MSI MAG A850GL PCIE5

Serial Number

Lab ID MS85002336

Certification ID 252336

Test Result Report ID: 24PS2336A

Certificate Issue Date: Jan 26, 2024

Scheme: ETA-EMI PSU

115V

230V

Scheme: LAMBDA PSU

115V

230V

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	MSI
Model	MAG A850GL PCIE5
OEM/ODM	CWT
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12

Rated Frequency (Hz)	47-63
Rated Power (W)	850
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Fluid Dynamic Bearing Fan (DF1202512FDHN)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	MS85002336
Date of receipt	Jan 8, 2024
Testing Date	Jan 25, 2024
Report Issued Date	Jan 26, 2024
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Modular Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	18AWG	No
4+4 pin EPS12V (750mm)	2	2	18AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	18AWG	No
12+4 pin PCIe (600mm) (450W)	1	1	16-26AWG	No
SATA (500mm+150mm+150mm+150mm)	2	8	18AWG	No
4-pin Molex (500mm+150mm+150mm+150mm) / FDD (+150mm)	1	4 / 1	18-20AWG	No

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70.5	2.5	0.3
	Watts	110		846	12.5	3.6
Total Max. Power (W)		850				

Parts Description

General Data	-
Manufacturer (OEM)	CWT
Platform	GPX
PCB Type	Double Sided
Primary Side	-
Transient Filter	2x Y caps,2x X caps, 2x CM chokes, 1x MOV,1x Power Integrations CAP200DG (discharge IC)
Inrush Protection	NTC Thermistor SCK-056 5Ohm & Relay
Bridge Rectifier(s)	1x Diodes GBU1506 (800V, 15A @ 125°C)
APFC MOSFETs	2x Great Power GP28S50 (500 V, 28 A @ 150 °C, Rds (on): 0.125 ohm) & 1x SPN5003 FET (for reduced no-load consumption)
APFC Boost Diode	1x CRMICRO CRXI06D065G2 (600V, 6A @ 167°C)
Bulk Cap(s)	1x CapXon (420V, 560uF, 2000h @ 105°C, HP)
Main Switchers	4x Silan Microelectronics SVF20N50F (500 V, 12.6 A @ 100 °C, Rds (on): 0.27 ohm)
MCU	1x Texas Instruments LM393
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	6x Infineon 014N04LS (40V, 107A @ 100°C, Rds(on): 1.4mOhm)
5V & 3.3V	DC-DC Converters: 4x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm) PWM Controller: ANPEC APW7159C
Filtering Capacitors	Electrolytic: 10x Elite (2,000h @ 105°C, PF), 5x CapXon (2-5,000 @ 105°C, KF), Polymer: 27x CapXon
Supervisor IC	IN1S429I - DCG

Fan Model	Martech DF1202512FDHN (120mm, 12V, 0.42A, Fluid Dynamic Bearing Fan)
Standby PWM Controller	Power Integrations TNY287PG

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	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.1 PSU Power Excursion	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.044%
Average Noise Output (>1450 Load Combinations)	38.49dBA
Average PF (>1450 Load Combinations)	0.982
Efficiency With 10W (≤500W) or 2% (>500W) Load	68.015%
Standby Power Consumption	0.0549W
Non-Accredited	
12V Ripple (Full Load)	30.17mV
5V Ripple (Full Load)	17.91mV
3.3V Ripple (Full Load)	18.42mV
5VSB Ripple (Full Load)	22.33mV
12V Load Regulation	0.54%
5V Load Regulation	0.40%
3.3V Load Regulation	0.60%
5VSB Load Regulation	2.89%
Inrush Current	23.860A

230V

Accredited		
Average Efficiency (>1450 load combinations)		91.304%
Average Noise Output (>1450 Load Combinations)		38.02dBA
Average PF (>1450 Load Combinations)		0.941
Efficiency With 10W (≤500W) or 2% (>500W) Load		67.867%
Standby Power Consumption		0.1190W
Non-Accredited		
12V Ripple (Full Load)		27.21mV
5V Ripple (Full Load)		14.24mV
3.3V Ripple (Full Load)		15.70mV
5VSB Ripple (Full Load)		17.56mV
12V Load Regulation		0.55%
5V Load Regulation		0.42%
3.3V Load Regulation		0.60%
5VSB Load Regulation		2.89%
Inrush Current		49.600A
12V Transient Response (200%)		11.44V
5V Transient Response (200%)		4.940V
3.3V Transient Response (200%)		3.206V
5VSB Transient Response (200%)		4.870V
Hold-Up Time & PWR_OK Signal		17.20ms
AC Loss to PWR_OK Hold Up Time		16.00ms
PWR_OK Inactive to DC Loss Delay		1.20ms
PSU Timings: T1 (20% / 100%)	23.0ms	22.0ms
PSU Timings: T3 (20% / 100%)	125.0ms	125.0ms
OPP (26.83°C / 40.00°C)	125.18%	117.37%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	17.2
AC Loss to PWR_OK Hold Up Time (ms)	16
PWR_OK Inactive to DC Loss Delay (ms)	1.2

Vampire Power

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.91 V	114.87 V	113.85 V	114.95 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.98 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.417	1.416	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.15 %	0.12 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.055 W	0.048 W	N/A	0.063 W	N/A	N/A
Apparent Power:	10.288 W	10.270 W	N/A	10.313 W	N/A	N/A
Power Factor:	0.005	N/A	N/A	N/A	N/A	N/A

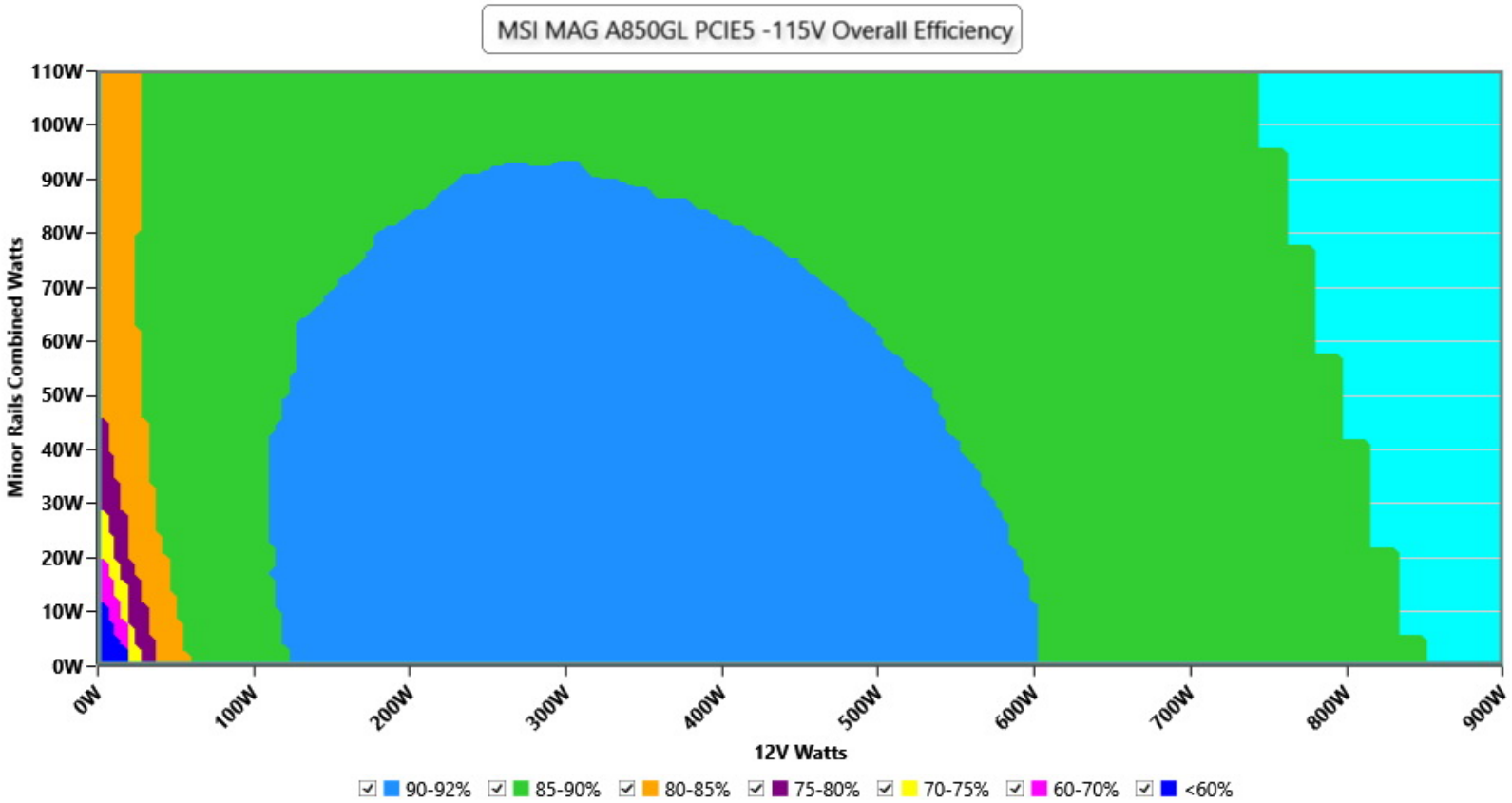
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.88 V	229.83 V	227.70 V	229.95 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.99 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:	0.17 %	0.15 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.119 W	0.091 W	N/A	0.161 W	N/A	N/A
Apparent Power:	34.688 W	34.656 W	N/A	34.717 W	N/A	N/A

Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

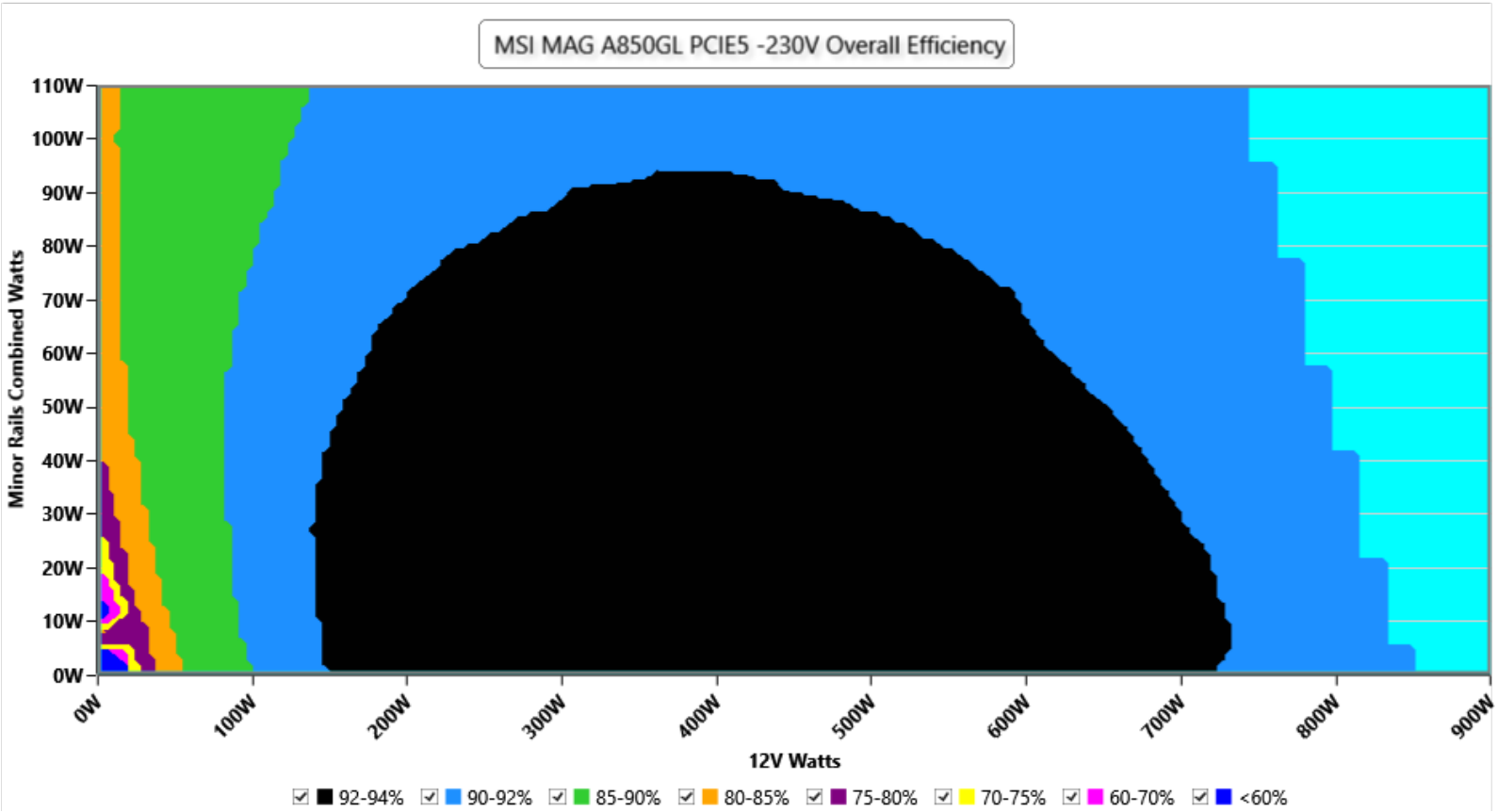
115V



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

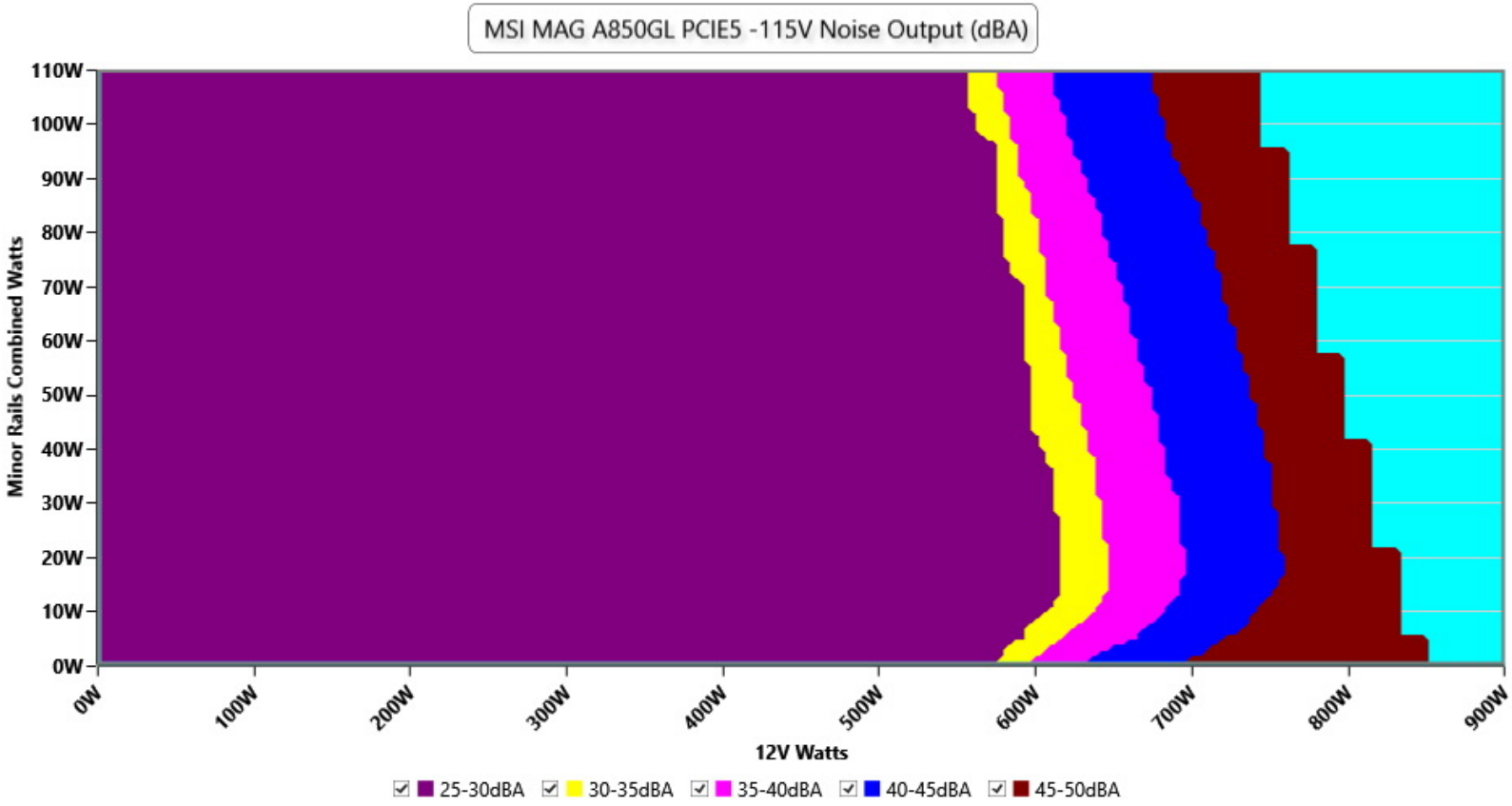


INFO

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

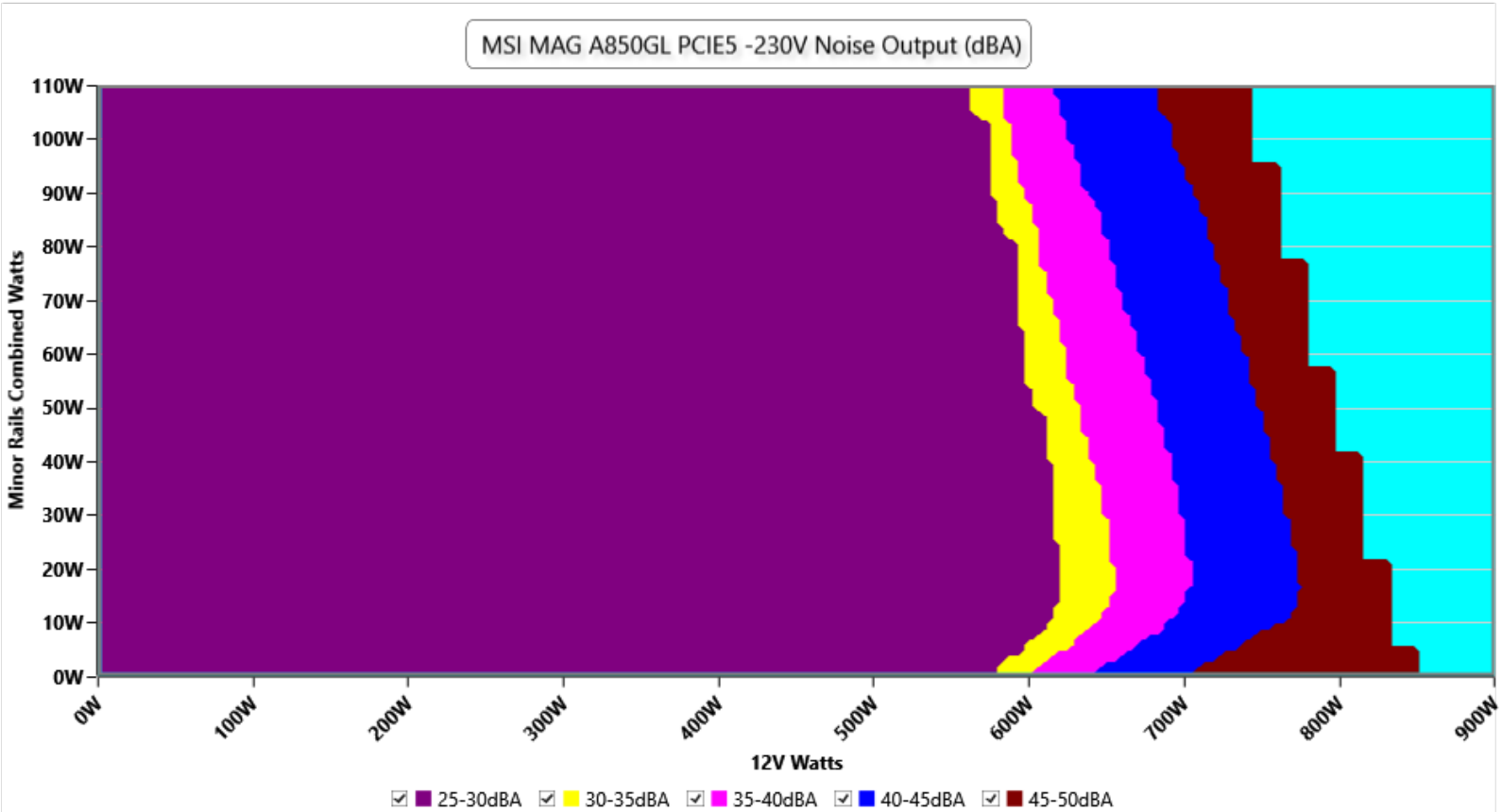
115V



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

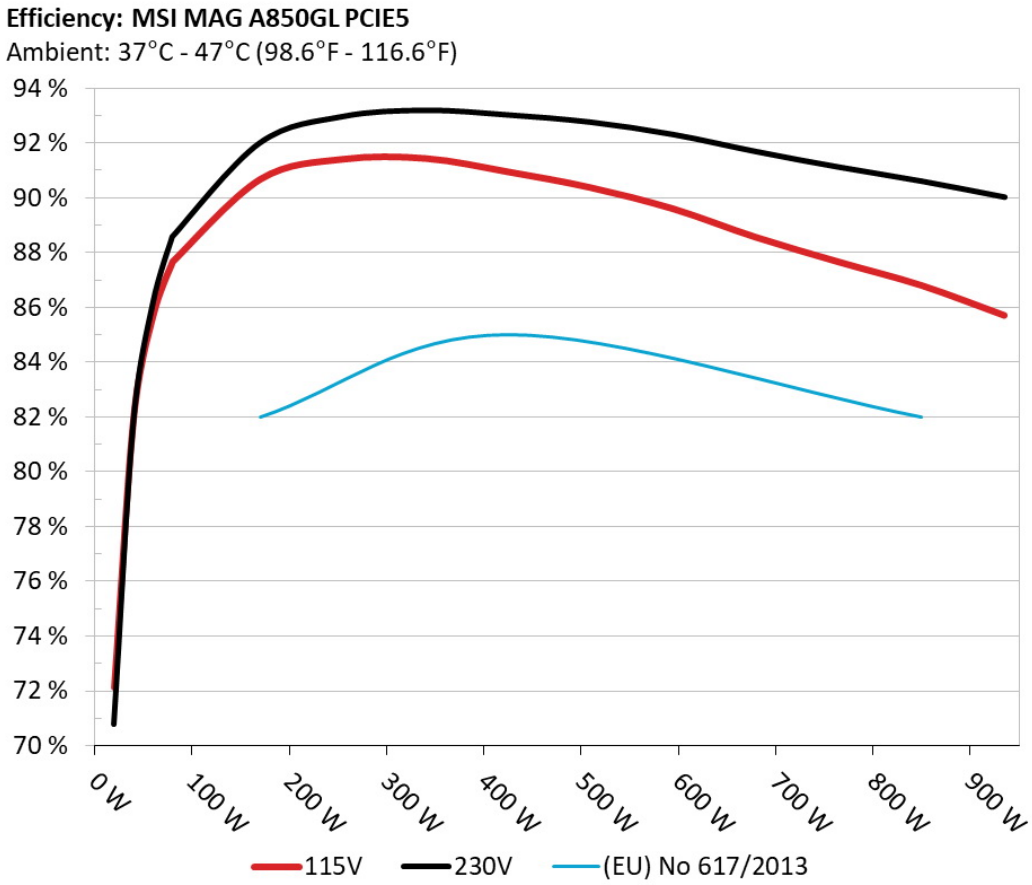


INFO

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

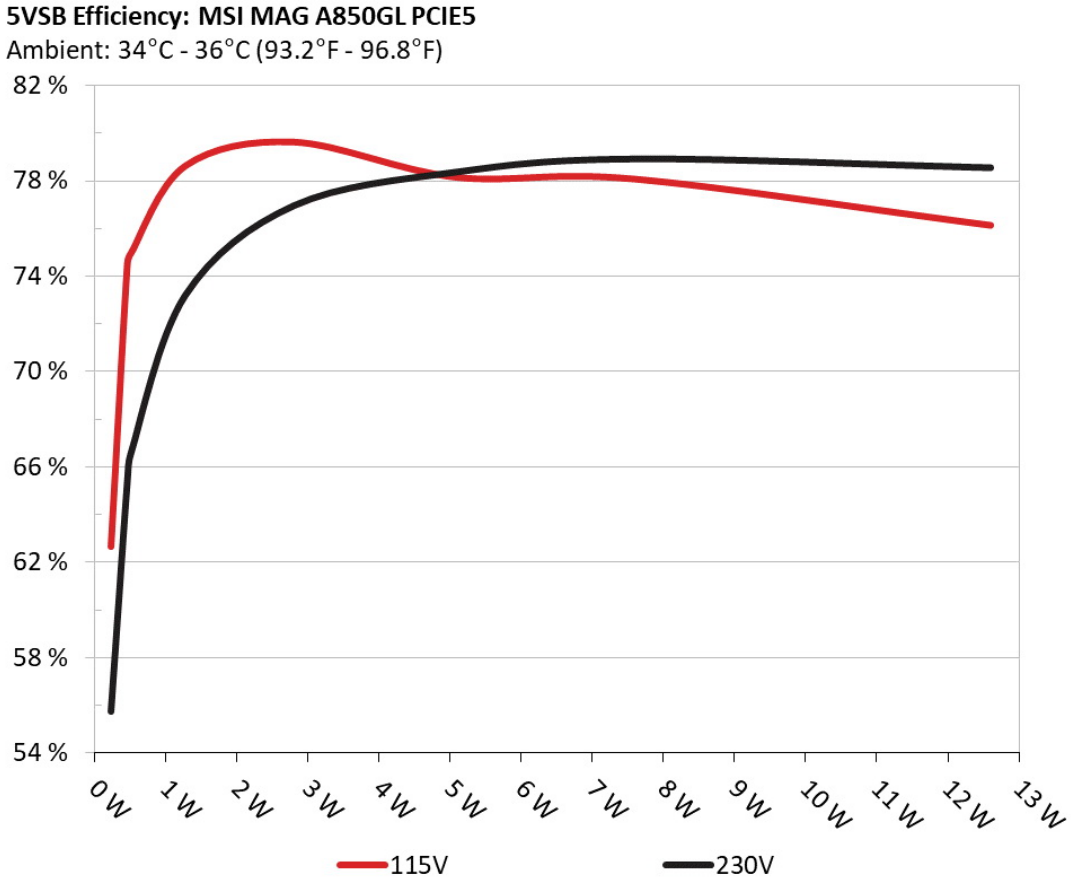
Efficiency under high ambient temperature



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

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

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	63.128%	0.028
	5.105V	0.289W		114.91V
2	0.09A	0.46W	75.033%	0.059
	5.105V	0.613W		114.9V
3	0.55A	2.801W	80.127%	0.261
	5.094V	3.496W		114.91V
4	1A	5.082W	78.649%	0.35
	5.082V	6.461W		114.9V
5	1.5A	7.601W	78.572%	0.406
	5.067V	9.674W		114.91V
6	2.5A	12.599W	76.629%	0.461
	5.04V	16.441W		114.9V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	56.243%	0.012
	5.109V	0.409W		229.93V
2	0.09A	0.46W	65.897%	0.02
	5.108V	0.699W		229.93V
3	0.55A	2.801W	77.445%	0.1
	5.094V	3.618W		229.89V
4	1A	5.082W	78.852%	0.166
	5.082V	6.446W		229.89V
5	1.5A	7.602W	79.403%	0.212
	5.068V	9.574W		229.89V
6	2.5A	12.601W	79.035%	0.294
	5.041V	15.943W		229.89V

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
10%	5.248A	1.992A	1.971A	0.986A	85.001	87.678%	1145	29.7	40.27°C	0.965
	12.082V	5.02V	3.348V	5.069V	96.944				44.32°C	114.88V
20%	11.515A	2.989A	2.959A	1.187A	169.939	90.69%	1148	29.8	40.83°C	0.98
	12.075V	5.018V	3.346V	5.055V	187.386				45.38°C	114.85V
30%	18.138A	3.489A	3.454A	1.388A	254.947	91.425%	1150	29.8	41.17°C	0.984
	12.068V	5.016V	3.344V	5.042V	278.86				46.26°C	114.83V
40%	24.776A	3.989A	3.949A	1.591A	340.037	91.454%	1153	29.9	41.7°C	0.984
	12.061V	5.014V	3.343V	5.029V	371.815				47.29°C	114.8V
50%	31.054A	4.987A	4.939A	1.795A	424.854	90.962%	1158	29.9	42.36°C	0.983
	12.055V	5.013V	3.341V	5.015V	467.064				48.37°C	114.77V
60%	37.318A	5.987A	5.93A	1.999A	509.392	90.389%	1162	30.2	42.86°C	0.985
	12.047V	5.012V	3.339V	5.002V	563.555				49.44°C	114.74V
70%	43.651A	6.988A	6.923A	2.206A	594.705	89.61%	1185	30.9	43.15°C	0.986
	12.041V	5.01V	3.337V	4.987V	663.662				50.24°C	114.7V
80%	49.999A	7.988A	7.918A	2.311A	679.528	88.573%	1926	43.8	43.65°C	0.987
	12.033V	5.006V	3.334V	4.976V	767.196				51.71°C	114.67V
90%	56.761A	8.492A	8.403A	2.417A	764.957	87.668%	2386	48.2	44.14°C	0.988
	12.024V	5.004V	3.332V	4.966V	872.564				53.19°C	114.63V
100%	63.449A	8.994A	8.917A	2.523A	849.669	86.814%	2384	48.2	45.91°C	0.989
	12.017V	5.003V	3.331V	4.954V	978.723				55.98°C	114.6V
110%	69.876A	9.998A	10.004A	2.528A	935.049	85.715%	2384	48.2	46.67°C	0.991
	12.011V	5V	3.329V	4.945V	1090.881				57.54°C	114.57V
CL1	0.116A	13.222A	13.104A	0A	111.296	83.4%	1165	30.3	41.37°C	0.976
	12.087V	5.006V	3.335V	5.082V	133.45				46.82°C	114.87V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.114A	19.956A	0A	0A	101.343	81.197%	1169	30.4	40.12°C	0.975
	12.093V	5.009V	3.347V	5.088V	124.815				47.13°C	114.88V
CL3	0.114A	0A	19.775A	0A	67.397	76.27%	1148	29.8	40.17°C	0.964
	12.088V	5.021V	3.338V	5.089V	88.368				49.23°C	114.88V
CL4	70.679A	0A	0A	0A	849.518	87.804%	2394	48.3	44.81°C	0.989
	12.020V	5.021V	3.347V	5.029V	967.525				55.79°C	114.61V

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
10%	5.248A	1.992A	1.971A	0.987A	85.004	88.584%	1144	29.6	40.15°C	0.819
	12.079V	5.02V	3.348V	5.068V	95.957				44.39°C	229.88V
20%	11.517A	2.99A	2.959A	1.187A	169.946	92.012%	1146	29.7	40.74°C	0.916
	12.073V	5.017V	3.345V	5.055V	184.698				45.27°C	229.87V
30%	18.141A	3.489A	3.454A	1.388A	254.95	92.973%	1152	29.9	41.04°C	0.942
	12.066V	5.016V	3.344V	5.042V	274.221				46.06°C	229.85V
40%	24.780A	3.989A	3.95A	1.591A	340.035	93.201%	1153	29.9	41.97°C	0.954
	12.059V	5.014V	3.342V	5.029V	364.841				47.48°C	229.83V
50%	31.059A	4.988A	4.939A	1.795A	424.839	93.033%	1158	29.9	42.04°C	0.959
	12.052V	5.012V	3.341V	5.015V	456.658				48.05°C	229.82V
60%	37.321A	5.987A	5.93A	1.999A	509.387	92.769%	1163	30.2	42.71°C	0.962
	12.046V	5.011V	3.339V	5.002V	549.094				49.24°C	229.8V
70%	43.654A	6.988A	6.923A	2.206A	594.703	92.316%	1245	32.5	43.09°C	0.965
	12.040V	5.009V	3.337V	4.987V	644.203				50.17°C	229.78V
80%	50.002A	7.989A	7.918A	2.311A	679.509	91.695%	1882	43.1	43.85°C	0.968
	12.032V	5.006V	3.334V	4.976V	741.055				51.94°C	229.77V
90%	56.750A	8.491A	8.402A	2.417A	764.936	91.125%	2388	48.2	44.45°C	0.971
	12.025V	5.004V	3.333V	4.965V	839.44				53.49°C	229.76V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	63.450A	8.994A	8.916A	2.523A	849.649	90.615%	2385	48.2	45.03°C	0.973
	12.017V	5.003V	3.331V	4.955V	937.646				55.06°C	229.74V
110%	69.877A	9.999A	10.004A	2.528A	935.035	90.031%	2387	48.2	46.56°C	0.975
	12.011V	5V	3.329V	4.945V	1038.568				57.48°C	229.73V
CL1	0.116A	13.224A	13.104A	0A	111.294	84.195%	1162	30.2	40.57°C	0.876
	12.087V	5.006V	3.335V	5.082V	132.185				46.04°C	229.87V
CL2	0.114A	19.958A	0A	0A	101.346	82.169%	1172	30.5	41.72°C	0.866
	12.093V	5.008V	3.347V	5.087V	123.341				48.77°C	229.87V
CL3	0.114A	0A	19.776A	0A	67.396	76.98%	1148	29.8	40.39°C	0.8
	12.091V	5.02V	3.338V	5.088V	87.549				49.43°C	229.88V
CL4	70.696A	0A	0A	0A	849.538	91.485%	2394	48.3	44.6°C	0.973
	12.017V	5.02V	3.346V	5.029V	928.616				55.57°C	229.74V

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])	Temps (In/Out)	PF/AC Volts
20W	1.230A	0.498A	0.492A	0.196A	20.001	72.111%	1128	29.1	36.77°C	0.805
	12.081V	5.023V	3.351V	5.097V	27.739				39.84°C	114.92V
40W	2.706A	0.697A	0.689A	0.294A	39.999	82.025%	1133	29.4	37.02°C	0.914
	12.082V	5.023V	3.35V	5.093V	48.766				40.31°C	114.89V
60W	4.182A	0.896A	0.886A	0.393A	59.997	85.727%	1136	29.5	38.4°C	0.945
	12.082V	5.022V	3.35V	5.088V	69.984				42.29°C	114.89V
80W	5.654A	1.095A	1.084A	0.492A	79.944	87.783%	1139	29.5	39.03°C	0.965
	12.081V	5.021V	3.349V	5.083V	91.068				42.98°C	114.89V

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
20W	1.229A	0.498A	0.492A	0.196A	19.995	70.796%	1128	29.1	36.89°C	0.432
	12.079V	5.024V	3.351V	5.098V	28.241				39.95°C	229.89V
40W	2.706A	0.697A	0.689A	0.294A	39.995	81.823%	1132	29.4	37.37°C	0.619
	12.082V	5.024V	3.351V	5.093V	48.873				40.7°C	229.88V
60W	4.182A	0.896A	0.886A	0.393A	59.994	86.154%	1135	29.5	38.35°C	0.739
	12.080V	5.022V	3.35V	5.088V	69.638				41.9°C	229.88V
80W	5.654A	1.095A	1.084A	0.492A	79.938	88.672%	1139	29.5	39.16°C	0.806
	12.080V	5.022V	3.35V	5.084V	90.149				42.94°C	229.88V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.09mV	14.05mV	15.40mV	15.40mV	Pass
20% Load	19.14mV	14.76mV	14.78mV	15.76mV	Pass
30% Load	21.49mV	15.17mV	15.04mV	18.31mV	Pass
40% Load	20.93mV	15.12mV	16.37mV	20.15mV	Pass
50% Load	18.83mV	14.61mV	15.70mV	20.92mV	Pass
60% Load	18.98mV	15.68mV	17.08mV	25.12mV	Pass
70% Load	19.18mV	16.25mV	16.78mV	18.57mV	Pass
80% Load	21.18mV	16.55mV	17.34mV	18.62mV	Pass
90% Load	20.06mV	17.37mV	17.08mV	21.02mV	Pass
100% Load	30.17mV	17.91mV	18.42mV	22.33mV	Pass
110% Load	31.82mV	19.12mV	19.23mV	22.19mV	Pass
Crossload1	29.27mV	17.17mV	18.66mV	15.55mV	Pass
Crossload2	18.93mV	19.00mV	13.61mV	14.12mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	18.16mV	14.71mV	19.75mV	15.04mV	Pass
Crossload4	29.90mV	15.27mV	17.42mV	19.80mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.15mV	12.05mV	12.28mV	13.56mV	Pass
20% Load	16.66mV	11.04mV	11.20mV	13.20mV	Pass
30% Load	21.06mV	10.98mV	12.43mV	15.86mV	Pass
40% Load	18.76mV	11.14mV	12.33mV	17.39mV	Pass
50% Load	15.45mV	11.85mV	12.74mV	19.28mV	Pass
60% Load	15.30mV	12.98mV	13.56mV	23.43mV	Pass
70% Load	14.48mV	12.72mV	13.10mV	17.34mV	Pass
80% Load	15.91mV	12.57mV	15.19mV	17.29mV	Pass
90% Load	16.93mV	13.44mV	14.89mV	19.44mV	Pass
100% Load	27.21mV	14.24mV	15.70mV	17.56mV	Pass
110% Load	29.52mV	14.24mV	16.29mV	19.26mV	Pass
Crossload1	25.51mV	13.31mV	15.53mV	13.22mV	Pass
Crossload2	16.42mV	18.65mV	12.74mV	14.63mV	Pass
Crossload3	15.76mV	11.80mV	17.29mV	13.20mV	Pass
Crossload4	26.15mV	13.45mV	14.48mV	16.44mV	Pass

The results above are not used in the certification process

MSI MAG A850GL PCIE5

Top side

Power specifications label

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 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

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