NZXT

NZXT C850 Gold

Serial Number 52241Z06500003

Lab ID NZ85002451

Certification ID 252451

Test Result Report ID: 24PS2451A

Certificate Issue Date: May 22, 2024

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	NZXT
Model	C850 Gold
OEM/ODM	Channel Well Technology
Serial Number	52241Z06500003
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10

Rated Frequency (Hz)	50-60
Rated Power (W)	850
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 (HA13525H12SF-Z)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	NZ85002451
Date of receipt	May 7, 2024
Testing Date	May 21, 2024
Report Issued Date	May 22, 2024
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	16-20AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
8 pin EPS12V (700mm)	1	1	16AWG	No
6+2 pin PCIe (650mm)	3	3	16-18AWG	No
12+4 pin PCIe (645mm) (600W)	1	1	16-24AWG	No
SATA (500mm+145mm+145mm+145mm)	3	12	18AWG	No
4-pin Molex (500mm+145mm+145mm+145mm)	1	4	18AWG	No

Modular Cables				
AC Power Cord (1415mm) - C13 coupler	1	1	14AWG	-

Protection Features(Manufacturer)

Over Power Protection	✓
Over Current (+12V) Protection	✓
Over Temperature Protection	✓
Short Circuit Protection	✓
Surge Protection	✓
Inrush Current Protection	✓
Fan Failure Protection	✓

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	70.83	3	0
	Watts	120		850	15	0
Total Max. Power (W)		850				

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 v3.1 PSU Power Excursion	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.749%
Average Noise Output (>1450 Load Combinations)	25.41dBA
Average PF (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	77.025%
Standby Power Consumption	0.0132W
Non-Accredited	
12V Ripple (Full Load)	18.63mV
5V Ripple (Full Load)	7.83mV
3.3V Ripple (Full Load)	8.71mV
5VSB Ripple (Full Load)	9.78mV
12V Load Regulation	0.91%
5V Load Regulation	0.34%
3.3V Load Regulation	0.78%
5VSB Load Regulation	1.57%
Inrush Current	35.610A

230V

Accredited	
Average Efficiency (>1450 load combinations)	90.910%
Average Noise Output (>1450 Load Combinations)	25.44dBA
Average PF (>1450 Load Combinations)	0.963
Efficiency With 10W (≤500W) or 2% (>500W) Load	76.621%
Standby Power Consumption	0.0704W
Non-Accredited	
12V Ripple (Full Load)	18.61mV
5V Ripple (Full Load)	10.75mV
3.3V Ripple (Full Load)	8.98mV

5VSB Ripple (Full Load)		8.47mV
12V Load Regulation		0.90%
5V Load Regulation		0.34%
3.3V Load Regulation		0.81%
5VSB Load Regulation		1.57%
Inrush Current		63.390A
12V Transient Response (200%)		11.58V
5V Transient Response (200%)		4.983V
3.3V Transient Response (200%)		3.233V
5VSB Transient Response (200%)		4.876V
Hold-Up Time & PWR_OK Signal		25.60ms
AC Loss to PWR_OK Hold Up Time		24.20ms
PWR_OK Inactive to DC Loss Delay		1.40ms
PSU Timings: T1 (20% / 100%)	63.0ms	60.0ms
PSU Timings: T3 (20% / 100%)	131.0ms	131.0ms
OPP (27.22°C / 42.84°C)	121.50%	121.14%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	25.6
AC Loss to PWR_OK Hold Up Time (ms)	24.2
PWR_OK Inactive to DC Loss Delay (ms)	1.4

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.18 V	115.14 V	113.85 V	115.18 V	116.15 V	PASS

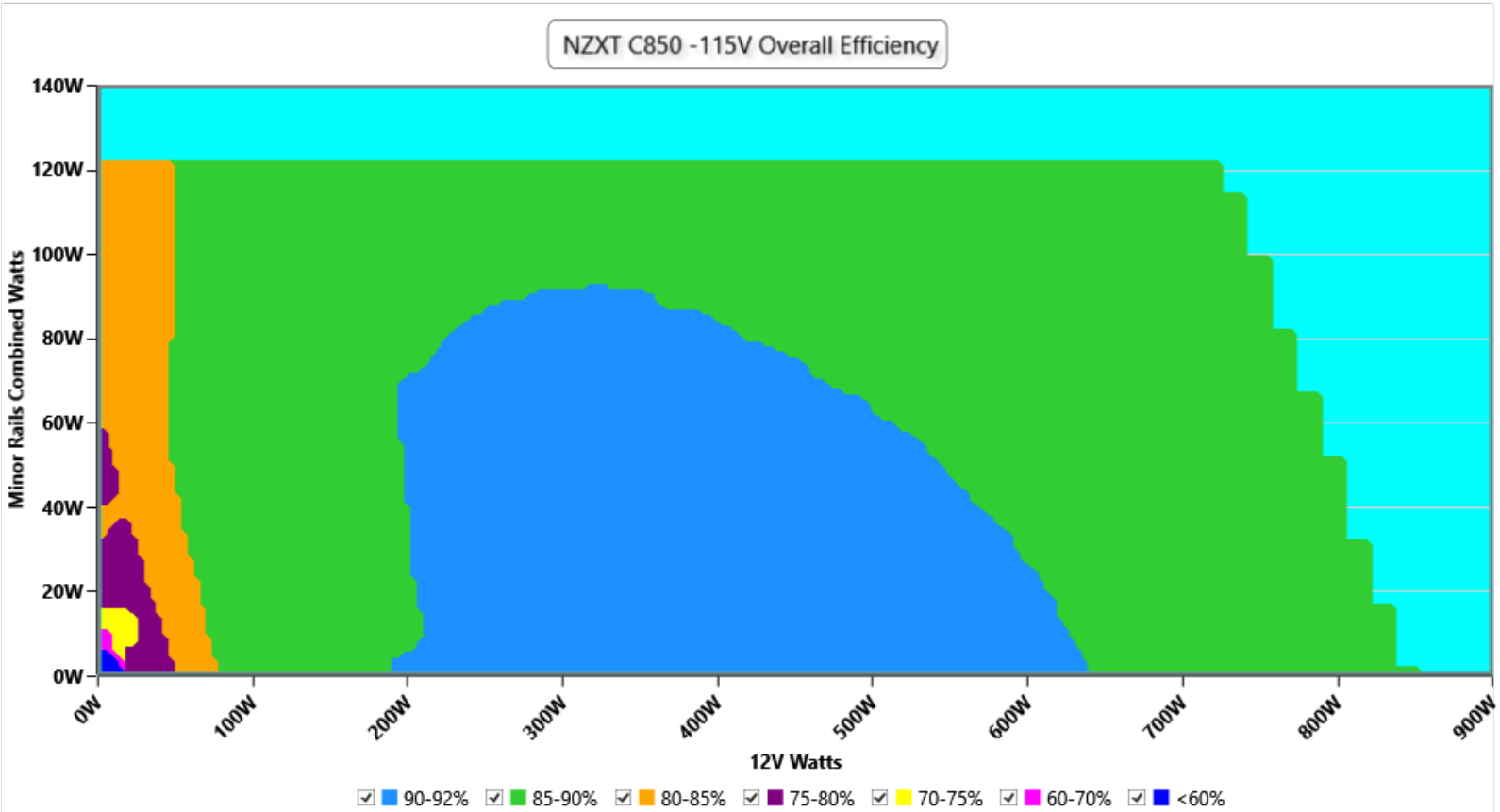
Mains Frequency:	60.00 Hz	59.95 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.11 %	N/A	0.15 %	2.00 %	PASS
Real Power:	0.013 W	0.011 W	N/A	0.086 W	N/A	N/A
Apparent Power:	9.991 W	9.986 W	N/A	10.020 W	N/A	N/A
Power Factor:	0.001	N/A	N/A	N/A	N/A	N/A

230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.38 V	230.34 V	227.70 V	230.40 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	50.00 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.14 %	0.13 %	N/A	0.16 %	2.00 %	PASS
Real Power:	0.070 W	0.061 W	N/A	0.084 W	N/A	N/A
Apparent Power:	33.435 W	33.422 W	N/A	33.445 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

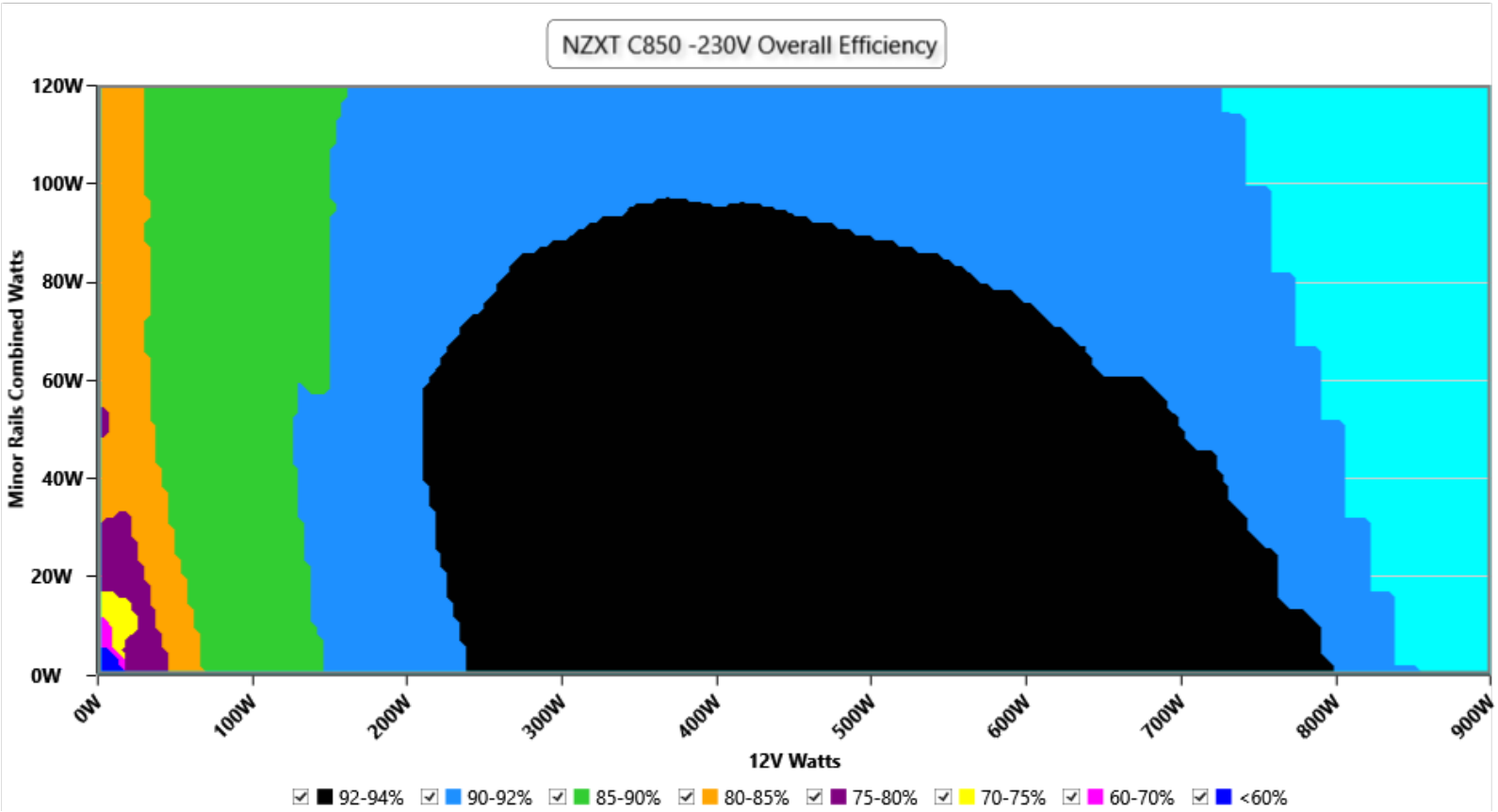
115V



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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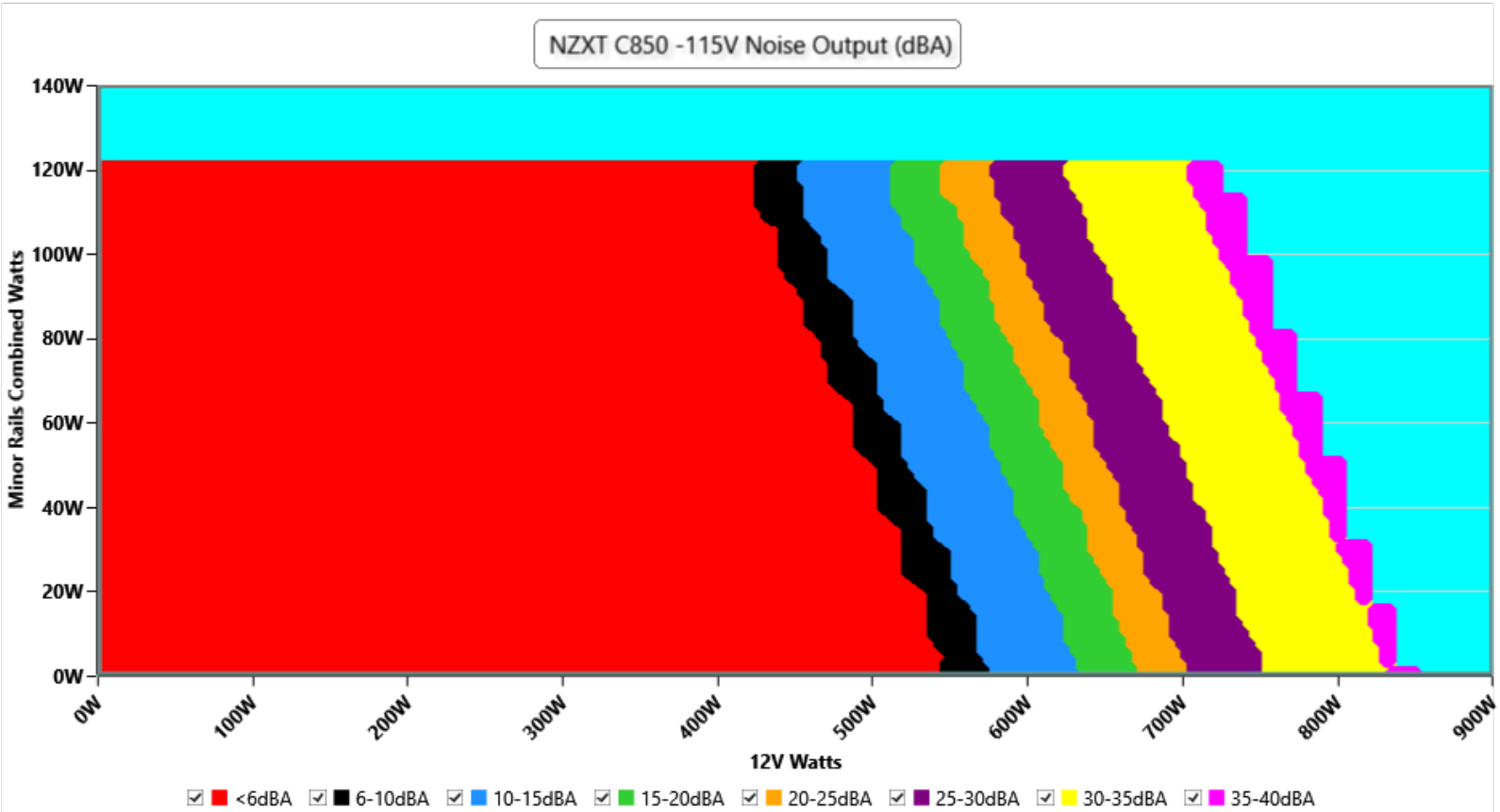
Noise Graph

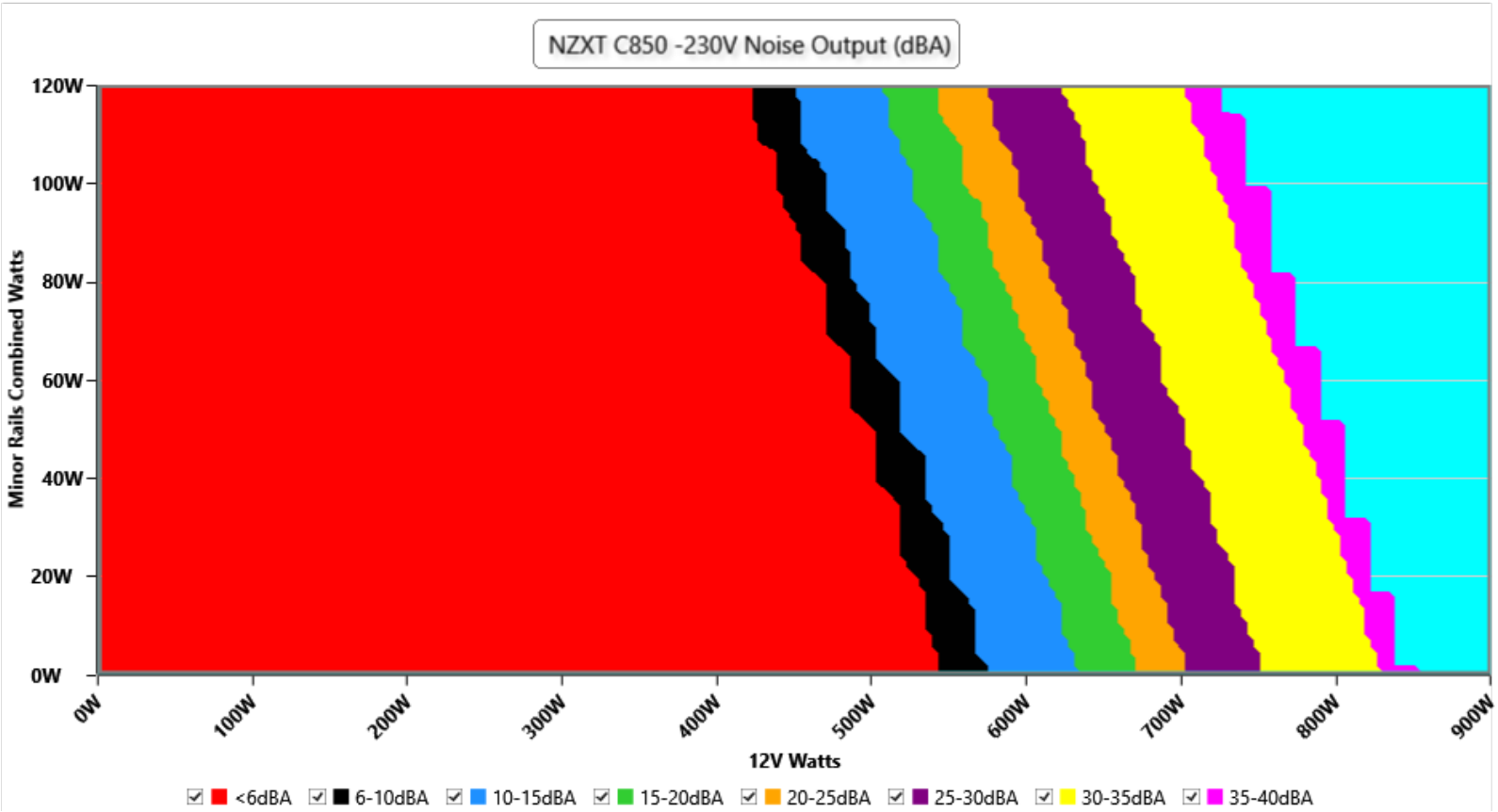
115V



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



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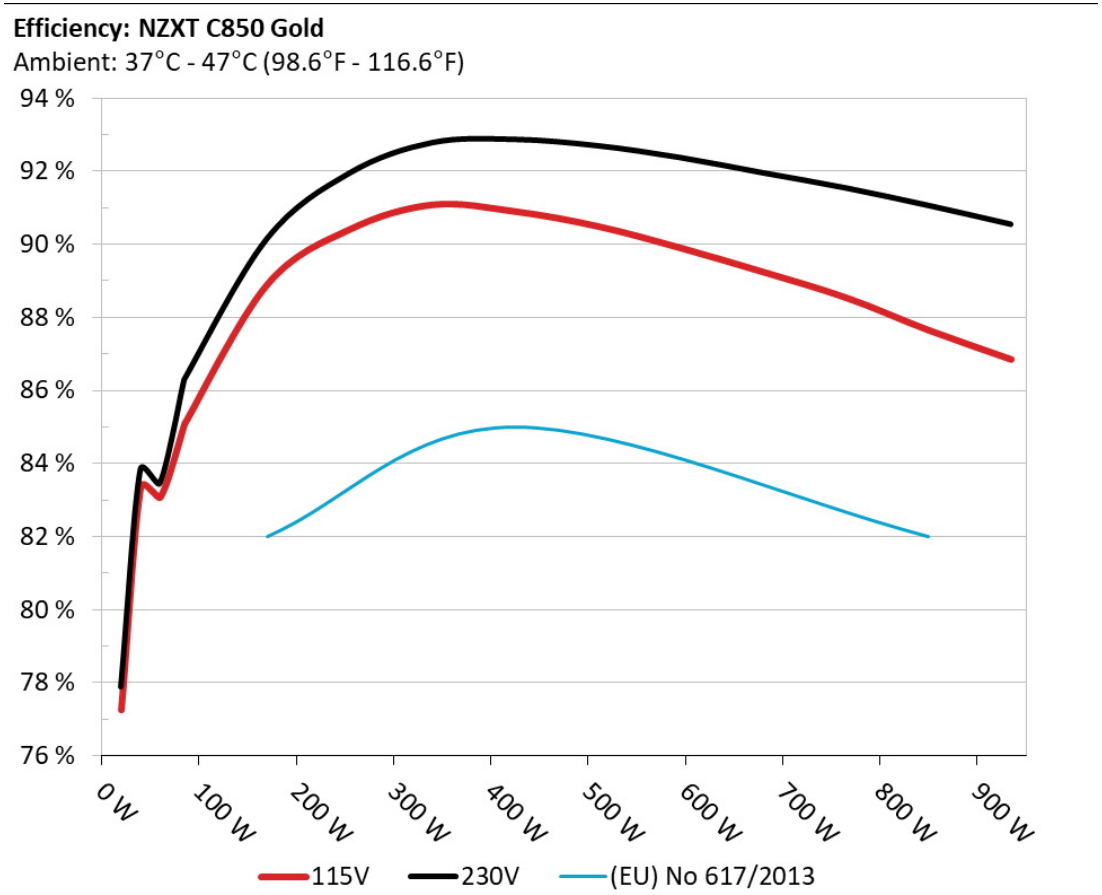
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance

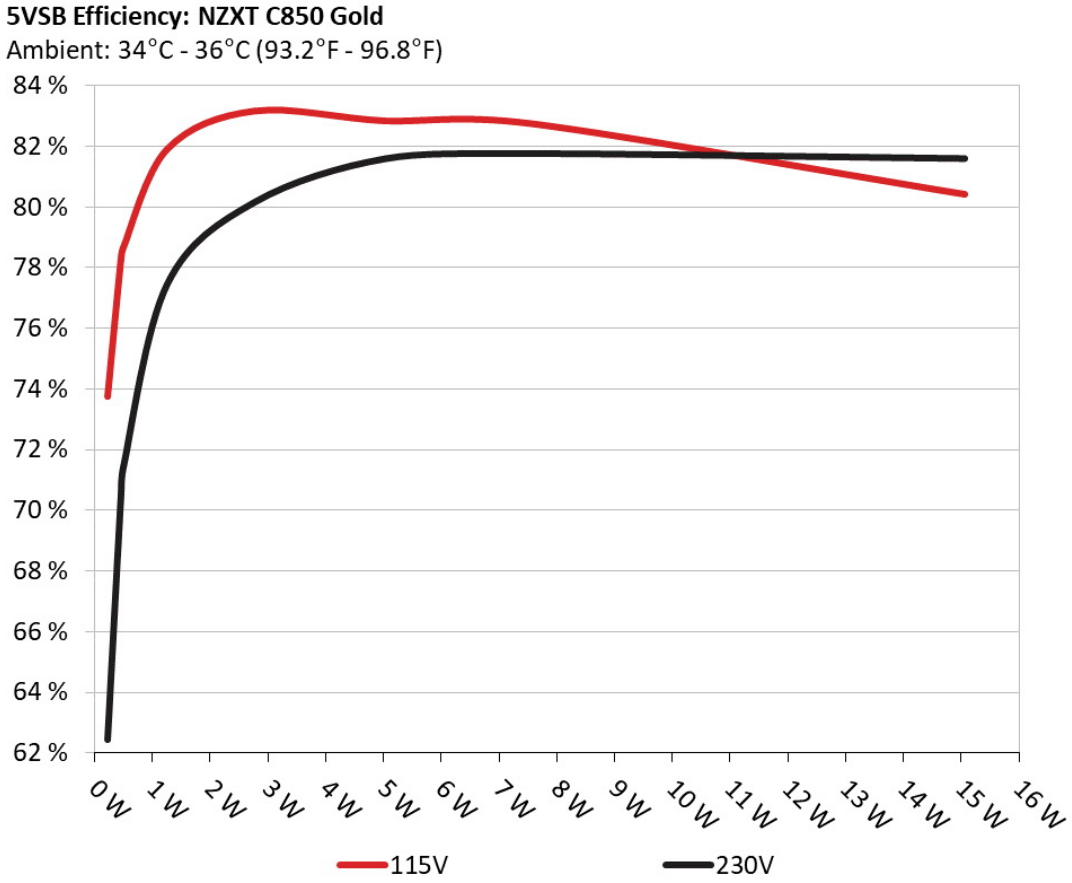
Efficiency under high ambient temperature



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**	0.227W	73.757%	0.031
	5.042V	0.308W		115.15V
2	**0.09A**	0.454W	78.223%	0.057
	5.041V	0.58W		115.15V
3	**0.55A**	2.771W	83.161%	0.263
	5.037V	3.332W		115.16V
4	**1A**	5.035W	82.835%	0.37
	5.034V	6.079W		115.16V
5	**1.5A**	7.548W	82.746%	0.428
	5.03V	9.121W		115.15V
6	**3A**	15.058W	80.417%	0.505
	5.019V	18.726W		115.14V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	**0.045A**	0.227W	62.437%	0.011
	5.047V	0.364W		230.37V
2	**0.09A**	0.454W	70.348%	0.019
	5.044V	0.646W		230.36V
3	**0.55A**	2.771W	80.141%	0.099
	5.038V	3.458W		230.35V
4	**1A**	5.036W	81.575%	0.166
	5.035V	6.173W		230.35V
5	**1.5A**	7.549W	81.741%	0.227
	5.032V	9.236W		230.35V
6	**3A**	15.059W	81.579%	0.34
	5.019V	18.459W		230.35V

Protection Features

Protection Features	
OCP (Cold @ 27°C)	12V: 85.4A (120.57%), 12.109V 5V: 27.6A (125.45%), 5.054V 3.3V: 28.6A (130%), 3.318V 5VSB: 5A (166.67%), 4.991V
OCP (Hot @ 44°C)	12V: 85A (120.01%), 12.121V 5V: 26.9A (122.27%), 5.063V 3.3V: 27.6A (125.45%), 3.317V 5VSB: 5A (166.67%), 4.993V
OPP (Cold @ 27°C)	1032.77W (121.5%)
OPP (Hot @ 43°C)	1029.73W (121.14%)
OTP	✓ (129°C @ secondary side)
SCP	12V to Earth: ✓ 5V to Earth: ✓ 3.3V to Earth: ✓ 5VSB to Earth: ✓
PWR_OK	Proper operation
NLO	✓
Fan Failure Protection	✓
SIP	Surge: MOV Inrush: NTC Thermistor & Bypass relay

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
	5.216A	**1.97A**	**1.972A**	**0.992A**	84.998	84.985%	0	<6.0	44.3°C	0.964
	12.153V	5.077V	3.346V	5.04V	100.016				40.03°C	115.12V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
	11.436A	**2.956A**	**2.961A**	**1.192A**	169.951	88.903%	0	<6.0	45.45°C	0.982
	12.159V	5.075V	3.343V	5.034V	191.166				40.83°C	115.09V
	18.007A	**3.45A**	**3.458A**	**1.393A**	254.97	90.416%	0	<6.0	46.4°C	0.986
	12.157V	5.074V	3.34V	5.028V	281.995				41.4°C	115.07V
	24.616A	**3.943A**	**3.957A**	**1.593A**	340.073	91.088%	0	<6.0	47.35°C	0.988
	12.141V	5.073V	3.337V	5.022V	373.349				41.79°C	115.05V
	30.870A	**4.932A**	**4.949A**	**1.796A**	425.097	90.903%	409	<6.0	42.1°C	0.99
	12.134V	5.071V	3.334V	5.014V	467.635				48.18°C	115.03V
	37.089A	**5.921A**	**5.943A**	**1.998A**	509.583	90.499%	412	<6.0	42.62°C	0.992
	12.126V	5.068V	3.332V	5.005V	563.078				49.12°C	115.01V
	43.373A	**6.91A**	**6.94A**	**2.201A**	594.867	89.906%	645	14.6	43.43°C	0.994
	12.121V	5.066V	3.329V	4.998V	661.659				50.45°C	114.98V
	49.676A	**7.9A**	**7.937A**	**2.305A**	679.703	89.247%	793	21.5	43.56°C	0.995
	12.115V	5.064V	3.326V	4.991V	761.594				51.59°C	114.96V
	56.370A	**8.397A**	**8.424A**	**2.408A**	765.174	88.541%	1031	29.9	44.57°C	0.995
	12.110V	5.062V	3.324V	4.983V	864.217				53.66°C	114.94V
	62.780A	**8.894A**	**8.944A**	**3.018A**	850.061	87.65%	1248	36.1	45.71°C	0.996
	12.112V	5.06V	3.321V	4.97V	969.831				55.74°C	114.92V
	69.061A	**9.887A**	**10.037A**	**3.022A**	934.604	86.852%	1459	40.2	46.74°C	0.996
	12.110V	5.058V	3.317V	4.964V	1076.079				57.68°C	114.89V
	0.115A	**14.252A**	**14.32A**	**0A**	121.305	82.342%	408	<6.0	40.74°C	0.976
	12.158V	5.066V	3.331V	5.04V	147.323				51.92°C	115.12V
	0.115A	**21.705A**	**0A**	**0A**	111.393	80.545%	407	<6.0	41.65°C	0.975
	12.162V	5.068V	3.334V	5.046V	138.303				50.93°C	115.13V
	0.115A	**0A**	**21.895A**	**0A**	73.995	74.772%	406	<6.0	41.18°C	0.965
	12.155V	5.081V	3.316V	5.04V	98.96				49.84°C	115.14V
	70.164A	**0A**	**0A**	**0A**	849.753	88.464%	1270	36.7	45.41°C	0.996
	12.111V	5.073V	3.32V	5.007V	960.571				51.83°C	114.93V

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
	5.217A	**1.972A**	**1.974A**	**0.992A**	85.001	86.191%	0	<6.0	44.37°C	0.879
	12.152V	5.073V	3.344V	5.04V	98.617				40.11°C	230.35V
	11.438A	**2.958A**	**2.963A**	**1.192A**	169.961	90.159%	0	<6.0	45.37°C	0.943
	12.157V	5.072V	3.341V	5.034V	188.508				40.78°C	230.34V
	18.008A	**3.452A**	**3.461A**	**1.393A**	254.97	91.959%	0	<6.0	46.22°C	0.962
	12.156V	5.071V	3.338V	5.028V	277.264				41.05°C	230.33V
	24.619A	**3.946A**	**3.959A**	**1.593A**	340.062	92.793%	0	<6.0	47.32°C	0.971
	12.139V	5.07V	3.334V	5.022V	366.472				41.77°C	230.32V
	30.866A	**4.935A**	**4.952A**	**1.796A**	424.994	92.88%	413	<6.0	42.26°C	0.976
	12.133V	5.067V	3.332V	5.013V	457.573				48.31°C	230.31V
	37.091A	**5.926A**	**5.946A**	**1.998A**	509.521	92.708%	413	<6.0	42.85°C	0.979
	12.124V	5.064V	3.33V	5.005V	549.602				49.53°C	230.3V
	43.385A	**6.916A**	**6.944A**	**2.201A**	594.854	92.384%	592	11.9	43.32°C	0.982
	12.118V	5.062V	3.327V	4.997V	643.89				50.38°C	230.28V
	49.685A	**7.906A**	**7.941A**	**2.305A**	679.669	91.967%	777	20.8	43.7°C	0.984
	12.112V	5.06V	3.324V	4.99V	739.036				51.78°C	230.28V
	56.376A	**8.403A**	**8.428A**	**2.409A**	765.096	91.552%	1034	30.0	44.23°C	0.986
	12.107V	5.058V	3.322V	4.983V	835.655				53.23°C	230.26V
	62.784A	**8.901A**	**8.947A**	**3.018A**	849.921	91.073%	1249	36.1	45.55°C	0.988
	12.109V	5.056V	3.319V	4.97V	933.232				55.58°C	230.25V
	69.063A	**9.887A**	**10.037A**	**3.022A**	934.486	90.558%	1459	40.2	46.62°C	0.988
	12.108V	5.057V	3.317V	4.964V	1031.914				57.48°C	230.24V
	0.115A	**14.252A**	**14.32A**	**0A**	121.291	83.479%	409	<6.0	41.38°C	0.924
	12.156V	5.066V	3.331V	5.04V	145.296				48.33°C	230.35V
	0.115A	**21.707A**	**0A**	**0A**	111.385	81.527%	408	<6.0	40.44°C	0.919
	12.161V	5.067V	3.334V	5.045V	136.624				47.53°C	230.35V
	0.115A	**0A**	**21.889A**	**0A**	73.985	75.817%	407	<6.0	40.87°C	0.879
	12.153V	5.081V	3.316V	5.04V	97.583				47.47°C	230.35V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
	70.161A	**0A**	**0A**	**0A**	849.607	91.838%	1273	36.7	45.05°C	0.987
	12.110V	5.072V	3.32V	5.007V	925.114				48.91°C	230.25V

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	1.232A	0.493A	0.494A	0.198A	20.003	77.248%	0	<6.0	39.68°C	0.875
	12.049V	5.073V	3.341V	5.048V	25.894				36.61°C	115.15V
40W	2.712A	0.69A	0.691A	0.297A	39.999	83.354%	0	<6.0	40.92°C	0.935
	12.053V	5.072V	3.344V	5.047V	47.984				37.62°C	115.14V
60W	4.159A	0.887A	0.887A	0.396A	59.996	83.07%	0	<6.0	42.16°C	0.953
	12.149V	5.073V	3.347V	5.046V	72.215				38.51°C	115.13V
80W	5.622A	1.084A	1.084A	0.496A	79.946	85.084%	0	<6.0	43.43°C	0.963
	12.152V	5.077V	3.347V	5.045V	93.962				39.51°C	115.11V

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	1.232A	0.493A	0.494A	0.198A	20.001	77.898%	0	<6.0	39.63°C	0.519
	12.048V	5.073V	3.341V	5.048V	25.674				36.57°C	230.36V
40W	2.712A	0.69A	0.691A	0.297A	39.998	83.843%	0	<6.0	41.09°C	0.72
	12.051V	5.073V	3.343V	5.047V	47.707				37.73°C	230.36V
60W	4.160A	0.887A	0.888A	0.397A	59.997	83.466%	0	<6.0	41.74°C	0.825
	12.144V	5.073V	3.346V	5.046V	71.882				38.07°C	230.36V
80W	5.624A	1.084A	1.085A	0.496A	79.955	86.305%	0	<6.0	42.83°C	0.869
	12.149V	5.073V	3.345V	5.044V	92.643				39.03°C	230.35V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.97mV	5.26mV	3.61mV	5.04mV	Pass
20% Load	7.38mV	5.82mV	3.51mV	5.15mV	Pass
30% Load	8.70mV	5.51mV	3.66mV	5.45mV	Pass
40% Load	10.65mV	5.81mV	4.68mV	5.30mV	Pass
50% Load	10.13mV	6.94mV	4.83mV	5.50mV	Pass
60% Load	11.50mV	15.35mV	14.80mV	5.86mV	Pass
70% Load	10.58mV	6.17mV	5.04mV	5.91mV	Pass
80% Load	11.80mV	7.75mV	7.83mV	6.06mV	Pass
90% Load	12.67mV	9.54mV	8.49mV	6.78mV	Pass
100% Load	18.63mV	7.83mV	8.71mV	9.78mV	Pass
110% Load	17.76mV	13.80mV	10.23mV	10.04mV	Pass
Crossload1	8.92mV	7.02mV	9.16mV	7.27mV	Pass
Crossload2	9.26mV	6.12mV	3.97mV	6.47mV	Pass
Crossload3	8.24mV	6.33mV	9.82mV	6.52mV	Pass
Crossload4	16.98mV	6.65mV	5.19mV	7.36mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.87mV	5.41mV	3.51mV	4.89mV	Pass
20% Load	7.02mV	5.36mV	3.66mV	5.35mV	Pass
30% Load	8.75mV	5.20mV	3.51mV	5.09mV	Pass
40% Load	11.58mV	5.97mV	4.78mV	6.16mV	Pass
50% Load	10.80mV	6.48mV	4.63mV	5.66mV	Pass
60% Load	10.19mV	15.56mV	13.83mV	5.66mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
70% Load	10.43mV	6.68mV	5.24mV	5.91mV	Pass
80% Load	11.04mV	7.50mV	7.73mV	5.60mV	Pass
90% Load	12.06mV	9.23mV	8.24mV	6.73mV	Pass
100% Load	18.61mV	10.75mV	8.98mV	8.47mV	Pass
110% Load	18.85mV	13.79mV	9.99mV	12.12mV	Pass
Crossload1	8.88mV	7.41mV	9.24mV	7.41mV	Pass
Crossload2	9.21mV	6.12mV	3.86mV	7.08mV	Pass
Crossload3	8.09mV	6.63mV	10.02mV	6.88mV	Pass
Crossload4	17.69mV	8.73mV	5.67mV	7.12mV	Pass

The results above are not used in the certification process

NZXT C850 Gold

Top side

Power specifications label

Cybenetics 提供自願性認證方案: 電源供應器方面有 ETA (效率) 、 LAMBDA (噪音) 與 SAFE (安全與正確運作) ; 散熱產品方面有 DELTA (機殼隔音) 與 PHI (風扇風量與靜壓)