Cybenetics

Anex

be quiet! L11-CM-700

Lab ID#: 528
Receipt Date: -
Test Date: -

Report: 20PS528A
Report Date: Jan 11, 2000

DUT INFORMATION

Brand	be quiet!
Manufacturer (OEM)	
Series	Pure Power 11
Model Number	L11-CM-700
Serial Number	299S8321001223
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60
Rated Power (W)	700
Type	ATX12V
Cooling	120mm Rifle Bearing Fan (BQ QF1-12025-HS)
Semi-Passive Operation	✗
Cable Design	Semi Modular

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					

CABLES AND CONNECTORS

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	-

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.620
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	62.659
Average Efficiency 5VSB	78.777
Standby Power Consumption (W) -115V	0.0981398
Standby Power Consumption (W) -230V	0.1557530
Average PF	0.979
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	17.09
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A+

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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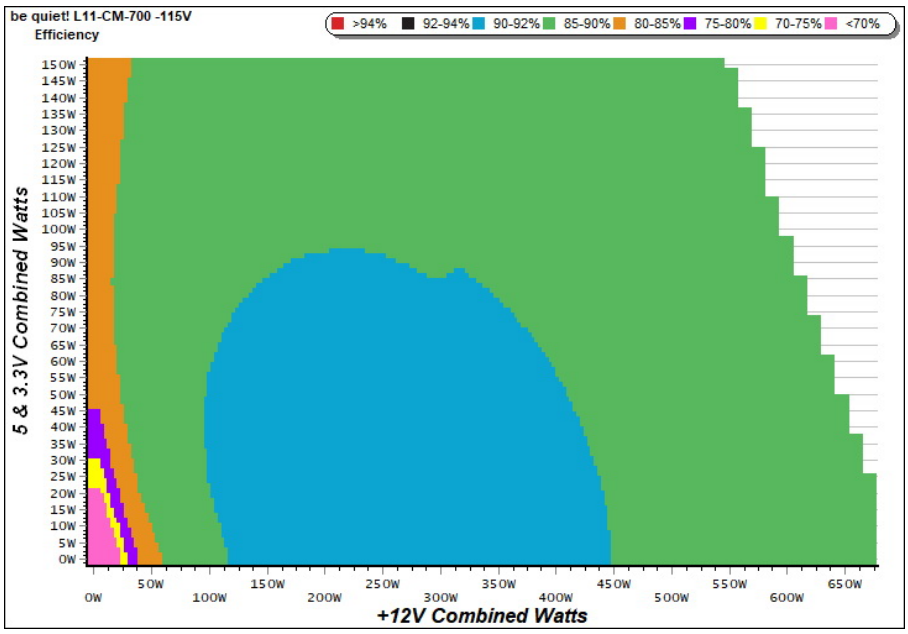
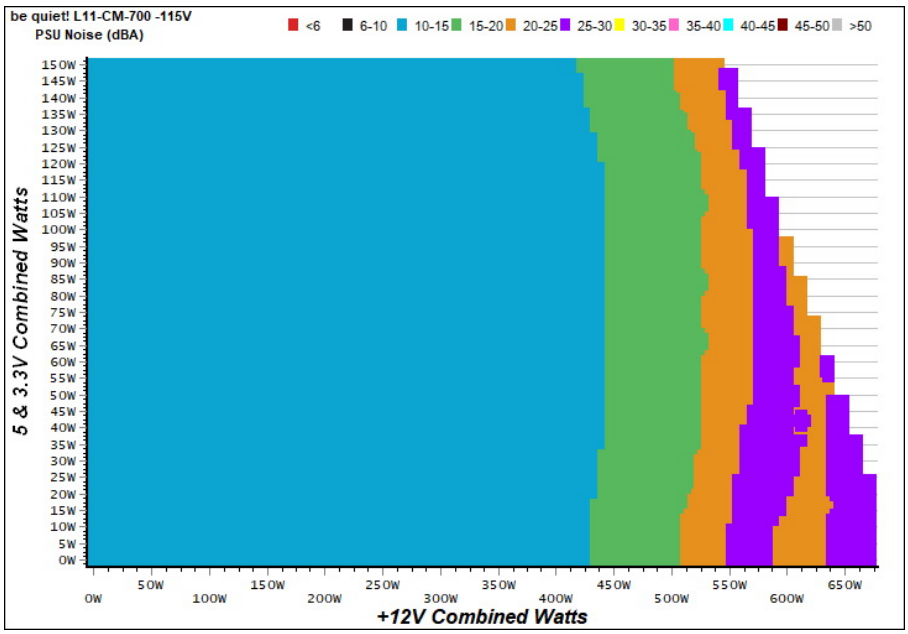
EFFICIENCY GRAPH



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



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

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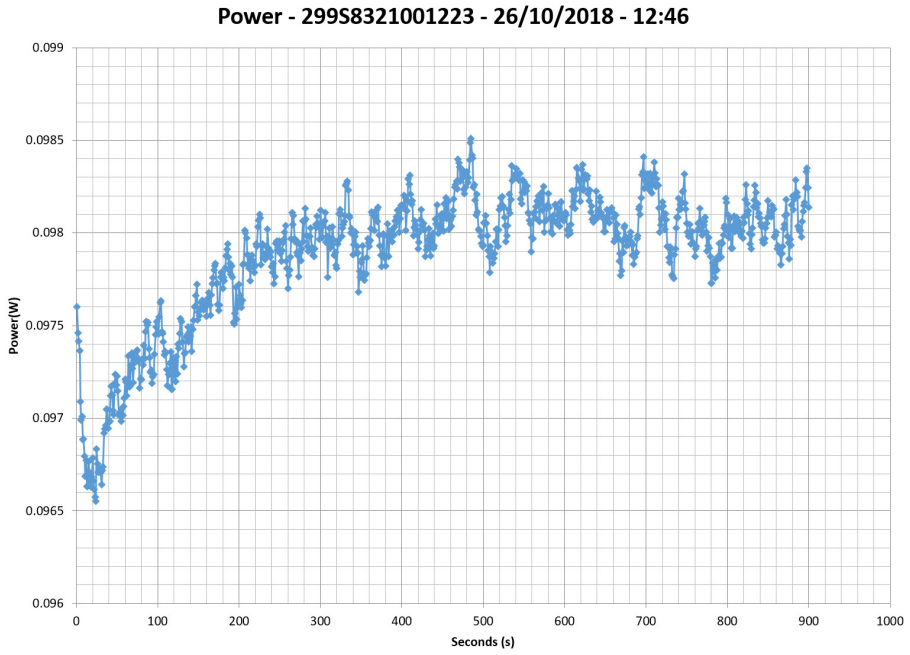
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

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

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

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

VAMPIRE POWER -115V



INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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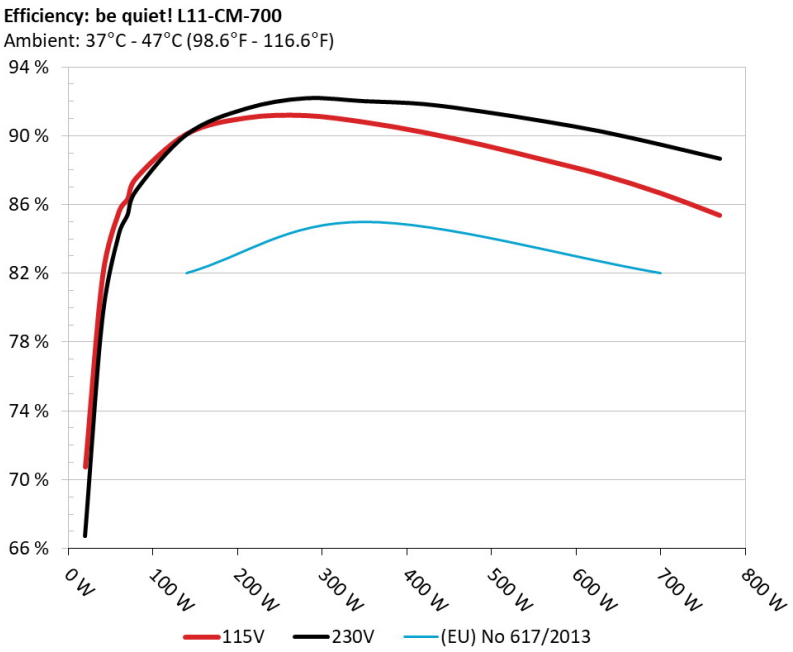
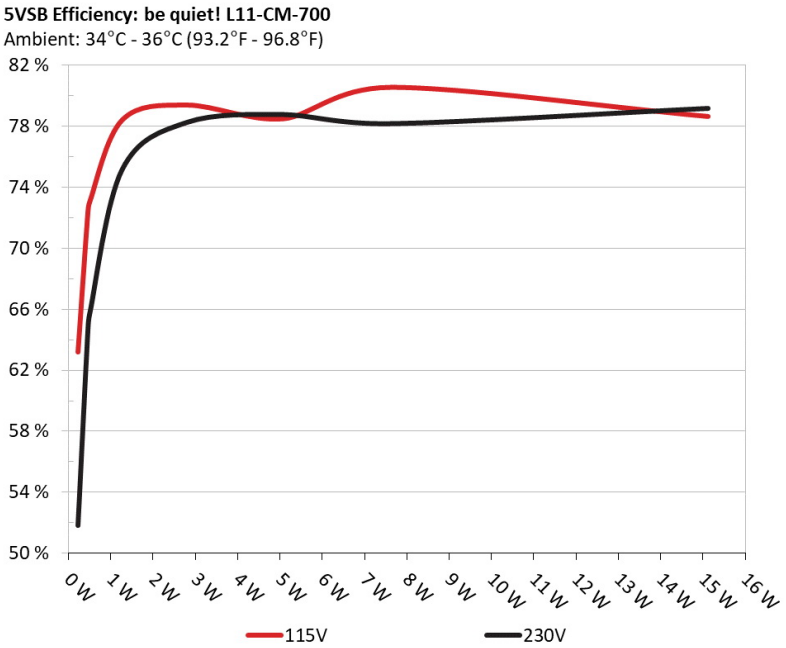
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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10-110% LOAD TESTS

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

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20-80W LOAD TESTS

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

RIPPLE MEASUREMENTS

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

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
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

Top side

Power specifications label

CERTIFICATIONS