zalman

Zalman GigaMax III 650W

Lab ID ZL65002251

Certification ID 252251

Test Result Report ID: 23PS2251A

Certificate Issue Date: Oct 5, 2023

230V

Scheme: ETA-EMI PSU



230V



Scheme: LAMBDA PSU



Outside Validation Scope



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	Zalman
Model	GigaMax III 650W
OEM/ODM	Jiumeng
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	200-240
□□□□ (Arms)	5

□□□□ (Hz)	50-60
□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Semi Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Fluid Dynamic Bearing Fan (D12BM-12)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	ZL65002251
Date of receipt	Sep 26, 2023
Testing Date	Oct 3, 2023
Report Issued Date	Oct 5, 2023
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□□ (Non-accredited measurements)

□□□□				
□□	□□□□	□□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (550mm)	1	1	18-20AWG	□
8 pin EPS 12V □□ (720mm) / 4+4pin EPS 12V □□ (+150mm)	1	1/1	18AWG	□
6+2pin PCIe□□ (570mm+150mm)	1	2	18AWG	□
SATA□□ (450mm+140mm+140mm)	2	6	18AWG	□
4-pin Molex (450mm+140mm+140mm)	1	3	18AWG	□
□□□□□				
12+4 pin PCIe (600mm) (450W)	1	1	18-26AWG	□

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54.16	3	0.3
	□	110		650	15	3.6
□□□□□ (W)		650				

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.1 PSU Power Excursion	✓

Performance Summary 230V

Accredited	
□□□□ (>1450 load combinations)	87.752%
Average Noise Output (>1450 Load Combinations)	31.66dBA
PF□□□ (>1450 Load Combinations)	0.957
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
□□□□□□	0.1555W
Non-Accredited	
12V Ripple (Full Load)	26.43mV
5V Ripple (Full Load)	20.75mV
3.3V Ripple (Full Load)	30.30mV
5VSB Ripple (Full Load)	30.67mV
12V Load Regulation	1.01%
5V Load Regulation	2.84%
3.3V Load Regulation	3.13%

5VSB Load Regulation		2.98%
Inrush Current		67.370A
12V Transient Response (150%)		11.50V
5V Transient Response (150%)		4.933V
3.3V Transient Response (150%)		3.199V
5VSB Transient Response (150%)		5.012V
□□□□ & PG□□		20.30ms
AC Loss to PWR_OK Hold Up Time		16.90ms
PWR_OK Inactive to DC Loss Delay		3.40ms
PSU Timings: T1 (20% / 100%)	16.0ms	16.0ms
PSU Timings: T3 (20% / 100%)	115.0ms	115.0ms
OPP (28.25°C / 0.00°C)	134.87%	-

□□□□ & PG□□

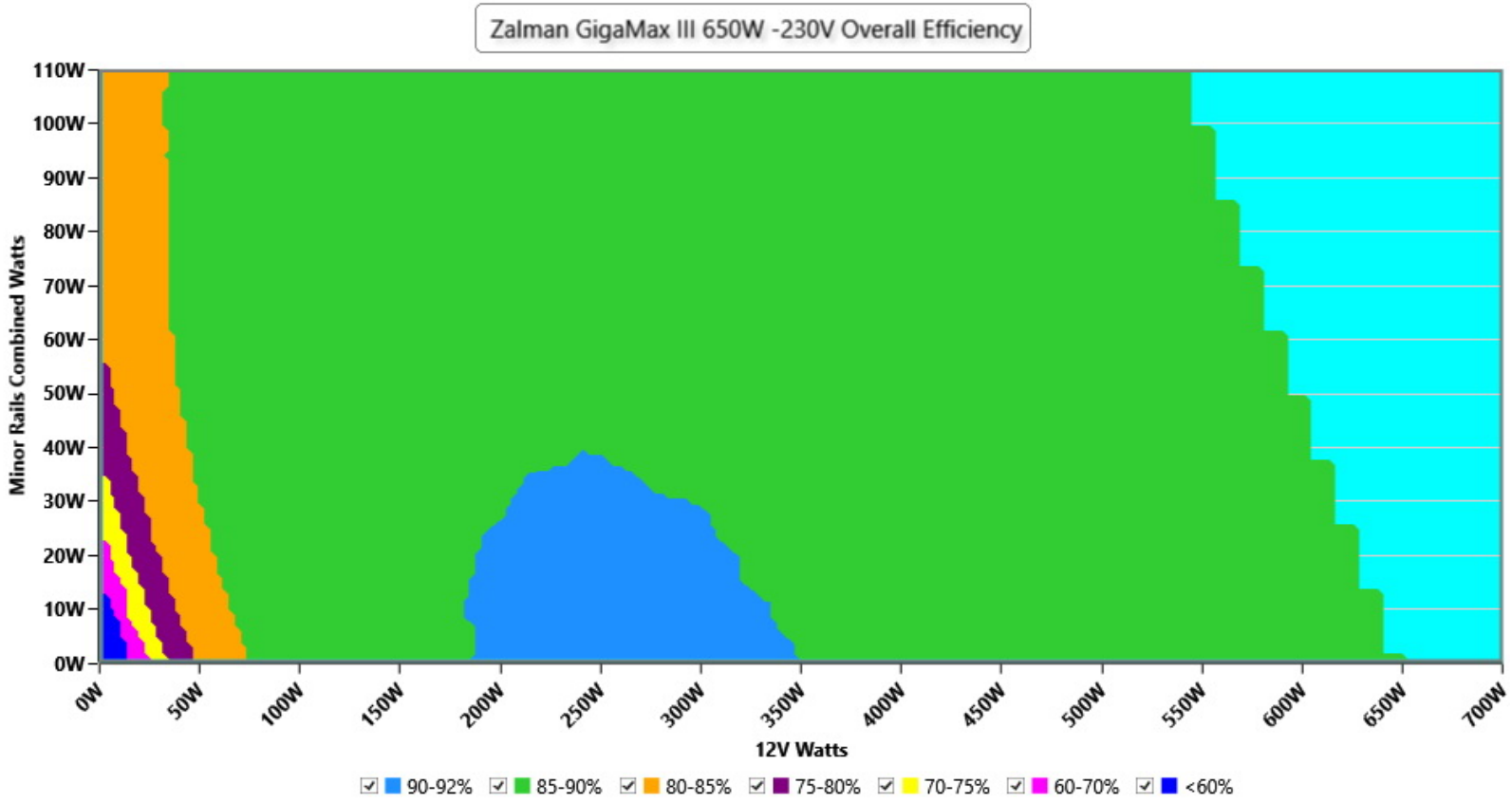
Hold-Up Time (ms)	20.3
AC Loss to PWR_OK Hold Up Time (ms)	16.9
PWR_OK Inactive to DC Loss Delay (ms)	3.4

□□□□

Tables 230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.90 V	229.87 V	227.70 V	229.96 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	50.00 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:	0.14 %	0.12 %	N/A	0.17 %	2.00 %	PASS
Real Power:	0.155 W	0.133 W	N/A	0.181 W	N/A	N/A
Apparent Power:	30.254 W	30.238 W	N/A	30.272 W	N/A	N/A
Power Factor:	0.005	N/A	N/A	N/A	N/A	N/A

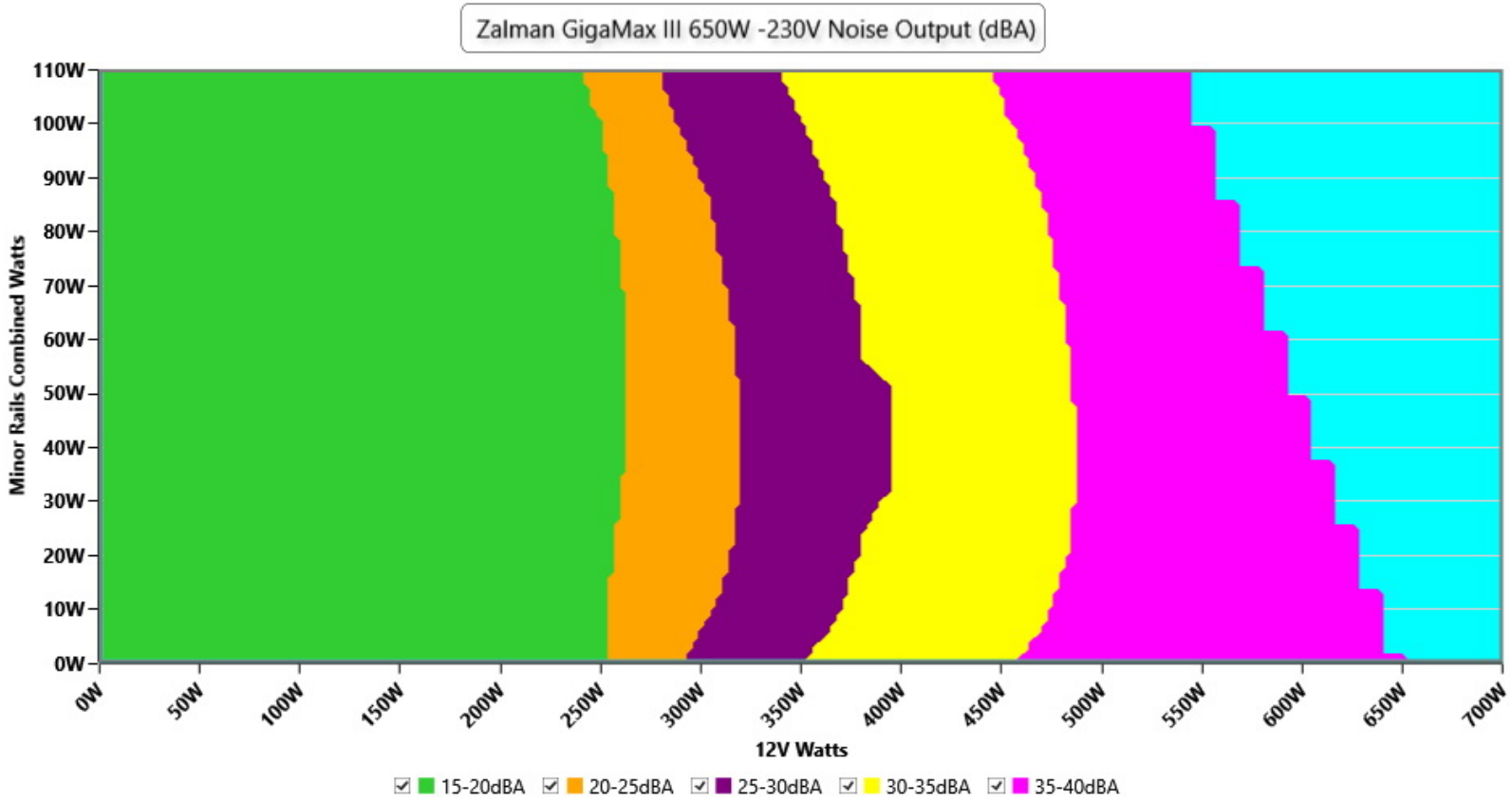
230V



□□

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

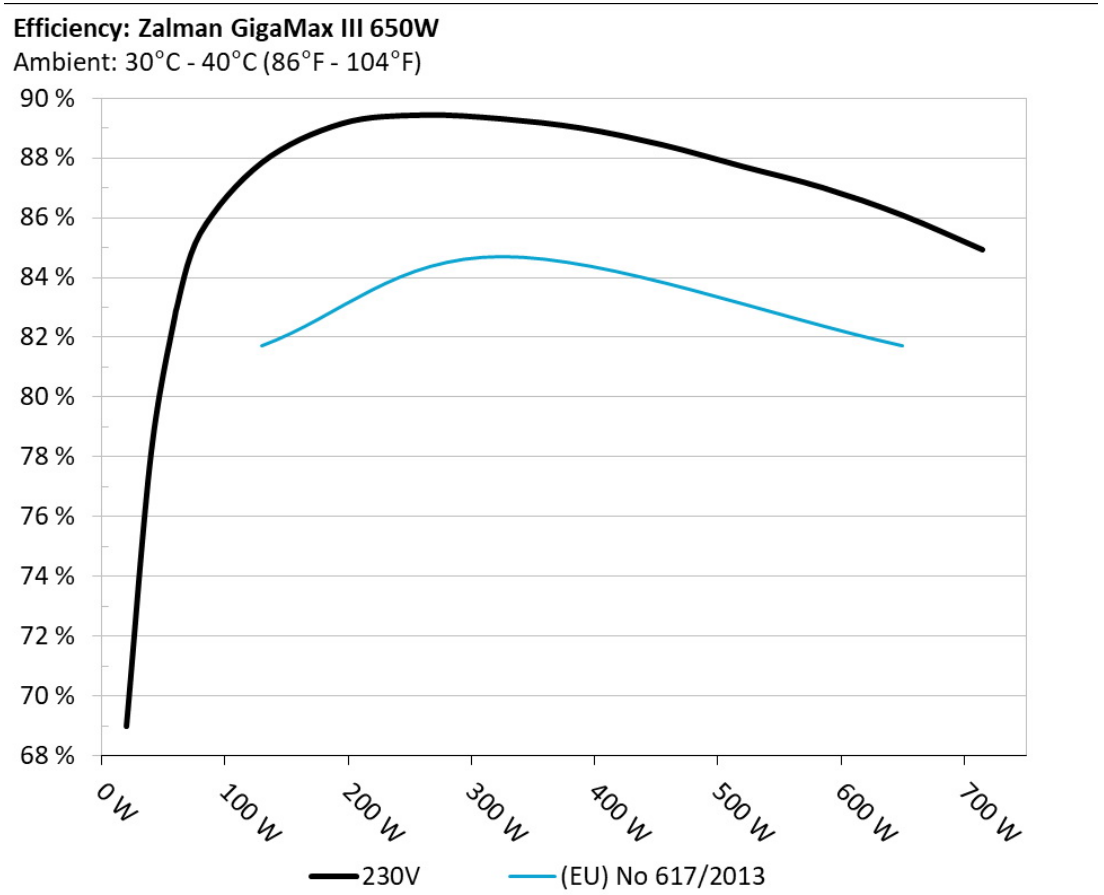
230V



□□

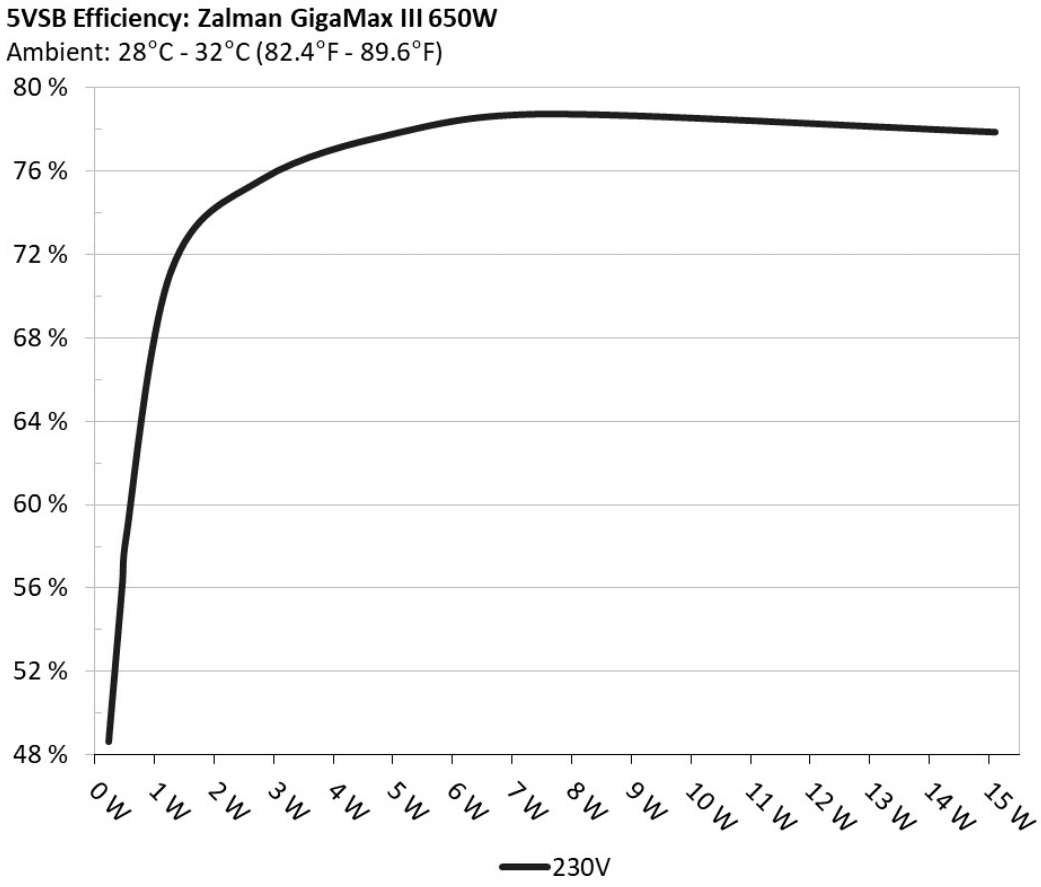
The PSU`s noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance



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□□□□



□□

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

□□□□ □□ 5Vsb □□ (ErP Lot3/6 & CEC) 230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.23W	48.131%	0.016
	5.117V	0.479W		229.88V

2	0.09A	0.46W	55.775%	0.027
	5.113V	0.826W		229.91V
3	0.55A	2.805W	75.098%	0.116
	5.1V	3.735W		229.89V
4	1A	5.088W	77.328%	0.185
	5.088V	6.581W		229.89V
5	1.5A	7.613W	78.224%	0.216
	5.075V	9.734W		229.89V
6	3A	15.101W	77.357%	0.319
	5.034V	19.522W		229.88V

Supplementary Tests (For Reference)

10-110%□□□□ 230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	3.544A	1.95A	1.969A	0.983A	65.001	83.165%	756	19.2	34.41°C	0.818
	12.245V	5.127V	3.352V	5.085V	78.158				38.64°C	229.87V
20%	8.096A	2.934A	2.962A	1.183A	129.928	88.137%	754	19.2	34.8°C	0.922
	12.233V	5.113V	3.343V	5.072V	147.418				39.39°C	229.86V
30%	13.001A	3.43A	3.464A	1.383A	194.926	89.442%	757	19.2	35.14°C	0.953
	12.221V	5.102V	3.334V	5.06V	217.937				40.27°C	229.85V
40%	17.921A	3.929A	3.971A	1.585A	260.006	89.722%	775	19.6	35.97°C	0.966
	12.210V	5.09V	3.324V	5.049V	289.766				41.49°C	229.84V
50%	22.504A	4.926A	4.979A	1.787A	324.998	89.596%	1062	26.6	36.29°C	0.974
	12.197V	5.076V	3.314V	5.036V	362.733				42.29°C	229.83V
60%	27.043A	5.928A	5.992A	1.991A	389.306	89.283%	1229	30.9	36.92°C	0.979
	12.184V	5.061V	3.304V	5.023V	436.036				43.52°C	229.81V
70%	31.676A	6.937A	7.013A	2.196A	454.633	88.73%	1384	33.9	37.41°C	0.983
	12.171V	5.046V	3.294V	5.009V	512.379				44.43°C	229.8V
80%	36.321A	7.951A	8.041A	2.301A	519.473	88.008%	1529	36.9	37.65°C	0.985
	12.158V	5.03V	3.283V	4.998V	590.262				45.66°C	229.79V

90%	41.370A	8.467A	8.551A	2.406A	584.916	87.295%	1688	39.7	38.96°C	0.986
	12.144V	5.018V	3.275V	4.987V	670.041				48.04°C	229.78V
100%	46.170A	8.989A	9.1A	3.023A	649.774	86.369%	1810	42.0	39.73°C	0.987
	12.130V	5.006V	3.264V	4.963V	752.323				49.81°C	229.76V
110%	50.846A	10.027A	10.248A	3.028A	714.417	85.222%	1848	43.6	40.31°C	0.989
	12.117V	4.986V	3.25V	4.955V	838.294				51.23°C	229.76V
CL1	0.115A	13.209A	13.281A	0A	111.301	82.053%	893	22.2	34.8°C	0.912
	12.235V	5.011V	3.291V	5.097V	135.647				40.29°C	229.86V
CL2	0.113A	19.989A	0A	0A	101.336	81.956%	755	19.2	34.1°C	0.9
	12.240V	5V	3.313V	5.102V	123.646				41.13°C	229.86V
CL3	0.113A	0A	20.054A	0A	67.395	76.546%	750	19.1	34.67°C	0.844
	12.240V	5.078V	3.292V	5.102V	88.045				43.72°C	229.87V
CL4	53.525A	0A	0A	0.001A	649.542	86.548%	1721	40.1	40.02°C	0.988
	12.135V	5.092V	3.306V	5.06V	750.507				50.99°C	229.76V

The results above are not used in the certification process

20-80□□□□□ 230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.212A	0.486A	0.49A	0.196A	19.995	69.278%	747	19	29.82°C	0.518
	12.253V	5.148V	3.366V	5.111V	28.86				32.91°C	229.88V
40W	2.668A	0.68A	0.687A	0.294A	39.998	78.416%	742	18.8	31.47°C	0.705
	12.249V	5.145V	3.363V	5.106V	51.011				34.81°C	229.87V
60W	4.126A	0.875A	0.884A	0.392A	60	83.232%	745	18.9	32.75°C	0.797
	12.246V	5.14V	3.359V	5.102V	72.09				36.24°C	229.87V
80W	5.581A	1.071A	1.082A	0.49A	79.951	85.774%	749	19.1	33.03°C	0.856
	12.242V	5.136V	3.356V	5.097V	93.213				36.89°C	229.87V

The results above are not used in the certification process

□□□ 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.97mV	10.78mV	9.92mV	11.92mV	Pass
20% Load	13.56mV	11.50mV	11.76mV	12.63mV	Pass
30% Load	14.07mV	11.80mV	13.71mV	14.32mV	Pass
40% Load	13.66mV	12.11mV	14.42mV	14.22mV	Pass
50% Load	14.63mV	13.69mV	17.19mV	16.73mV	Pass
60% Load	17.29mV	15.12mV	19.59mV	18.77mV	Pass
70% Load	17.55mV	16.09mV	21.74mV	20.82mV	Pass
80% Load	17.75mV	15.94mV	22.92mV	19.23mV	Pass
90% Load	24.92mV	18.44mV	25.27mV	22.30mV	Pass
100% Load	26.43mV	20.75mV	30.30mV	30.67mV	Pass
110% Load	29.86mV	22.16mV	32.00mV	31.87mV	Pass
Crossload1	19.13mV	16.17mV	19.65mV	15.80mV	Pass
Crossload2	16.47mV	22.17mV	15.55mV	11.92mV	Pass
Crossload3	15.55mV	10.83mV	17.60mV	14.58mV	Pass
Crossload4	29.77mV	18.07mV	27.20mV	23.17mV	Pass

The results above are not used in the certification process





Zalman GigaMax III 650W

Top side

Power specifications label

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

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CYBENETICS LTD Syrou 6, Latsia, 2231, Nicosia Cyprus

www.cybenetics.com - info@cybenetics.com