



Make It Yours.

Cooler Master V850i Gold



Lab ID CM85002163

Certification ID 252163

Test Result Report ID: 23PS2163A

Certificate Issue Date: Apr 4, 2023

115V

230V

Scheme: ETA-EMI PSU



115V

230V

Scheme: LAMBDA PSU





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	Brueel & Kjaer 2270 G4
Microphone	Brueel & 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	V850i Gold
OEM/ODM	Chicony Power
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
V_{rms}	100-240
I_{rms}	12-6

□□□□ (Hz)	50-60
□□□□ (W)	850
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	135mm Fluid Dynamic Bearing Fan (YY14025M12B)
□□□□	✓
Cybenetics Testing Information	
Lab ID	CM85002163
Date of receipt	Mar 28, 2023
Testing Date	Mar 31, 2023
Report Issued Date	Apr 4, 2023
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□□	□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (650mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (650mm)	1	1	18AWG	□
8 pin EPS 12V □□ (650mm)	1	1	18AWG	□
6+2pin PCIe□□ (550mm)	3	3	16-18AWG	□
12+4 pin PCIe (650mm) (450W)	1	1	16-24AWG	□
SATA□□ (500mm+120mm+120mm+120mm)	3	12	18AWG	□
□ 4pin Molex□□ (400mm+120mm+120mm+120mm)	1	4	18AWG	□

Motherboard USB Cable (810mm)	1	1	24AWG	□
AC Power Cord (1400mm) - C13 coupler	1	1	14AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	70.8	3	0.3
	□	120		849.6	15	3.6
□□□□ (W)		850				

Parts Description

General Data	-
Manufacturer (OEM)	Chicony Power
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor JNR15S100L (10 Ohm) & Relay
Bridge Rectifier(s)	2x Diodes GBU15JL (600V, 15A @ 115°C)
APFC MOSFETs	2x Infineon IPP60R120P7 (600V, 16A @ 100°C, Rds(on): 0.120Ohm) & 1x Champion CM03X (reduce the no load consumption)
APFC Boost Diode	1x CREE C6D10065A (650V, 10A @ 155°C)
Bulk Cap(s)	1x Rubycon (450V, 680uF, 3,000h @ 105°C, MXK)
Main Switchers	2x STMicroelectronics STF33N60M6 (600V, 15.8A @ 100°C, Rds(on): 0.125Ohm)
APFC Controller	Infineon ICE2PCS01G
Resonant Controller	MPS HR100A
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	-
5V & 3.3V	DC-DC Converters: 4x Alpha & Omega AON6144 (40V, 89A @ 100°C, Rds(on): 2.4mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 3x Nippon Chemi-Con (2-5,000h @ 105°C, KZE), 2x Nichicon (5-6,000h @ 105°C, HV), 1x Nichicon (2-4,000h @ 105°C, HD), 2x Rubycon (6-10,000h @ 105°C, ZLH) Polymer: 11x Nippon Chemi-Con, 7x FPCAP, 10x NIC, 2x Nichicon

Supervisor IC	Weltrend WT7502R
ARM Microcontroller	Nuvoton M032EC1AE (USB connectivity & Fan control)
Fan Model	Snowfan YY14025M12B (135mm, 12V, 0.40A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifier	STMicroelectronics STD4N80K5 FET(800V, 1.7A @ 100°C, Rds(on): 2.5Ohm) &1x Advanced Power AP6N6R5LMT-L FET (60V, 16.9A @ 70°C, Rds(on): 6.5mOhm)
Standby PWM Controller	OnSemiconductor NCP12400
-12V Circuit	-
Rectifier	UTC LM7912L (-12V, 1A)

Test Results

Temperature & Compliance Info

□□□□ (°C / °F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.0 Compliance	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	89.467%
Average Noise Output (>1450 Load Combinations)	26.46dBA
PF□□□ (>1450 Load Combinations)	0.991
Efficiency With 10W (≤500W) or 2% (>500W) Load	72.513%
□□□□□	0.0654W
Non-Accredited	
12V Ripple (Full Load)	24.90mV
5V Ripple (Full Load)	16.75mV
3.3V Ripple (Full Load)	21.75mV

5VSB Ripple (Full Load)	15.99mV
12V Load Regulation	0.80%
5V Load Regulation	0.70%
3.3V Load Regulation	1.10%
5VSB Load Regulation	3.39%
Inrush Current	23.360A

230V

Accredited		
η _{avg} (>1450 load combinations)	91.556%	
Average Noise Output (>1450 Load Combinations)	26.42dBA	
PF _{avg} (>1450 Load Combinations)	0.955	
Efficiency With 10W (≤500W) or 2% (>500W) Load	74.432%	
η _{min}	0.1311W	
Non-Accredited		
12V Ripple (Full Load)	24.71mV	
5V Ripple (Full Load)	17.28mV	
3.3V Ripple (Full Load)	23.65mV	
5VSB Ripple (Full Load)	22.60mV	
12V Load Regulation	0.78%	
5V Load Regulation	0.70%	
3.3V Load Regulation	1.10%	
5VSB Load Regulation	3.37%	
Inrush Current	79.470A	
12V Transient Response (200%)	11.41V	
5V Transient Response (200%)	4.956V	
3.3V Transient Response (200%)	3.195V	
5VSB Transient Response (200%)	4.904V	
η _{min} & PG _{min}	29.30ms	
AC Loss to PWR_OK Hold Up Time	20.80ms	
PWR_OK Inactive to DC Loss Delay	8.50ms	
PSU Timings: T1 (20% / 100%)	49.0ms	45.0ms

PSU Timings: T3 (20% / 100%)	127.0ms	125.0ms
OPP (28.06°C / 46.25°C)	121.50%	121.49%

|||| & PG||

Hold-Up Time (ms)	29.3
AC Loss to PWR_OK Hold Up Time (ms)	20.8
PWR_OK Inactive to DC Loss Delay (ms)	8.5



Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.93 V	114.89 V	113.85 V	114.97 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.417	1.416	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.14 %	0.12 %	N/A	0.19 %	2.00 %	PASS
Real Power:	0.065 W	0.058 W	N/A	0.074 W	N/A	N/A
Apparent Power:	7.649 W	7.621 W	N/A	7.679 W	N/A	N/A
Power Factor:	0.009	N/A	N/A	N/A	N/A	N/A

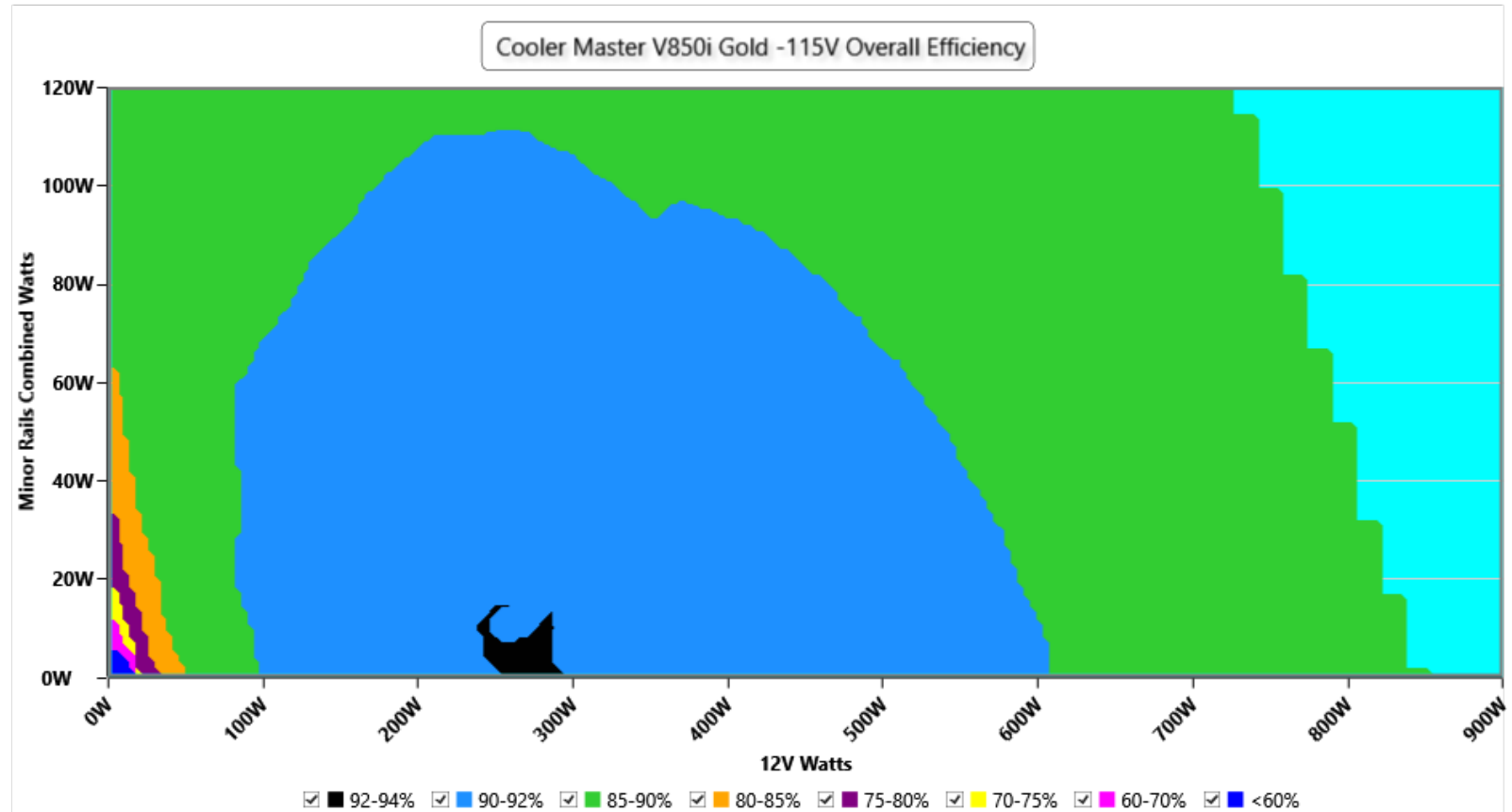
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.90 V	229.86 V	227.70 V	229.97 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:	1.417	1.416	1.340	1.418	1.490	PASS

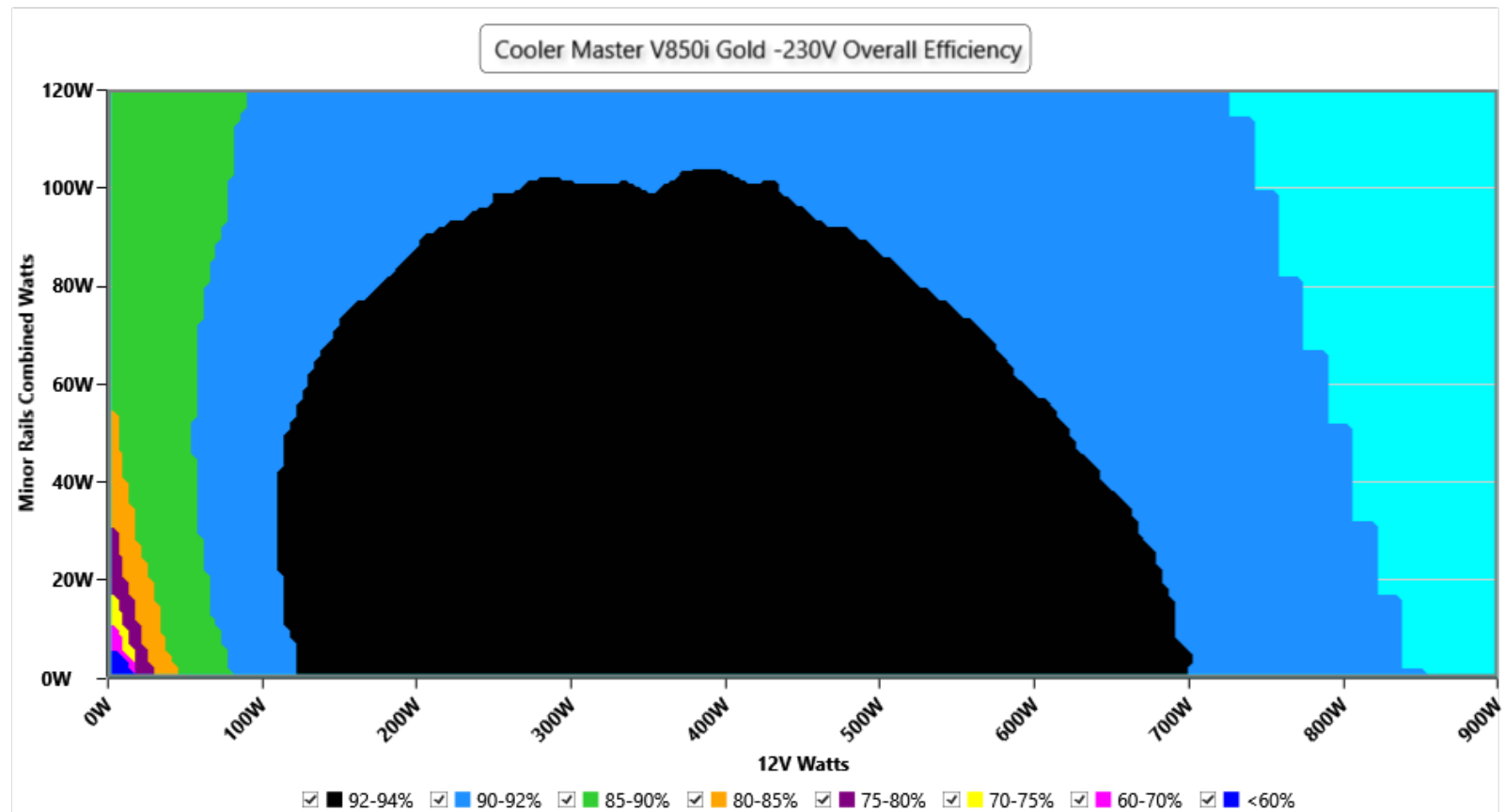
Mains Voltage THD:	0.15 %	0.13 %	N/A	0.17 %	2.00 %	PASS
Real Power:	0.131 W	0.113 W	N/A	0.153 W	N/A	N/A
Apparent Power:	27.599 W	27.403 W	N/A	27.834 W	N/A	N/A
Power Factor:	0.005	N/A	N/A	N/A	N/A	N/A



115V



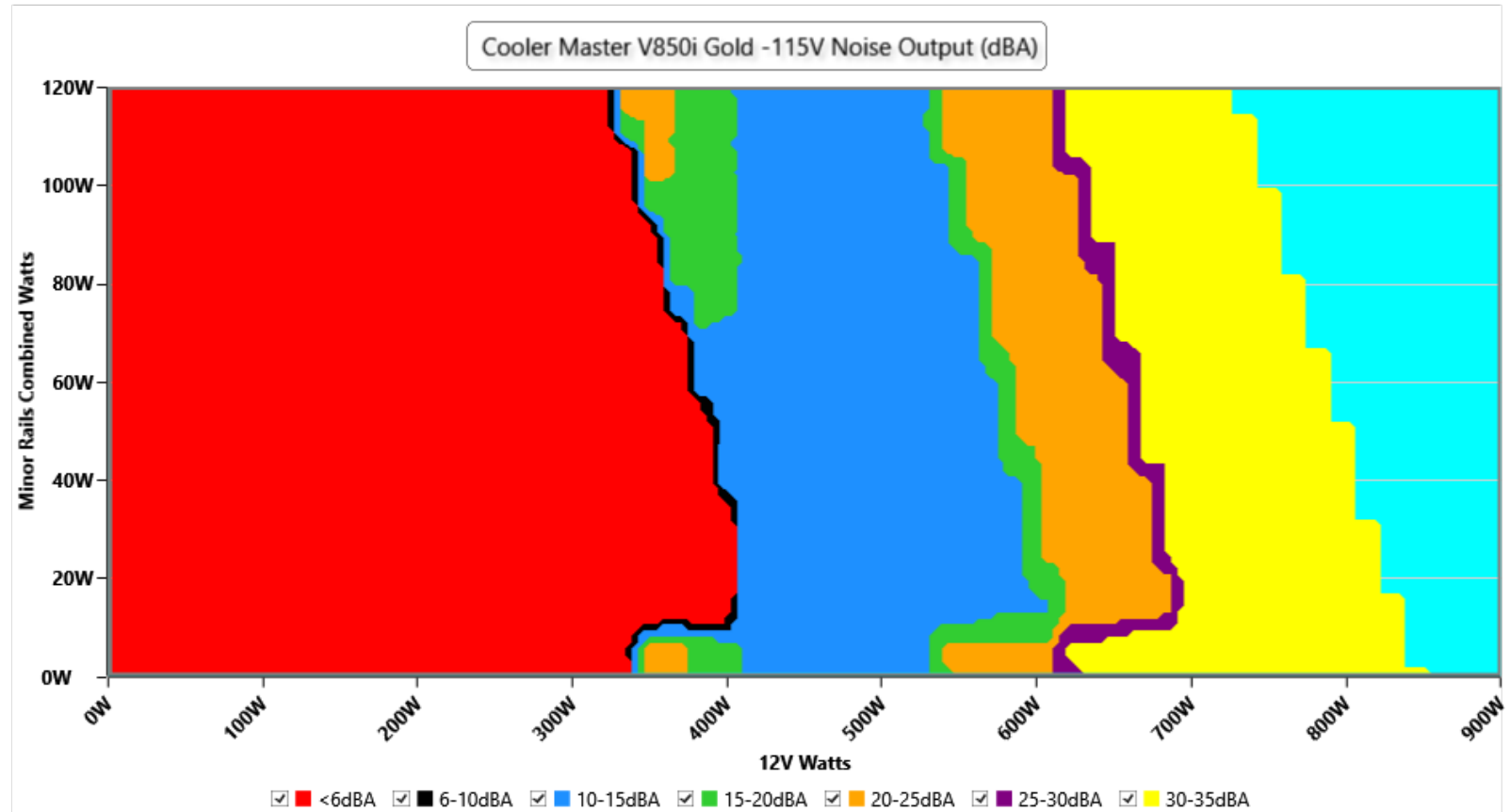
This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations



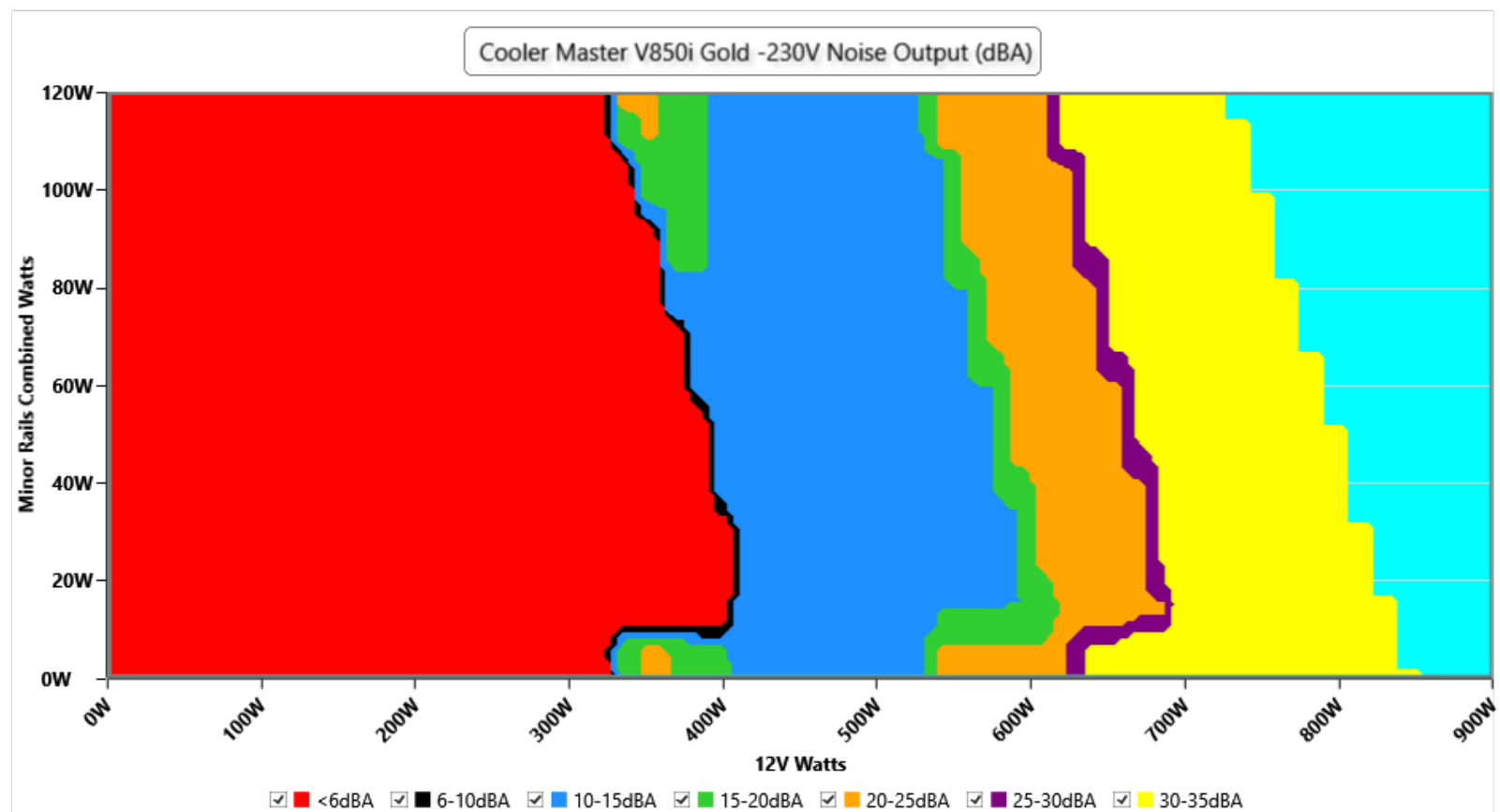
This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations



115V

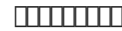


The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails



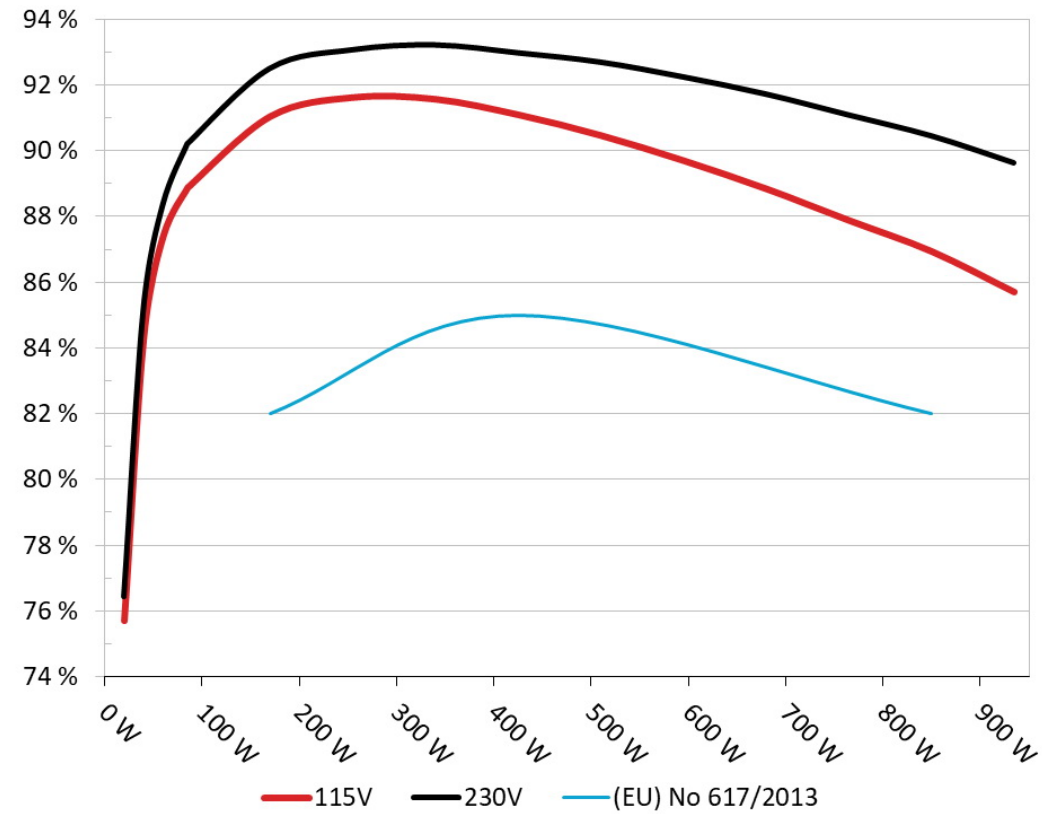
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance



Efficiency: Cooler Master V850i Gold

Ambient: 37°C - 47°C (98.6°F - 116.6°F)

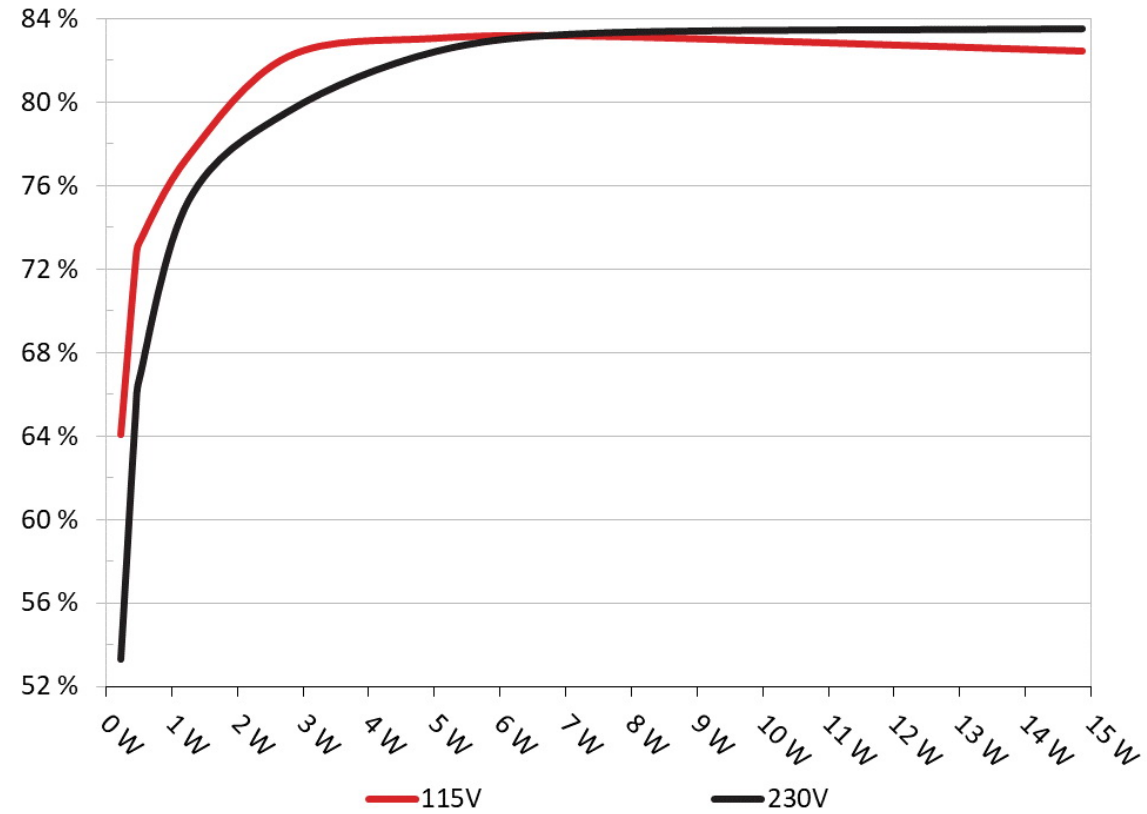


The PSU's efficiency under high ambient temperatures with 115V and 230V input. For this graph the results of the 10-110% load regulation table are used

5Vsb

5VSB Efficiency: Cooler Master V850i Gold

Ambient: 34°C - 36°C (93.2°F - 96.8°F)



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	0.228W	64.062%	0.046
	5.071V	0.356W		114.92V
2	0.09A	0.456W	72.45%	0.081
	5.067V	0.629W		114.92V
3	0.55A	2.773W	82.195%	0.318
	5.041V	3.374W		114.93V
4	1A	5.022W	83.074%	0.419
	5.021V	6.045W		114.93V
5	1.5A	7.509W	83.168%	0.467
	5.005V	9.029W		114.93V
6	3A	14.869W	82.461%	0.526
	4.956V	18.031W		114.92V

230V

#	5VSB	DC/AC ()		PF/AC
1	0.045A	0.228W	53.295%	0.016
	5.071V	0.428W		229.89V
2	0.09A	0.456W	65.228%	0.026
	5.067V	0.699W		229.88V
3	0.55A	2.773W	79.511%	0.123
	5.041V	3.488W		229.88V
4	1A	5.021W	82.389%	0.198
	5.021V	6.095W		229.88V
5	1.5A	7.507W	83.271%	0.263
	5.004V	9.015W		229.88V
6	3A	14.866W	83.474%	0.37
	4.955V	17.809W		229.88V

Supplementary Tests (For Reference)

10-110%□□□

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□ (RPM)	□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	5.246A	1.985A	1.998A	0.996A	85.004	88.755%	0	<6.0	43.86°C	0.935
	12.087V	5.037V	3.304V	5.02V	95.774				39.64°C	114.91V
20%	11.514A	2.98A	3A	1.199A	169.951	91.039%	0	<6.0	45.49°C	0.975
	12.077V	5.033V	3.3V	5.005V	186.678				40.88°C	114.9V
30%	18.139A	3.479A	3.503A	1.402A	254.962	91.615%	0	<6.0	46.76°C	0.987
	12.069V	5.03V	3.297V	4.993V	278.295				41.65°C	114.87V
40%	24.779A	3.978A	4.008A	1.606A	340.053	91.561%	0	<6.0	47.35°C	0.991
	12.061V	5.028V	3.293V	4.981V	371.392				41.8°C	114.86V
50%	31.066A	4.976A	5.016A	1.812A	424.903	91.09%	475	11.7	42.03°C	0.994
	12.051V	5.024V	3.29V	4.968V	466.467				48.11°C	114.83V
60%	37.336A	5.976A	6.026A	2A	509.348	90.464%	475	11.7	42.63°C	0.995
	12.042V	5.02V	3.286V	4.956V	563.041				49.27°C	114.81V
70%	43.680A	6.978A	7.038A	2.226A	594.753	89.696%	794	23.6	43.49°C	0.996
	12.034V	5.017V	3.283V	4.942V	663.076				50.56°C	114.79V
80%	50.036A	7.979A	8.049A	2.332A	679.588	88.84%	799	23.8	44.18°C	0.996
	12.025V	5.013V	3.279V	4.932V	764.955				52.22°C	114.77V
90%	56.801A	8.483A	8.546A	2.437A	765.007	87.875%	1356	39.8	45.08°C	0.996
	12.016V	5.01V	3.275V	4.924V	870.558				54.17°C	114.74V
100%	63.311A	8.988A	9.075A	3.064A	849.835	86.933%	1359	39.8	45.42°C	0.997
	12.006V	5.008V	3.272V	4.896V	977.565				55.44°C	114.72V
110%	69.703A	9.994A	10.186A	3.068A	934.422	85.706%	1777	47.1	47.22°C	0.997
	11.996V	5.004V	3.268V	4.89V	1090.269				58.15°C	114.69V
CL1	0.116A	14.4A	14.467A	0A	121.31	85.189%	0	<6.0	54.41°C	0.961
	12.077V	5.015V	3.297V	5.044V	142.406				48.89°C	114.89V

CL2	0.116A	19.96A	0A	0A	101.416	84.397%	0	<6.0	52.04°C	0.948
	12.085V	5.011V	3.304V	5.062V	120.165				44.81°C	114.9V
CL3	0.115A	0A	20.014A	0A	67.38	79.09%	480	11.9	43.42°C	0.926
	12.083V	5.037V	3.297V	5.047V	85.194				52.52°C	114.9V
CL4	70.725A	0A	0A	0A	849.543	87.48%	1361	39.8	45.84°C	0.997
	12.012V	5.028V	3.28V	5.037V	971.141				56.81°C	114.71V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	5.246A	1.985A	1.998A	0.996A	85.005	90.121%	0	<6.0	44.99°C	0.804
	12.086V	5.037V	3.303V	5.019V	94.324				40.74°C	229.88V
20%	11.515A	2.98A	3A	1.199A	169.954	92.52%	0	<6.0	45.56°C	0.901
	12.076V	5.033V	3.3V	5.005V	183.695				40.88°C	229.87V
30%	18.141A	3.479A	3.503A	1.402A	254.976	93.087%	0	<6.0	46.39°C	0.938
	12.069V	5.031V	3.297V	4.994V	273.912				41.22°C	229.86V
40%	24.780A	3.978A	4.008A	1.606A	340.064	93.234%	0	<6.0	47.63°C	0.961
	12.060V	5.028V	3.294V	4.982V	364.743				42.12°C	229.85V
50%	31.069A	4.976A	5.016A	1.811A	424.929	92.993%	477	11.8	42.51°C	0.973
	12.051V	5.024V	3.29V	4.969V	456.946				48.58°C	229.85V
60%	37.339A	5.976A	6.026A	2A	509.37	92.712%	474	11.7	42.66°C	0.981
	12.042V	5.02V	3.286V	4.957V	549.408				49.29°C	229.83V
70%	43.682A	6.978A	7.038A	2.226A	594.771	92.26%	793	23.5	43.14°C	0.985
	12.034V	5.017V	3.283V	4.943V	644.674				50.24°C	229.82V
80%	50.038A	7.979A	8.049A	2.331A	679.602	91.737%	798	23.8	44.18°C	0.987
	12.025V	5.013V	3.279V	4.933V	740.815				52.22°C	229.81V
90%	56.800A	8.483A	8.546A	2.437A	765.01	91.098%	1359	39.8	45.54°C	0.989
	12.016V	5.011V	3.276V	4.924V	839.777				54.62°C	229.8V
100%	63.312A	8.988A	9.075A	3.064A	849.836	90.462%	1362	39.8	46.67°C	0.99
	12.006V	5.008V	3.272V	4.896V	939.437				56.76°C	229.79V

110%	69.702A	9.994A	10.186A	3.068A	934.419	89.642%	1776	47.1	47.31°C	0.992
	11.996V	5.004V	3.268V	4.89V	1042.393				58.25°C	229.78V
CL1	0.115A	14.4A	14.467A	0A	121.3	86.561%	0	<6.0	49.09°C	0.869
	12.078V	5.015V	3.296V	5.045V	140.132				43.61°C	229.88V
CL2	0.116A	19.956A	0A	0A	101.405	85.542%	480	11.9	46.58°C	0.845
	12.085V	5.012V	3.304V	5.062V	118.545				53.64°C	229.88V
CL3	0.116A	0A	20.012A	0A	67.384	80.594%	0	<6.0	54.84°C	0.781
	12.083V	5.037V	3.297V	5.047V	83.608				45.81°C	229.88V
CL4	70.756A	0A	0A	0A	849.727	90.647%	1768	46.9	46.41°C	0.99
	12.009V	5.026V	3.279V	5.037V	937.397				57.35°C	229.79V

The results above are not used in the certification process

20-80mm

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□ (RPM)	□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.228A	0.496A	0.499A	0.198A	20.003	75.713%	0	<6.0	39.78°C	0.797
	12.101V	5.043V	3.308V	5.062V	26.421				36.72°C	114.91V
40W	2.704A	0.694A	0.698A	0.297A	40.002	84.339%	0	<6.0	40.62°C	0.88
	12.094V	5.042V	3.307V	5.056V	47.431				37.36°C	114.92V
60W	4.180A	0.892A	0.898A	0.396A	60.002	87.402%	0	<6.0	42.39°C	0.912
	12.090V	5.042V	3.307V	5.05V	68.651				38.69°C	114.92V
80W	5.652A	1.091A	1.098A	0.496A	79.957	88.872%	0	<6.0	43.47°C	0.93
	12.088V	5.041V	3.306V	5.045V	89.967				39.48°C	114.92V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□□)	□□	□□□□ (RPM)	□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.228A	0.496A	0.499A	0.198A	20.002	76.428%	0	<6.0	39.57°C	0.5
	12.099V	5.043V	3.308V	5.061V	26.174				36.52°C	229.89V
40W	2.704A	0.694A	0.698A	0.297A	40.002	85.186%	0	<6.0	40.57°C	0.635
	12.093V	5.042V	3.307V	5.055V	46.96				37.24°C	229.89V
60W	4.180A	0.892A	0.898A	0.396A	60.002	88.374%	0	<6.0	41.39°C	0.73
	12.089V	5.042V	3.307V	5.049V	67.894				37.94°C	229.88V
80W	5.654A	1.091A	1.098A	0.496A	79.958	90.218%	0	<6.0	42.37°C	0.791
	12.087V	5.041V	3.306V	5.044V	88.628				38.56°C	229.88V

The results above are not used in the certification process



115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.29mV	8.27mV	10.94mV	12.18mV	Pass
20% Load	8.24mV	7.81mV	12.07mV	16.07mV	Pass
30% Load	8.75mV	7.87mV	13.76mV	16.99mV	Pass
40% Load	10.13mV	8.12mV	13.75mV	25.95mV	Pass
50% Load	11.82mV	8.94mV	14.78mV	26.97mV	Pass
60% Load	12.33mV	10.27mV	15.60mV	28.55mV	Pass
70% Load	13.46mV	11.54mV	17.44mV	21.29mV	Pass
80% Load	14.74mV	12.51mV	18.77mV	22.26mV	Pass
90% Load	16.02mV	13.23mV	19.69mV	22.87mV	Pass
100% Load	24.90mV	16.75mV	21.75mV	15.99mV	Pass
110% Load	27.05mV	17.45mV	22.64mV	16.61mV	Pass
Crossload1	15.90mV	19.82mV	20.84mV	18.64mV	Pass
Crossload2	12.74mV	13.48mV	13.35mV	16.68mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	9.64mV	17.93mV	22.96mV	17.81mV	Pass
Crossload4	23.29mV	8.64mV	15.96mV	21.53mV	Pass

The results above are not used in the certification process

230V

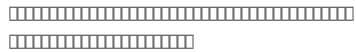
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.03mV	8.48mV	11.25mV	13.05mV	Pass
20% Load	7.64mV	7.51mV	12.48mV	14.99mV	Pass
30% Load	8.04mV	8.02mV	13.35mV	25.08mV	Pass
40% Load	9.01mV	8.53mV	13.75mV	28.71mV	Pass
50% Load	10.13mV	9.09mV	15.24mV	31.98mV	Pass
60% Load	11.31mV	10.37mV	16.42mV	29.68mV	Pass
70% Load	13.00mV	12.05mV	17.18mV	26.71mV	Pass
80% Load	14.38mV	12.56mV	18.56mV	23.75mV	Pass
90% Load	15.45mV	13.07mV	19.23mV	24.67mV	Pass
100% Load	24.71mV	17.28mV	23.65mV	22.60mV	Pass
110% Load	26.92mV	18.65mV	23.50mV	23.19mV	Pass
Crossload1	14.97mV	20.07mV	20.76mV	18.98mV	Pass
Crossload2	12.28mV	13.64mV	13.75mV	21.29mV	Pass
Crossload3	9.59mV	17.77mV	22.29mV	17.04mV	Pass
Crossload4	23.28mV	8.72mV	15.92mV	20.92mV	Pass

The results above are not used in the certification process

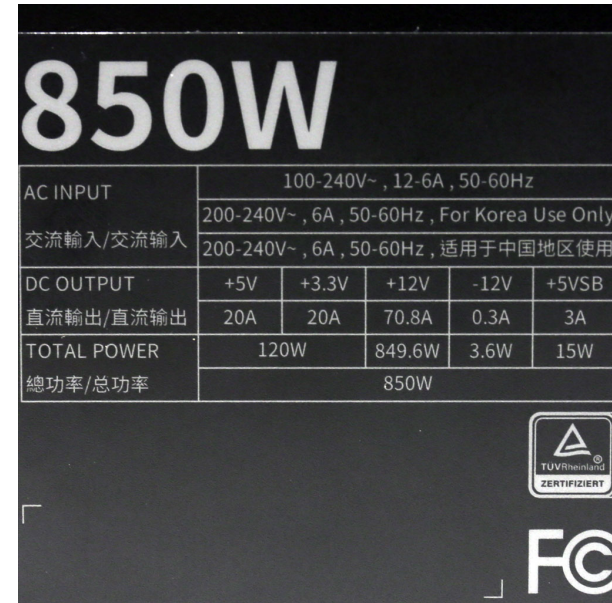
Cooler Master V850i Gold



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