Corsair CX450 (Great Wall)

Serial Number 18114851000036261087

Lab ID 404

Certification ID 25404

Test Result Report ID: 19PS404A

Certificate Issue Date: Nov 6, 2018

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	Corsair
Model	CX450 (Great Wall)
OEM/ODM	Great Wall
Serial Number	18114851000036261087
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	6-3
Rated Frequency (Hz)	47-63

Rated Power (W)	450
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Rifle Bearing Fan (D12SM-12)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	404
Date of receipt	Oct 27, 2018
Testing Date	Nov 4, 2018
Report Issued Date	Nov 6, 2018
DUT Notes	RPS0063 / CP-9020120
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	18-22AWG	No
4+4 pin EPS12V (670mm)	1	1	18AWG	No
6+2 pin PCIe (600mm)	1	1	18AWG	No
SATA (410mm+120mm)	2	4	18AWG	No
4 pin Molex (410mm+120mm+120mm+120mm)	1	4	18AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	37.4	3	0.8
	Watts	110		448.8	15	9.6
Total Max. Power (W)		450				

Parts Description

General Data	
Manufacturer (OEM)	Great Wall
Platform Model	GW-ATX450BL
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier	GBU1508 (800V, 15A @ 100°C)
APFC MOSFETS	2x ROHM R6020ANX (600V, 9.7A @ 100°C, 0.22Ohm)
APFC Boost Diode	STi STTH8S06FP (600V, 8A @ 150°C)
Hold-up Cap	Nippon Chemi-Con (450V, 220uF, 2-3,000h @ 105°C, KMM)
Main Switchers	2x Jilin Sino-Microelectronics JCS18N50H (500V, 11A @ 100°C, 0.27Ohm)
APFC Controller	Champion CM6500UNX & CM03X Green PFC controller
Resonant Controller	Champion CM6901
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	2x Silan Microelectronics SVD3205T (55V, 80A @ 25°C, 8mOhm)
5V & 3.3V	DC-DC Converters: 6x A-Power AP0403GH (30V, 50A @ 100°C, 4.5mOhm) PWM Controller: APW7159C
Filtering Capacitors	Electrolytics: Elite EJ (3-5,000h @ 105°C), ED (2-5,000h @ 105°C), EK (2-5,000h @ 105°C), 1x Teapo (3-6,000h @ 105°C, SY), 1x Rubycon (105°C) Polymers: Nichicon (LF)
Supervisor IC	Sitronix/Infinno ST9S429-PG14 (OCP, OVP, UVP, SCP, PG)
Fan Model	Yate Loon D12SM-12 (120mm, 12V, 0.30A, 1700RPM, 72CFM, 34 dBA, Sleeve Bearing)
5VSB Circuit	

Rectifier	A-Power AP04N60H-HF (600V, 2.2A @ 100°C, 2.5Ohm)
Standby PWM Controller	SI8016HSP8

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)	85.253%
Average Noise Output (>1450 Load Combinations)	36.08dBA
Average PF (>1450 Load Combinations)	0.989
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0671W
Non-Accredited	
12V Ripple (Full Load)	44.22mV
5V Ripple (Full Load)	17.94mV
3.3V Ripple (Full Load)	18.05mV
5VSB Ripple (Full Load)	14.86mV
12V Load Regulation	0.34%
5V Load Regulation	0.30%
3.3V Load Regulation	0.54%
5VSB Load Regulation	2.12%
Inrush Current	-

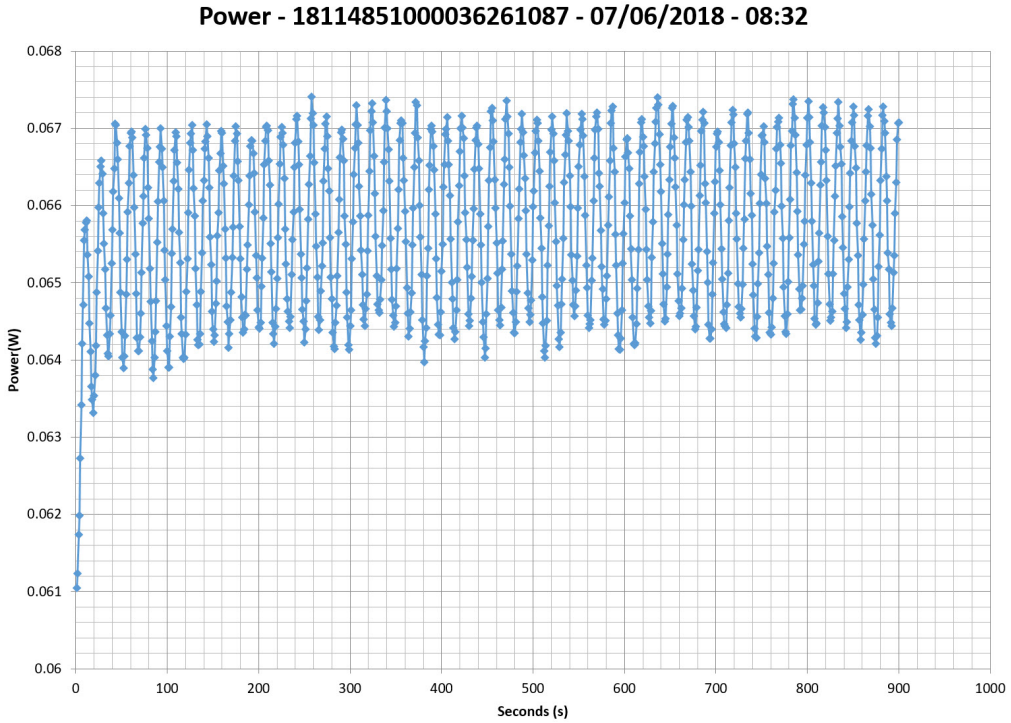
230V		
Accredited		
Average Efficiency (>1450 load combinations)	87.701%	
Average Noise Output (>1450 Load Combinations)	36.05dBA	
Average PF (>1450 Load Combinations)	0.951	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0826W	
Non-Accredited		
12V Ripple (Full Load)	42.52mV	
5V Ripple (Full Load)	17.41mV	
3.3V Ripple (Full Load)	17.04mV	
5VSB Ripple (Full Load)	14.03mV	
12V Load Regulation	0.32%	
5V Load Regulation	0.26%	
3.3V Load Regulation	0.51%	
5VSB Load Regulation	2.10%	
Inrush Current	-	
Hold-Up Time & PWR_OK Signal	9.10ms	
AC Loss to PWR_OK Hold Up Time	6.80ms	
PWR_OK Inactive to DC Loss Delay	2.30ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

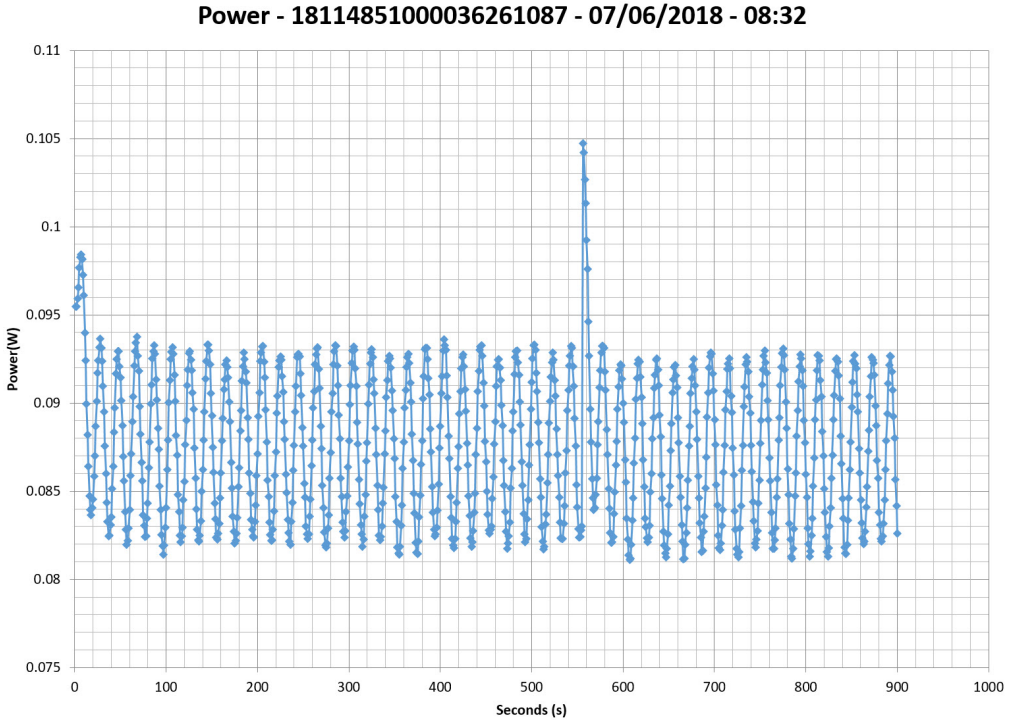
Hold-Up Time (ms)	9.1
AC Loss to PWR_OK Hold Up Time (ms)	6.8
PWR_OK Inactive to DC Loss Delay (ms)	2.3

Graphs

115V

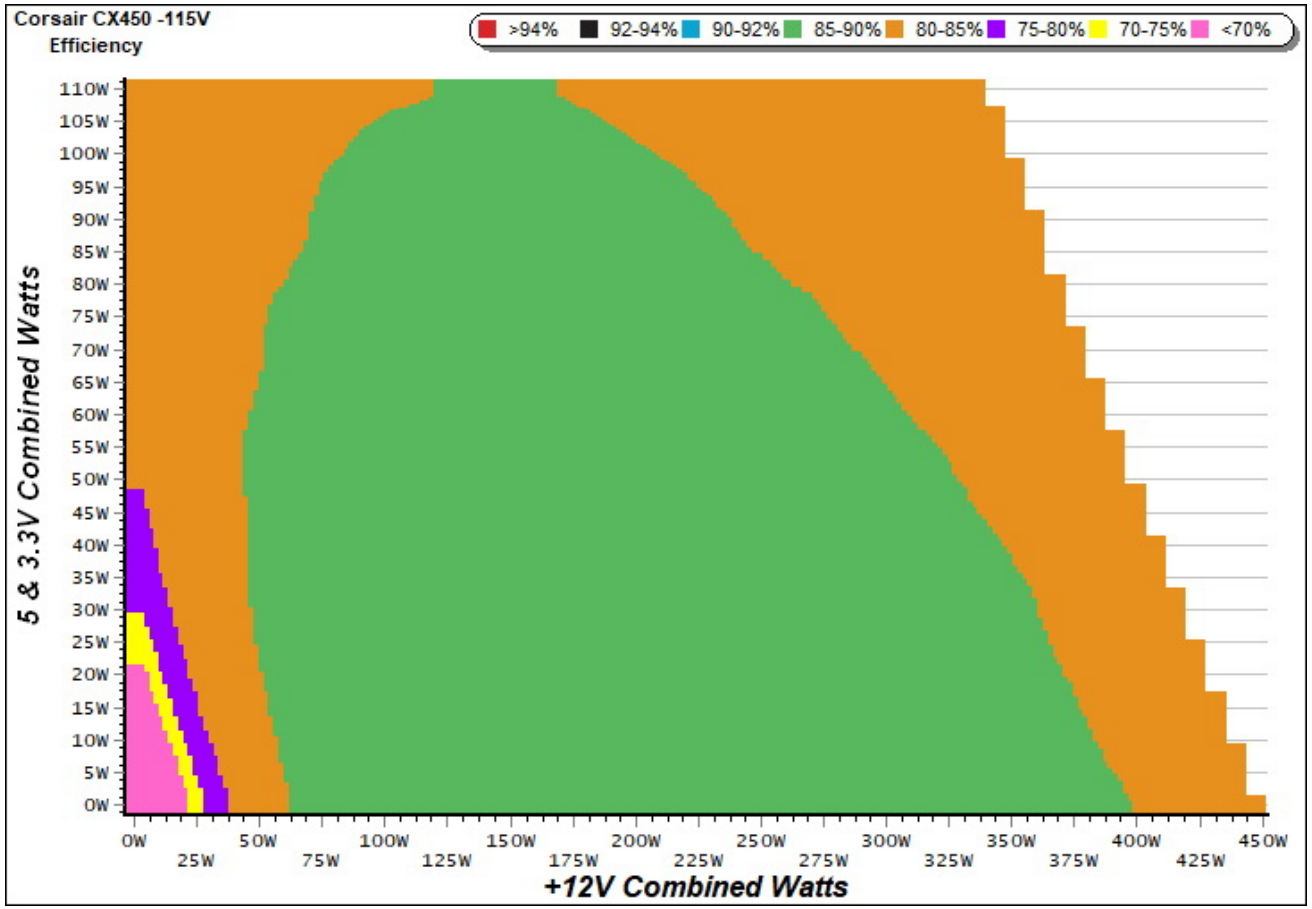


230V



Efficiency Graph

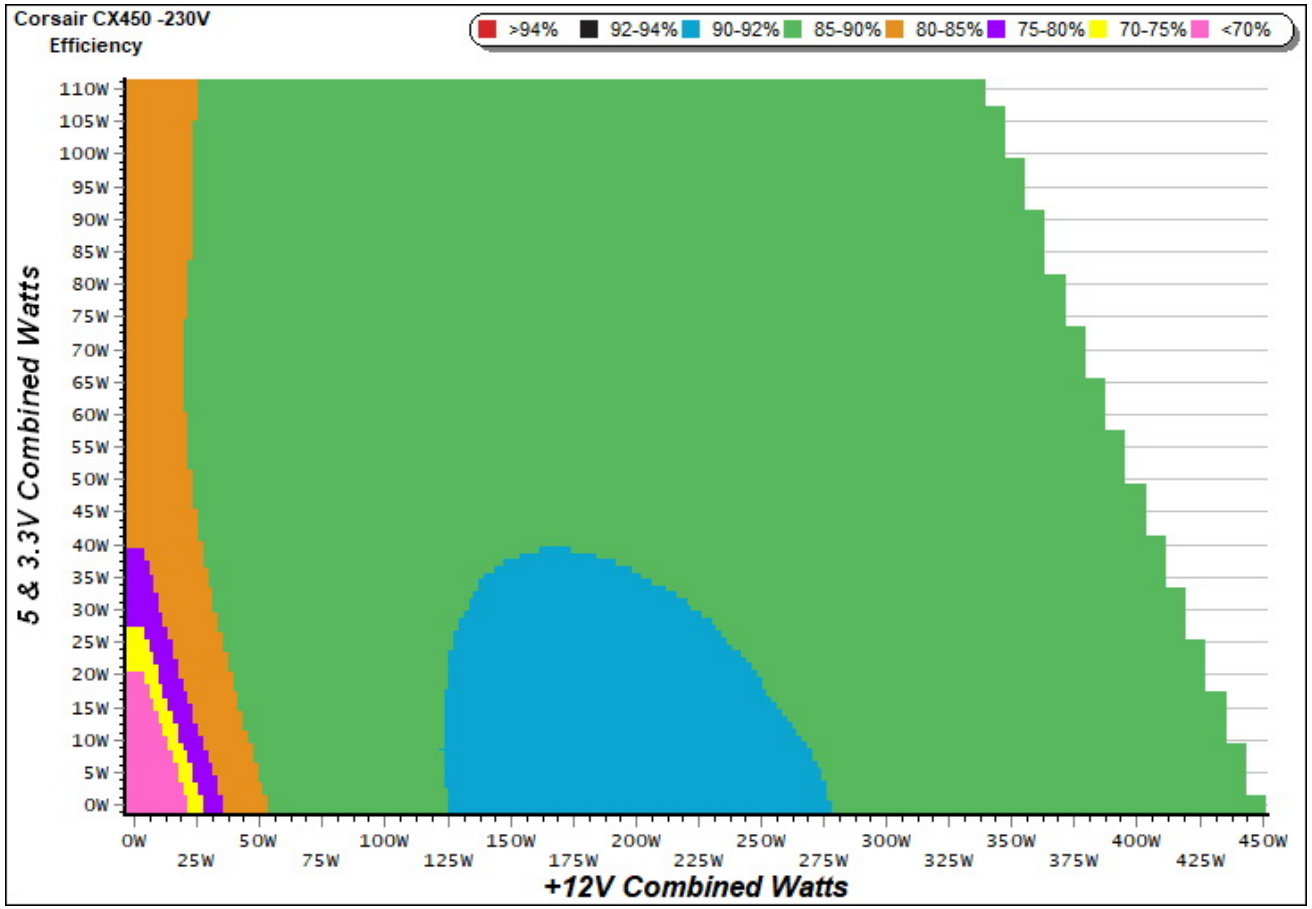
115V



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

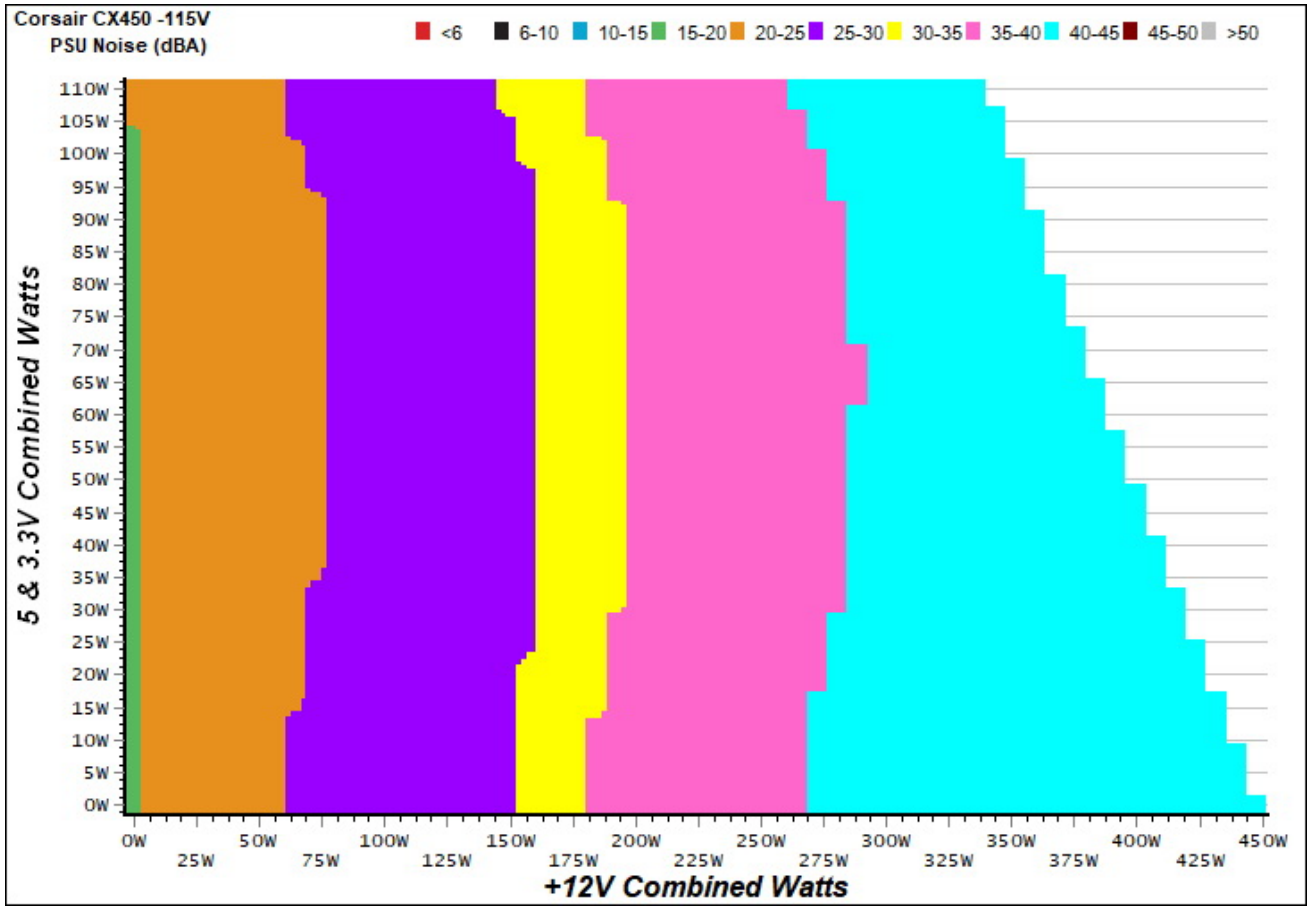


INFO

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

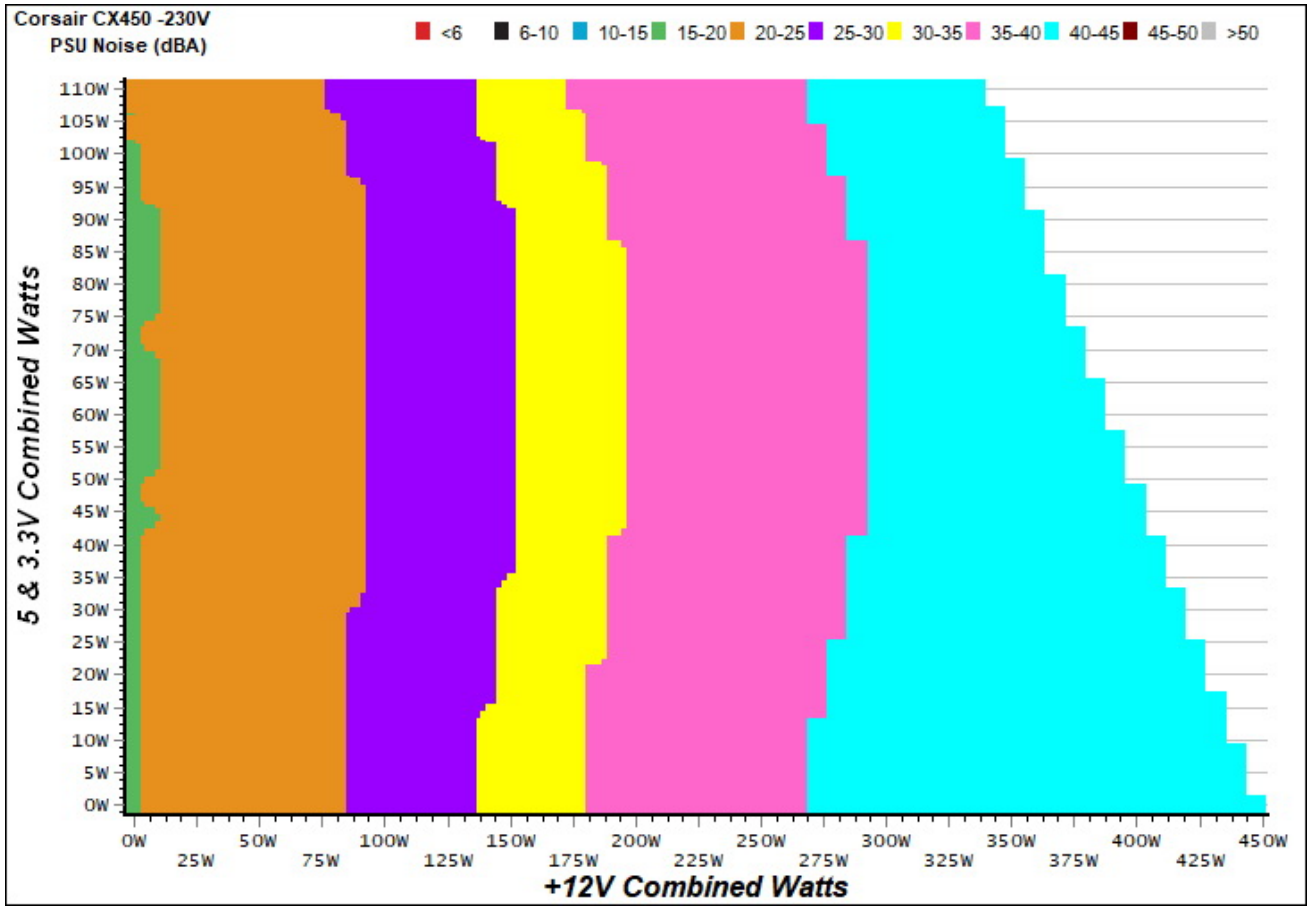
115V



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

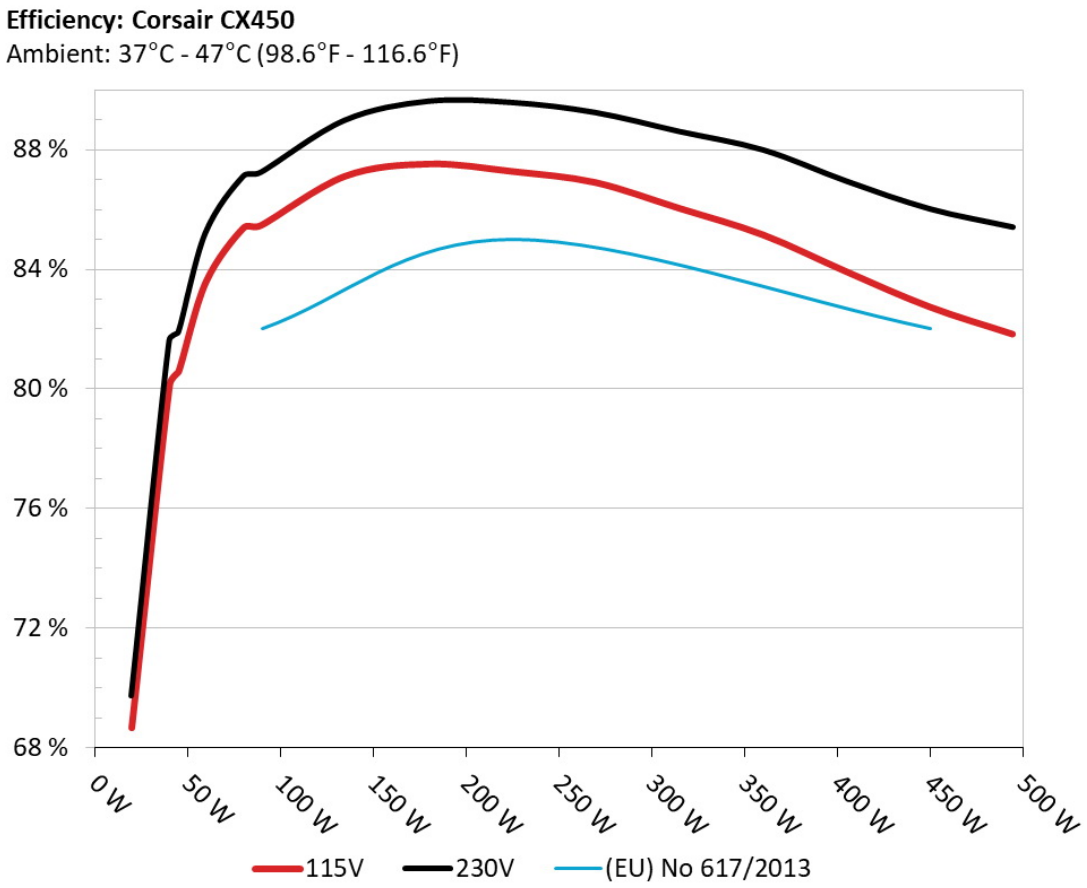


INFO

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

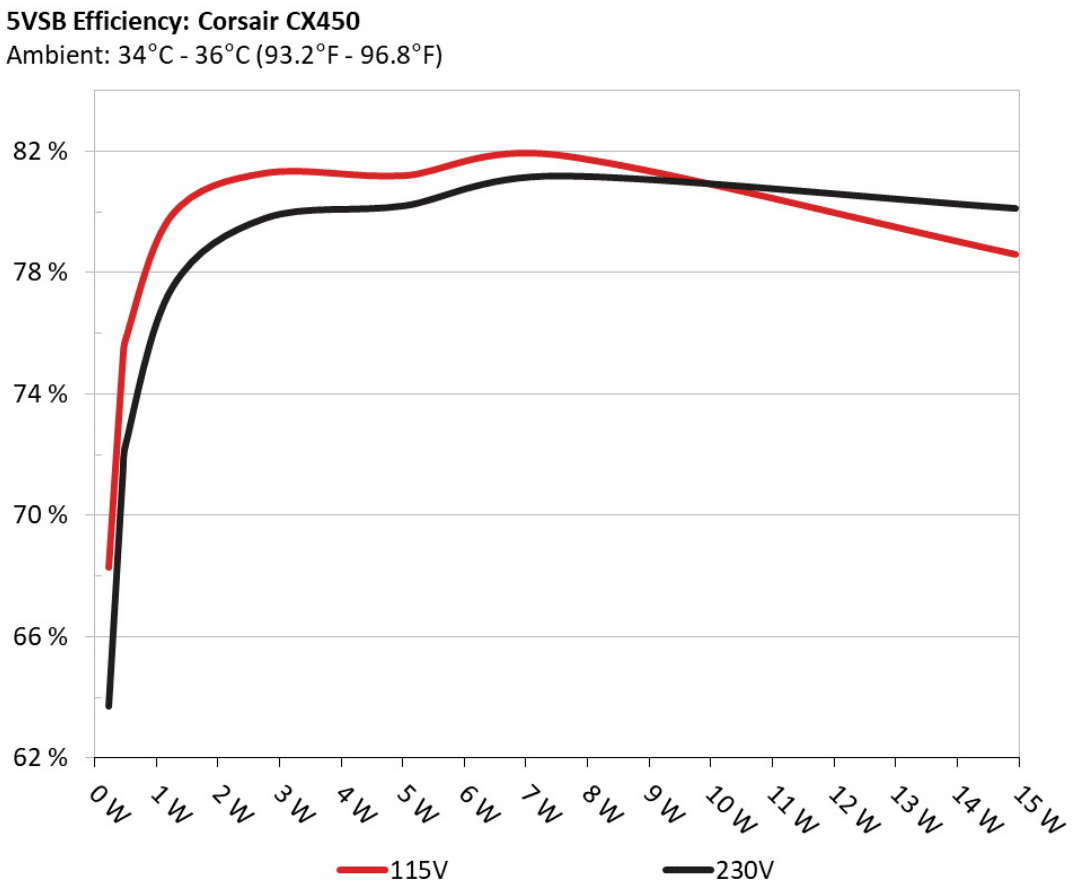
Efficiency under high ambient temperature



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	0.228	68.263%	0.028
	5.050V	0.334		115.37V
2	0.090A	0.455	75.083%	0.051
	5.049V	0.606		115.38V
3	0.550A	2.772	81.290%	0.230
	5.039V	3.410		115.37V
4	1.000A	5.029	81.205%	0.322
	5.028V	6.193		115.38V
5	1.500A	7.526	81.884%	0.375
	5.016V	9.191		115.36V
6	3.000A	14.942	78.605%	0.447
	4.980V	19.009		115.35V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228	63.687%	0.011
	5.050V	0.358		230.93V
2	0.090A	0.455	71.317%	0.019
	5.048V	0.638		230.94V
3	0.550A	2.772	79.793%	0.096
	5.038V	3.474		230.93V
4	1.000A	5.028	80.204%	0.161
	5.027V	6.269		230.93V
5	1.500A	7.525	81.185%	0.216
	5.015V	9.269		230.75V
6	3.001A	14.940	80.116%	0.318
	4.979V	18.648		230.76V

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	1.924A	1.995A	1.982A	0.996A	44.813	80.582%	1230	27.6	40.07°C	0.955
	12.070V	5.008V	3.328V	5.023V	55.612				45.61°C	115.31V
2	4.841A	2.998A	2.976A	1.197A	89.319	85.465%	1340	29.3	40.76°C	0.981
	12.066V	5.006V	3.326V	5.014V	104.509				46.71°C	115.25V
3	8.162A	3.498A	3.457A	1.398A	134.428	87.103%	1395	31.5	41.09°C	0.988
	12.060V	5.004V	3.324V	5.007V	154.333				48.21°C	115.19V
4	11.484A	3.997A	3.973A	1.601A	179.644	87.516%	1575	35.1	41.74°C	0.990
	12.056V	5.003V	3.321V	4.998V	205.269				50.76°C	115.13V
5	14.475A	5.000A	4.971A	1.804A	224.927	87.265%	1710	37.7	42.12°C	0.992
	12.050V	5.001V	3.319V	4.989V	257.751				51.89°C	115.07V
6	17.403A	6.003A	5.966A	2.008A	269.436	86.899%	1865	40.2	42.81°C	0.993
	12.046V	4.999V	3.317V	4.981V	310.057				53.15°C	115.10V
7	20.396A	7.006A	6.967A	2.213A	314.729	86.036%	1865	40.2	43.11°C	0.994
	12.042V	4.998V	3.316V	4.971V	365.809				54.46°C	115.03V
8	23.392A	8.007A	7.966A	2.419A	360.029	85.148%	1865	40.2	43.83°C	0.995
	12.039V	4.997V	3.314V	4.962V	422.828				55.64°C	114.97V
9	26.793A	8.508A	8.456A	2.421A	404.935	83.918%	1870	40.3	44.22°C	0.995
	12.034V	4.995V	3.312V	4.958V	482.539				56.86°C	114.89V
10	29.931A	9.014A	8.975A	3.038A	449.755	82.743%	1865	40.2	45.32°C	0.994
	12.029V	4.993V	3.310V	4.938V	543.555				58.66°C	114.87V
11	33.661A	9.014A	8.974A	3.042A	494.583	81.830%	1865	40.2	46.51°C	0.994
	12.028V	4.993V	3.309V	4.933V	604.405				60.88°C	114.85V
CL1	0.136A	13.001A	12.999A	0.000A	109.905	81.270%	1862	40.1	43.10°C	0.987
	12.056V	5.004V	3.324V	5.029V	135.234				54.76°C	115.21V

CL2	37.419A	1.003A	1.001A	1.000A	463.776	83.467%	1873	40.3	45.55°C	0.995
	12.038V	4.999V	3.314V	4.994V	555.639				59.00°C	114.91V

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	1.924A	1.998A	1.982A	0.996A	44.828	81.905%	1280	28.9	38.40°C	0.757
	12.071V	5.008V	3.328V	5.021V	54.732				44.94°C	230.91V
2	4.843A	2.998A	2.976A	1.197A	89.337	87.264%	1360	30.5	38.68°C	0.892
	12.066V	5.005V	3.325V	5.013V	102.375				45.58°C	230.88V
3	8.163A	3.498A	3.459A	1.399A	134.453	89.002%	1455	33.2	39.28°C	0.937
	12.061V	5.004V	3.323V	5.004V	151.067				46.64°C	230.85V
4	11.486A	3.999A	3.974A	1.601A	179.673	89.642%	1585	35.4	40.16°C	0.957
	12.056V	5.002V	3.321V	4.996V	200.433				47.88°C	230.81V
5	14.476A	5.001A	4.970A	1.805A	224.958	89.597%	1725	38.2	40.78°C	0.968
	12.051V	5.001V	3.319V	4.988V	251.078				48.92°C	230.78V
6	17.405A	6.003A	5.967A	2.009A	269.465	89.264%	1865	40.2	42.06°C	0.974
	12.046V	4.999V	3.317V	4.979V	301.873				50.49°C	230.75V
7	20.400A	7.005A	6.967A	2.214A	314.766	88.630%	1865	40.2	43.14°C	0.978
	12.042V	4.998V	3.315V	4.970V	355.147				51.86°C	230.71V
8	23.396A	8.007A	7.967A	2.420A	360.082	88.011%	1870	40.3	44.45°C	0.982
	12.039V	4.997V	3.314V	4.960V	409.134				53.54°C	230.50V
9	26.796A	8.510A	8.452A	2.422A	405.002	86.963%	1865	40.2	45.11°C	0.984
	12.035V	4.996V	3.312V	4.956V	465.715				54.65°C	230.73V
10	29.927A	9.013A	8.972A	3.041A	449.816	86.039%	1873	40.3	46.58°C	0.986
	12.032V	4.995V	3.311V	4.935V	522.805				56.82°C	230.69V
11	33.660A	9.012A	8.974A	3.043A	494.636	85.428%	1865	40.2	47.60°C	0.987
	12.030V	4.994V	3.309V	4.931V	579.012				58.42°C	230.66V
CL1	0.136A	13.003A	13.001A	0.000A	109.935	83.122%	1865	40.2	43.42°C	0.925
	12.058V	5.005V	3.324V	5.027V	132.258				51.51°C	230.95V

CL2	37.421A	1.002A	0.999A	1.000A	463.863	86.925%	1880	40.5	45.91°C	0.986
	12.040V	5.000V	3.315V	4.993V	533.638				55.97°C	230.69V

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	1.197A	0.499A	0.478A	0.198A	19.535	68.672%	1105	24.0	0.880
	12.067V	5.009V	3.329V	5.045V	28.447				115.35V
2	2.455A	0.999A	0.990A	0.397A	39.928	80.127%	1100	24.0	0.948
	12.069V	5.008V	3.328V	5.039V	49.831				115.32V
3	3.649A	1.495A	1.472A	0.596A	59.420	83.556%	1170	26.1	0.969
	12.068V	5.008V	3.327V	5.032V	71.114				115.30V
4	4.910A	1.997A	1.982A	0.796A	79.834	85.380%	1235	27.7	0.979
	12.066V	5.006V	3.326V	5.026V	93.504				115.26V

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	1.197A	0.499A	0.478A	0.198A	19.537	69.745%	1210	27.4	0.540
	12.070V	5.009V	3.330V	5.043V	28.012				230.92V
2	2.457A	0.997A	0.991A	0.397A	39.950	81.627%	1195	27.3	0.725
	12.071V	5.008V	3.329V	5.037V	48.942				230.91V
3	3.649A	1.497A	1.473A	0.597A	59.440	85.231%	1245	27.9	0.819
	12.069V	5.008V	3.327V	5.030V	69.740				230.89V
4	4.910A	1.998A	1.984A	0.796A	79.855	87.135%	1330	29.2	0.874
	12.068V	5.006V	3.326V	5.024V	91.645				230.88V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	22.8 mV	7.4 mV	7.1 mV	6.5 mV	Pass
20% Load	35.3 mV	8.8 mV	8.3 mV	7.0 mV	Pass
30% Load	54.7 mV	10.0 mV	9.2 mV	7.6 mV	Pass
40% Load	41.7 mV	10.6 mV	10.5 mV	8.1 mV	Pass
50% Load	37.1 mV	12.1 mV	11.5 mV	9.0 mV	Pass
60% Load	35.7 mV	14.4 mV	12.3 mV	9.8 mV	Pass
70% Load	35.3 mV	14.8 mV	14.0 mV	11.1 mV	Pass
80% Load	36.6 mV	14.7 mV	14.9 mV	12.8 mV	Pass
90% Load	39.0 mV	15.6 mV	16.7 mV	14.6 mV	Pass
100% Load	44.2 mV	17.9 mV	18.1 mV	14.9 mV	Pass
110% Load	48.1 mV	20.0 mV	18.6 mV	20.1 mV	Pass
Crossload 1	54.1 mV	13.9 mV	15.5 mV	10.7 mV	Pass
Crossload 2	45.2 mV	14.8 mV	13.7 mV	15.7 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	21.7 mV	7.4 mV	7.3 mV	6.4 mV	Pass
20% Load	36.3 mV	8.7 mV	8.3 mV	6.9 mV	Pass
30% Load	53.2 mV	9.7 mV	9.3 mV	7.5 mV	Pass
40% Load	40.8 mV	10.2 mV	10.2 mV	8.0 mV	Pass
50% Load	36.8 mV	12.3 mV	11.0 mV	8.9 mV	Pass
60% Load	34.7 mV	13.5 mV	12.7 mV	9.9 mV	Pass
70% Load	35.9 mV	14.1 mV	13.4 mV	10.7 mV	Pass
80% Load	36.6 mV	14.7 mV	14.8 mV	11.6 mV	Pass

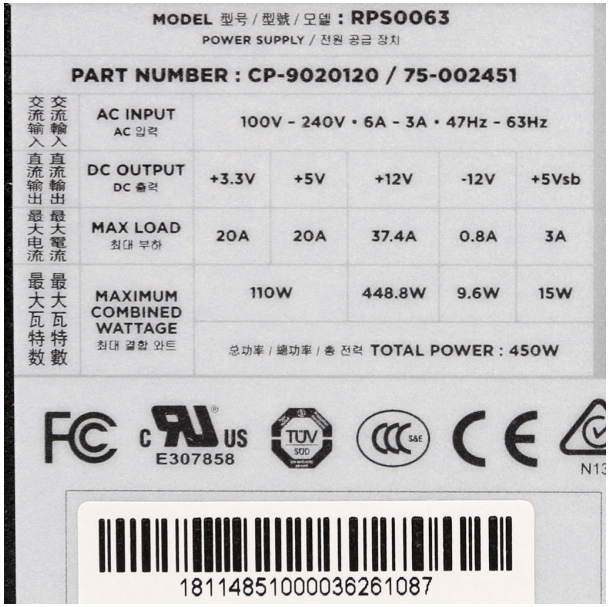
Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	38.7 mV	15.5 mV	16.0 mV	12.8 mV	Pass
100% Load	42.5 mV	17.4 mV	17.0 mV	14.0 mV	Pass
110% Load	47.0 mV	17.6 mV	17.2 mV	15.2 mV	Pass
Crossload 1	53.4 mV	12.7 mV	14.0 mV	10.9 mV	Pass
Crossload 2	43.0 mV	14.0 mV	13.1 mV	14.1 mV	Pass

The results above are not used in the certification process

Corsair CX450 (Great Wall)



Top side



Power specifications table