



Corsair VS650

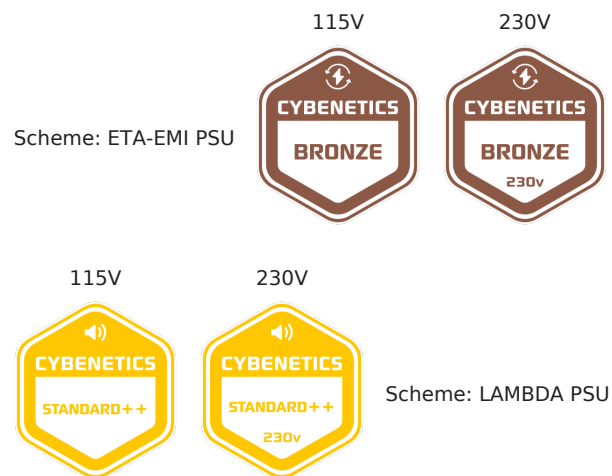
Serial Number 19439868000052723564

Lab ID CR65001683

Certification ID 251683

Test Result Report ID: 20PS1683A

Certificate Issue Date: Jul 17, 2020



A handwritten signature in blue ink, appearing to read "A. Bitziopoulos", written over a faint circular stamp.

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	Corsair
Model	VS650
OEM/ODM	HEC
Serial Number	19439868000052723564
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	47-63

Rated Power (W)	650
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Sleeve Bearing Fan (D12SH-12)
Semi-Passive Operation	<i>x</i>
Cybenetics Testing Information	
Lab ID	CR65001683
Date of receipt	Jul 9, 2020
Testing Date	Jul 14, 2020
Report Issued Date	Jul 17, 2020
DUT Notes	CP-9020172
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Native Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Caps
ATX connector 20+4 pin (550mm)	1	1	18-20AWG	No
4+4 pin EPS12V (610mm)	1	1	18AWG	No
6+2 pin PCIe (560mm+120mm)	1	2	18AWG	No
SATA (460mm+120mm+120mm)	2	6	18AWG	No
SATA (460mm) / 4-pin Molex (+120mm+120mm) / FDD (+150mm)	1	1 / 2 / 1	18-20AWG	No
Modular Cables				
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

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				

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	81.932%
Average Noise Output (>1450 Load Combinations)	34.08dBA
Average PF (>1450 Load Combinations)	0.991
Efficiency With 10W (≤500W) or 2% (>500W) Load	56.915%
Standby Power Consumption	0.0462W
Non-Accredited	
12V Ripple (Full Load)	63.03mV
5V Ripple (Full Load)	41.11mV
3.3V Ripple (Full Load)	26.19mV
5VSB Ripple (Full Load)	22.09mV
12V Load Regulation	2.03%
5V Load Regulation	1.55%
3.3V Load Regulation	4.01%

5VSB Load Regulation	3.88%
Inrush Current	34.130A

230V

Accredited		
Average Efficiency (>1450 load combinations)	85.089%	
Average Noise Output (>1450 Load Combinations)	34.07dBA	
Average PF (>1450 Load Combinations)	0.968	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1066W	
Non-Accredited		
12V Ripple (Full Load)	66.04mV	
5V Ripple (Full Load)	42.48mV	
3.3V Ripple (Full Load)	26.64mV	
5VSB Ripple (Full Load)	19.40mV	
12V Load Regulation	2.01%	
5V Load Regulation	1.71%	
3.3V Load Regulation	3.96%	
5VSB Load Regulation	3.80%	
Inrush Current	71.030A	
Hold-Up Time & PWR_OK Signal	14.10ms	
AC Loss to PWR_OK Hold Up Time	12.00ms	
PWR_OK Inactive to DC Loss Delay	2.10ms	
PSU Timings: T1 (20% / 100%)	52.0ms	52.0ms
PSU Timings: T3 (20% / 100%)	280.0ms	280.0ms
OPP (0.00°C / 0.00°C)	120.32%	-

Hold-Up Time & PWR_OK Signal

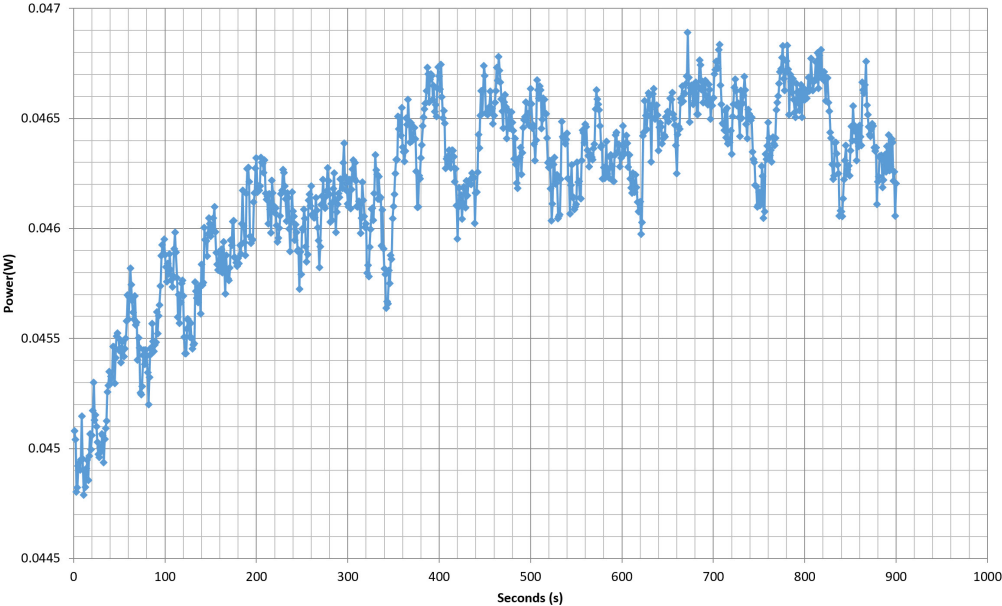
Hold-Up Time (ms)	14.1
AC Loss to PWR_OK Hold Up Time (ms)	12

Vampire Power

Graphs

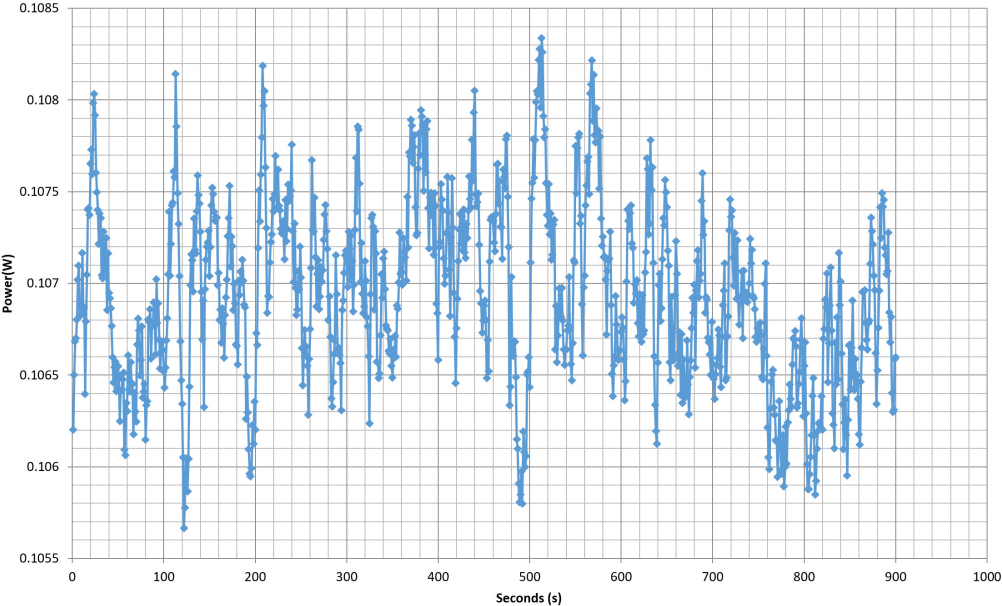
115V

Power - 19439868000052723564 - 10/07/2020 - 14:52



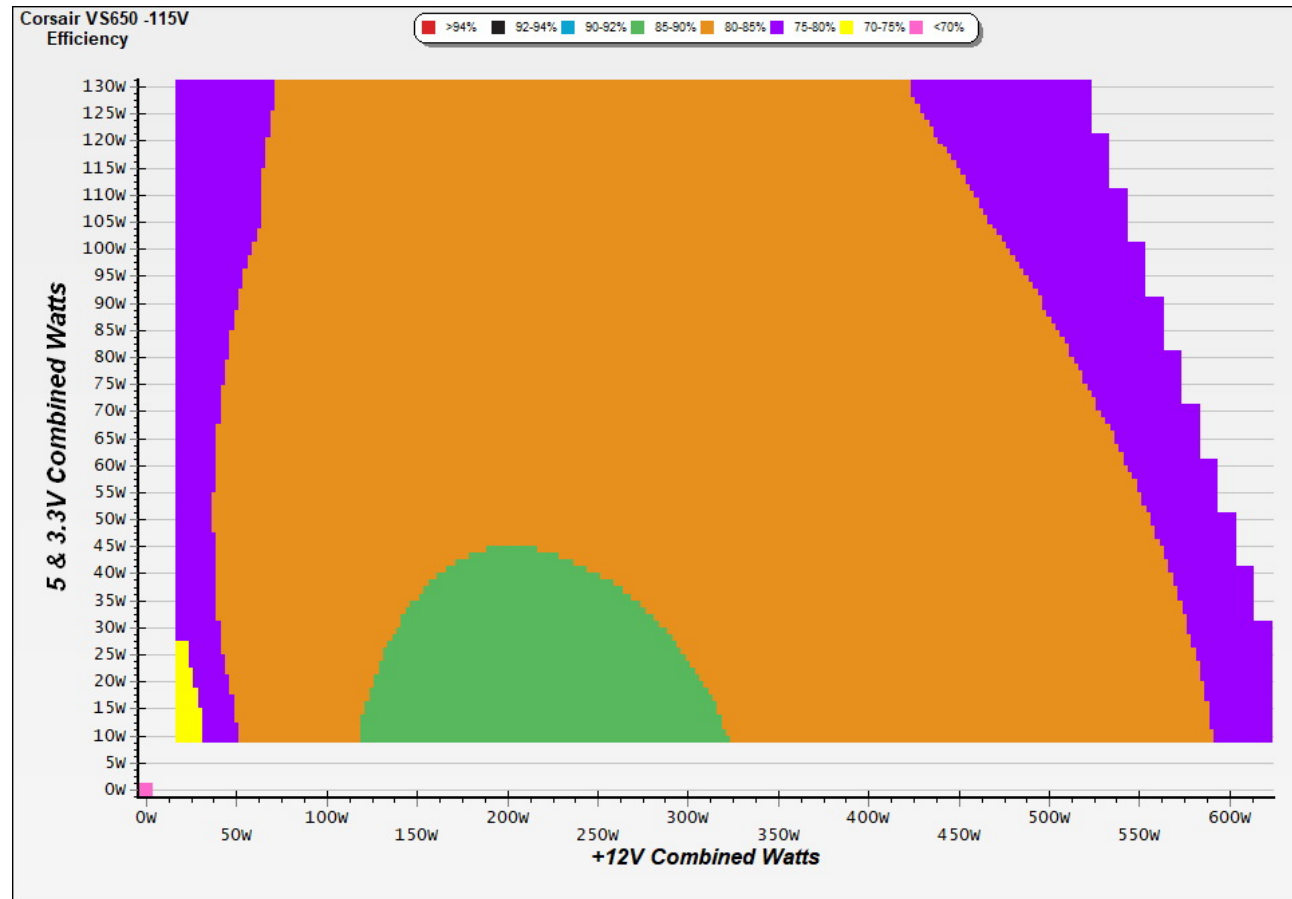
230V

Power - 19439868000052723564 - 10/07/2020 - 14:52



Efficiency Graph

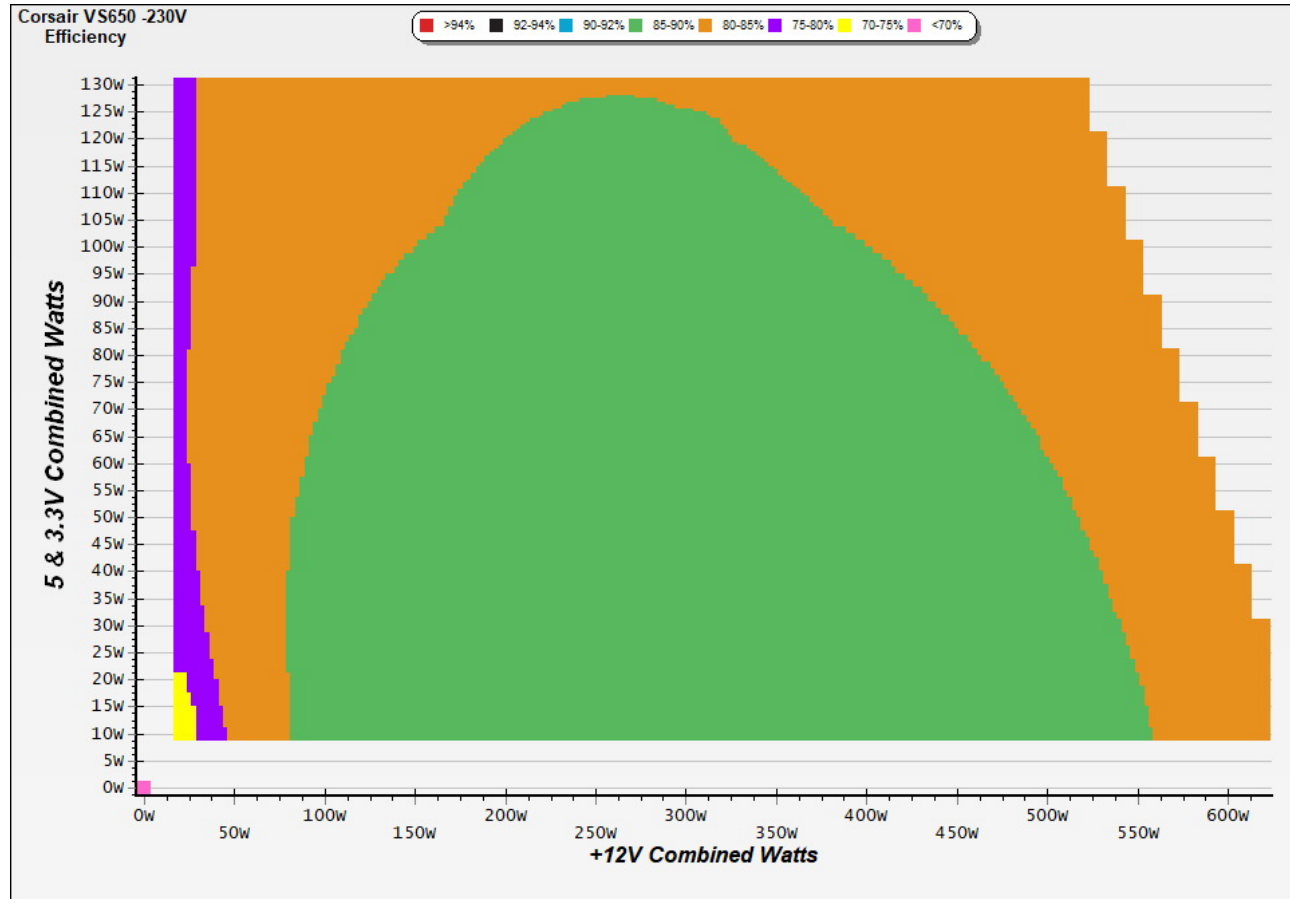
115V



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

230V

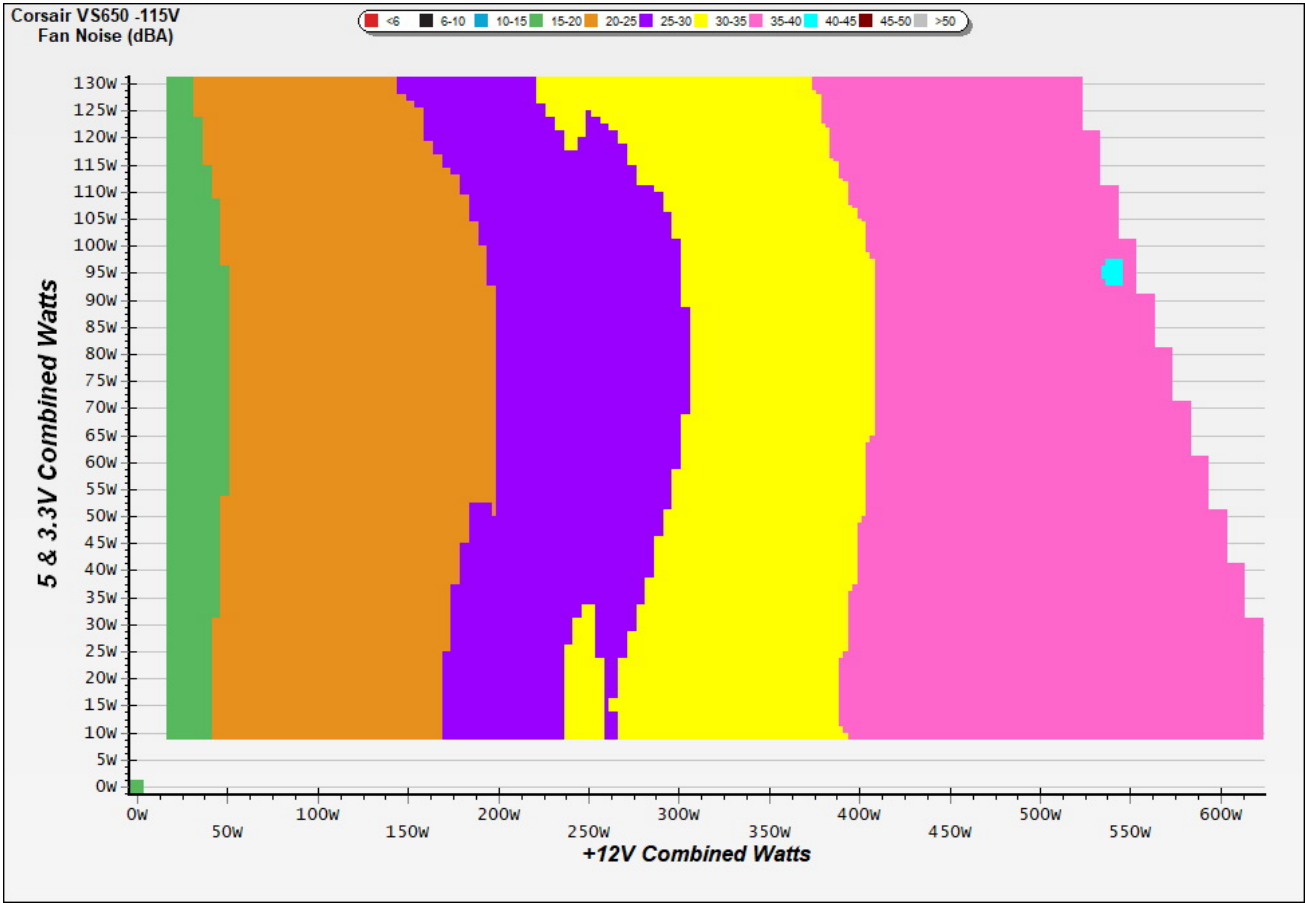


INFO

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

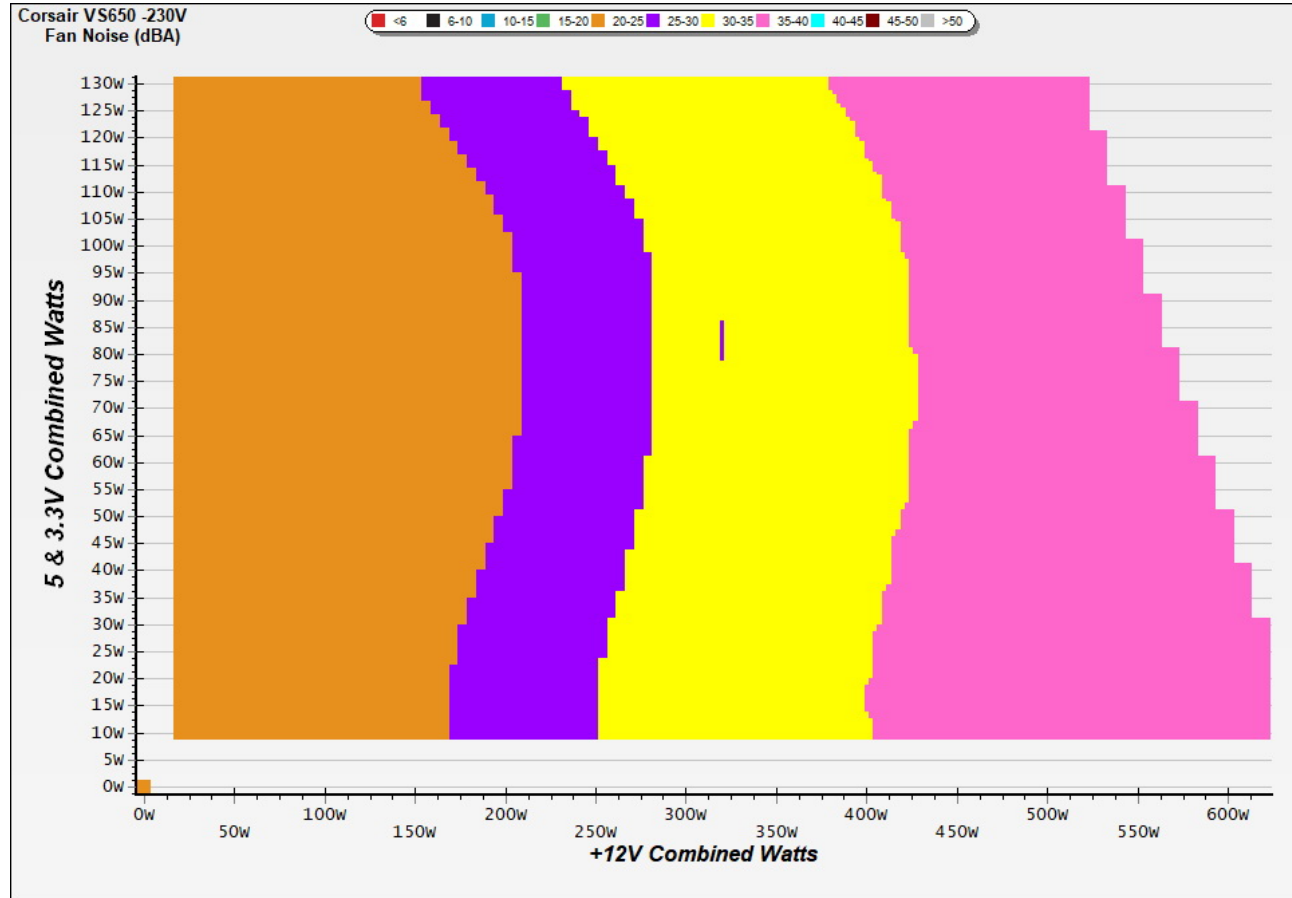
115V



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

230V



INFO

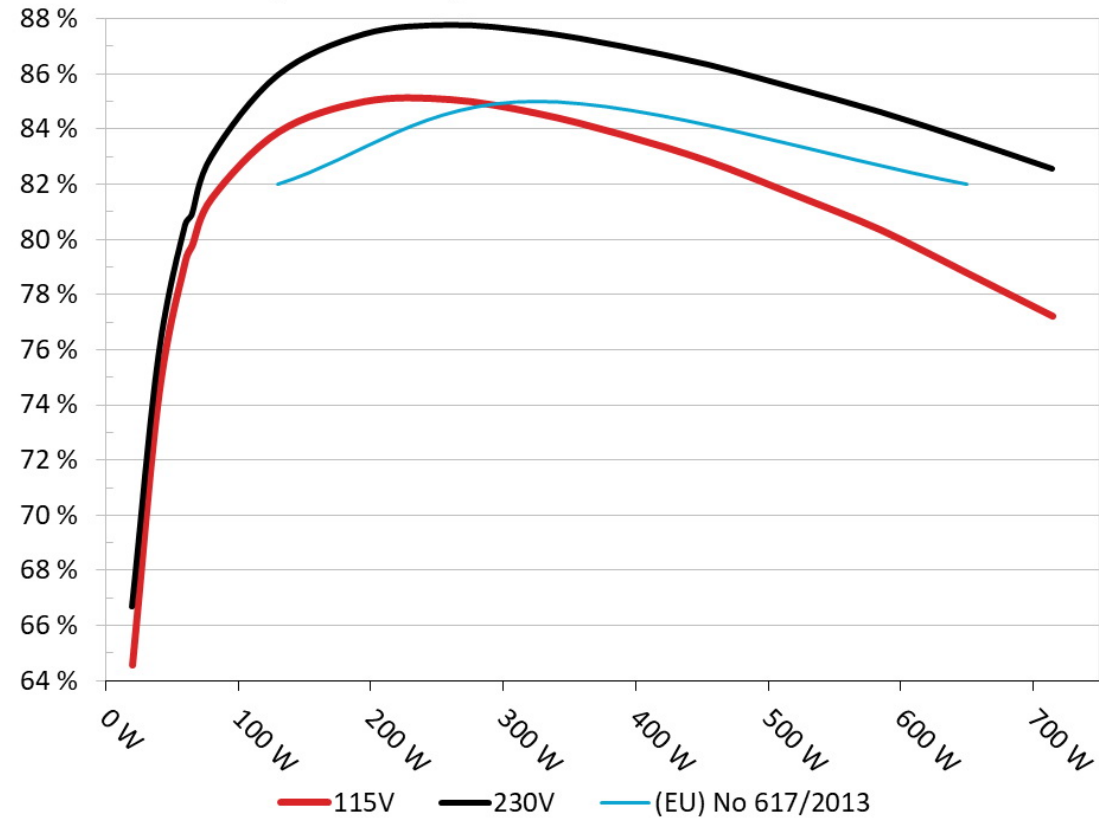
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance

Efficiency under high ambient temperature

Efficiency: Corsair VS650

Ambient: 32°C - 40°C (89.6°F - 104°F)



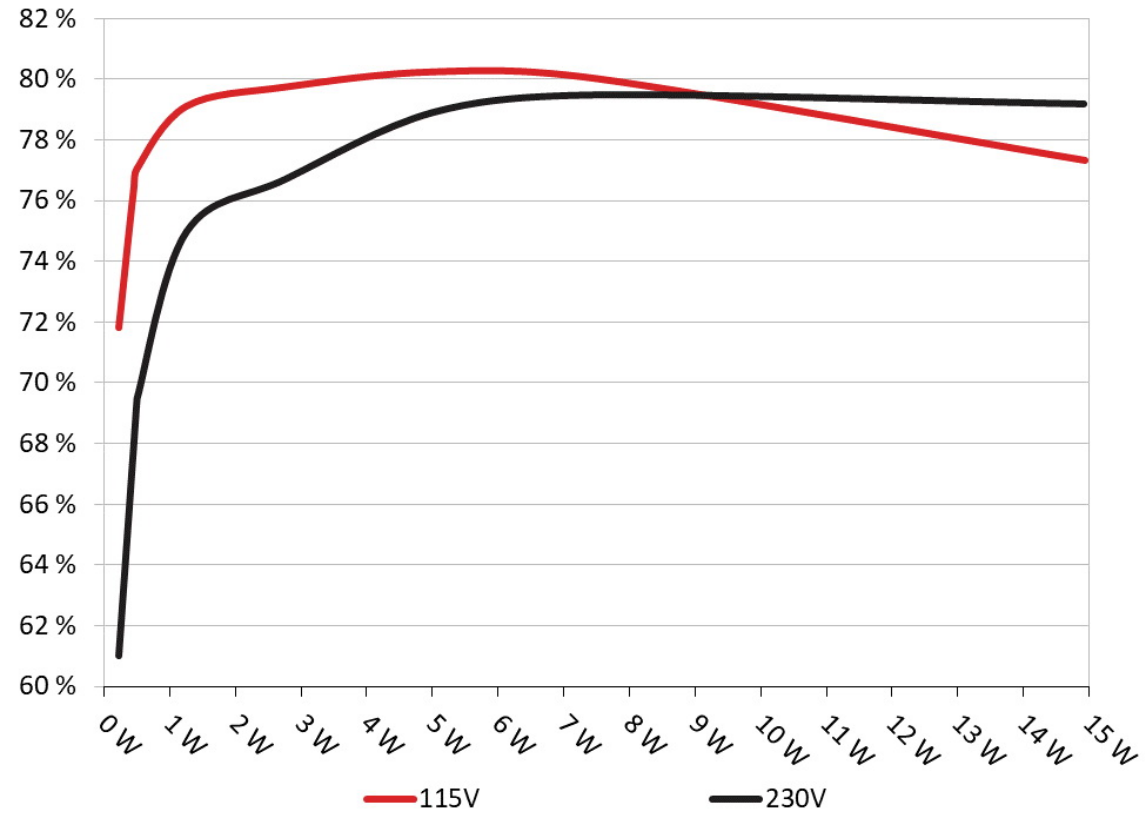
INFO

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 VS650

Ambient: 28°C - 32°C (82.4°F - 89.8°F)



INFO

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

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227	71.835%	0.037
	5.037V	0.316		115.15V
2	0.090A	0.453	76.391%	0.067
	5.037V	0.593		115.15V
3	0.550A	2.765	79.752%	0.278
	5.027V	3.467		115.16V
4	1.000A	5.018	80.249%	0.360
	5.018V	6.253		115.16V
5	1.500A	7.511	80.023%	0.406
	5.008V	9.386		115.16V
6	2.999A	14.930	77.337%	0.469
	4.978V	19.305		115.16V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227	61.022%	0.013
	5.036V	0.372		230.29V
2	0.090A	0.453	69.479%	0.023
	5.036V	0.652		230.29V
3	0.550A	2.765	76.699%	0.118
	5.028V	3.605		230.29V
4	1.000A	5.018	78.899%	0.187
	5.018V	6.360		230.29V
5	1.500A	7.506	79.471%	0.244
	5.004V	9.445		230.29V
6	2.999A	14.926	79.175%	0.338
	4.977V	18.852		230.29V

Supplementary Tests (For Reference)

Typical 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	3.536A	1.974A	1.967A	1.000A	64.955	79.782%	731	16.7	34.01°C	0.980
	12.260V	5.068V	3.356V	4.998V	81.416				37.45°C	115.17V
2	8.099A	2.967A	2.964A	1.204A	130.009	83.905%	765	17.9	34.74°C	0.977
	12.237V	5.056V	3.341V	4.982V	154.948				38.77°C	115.17V
3	13.017A	3.458A	3.468A	1.410A	195.003	85.015%	867	20.5	35.34°C	0.985
	12.212V	5.058V	3.330V	4.965V	229.374				40.18°C	115.17V
4	17.962A	3.954A	3.978A	1.616A	259.999	85.087%	1024	24.4	35.62°C	0.990
	12.181V	5.059V	3.318V	4.951V	305.567				41.24°C	115.16V
5	22.575A	4.954A	4.996A	1.825A	325.025	84.588%	1200	29.3	36.24°C	0.993
	12.160V	5.047V	3.304V	4.933V	384.244				42.59°C	115.15V
6	27.150A	5.959A	6.019A	2.000A	389.133	83.815%	1352	33.3	36.66°C	0.995
	12.136V	5.036V	3.290V	4.915V	464.278				43.63°C	115.15V
7	31.826A	6.970A	7.056A	2.246A	454.586	82.846%	1504	36.0	37.41°C	0.996
	12.112V	5.022V	3.275V	4.897V	548.712				45.32°C	115.15V
8	36.544A	7.978A	8.098A	2.461A	519.917	81.621%	1692	39.4	37.71°C	0.996
	12.082V	5.015V	3.258V	4.876V	636.993				46.44°C	115.14V
9	41.706A	8.470A	8.628A	2.469A	584.840	80.349%	1797	40.3	38.88°C	0.997
	12.045V	5.017V	3.245V	4.860V	727.875				48.32°C	115.14V
10	46.622A	8.971A	9.193A	3.104A	649.667	78.794%	1926	42.7	39.28°C	0.997
	12.011V	5.016V	3.230V	4.832V	824.514				50.21°C	115.13V
11	52.193A	8.955A	9.225A	3.113A	714.494	77.222%	1997	42.8	40.39°C	0.998
	11.971V	5.025V	3.219V	4.818V	925.241				52.29°C	115.12V
CL1	0.096A	16.001A	15.999A	0.000A	125.968	75.173%	1445	34.3	35.95°C	0.980
	12.691V	4.514V	3.289V	4.952V	167.571				42.26°C	115.17V

CL2	52.992A	1.000A	1.000A	1.000A	628.838	79.489%	1847	41.8	40.19°C	0.997
	11.840V	5.233V	3.273V	4.908V	791.105				52.44°C	115.13V

The results above are not used in the certification process

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	3.536A	1.975A	1.967A	1.000A	64.955	80.883%	742	17.3	34.30°C	0.877
	12.259V	5.068V	3.356V	4.997V	80.307				37.54°C	230.32V
2	8.099A	2.968A	2.963A	1.205A	130.013	85.964%	771	18.1	34.50°C	0.933
	12.237V	5.055V	3.341V	4.981V	151.242				38.30°C	230.32V
3	13.017A	3.461A	3.469A	1.411A	195.012	87.452%	877	20.7	35.08°C	0.958
	12.211V	5.058V	3.330V	4.964V	222.994				39.35°C	230.32V
4	17.963A	3.955A	3.978A	1.617A	260.014	87.785%	1051	24.8	35.78°C	0.965
	12.181V	5.058V	3.318V	4.950V	296.193				40.96°C	230.32V
5	22.581A	4.955A	4.995A	1.825A	325.044	87.537%	1203	29.9	36.50°C	0.972
	12.158V	5.047V	3.303V	4.931V	371.320				42.63°C	230.32V
6	27.160A	5.958A	6.021A	2.000A	389.183	87.018%	1350	32.4	36.80°C	0.978
	12.134V	5.034V	3.289V	4.914V	447.245				43.52°C	230.32V
7	31.849A	6.969A	7.057A	2.248A	454.674	86.346%	1496	35.8	37.36°C	0.981
	12.106V	5.024V	3.273V	4.893V	526.572				44.88°C	230.32V
8	36.559A	7.978A	8.103A	2.462A	519.986	85.500%	1652	38.1	37.61°C	0.984
	12.079V	5.014V	3.257V	4.873V	608.171				45.71°C	230.32V
9	41.714A	8.475A	8.628A	2.470A	584.906	84.627%	1788	40.2	38.65°C	0.985
	12.044V	5.015V	3.245V	4.859V	691.159				47.71°C	230.33V
10	46.622A	8.974A	9.195A	3.105A	649.721	83.622%	1921	42.6	39.86°C	0.987
	12.012V	5.015V	3.229V	4.832V	776.970				49.86°C	230.32V
11	52.192A	8.952A	9.230A	3.114A	714.531	82.569%	2004	42.8	40.84°C	0.988
	11.972V	5.026V	3.217V	4.818V	865.374				51.71°C	230.32V
CL1	0.099A	16.001A	15.998A	0.000A	126.135	76.767%	1660	38.1	36.18°C	0.940
	12.688V	4.516V	3.289V	4.951V	164.308				41.99°C	230.33V

CL2	51.996A	1.000A	1.000A	1.000A	628.941	84.095%	1865	42.5	39.93°C	0.986
	11.838V	5.235V	3.272V	4.906V	747.897				49.82°C	230.31V

The results above are not used in the certification process

Light Load Tests

115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.210A	0.489A	0.490A	0.199A	19.984	64.556%	689	15.7	0.929
	12.261V	5.105V	3.370V	5.027V	30.956				115.17V
2	2.421A	0.981A	0.980A	0.399A	39.974	74.392%	706	16.4	0.966
	12.258V	5.094V	3.365V	5.019V	53.734				115.17V
3	3.635A	1.476A	1.473A	0.599A	60.006	79.247%	716	16.4	0.973
	12.257V	5.083V	3.359V	5.010V	75.720				115.18V
4	4.844A	1.971A	1.967A	0.800A	79.956	81.515%	730	16.6	0.985
	12.254V	5.073V	3.354V	5.001V	98.087				115.18V

The results above are not used in the certification process

230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.210A	0.490A	0.489A	0.199A	19.982	66.678%	710	16.4	0.644
	12.259V	5.106V	3.370V	5.025V	29.968				230.31V
2	2.421A	0.982A	0.979A	0.399A	39.972	75.789%	711	16.4	0.793
	12.257V	5.094V	3.365V	5.017V	52.741				230.32V
3	3.636A	1.474A	1.473A	0.599A	60.004	80.523%	722	16.5	0.863
	12.256V	5.084V	3.359V	5.008V	74.518				230.32V
4	4.844A	1.971A	1.968A	0.800A	79.955	83.020%	735	17.0	0.900
	12.253V	5.074V	3.354V	5.000V	96.308				230.32V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.50mV	12.50mV	12.80mV	11.60mV	Pass
20% Load	11.00mV	13.10mV	14.00mV	13.20mV	Pass
30% Load	12.10mV	12.20mV	13.90mV	12.20mV	Pass
40% Load	14.70mV	11.90mV	14.00mV	13.30mV	Pass
50% Load	17.00mV	14.80mV	14.90mV	12.90mV	Pass
60% Load	20.90mV	17.50mV	16.50mV	13.10mV	Pass
70% Load	25.70mV	21.50mV	17.70mV	16.40mV	Pass
80% Load	30.50mV	23.60mV	21.50mV	17.40mV	Pass
90% Load	38.90mV	28.60mV	23.40mV	18.10mV	Pass
100% Load	63.00mV	41.10mV	26.20mV	22.10mV	Pass
110% Load	75.70mV	45.20mV	26.90mV	24.30mV	Pass
Crossload1	26.90mV	50.20mV	25.80mV	11.90mV	Fail
Crossload2	70.30mV	41.30mV	22.70mV	22.50mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.60mV	11.90mV	12.90mV	10.40mV	Pass
20% Load	13.10mV	14.30mV	14.00mV	12.30mV	Pass
30% Load	14.00mV	12.10mV	13.90mV	10.30mV	Pass
40% Load	15.80mV	12.30mV	14.40mV	12.00mV	Pass
50% Load	18.50mV	14.40mV	15.30mV	12.40mV	Pass
60% Load	22.40mV	17.10mV	16.60mV	13.10mV	Pass
70% Load	24.40mV	20.10mV	17.80mV	14.70mV	Pass
80% Load	28.90mV	23.10mV	21.60mV	14.10mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	36.30mV	27.50mV	22.70mV	15.30mV	Pass
100% Load	66.00mV	42.50mV	26.60mV	19.40mV	Pass
110% Load	78.20mV	46.90mV	26.90mV	20.30mV	Pass
Crossload1	28.00mV	52.80mV	25.50mV	11.90mV	Fail
Crossload2	69.50mV	42.60mV	23.20mV	20.70mV	Pass

The results above are not used in the certification process

Corsair VS650



Top side

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

CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

MODEL / MODELO / 型号 / 모델 / 型號: RP50102					
POWER SUPPLY / FUENTE DE ALIMENTACIÓN / FONTE DE ALIMENTAÇÃO / 전원 공급 장치					
PART NUMBER : CP-9020172 / 75-003437					
交流輸入 AC INPUT	ENTRADA DE CA / ENTRADA CA / AC 입력		100V - 240V • 10A - 5A • 47Hz - 63Hz		
直流輸出 DC OUTPUT	SALIDA DE CC / SALIDA CC / DC 출력		+5V	+3.3V	+12V -12V +5Vsb
最大電流 MAX LOAD	CARGA MÁXIMA / CARGA MÁX / 최대 부하		20A	24A	52A 0.3A 3A
最大瓦特數 MAXIMUM COMBINED WATTAGE	VATAJE COMBINADO MÁXIMO / POTÊNCIA MÁXIMA COMBINADA / 최대 결합 와트		130W	624W	3.6W 15W
			TOTAL POWER: 650W 总功率 / 總功率 / 총출력		
 					
R39708 RoHS					

Power specifications label

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

www.cybenetics.com - info@cybenetics.com