

GIGABYTE™

Gigabyte UD850GM

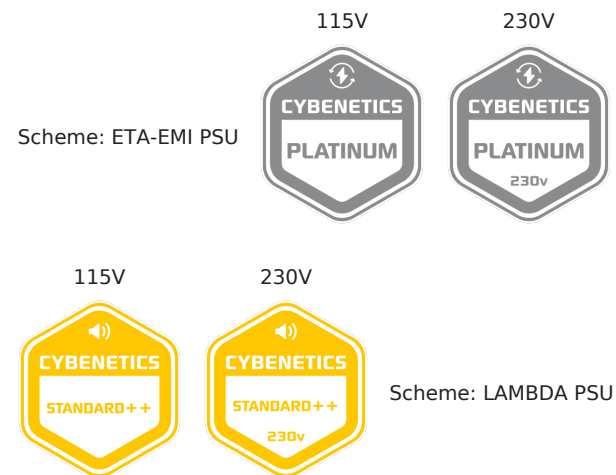
Serial Number SN21443G005516

Lab ID GB85002006

Certification ID 252006

Test Result Report ID: 22PS2006A

Certificate Issue Date: Apr 19, 2021



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	Gigabyte
Model	UD850GM
OEM/ODM	MEIC
Serial Number	SN21443G005516
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-6
Rated Frequency (Hz)	60-50

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 Rifle Bearing Fan (D12SH-12)
Semi-Passive Operation	✓
Cybenetics Testing Information	
Lab ID	GB85002006
Date of receipt	Mar 29, 2022
Testing Date	Apr 19, 2022
Report Issued Date	Apr 19, 2021
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 (610mm)	1	1	18AWG	No
4+4 pin EPS12V (600mm)	2	2	18AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	18AWG	No
SATA (600mm+150mm+150mm+150mm)	2	8	18AWG	No
4-pin Molex (500mm+115mm+115mm) / FDD (+150mm)	1	3 / 1	18AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	16AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70.8	3	0.3
	Watts	850		849.6	15	3.6
Total Max. Power (W)		850				

Parts Description

General Data	-
Manufacturer (OEM)	MEIC
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x Chipown PN8200 (Discharge IC)
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU1506 (800V, 15A @ 100°C)
APFC MOSFETs	2x NCE Power NCE65TF099F (650V, 24A @ 100°C, Rds(on): 0.109Ohm)
APFC Boost Diode	1x JF SC1065 (600V, 10A @ 156°C)
Bulk Cap(s)	1x Nippon Chemi-Con (400V, 820uF, 2,000h @ 105°C, KMW)
Main Switchers	2x NCE Power NCE65TF099F (650V, 24A @ 100°C, Rds(on): 0.109Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	no info
5V & 3.3V	DC-DC Converters: 4x Alpha & Omega AON6354 (30V, 52A @ 100°C, Rds(on): 4.4mOhm) PWM Controllers: 2x uPI-Semi uP9303B
Filtering Capacitors	Electrolytic: 10x Lelon (4-7,000h @ 105°C, RXW), 2x Lelon (4-10,000h @ 105°C, RZW), 2x Lelon (2-5,000h @ 105°C, RXK) Polymer: 10x Lelon, 4x no info
Supervisor IC	Weltrend WT7502R (OVP, UVP, SCP, PG)
Fan Model	Yate Loon D12SH-12 (120mm, 12V, 0.30A, Rifle Bearing Fan)
5VSB Circuit	-

Rectifier	1x JF Semiconductor SP10U45L SBR (45V, 10A)
Standby PWM Controller	PR8109T

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	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.035%
Average Noise Output (>1450 Load Combinations)	33.26dBA
Average PF (>1450 Load Combinations)	0.978
Efficiency With 10W (≤500W) or 2% (>500W) Load	67.767%
Standby Power Consumption	0.0326W
Non-Accredited	
12V Ripple (Full Load)	30.25mV
5V Ripple (Full Load)	23.12mV
3.3V Ripple (Full Load)	26.59mV
5VSB Ripple (Full Load)	29.54mV
12V Load Regulation	0.72%
5V Load Regulation	1.67%
3.3V Load Regulation	2.41%
5VSB Load Regulation	2.65%
Inrush Current	29.940A

230V

Accredited		
Average Efficiency (>1450 load combinations)	91.186%	
Average Noise Output (>1450 Load Combinations)	34.11dBA	
Average PF (>1450 Load Combinations)	0.949	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1541W	
Non-Accredited		
12V Ripple (Full Load)	27.39mV	
5V Ripple (Full Load)	23.75mV	
3.3V Ripple (Full Load)	26.61mV	
5VSB Ripple (Full Load)	28.78mV	
12V Load Regulation	0.73%	
5V Load Regulation	1.77%	
3.3V Load Regulation	2.41%	
5VSB Load Regulation	2.65%	
Inrush Current	78.580A	
Hold-Up Time & PWR_OK Signal	19.30ms	
AC Loss to PWR_OK Hold Up Time	16.60ms	
PWR_OK Inactive to DC Loss Delay	2.70ms	
PSU Timings: T1 (20% / 100%)	63.0ms	63.0ms
PSU Timings: T3 (20% / 100%)	136.0ms	137.0ms
OPP (25.43°C / 41.18°C)	129.17%	126.81%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	19.3
AC Loss to PWR_OK Hold Up Time (ms)	16.6
PWR_OK Inactive to DC Loss Delay (ms)	2.7



Tables

115V

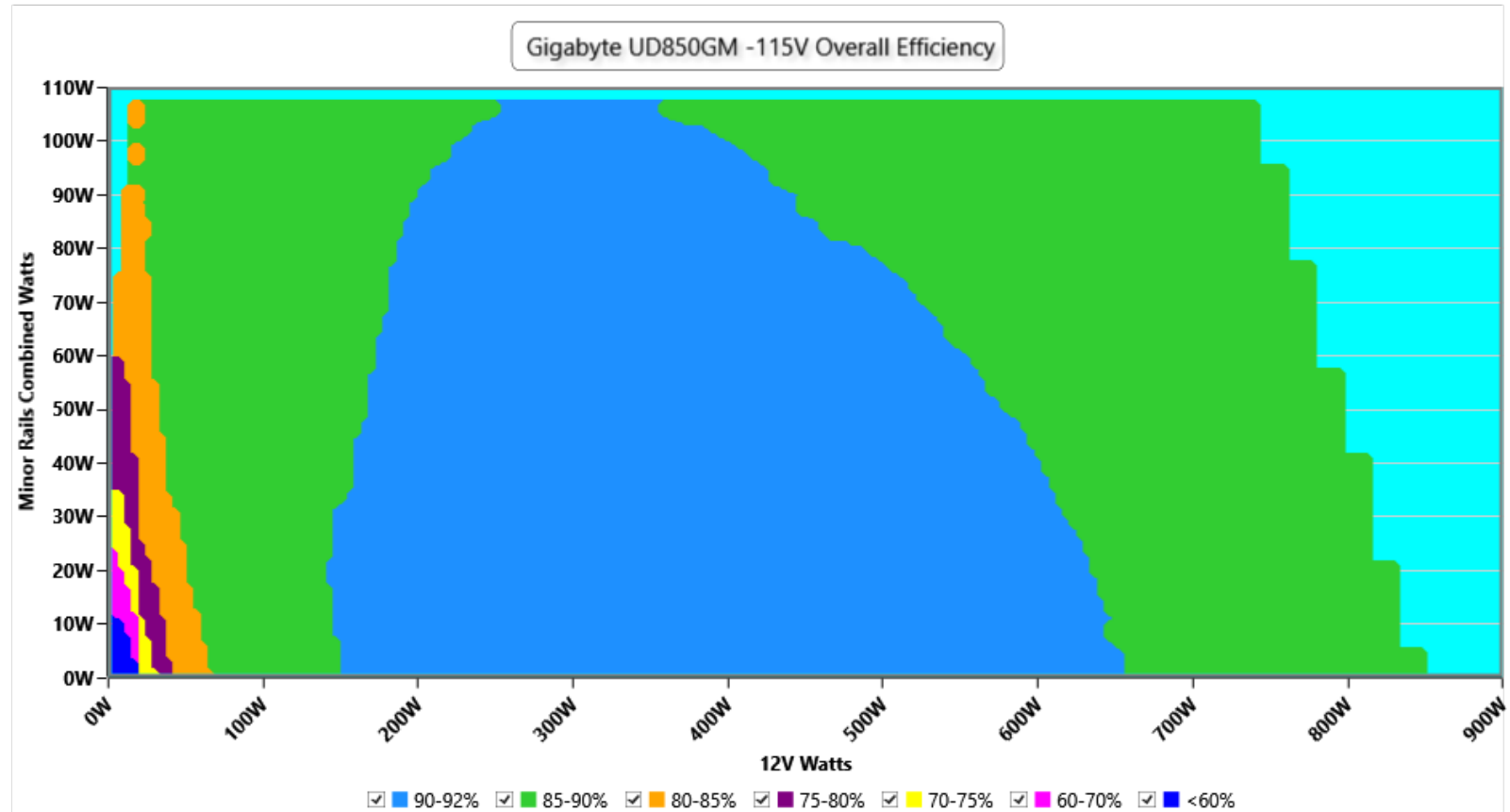
Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.14 V	115.14 V	113.85 V	115.17 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	60.00 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.11 %	N/A	0.15 %	2.00 %	PASS
Real Power:	0.033 W	0.026 W	N/A	0.057 W	N/A	N/A
Apparent Power:	7.036 W	7.031 W	N/A	7.048 W	N/A	N/A
Power Factor:	0.008	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	230.35 V	227.70 V	230.38 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	50.00 Hz	49.50 Hz	50.00 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:	0.154 W	0.142 W	N/A	0.165 W	N/A	N/A
Apparent Power:	23.547 W	23.540 W	N/A	23.556 W	N/A	N/A
Power Factor:	0.007	N/A	N/A	N/A	N/A	N/A

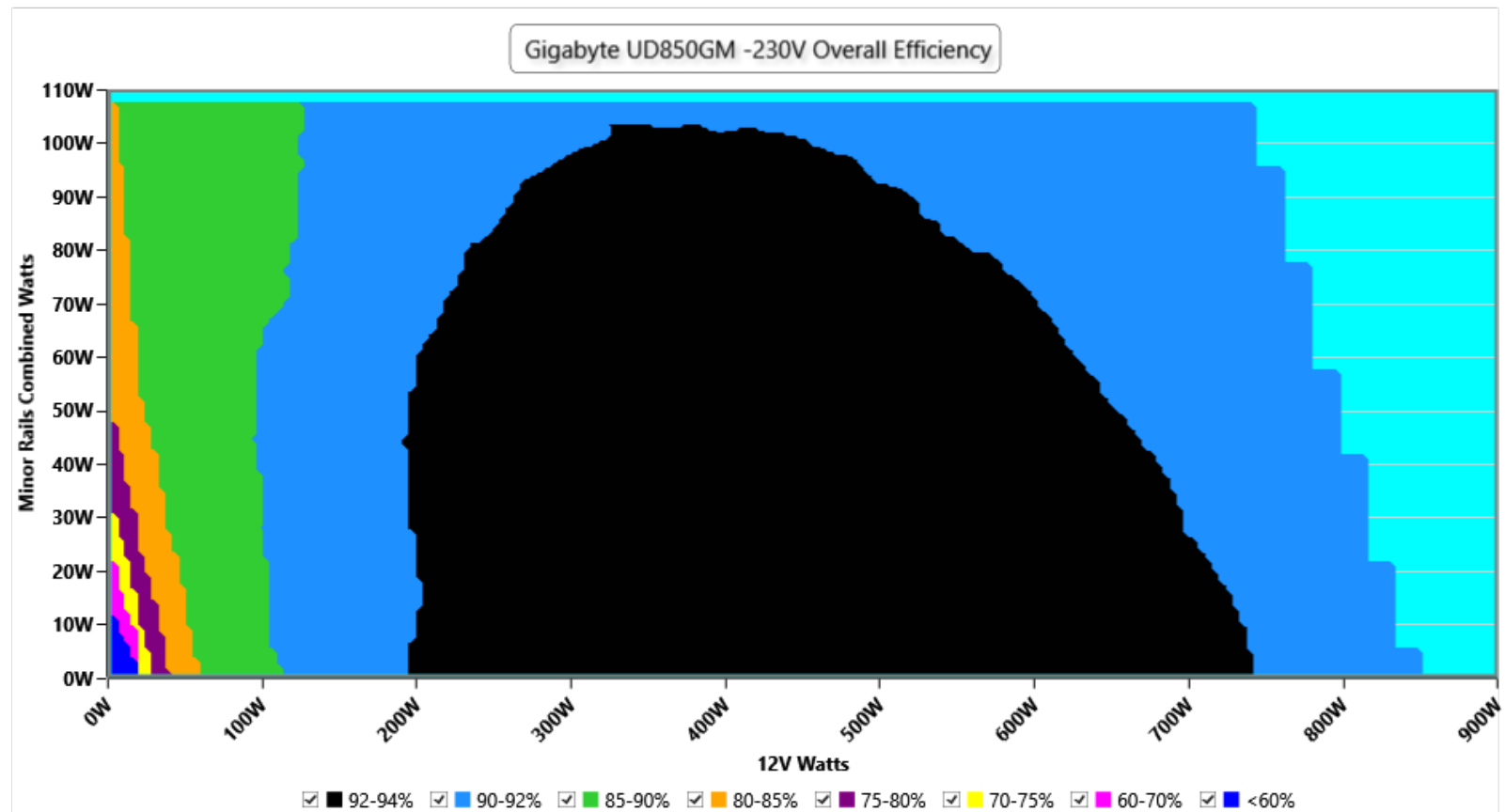
Efficiency Graph

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

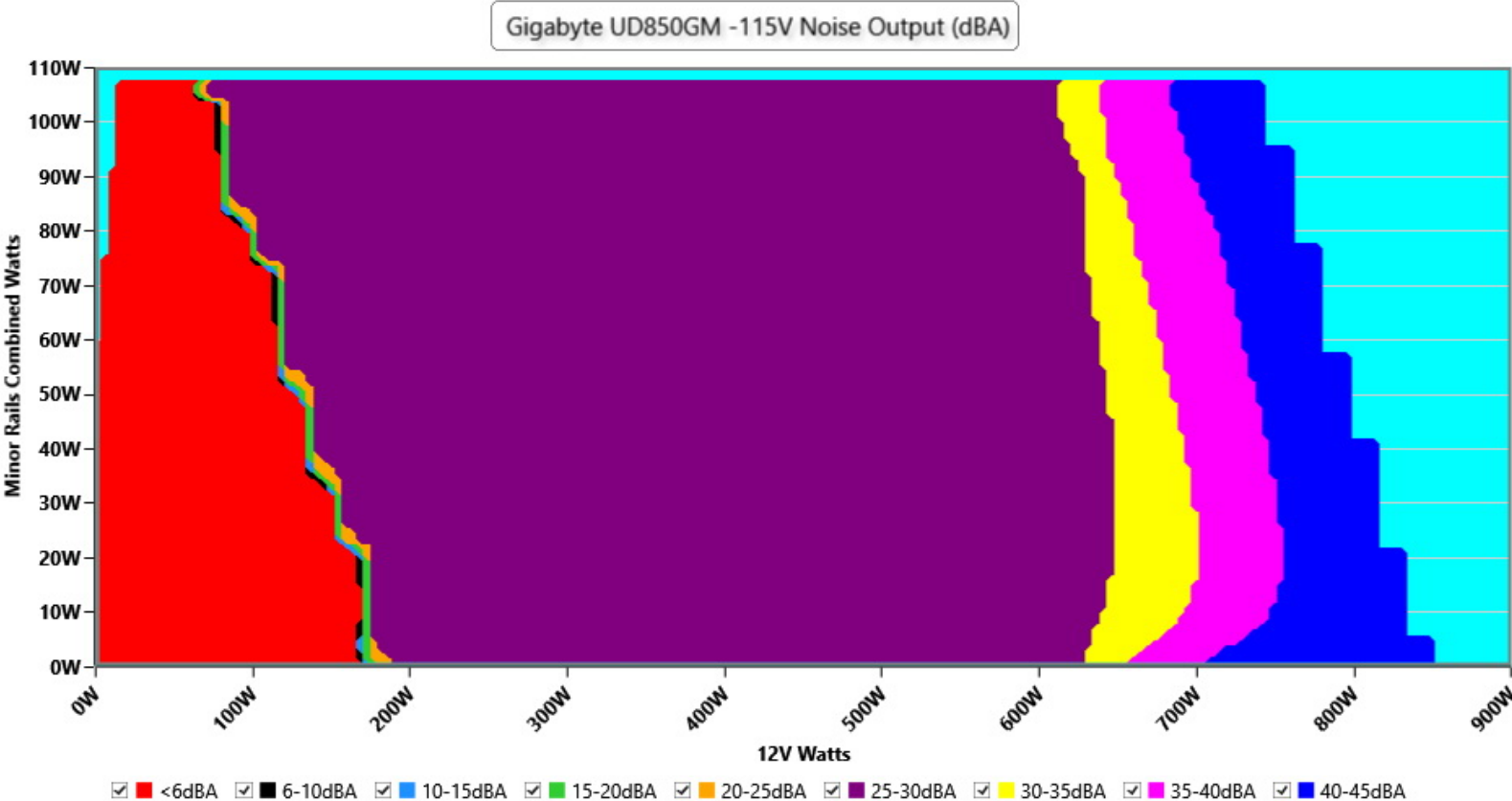


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This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

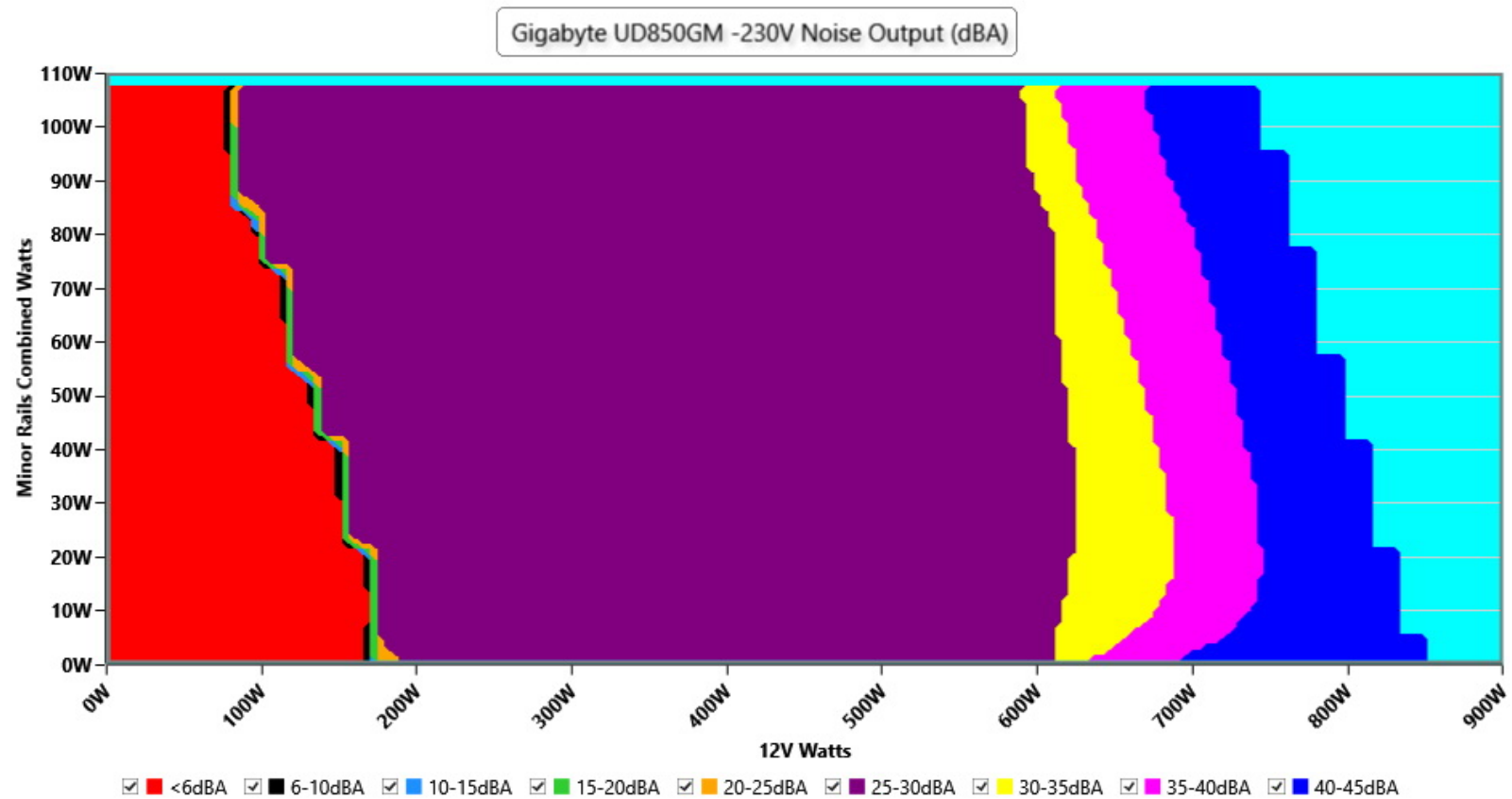
Noise Graph

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



INFO

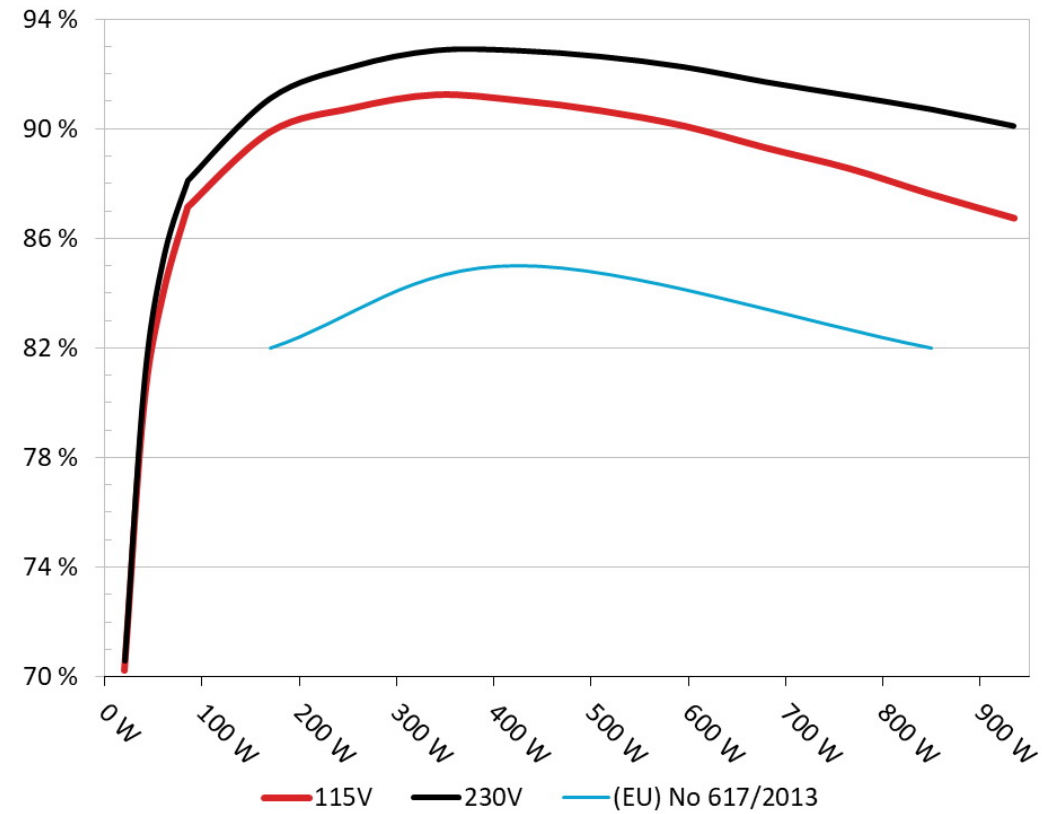
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance

Efficiency under high ambient temperature

Efficiency: Gigabyte UD850GM

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



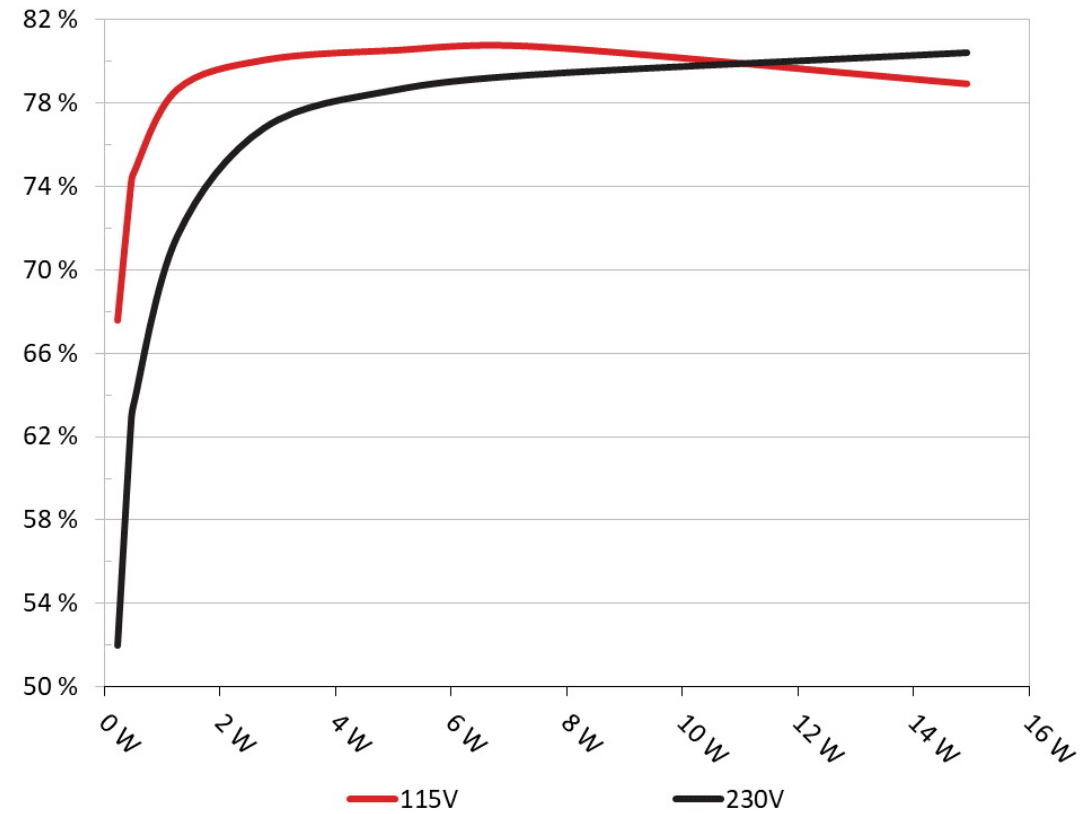
INFO

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: Gigabyte UD850GM

Ambient: 34°C - 36°C (93.2°F - 96.8°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	0.227W	67.569%	0.047
	5.036V	0.336W		115.15V
2	0.09A	0.453W	73.942%	0.084
	5.035V	0.613W		115.15V
3	0.55A	2.765W	80.038%	0.317
	5.027V	3.455W		115.14V
4	1A	5.019W	80.502%	0.4
	5.017V	6.235W		115.14V
5	1.5A	7.513W	80.673%	0.436
	5.007V	9.313W		115.14V
6	3A	14.93W	78.897%	0.484
	4.976V	18.923W		115.13V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.227W	51.997%	0.019
	5.036V	0.437W		230.36V
2	0.09A	0.453W	62.428%	0.031
	5.035V	0.725W		230.36V
3	0.55A	2.765W	76.801%	0.14
	5.026V	3.601W		230.37V
4	1A	5.019W	78.616%	0.218
	5.017V	6.382W		230.36V
5	1.5A	7.512W	79.368%	0.278
	5.007V	9.464W		230.36V
6	3A	14.931W	80.407%	0.363
	4.977V	18.57W		230.36V

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%	5.230A	1.961A	1.947A	0.999A	84.998	86.584%	0	<6.0	44.67°C	0.947
	12.121V	5.099V	3.39V	5.007V	98.165				40.23°C	115.11V
20%	11.474A	2.947A	2.928A	1.201A	169.941	89.903%	0	<6.0	45.26°C	0.966
	12.117V	5.09V	3.381V	4.996V	189.022				40.45°C	115.1V
30%	18.079A	3.445A	3.422A	1.404A	254.95	90.774%	979	28.3	41.49°C	0.977
	12.108V	5.081V	3.375V	4.986V	280.877				46.85°C	115.07V
40%	24.700A	3.944A	3.92A	1.608A	340.037	91.254%	981	28.3	41.68°C	0.98
	12.098V	5.071V	3.368V	4.976V	372.627				47.58°C	115.05V
50%	30.974A	4.939A	4.912A	1.813A	424.991	91.049%	983	28.4	41.86°C	0.984
	12.090V	5.062V	3.359V	4.965V	466.771				48.37°C	115.02V
60%	37.232A	5.938A	5.91A	2A	509.446	90.673%	987	28.6	42.2°C	0.986
	12.079V	5.053V	3.351V	4.954V	561.846				49.29°C	115.01V
70%	43.571A	6.942A	6.912A	2.226A	594.902	90.115%	1106	31.7	43.76°C	0.987
	12.067V	5.043V	3.342V	4.942V	660.166				51.31°C	114.98V
80%	49.910A	7.949A	7.919A	2.332A	679.748	89.311%	1766	42.1	43.86°C	0.988
	12.059V	5.034V	3.334V	4.932V	761.098				52.02°C	114.96V
90%	56.660A	8.462A	8.418A	2.438A	765.181	88.56%	2087	45.9	44.52°C	0.989
	12.049V	5.024V	3.326V	4.924V	864.021				53.65°C	114.93V
100%	63.175A	8.974A	8.957A	3.062A	849.959	87.614%	2121	46.2	45.22°C	0.991
	12.034V	5.015V	3.316V	4.9V	970.115				55.22°C	114.91V
110%	69.561A	9.992A	10.072A	3.067A	934.582	86.75%	2119	46.2	46.9°C	0.992
	12.023V	5.004V	3.306V	4.892V	1077.342				57.77°C	114.88V
CL1	0.116A	12.402A	12.378A	0A	106.306	83.852%	0	<6.0	48.23°C	0.954
	12.121V	5.096V	3.369V	5.011V	126.78				41.7°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	19.646A	0A	0A	101.398	82.183%	0	<6.0	50.52°C	0.953
	12.127V	5.09V	3.367V	5.022V	123.381				42.55°C	115.12V
CL3	0.115A	0A	19.579A	0A	67.393	77.569%	0	<6.0	52.217°C	0.938
	12.121V	5.072V	3.371V	5.007V	86.889				43.06°C	115.13V
CL4	70.588A	0A	0A	0.001A	849.689	88.373%	2112	46.1	44.18°C	0.991
	12.037V	5.009V	3.326V	4.979V	961.482				54.21°C	114.91V

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%	5.233A	1.959A	1.946A	0.999A	84.999	87.52%	0	<6.0	45.62°C	0.854
	12.115V	5.104V	3.391V	5.006V	97.127				41.12°C	230.33V
20%	11.478A	2.945A	2.927A	1.201A	169.945	91.111%	0	<6.0	46.74°C	0.915
	12.113V	5.094V	3.382V	4.995V	186.531				41.66°C	230.32V
30%	18.081A	3.442A	3.422A	1.405A	254.953	92.268%	987	28.6	42.16°C	0.941
	12.107V	5.084V	3.375V	4.984V	276.32				47.93°C	230.31V
40%	24.706A	3.942A	3.921A	1.609A	340.045	92.858%	987	28.6	42.49°C	0.954
	12.096V	5.075V	3.367V	4.973V	366.199				48.62°C	230.3V
50%	30.986A	4.937A	4.913A	1.814A	425.019	92.85%	988	28.6	42.99°C	0.963
	12.086V	5.065V	3.358V	4.962V	457.748				49.49°C	230.3V
60%	37.250A	5.936A	5.912A	2.001A	509.488	92.635%	991	28.7	43.15°C	0.969
	12.074V	5.055V	3.349V	4.95V	549.991				50.23°C	230.29V
70%	43.583A	6.939A	6.916A	2.228A	594.888	92.256%	1158	33.6	43.51°C	0.973
	12.064V	5.046V	3.34V	4.938V	644.817				51.21°C	230.28V
80%	49.926A	7.946A	7.923A	2.333A	679.719	91.706%	1720	41.7	44.29°C	0.976
	12.054V	5.036V	3.332V	4.929V	741.195				52.66°C	230.26V
90%	56.680A	8.458A	8.423A	2.439A	765.15	91.212%	2122	46.1	44.91°C	0.979
	12.044V	5.025V	3.324V	4.92V	838.872				54.18°C	230.25V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	63.183A	8.975A	8.958A	3.062A	849.942	90.706%	2126	46.2	45.13°C	0.981
	12.033V	5.015V	3.315V	4.9V	937.033				55.37°C	230.23V
110%	69.568A	9.992A	10.073A	3.067A	934.544	90.101%	2131	46.3	46.57°C	0.983
	12.021V	5.004V	3.305V	4.892V	1037.218				57.5°C	230.22V
CL1	0.115A	12.398A	12.366A	0A	106.301	84.685%	0	<6.0	49.39°C	0.884
	12.120V	5.098V	3.372V	5.011V	125.527				42.83°C	230.33V
CL2	0.115A	19.634A	0A	0A	101.395	83.402%	0	<6.0	50.75°C	0.88
	12.127V	5.093V	3.367V	5.022V	121.576				43.42°C	230.33V
CL3	0.115A	0A	19.616A	0A	67.388	78.407%	0	<6.0	52.42°C	0.84
	12.120V	5.079V	3.364V	5.007V	85.944				44.31°C	230.34V
CL4	70.593A	0A	0A	0.001A	849.669	91.372%	2124	46.1	45.74°C	0.981
	12.036V	5.009V	3.323V	4.978V	929.893				55.84°C	230.24V

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	1.226A	0.49A	0.486A	0.199A	19.997	70.236%	0	<6.0	40.23°C	0.867
	12.117V	5.099V	3.396V	5.03V	28.472				37.14°C	115.13V
40W	2.700A	0.687A	0.681A	0.298A	39.996	79.921%	0	<6.0	40.82°C	0.908
	12.106V	5.097V	3.394V	5.027V	50.05				37.48°C	115.12V
60W	4.172A	0.883A	0.875A	0.398A	59.995	84.027%	0	<6.0	42.65°C	0.932
	12.112V	5.095V	3.393V	5.023V	71.401				38.91°C	115.12V
80W	5.638A	1.079A	1.07A	0.498A	79.944	87.157%	0	<6.0	43.01°C	0.943
	12.117V	5.096V	3.392V	5.019V	91.724				38.94°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	1.240A	0.5A	0.5A	0.2A	20.284	70.589%	0	<6.0	40.01°C	0.629
	12.115V	5.103V	3.395V	5.03V	28.736				36.87°C	230.38V
40W	2.720A	0.7A	0.7A	0.3A	40.384	80.794%	0	<6.0	40.81°C	0.752
	12.104V	5.102V	3.394V	5.026V	49.985				37.47°C	230.38V
60W	4.224A	0.9A	0.9A	0.4A	60.812	85.389%	0	<6.0	41.72°C	0.812
	12.111V	5.1V	3.393V	5.022V	71.214				38.18°C	230.38V
80W	5.704A	1.1A	1.1A	0.5A	80.967	88.113%	0	<6.0	43.74°C	0.847
	12.117V	5.101V	3.391V	5.017V	91.885				39.93°C	230.38V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.08mV	10.18mV	7.83mV	18.61mV	Pass
20% Load	8.17mV	11.30mV	8.96mV	19.98mV	Pass
30% Load	21.89mV	12.88mV	9.37mV	21.31mV	Pass
40% Load	17.45mV	12.99mV	10.34mV	22.33mV	Pass
50% Load	18.06mV	14.78mV	12.03mV	23.35mV	Pass
60% Load	18.48mV	15.96mV	14.28mV	23.40mV	Pass
70% Load	17.09mV	17.18mV	16.74mV	23.96mV	Pass
80% Load	17.71mV	20.10mV	22.42mV	23.81mV	Pass
90% Load	18.23mV	20.51mV	23.49mV	24.47mV	Pass
100% Load	30.25mV	23.12mV	26.59mV	29.54mV	Pass
110% Load	30.82mV	24.74mV	29.50mV	30.89mV	Pass
Crossload1	9.13mV	20.68mV	28.50mV	18.64mV	Pass
Crossload2	7.30mV	16.62mV	16.74mV	16.42mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	5.98mV	14.47mV	25.18mV	16.57mV	Pass
Crossload4	28.35mV	14.76mV	9.44mV	24.14mV	Pass

The results above are not used in the certification process

230V

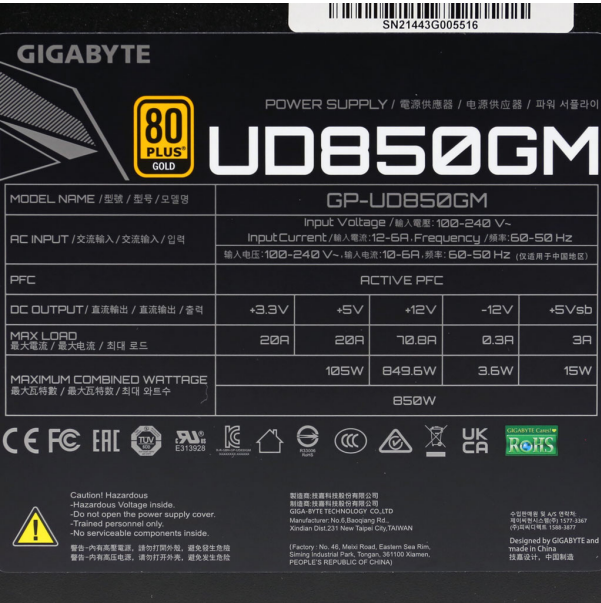
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.36mV	9.72mV	7.47mV	19.42mV	Pass
20% Load	7.51mV	12.12mV	8.70mV	20.95mV	Pass
30% Load	22.56mV	13.04mV	9.37mV	21.72mV	Pass
40% Load	16.94mV	12.73mV	10.24mV	22.28mV	Pass
50% Load	16.12mV	14.57mV	12.13mV	23.81mV	Pass
60% Load	15.72mV	15.90mV	14.12mV	23.30mV	Pass
70% Load	14.54mV	16.87mV	16.68mV	23.65mV	Pass
80% Load	15.31mV	20.10mV	23.39mV	23.65mV	Pass
90% Load	16.90mV	21.94mV	24.05mV	25.49mV	Pass
100% Load	27.39mV	23.75mV	26.61mV	28.78mV	Pass
110% Load	29.03mV	24.97mV	30.13mV	30.76mV	Pass
Crossload1	8.92mV	20.62mV	29.77mV	18.62mV	Pass
Crossload2	7.82mV	17.59mV	16.53mV	17.18mV	Pass
Crossload3	5.93mV	13.81mV	25.18mV	17.08mV	Pass
Crossload4	26.02mV	14.97mV	9.46mV	24.21mV	Pass

The results above are not used in the certification process

Gigabyte UD850GM



Top side



Power specifications label

Cybenetics [redacted]

ETA[redacted]

LAMBDA[redacted]

SAFE[redacted]

DELTA[redacted]

PHI[redacted]

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