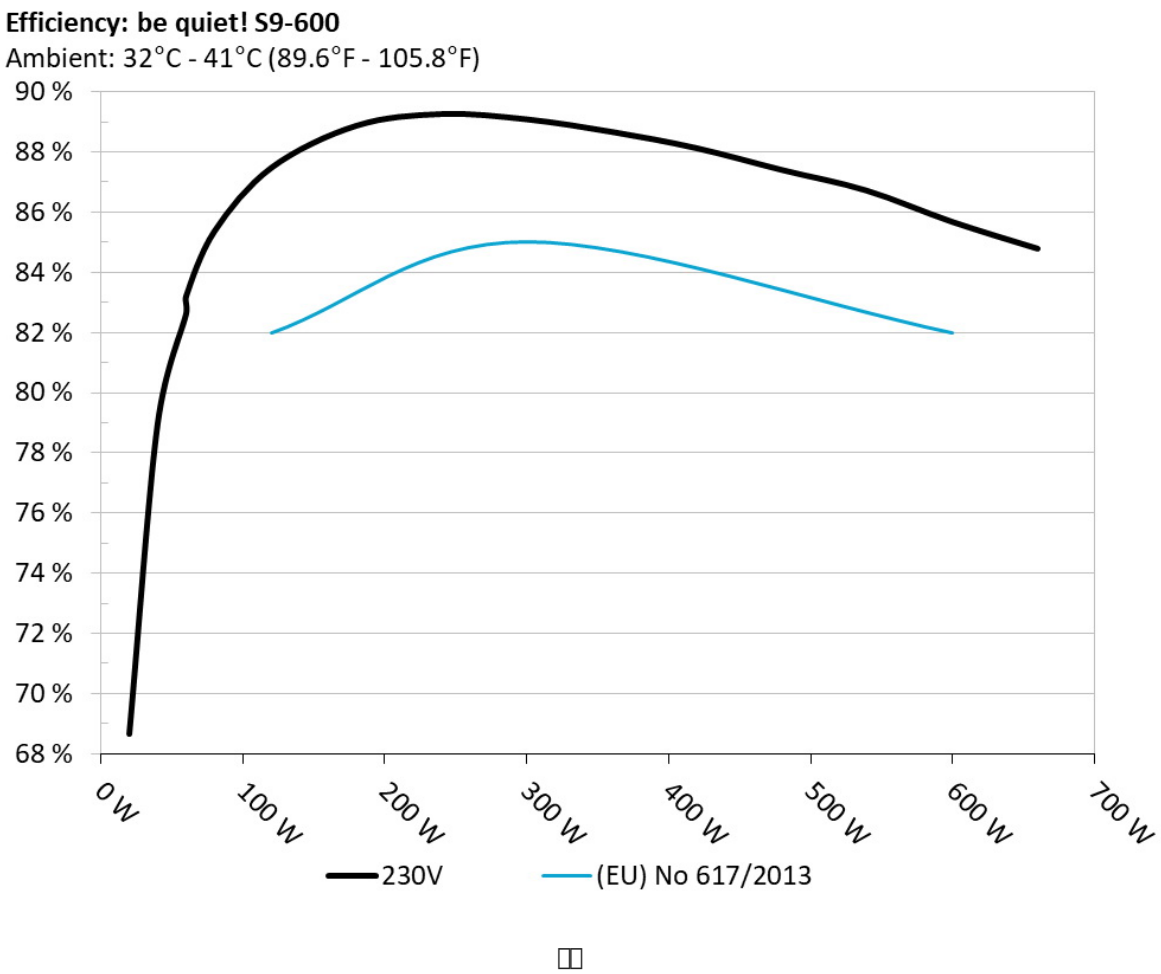
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	524 RPM · 13.2 dB(A) · 34.2 °C	524 RPM · 13.2 dB(A) · 34.2 °C	**+0.0 dB(A)**
20%	532 RPM · 13.5 dB(A) · 34.7 °C	532 RPM · 13.5 dB(A) · 34.7 °C	**+0.0 dB(A)**
50%	788 RPM · 19.4 dB(A) · 36.6 °C	788 RPM · 19.4 dB(A) · 36.6 °C	**+0.0 dB(A)**
100%	1618 RPM · 39.1 dB(A) · 39.9 °C	1618 RPM · 39.1 dB(A) · 39.9 °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.

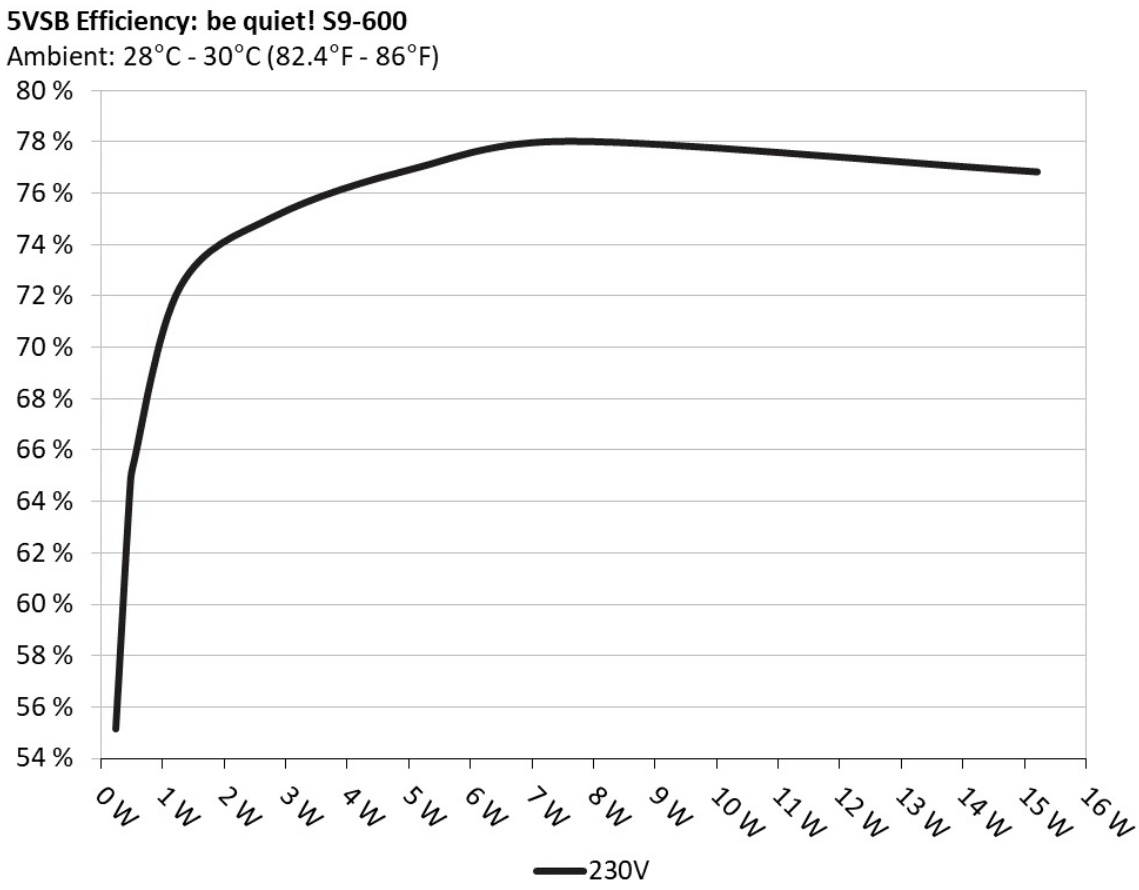
Informational. Not part of the ETA or LAMBDA rating.

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) 230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.231	55.131%	0.018
	5.125V	0.419		230.25V

2	0.090A	0.461	64.476%	0.030
	5.123V	0.715		230.25V
3	0.550A	2.813	75.093%	0.141
	5.113V	3.746		230.25V
4	1.000A	5.106	76.967%	0.211
	5.105V	6.634		230.25V
5	1.500A	7.646	78.012%	0.260
	5.097V	9.801		230.25V
6	3.000A	15.212	76.821%	0.332
	5.070V	19.802		230.25V

Supplementary Tests (For Reference)

10-110%□□□□ 230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.154A	1.974A	1.960A	0.981A	60.010	82.636%	524	13.2	34.24°C	0.877
	12.175V	5.066V	3.372V	5.097V	72.620				38.28°C	230.27V
2	7.333A	2.970A	2.946A	1.180A	120.035	87.492%	532	13.5	34.68°C	0.950
	12.155V	5.051V	3.361V	5.084V	137.196				39.39°C	230.26V
3	11.867A	3.472A	3.445A	1.381A	180.034	88.891%	552	13.6	35.22°C	0.971
	12.133V	5.040V	3.352V	5.072V	202.533				40.59°C	230.26V
4	16.422A	3.977A	3.948A	1.582A	240.039	89.280%	648	16.8	35.76°C	0.980
	12.108V	5.029V	3.343V	5.059V	268.861				42.19°C	230.24V
5	20.649A	4.988A	4.953A	1.784A	300.072	89.101%	788	19.4	36.62°C	0.985
	12.086V	5.013V	3.332V	5.045V	336.778				44.19°C	230.25V
6	24.884A	6.005A	5.964A	1.988A	360.033	88.685%	939	25.0	36.89°C	0.988
	12.065V	4.997V	3.320V	5.030V	405.970				45.01°C	230.25V
7	29.112A	7.029A	6.982A	2.194A	419.655	88.142%	1078	28.5	37.11°C	0.990
	12.041V	4.981V	3.309V	5.015V	476.110				46.20°C	230.25V
8	33.432A	8.003A	8.009A	2.401A	479.883	87.417%	1227	33.3	37.43°C	0.992
	12.017V	4.964V	3.296V	5.000V	548.960				47.35°C	230.25V

9	38.111A	8.587A	8.521A	2.406A	539.470	86.732%	1382	35.4	38.28°C	0.993
	11.990V	4.951V	3.286V	4.990V	621.996				48.77°C	230.24V
10	42.642A	9.118A	9.071A	3.021A	599.898	85.688%	1618	39.1	39.89°C	0.993
	11.964V	4.937V	3.275V	4.967V	700.096				51.20°C	230.24V
11	47.751A	9.133A	9.097A	3.027A	659.908	84.800%	1753	41.2	40.79°C	0.994
	11.941V	4.928V	3.265V	4.957V	778.194				52.59°C	230.24V
CL1	0.105A	14.004A	13.999A	0.000A	117.435	80.648%	924	24.5	36.63°C	0.954
	12.148V	4.967V	3.329V	5.084V	145.615				44.73°C	230.26V
CL2	48.008A	1.000A	1.001A	1.000A	587.952	86.933%	1536	38.4	39.35°C	0.993
	11.969V	5.008V	3.307V	5.025V	676.324				51.09°C	230.23V

The results above are not used in the certification process

20-80□□□□□ 230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.218A	0.491A	0.490A	0.195A	20.000	68.653%	514	12.2	0.661
	12.191V	5.083V	3.382V	5.120V	29.132				230.28V
2	2.437A	0.985A	0.977A	0.391A	39.990	78.985%	514	12.2	0.809
	12.183V	5.077V	3.378V	5.112V	50.630				230.28V
3	3.660A	1.480A	1.467A	0.588A	60.021	83.217%	518	13.0	0.876
	12.176V	5.071V	3.374V	5.105V	72.126				230.27V
4	4.879A	1.975A	1.958A	0.785A	79.972	85.378%	522	13.1	0.911
	12.169V	5.064V	3.369V	5.098V	93.668				230.27V

The results above are not used in the certification process

□□□□ 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.70mV	22.10mV	12.70mV	6.90mV	Pass
20% Load	14.90mV	22.60mV	12.30mV	9.00mV	Pass
30% Load	16.00mV	23.40mV	13.00mV	9.20mV	Pass
40% Load	17.80mV	23.70mV	12.50mV	9.00mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
50% Load	20.30mV	24.90mV	14.30mV	9.70mV	Pass
60% Load	24.30mV	26.80mV	15.50mV	11.30mV	Pass
70% Load	28.20mV	28.50mV	17.70mV	13.90mV	Pass
80% Load	33.00mV	30.60mV	19.00mV	17.70mV	Pass
90% Load	39.00mV	32.80mV	20.00mV	17.80mV	Pass
100% Load	63.90mV	38.40mV	24.70mV	18.10mV	Pass
110% Load	75.30mV	41.50mV	26.30mV	19.50mV	Pass
Crossload1	23.10mV	35.60mV	20.10mV	9.20mV	Pass
Crossload2	58.30mV	31.50mV	21.60mV	15.20mV	Pass

The results above are not used in the certification process

be quiet! System Power 9 600W

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

Cybenetics 提供自愿性认证计划：电源方面有 ETA (效率)、LAMBDA (噪声) 与 SAFE (安全与正确运行)；散热产品方面有 DELTA (机箱隔音) 与 PHI (风扇风量与静压)

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com