Make It Yours.

Cooler Master MWE Gold 850 V2 (GX Gold 850)

Serial Number

Lab ID CM85001769

Certification ID 251769

Test Result Report ID: 20PS1769A

Certificate Issue Date: Dec 22, 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	Cooler Master
Model	MWE Gold 850 V2 (GX Gold 850)
OEM/ODM	Huizhou Xin Hui Yuan Tech (Fusion Power)
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6
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	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	CM85001769
Date of receipt	Dec 14, 2020
Testing Date	Dec 17, 2020
Report Issued Date	Dec 22, 2020
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 (610mm)	1	1	18-22AWG	No
4+4 pin EPS12V (610mm)	1	1	18AWG	No
8 pin EPS12V (650mm)	1	1	18AWG	No
6+2 pin PCIe (560mm+125mm)	2	4	16-18AWG	No
SATA (500mm+125mm+125mm+125mm)	3	12	18AWG	No
4-pin Molex (500mm+125mm+125mm+125mm)	1	4	18-20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	16AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70.8	3	0.3
	Watts	100		849.6	15	3.6
Total Max. Power (W)		850				

Parts Description

General Data	-
Manufacturer (OEM)	Huizhou Xin Hui Yuan Tech (Fusion Power)
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor MF72 5D15 (5Ohm) & Relay
Bridge Rectifier(s)	2x GBU15J (600V, 15A @ 100°C)
APFC MOSFETs	2x NCE Power NCE65TF130 (650V, 18A @ 100°C, Rds(on): 0.13Ohm)
APFC Boost Diode	1x GH3D08065I
Bulk Cap(s)	1x Elite (400V, 680uF, 2,000h @ 105°C, PL)
Main Switchers	4x Great Power GPT13N50DG (500V, 13A, Rds(on): 0.49Ohm)
APFC Controller	ON Semiconductor NCP1654
Resonant Controller	Champion CM6901T6X
Topology	Primary side: APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Excelliance MOS Corp EMP16N04HS (40V, 100A @ 100°C, Rds(on): 1.6mOhm)
5V & 3.3V	DC-DC Converters: 4x Excelliance MOS Corp EMB06N03HR (30V, 45A @ 100°C, Rds(on): 6mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 10x Elite (4-10,000h @ 105°C, EY), 7x Lelon (105°C, LZG) Polymer: 6x FPCAP, 4x Elite, 4x no info
Supervisor IC	IN1S313I-DAG
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-

Standby PWM Controller	Excelliance MOS Corp EM8569C

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	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.571%
Average Noise Output (>1450 Load Combinations)	35.18dBA
Average PF (>1450 Load Combinations)	0.989
Efficiency With 10W (≤500W) or 2% (>500W) Load	63.292%
Standby Power Consumption	0.0650W
Non-Accredited	
12V Ripple (Full Load)	28.25mV
5V Ripple (Full Load)	16.93mV
3.3V Ripple (Full Load)	34.69mV
5VSB Ripple (Full Load)	16.28mV
12V Load Regulation	0.28%
5V Load Regulation	0.59%
3.3V Load Regulation	0.89%
5VSB Load Regulation	3.91%
Inrush Current	24.970A

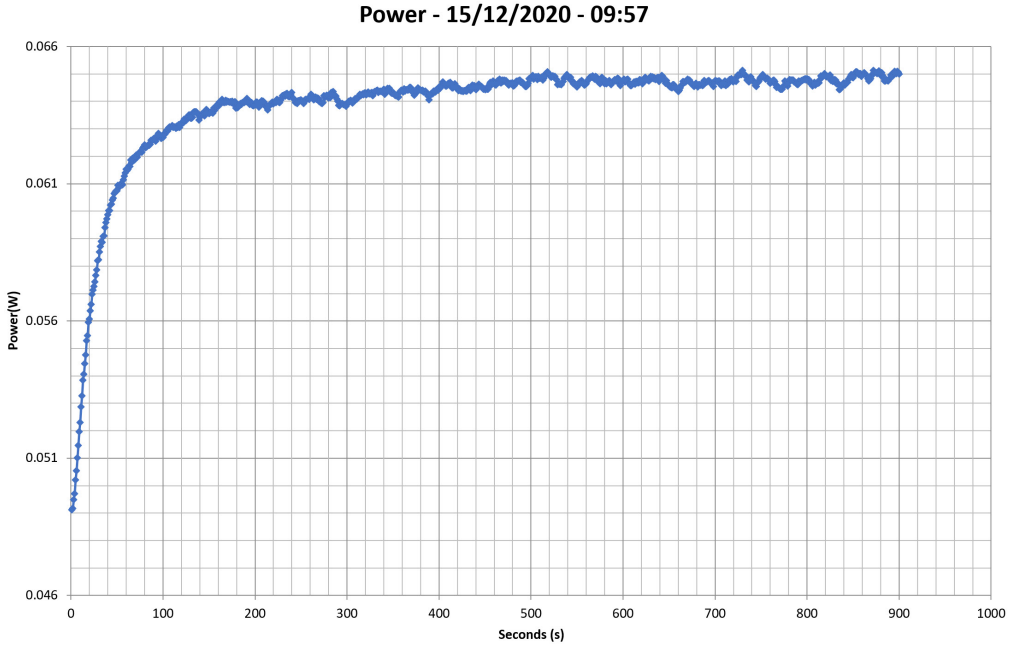
230V		
Accredited		
Average Efficiency (>1450 load combinations)	90.720%	
Average Noise Output (>1450 Load Combinations)	34.18dBA	
Average PF (>1450 Load Combinations)	0.954	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1227W	
Non-Accredited		
12V Ripple (Full Load)	23.40mV	
5V Ripple (Full Load)	14.25mV	
3.3V Ripple (Full Load)	18.74mV	
5VSB Ripple (Full Load)	12.30mV	
12V Load Regulation	0.29%	
5V Load Regulation	0.61%	
3.3V Load Regulation	0.92%	
5VSB Load Regulation	3.89%	
Inrush Current	84.120A	
Hold-Up Time & PWR_OK Signal	20.60ms	
AC Loss to PWR_OK Hold Up Time	16.20ms	
PWR_OK Inactive to DC Loss Delay	4.40ms	
PSU Timings: T1 (20% / 100%)	56.0ms	53.0ms
PSU Timings: T3 (20% / 100%)	128.0ms	128.0ms
OPP (26.50°C / 45.00°C)	127.50%	112.71%

Hold-Up Time & PWR_OK Signal

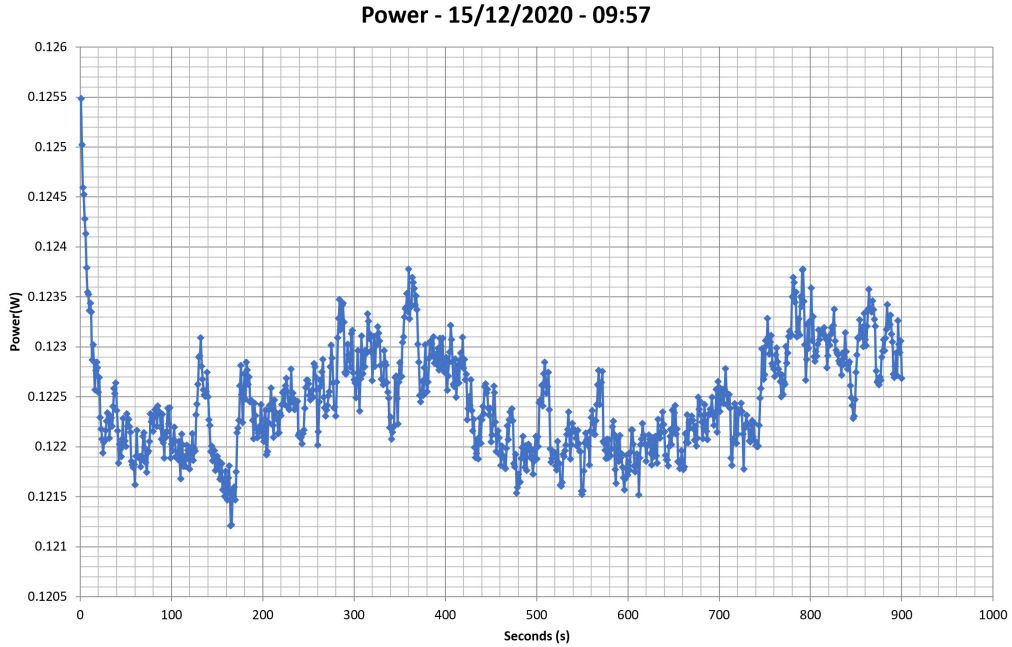
Hold-Up Time (ms)	20.6
AC Loss to PWR_OK Hold Up Time (ms)	16.2
PWR_OK Inactive to DC Loss Delay (ms)	4.4

Graphs

115V

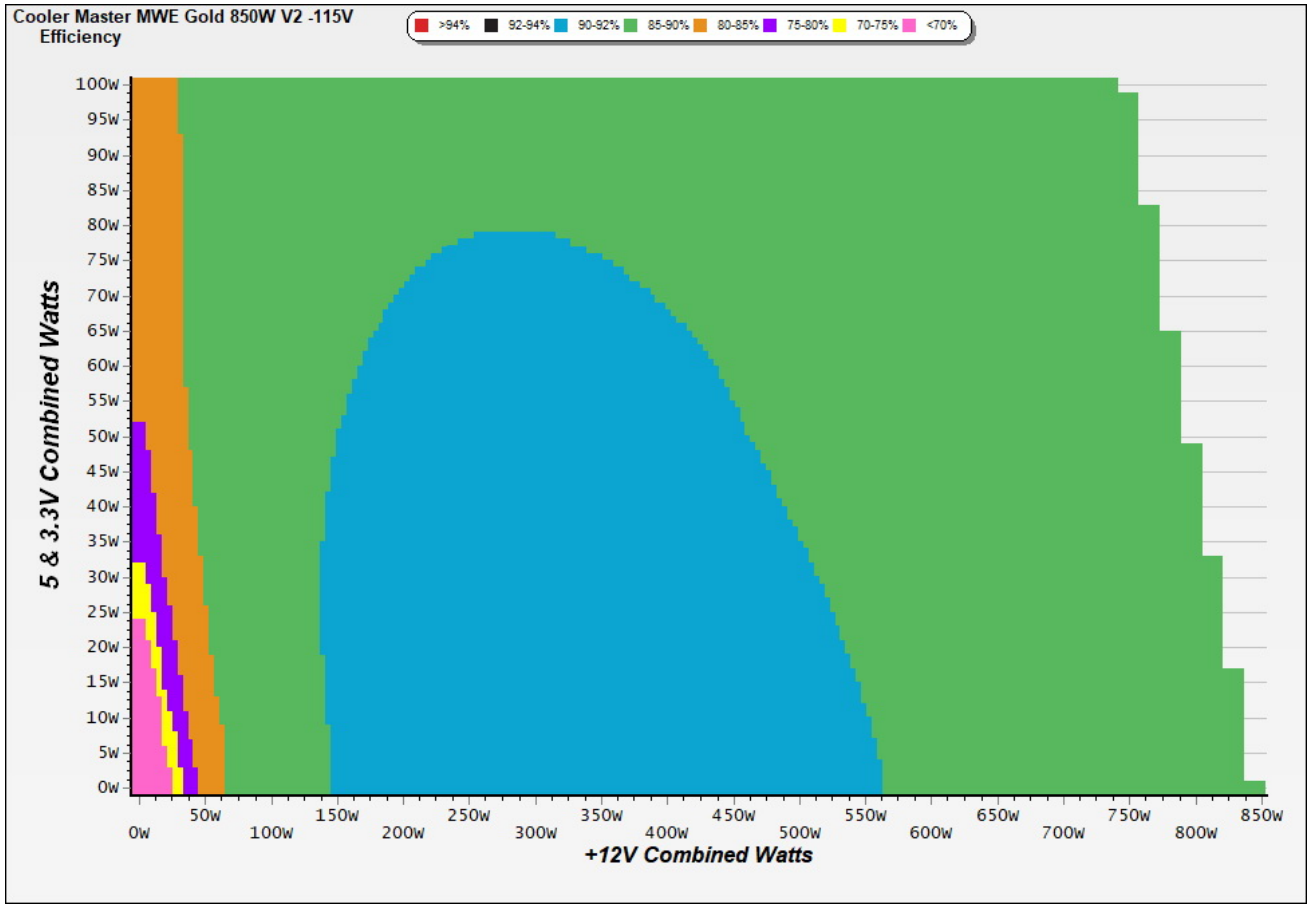


230V



Efficiency Graph

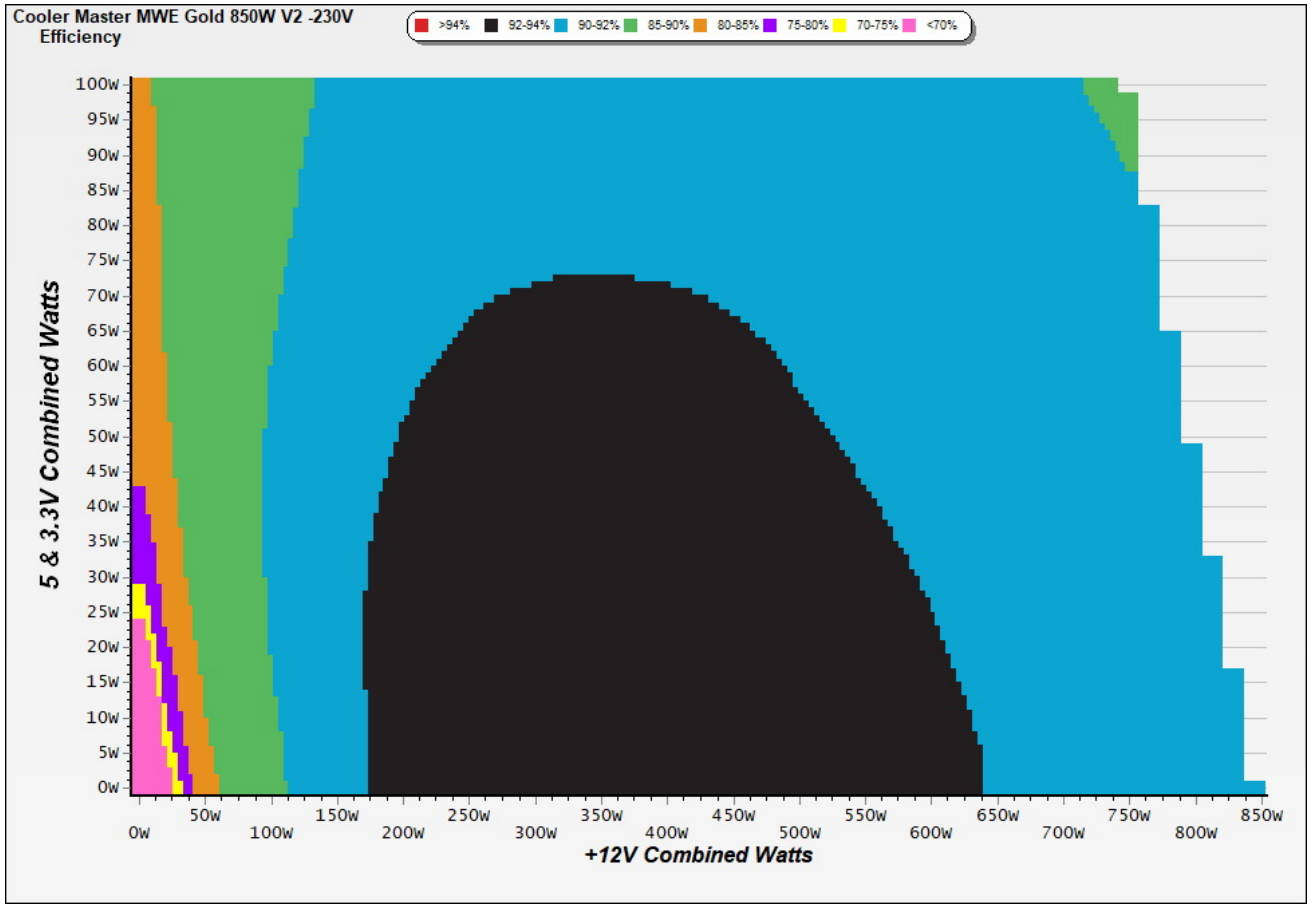
115V



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

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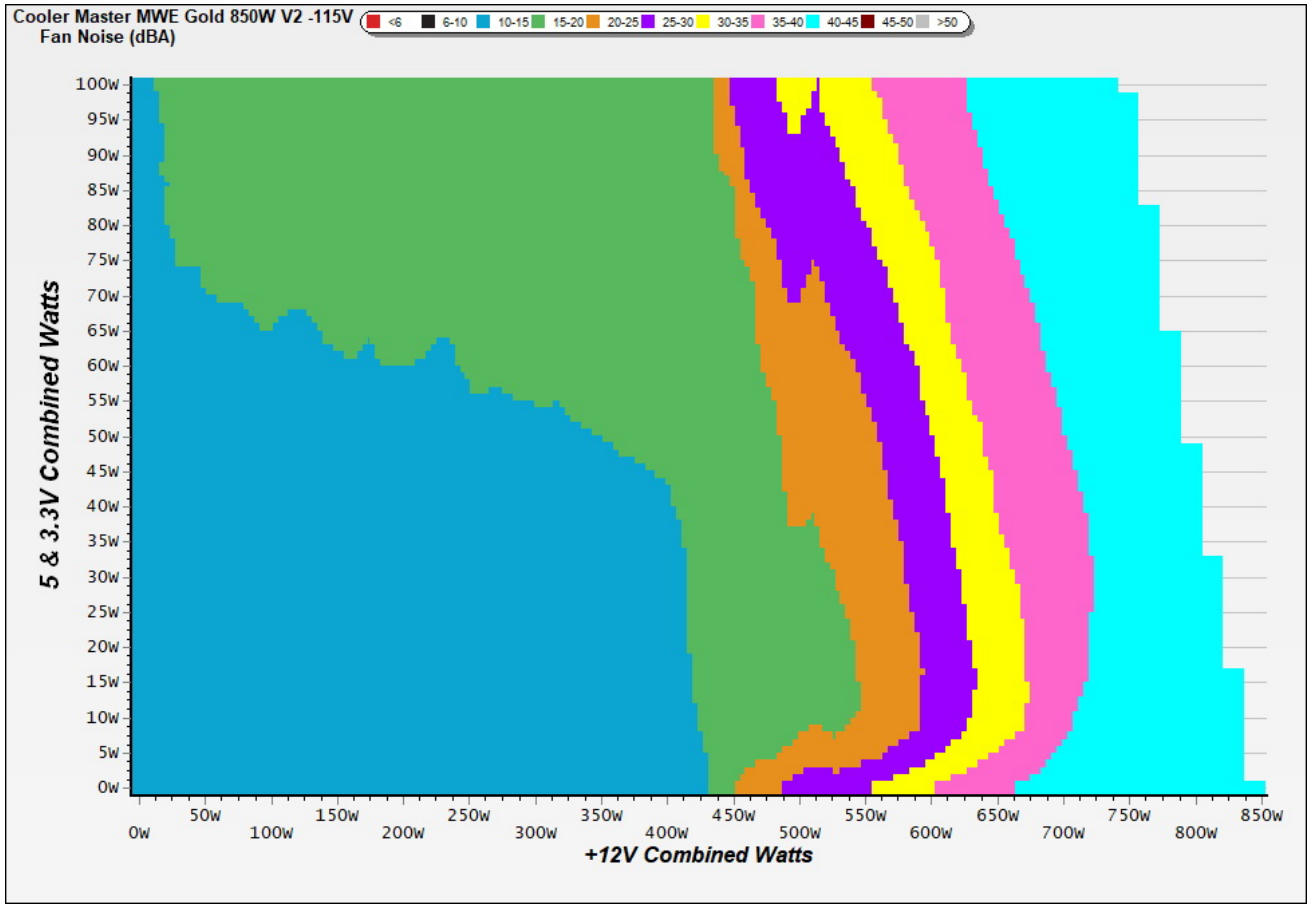
Noise Graph

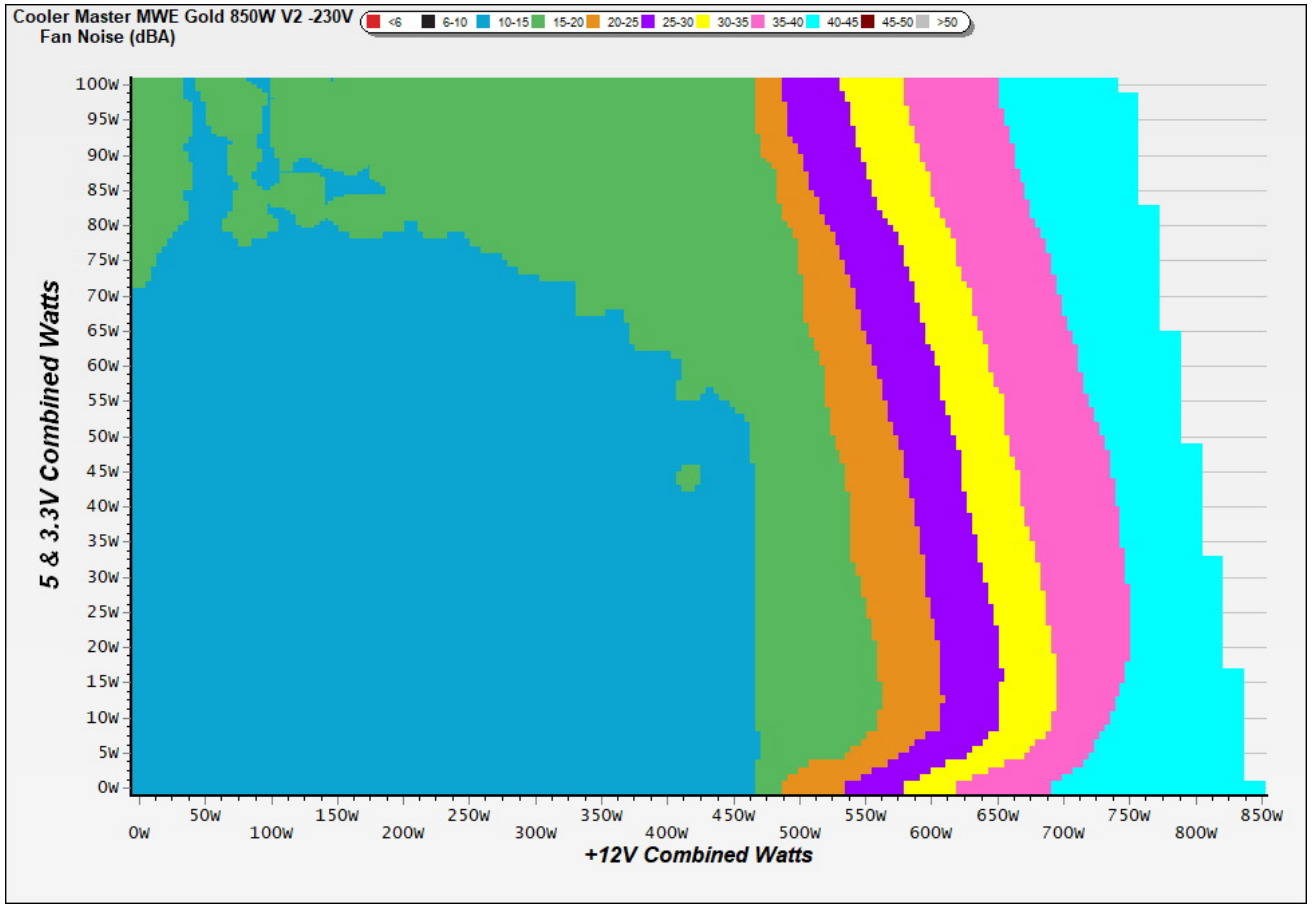
115V



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

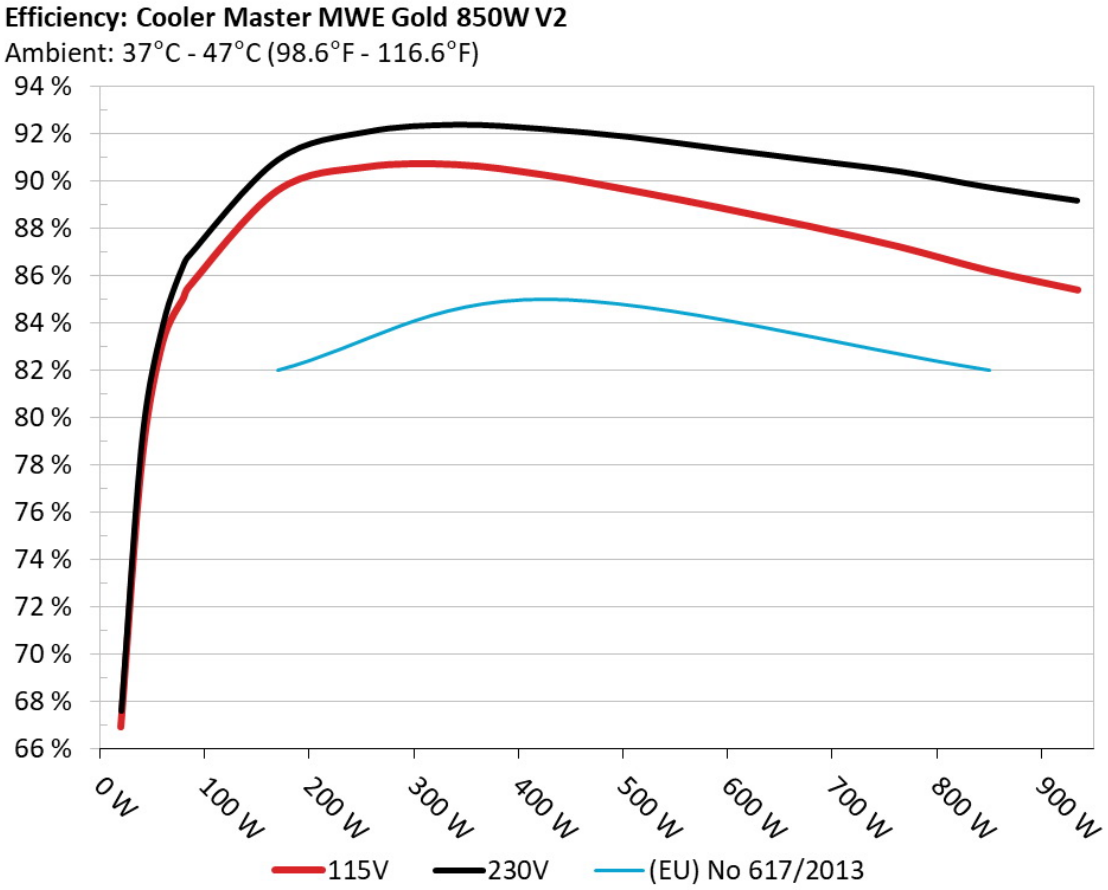


INFO

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

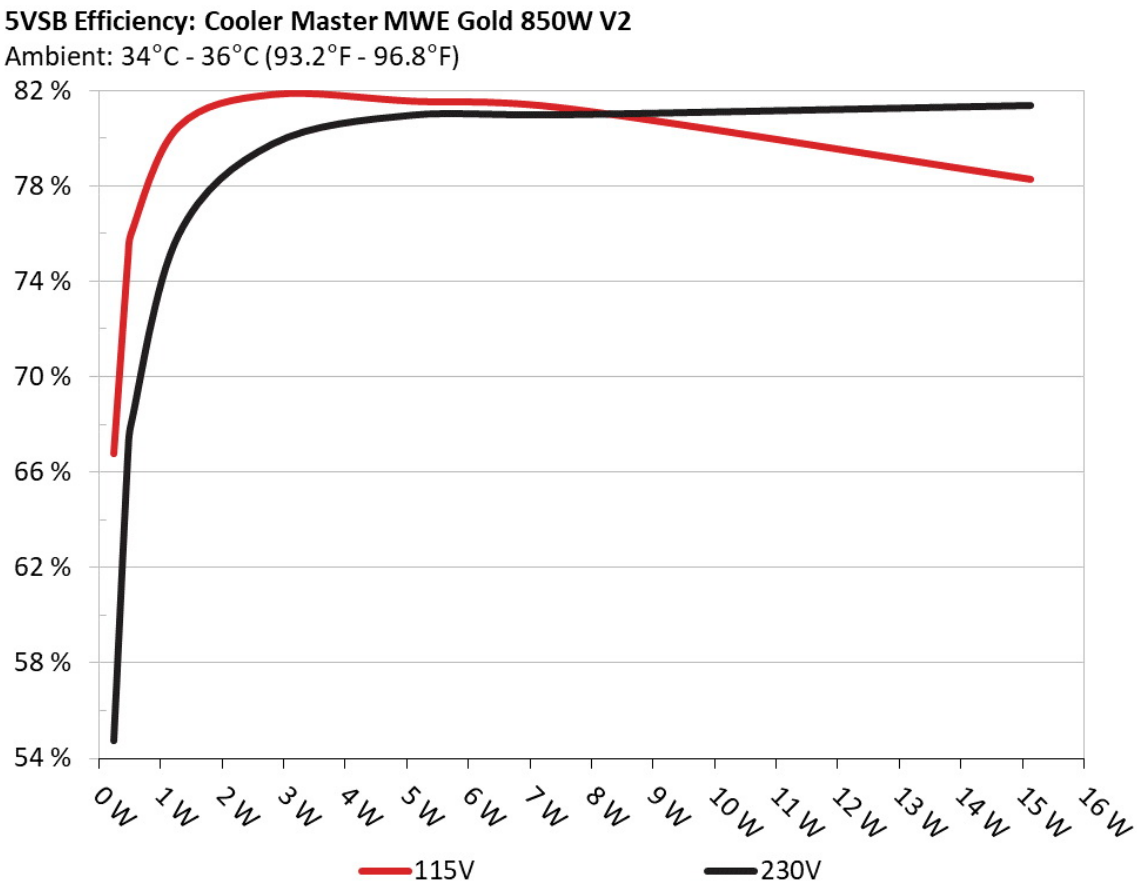
Efficiency under high ambient temperature



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	0.231	66.763%	0.041
	5.127V	0.346		115.12V
2	0.090A	0.461	74.959%	0.072
	5.126V	0.615		115.12V
3	0.550A	2.813	81.821%	0.289
	5.114V	3.438		115.11V
4	1.000A	5.101	81.538%	0.379
	5.101V	6.256		115.11V
5	1.500A	7.631	81.224%	0.427
	5.087V	9.395		115.12V
6	3.000A	15.136	78.267%	0.490
	5.045V	19.339		115.12V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	54.739%	0.015
	5.127V	0.422		230.25V
2	0.090A	0.461	66.812%	0.025
	5.126V	0.690		230.25V
3	0.550A	2.813	79.756%	0.118
	5.113V	3.527		230.26V
4	1.000A	5.101	80.968%	0.190
	5.101V	6.300		230.26V
5	1.500A	7.631	80.983%	0.251
	5.087V	9.423		230.26V
6	3.000A	15.136	81.368%	0.349
	5.045V	18.602		230.26V

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	5.273A	1.977A	1.965A	0.983A	84.963	85.519%	788	15.9	40.13°C	0.972
	12.017V	5.058V	3.359V	5.085V	99.350				43.35°C	115.10V
2	11.582A	2.968A	2.950A	1.184A	170.033	89.600%	788	15.9	40.51°C	0.980
	12.013V	5.054V	3.355V	5.068V	189.769				44.36°C	115.10V
3	18.234A	3.464A	3.445A	1.386A	255.042	90.584%	793	16.1	41.04°C	0.987
	12.010V	5.052V	3.353V	5.051V	281.553				45.46°C	115.10V
4	24.890A	3.962A	3.941A	1.589A	340.059	90.685%	800	16.5	41.83°C	0.992
	12.007V	5.049V	3.350V	5.034V	374.991				47.41°C	115.09V
5	31.196A	4.955A	4.930A	1.795A	424.948	90.243%	1065	24.6	42.04°C	0.994
	12.003V	5.046V	3.346V	5.016V	470.893				48.32°C	115.09V
6	37.475A	5.951A	5.923A	2.000A	509.463	89.578%	1694	38.1	42.97°C	0.996
	11.999V	5.042V	3.343V	4.997V	568.739				50.27°C	115.08V
7	43.824A	6.947A	6.917A	2.210A	594.781	88.843%	2032	43.0	43.28°C	0.996
	11.995V	5.039V	3.340V	4.979V	669.478				51.37°C	115.08V
8	50.179A	7.946A	7.912A	2.420A	680.105	88.057%	2044	43.1	43.80°C	0.997
	11.991V	5.035V	3.336V	4.961V	772.347				52.27°C	115.07V
9	56.938A	8.447A	8.398A	2.426A	765.015	87.203%	2051	43.2	44.72°C	0.997
	11.987V	5.032V	3.333V	4.948V	877.277				53.85°C	115.07V
10	63.429A	8.946A	8.916A	3.051A	849.836	86.201%	2056	43.3	45.83°C	0.997
	11.984V	5.030V	3.331V	4.918V	985.874				55.66°C	115.06V
11	70.513A	8.952A	8.924A	3.058A	934.592	85.387%	2064	43.4	46.77°C	0.998
	11.982V	5.027V	3.328V	4.907V	1094.535				57.48°C	115.05V
CL1	0.117A	12.001A	11.998A	0.000A	102.085	82.586%	827	17.2	42.27°C	0.986
	12.018V	5.042V	3.348V	5.090V	123.610				48.47°C	115.10V

CL2	70.834A	1.001A	1.001A	1.000A	862.325	86.898%	2057	43.3	45.34°C	0.997
	11.985V	5.042V	3.339V	4.991V	992.347				55.25°C	115.06V

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	5.272A	1.976A	1.966A	0.983A	84.956	86.863%	789	15.9	40.03°C	0.825
	12.018V	5.058V	3.358V	5.087V	97.805				43.99°C	230.23V
2	11.580A	2.968A	2.951A	1.184A	170.014	90.912%	790	16.0	40.44°C	0.925
	12.013V	5.054V	3.355V	5.069V	187.010				45.05°C	230.23V
3	18.232A	3.465A	3.446A	1.386A	255.021	92.085%	793	16.1	41.23°C	0.954
	12.010V	5.051V	3.352V	5.052V	276.942				46.49°C	230.23V
4	24.888A	3.962A	3.941A	1.589A	340.038	92.388%	802	16.5	41.69°C	0.971
	12.007V	5.049V	3.350V	5.035V	368.053				47.85°C	230.22V
5	31.195A	4.956A	4.931A	1.794A	424.905	92.202%	1140	27.6	42.15°C	0.978
	12.002V	5.045V	3.346V	5.017V	460.842				49.13°C	230.23V
6	37.480A	5.951A	5.924A	2.000A	509.454	91.852%	1609	37.0	42.32°C	0.984
	11.997V	5.042V	3.343V	4.999V	554.648				50.21°C	230.23V
7	43.828A	6.948A	6.918A	2.209A	594.784	91.362%	2029	42.9	43.16°C	0.985
	11.994V	5.038V	3.340V	4.980V	651.019				51.70°C	230.23V
8	50.180A	7.948A	7.910A	2.419A	680.118	90.888%	2042	43.1	43.77°C	0.987
	11.991V	5.035V	3.336V	4.962V	748.305				52.76°C	230.23V
9	56.940A	8.446A	8.400A	2.425A	765.039	90.409%	2048	43.2	44.52°C	0.988
	11.987V	5.032V	3.333V	4.949V	846.195				53.98°C	230.24V
10	63.436A	8.950A	8.920A	3.051A	849.871	89.742%	2056	43.3	45.86°C	0.989
	11.983V	5.029V	3.330V	4.918V	947.015				56.04°C	230.24V
11	70.520A	8.954A	8.926A	3.058A	934.624	89.177%	2062	43.4	46.70°C	0.990
	11.981V	5.027V	3.328V	4.907V	1048.057				57.46°C	230.24V
CL1	0.117A	12.002A	11.998A	0.000A	102.089	83.922%	822	17.0	42.40°C	0.877
	12.018V	5.042V	3.348V	5.090V	121.648				49.60°C	230.25V

CL2	70.846A	1.000A	0.998A	1.000A	862.314	90.338%	2057	43.3	45.78°C	0.989
	11.983V	5.041V	3.339V	4.992V	954.542				55.86°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])	PF/AC Volts
1	1.235A	0.494A	0.490A	0.195A	19.990	66.921%	780	15.3	0.834
	12.019V	5.062V	3.362V	5.118V	29.871				115.11V
2	2.470A	0.987A	0.981A	0.392A	39.979	78.127%	783	15.6	0.923
	12.018V	5.060V	3.361V	5.109V	51.172				115.11V
3	3.708A	1.483A	1.473A	0.588A	60.010	83.182%	785	15.7	0.962
	12.017V	5.059V	3.360V	5.101V	72.143				115.11V
4	4.940A	1.976A	1.964A	0.786A	79.962	85.063%	787	15.9	0.968
	12.018V	5.058V	3.359V	5.092V	94.003				115.10V

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	1.235A	0.492A	0.491A	0.195A	19.984	67.607%	784	15.6	0.539
	12.020V	5.062V	3.362V	5.119V	29.559				230.22V
2	2.469A	0.988A	0.982A	0.391A	39.972	79.124%	785	15.7	0.678
	12.019V	5.060V	3.361V	5.110V	50.518				230.22V
3	3.708A	1.482A	1.471A	0.588A	60.003	83.970%	785	15.7	0.761
	12.018V	5.059V	3.360V	5.102V	71.458				230.22V
4	4.939A	1.977A	1.965A	0.785A	79.954	86.526%	789	15.9	0.812
	12.018V	5.058V	3.359V	5.093V	92.405				230.23V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.60mV	7.60mV	13.70mV	8.40mV	Pass
20% Load	15.20mV	7.60mV	13.50mV	8.80mV	Pass
30% Load	14.50mV	8.30mV	14.00mV	8.60mV	Pass
40% Load	13.10mV	11.50mV	15.40mV	9.20mV	Pass
50% Load	13.00mV	12.50mV	16.00mV	9.90mV	Pass
60% Load	12.30mV	10.70mV	15.00mV	10.60mV	Pass
70% Load	12.80mV	10.40mV	14.80mV	12.20mV	Pass
80% Load	14.00mV	11.50mV	15.70mV	13.00mV	Pass
90% Load	14.40mV	12.60mV	16.50mV	13.50mV	Pass
100% Load	28.30mV	16.90mV	34.70mV	16.30mV	Pass
110% Load	30.20mV	18.30mV	35.80mV	17.00mV	Pass
Crossload1	16.60mV	10.60mV	20.30mV	8.10mV	Pass
Crossload2	24.20mV	14.20mV	19.80mV	15.10mV	Pass

The results above are not used in the certification process

230V

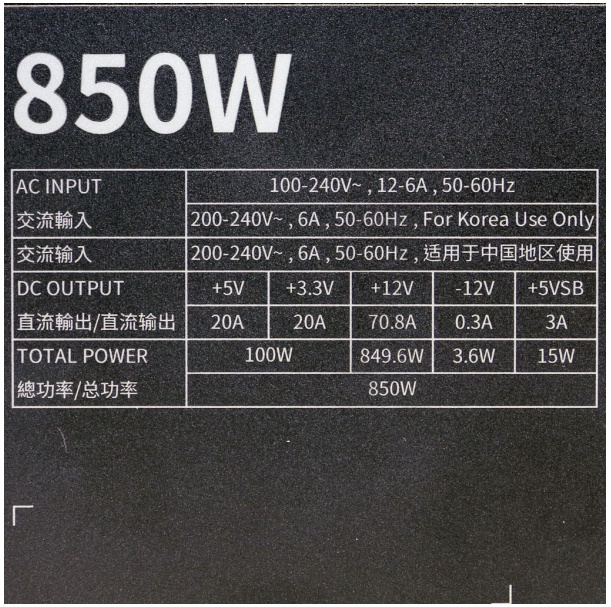
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.30mV	7.80mV	13.30mV	8.70mV	Pass
20% Load	17.50mV	8.10mV	13.60mV	8.70mV	Pass
30% Load	16.60mV	9.00mV	12.90mV	8.70mV	Pass
40% Load	14.80mV	11.70mV	15.30mV	9.00mV	Pass
50% Load	12.40mV	12.70mV	17.40mV	9.50mV	Pass
60% Load	12.70mV	10.80mV	16.30mV	10.10mV	Pass
70% Load	13.20mV	10.90mV	15.90mV	10.40mV	Pass
80% Load	14.20mV	11.80mV	16.80mV	10.70mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	14.70mV	12.90mV	16.90mV	10.90mV	Pass
100% Load	23.40mV	14.30mV	18.70mV	12.30mV	Pass
110% Load	26.80mV	15.00mV	19.60mV	13.10mV	Pass
Crossload1	17.00mV	10.50mV	18.80mV	7.80mV	Pass
Crossload2	24.00mV	13.10mV	19.00mV	11.90mV	Pass

The results above are not used in the certification process

Cooler Master MWE Gold 850 V2 (GX Gold 850)

Top side



Power specifications label