Anex

Cooler Master V650 Gold

Lab ID#: CM19650004
Receipt Date: Feb 27, 2019
Test Date: Feb 3, 2019

Report: 19PS645A
Report Date: Jan 3, 2019

DUT INFORMATION

Brand	Cooler Master
Manufacturer (OEM)	Chicony Electronics
Series	V Gold Series
Model Number	V650 Gold
Serial Number	MPY6501AFAAGV1184300008
DUT Notes	MPY-6501-AFAAGV

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	9
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (APISTEK SAC4H2H)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	3	0.3
	Watts	130		648	15	3.6
Total Max. Power (W)		650				

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (650mm)	1	1	18-22AWG	No
4+4 pin EPS12V (650mm)	1	1	18AWG	No
8 pin EPS12V (650mm)	1	1	18AWG	No
6+2 pin PCIe (550mm+120mm)	2	4	18AWG	No
SATA (500mm+120mm+120mm+120mm)	2	8	18AWG	No
4 pin Molex (500mm+120mm+120mm+120mm)	1	4	18AWG	No
FDD Adapter (125mm)	1	1	22AWG	No
AC Power Cord (1350mm) - C13 coupler	1	1	18AWG	-

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	89.069
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	67.603
Average Efficiency 5VSB	79.254
Standby Power Consumption (W) -115V	0.0771163
Standby Power Consumption (W) -230V	0.1659280
Average PF	0.974
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	26.20
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A-

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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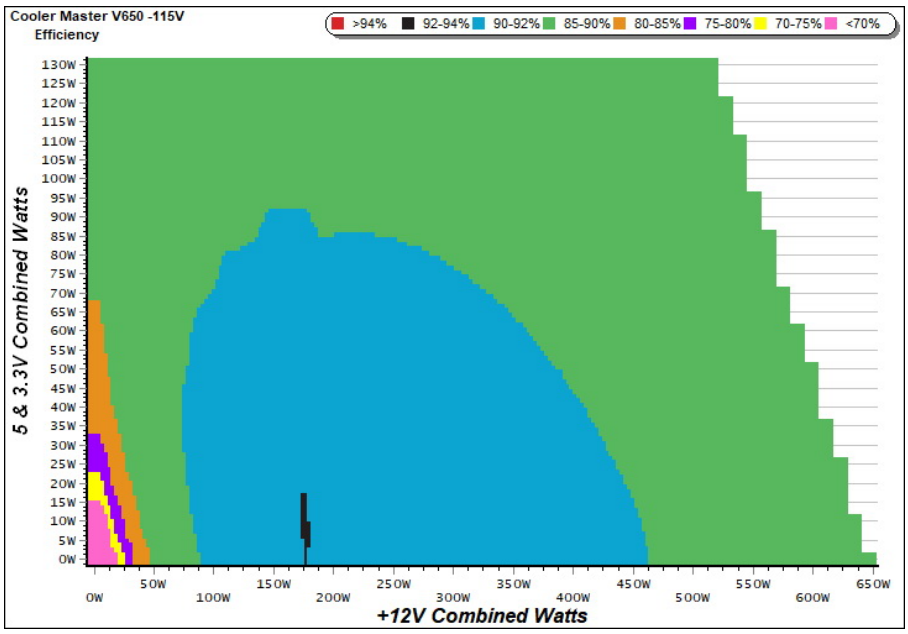
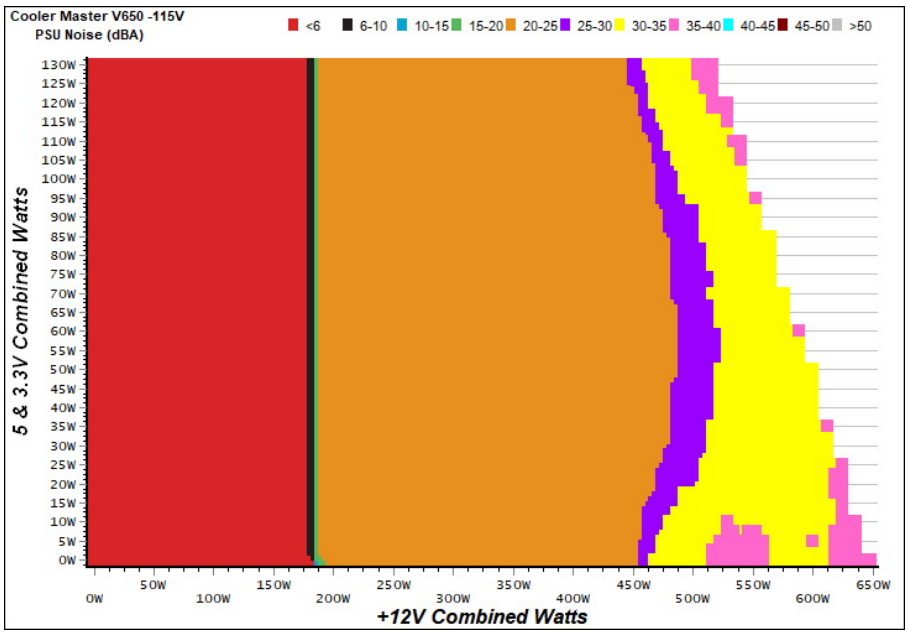
EFFICIENCY GRAPH



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



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

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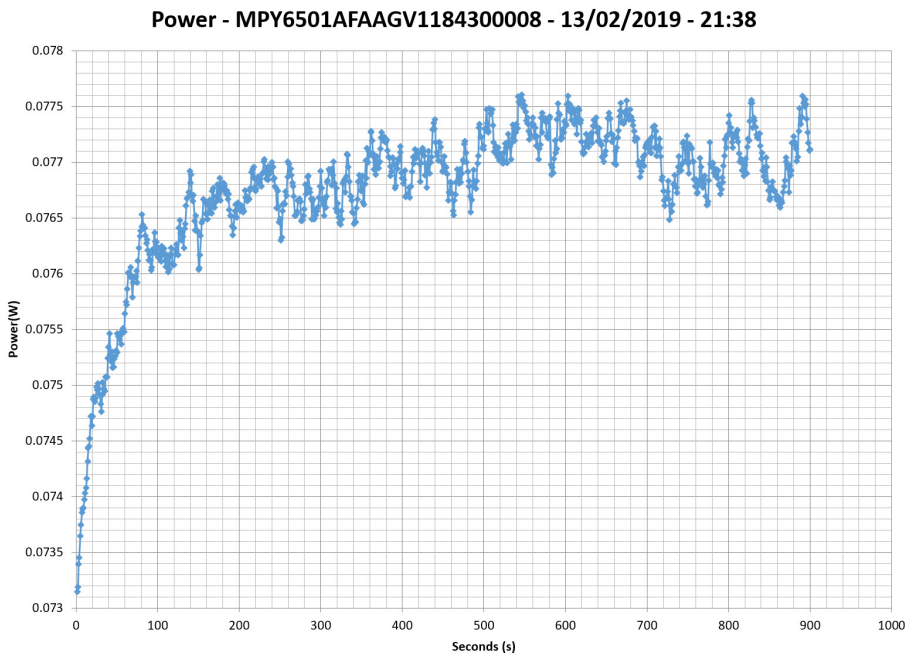
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.232	64.266%	0.041
	5.140V	0.361		115.10V
2	0.090A	0.463	71.561%	0.072
	5.138V	0.647		115.10V
3	0.550A	2.815	79.520%	0.244
	5.117V	3.540		115.10V
4	1.000A	5.097	79.840%	0.296
	5.097V	6.384		115.10V
5	1.500A	7.612	80.050%	0.323
	5.074V	9.509		115.10V
6	2.999A	15.009	79.145%	0.362
	5.004V	18.964		115.10V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.232	50.877%	0.019
	5.139V	0.456		230.24V
2	0.090A	0.463	61.816%	0.030
	5.137V	0.749		230.23V
3	0.550A	2.814	76.801%	0.129
	5.115V	3.664		230.24V
4	1.000A	5.095	78.300%	0.189
	5.095V	6.507		230.24V
5	1.500A	7.608	78.856%	0.229
	5.072V	9.648		230.24V
6	3.000A	15.004	78.444%	0.284
	5.002V	19.127		230.23V

VAMPIRE POWER -115V



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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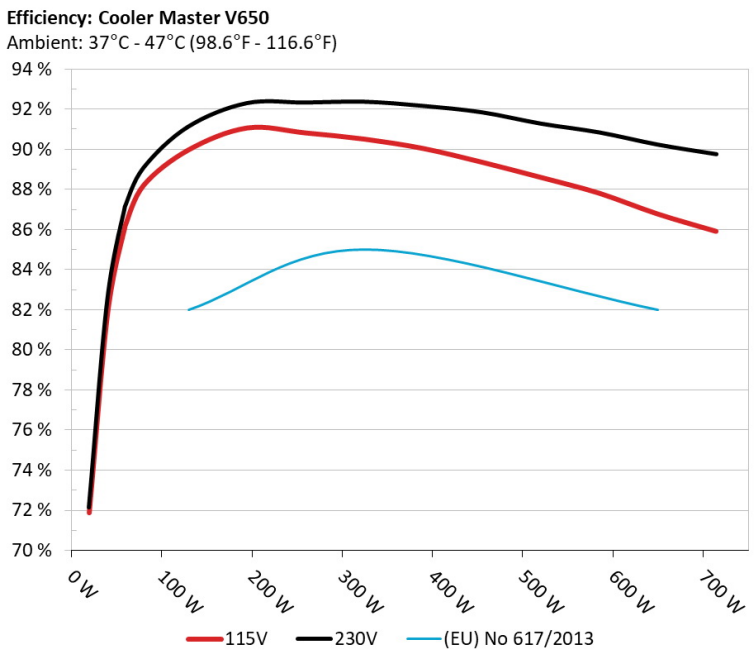
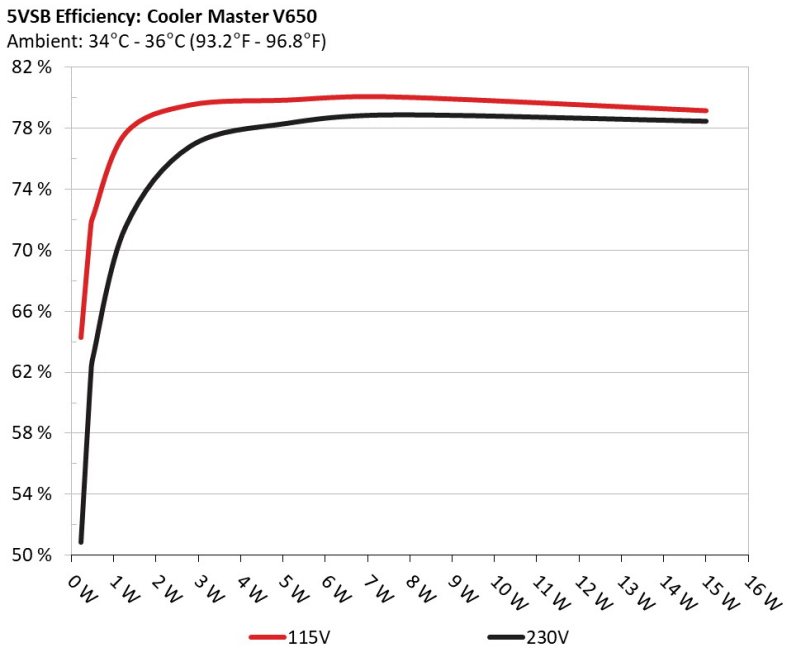
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.574A	1.991A	1.956A	0.983A	64.904	86.205%	0	<6.0	44.49°C	0.898
	12.115V	5.024V	3.375V	5.088V	75.290				40.12°C	115.14V
2	8.136A	2.990A	2.933A	1.183A	129.381	89.955%	0	<6.0	45.67°C	0.941
	12.104V	5.019V	3.373V	5.074V	143.829				40.70°C	115.15V
3	13.106A	3.491A	3.410A	1.383A	194.489	91.055%	0	<6.0	46.99°C	0.961
	12.093V	5.015V	3.370V	5.061V	213.594				41.33°C	115.16V
4	18.085A	3.990A	3.923A	1.585A	259.692	90.806%	828	23.7	41.74°C	0.978
	12.081V	5.014V	3.365V	5.048V	285.986				48.14°C	115.15V
5	22.738A	4.992A	4.907A	1.788A	324.955	90.497%	829	23.7	42.08°C	0.983
	12.070V	5.010V	3.362V	5.034V	359.079				49.19°C	115.14V
6	27.338A	5.994A	5.895A	1.992A	389.444	90.036%	832	23.8	42.50°C	0.987
	12.058V	5.005V	3.359V	5.021V	432.543				50.63°C	115.13V
7	32.014A	7.002A	6.883A	2.198A	454.741	89.351%	1002	28.9	43.14°C	0.989
	12.046V	4.999V	3.356V	5.004V	508.938				52.21°C	115.12V
8	36.692A	8.009A	7.874A	2.404A	520.035	88.595%	1265	35.4	43.89°C	0.991
	12.036V	4.995V	3.353V	4.993V	586.983				53.67°C	115.12V
9	41.781A	8.515A	8.356A	2.405A	584.950	87.804%	1493	39.6	44.50°C	0.993
	12.026V	4.991V	3.350V	4.990V	666.202				54.96°C	115.11V
10	46.611A	9.024A	8.872A	3.027A	649.776	86.769%	1644	41.9	45.33°C	0.994
	12.016V	4.987V	3.347V	4.956V	748.860				56.37°C	115.11V
11	52.062A	9.031A	8.877A	3.030A	714.601	85.906%	1794	43.7	46.70°C	0.995
	12.003V	4.983V	3.345V	4.952V	831.841				58.39°C	115.11V
CL1	0.133A	16.000A	16.000A	0.000A	135.225	84.896%	0	0	49.72°C	0.949
	12.092V	4.989V	3.362V	5.115V	159.284				42.12°C	115.13V
CL2	54.002A	1.002A	0.999A	1.000A	662.199	87.262%	1682	42.3	45.13°C	0.994
	12.014V	4.998V	3.355V	5.060V	758.867				56.27°C	115.11V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.193A	0.497A	0.472A	0.195A	19.561	71.878%	0	<6.0	0.774
	12.127V	5.031V	3.376V	5.129V	27.214				115.13V
2	2.448A	0.995A	0.976A	0.391A	39.975	81.844%	0	<6.0	0.857
	12.122V	5.029V	3.375V	5.118V	48.843				115.13V
3	3.639A	1.493A	1.451A	0.588A	59.499	86.152%	0	<6.0	0.889
	12.117V	5.027V	3.375V	5.108V	69.063				115.15V
4	4.893A	1.991A	1.955A	0.785A	79.872	88.199%	0	<6.0	0.912
	12.113V	5.025V	3.374V	5.097V	90.559				115.14V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.1 mV	6.7 mV	14.0 mV	8.0 mV	Pass
20% Load	7.4 mV	8.9 mV	15.0 mV	8.6 mV	Pass
30% Load	8.7 mV	12.7 mV	18.0 mV	9.6 mV	Pass
40% Load	10.7 mV	9.7 mV	18.7 mV	10.7 mV	Pass
50% Load	20.0 mV	10.6 mV	19.0 mV	12.2 mV	Pass
60% Load	15.0 mV	12.1 mV	20.4 mV	13.5 mV	Pass
70% Load	18.4 mV	13.0 mV	23.0 mV	14.4 mV	Pass
80% Load	21.4 mV	15.1 mV	24.1 mV	17.0 mV	Pass
90% Load	24.5 mV	14.8 mV	27.5 mV	17.3 mV	Pass
100% Load	36.7 mV	16.2 mV	29.8 mV	20.8 mV	Pass
110% Load	32.5 mV	15.6 mV	28.2 mV	20.0 mV	Pass
Crossload 1	12.1 mV	14.8 mV	20.2 mV	12.5 mV	Pass
Crossload 2	33.6 mV	15.2 mV	27.0 mV	18.2 mV	Pass

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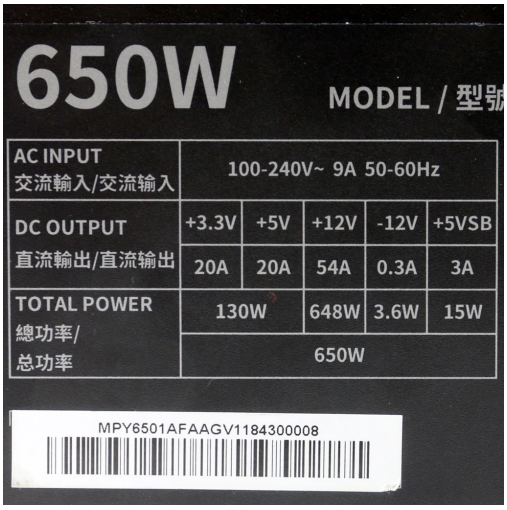
HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	20.6
AC Loss to PWR_OK Hold Up Time (ms)	18.0
PWR_OK Inactive to DC Loss Delay (ms)	2.6

Top side



Power specifications label

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