Make It Yours.

Cooler Master MWE Bronze 650

MPE6501ACAAB1191400013

Lab ID CM19650039

Certification ID 25726

Test Result Report ID: 20PS726A

Certificate Issue Date: Jun 21, 2019

115V 230V

Scheme: ETA-EMI PSU



115V 230V





Scheme: LAMBDA PSU



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 Bronze 650
OEM/ODM	Gospower
Serial Number	MPE6501ACAAB1191400013
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	10-5
□□□□ (Hz)	50-60

□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
□□□□□	✓
Cybenetics Testing Information	
Lab ID	CM19650039
Date of receipt	Jul 5, 2019
Testing Date	May 21, 2019
Report Issued Date	Jun 21, 2019
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	□
8 pin EPS 12V □□ (630mm) / 4+4 pin EPS 12V □□ (120mm)	1	1 / 1	18AWG	□
6+2pin PCIe□□ (530mm+120mm)	2	4	16-18AWG	□
SATA□□ (530mm+120mm+120mm+120mm)	2	8	18AWG	□
4-pin Molex (520mm+120mm+120mm+120mm)	1	4	18AWG	□
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54	3	0.3
	□	120		648	15	3.6
□□□□□ (W)		650				

Parts Description

General Data	
Manufacturer (OEM)	Gospower
PCB Type	Single Sided
Primary Side	
Transient Filter	3x Y caps, 2x X caps, 2x CM chokes
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x GBU2508 (800V, 25A @ 100°C)
APFC MOSFETS	2x Sanrise Tech SRC60R140B (630V, 11.2A @ 125°C, 0.14Ohm)
APFC Boost Diode	1x Jilin Sino Microelectronics 15F60UHF (600V, 15A @ 100°C)
Hold-up Cap(s)	1x Elite (420V, 560uF, 2000h @ 85°C, GM)
Main Switchers	2x Jilin Sino Microelectronics JCS18N50FH (500V, 11A @ 100°C, 0.27Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controllers	Champion CU6901V
Topology	Primary side: Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nce Power NCEP40T11K (40V, 85A @ 100°C, 2.8mOhm)
5V & 3.3V	DC-DC Converters: 4x IPS FTD05N03NA (30V, 75A @ 100°C, 6mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytics: 6x Elite (2-5,000h @ 105°C, ED), 4x Elite (2,000h @ 105°C, EL), 1x CapXon (2-5,000h @ 105°C, KF), 1x CapXon (3-10,000h @ 105°C, GH) Polymers: CapXon
Supervisor IC	IN1S313I-SAG
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, Fluid Dynamic Bearing Fan)
5VSB Circuit	

Rectifier	-
Standby PWM Controller	On-Bright OB2365SP

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)	86.077%
Average Noise Output (>1450 Load Combinations)	38.27dBA
PF□□□ (>1450 Load Combinations)	0.976
Efficiency With 10W (≤500W) or 2% (>500W) Load	72.353%
□□□□□□	0.0804W
Non-Accredited	
12V Ripple (Full Load)	33.40mV
5V Ripple (Full Load)	19.51mV
3.3V Ripple (Full Load)	17.19mV
5VSB Ripple (Full Load)	28.39mV
12V Load Regulation	0.97%
5V Load Regulation	1.86%
3.3V Load Regulation	2.07%
5VSB Load Regulation	2.70%
Inrush Current	66.030A

230V

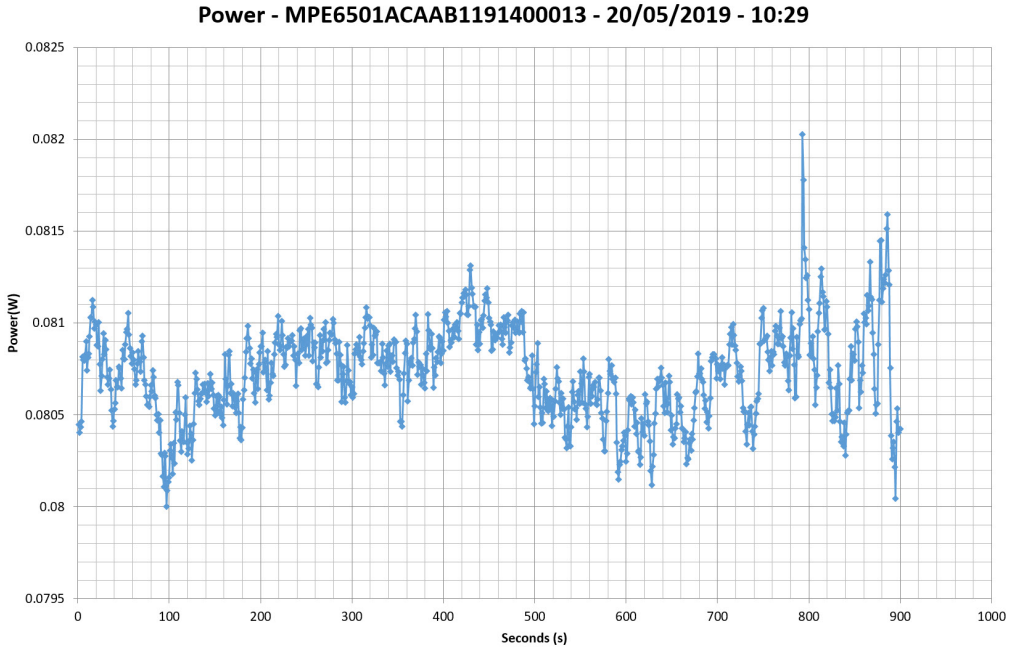
Accredited		
□□□□ (>1450 load combinations)		88.392%
Average Noise Output (>1450 Load Combinations)		38.95dBA
PF□□□ (>1450 Load Combinations)		0.905
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.2063W
Non-Accredited		
12V Ripple (Full Load)		33.26mV
5V Ripple (Full Load)		19.81mV
3.3V Ripple (Full Load)		16.75mV
5VSB Ripple (Full Load)		27.45mV
12V Load Regulation		0.97%
5V Load Regulation		1.84%
3.3V Load Regulation		2.04%
5VSB Load Regulation		2.63%
Inrush Current		95.150A
□□□□ & PG□□		22.40ms
AC Loss to PWR_OK Hold Up Time		20.40ms
PWR_OK Inactive to DC Loss Delay		2.00ms
OPP (0.00°C / 0.00°C)	-	-

□□□□ & PG□□

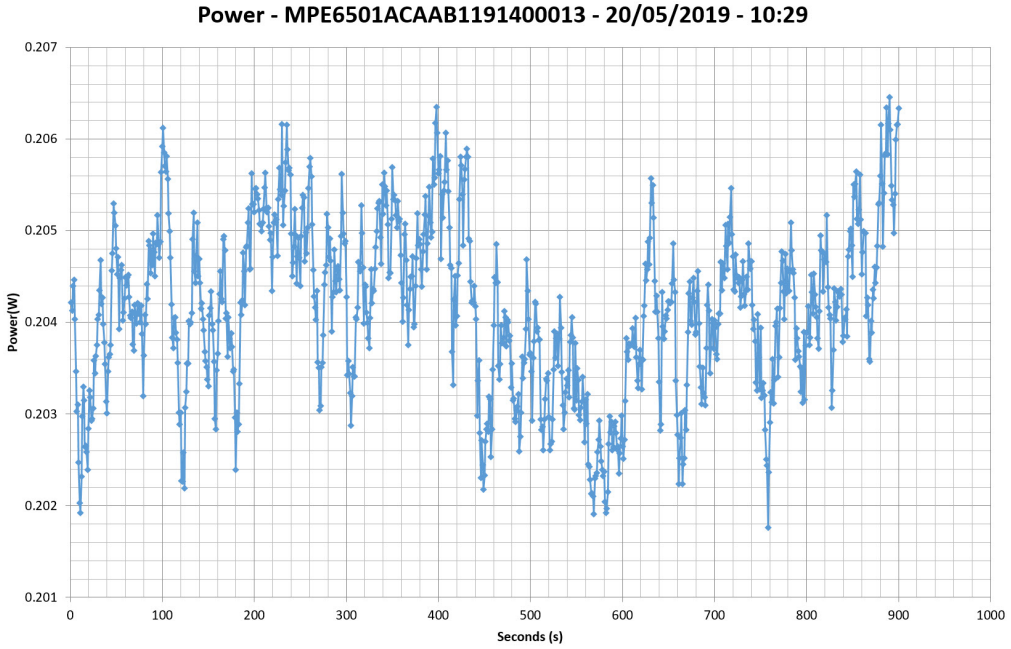
Hold-Up Time (ms)	22.4
AC Loss to PWR_OK Hold Up Time (ms)	20.4
PWR_OK Inactive to DC Loss Delay (ms)	2

Graphs

115V



230V



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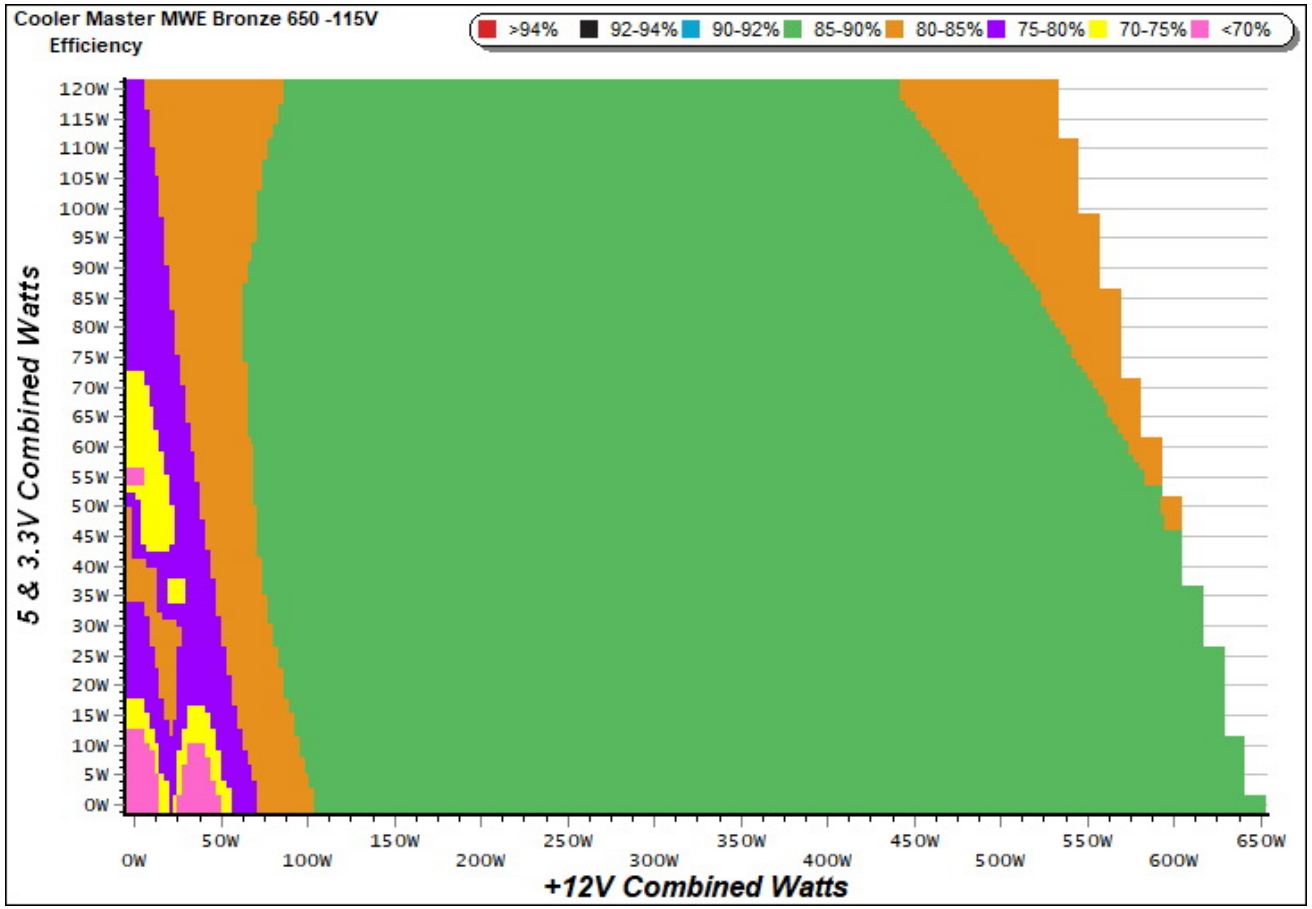
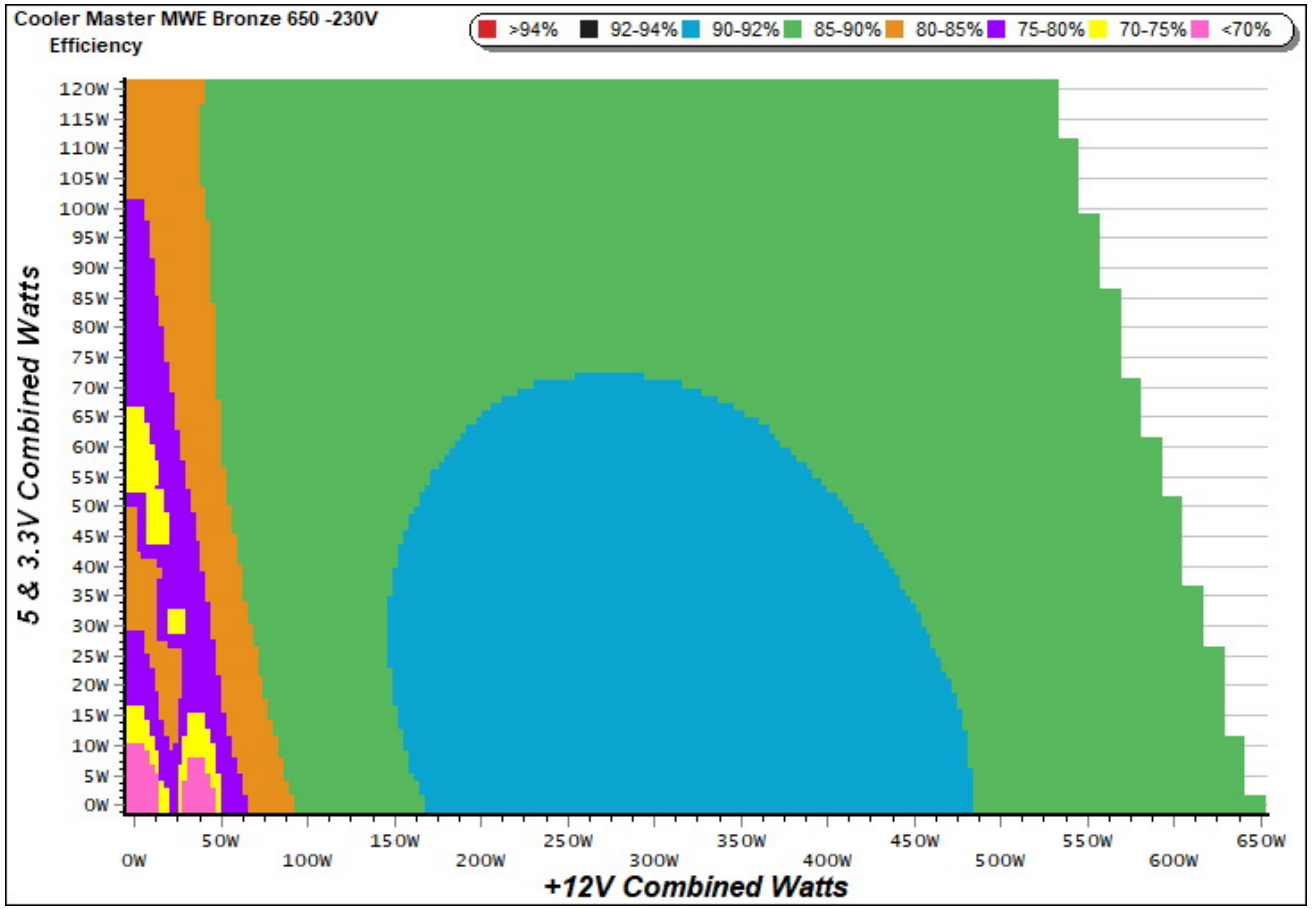
115V



□□

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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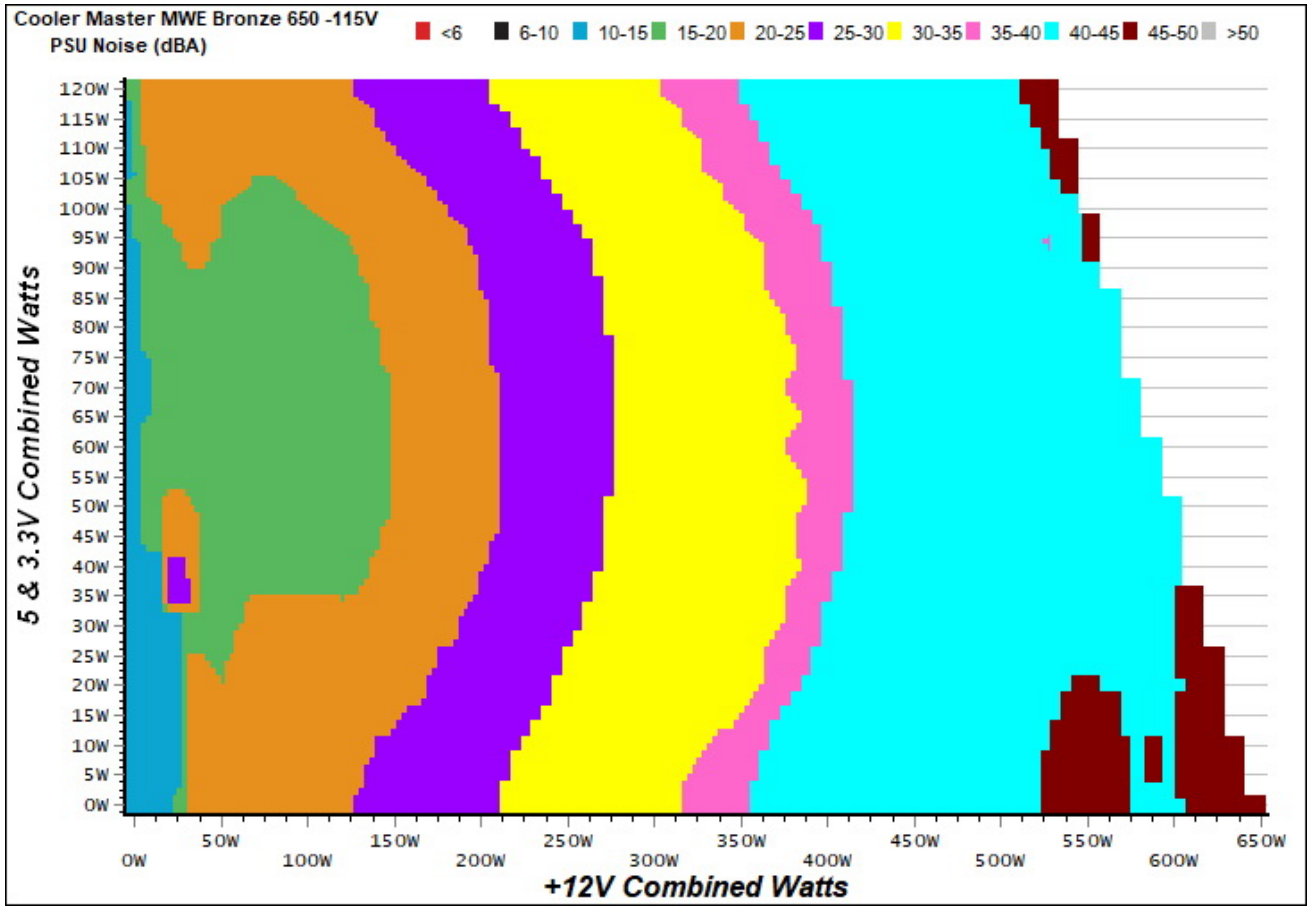
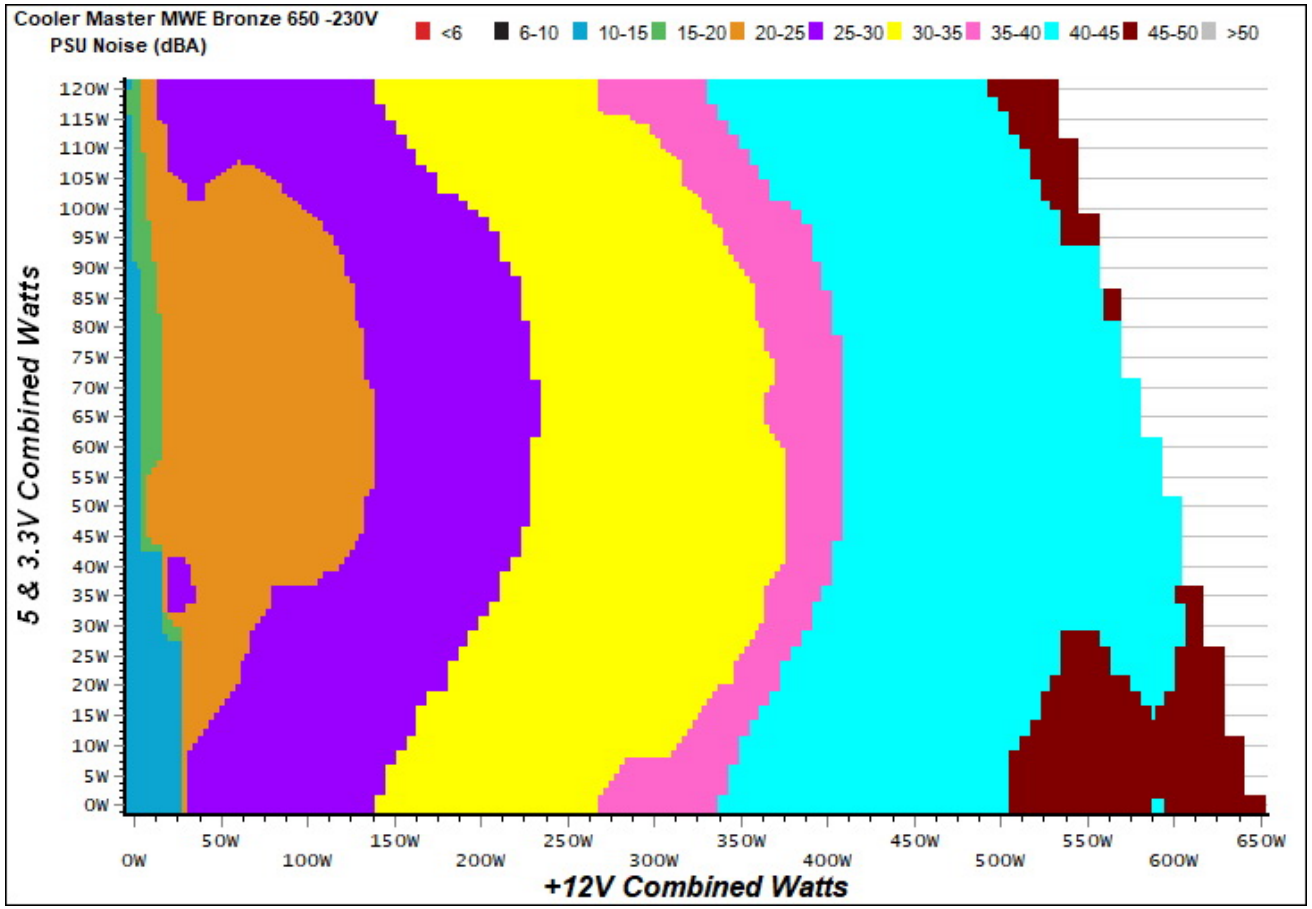
115V



□□

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
20%	1225 RPM · 27.2 dB(A) · 35.9 °C	1225 RPM · 27.2 dB(A) · 35.9 °C	**+0.0 dB(A)**
50%	1887 RPM · 38.4 dB(A) · 37.4 °C	1887 RPM · 38.4 dB(A) · 37.4 °C	**+0.0 dB(A)**
100%	2453 RPM · 45.9 dB(A) · 39.9 °C	2453 RPM · 45.9 dB(A) · 39.9 °C	**+0.0 dB(A)**

230V

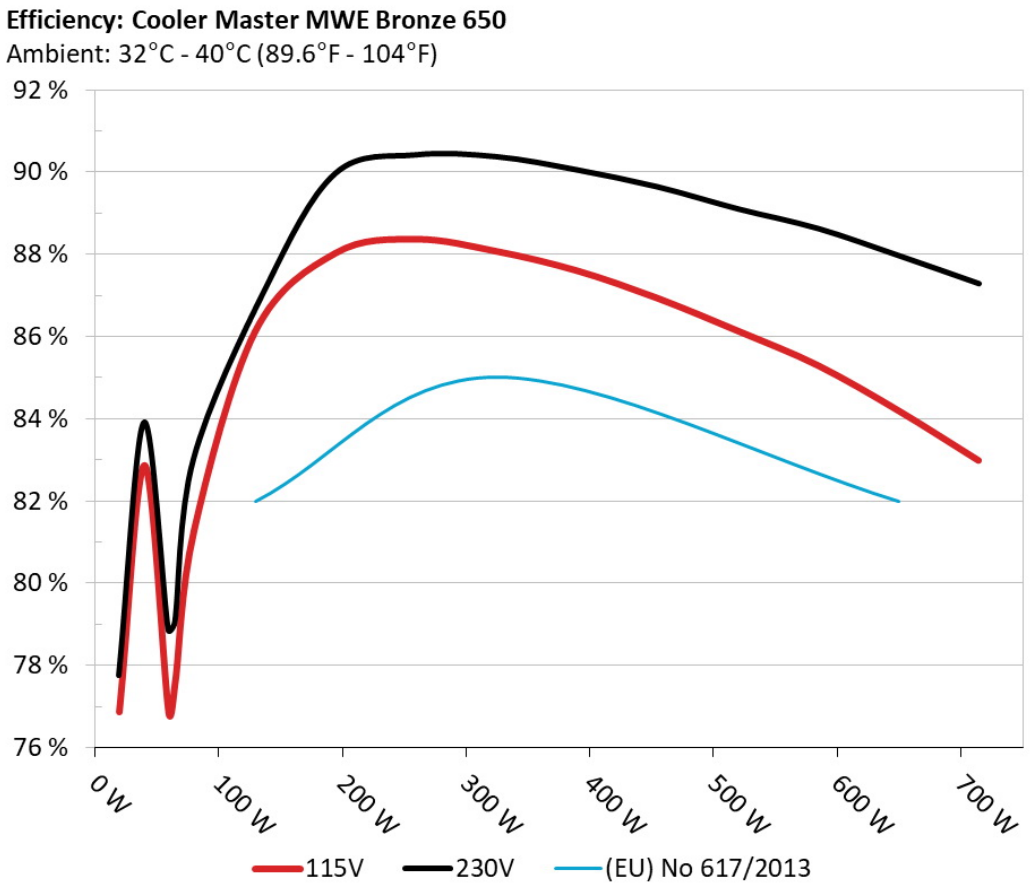
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
20%	1064 RPM · 22.8 dB(A) · 34.4 °C	1064 RPM · 22.8 dB(A) · 34.4 °C	**+0.0 dB(A)**
50%	1609 RPM · 33.1 dB(A) · 36.0 °C	1609 RPM · 33.1 dB(A) · 36.0 °C	**+0.0 dB(A)**
100%	2452 RPM · 45.9 dB(A) · 39.7 °C	2452 RPM · 45.9 dB(A) · 39.7 °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.

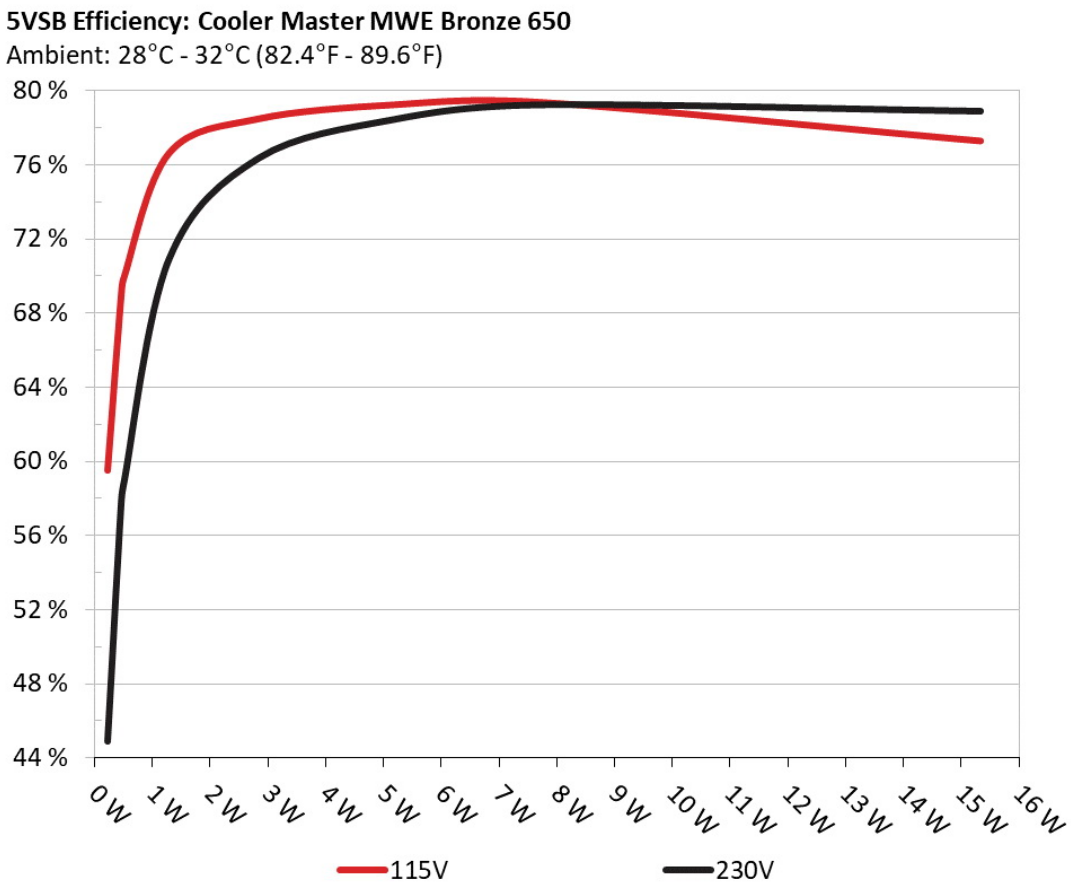
Informational. Not part of the ETA or LAMBDA rating.

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	0.234	59.542%	0.025
	5.188V	0.393		115.15V
2	0.090A	0.468	68.925%	0.043
	5.187V	0.679		115.15V
3	0.550A	2.848	78.457%	0.203
	5.176V	3.630		115.15V
4	1.000A	5.166	79.209%	0.305
	5.165V	6.522		115.15V
5	1.500A	7.730	79.347%	0.372
	5.152V	9.742		115.16V
6	3.000A	15.343	77.267%	0.453
	5.114V	19.857		115.16V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.234	44.914%	0.010
	5.188V	0.521		230.29V
2	0.090A	0.468	57.707%	0.015
	5.187V	0.811		230.29V
3	0.550A	2.848	76.354%	0.069
	5.176V	3.730		230.33V
4	1.000A	5.166	78.427%	0.117
	5.165V	6.587		230.32V
5	1.500A	7.729	79.231%	0.165
	5.152V	9.755		230.33V
6	3.000A	15.343	78.888%	0.272
	5.114V	19.449		230.30V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.569A	2.004A	1.955A	0.970A	64.893	77.606%	1115	24.1	35.08°C	0.912
	12.131V	4.991V	3.373V	5.156V	83.618				40.81°C	115.12V
2	8.126A	3.012A	2.939A	1.166A	129.381	86.115%	1225	27.2	35.86°C	0.958
	12.120V	4.981V	3.366V	5.145V	150.242				42.13°C	115.12V
3	13.105A	3.519A	3.425A	1.364A	194.475	88.026%	1297	28.7	36.49°C	0.965
	12.092V	4.973V	3.360V	5.133V	220.929				43.17°C	115.11V
4	18.086A	4.030A	3.938A	1.562A	259.692	88.363%	1443	32.1	36.80°C	0.974
	12.080V	4.965V	3.353V	5.122V	293.892				44.17°C	115.11V
5	22.742A	5.046A	4.932A	1.762A	324.972	88.067%	1887	38.4	37.40°C	0.983
	12.069V	4.954V	3.345V	5.110V	369.005				45.28°C	115.11V
6	27.342A	6.070A	5.932A	1.962A	389.495	87.601%	2095	41.2	37.86°C	0.987
	12.058V	4.944V	3.337V	5.097V	444.626				46.36°C	115.11V
7	32.018A	7.098A	6.938A	2.164A	454.804	86.931%	2406	45.1	38.51°C	0.989
	12.046V	4.933V	3.329V	5.085V	523.176				47.65°C	115.11V
8	36.698A	8.129A	7.948A	2.367A	520.110	86.131%	2455	45.9	38.88°C	0.991
	12.036V	4.922V	3.321V	5.072V	603.860				48.74°C	115.11V
9	41.788A	8.649A	8.444A	2.370A	585.014	85.290%	2454	45.9	39.46°C	0.992
	12.025V	4.915V	3.316V	5.065V	685.913				49.83°C	115.10V
10	46.624A	9.172A	8.977A	2.976A	649.858	84.194%	2453	45.9	39.85°C	0.993
	12.014V	4.907V	3.309V	5.042V	771.858				50.78°C	115.10V
11	52.067A	9.183A	8.991A	2.980A	714.680	82.981%	2452	45.9	40.28°C	0.993
	12.003V	4.902V	3.303V	5.036V	861.260				51.78°C	115.10V
CL1	0.139A	14.001A	13.999A	0.000A	117.437	78.674%	2185	42.8	37.01°C	0.956
	12.109V	4.924V	3.344V	5.159V	149.271				45.89°C	115.12V

CL2	54.005A	1.002A	1.002A	1.000A	662.490	84.869%	2457	45.9	39.70°C	0.993
	12.019V	4.955V	3.330V	5.103V	780.603				50.81°C	115.10V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.565A	2.004A	1.955A	0.970A	64.841	79.060%	1047	22.1	34.01°C	0.649
	12.130V	4.991V	3.373V	5.156V	82.015				39.74°C	230.25V
2	8.122A	3.014A	2.943A	2.942A	138.335	87.198%	1064	22.8	34.41°C	0.832
	12.119V	4.978V	3.363V	5.100V	158.645				40.49°C	230.24V
3	13.103A	3.520A	3.422A	1.364A	194.429	89.978%	1131	24.9	35.24°C	0.870
	12.091V	4.973V	3.359V	5.133V	216.085				41.79°C	230.25V
4	18.085A	4.027A	3.937A	1.562A	259.662	90.432%	1340	29.9	35.71°C	0.907
	12.080V	4.965V	3.353V	5.122V	287.134				42.67°C	230.25V
5	22.742A	5.048A	4.931A	1.761A	324.951	90.386%	1609	33.1	36.04°C	0.935
	12.068V	4.954V	3.345V	5.110V	359.515				43.82°C	230.25V
6	27.344A	6.071A	5.933A	1.962A	389.468	90.067%	2007	41.2	36.98°C	0.945
	12.056V	4.943V	3.337V	5.098V	432.421				45.23°C	230.26V
7	32.020A	7.098A	6.940A	2.163A	454.792	89.653%	2212	42.8	37.16°C	0.953
	12.045V	4.932V	3.329V	5.086V	507.278				45.83°C	230.25V
8	36.703A	8.129A	7.948A	2.366A	520.084	89.114%	2456	45.9	37.80°C	0.960
	12.034V	4.921V	3.321V	5.073V	583.619				47.17°C	230.25V
9	41.795A	8.651A	8.447A	2.369A	585.014	88.635%	2452	45.9	38.34°C	0.964
	12.023V	4.914V	3.315V	5.066V	660.029				48.63°C	230.26V
10	46.628A	9.175A	8.977A	2.975A	649.854	87.979%	2452	45.9	39.66°C	0.967
	12.013V	4.906V	3.308V	5.043V	738.646				50.82°C	230.26V
11	52.066A	9.183A	8.993A	2.980A	714.675	87.296%	2448	45.9	40.30°C	0.969
	12.003V	4.902V	3.303V	5.036V	818.676				52.19°C	230.26V
CL1	0.144A	14.004A	13.998A	0.000A	117.481	80.031%	2226	42.9	35.99°C	0.811
	12.110V	4.923V	3.343V	5.158V	146.795				43.35°C	230.27V

CL2	54.016A	1.002A	1.000A	1.000A	662.507	88.503%	2455	45.9	39.91°C	0.967
	12.017V	4.954V	3.329V	5.103V	748.569				50.78°C	230.28V

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	1.197A	0.498A	0.473A	0.193A	19.588	76.864%	0	<6.0	0.693
	12.111V	5.004V	3.381V	5.182V	25.484				115.12V
2	2.447A	1.001A	0.975A	0.387A	39.965	82.862%	0	<6.0	0.868
	12.122V	5.000V	3.379V	5.175V	48.231				115.12V
3	3.634A	1.502A	1.450A	0.581A	59.489	76.855%	1018	21.2	0.919
	12.132V	4.996V	3.376V	5.167V	77.404				115.12V
4	4.887A	2.004A	1.957A	0.775A	79.867	81.256%	1091	23.9	0.948
	12.128V	4.990V	3.372V	5.160V	98.290				115.12V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.194A	0.500A	0.472A	0.193A	19.560	77.761%	0	<6.0	0.329
	12.112V	5.006V	3.383V	5.181V	25.154				230.25V
2	2.444A	0.999A	0.977A	0.387A	39.930	83.922%	0	<6.0	0.494
	12.123V	5.002V	3.380V	5.174V	47.580				230.25V
3	3.631A	1.502A	1.449A	0.581A	59.444	78.874%	972	20.1	0.627
	12.131V	4.995V	3.376V	5.167V	75.366				230.25V
4	4.884A	2.004A	1.954A	0.775A	79.817	83.021%	1077	23.3	0.699
	12.127V	4.990V	3.372V	5.160V	96.141				230.25V

The results above are not used in the certification process

□□□

115V

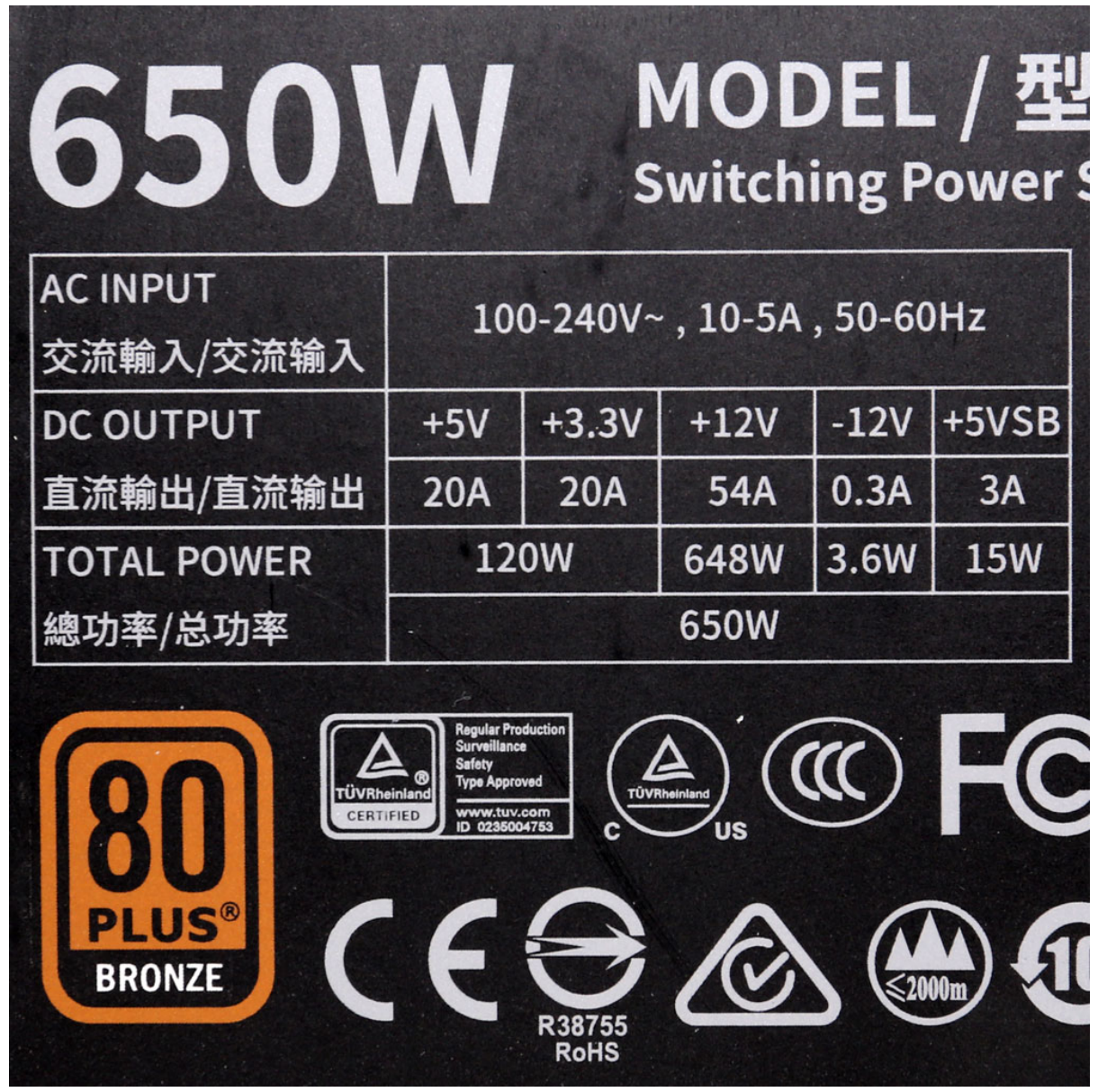
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.6 mV	15.7 mV	9.1 mV	18.2 mV	Pass
20% Load	9.0 mV	15.8 mV	9.7 mV	16.8 mV	Pass
30% Load	25.7 mV	15.5 mV	10.0 mV	17.4 mV	Pass
40% Load	24.5 mV	15.9 mV	10.9 mV	17.1 mV	Pass
50% Load	24.1 mV	16.0 mV	11.0 mV	18.1 mV	Pass
60% Load	21.9 mV	16.9 mV	13.4 mV	21.0 mV	Pass
70% Load	24.0 mV	16.7 mV	14.6 mV	21.7 mV	Pass
80% Load	23.2 mV	17.0 mV	16.6 mV	23.5 mV	Pass
90% Load	22.5 mV	18.3 mV	17.9 mV	24.2 mV	Pass
100% Load	33.4 mV	19.5 mV	17.2 mV	28.4 mV	Pass
110% Load	33.9 mV	19.7 mV	18.6 mV	30.6 mV	Pass
Crossload 1	21.7 mV	24.3 mV	18.2 mV	17.5 mV	Pass
Crossload 2	31.8 mV	18.5 mV	11.8 mV	25.7 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.6 mV	16.3 mV	9.8 mV	18.8 mV	Pass
20% Load	7.9 mV	15.8 mV	9.4 mV	19.4 mV	Pass
30% Load	26.4 mV	15.9 mV	10.5 mV	17.3 mV	Pass
40% Load	24.1 mV	15.8 mV	10.7 mV	17.0 mV	Pass
50% Load	23.0 mV	16.5 mV	11.4 mV	17.9 mV	Pass
60% Load	21.8 mV	16.5 mV	13.2 mV	18.2 mV	Pass
70% Load	22.6 mV	16.4 mV	14.1 mV	21.0 mV	Pass
80% Load	22.6 mV	17.4 mV	16.4 mV	21.1 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	22.1 mV	18.5 mV	16.6 mV	23.4 mV	Pass
100% Load	33.3 mV	19.8 mV	16.8 mV	27.5 mV	Pass
110% Load	33.6 mV	20.7 mV	18.0 mV	26.8 mV	Pass
Crossload 1	24.6 mV	25.3 mV	18.3 mV	17.4 mV	Pass
Crossload 2	33.3 mV	18.3 mV	11.8 mV	22.2 mV	Pass

The results above are not used in the certification process

Cooler Master MWE Bronze 650

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

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