EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Cooler Master M2000 Platinum

Lab ID#: CM20001991
Receipt Date: Feb 10, 2022
Test Date: Mar 17, 2022

Report: 22PS1991A
Report Date: Mar 18, 2022

DUT INFORMATION

Brand	Cooler Master
Manufacturer (OEM)	Enhance Electronics
Series	M Platinum
Model Number	MPZ-K001-AFFBP-EU
Serial Number	MPZK001AFFBPEU1214400102
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	200-240
Rated Current (Arms)	12
Rated Frequency (Hz)	50-60
Rated Power (W)	2000
Type	ATX12V
Cooling	135mm Double Ball Bearing Fan (RL4Z B1352512EH-3M)
Semi-Passive Operation	✗
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓

230V

Average Efficiency	91.926%
Average Efficiency 5VSB	83.389%
Standby Power Consumption (W)	0.1726000
Average PF	0.961
Avg Noise Output	39.95 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard+

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	22	166	3	0.3
	Watts	120		1992	15	3.6
Total Max. Power (W)		2000				

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16-22AWG	No
4+4 pin EPS12V (750mm)	2	2	16AWG	No
6+2 pin PCIe (750mm)	4	4	16AWG	No
6+2 pin PCIe (650mm+120mm)	7	14	16-18AWG	No
SATA (500mm+140mm+140mm+140mm)	3	12	18AWG	No
4-pin Molex (500mm+150mm+150mm) / FDD (+150mm)	1	3 / 1	18-22AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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Cooler Master M2000 Platinum

General Data	-
Manufacturer (OEM)	Enhance Electronics
PCB Type	Double Sided
Primary Side	**-**
Transient Filter	6x Y caps, 3x X caps, 2x CM chokes, 2x MOV
Inrush Protection	NTC Thermistor MF72-12D20 (12 Ohm) & Relay
Bridge Rectifier(s)	2x
APFC MOSFETs	2x Oriental Semiconductor OSG55R070HF (550V, 30A @ 100°C, Rds(on): 0.07Ohm)
APFC Boost Diode	2x CREE C3D10060A (600V, 10A @ 153°C)
Bulk Cap(s)	3x Nippon Chemi-Con (450V, 680uF each or 2,040uF, 2,000h @ 105°C, KMZ)
Main Switchers	4x Oriental Semiconductor OSG60R074FSZF (600V, 30A @ 100°C, Rds(on): 0.074Ohm)
IC Driver(s)	2x Silicon Labs Si8230BD
APFC Controller	ATK AT6201ZSPF
Resonant Controller	ATK AT6301ZTSF
Topology	Primary side: Interleaved PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	**-**
+12V MOSFETs	no info
5V & 3.3V	DC-DC Converters
Filtering Capacitors	Electrolytic: 5x Unicon (2,000h @ 125°C, UPL), 1x Rubycon (3-6,000h @ 105°C, YXG), 3x Rubycon (4-10,000h @ 105°C, YXF) Polymer: 20x Unicon
Supervisor IC	Weltrend WT7527RA (OCP, OVP, UVP, SCP, PG)
Fan Controller	ATK AT1051ZSP8
Fan Model	Globe Fan RL4Z B1352512EH (135mm, 12V, 0.50A, Double Ball Bearing Fan)
5VSB Circuit	**-**
Rectifier	1x 45R10S SBR
Standby PWM Controller	ATK AT6002H

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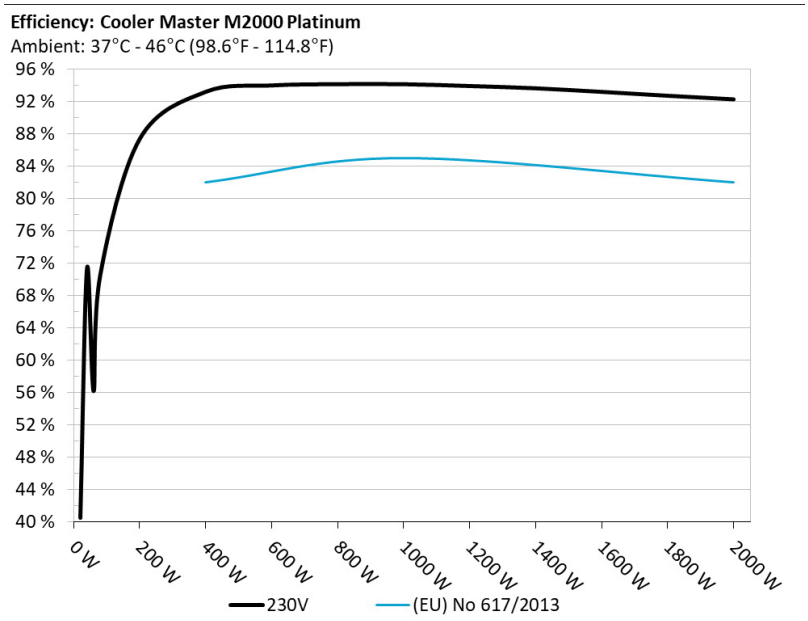
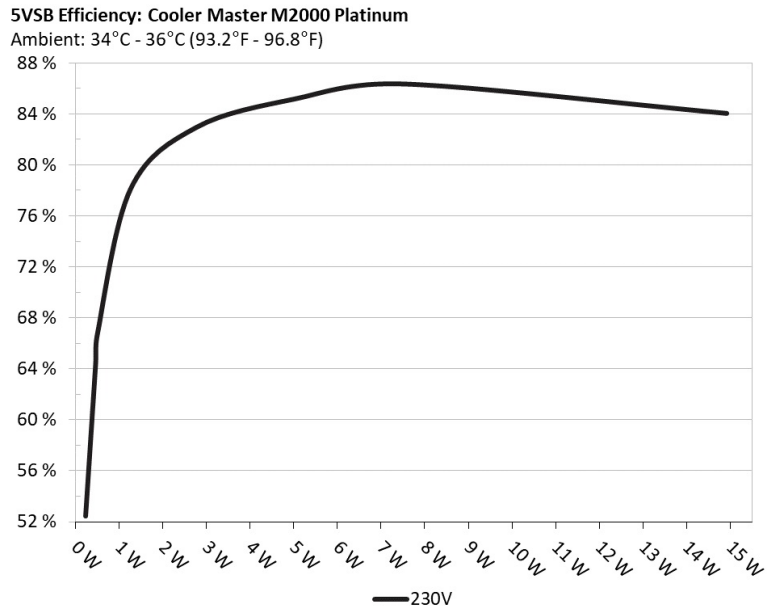
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	52.429%	0.008
	5.046V	0.434W		230.28V
2	0.09A	0.454W	64.27%	0.012
	5.044V	0.707W		230.28V
3	0.55A	2.769W	82.941%	0.057
	5.033V	3.338W		230.28V
4	1A	5.022W	85.161%	0.1
	5.021V	5.897W		230.28V
5	1.5A	7.514W	86.337%	0.143
	5.009V	8.703W		230.28V
6	3A	14.915W	84.03%	0.257
	4.971V	17.749W		230.27V

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230V

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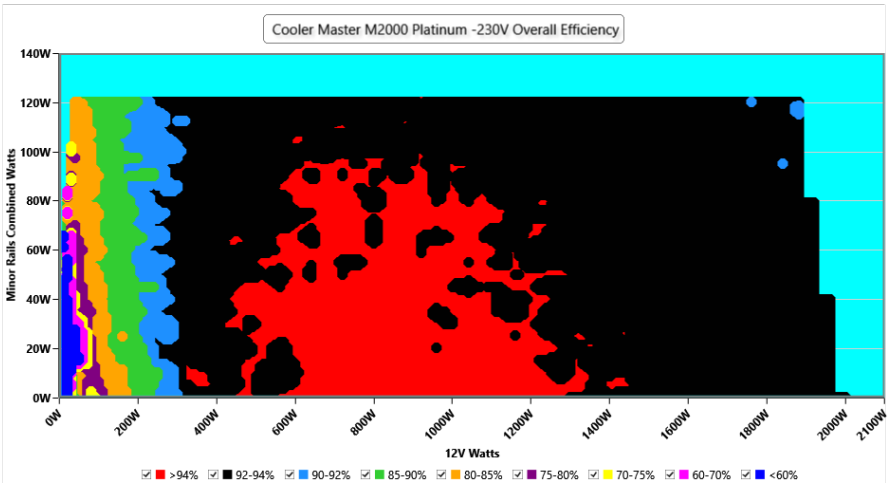
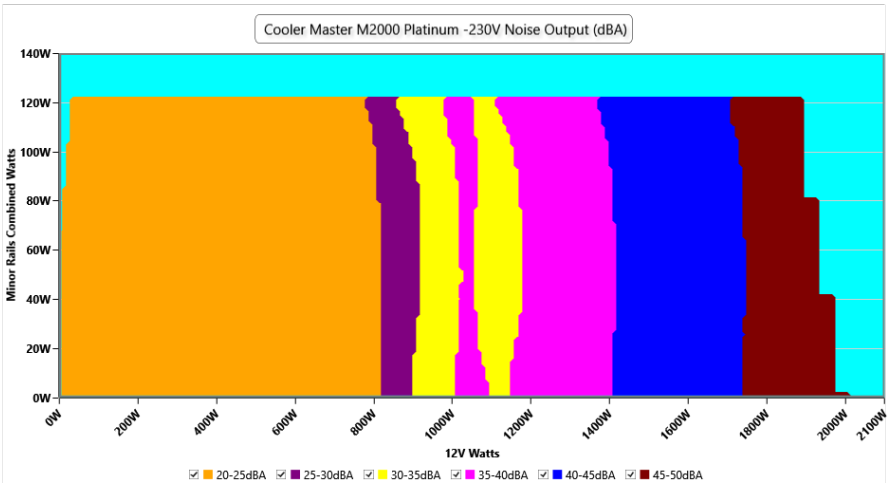
EFFICIENCY GRAPH 230V



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 230V



INFO

The PSU's noise in its entire operational range and under 30-32 °C (+-2 °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

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VAMPIRE POWER -230V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.27 V	230.18 V	227.70 V	230.34 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.99 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.416	1.415	1.340	1.417	1.490	PASS
Mains Voltage THD:	0.13 %	0.10 %	N/A	0.20 %	2.00 %	PASS
Real Power:	0.173 W	0.136 W	N/A	0.222 W	N/A	N/A
Apparent Power:	57.296 W	56.956 W	N/A	57.626 W	N/A	N/A
Power Factor:	0.003	N/A	N/A	N/A	N/A	N/A

INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	14.831A	2.003A	1.975A	0.998A	199.996	87.39%	768	22.9	40.28°C	0.886
	12.029V	4.993V	3.342V	5.011V	228.859				45.38°C	230.26V
20%	30.699A	3.009A	2.971A	1.201A	399.674	93.218%	1062	32.8	40.79°C	0.966
	12.013V	4.984V	3.331V	4.996V	428.71				46.25°C	230.24V
50%	79.292A	5.039A	4.999A	1.819A	999.311	94.161%	1697	46.1	42.28°C	0.985
	11.966V	4.961V	3.3V	4.949V	1061.313				49.23°C	230.17V
100%	160.778A	9.168A	9.166A	3.088A	1999.489	92.288%	2191	52.7	46.17°C	0.988
	11.878V	4.909V	3.239V	4.858V	2166.324				56.05°C	230.04V

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Cooler Master M2000 Platinum

Top side

Power specifications label

Aristeidis Bitziopoulos
Lab Director

CERTIFICATIONS 230V

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