



be quiet! Pure Power 11 700W

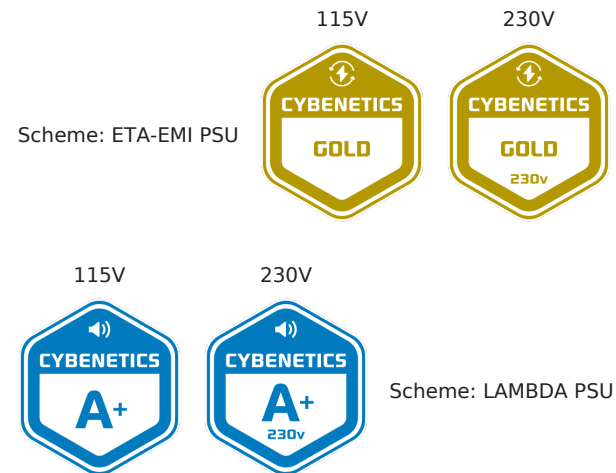
Serial Number 299S8321001223

Lab ID 528

Certification ID 25528

Test Result Report ID: 20PS528A

Certificate Issue Date: Jan 11, 2018



A handwritten signature in blue ink, appearing to read "A. Bitziopoulos", is positioned above the name of the Certification Body General Manager.

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 700W
OEM/ODM	
Serial Number	299S8321001223
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60

Rated Power (W)	700
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Semi Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Rifle Bearing Fan (BQ QF1-12025-HS)
Semi-Passive Operation	X
Cybenetics Testing Information	
Lab ID	528
Date of receipt	Dec 28, 2017
Testing Date	Jan 9, 2018
Report Issued Date	Jan 11, 2018
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Native Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Caps
ATX connector 20+4 pin (550mm)	1	1	18-24AWG	No
4+4 pin EPS12V (600mm)	1	1	18AWG	No
Modular Cables				
Description	Cable Count	Connector Count (Total)	Gauge	Gauge
6+2 pin PCIe (500mm+150mm)	2	4	18AWG	No
SATA (500mm+150mm+150mm)	1	3	18AWG	No
SATA (500mm) / 4-pin Molex (+150mm+150mm)	1	1 / 2	18AWG	No
SATA (500mm+150mm) / 4-pin Molex (+150mm) / FDD (+150mm)	1	2 / 1 / 1	18-22AWG	No

AC Power Cord (1360mm)	1	1	18AWG	-
------------------------	---	---	-------	---

Power Specifications

Rail		3.3V	5V	12V1	12V2	5VSB	-12V
Max. Power	Amps	25	20	36	30	3	0.3
	Watts	150		56	15		3.6
				672			
Total Max. Power (W)		700					

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	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.620%
Average Noise Output (>1450 Load Combinations)	17.09dBA
Average PF (>1450 Load Combinations)	0.979
Efficiency With 10W (≤500W) or 2% (>500W) Load	62.659%
Standby Power Consumption	0.0981W
Non-Accredited	
12V Ripple (Full Load)	43.31mV
5V Ripple (Full Load)	35.83mV
3.3V Ripple (Full Load)	41.58mV
5VSB Ripple (Full Load)	18.20mV

12V Load Regulation	0.99%
5V Load Regulation	2.07%
3.3V Load Regulation	3.13%
5VSB Load Regulation	2.96%
Inrush Current	117.623A

230V

Accredited		
Average Efficiency (>1450 load combinations)	90.190%	
Average Noise Output (>1450 Load Combinations)	16.29dBA	
Average PF (>1450 Load Combinations)	0.958	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1558W	
Non-Accredited		
12V Ripple (Full Load)	25.79mV	
5V Ripple (Full Load)	30.45mV	
3.3V Ripple (Full Load)	37.18mV	
5VSB Ripple (Full Load)	12.69mV	
12V Load Regulation	0.95%	
5V Load Regulation	1.99%	
3.3V Load Regulation	2.82%	
5VSB Load Regulation	2.90%	
Inrush Current	91.489A	
Hold-Up Time & PWR_OK Signal	26.00ms	
AC Loss to PWR_OK Hold Up Time	24.60ms	
PWR_OK Inactive to DC Loss Delay	1.40ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

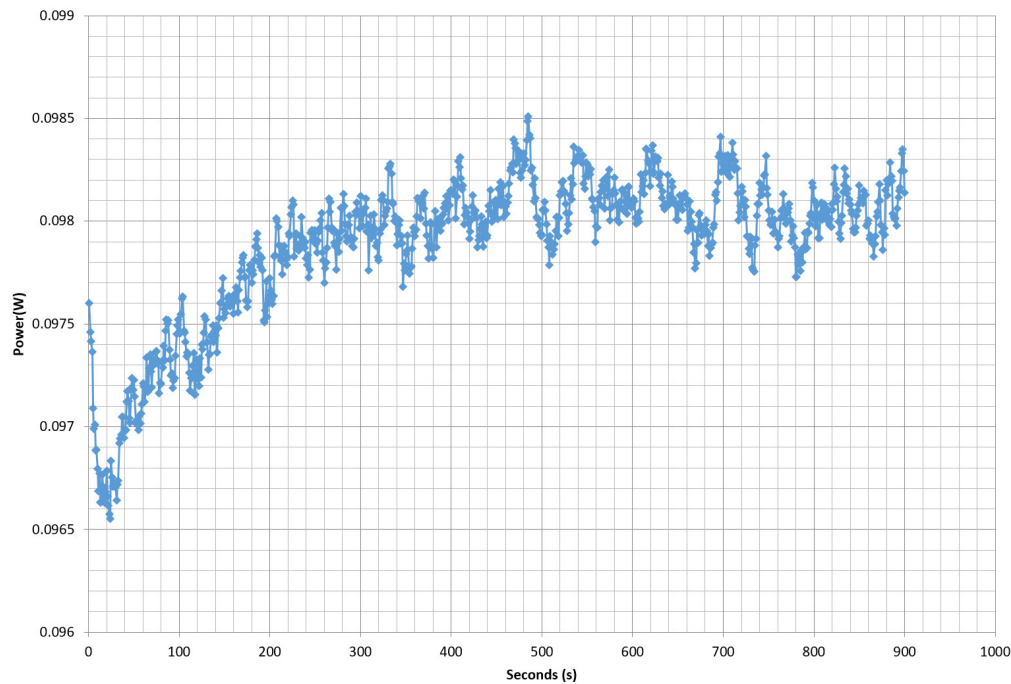
Hold-Up Time (ms)	26.0
AC Loss to PWR_OK Hold Up Time (ms)	24.6
PWR_OK Inactive to DC Loss Delay (ms)	1.4

Stromverbrauch im Ruhezustand

Graphs

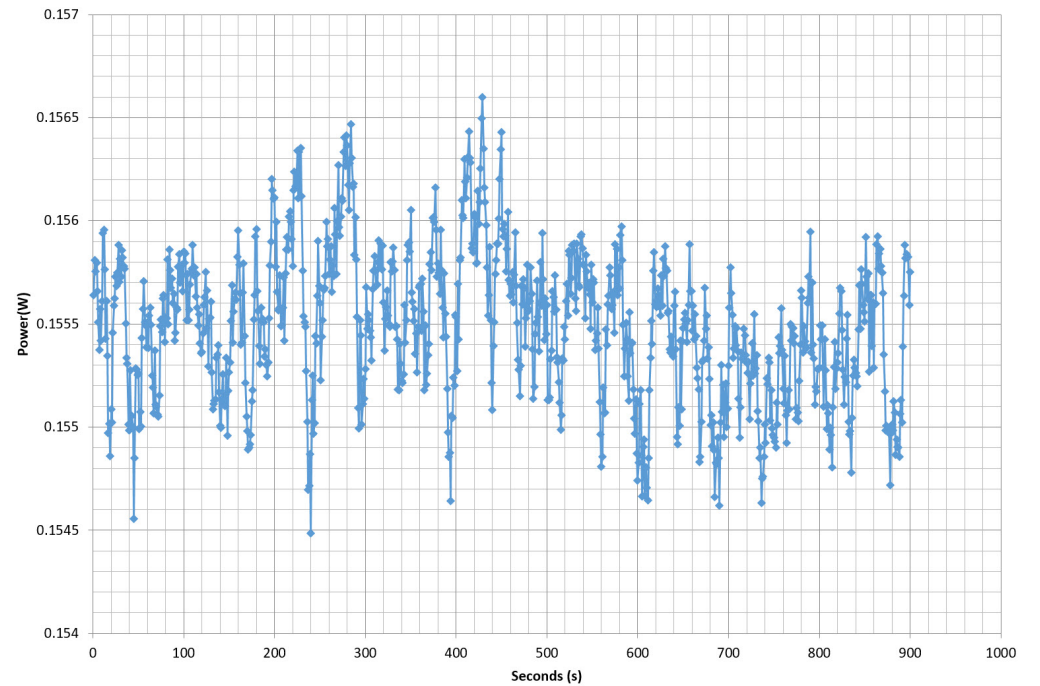
115V

Power - 299S8321001223 - 26/10/2018 - 12:46



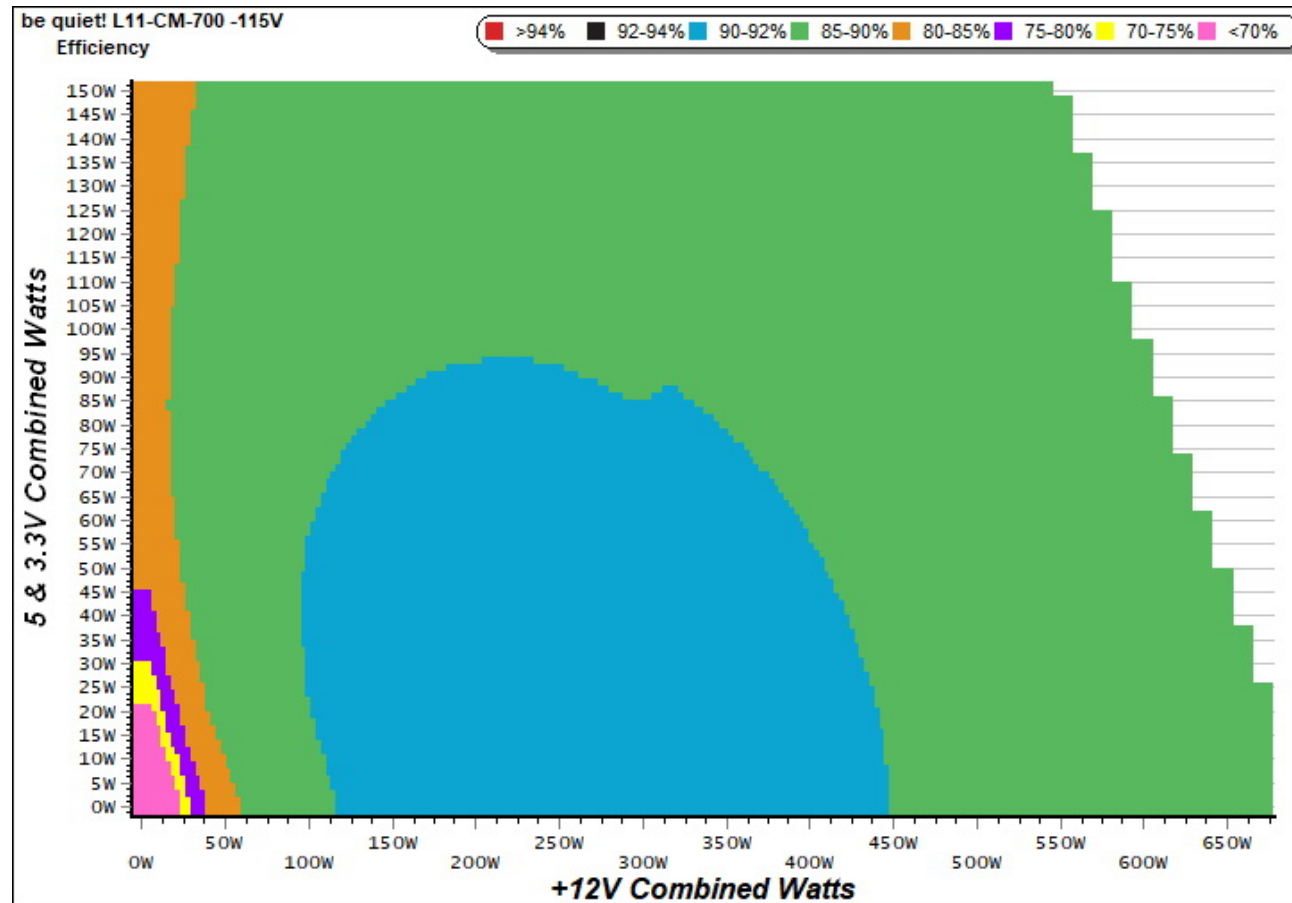
230V

Power - 299S8321001223 - 26/10/2018 - 12:46



Efficiency Graph

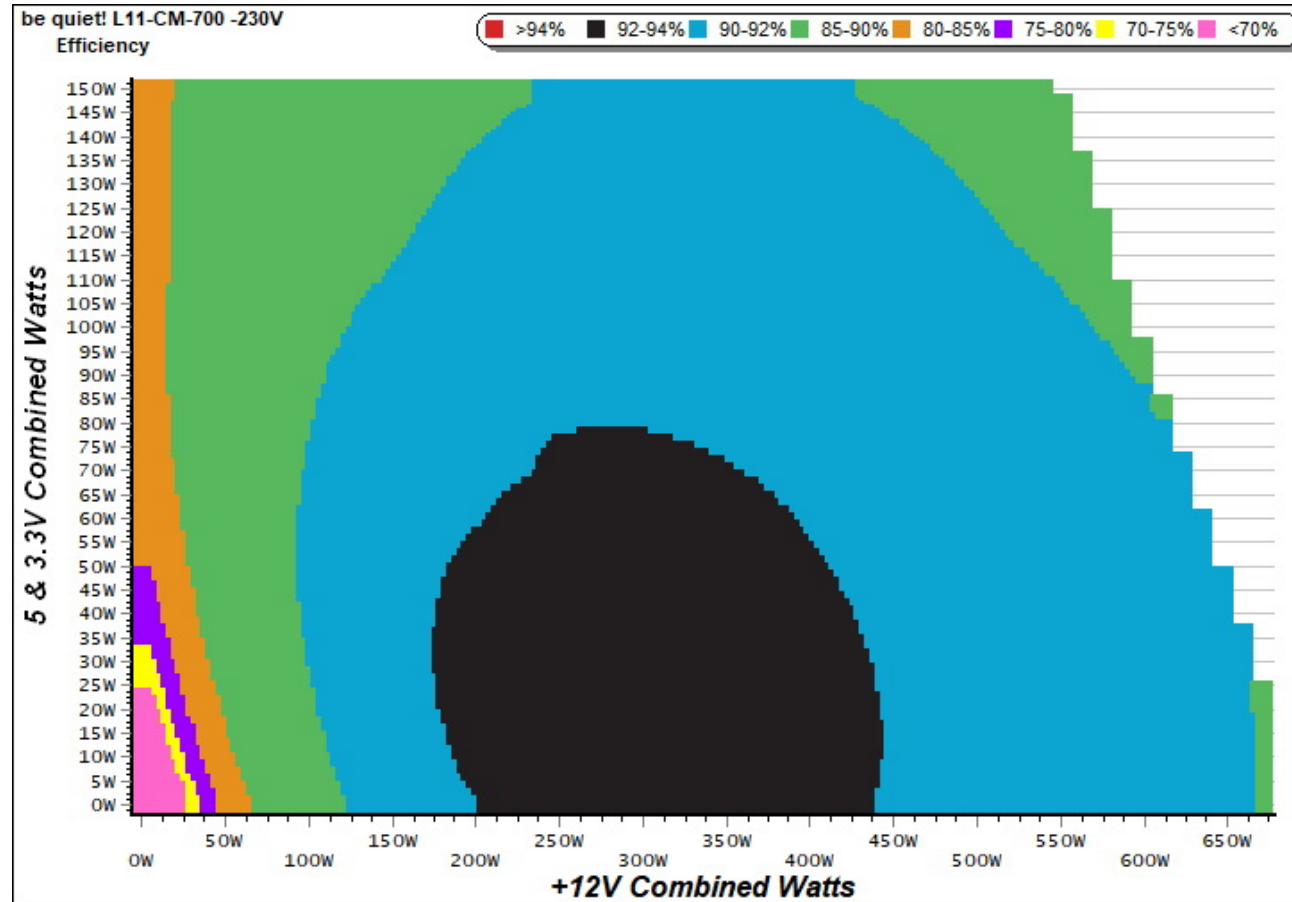
115V



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

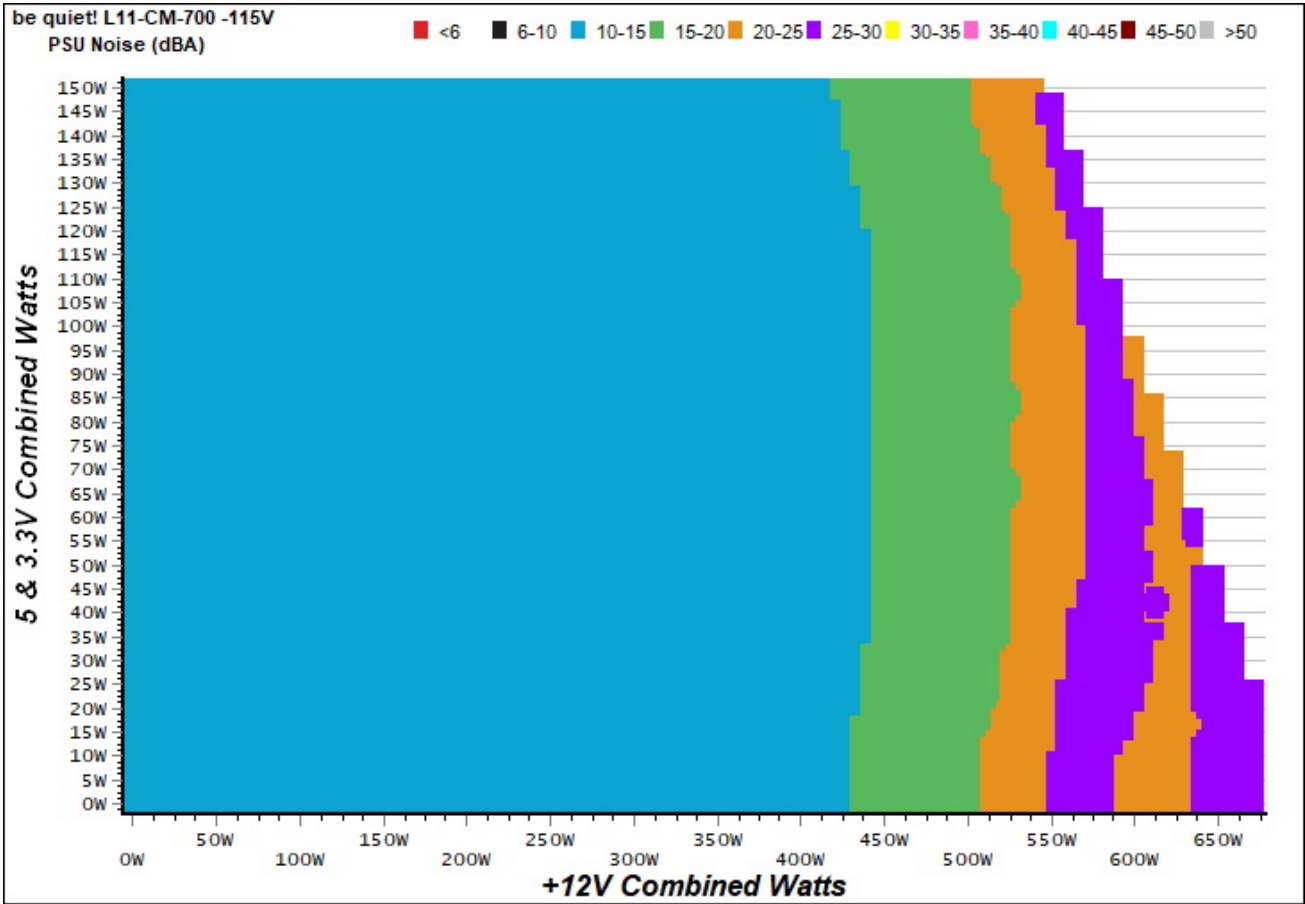


INFO

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.

Noise Graph

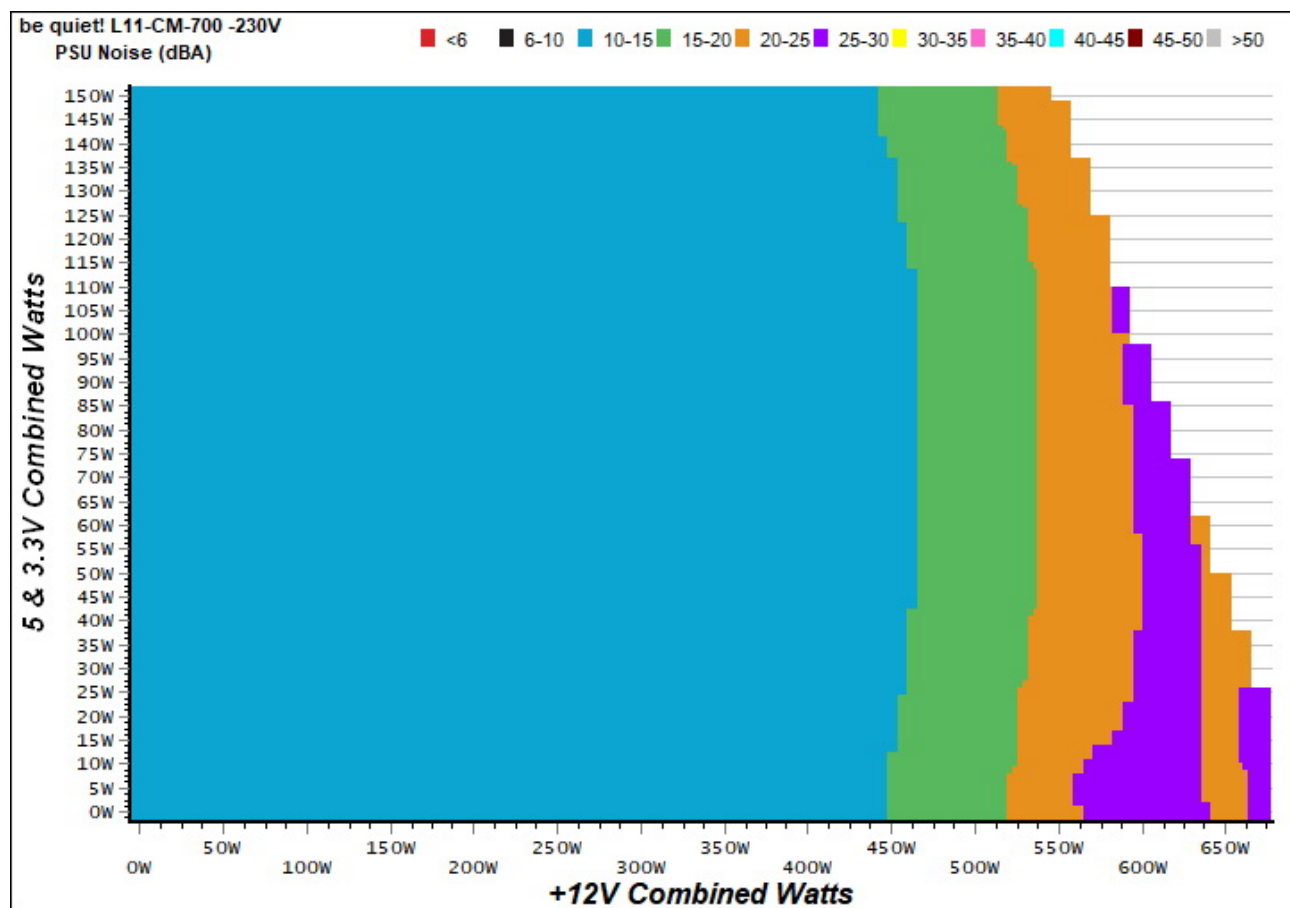
115V



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

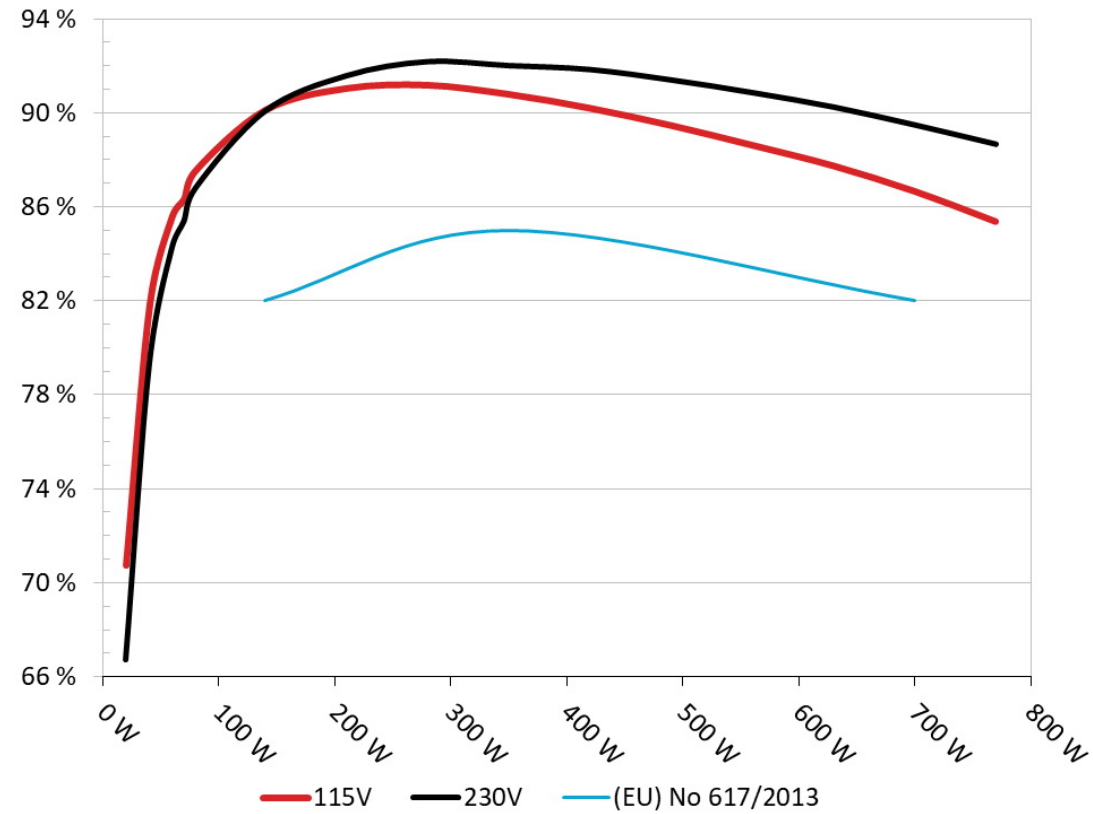
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails.

Indicative Performance

Efficiency under high ambient temperature

Efficiency: be quiet! L11-CM-700

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



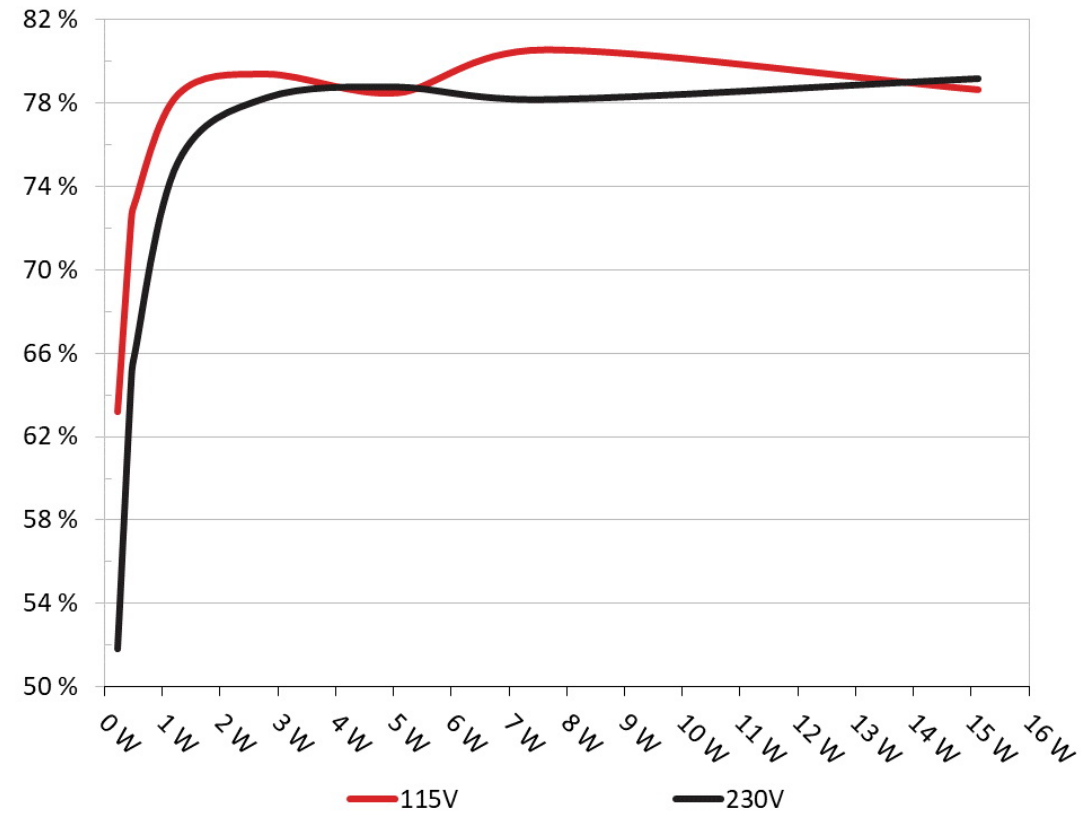
INFO

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

5VSB Efficiency: be quiet! L11-CM-700

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



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	0.230	63.187%	0.068
	5.104V	0.364		115.06V
2	0.090A	0.460	72.214%	0.115
	5.102V	0.637		115.06V
3	0.550A	2.801	79.393%	0.329
	5.092V	3.528		115.05V
4	1.000A	5.083	78.490%	0.382
	5.082V	6.476		115.06V
5	1.500A	7.609	80.553%	0.408
	5.072V	9.446		115.05V
6	3.000A	15.122	78.642%	0.453
	5.040V	19.229		115.06V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	51.802%	0.026
	5.102V	0.444		230.20V
2	0.090A	0.460	64.426%	0.041
	5.101V	0.714		230.20V
3	0.550A	2.801	78.262%	0.173
	5.091V	3.579		230.21V
4	1.000A	5.083	78.782%	0.248
	5.082V	6.452		230.21V
5	1.500A	7.608	78.183%	0.296
	5.071V	9.731		230.20V
6	3.001A	15.120	79.183%	0.356
	5.039V	19.095		230.21V

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
1	3.971A	1.990A	1.948A	0.985A	69.651	86.337%	685	12.5	40.04°C	0.915
	12.101V	5.026V	3.386V	5.077V	80.673				44.95°C	115.05V
2	9.002A	2.991A	2.933A	1.185A	139.723	90.135%	687	12.1	40.45°C	0.948
	12.088V	5.017V	3.375V	5.064V	155.015				45.72°C	115.05V
3	14.378A	3.495A	3.415A	1.386A	209.635	91.060%	687	12.1	41.26°C	0.968
	12.076V	5.009V	3.367V	5.052V	230.217				46.74°C	115.05V
4	19.764A	4.003A	3.932A	1.588A	279.657	91.198%	689	11.2	41.88°C	0.979
	12.065V	4.997V	3.357V	5.038V	306.649				47.84°C	115.04V
5	24.829A	5.013A	4.928A	1.791A	349.737	90.811%	692	11.1	42.54°C	0.987
	12.052V	4.988V	3.347V	5.024V	385.125				48.86°C	115.04V
6	29.908A	6.027A	5.934A	1.996A	419.850	90.217%	693	10.9	42.97°C	0.991
	12.039V	4.977V	3.335V	5.011V	465.380				50.52°C	115.04V
7	34.993A	7.052A	6.956A	2.202A	489.979	89.479%	789	14.0	43.22°C	0.992
	12.027V	4.964V	3.322V	4.997V	547.594				52.08°C	115.03V
8	40.096A	8.081A	7.984A	2.409A	560.070	88.639%	1047	19.1	43.89°C	0.993
	12.013V	4.950V	3.306V	4.982V	631.853				53.30°C	115.03V
9	45.607A	8.606A	8.497A	2.414A	629.791	87.761%	1270	25.1	44.55°C	0.994
	12.000V	4.939V	3.295V	4.973V	717.623				54.54°C	115.03V
10	50.897A	9.137A	9.053A	3.031A	699.814	86.678%	1476	29.4	45.19°C	0.995
	11.987V	4.926V	3.281V	4.949V	807.369				56.29°C	115.03V
11	56.801A	9.156A	9.081A	3.037A	769.846	85.389%	1712	33.5	46.98°C	0.993
	11.974V	4.916V	3.270V	4.941V	901.578				58.52°C	115.02V
CL1	0.139A	18.004A	18.000A	0.000A	151.169	82.350%	906	17.7	42.94°C	0.958
	12.068V	4.967V	3.337V	5.063V	183.568				48.88°C	115.05V

CL2	56.005A	1.002A	1.001A	1.000A	685.276	86.822%	1496	29.9	45.73°C	0.994
	11.999V	4.949V	3.300V	5.009V	789.287				56.46°C	115.03V

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
1	3.971A	1.994A	1.960A	0.985A	69.640	85.384%	685	12.5	39.69°C	0.860
	12.097V	5.015V	3.368V	5.077V	81.561				44.89°C	230.19V
2	9.006A	2.997A	2.949A	1.185A	139.748	90.084%	686	12.2	40.82°C	0.917
	12.085V	5.007V	3.358V	5.065V	155.131				46.70°C	230.20V
3	14.387A	3.503A	3.434A	1.385A	209.686	91.584%	687	12.1	41.14°C	0.942
	12.072V	4.997V	3.350V	5.053V	228.954				47.57°C	230.20V
4	19.778A	4.008A	3.950A	1.587A	279.722	92.183%	689	11.2	41.95°C	0.955
	12.060V	4.991V	3.341V	5.040V	303.443				48.76°C	230.02V
5	24.844A	5.022A	4.952A	1.791A	349.827	92.017%	687	12.1	42.03°C	0.969
	12.048V	4.980V	3.331V	5.026V	380.176				49.89°C	230.19V
6	29.916A	6.034A	5.954A	1.996A	419.899	91.847%	683	12.4	42.87°C	0.974
	12.037V	4.973V	3.324V	5.011V	457.172				51.26°C	230.20V
7	35.008A	7.057A	6.974A	2.202A	490.012	91.405%	781	13.9	43.21°C	0.978
	12.023V	4.961V	3.312V	4.997V	536.087				52.13°C	230.20V
8	40.111A	8.089A	8.002A	2.409A	560.102	90.864%	1050	19.4	44.44°C	0.981
	12.009V	4.946V	3.299V	4.982V	616.417				53.83°C	230.20V
9	45.617A	8.611A	8.514A	2.414A	629.832	90.253%	1281	25.2	44.84°C	0.983
	11.998V	4.937V	3.289V	4.973V	697.855				54.85°C	230.19V
10	50.907A	9.144A	9.071A	3.032A	699.849	89.492%	1478	29.4	45.72°C	0.985
	11.985V	4.923V	3.275V	4.949V	782.023				56.60°C	230.19V
11	56.816A	9.162A	9.095A	3.038A	769.856	88.674%	1682	33.1	46.70°C	0.986
	11.971V	4.913V	3.265V	4.939V	868.183				58.38°C	230.19V
CL1	0.139A	18.005A	18.002A	0.000A	150.730	83.084%	913	17.8	42.45°C	0.929
	12.065V	4.959V	3.320V	5.063V	181.418				49.58°C	230.20V

CL2	56.008A	1.002A	1.000A	1.000A	685.124	89.629%	1477	29.4	45.74°C	0.985
	11.996V	4.942V	3.292V	5.008V	764.403				56.47°C	230.18V

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])	PF/AC Volts
1	1.195A	0.497A	0.472A	0.196A	19.575	70.727%	677	11.5	0.836
	12.112V	5.035V	3.391V	5.100V	27.677				115.05V
2	2.453A	0.994A	0.972A	0.393A	39.992	81.845%	681	12.4	0.885
	12.107V	5.030V	3.387V	5.093V	48.863				115.04V
3	3.636A	1.491A	1.446A	0.590A	59.410	85.605%	682	12.4	0.906
	12.104V	5.030V	3.387V	5.087V	69.400				115.05V
4	4.896A	1.987A	1.949A	0.787A	79.824	87.568%	684	12.5	0.922
	12.100V	5.026V	3.385V	5.080V	91.157				115.05V

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])	PF/AC Volts
1	1.191A	0.497A	0.472A	0.196A	19.507	66.739%	681	12.4	0.696
	12.107V	5.022V	3.374V	5.099V	29.229				230.19V
2	2.450A	0.995A	0.978A	0.393A	39.944	79.345%	682	12.4	0.795
	12.103V	5.019V	3.371V	5.092V	50.342				230.19V
3	3.638A	1.493A	1.455A	0.590A	59.412	84.277%	683	12.4	0.842
	12.099V	5.018V	3.370V	5.086V	70.496				230.19V
4	4.897A	1.994A	1.962A	0.787A	79.833	86.821%	685	12.5	0.873
	12.095V	5.015V	3.367V	5.080V	91.951				230.19V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.7 mV	12.7 mV	11.6 mV	15.5 mV	Pass
20% Load	13.1 mV	17.4 mV	17.3 mV	18.5 mV	Pass
30% Load	16.6 mV	19.9 mV	21.5 mV	17.9 mV	Pass
40% Load	18.0 mV	21.9 mV	22.7 mV	11.4 mV	Pass
50% Load	20.8 mV	24.7 mV	25.4 mV	12.5 mV	Pass
60% Load	21.8 mV	26.2 mV	28.4 mV	11.4 mV	Pass
70% Load	24.1 mV	27.6 mV	32.2 mV	14.5 mV	Pass
80% Load	25.7 mV	30.9 mV	33.6 mV	15.6 mV	Pass
90% Load	33.3 mV	33.0 mV	36.5 mV	16.6 mV	Pass
100% Load	43.3 mV	35.8 mV	41.6 mV	18.2 mV	Pass
110% Load	59.6 mV	37.9 mV	44.4 mV	19.9 mV	Pass
Crossload 1	18.2 mV	27.5 mV	24.4 mV	19.3 mV	Pass
Crossload 2	39.0 mV	33.8 mV	37.5 mV	18.9 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.8 mV	12.7 mV	9.9 mV	13.7 mV	Pass
20% Load	6.7 mV	13.5 mV	11.8 mV	16.6 mV	Pass
30% Load	8.3 mV	15.7 mV	14.5 mV	20.8 mV	Pass
40% Load	10.9 mV	16.5 mV	17.6 mV	22.9 mV	Pass
50% Load	12.8 mV	18.2 mV	20.1 mV	23.5 mV	Pass
60% Load	15.2 mV	20.0 mV	22.5 mV	12.8 mV	Pass
70% Load	16.2 mV	21.4 mV	26.0 mV	13.6 mV	Pass
80% Load	18.7 mV	24.1 mV	28.9 mV	14.4 mV	Pass

