NZXT

NZXT NP-C650M

31195051802704

Lab ID NZ65001648

Certification ID 251648

Test Result Report ID: 20PS1648A

Certificate Issue Date: May 7, 2020

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





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	NZXT
Model	NP-C650M
OEM/ODM	Seasonic
Serial Number	31195051802704
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	9-4.5
□□□□ (Hz)	50-60

□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	NZ65001648
Date of receipt	Apr 2, 2020
Testing Date	Apr 30, 2020
Report Issued Date	May 7, 2020
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (610mm)	1	1	18-20AWG	□
4+4 pin EPS 12V □□ (650mm)	1	1	18AWG	□
6+2pin PCIe□□ (680mm+80mm)	2	4	18AWG	□
SATA□□ (500mm+100mm+100mm+100mm)	2	8	18AWG	□
4-pin Molex (500+100mm+100mm)	2	6	18AWG	□
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54	3	0.3
	□	100		648	15	3.6
□□□□□ (W)		650				

Test Results

Temperature & Compliance Info

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

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.572%
Average Noise Output (>1450 Load Combinations)	20.86dBA
PF□□□ (>1450 Load Combinations)	0.975
Efficiency With 10W (≤500W) or 2% (>500W) Load	61.251%
□□□□□□	0.0447W
Non-Accredited	
12V Ripple (Full Load)	19.91mV
5V Ripple (Full Load)	17.10mV
3.3V Ripple (Full Load)	15.53mV
5VSB Ripple (Full Load)	11.22mV
12V Load Regulation	0.27%
5V Load Regulation	0.38%
3.3V Load Regulation	0.42%

5VSB Load Regulation	2.62%
Inrush Current	27.830A

230V

Accredited		
□□□□ (>1450 load combinations)		90.686%
Average Noise Output (>1450 Load Combinations)		19.06dBA
PF□□□ (>1450 Load Combinations)		0.934
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0706W
Non-Accredited		
12V Ripple (Full Load)		20.57mV
5V Ripple (Full Load)		17.46mV
3.3V Ripple (Full Load)		15.97mV
5VSB Ripple (Full Load)		10.45mV
12V Load Regulation		0.24%
5V Load Regulation		0.32%
3.3V Load Regulation		0.39%
5VSB Load Regulation		2.46%
Inrush Current		59.280A
□□□□ & PG□□		22.70ms
AC Loss to PWR_OK Hold Up Time		19.30ms
PWR_OK Inactive to DC Loss Delay		3.40ms
PSU Timings: T1 (20% / 100%)	82.0ms	82.0ms
PSU Timings: T3 (20% / 100%)	325.0ms	325.0ms
OPP (0.00°C / 0.00°C)	136.63%	-

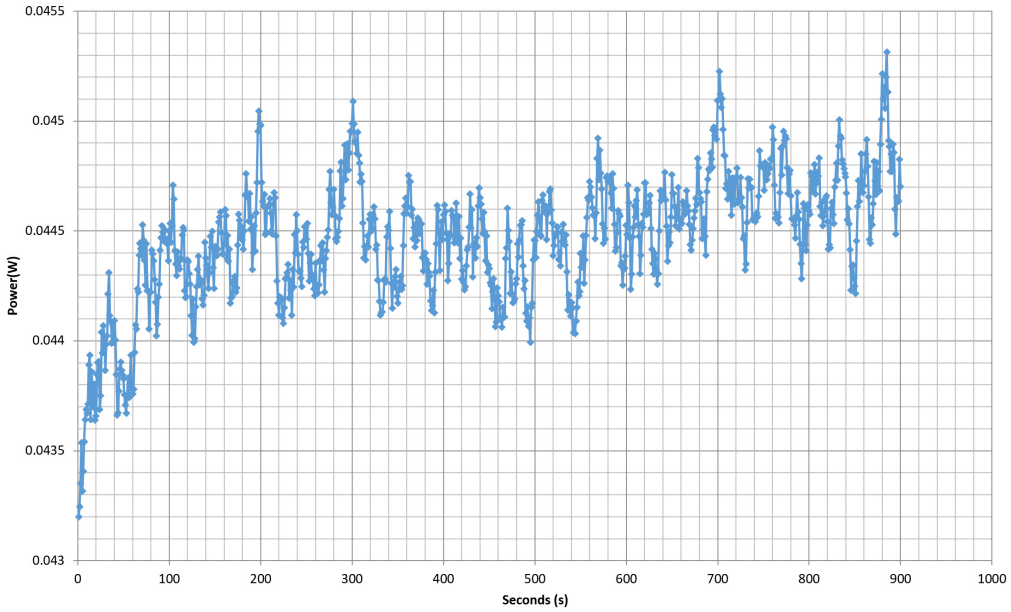
□□□□ & PG□□

Hold-Up Time (ms)	22.7
AC Loss to PWR_OK Hold Up Time (ms)	19.3

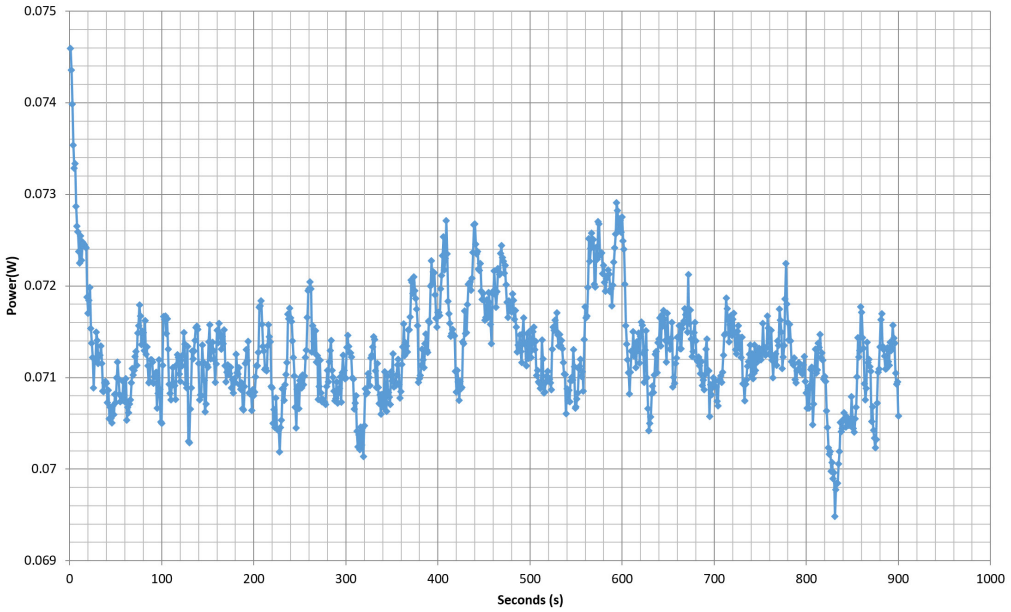
PWR_OK Inactive to DC Loss Delay (ms)	3.4

Graphs

115V



230V



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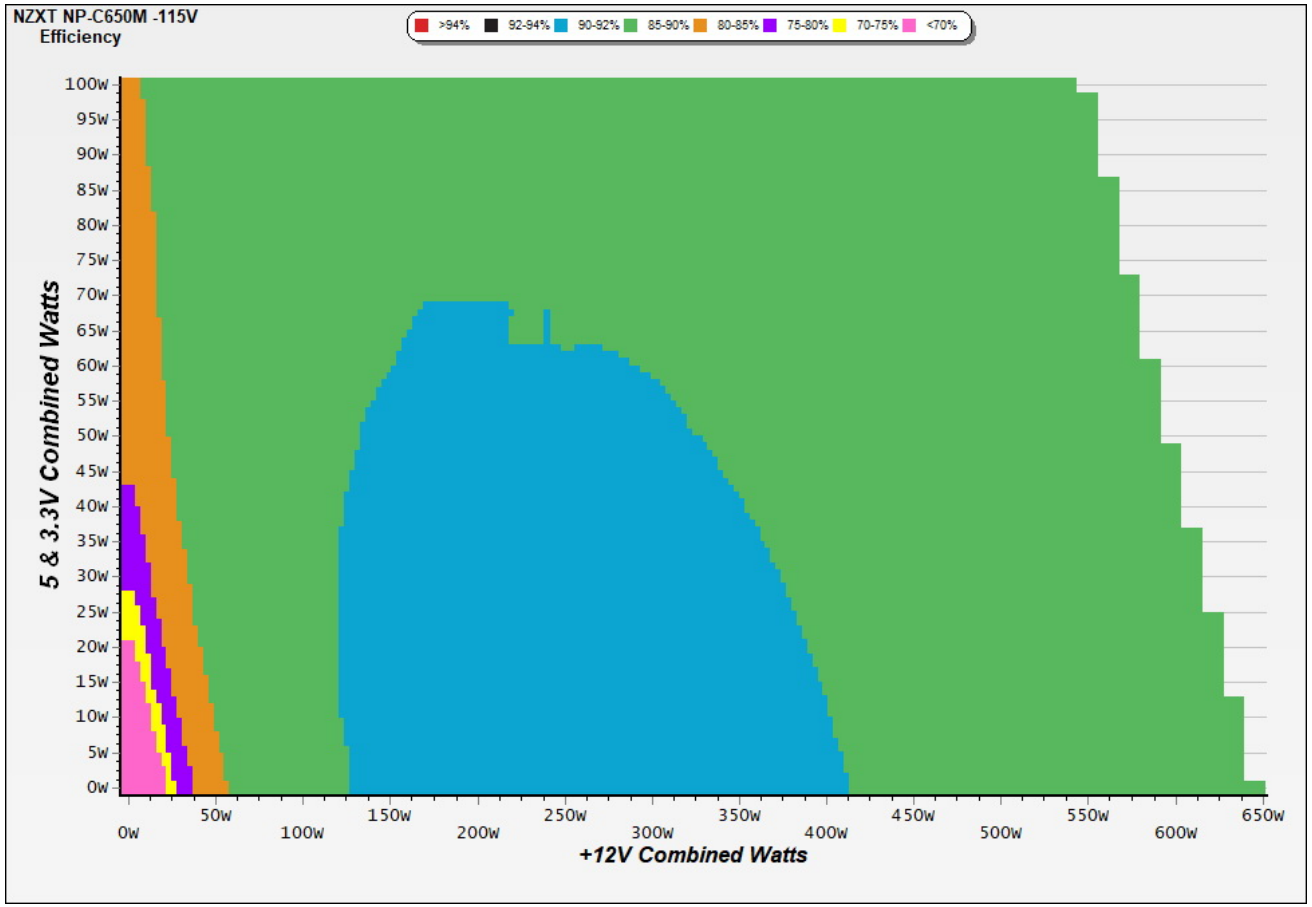
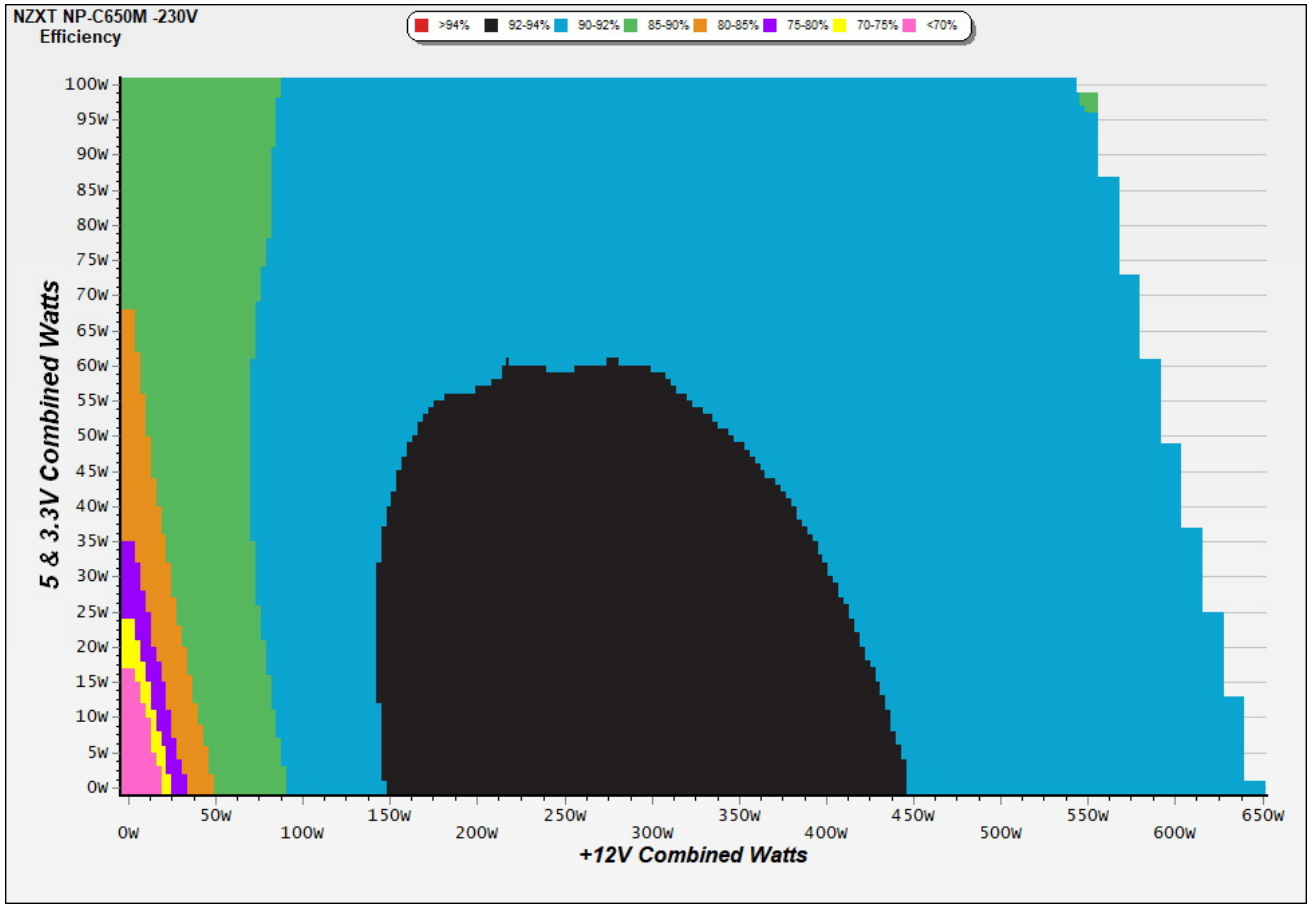
115V



□□

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

230V



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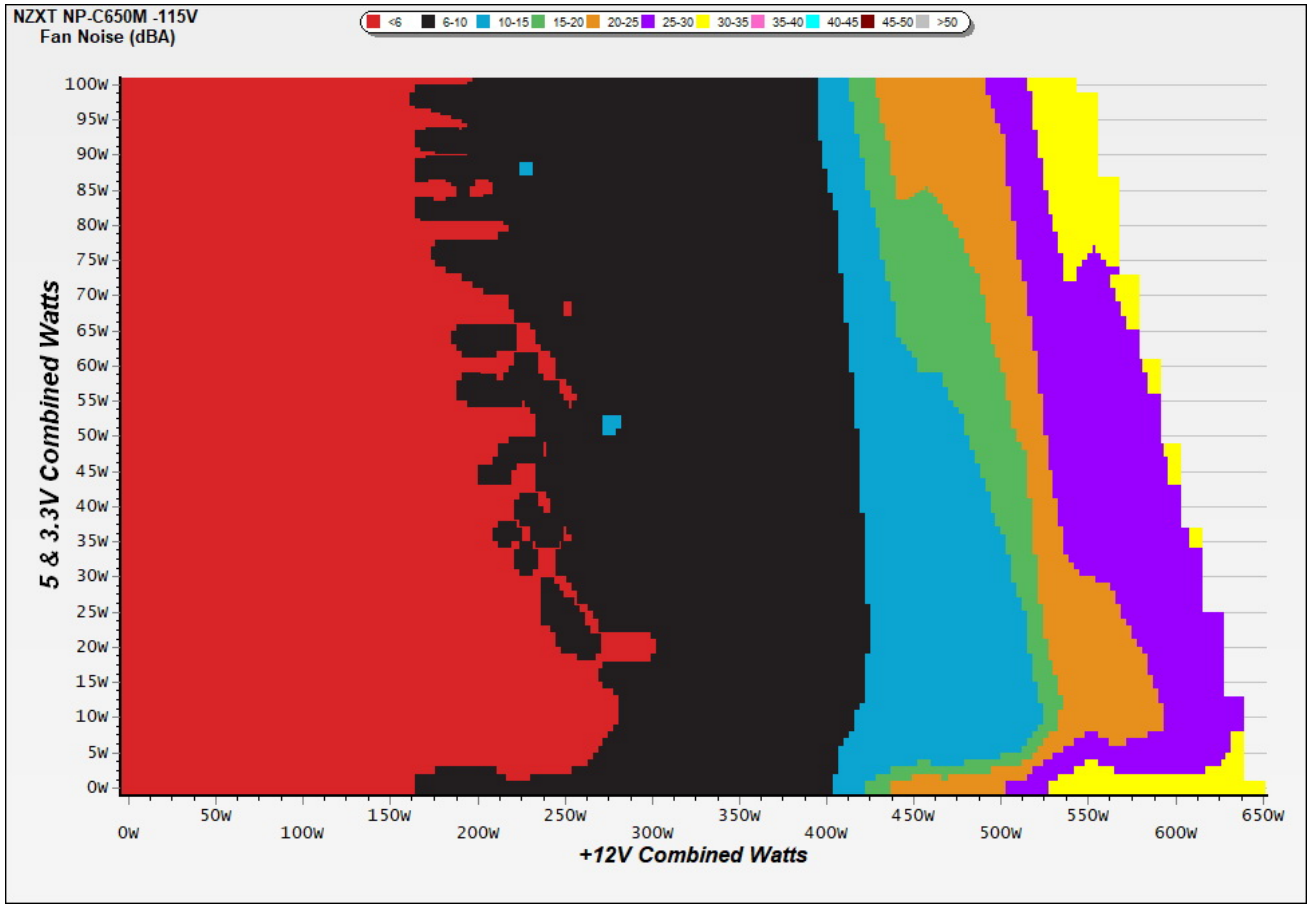
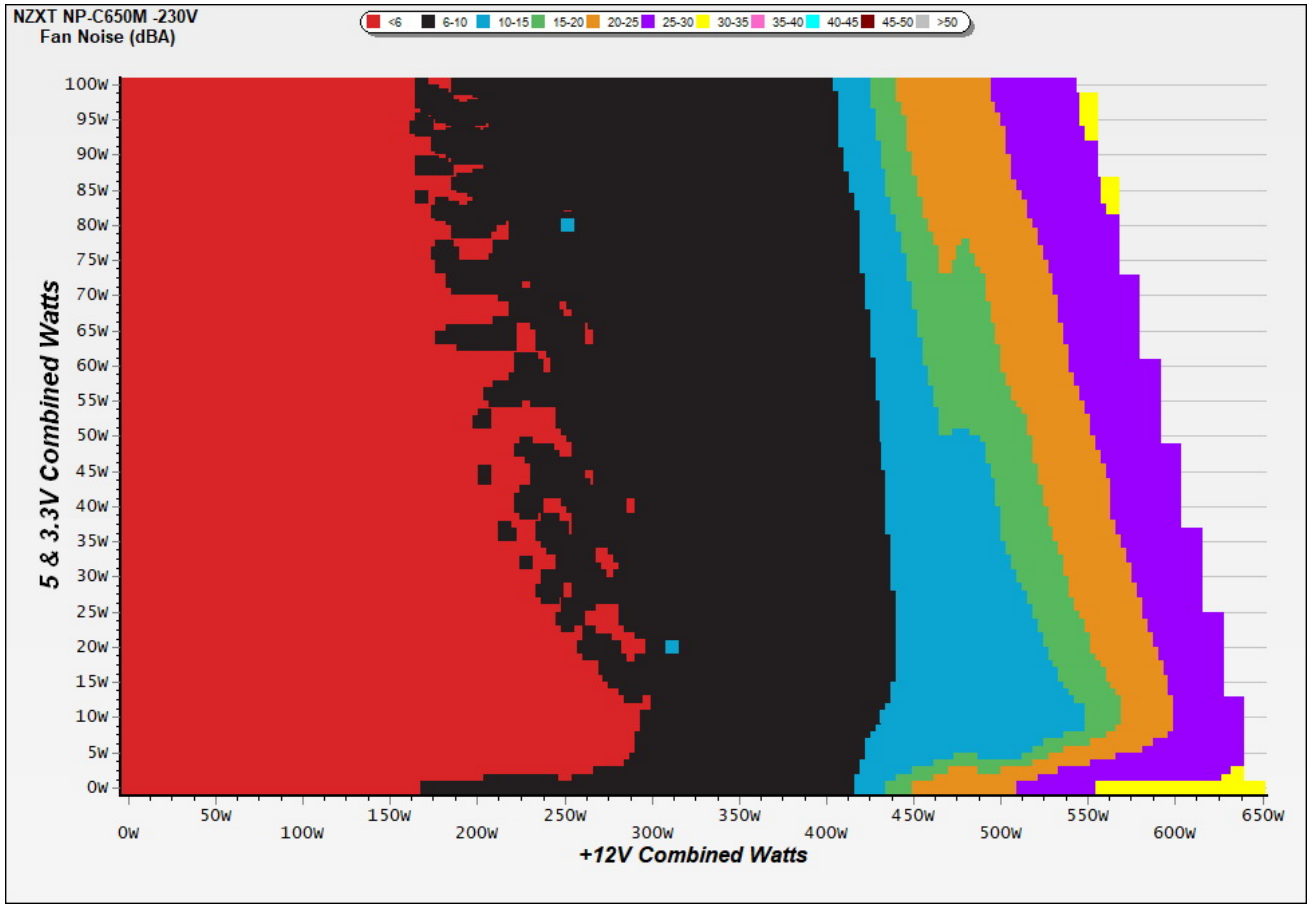
115V



□□

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

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)

115V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	0 RPM · <6.0 dB(A) · 45.1 °C	0 RPM · <6.0 dB(A) · 45.1 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 46.3 °C	0 RPM · <6.0 dB(A) · 46.3 °C	fan off in both
50%	560 RPM · 10.0 dB(A) · 42.6 °C	560 RPM · 10.0 dB(A) · 42.6 °C	**+0.0 dB(A)**
100%	2076 RPM · 44.4 dB(A) · 45.5 °C	2076 RPM · 44.4 dB(A) · 45.5 °C	**+0.0 dB(A)**

230V

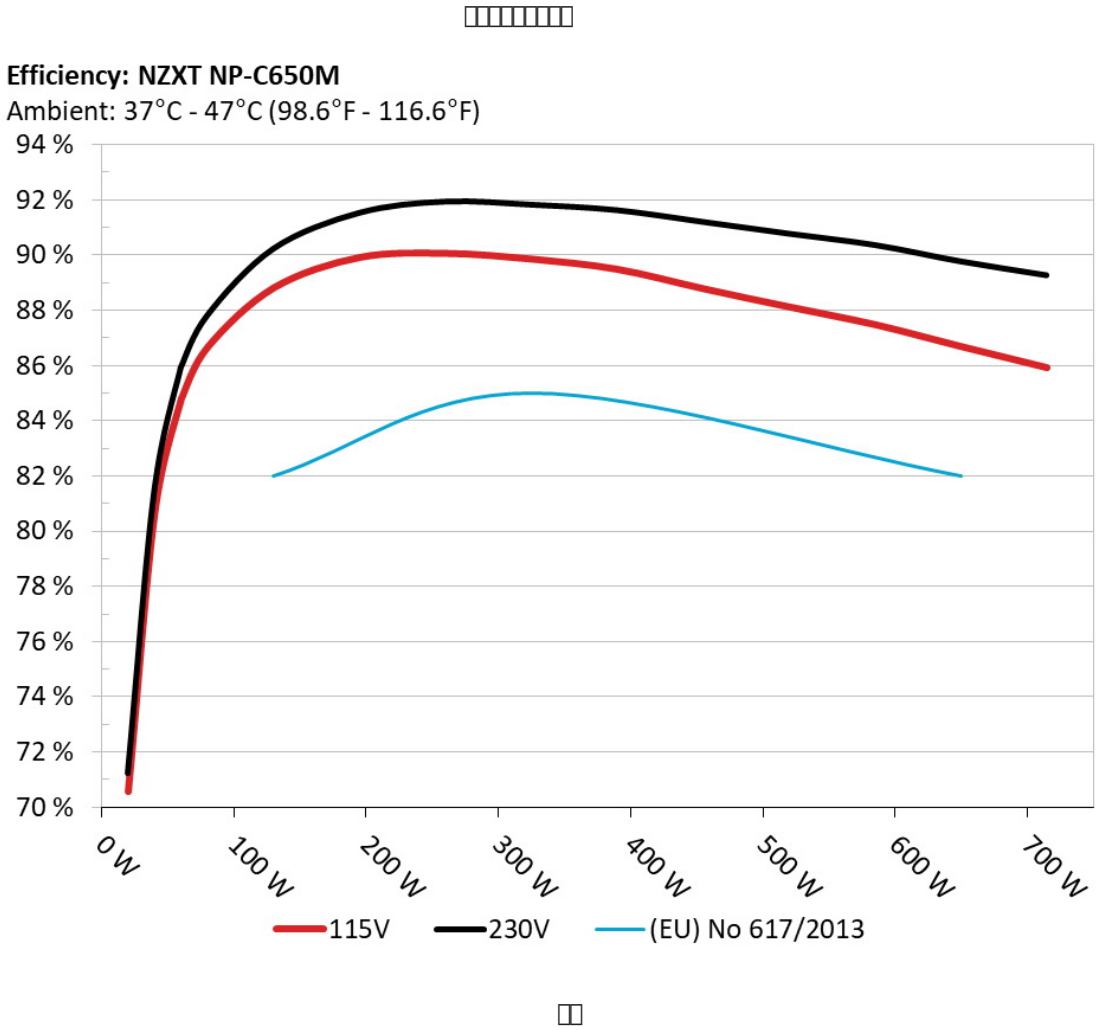
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	0 RPM · <6.0 dB(A) · 46.2 °C	0 RPM · <6.0 dB(A) · 46.2 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 46.8 °C	0 RPM · <6.0 dB(A) · 46.8 °C	fan off in both
50%	559 RPM · 10.0 dB(A) · 42.2 °C	559 RPM · 10.0 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	2024 RPM · 44.0 dB(A) · 46.1 °C	2024 RPM · 44.0 dB(A) · 46.1 °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.

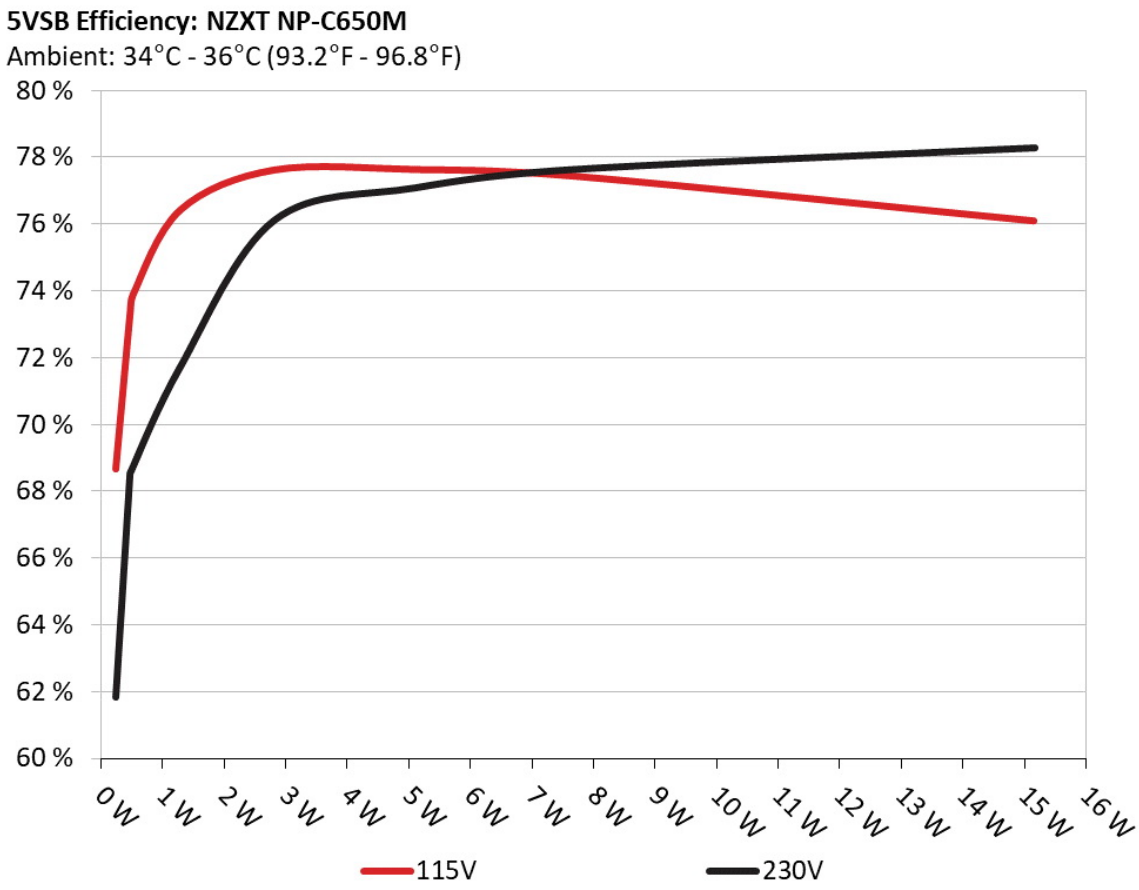
Informational. Not part of the ETA or LAMBDA rating.

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)

115V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.230	68.657%	0.054
	5.122V	0.335		115.15V
2	0.090A	0.461	73.291%	0.098
	5.121V	0.629		115.15V
3	0.550A	2.810	77.603%	0.329
	5.111V	3.621		115.15V
4	1.000A	5.100	77.614%	0.398
	5.101V	6.571		115.16V
5	1.500A	7.634	77.424%	0.434
	5.090V	9.860		115.16V
6	2.999A	15.148	76.079%	0.479
	5.051V	19.911		115.15V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.230	61.828%	0.019
	5.122V	0.372		230.22V
2	0.090A	0.461	68.499%	0.033
	5.121V	0.673		230.22V
3	0.550A	2.810	76.131%	0.160
	5.111V	3.691		230.20V
4	1.000A	5.100	77.098%	0.240
	5.101V	6.615		230.20V
5	1.500A	7.634	77.644%	0.295
	5.090V	9.832		230.20V
6	2.998A	15.166	78.296%	0.371
	5.058V	19.370		230.20V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.599A	1.987A	1.986A	0.982A	64.951	84.810%	0	<6.0	45.12°C	0.928
	12.044V	5.035V	3.324V	5.091V	76.584				40.31°C	115.13V
2	8.230A	2.980A	2.980A	1.181A	129.999	88.830%	0	<6.0	46.26°C	0.957
	12.042V	5.032V	3.322V	5.079V	146.346				40.99°C	115.13V
3	13.203A	3.481A	3.476A	1.381A	194.999	89.930%	0	<6.0	47.72°C	0.971
	12.039V	5.029V	3.321V	5.068V	216.834				41.68°C	115.13V
4	18.180A	3.978A	3.978A	1.582A	259.999	90.076%	0	<6.0	48.57°C	0.979
	12.035V	5.027V	3.320V	5.056V	288.643				41.87°C	115.12V
5	22.817A	4.974A	4.971A	1.784A	325.031	89.870%	560	10.0	42.60°C	0.984
	12.032V	5.027V	3.318V	5.044V	361.668				50.04°C	115.12V
6	27.392A	5.972A	5.969A	1.987A	389.308	89.505%	572	10.5	42.91°C	0.987
	12.029V	5.025V	3.317V	5.033V	434.959				51.00°C	115.13V
7	32.062A	6.971A	6.971A	2.191A	454.659	88.798%	811	19.0	43.16°C	0.988
	12.025V	5.022V	3.315V	5.019V	512.016				52.27°C	115.13V
8	36.731A	7.971A	7.966A	2.396A	519.956	88.135%	1197	31.4	43.75°C	0.990
	12.021V	5.021V	3.313V	5.008V	589.951				53.69°C	115.13V
9	41.803A	8.467A	8.453A	2.399A	584.878	87.493%	1540	34.4	44.42°C	0.991
	12.018V	5.020V	3.311V	5.001V	668.484				55.08°C	115.13V
10	46.612A	8.969A	8.974A	3.011A	649.704	86.704%	2076	44.4	45.49°C	0.991
	12.014V	5.018V	3.310V	4.981V	749.333				56.53°C	115.12V
11	52.025A	8.973A	8.977A	3.016A	714.527	85.940%	2128	45.4	46.66°C	0.992
	12.010V	5.016V	3.308V	4.974V	831.422				58.32°C	115.12V
CL1	0.099A	12.000A	11.999A	0.000A	101.353	84.907%	562	10.1	41.97°C	0.951
	12.040V	5.027V	3.320V	5.093V	119.370				50.54°C	115.16V

CL2	53.997A	1.000A	1.002A	1.000A	662.036	87.236%	1940	43.2	45.90°C	0.992
	12.013V	5.017V	3.312V	5.035V	758.902				56.39°C	115.13V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.600A	1.984A	1.985A	0.982A	64.950	85.933%	0	<6.0	46.20°C	0.767
	12.044V	5.037V	3.324V	5.091V	75.582				40.70°C	230.31V
2	8.230A	2.978A	2.979A	1.181A	129.998	90.243%	0	<6.0	46.84°C	0.885
	12.042V	5.035V	3.323V	5.080V	144.053				40.79°C	230.31V
3	13.202A	3.478A	3.478A	1.381A	194.994	91.544%	0	<6.0	48.33°C	0.925
	12.039V	5.033V	3.321V	5.069V	213.005				41.68°C	230.31V
4	18.178A	3.977A	3.975A	1.581A	259.989	91.953%	0	<6.0	49.03°C	0.946
	12.036V	5.030V	3.320V	5.058V	282.742				41.86°C	230.31V
5	22.814A	4.972A	4.971A	1.783A	325.021	91.840%	559	10.0	42.20°C	0.958
	12.033V	5.029V	3.319V	5.046V	353.898				50.17°C	230.30V
6	27.386A	5.968A	5.970A	1.986A	389.235	91.644%	571	10.5	42.84°C	0.966
	12.029V	5.028V	3.317V	5.035V	424.726				51.68°C	230.31V
7	32.056A	6.967A	6.967A	2.189A	454.572	91.218%	718	15.3	43.68°C	0.971
	12.025V	5.025V	3.315V	5.022V	498.337				52.84°C	230.31V
8	36.722A	7.967A	7.966A	2.393A	519.875	90.787%	1149	29.7	44.24°C	0.975
	12.022V	5.023V	3.313V	5.012V	572.631				53.82°C	230.31V
9	41.791A	8.461A	8.453A	2.397A	584.780	90.377%	1462	35.1	44.31°C	0.978
	12.019V	5.023V	3.312V	5.005V	647.043				54.48°C	230.30V
10	46.601A	8.962A	8.969A	3.008A	649.602	89.784%	2024	44.0	46.14°C	0.981
	12.015V	5.021V	3.311V	4.986V	723.518				57.26°C	230.30V
11	52.009A	8.965A	8.975A	3.011A	714.429	89.281%	2130	45.5	47.14°C	0.983
	12.012V	5.020V	3.309V	4.980V	800.207				58.79°C	230.30V
CL1	0.100A	11.998A	11.996A	0.000A	101.381	86.257%	552	9.7	42.34°C	0.857
	12.040V	5.030V	3.320V	5.094V	117.534				49.97°C	230.32V

CL2	53.991A	1.000A	1.001A	1.000A	662.025	90.333%	1923	43.0	45.97°C	0.981
	12.014V	5.023V	3.312V	5.039V	732.868				57.32°C	230.30V

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	1.231A	0.496A	0.495A	0.196A	19.976	70.587%	0	<6.0	0.802
	12.047V	5.037V	3.323V	5.115V	28.300				115.12V
2	2.463A	0.993A	0.992A	0.391A	39.966	80.684%	0	<6.0	0.892
	12.047V	5.037V	3.323V	5.108V	49.534				115.12V
3	3.699A	1.488A	1.490A	0.588A	59.999	84.702%	0	<6.0	0.922
	12.045V	5.036V	3.323V	5.101V	70.835				115.12V
4	4.928A	1.986A	1.986A	0.785A	79.951	86.680%	0	<6.0	0.937
	12.044V	5.035V	3.323V	5.094V	92.237				115.13V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.231A	0.496A	0.496A	0.196A	19.979	71.216%	0	<6.0	0.502
	12.047V	5.039V	3.323V	5.115V	28.054				230.32V
2	2.464A	0.992A	0.991A	0.391A	39.968	81.454%	0	<6.0	0.654
	12.045V	5.039V	3.323V	5.108V	49.068				230.31V
3	3.699A	1.489A	1.489A	0.588A	60.000	85.687%	0	<6.0	0.748
	12.044V	5.038V	3.323V	5.101V	70.022				230.31V
4	4.928A	1.986A	1.986A	0.785A	79.952	87.819%	0	<6.0	0.810
	12.043V	5.038V	3.323V	5.095V	91.042				230.30V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.10mV	10.30mV	10.20mV	6.70mV	Pass
20% Load	19.20mV	10.80mV	11.10mV	7.10mV	Pass
30% Load	21.80mV	11.30mV	11.10mV	7.80mV	Pass
40% Load	23.90mV	12.20mV	11.90mV	7.40mV	Pass
50% Load	21.70mV	12.50mV	12.80mV	7.90mV	Pass
60% Load	15.20mV	13.10mV	12.60mV	8.40mV	Pass
70% Load	14.20mV	13.20mV	12.90mV	8.50mV	Pass
80% Load	15.10mV	14.70mV	14.20mV	10.10mV	Pass
90% Load	15.90mV	15.60mV	14.30mV	10.80mV	Pass
100% Load	19.90mV	17.10mV	15.50mV	11.20mV	Pass
110% Load	22.60mV	17.00mV	15.70mV	11.60mV	Pass
Crossload1	20.50mV	17.30mV	15.10mV	7.30mV	Pass
Crossload2	19.70mV	13.60mV	12.20mV	10.10mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.30mV	10.40mV	10.30mV	7.00mV	Pass
20% Load	19.00mV	10.80mV	10.70mV	7.30mV	Pass
30% Load	22.20mV	11.10mV	11.30mV	7.40mV	Pass
40% Load	23.90mV	11.50mV	12.40mV	7.50mV	Pass
50% Load	21.80mV	12.80mV	12.80mV	8.00mV	Pass
60% Load	15.50mV	12.70mV	13.70mV	8.40mV	Pass
70% Load	14.60mV	13.50mV	13.20mV	8.50mV	Pass
80% Load	14.90mV	14.30mV	14.80mV	9.30mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	15.40mV	15.70mV	15.20mV	9.60mV	Pass
100% Load	20.60mV	17.50mV	16.00mV	10.50mV	Pass
110% Load	25.50mV	17.60mV	15.80mV	10.70mV	Pass
Crossload1	20.10mV	16.30mV	14.60mV	7.20mV	Pass
Crossload2	20.70mV	13.70mV	13.60mV	9.50mV	Pass

The results above are not used in the certification process

NZXT NP-C650M

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)