EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Corsair VS650

Lab ID#: 554
Receipt Date: Nov 17, 2018
Test Date: Nov 28, 2018

Report:
Report Date: Nov 30, 2018

DUT INFORMATION

Brand	Corsair
Manufacturer (OEM)	HEC
Series	VS
Model Number	
Serial Number	184339863000052672383
DUT Notes	CP-9020172

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	47-63
Rated Power (W)	650
Type	ATX12V
Cooling	120mm Sleeve Bearing Fan (D12SH-12)
Semi-Passive Operation	✗
Cable Design	Fixed cables

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)	28-30 / 82.4-86
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	83.258%
Efficiency With 10W (≤500W) or 2% (>500W)	58.099
Average Efficiency 5VSB	79.375%
Standby Power Consumption (W)	0.0481592
Average PF	0.991
Avg Noise Output	34.11 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	Standard++

230V

Average Efficiency	85.506%
Average Efficiency 5VSB	78.487%
Standby Power Consumption (W)	0.1119340
Average PF	0.959
Avg Noise Output	34.27 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	24	20	52	3	0.3
	Watts	130		624	15	3.6
Total Max. Power (W)		650				

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

Hold-Up Time (ms)	12.4
AC Loss to PWR_OK Hold Up Time (ms)	9.4
PWR_OK Inactive to DC Loss Delay (ms)	3.0

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CABLES AND CONNECTORS

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (550mm)	1	1	18-20AWG	No
4+4 pin EPS12V (610mm)	1	1	18AWG	No
6+2 pin PCIe (550mm+110mm)	1	2	18AWG	No
SATA (440mm+120mm+120mm)	2	6	18AWG	No
SATA (440mm) / 4-pin Molex (+120mm+120mm) / FDD (+120mm)	1	1 / 2 / 1	18-20AWG	No
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

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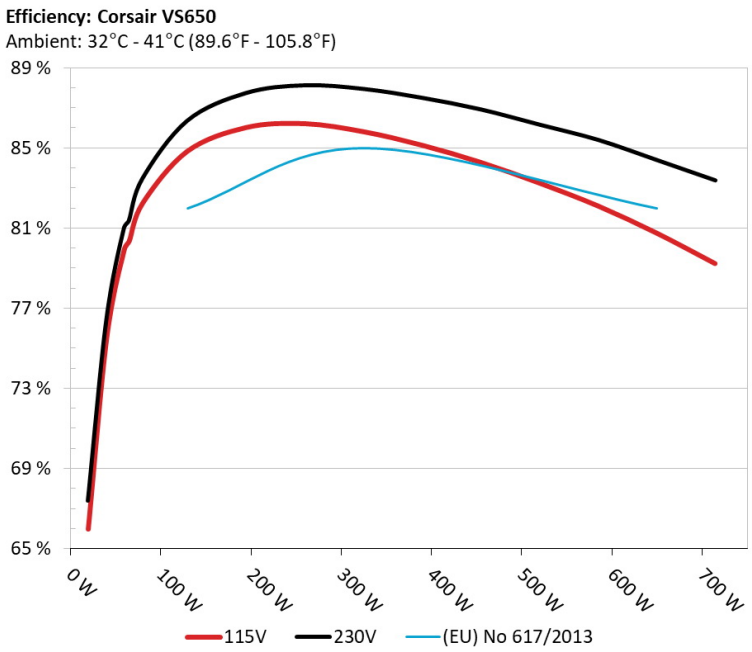
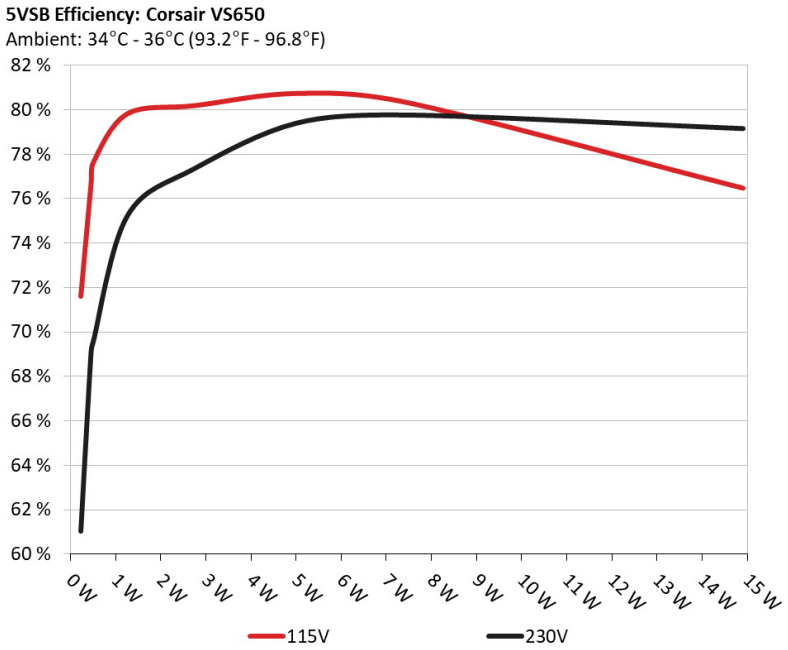
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227	71.609%	0.035
	5.033V	0.317		115.05V
2	0.090A	0.453	76.650%	0.065
	5.032V	0.591		115.05V
3	0.550A	2.763	80.180%	0.272
	5.022V	3.446		115.04V
4	1.000A	5.013	80.725%	0.356
	5.013V	6.210		115.04V
5	1.500A	7.503	80.298%	0.404
	5.002V	9.344		115.05V
6	3.000A	14.909	76.468%	0.471
	4.970V	19.497		115.05V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227	61.022%	0.160
	5.000V	0.372		230.20V
2	0.090A	0.453	69.055%	0.023
	5.032V	0.656		230.19V
3	0.550A	2.763	77.373%	0.116
	5.022V	3.571		230.20V
4	1.000A	5.013	79.408%	0.184
	5.013V	6.313		230.19V
5	1.500A	7.503	79.768%	0.241
	5.002V	9.406		230.18V
6	3.000A	14.908	79.159%	0.337
	4.969V	18.833		230.18V

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115V

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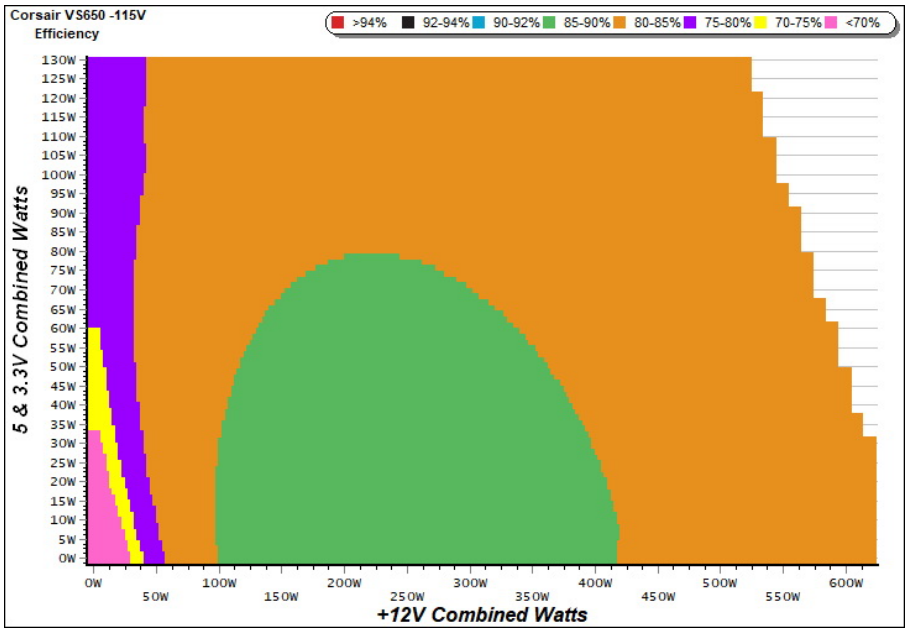
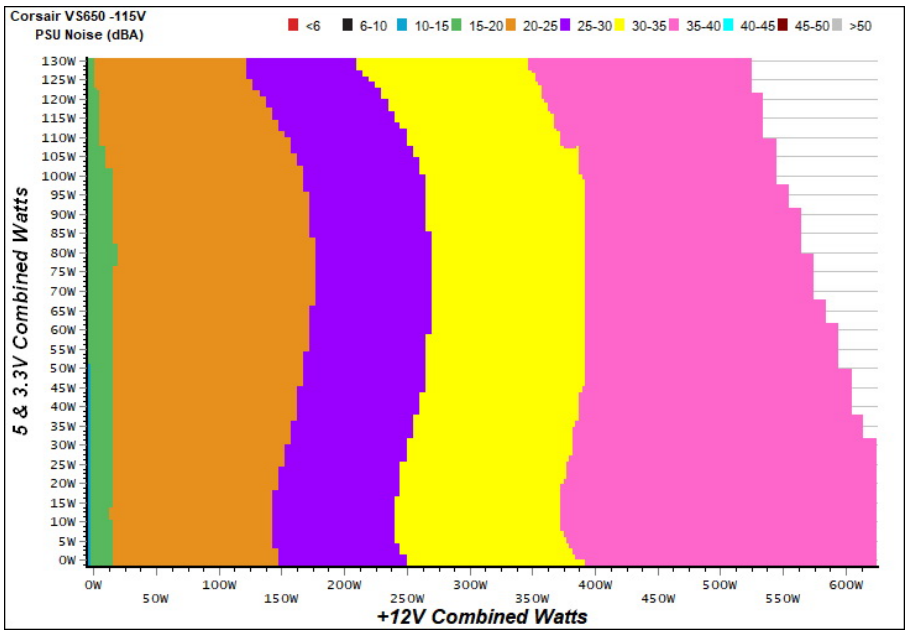
EFFICIENCY GRAPH 115V



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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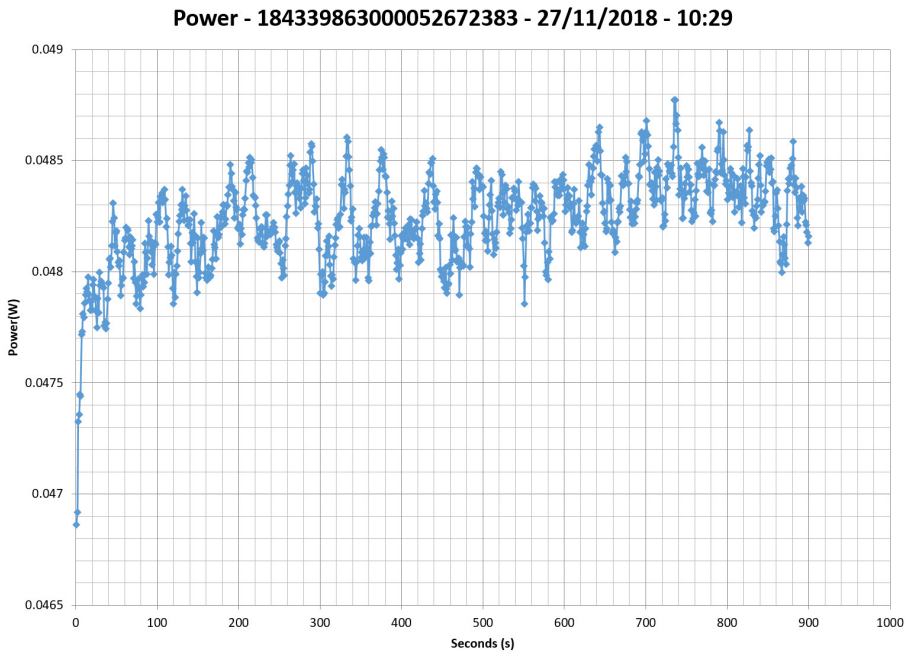
VAMPIRE POWER -115V



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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Corsair VS650

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	3.516A	1.966A	1.957A	1.001A	64.756	80.347%	712	16.8	34.08°C	0.983
	12.277V	5.084V	3.370V	4.994V	80.595				36.97°C	115.04V
2	8.027A	2.957A	2.946A	1.205A	129.260	84.845%	821	20.3	34.32°C	0.975
	12.255V	5.072V	3.358V	4.978V	152.349				37.74°C	115.04V
3	12.962A	3.450A	3.432A	1.411A	194.343	86.030%	981	23.9	35.36°C	0.985
	12.217V	5.070V	3.349V	4.962V	225.901				39.38°C	115.04V
4	17.920A	3.945A	3.951A	1.617A	259.569	86.224%	1092	27.7	36.01°C	0.990
	12.186V	5.069V	3.340V	4.948V	301.041				40.53°C	115.04V
5	22.563A	4.944A	4.957A	1.825A	324.893	85.819%	1253	31.2	36.38°C	0.994
	12.161V	5.058V	3.328V	4.932V	378.580				41.26°C	115.04V
6	27.143A	5.943A	5.967A	2.036A	389.390	85.150%	1397	33.8	37.48°C	0.995
	12.143V	5.048V	3.316V	4.914V	457.300				42.66°C	115.03V
7	31.827A	6.946A	6.989A	2.248A	454.713	84.290%	1541	36.6	37.70°C	0.997
	12.116V	5.039V	3.304V	4.895V	539.463				43.36°C	115.03V
8	36.535A	7.954A	8.020A	2.462A	520.035	83.254%	1679	38.3	38.42°C	0.997
	12.088V	5.029V	3.291V	4.876V	624.635				44.59°C	115.03V
9	41.683A	8.451A	8.533A	2.468A	584.957	82.109%	1820	40.8	38.79°C	0.998
	12.054V	5.030V	3.281V	4.864V	712.419				45.57°C	115.03V
10	46.612A	8.945A	9.091A	3.104A	649.797	80.760%	1933	42.7	40.21°C	0.998
	12.016V	5.031V	3.267V	4.834V	804.600				47.57°C	115.03V
11	52.212A	8.926A	9.121A	3.113A	714.633	79.236%	1942	42.7	40.89°C	0.998
	11.969V	5.042V	3.256V	4.820V	901.910				49.62°C	115.02V
CL1	0.136A	16.003A	15.999A	0.000A	126.975	76.404%	1326	32.8	36.77°C	0.977
	12.744V	4.498V	3.329V	4.953V	166.188				41.79°C	115.05V
CL2	51.975A	1.001A	1.000A	1.000A	627.555	81.304%	1855	42.3	40.28°C	0.998
	11.815V	5.263V	3.292V	4.911V	771.863				47.21°C	115.03V

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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	1.164A	0.486A	0.470A	0.199A	19.365	65.964%	602	13.4	0.937
	12.275V	5.118V	3.381V	5.023V	29.357				115.04V
2	2.408A	0.976A	0.976A	0.399A	39.829	75.518%	635	14.8	0.970
	12.270V	5.109V	3.377V	5.015V	52.741				115.04V
3	3.581A	1.470A	1.451A	0.599A	59.322	79.929%	692	16.2	0.976
	12.269V	5.098V	3.373V	5.006V	74.218				115.04V
4	4.818A	1.964A	1.958A	0.801A	79.698	82.247%	708	16.8	0.983
	12.268V	5.088V	3.368V	4.997V	96.901				115.04V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.3 mV	5.2 mV	10.4 mV	6.0 mV	Pass
20% Load	6.8 mV	6.3 mV	17.2 mV	8.2 mV	Pass
30% Load	11.3 mV	7.8 mV	17.7 mV	9.0 mV	Pass
40% Load	14.0 mV	9.2 mV	19.0 mV	10.9 mV	Pass
50% Load	16.9 mV	10.6 mV	19.2 mV	11.4 mV	Pass
60% Load	19.1 mV	13.8 mV	23.0 mV	13.1 mV	Pass
70% Load	24.0 mV	16.6 mV	24.6 mV	14.5 mV	Pass
80% Load	26.2 mV	19.0 mV	26.2 mV	18.4 mV	Pass
90% Load	31.6 mV	21.2 mV	29.1 mV	19.4 mV	Pass
100% Load	51.0 mV	31.1 mV	30.2 mV	21.0 mV	Pass
110% Load	62.0 mV	34.7 mV	34.6 mV	25.6 mV	Pass
Crossload 1	20.0 mV	39.1 mV	23.2 mV	13.4 mV	Pass
Crossload 2	58.2 mV	33.1 mV	28.1 mV	14.2 mV	Pass

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230V

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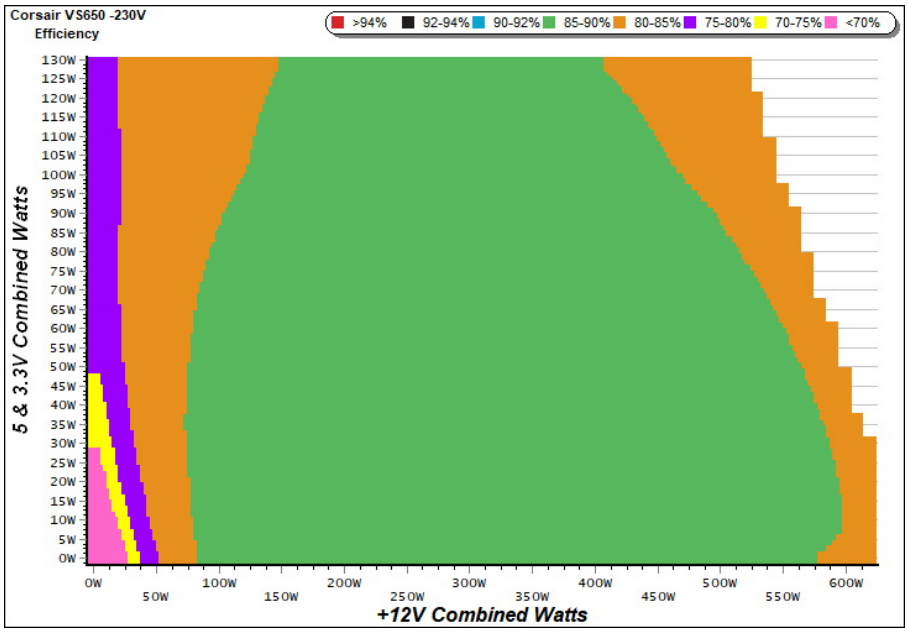
EFFICIENCY GRAPH 230V



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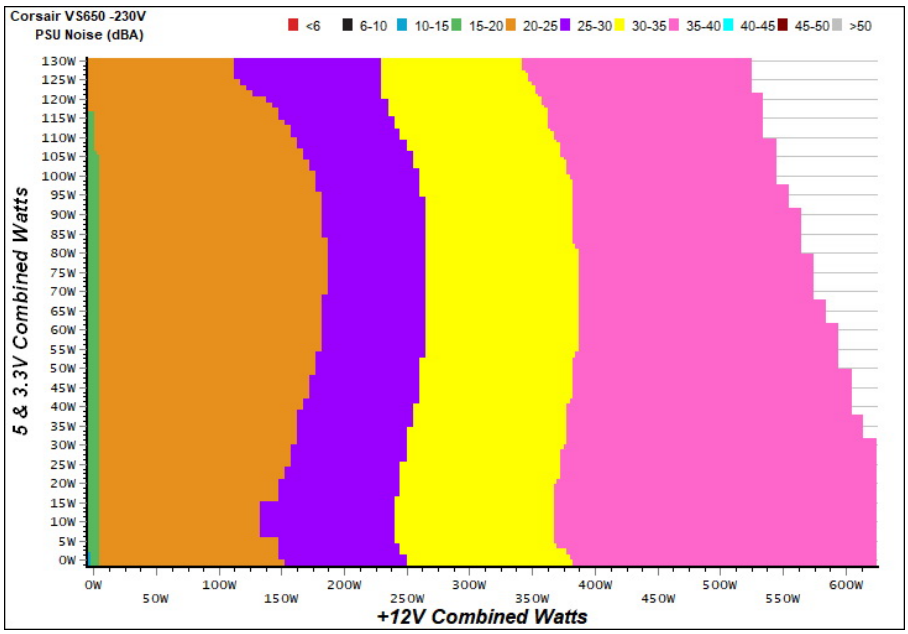
NOISE GRAPH 230V



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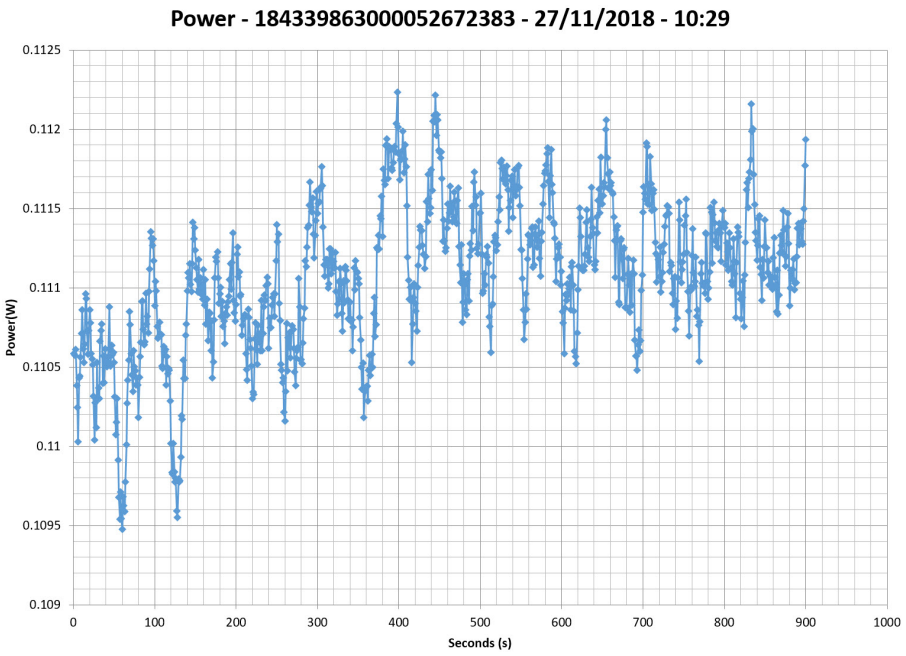
VAMPIRE POWER -230V



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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	3.507A	1.966A	1.954A	1.001A	64.628	81.358%	688	16.2	34.48°C	0.868
	12.276V	5.083V	3.370V	4.993V	79.437				36.42°C	230.19V
2	8.018A	2.955A	2.945A	1.206A	129.124	86.346%	849	20.7	35.03°C	0.918
	12.253V	5.072V	3.358V	4.977V	149.542				37.30°C	230.18V
3	12.952A	3.449A	3.431A	1.411A	194.210	87.733%	907	22.4	35.24°C	0.950
	12.217V	5.069V	3.349V	4.962V	221.364				38.09°C	230.18V
4	17.911A	3.944A	3.950A	1.618A	259.425	88.123%	1105	28.0	36.01°C	0.962
	12.185V	5.068V	3.339V	4.946V	294.389				39.38°C	230.18V
5	22.555A	4.941A	4.954A	1.825A	324.742	87.939%	1248	30.9	36.23°C	0.972
	12.160V	5.057V	3.328V	4.931V	369.279				40.06°C	230.18V
6	27.134A	5.941A	5.966A	2.036A	389.249	87.499%	1411	33.9	37.26°C	0.978
	12.142V	5.049V	3.317V	4.913V	444.862				41.33°C	230.18V
7	31.816A	6.946A	6.989A	2.248A	454.579	86.917%	1552	36.7	37.81°C	0.978
	12.116V	5.039V	3.304V	4.895V	523.004				42.27°C	230.18V
8	36.523A	7.952A	8.019A	2.462A	519.884	86.156%	1687	39.3	38.88°C	0.978
	12.088V	5.029V	3.292V	4.876V	603.424				43.74°C	230.18V
9	41.667A	8.449A	8.530A	2.467A	584.781	85.395%	1801	40.4	39.23°C	0.980
	12.055V	5.030V	3.281V	4.864V	684.792				44.76°C	230.18V
10	46.584A	8.942A	9.083A	3.103A	649.631	84.392%	1912	42.6	39.85°C	0.983
	12.020V	5.032V	3.269V	4.835V	769.777				46.09°C	230.18V
11	52.182A	8.923A	9.112A	3.111A	714.461	83.377%	1929	42.7	40.90°C	0.986
	11.973V	5.043V	3.258V	4.822V	856.902				48.12°C	230.18V
CL1	0.128A	16.001A	15.996A	0.000A	126.823	77.848%	1499	35.9	36.91°C	0.926
	12.747V	4.496V	3.329V	4.953V	162.911				40.67°C	230.19V
CL2	51.943A	0.999A	0.998A	1.000A	627.577	84.774%	1837	41.3	39.41°C	0.985
	11.823V	5.260V	3.294V	4.912V	740.293				45.41°C	230.18V

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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	1.156A	0.486A	0.468A	0.199A	19.257	67.393%	582	12.3	0.622
	12.273V	5.118V	3.381V	5.022V	28.574				230.17V
2	2.400A	0.976A	0.972A	0.399A	39.716	76.411%	590	13.3	0.783
	12.270V	5.107V	3.377V	5.014V	51.977				230.18V
3	3.572A	1.469A	1.450A	0.599A	59.202	80.989%	633	14.8	0.855
	12.269V	5.097V	3.373V	5.005V	73.099				230.17V
4	4.808A	1.963A	1.957A	0.801A	79.566	83.459%	658	15.2	0.889
	12.268V	5.088V	3.368V	4.997V	95.335				230.18V

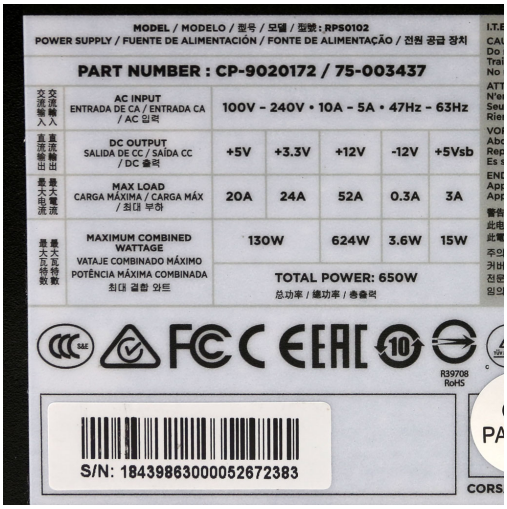
RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.3 mV	5.2 mV	10.6 mV	5.2 mV	Pass
20% Load	8.7 mV	6.6 mV	12.4 mV	7.6 mV	Pass
30% Load	10.0 mV	7.3 mV	15.1 mV	8.4 mV	Pass
40% Load	14.2 mV	8.7 mV	16.9 mV	9.4 mV	Pass
50% Load	18.4 mV	10.2 mV	19.6 mV	10.1 mV	Pass
60% Load	21.4 mV	13.3 mV	21.6 mV	10.7 mV	Pass
70% Load	24.4 mV	16.8 mV	24.1 mV	11.9 mV	Pass
80% Load	28.2 mV	18.9 mV	26.4 mV	12.7 mV	Pass
90% Load	33.3 mV	20.3 mV	28.1 mV	13.6 mV	Pass
100% Load	56.2 mV	31.4 mV	33.7 mV	19.8 mV	Pass
110% Load	68.0 mV	37.2 mV	33.4 mV	19.6 mV	Pass
Crossload 1	21.1 mV	42.5 mV	19.5 mV	11.8 mV	Pass
Crossload 2	61.8 mV	33.3 mV	30.5 mV	10.8 mV	Pass

Anex

Corsair VS650

Top side



Power specifications label

CERTIFICATIONS 115V

CYBENETICS BRONZE

CYBENETICS STANDARD++

CERTIFICATIONS 230V

CYBENETICS BRONZE 230v

CYBENETICS STANDARD++ 230v

Aristeidis Bitziopoulos
Lab Director