

## Anex

Corsair RM650 (2019) (#2)

Lab ID#: CR19650015  
Receipt Date: Mar 21, 2019  
Test Date: May 4, 2019

Report:

Report Date: Aug 4, 2019

### DUT INFORMATION

Brand	Corsair
Manufacturer (OEM)	Channel Well Technology
Series	RM
Model Number	
Serial Number	19027120000038920016
DUT Notes	CP-9020194

### DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	47-63
Rated Power (W)	650
Type	ATX12V
Cooling	140mm Rifle Bearing Fan (HA1425M12F-Z)
Semi-Passive Operation	✓
Cable Design	Fully Modular

### 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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### RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

### 115V

Average Efficiency	88.782%
Efficiency With 10W (≤500W) or 2% (>500W)	75.342
Average Efficiency 5VSB	77.636%
Standby Power Consumption (W)	0.0371971
Average PF	0.991
Avg Noise Output	19.31 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A+

### 230V

Average Efficiency	90.816%
Average Efficiency 5VSB	77.116%
Standby Power Consumption (W)	0.0636784
Average PF	0.961
Avg Noise Output	19.50 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A+

### 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				

### HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	20.90
AC Loss to PWR_OK Hold Up Time (ms)	18.60
PWR_OK Inactive to DC Loss Delay (ms)	2.30

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## CABLES AND CONNECTORS

### Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	18-20AWG	No
4+4 pin EPS12V (650mm)	2	2	18AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	16-18AWG	No
SATA (500mm+100mm+100mm)	2	6	18AWG	No
4 pin Molex (450mm+100mm+100mm+100mm)	1	4	18AWG	No
AC Power Cord (1420mm) - C13 coupler	1	1	16AWG	-

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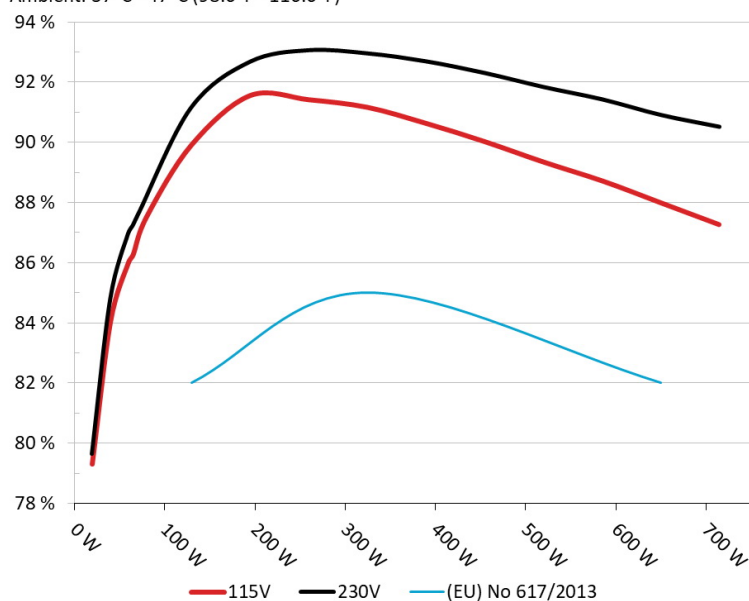
## Anex

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### EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

#### Efficiency: Corsair RM650

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



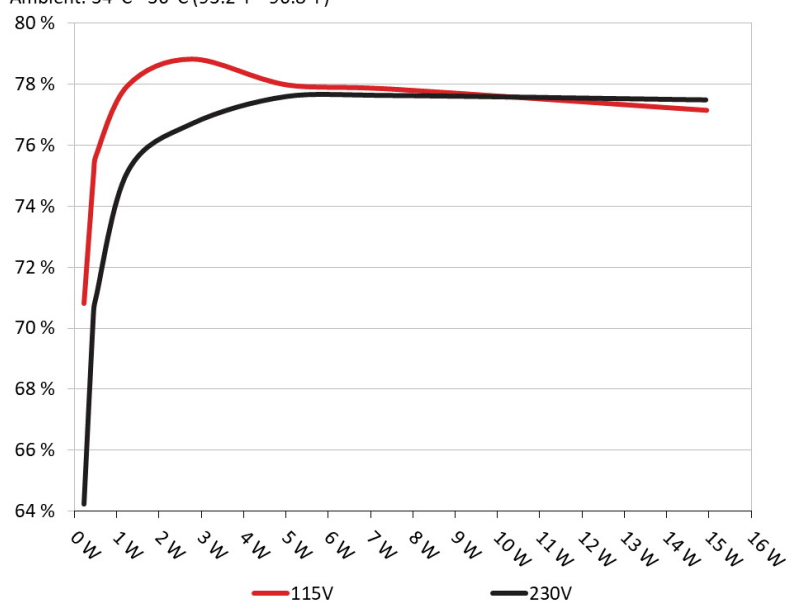
#### INFO

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

#### 5VSB Efficiency: Corsair RM650

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



#### INFO

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228	70.807%	0.032
	5.055V	0.322		115.13V
2	0.090A	0.455	75.083%	0.058
	5.054V	0.606		115.13V
3	0.550A	2.774	78.829%	0.254
	5.043V	3.519		115.11V
4	1.000A	5.032	77.979%	0.343
	5.031V	6.453		115.11V
5	1.500A	7.528	77.841%	0.393
	5.018V	9.671		115.12V
6	3.000A	14.939	77.148%	0.457
	4.980V	19.364		115.12V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228	64.225%	0.010
	5.054V	0.355		230.27V
2	0.090A	0.455	70.543%	0.019
	5.053V	0.645		230.26V
3	0.550A	2.774	76.693%	0.099
	5.042V	3.617		230.29V
4	1.000A	5.031	77.591%	0.163
	5.030V	6.484		230.29V
5	1.500A	7.526	77.620%	0.218
	5.017V	9.696		230.28V
6	3.000A	14.932	77.476%	0.315
	4.978V	19.273		230.27V

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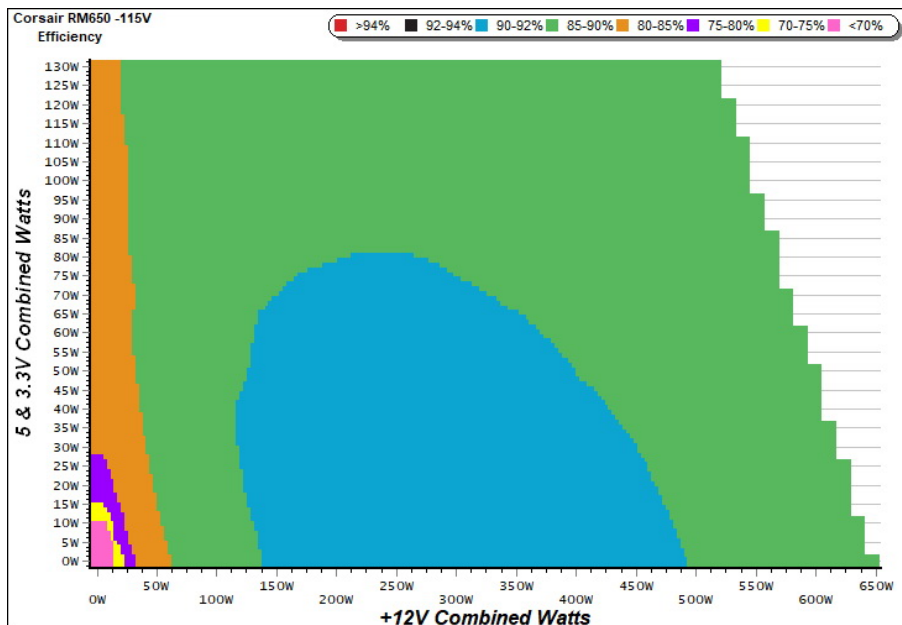
# 115V

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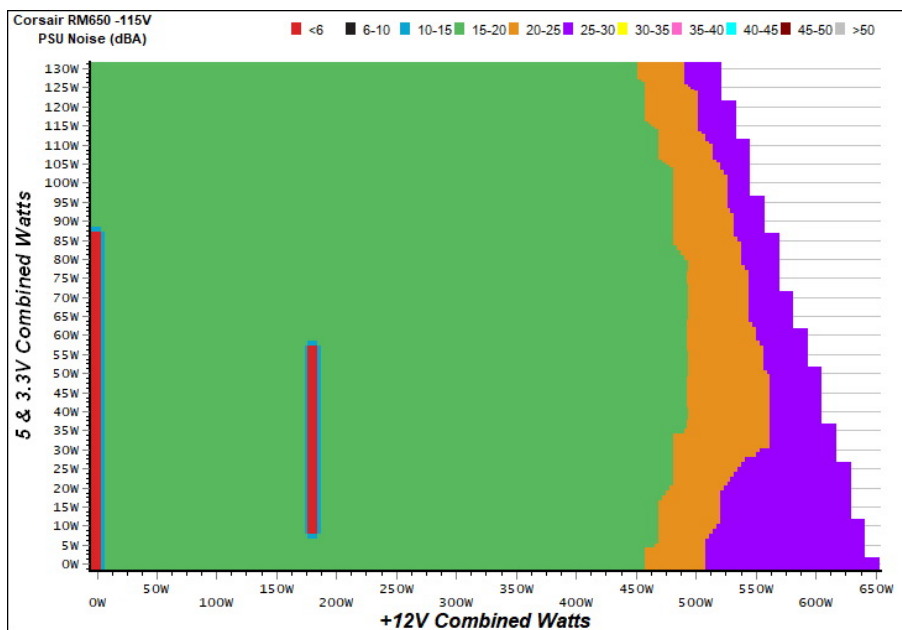
#### EFFICIENCY GRAPH 115V



#### 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

#### NOISE GRAPH 115V



#### INFO

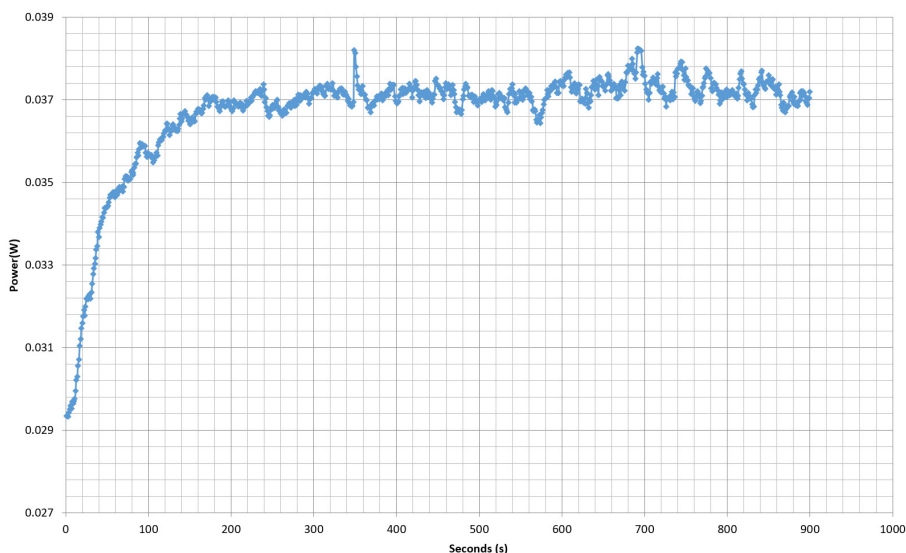
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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### VAMPIRE POWER -115V

Power - 19027120000038920016 - 01/04/2019 - 16:44



#### 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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### 10-110% 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	3.578A	1.985A	1.999A	0.997A	64.831	86.265%	0	<6.0	43.82°C	0.966
	12.082V	5.038V	3.302V	5.016V	75.153				39.88°C	115.11V
2	8.103A	2.978A	3.000A	1.198A	129.365	89.902%	0	<6.0	44.84°C	0.988
	12.152V	5.036V	3.299V	5.011V	143.896				40.52°C	115.11V
3	13.061A	3.478A	3.488A	1.399A	194.462	91.546%	0	<6.0	45.80°C	0.992
	12.132V	5.034V	3.296V	5.005V	212.421				41.09°C	115.12V
4	18.030A	3.975A	4.005A	1.601A	259.712	91.408%	784	16.1	41.93°C	0.995
	12.119V	5.032V	3.296V	4.999V	284.124				46.95°C	115.11V
5	22.669A	4.975A	5.010A	1.803A	324.996	91.154%	786	16.2	42.52°C	0.995
	12.108V	5.029V	3.293V	4.993V	356.537				48.24°C	115.11V
6	27.246A	5.971A	6.015A	2.006A	389.540	90.625%	918	21.2	42.72°C	0.994
	12.102V	5.026V	3.291V	4.987V	429.836				48.90°C	115.12V
7	31.903A	6.969A	7.019A	2.209A	454.850	90.018%	1049	25.7	43.10°C	0.994
	12.091V	5.024V	3.290V	4.982V	505.289				50.43°C	115.12V
8	36.562A	7.968A	8.025A	2.412A	520.146	89.340%	1210	30.4	43.72°C	0.995
	12.082V	5.021V	3.289V	4.976V	582.209				51.98°C	115.12V
9	41.608A	8.469A	8.517A	2.413A	585.056	88.717%	1413	35.0	44.29°C	0.996
	12.078V	5.019V	3.288V	4.975V	659.461				53.20°C	115.11V
10	46.396A	8.973A	9.038A	3.027A	649.870	87.992%	1598	38.5	45.56°C	0.996
	12.073V	5.017V	3.287V	4.957V	738.554				55.31°C	115.11V
11	51.775A	8.975A	9.043A	3.029A	714.711	87.266%	1766	41.1	46.99°C	0.996
	12.071V	5.016V	3.285V	4.955V	819.007				57.77°C	115.11V
CL1	0.138A	16.003A	16.000A	0.000A	134.699	84.053%	926	21.8	42.46°C	0.990
	12.144V	5.019V	3.294V	5.069V	160.254				48.60°C	115.13V
CL2	54.178A	1.002A	1.001A	1.000A	667.952	88.513%	1643	39.2	45.71°C	0.996
	12.083V	5.025V	3.285V	4.996V	754.641				55.62°C	115.11V

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### 20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.190A	0.495A	0.483A	0.199A	19.455	79.314%	0	<6.0	0.807
	12.072V	5.037V	3.299V	5.032V	24.529				115.11V
2	2.450A	0.992A	0.997A	0.398A	39.873	84.069%	0	<6.0	0.930
	12.074V	5.038V	3.303V	5.029V	47.429				115.11V
3	3.642A	1.487A	1.481A	0.597A	59.378	85.984%	0	<6.0	0.962
	12.080V	5.037V	3.303V	5.025V	69.057				115.11V
4	4.880A	1.985A	1.999A	0.797A	79.783	87.523%	0	<6.0	0.976
	12.127V	5.037V	3.303V	5.021V	91.157				115.11V

### RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.5 mV	7.8 mV	10.8 mV	9.2 mV	Pass
20% Load	7.1 mV	8.1 mV	11.4 mV	10.5 mV	Pass
30% Load	10.4 mV	8.8 mV	11.6 mV	10.8 mV	Pass
40% Load	9.7 mV	9.1 mV	12.2 mV	10.1 mV	Pass
50% Load	10.4 mV	11.3 mV	15.5 mV	11.5 mV	Pass
60% Load	10.1 mV	10.5 mV	13.1 mV	9.8 mV	Pass
70% Load	11.2 mV	11.0 mV	13.8 mV	10.7 mV	Pass
80% Load	11.8 mV	11.4 mV	15.0 mV	10.6 mV	Pass
90% Load	12.7 mV	11.9 mV	15.1 mV	10.7 mV	Pass
100% Load	17.8 mV	13.4 mV	15.9 mV	11.4 mV	Pass
110% Load	21.2 mV	13.6 mV	15.9 mV	11.4 mV	Pass
Crossload 1	21.9 mV	11.7 mV	16.7 mV	10.8 mV	Pass
Crossload 2	16.3 mV	10.7 mV	13.4 mV	10.8 mV	Pass

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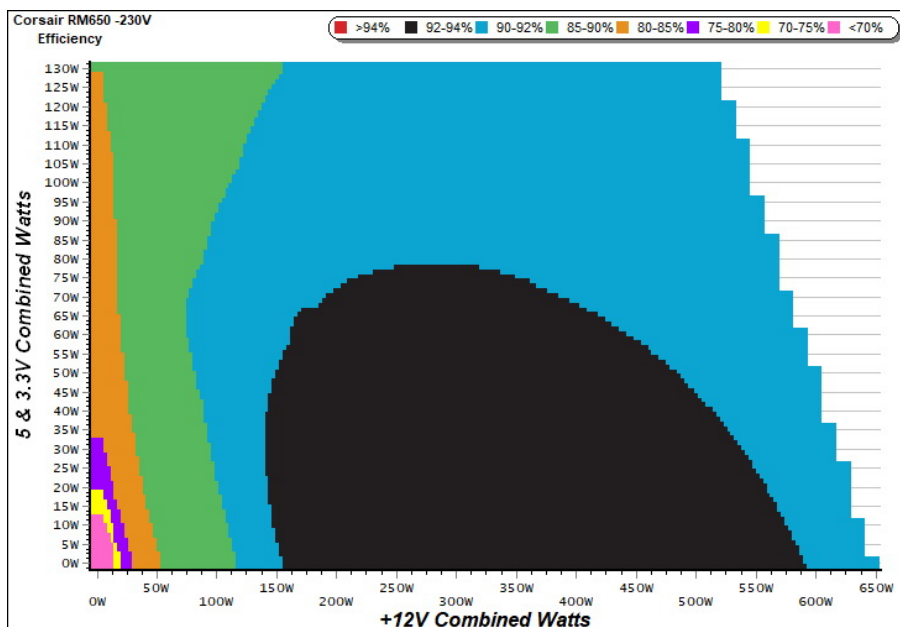
# 230V

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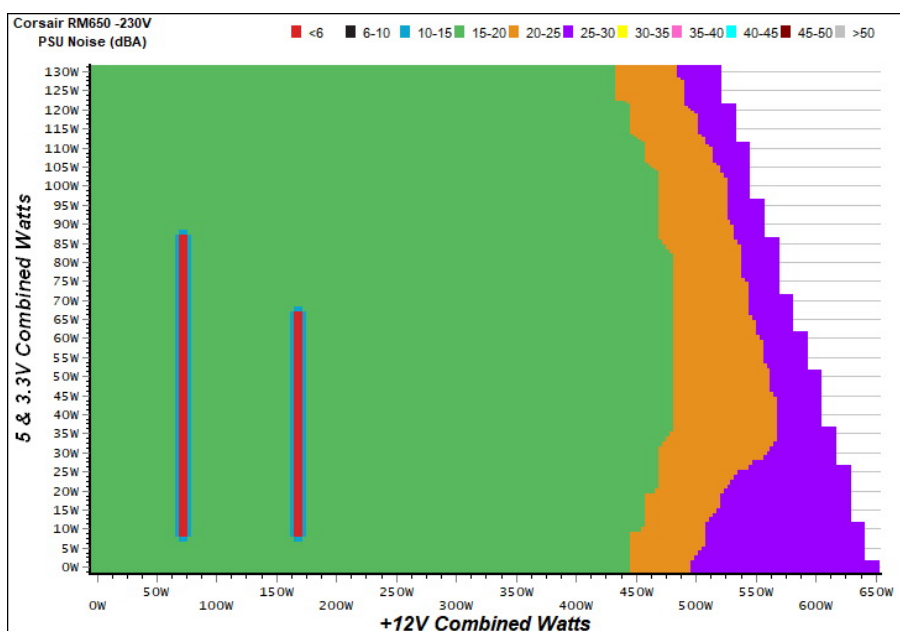
### EFFICIENCY GRAPH 230V



#### 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

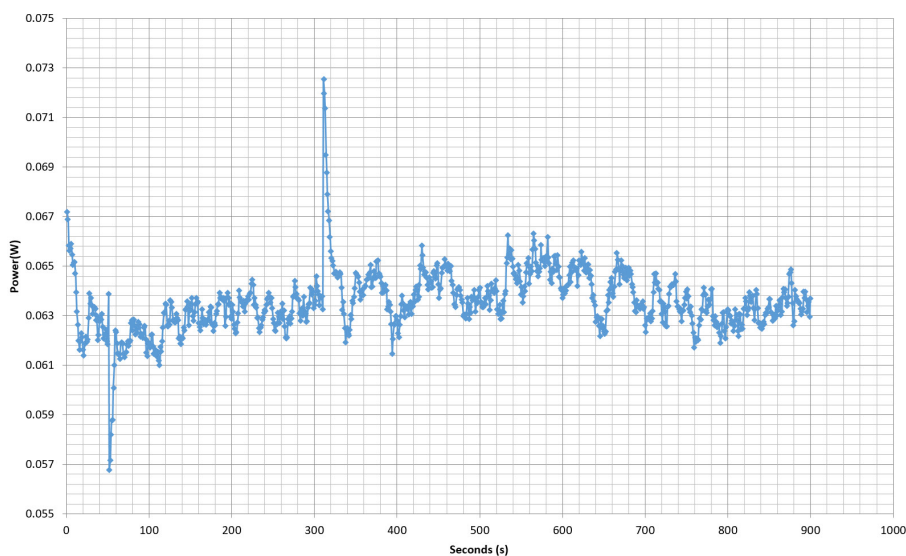
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### VAMPIRE POWER -230V

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### 10-110% LOAD TESTS 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	3.585A	1.985A	1.998A	0.997A	64.928	87.244%	0	<6.0	44.01°C	0.789
	12.085V	5.040V	3.301V	5.019V	74.421				39.84°C	230.27V
2	8.100A	2.978A	3.001A	1.197A	129.372	91.145%	0	<6.0	45.53°C	0.916
	12.157V	5.038V	3.298V	5.013V	141.941				40.55°C	230.27V
3	13.065A	3.476A	3.487A	1.398A	194.468	92.668%	791	16.3	41.33°C	0.953
	12.129V	5.036V	3.297V	5.008V	209.855				46.90°C	230.26V
4	18.027A	3.973A	4.005A	1.600A	259.654	93.055%	788	16.2	41.71°C	0.969
	12.118V	5.034V	3.296V	5.001V	279.032				47.83°C	230.25V
5	22.667A	4.968A	5.009A	1.802A	324.931	92.948%	790	16.3	42.13°C	0.978
	12.107V	5.032V	3.294V	4.996V	349.582				48.75°C	230.24V
6	27.250A	5.966A	6.012A	2.004A	389.445	92.686%	791	16.3	42.60°C	0.982
	12.097V	5.029V	3.293V	4.991V	420.177				49.74°C	230.24V
7	31.902A	6.962A	7.019A	2.207A	454.763	92.298%	925	21.8	43.06°C	0.985
	12.089V	5.027V	3.291V	4.985V	492.709				50.85°C	230.24V
8	36.556A	7.963A	8.025A	2.411A	520.074	91.832%	1193	30.1	43.68°C	0.987
	12.082V	5.024V	3.289V	4.979V	566.330				52.34°C	230.24V
9	41.608A	8.467A	8.516A	2.411A	585.024	91.423%	1406	34.8	44.41°C	0.989
	12.077V	5.022V	3.288V	4.978V	639.911				53.70°C	230.25V
10	46.397A	8.968A	9.038A	3.026A	649.865	90.906%	1635	39.0	45.55°C	0.990
	12.073V	5.019V	3.286V	4.959V	714.877				55.66°C	230.25V
11	51.787A	8.973A	9.043A	3.027A	714.694	90.514%	1763	41.0	46.87°C	0.991
	12.068V	5.018V	3.284V	4.957V	789.591				57.55°C	230.25V
CL1	0.142A	16.004A	15.999A	0.000A	134.782	85.124%	928	21.9	42.36°C	0.930
	12.142V	5.022V	3.293V	5.071V	158.336				48.52°C	230.26V
CL2	54.179A	1.002A	1.001A	1.000A	667.863	91.515%	1589	38.3	45.68°C	0.990
	12.081V	5.028V	3.285V	5.000V	729.789				55.96°C	230.26V

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### 20-80W LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.198A	0.496A	0.485A	0.199A	19.564	79.661%	0	<6.0	0.418
	12.074V	5.039V	3.298V	5.035V	24.559				230.27V
2	2.459A	0.993A	0.997A	0.398A	39.997	84.817%	0	<6.0	0.645
	12.076V	5.041V	3.303V	5.032V	47.157				230.27V
3	3.651A	1.486A	1.484A	0.597A	59.503	86.953%	0	<6.0	0.765
	12.082V	5.040V	3.302V	5.028V	68.431				230.27V
4	4.274A	1.984A	1.998A	0.796A	72.564	87.722%	0	<6.0	0.817
	12.159V	5.040V	3.302V	5.024V	82.720				230.28V

### RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.2 mV	7.5 mV	11.3 mV	9.4 mV	Pass
20% Load	7.4 mV	7.7 mV	10.7 mV	9.6 mV	Pass
30% Load	11.3 mV	8.7 mV	11.6 mV	9.8 mV	Pass
40% Load	10.1 mV	8.5 mV	12.3 mV	9.6 mV	Pass
50% Load	9.6 mV	10.1 mV	14.3 mV	10.5 mV	Pass
60% Load	9.7 mV	10.6 mV	12.8 mV	10.0 mV	Pass
70% Load	10.0 mV	11.3 mV	12.8 mV	10.2 mV	Pass
80% Load	10.1 mV	11.0 mV	15.0 mV	9.7 mV	Pass
90% Load	12.1 mV	11.7 mV	15.0 mV	10.2 mV	Pass
100% Load	17.9 mV	13.0 mV	16.5 mV	10.8 mV	Pass
110% Load	19.9 mV	13.4 mV	24.6 mV	10.9 mV	Pass
Crossload 1	24.3 mV	11.4 mV	16.5 mV	10.5 mV	Pass
Crossload 2	16.7 mV	10.9 mV	14.7 mV	10.6 mV	Pass

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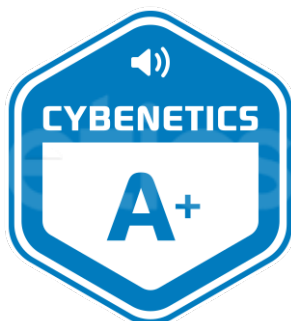


Top side

MODEL / MODELO / 型号 / 型號 / 모델: RPS0118 POWER SUPPLY / FUENTE DE ALIMENTACIÓN / 전원 공급 장치					
PART NUMBER: CP-9020194/75-003892					
交流輸入 AC INPUT	100V - 240V • 10A - 5A • 47Hz - 63Hz				
直流輸出 DC OUTPUT	+5V	+3.3V	+12V	-12V	+5Vsb
最大電流 MAX LOAD	20A	20A	54A	0.3A	3A
最大瓦特數 MAX POWER	130W	648W	3.6W	15W	
TOTAL POWER: 650W POWER TOTAL / 總功率 / 총출력					

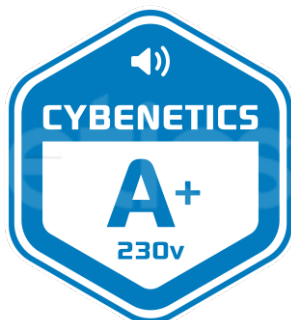
Power specifications label

## CERTIFICATIONS 115V




**Aristeidis Bitziopoulos**  
Lab Director

## CERTIFICATIONS 230V



All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case