MSI MAG A1000GL PCIE5

Serial Number

Lab ID MS10002409

Certification ID 252409

Test Result Report ID: 24PS2409A

Certificate Issue Date: Apr 9, 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 A1000GL PCIE5
OEM/ODM	CWT
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240

Rated Current (Arms)	13
Rated Frequency (Hz)	50-60
Rated Power (W)	1000
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	MS10002409
Date of receipt	Mar 22, 2024
Testing Date	Apr 8, 2024
Report Issued Date	Apr 9, 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	16AWG	No
4+4 pin EPS12V (750mm)	2	2	16AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	16-18AWG	No
12+4 pin PCIe (590mm) (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
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	83.3	3	0.3
	Watts	120		999.6	15	3.6
Total Max. Power (W)		1000				

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)	88.756%
Average Noise Output (>1450 Load Combinations)	34.32dBA
Average PF (>1450 Load Combinations)	0.987
Efficiency With 10W (≤500W) or 2% (>500W) Load	76.401%
Standby Power Consumption	0.0148W
Non-Accredited	
12V Ripple (Full Load)	24.43mV

5V Ripple (Full Load)	15.25mV
3.3V Ripple (Full Load)	12.33mV
5VSB Ripple (Full Load)	17.54mV
12V Load Regulation	1.03%
5V Load Regulation	0.50%
3.3V Load Regulation	1.07%
5VSB Load Regulation	2.03%
Inrush Current	24.390A

230V

Accredited	
Average Efficiency (>1450 load combinations)	90.885%
Average Noise Output (>1450 Load Combinations)	34.15dBA
Average PF (>1450 Load Combinations)	0.962
Efficiency With 10W (≤500W) or 2% (>500W) Load	75.287%
Standby Power Consumption	0.0701W
Non-Accredited	
12V Ripple (Full Load)	25.16mV
5V Ripple (Full Load)	15.40mV
3.3V Ripple (Full Load)	12.03mV
5VSB Ripple (Full Load)	15.64mV
12V Load Regulation	1.05%
5V Load Regulation	0.52%
3.3V Load Regulation	1.07%
5VSB Load Regulation	2.04%
Inrush Current	47.220A
12V Transient Response (200%)	11.40V
5V Transient Response (200%)	4.959V
3.3V Transient Response (200%)	3.270V
5VSB Transient Response (200%)	4.903V
Hold-Up Time & PWR_OK Signal	19.50ms
AC Loss to PWR_OK Hold Up Time	17.40ms

PWR_OK Inactive to DC Loss Delay		2.10ms
PSU Timings: T1 (20% / 100%)	64.0ms	64.0ms
PSU Timings: T3 (20% / 100%)	131.0ms	132.0ms
OPP (27.60°C / 43.34°C)	124.04%	124.35%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	19.5
AC Loss to PWR_OK Hold Up Time (ms)	17.4
PWR_OK Inactive to DC Loss Delay (ms)	2.1

Stromverbrauch im Ruhezustand

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.12 V	115.10 V	113.85 V	115.16 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.11 %	N/A	0.15 %	2.00 %	PASS
Real Power:	0.015 W	0.013 W	N/A	0.017 W	N/A	N/A
Apparent Power:	9.739 W	9.736 W	N/A	9.746 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

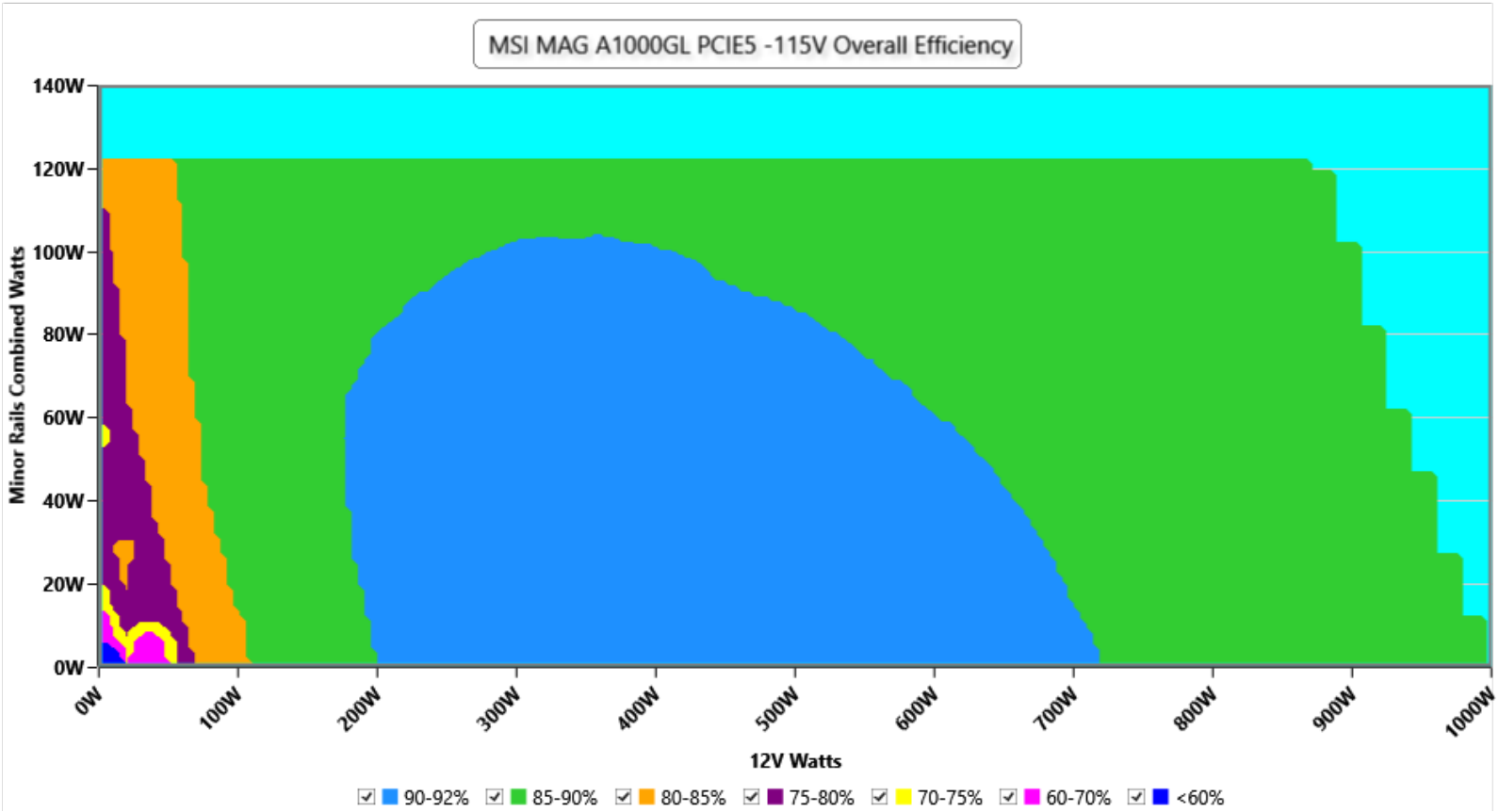
230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.37 V	230.33 V	227.70 V	230.37 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:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.14 %	0.13 %	N/A	0.16 %	2.00 %	PASS
Real Power:	0.070 W	0.062 W	N/A	0.086 W	N/A	N/A
Apparent Power:	32.577 W	32.564 W	N/A	32.589 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

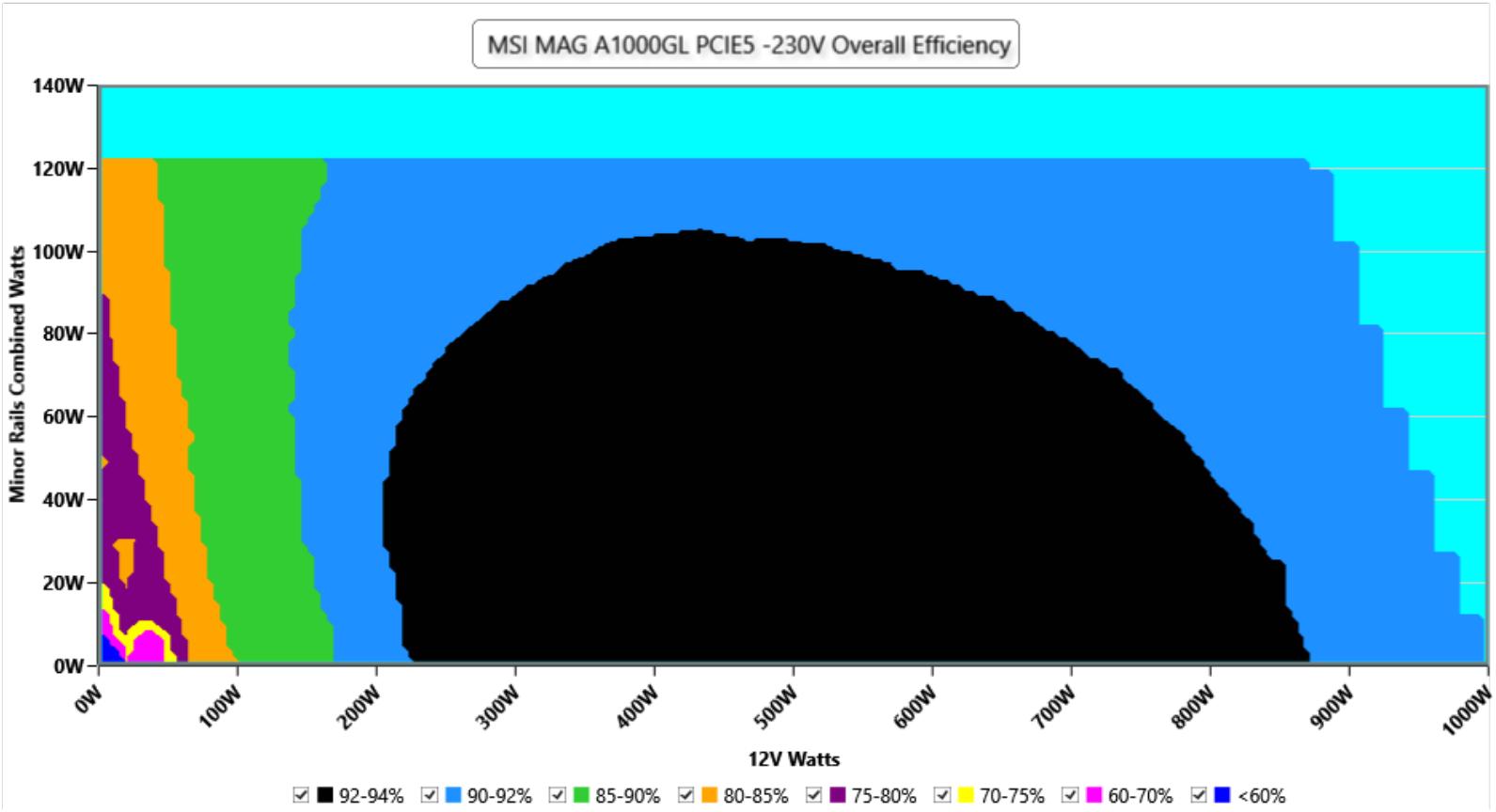
115V



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

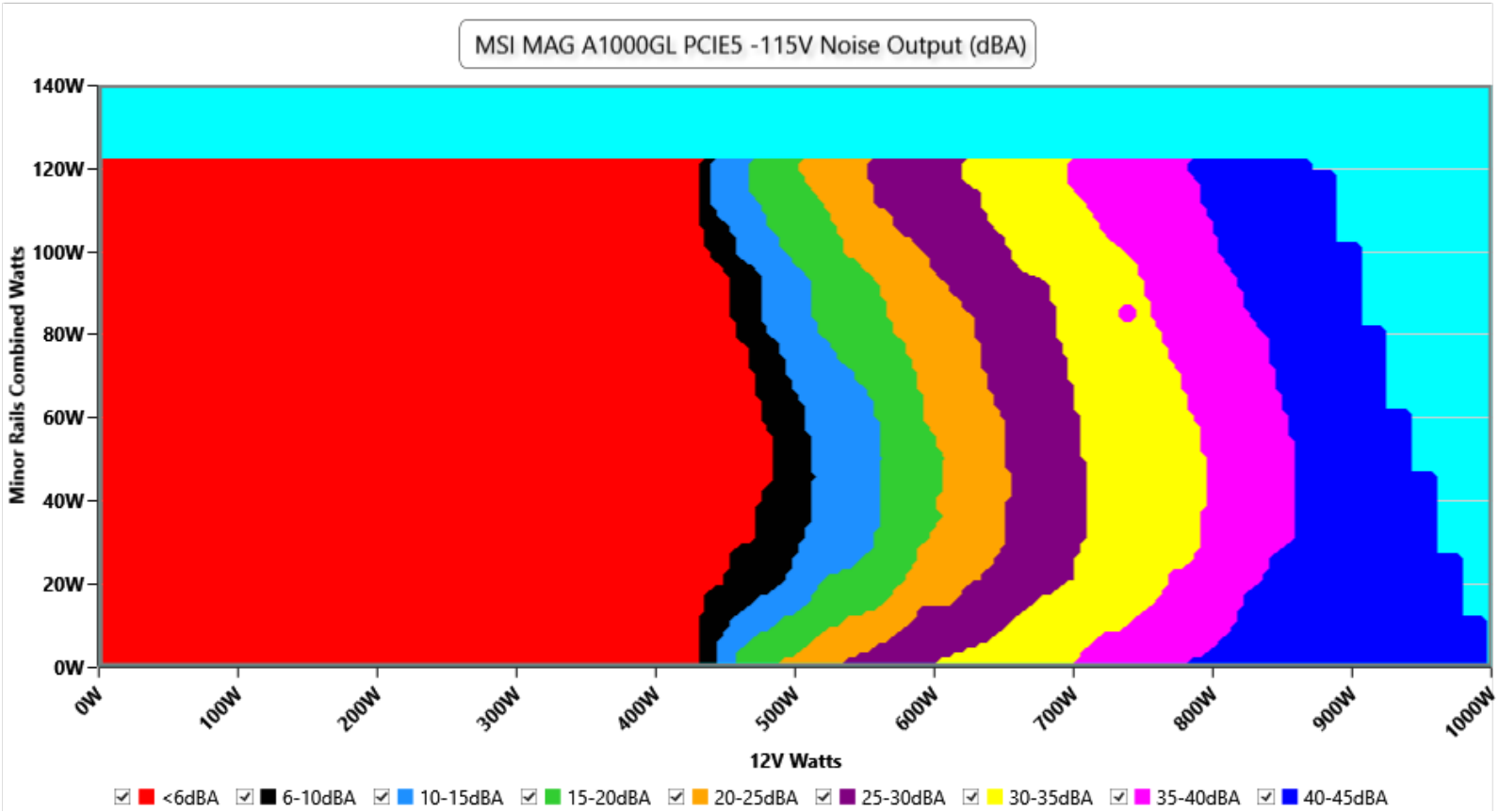


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Noise Graph

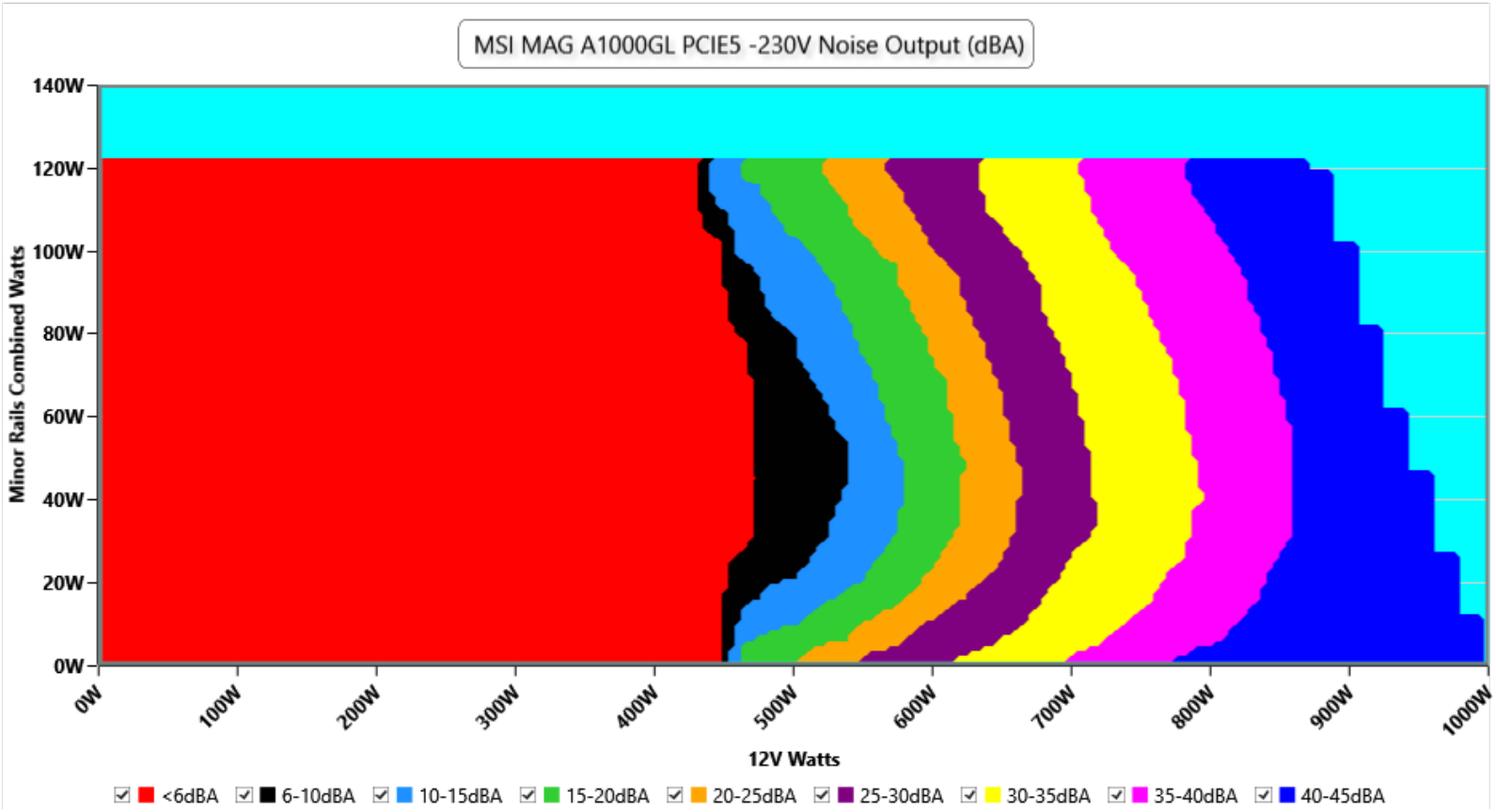
115V



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

Noise under high ambient temperature (indicative)

115V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	404 RPM · <6.0 dB(A) · 40.2 °C	404 RPM · <6.0 dB(A) · 40.2 °C	<6.0 in both
20%	405 RPM · <6.0 dB(A) · 40.9 °C	405 RPM · <6.0 dB(A) · 40.9 °C	<6.0 in both
50%	554 RPM · 12.0 dB(A) · 42.3 °C	554 RPM · 12.0 dB(A) · 42.3 °C	**+0.0 dB(A)**
100%	2216 RPM · 50.5 dB(A) · 45.9 °C	2216 RPM · 50.5 dB(A) · 45.9 °C	**+0.0 dB(A)**

230V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	409 RPM · 6.2 dB(A) · 40.3 °C	409 RPM · 6.2 dB(A) · 40.3 °C	**+0.0 dB(A)**
20%	409 RPM · 6.2 dB(A) · 40.6 °C	409 RPM · 6.2 dB(A) · 40.6 °C	**+0.0 dB(A)**
50%	622 RPM · 15.5 dB(A) · 42.5 °C	622 RPM · 15.5 dB(A) · 42.5 °C	**+0.0 dB(A)**
100%	1237 RPM · 37.0 dB(A) · 45.6 °C	1237 RPM · 37.0 dB(A) · 45.6 °C	**+0.0 dB(A)**

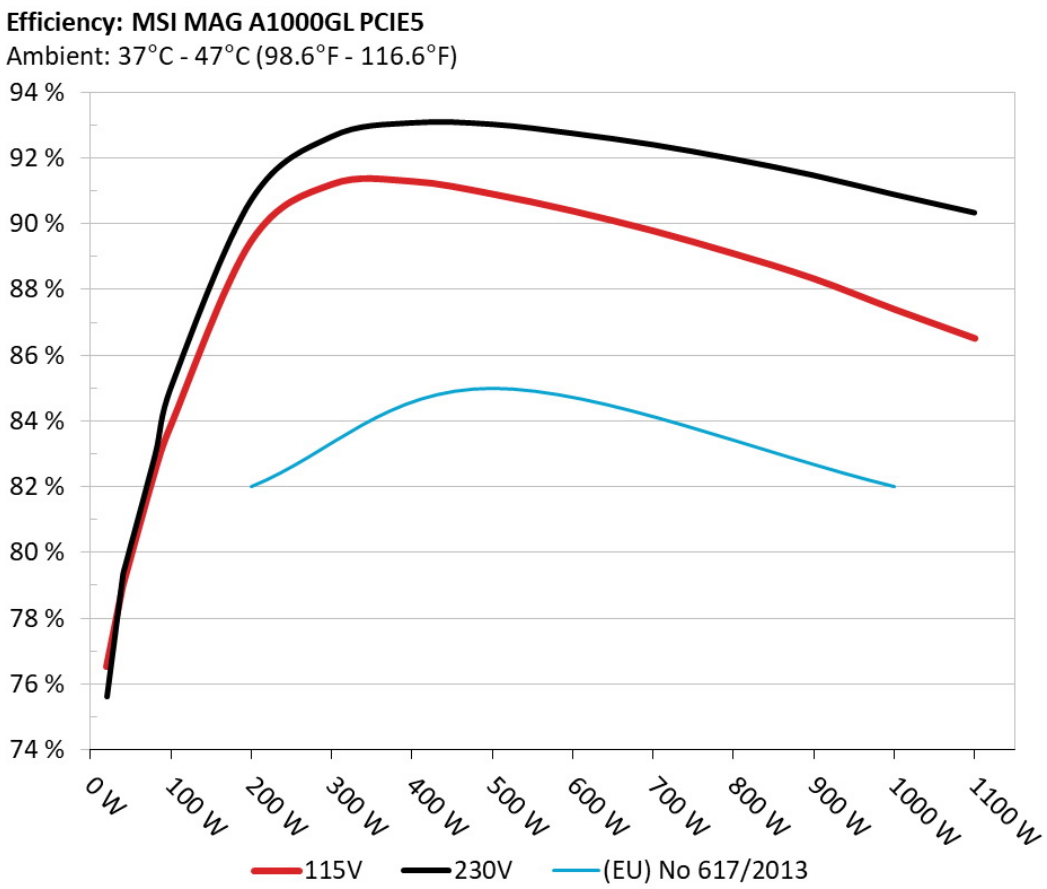
INFO

Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative of how the fan behaves when it is hot. "<6.0" is the floor of our sound meter: the fan is stopped or too quiet to measure (the fan speed column says which); with the fan stopped, the intake sensor can read higher than the chamber air.

Informational. Not part of the ETA or LAMBDA rating.

Indicative Performance

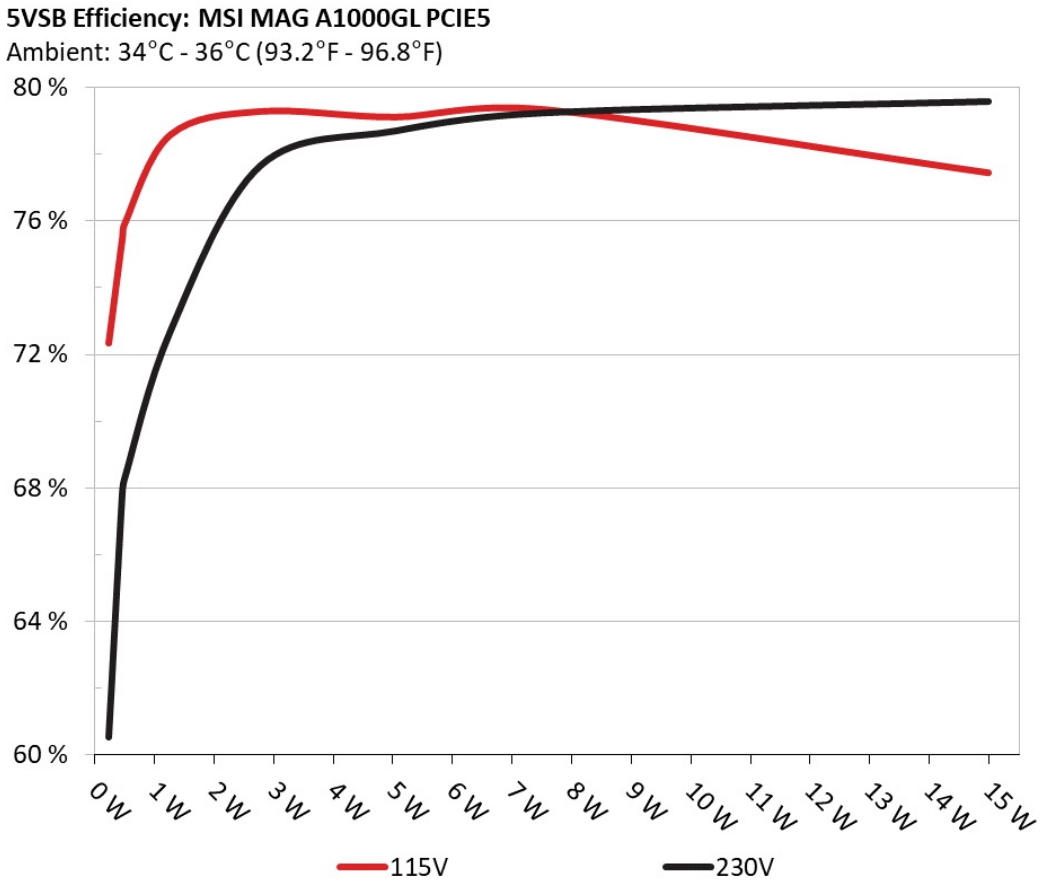
Efficiency under high ambient temperature



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	0.228W	72.348%	0.032
	5.061V	0.315W		115.16V
2	0.09A	0.455W	75.455%	0.061
	5.059V	0.603W		115.16V
3	0.55A	2.778W	79.275%	0.277
	5.048V	3.504W		115.17V
4	1A	5.04W	79.104%	0.383
	5.038V	6.372W		115.17V
5	1.5A	7.544W	79.327%	0.439
	5.028V	9.51W		115.17V
6	3.001A	14.982W	77.441%	0.513
	4.993V	19.345W		115.16V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	60.544%	0.012
	5.065V	0.377W		230.41V
2	0.09A	0.456W	67.864%	0.021
	5.062V	0.672W		230.41V
3	0.55A	2.778W	77.655%	0.105
	5.049V	3.577W		230.41V
4	1A	5.04W	78.687%	0.175
	5.038V	6.407W		230.41V
5	1.5A	7.544W	79.227%	0.236
	5.028V	9.522W		230.41V
6	3.001A	14.982W	79.567%	0.346
	4.993V	18.832W		230.4V

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%	6.444A	1.983A	1.937A	0.992A	100.01	83.86%	404	<6.0	40.17°C	0.981
	12.168V	5.045V	3.407V	5.042V	119.258				44.4°C	115.12V
20%	13.896A	2.975A	2.909A	1.193A	199.965	89.462%	405	<6.0	40.89°C	0.988
	12.166V	5.042V	3.403V	5.032V	223.519				45.44°C	115.09V
30%	21.732A	3.473A	3.397A	1.387A	300.019	91.188%	405	<6.0	41.13°C	0.985
	12.146V	5.041V	3.4V	5.048V	329.012				46.21°C	115.06V
40%	29.555A	3.97A	3.887A	1.587A	399.752	91.282%	406	<6.0	41.88°C	0.985
	12.131V	5.039V	3.396V	5.042V	437.931				47.39°C	115.02V
50%	37.056A	4.965A	4.864A	1.789A	499.464	90.899%	554	12.0	42.3°C	0.987
	12.115V	5.037V	3.393V	5.032V	549.472				48.35°C	114.99V
60%	44.651A	5.962A	5.843A	1.993A	600.009	90.378%	871	26.5	42.46°C	0.989
	12.098V	5.034V	3.389V	5.02V	663.887				49.01°C	114.96V
70%	52.200A	6.96A	6.825A	2.197A	699.736	89.777%	1209	36.2	43.11°C	0.991
	12.081V	5.03V	3.385V	5.007V	779.416				50.13°C	114.93V
80%	59.839A	7.958A	7.808A	2.302A	799.764	89.084%	1588	43.2	43.62°C	0.992
	12.063V	5.026V	3.381V	4.997V	897.757				51.8°C	114.9V
90%	67.818A	8.461A	8.292A	2.407A	899.601	88.324%	1917	47.6	44.52°C	0.993
	12.049V	5.024V	3.377V	4.986V	1018.521				53.54°C	114.89V
100%	75.556A	8.963A	8.805A	3.022A	999.666	87.394%	2216	50.5	45.87°C	0.994
	12.044V	5.021V	3.373V	4.964V	1143.868				55.89°C	114.86V
110%	83.214A	9.964A	9.885A	3.026A	1100.239	86.507%	2217	50.5	46.57°C	0.994
	12.040V	5.019V	3.369V	4.957V	1271.85				57.49°C	114.82V
CL1	0.115A	14.335A	14.064A	0A	121.307	81.2%	443	7.1	41.23°C	0.985
	12.168V	5.037V	3.391V	5.062V	149.39				46.76°C	115.12V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.115A	21.825A	0A	0A	111.394	78.279%	442	7.1	41.13°C	0.986
	12.176V	5.04V	3.401V	5.069V	142.304				48.64°C	115.12V
CL3	0.115A	0A	21.461A	0A	73.992	73.673%	441	7.1	41.61°C	0.979
	12.173V	5.057V	3.382V	5.064V	100.432				50.73°C	115.13V
CL4	83.013A	0A	0A	0A	1000.08	88.025%	2216	50.5	45.71°C	0.994
	12.047V	5.038V	3.381V	5.048V	1136.137				56.67°C	114.85V

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%	6.446A	1.983A	1.938A	0.992A	100.035	85.046%	409	6.2	40.33°C	0.895
	12.168V	5.046V	3.406V	5.042V	117.625				44.58°C	230.43V
20%	13.901A	2.975A	2.91A	1.193A	199.997	90.728%	409	6.2	40.62°C	0.949
	12.164V	5.043V	3.403V	5.031V	220.435				45.21°C	230.41V
30%	21.737A	3.472A	3.398A	1.387A	300.06	92.641%	410	6.2	41.12°C	0.965
	12.145V	5.042V	3.399V	5.048V	323.888				46.15°C	230.4V
40%	29.569A	3.97A	3.888A	1.587A	399.869	93.057%	410	6.2	41.68°C	0.972
	12.129V	5.04V	3.396V	5.041V	429.693				47.19°C	230.39V
50%	37.079A	4.965A	4.866A	1.79A	499.637	93.013%	622	15.5	42.47°C	0.975
	12.113V	5.037V	3.392V	5.03V	537.17				48.52°C	230.37V
60%	44.673A	5.962A	5.845A	1.993A	600.138	92.737%	917	28.2	42.6°C	0.978
	12.095V	5.034V	3.388V	5.018V	647.136				49.22°C	230.36V
70%	52.224A	6.96A	6.827A	2.198A	699.852	92.392%	1234	36.9	43.13°C	0.98
	12.078V	5.03V	3.384V	5.006V	757.481				50.16°C	230.34V
80%	59.865A	7.958A	7.811A	2.303A	799.872	91.959%	1237	37.0	43.89°C	0.981
	12.060V	5.027V	3.38V	4.995V	869.811				52.01°C	230.32V
90%	67.839A	8.461A	8.293A	2.407A	899.666	91.464%	1237	37.0	44.21°C	0.981
	12.046V	5.024V	3.376V	4.986V	983.63				53.29°C	230.31V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	75.578A	8.963A	8.806A	3.023A	999.686	90.882%	1237	37.0	45.55°C	0.983
	12.041V	5.021V	3.373V	4.963V	1099.975				55.57°C	230.29V
110%	83.244A	9.964A	9.886A	3.027A	1100.288	90.326%	1237	37.0	46.65°C	0.984
	12.036V	5.019V	3.368V	4.957V	1218.135				57.58°C	230.28V
CL1	0.115A	14.339A	14.067A	0A	121.304	81.864%	444	7.1	41.35°C	0.922
	12.165V	5.035V	3.391V	5.06V	148.181				46.84°C	230.41V
CL2	0.115A	21.837A	0A	0A	111.397	78.704%	444	7.1	41.26°C	0.917
	12.174V	5.037V	3.4V	5.067V	141.541				48.28°C	230.41V
CL3	0.115A	0A	21.464A	0A	73.994	74.426%	444	7.1	41.67°C	0.871
	12.172V	5.054V	3.382V	5.063V	99.418				50.72°C	230.41V
CL4	83.042A	0A	0A	0A	1000.128	91.453%	2225	50.6	45.89°C	0.983
	12.043V	5.036V	3.38V	5.047V	1093.595				56.87°C	230.29V

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	0.495A	0.484A	0.197A	20.004	76.524%	398	<6.0	36.59°C	0.888
	12.082V	5.046V	3.409V	5.065V	26.137				39.66°C	115.15V
40W	2.704A	0.694A	0.678A	0.296A	40.002	82.951%	399	<6.0	37.09°C	0.947
	12.087V	5.046V	3.409V	5.062V	48.225				40.35°C	115.15V
60W	4.152A	0.892A	0.871A	0.395A	60.001	78.956%	402	<6.0	38.16°C	0.969
	12.168V	5.046V	3.409V	5.059V	75.985				42.01°C	115.13V
80W	5.615A	1.09A	1.065A	0.495A	79.958	82.44%	403	<6.0	39.1°C	0.978
	12.168V	5.046V	3.408V	5.056V	96.986				43.06°C	115.12V

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	1.230A	0.495A	0.484A	0.197A	20.011	75.616%	403	<6.0	36.86°C	0.509
	12.081V	5.047V	3.409V	5.064V	26.468				39.94°C	230.44V
40W	2.706A	0.694A	0.678A	0.297A	40.009	82.152%	404	<6.0	37.55°C	0.707
	12.086V	5.047V	3.408V	5.061V	48.697				40.85°C	230.44V
60W	4.154A	0.892A	0.872A	0.396A	60.008	79.351%	407	<6.0	38.79°C	0.822
	12.166V	5.047V	3.409V	5.058V	75.625				42.3°C	230.43V
80W	5.618A	1.09A	1.065A	0.495A	79.981	82.98%	408	<6.0	39.44°C	0.865
	12.167V	5.047V	3.408V	5.055V	96.379				43.3°C	230.43V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.67mV	7.55mV	5.60mV	6.11mV	Pass
20% Load	9.31mV	6.27mV	4.88mV	6.16mV	Pass
30% Load	11.51mV	7.24mV	5.34mV	6.88mV	Pass
40% Load	11.25mV	8.87mV	5.70mV	7.75mV	Pass
50% Load	11.70mV	11.33mV	6.51mV	9.07mV	Pass
60% Load	12.72mV	17.65mV	9.46mV	9.99mV	Pass
70% Load	14.45mV	11.07mV	7.12mV	9.88mV	Pass
80% Load	15.31mV	12.14mV	10.48mV	11.36mV	Pass
90% Load	16.64mV	13.77mV	10.89mV	13.04mV	Pass
100% Load	24.43mV	15.25mV	12.33mV	17.54mV	Pass
110% Load	25.12mV	17.19mV	12.84mV	18.83mV	Pass
Crossload1	20.96mV	10.12mV	11.25mV	7.54mV	Pass
Crossload2	10.89mV	13.67mV	5.44mV	6.32mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	12.97mV	8.52mV	15.36mV	6.32mV	Pass
Crossload4	22.92mV	13.65mV	8.74mV	11.40mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.67mV	7.60mV	5.55mV	6.27mV	Pass
20% Load	8.45mV	6.02mV	4.98mV	5.66mV	Pass
30% Load	11.11mV	6.99mV	4.98mV	6.11mV	Pass
40% Load	9.99mV	7.39mV	4.93mV	6.73mV	Pass
50% Load	11.55mV	13.16mV	6.61mV	7.44mV	Pass
60% Load	13.18mV	18.52mV	9.36mV	8.00mV	Pass
70% Load	13.89mV	11.37mV	6.71mV	8.35mV	Pass
80% Load	15.27mV	12.04mV	10.43mV	9.53mV	Pass
90% Load	17.04mV	13.47mV	11.04mV	10.60mV	Pass
100% Load	25.16mV	15.40mV	12.03mV	15.64mV	Pass
110% Load	25.29mV	17.94mV	12.92mV	15.59mV	Pass
Crossload1	21.52mV	9.56mV	11.36mV	7.08mV	Pass
Crossload2	10.99mV	13.31mV	5.09mV	6.47mV	Pass
Crossload3	12.92mV	8.06mV	15.77mV	6.62mV	Pass
Crossload4	23.61mV	13.36mV	9.16mV	10.90mV	Pass

The results above are not used in the certification process

MSI MAG A1000GL PCIE5



Top side



Power specifications label

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