Gamer Storm PL650D

10000142801B4241500002

Lab ID GA65002435

Certification ID 252435

Test Result Report ID: 24PS2435A

Certificate Issue Date: Sep 20, 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	Gamer Storm
Model	PL650D
OEM/ODM	Helly Technology
Serial Number	10000142801B4241500002
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	9-4.5

□□□□ (Hz)	50-60
□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	120mm Hydraulic Bearing Fan (W12025HZ12SEMA)
□□□□□	✗
Cybenetics Testing Information	
Lab ID	GA65002435
Date of receipt	Aug 14, 2024
Testing Date	Sep 6, 2024
Report Issued Date	Sep 20, 2024
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□				
□□	□□□□	□□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (560mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (735mm+145mm)	1	2	18AWG	□
6+2pin PCIe□□ (580mm+120mm)	1	2	18AWG	□
6+2pin PCIe□□ (580mm)	1	1	18AWG	□
12+2 pin PCIe (590mm) (600W)	1	1	16-26AWG	□
SATA□□ (445mm+105mm+105mm+105mm) / 4-pin Molex (+100mm)	2	8 / 2	18AWG	□
□□□□□				

AC Power Cord (1395mm) - C13 coupler	1	1	18AWG	-

Protection Features(Manufacturer)

Over Power Protection	✓
Over Current (+12V) Protection	✓
Over Temperature Protection	✓
Short Circuit Protection	✓
Surge Protection	✓
Inrush Current Protection	✓
Fan Failure Protection	✗

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54	3	0.3
	□	100		648	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

115V

Accredited	
□□□□ (>1450 load combinations)	86.252%
Average Noise Output (>1450 Load Combinations)	35.21dBA
PF□□□ (>1450 Load Combinations)	0.986
Efficiency With 10W (≤500W) or 2% (>500W) Load	61.262%
□□□□□□	0.0311W
Non-Accredited	
12V Ripple (Full Load)	33.00mV
5V Ripple (Full Load)	19.95mV
3.3V Ripple (Full Load)	18.49mV
5VSB Ripple (Full Load)	17.69mV
12V Load Regulation	0.68%
5V Load Regulation	0.45%
3.3V Load Regulation	0.76%
5VSB Load Regulation	3.59%
Inrush Current	16.040A

230V

Accredited	
□□□□ (>1450 load combinations)	88.600%
Average Noise Output (>1450 Load Combinations)	34.65dBA
PF□□□ (>1450 Load Combinations)	0.949
Efficiency With 10W (≤500W) or 2% (>500W) Load	60.197%
□□□□□□	0.0673W
Non-Accredited	
12V Ripple (Full Load)	30.95mV
5V Ripple (Full Load)	18.24mV
3.3V Ripple (Full Load)	17.39mV

5VSB Ripple (Full Load)		13.92mV
12V Load Regulation		0.69%
5V Load Regulation		0.45%
3.3V Load Regulation		0.73%
5VSB Load Regulation		3.63%
Inrush Current		32.620A
12V Transient Response (200%)		11.35V
5V Transient Response (200%)		5.046V
3.3V Transient Response (200%)		3.223V
5VSB Transient Response (200%)		4.929V
□□□□ & PG□□		15.80ms
AC Loss to PWR_OK Hold Up Time		14.40ms
PWR_OK Inactive to DC Loss Delay		1.40ms
PSU Timings: T1 (20% / 100%)	27.0ms	27.0ms
PSU Timings: T3 (20% / 100%)	117.0ms	118.0ms
OPP (25.64°C / 43.22°C)	115.51%	121.57%

□□□□ & PG□□

Hold-Up Time (ms)	15.8
AC Loss to PWR_OK Hold Up Time (ms)	14.4
PWR_OK Inactive to DC Loss Delay (ms)	1.4

□□□□

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.17 V	115.16 V	113.85 V	115.20 V	116.15 V	PASS

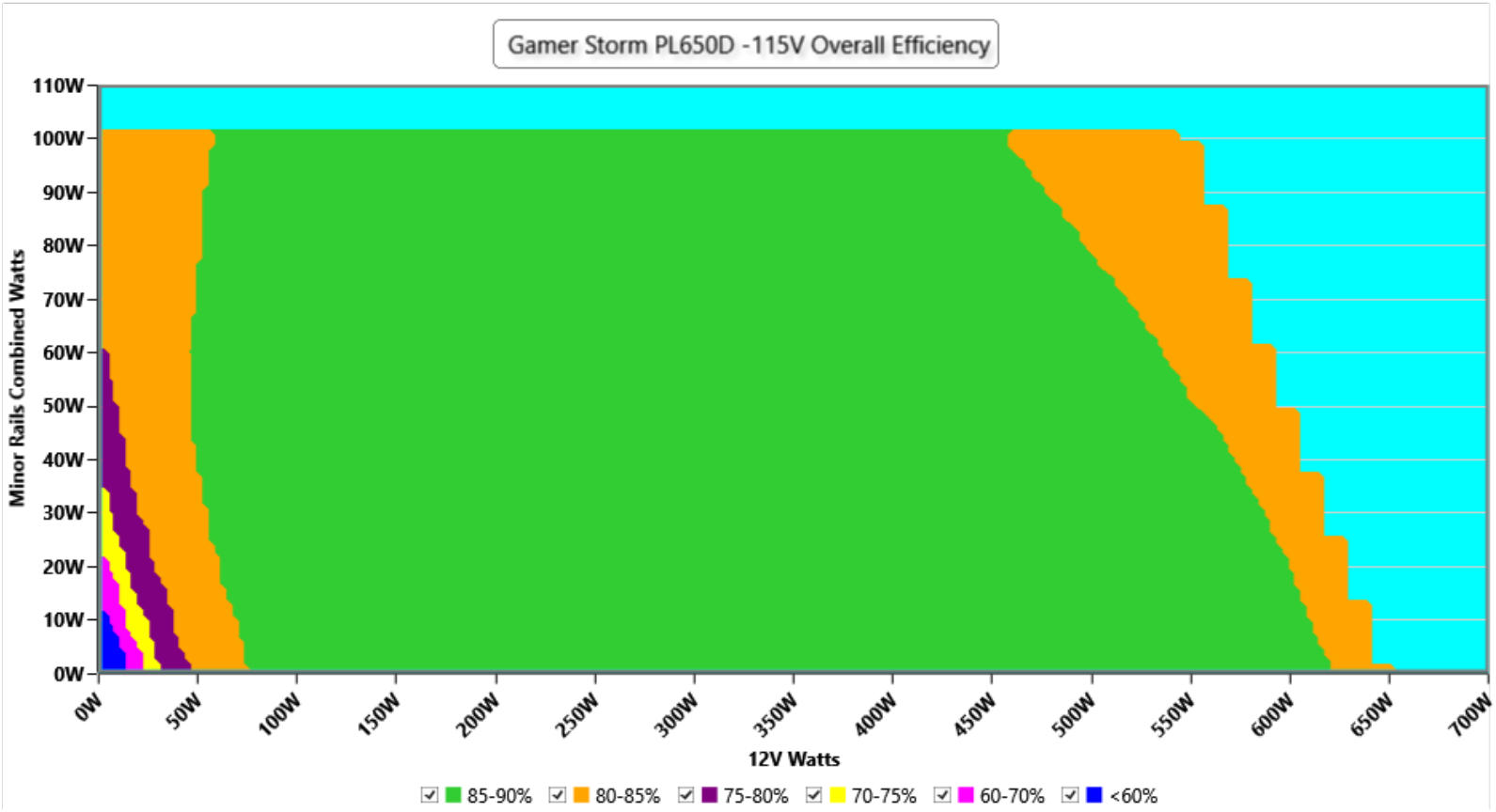
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.415	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.10 %	N/A	0.15 %	2.00 %	PASS
Real Power:	0.031 W	0.007 W	N/A	0.047 W	N/A	N/A
Apparent Power:	8.439 W	8.435 W	N/A	8.446 W	N/A	N/A
Power Factor:	0.005	N/A	N/A	N/A	N/A	N/A

230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.38 V	230.38 V	227.70 V	230.42 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:	0.067 W	0.057 W	N/A	0.079 W	N/A	N/A
Apparent Power:	28.249 W	28.236 W	N/A	28.264 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

□□□□□□

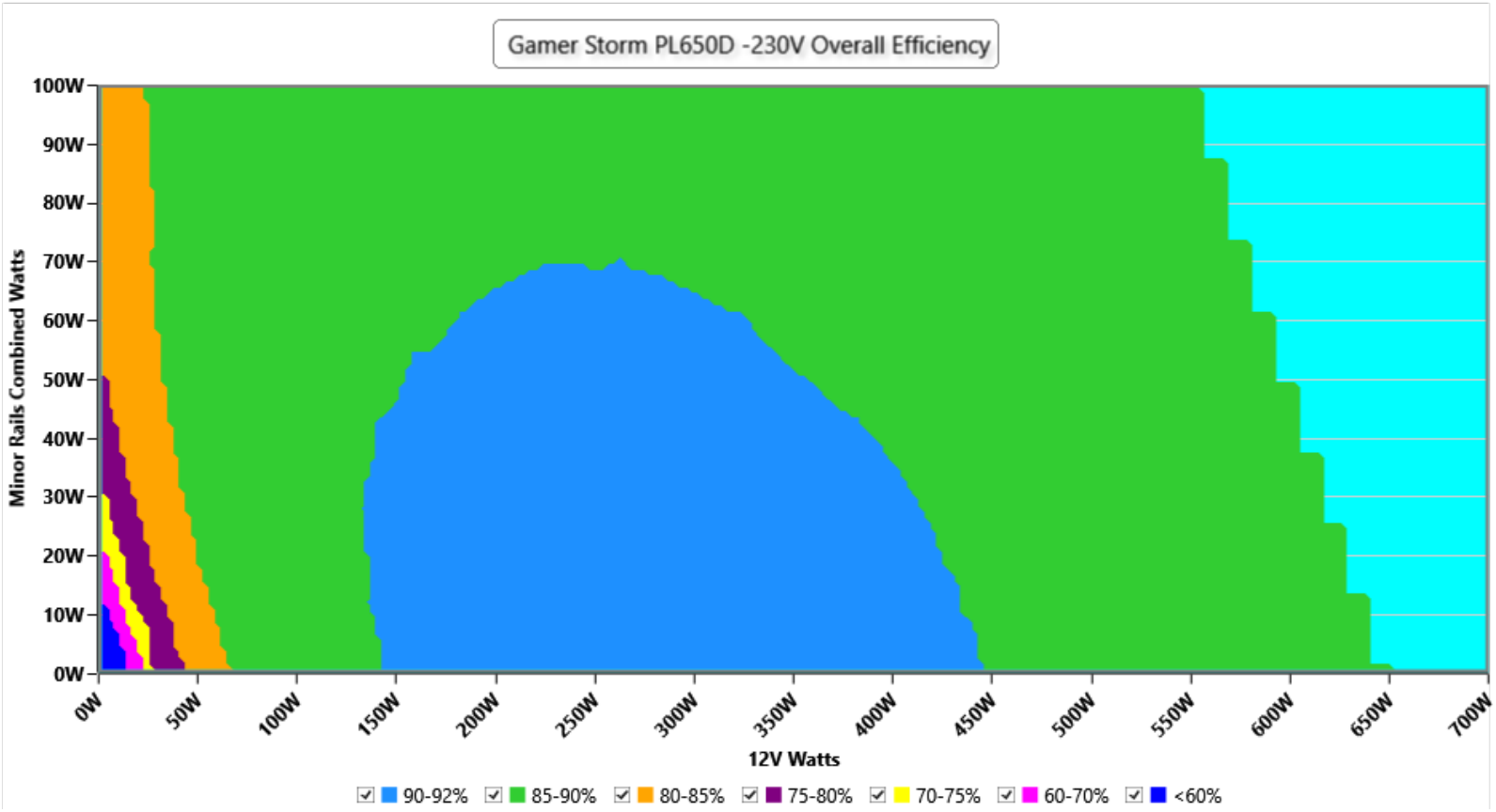
115V



□□

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

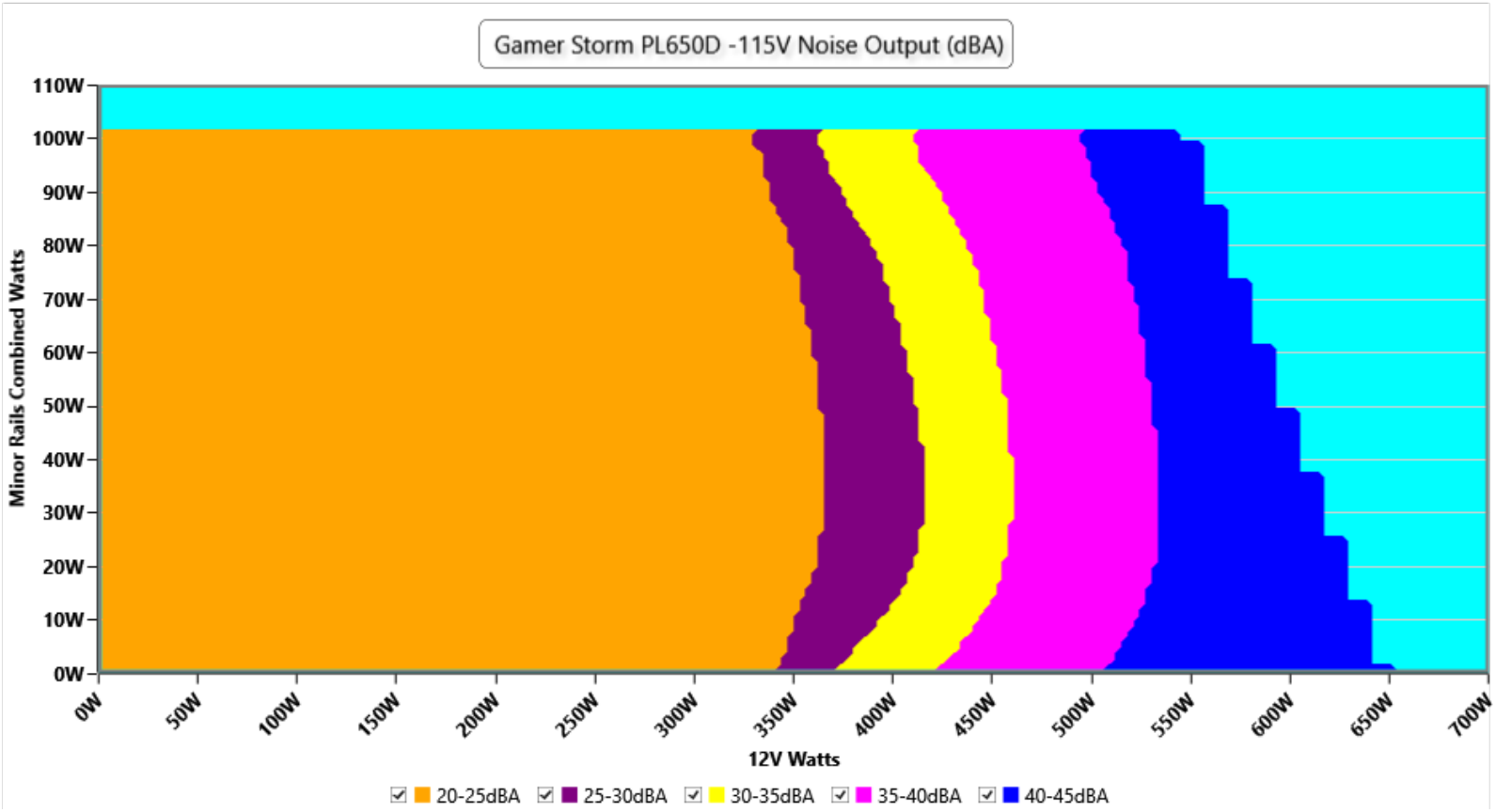
230V



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□□□□□

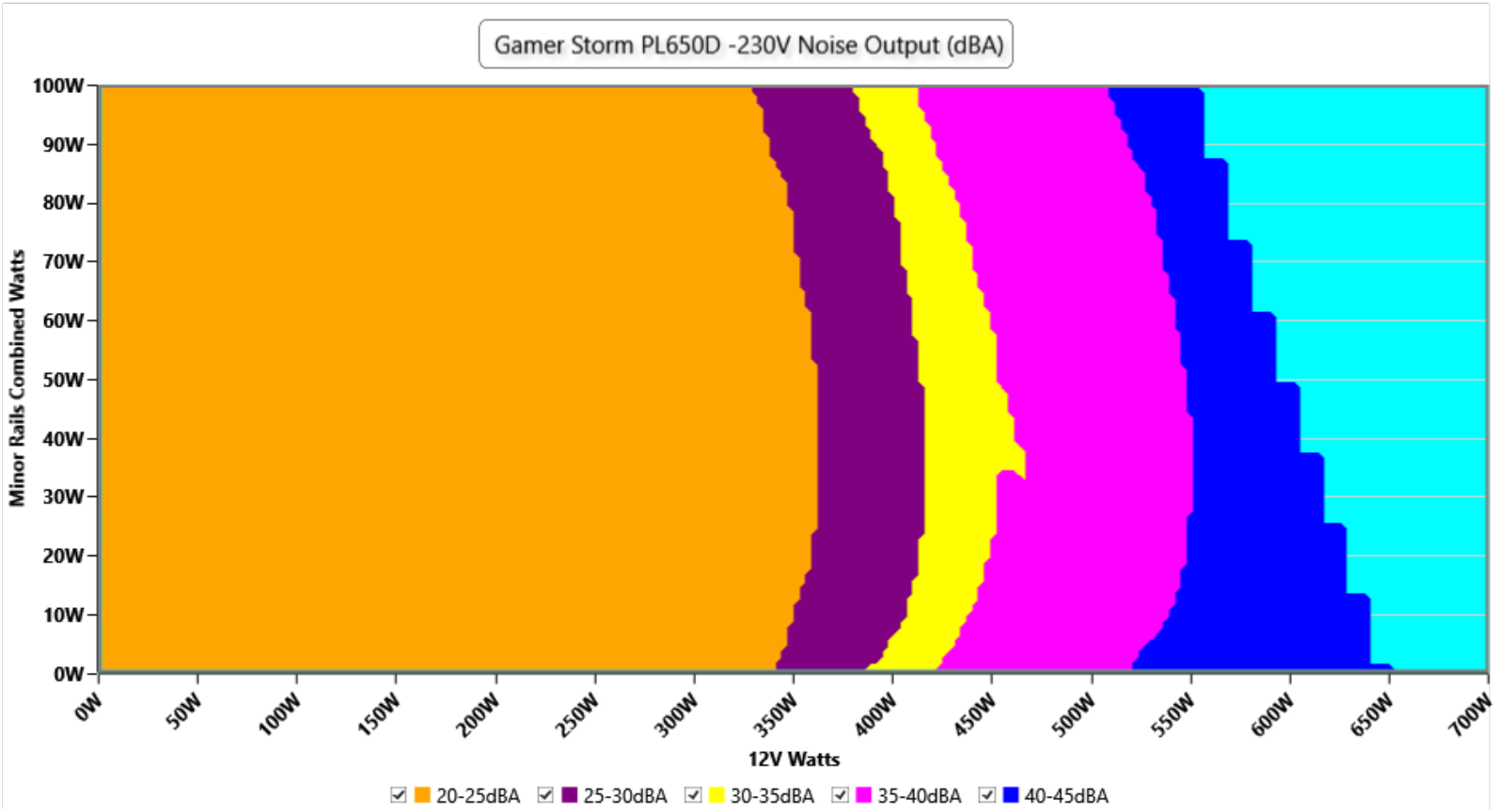
115V



□□

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



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%	1052 RPM · 24.8 dB(A) · 40.2 °C	1052 RPM · 24.8 dB(A) · 40.2 °C	**+0.0 dB(A)**
20%	1059 RPM · 25.2 dB(A) · 40.7 °C	1059 RPM · 25.2 dB(A) · 40.7 °C	**+0.0 dB(A)**
50%	1226 RPM · 29.0 dB(A) · 42.3 °C	1226 RPM · 29.0 dB(A) · 42.3 °C	**+0.0 dB(A)**
100%	2104 RPM · 44.4 dB(A) · 45.8 °C	2104 RPM · 44.4 dB(A) · 45.8 °C	**+0.0 dB(A)**

230V

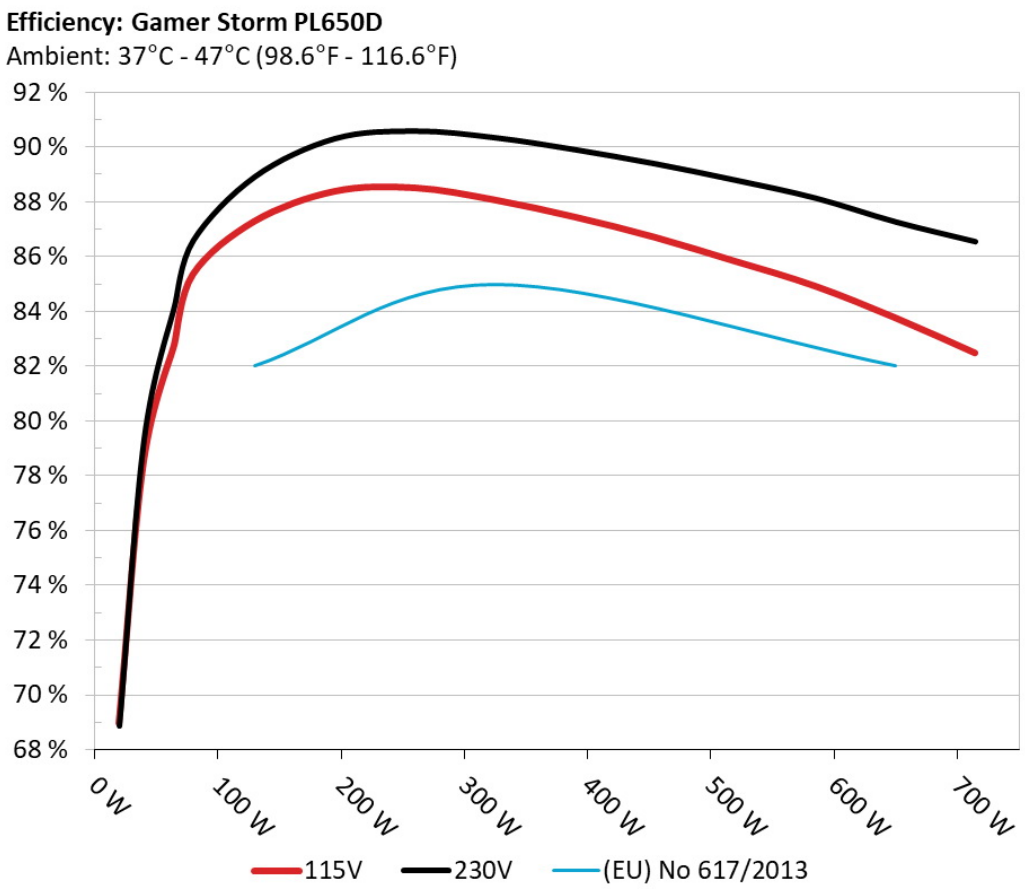
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	1056 RPM · 25.1 dB(A) · 40.3 °C	1056 RPM · 25.1 dB(A) · 40.3 °C	**+0.0 dB(A)**
20%	1060 RPM · 25.2 dB(A) · 40.7 °C	1060 RPM · 25.2 dB(A) · 40.7 °C	**+0.0 dB(A)**
50%	1185 RPM · 28.3 dB(A) · 42.2 °C	1185 RPM · 28.3 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	2107 RPM · 44.5 dB(A) · 45.8 °C	2107 RPM · 44.5 dB(A) · 45.8 °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, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

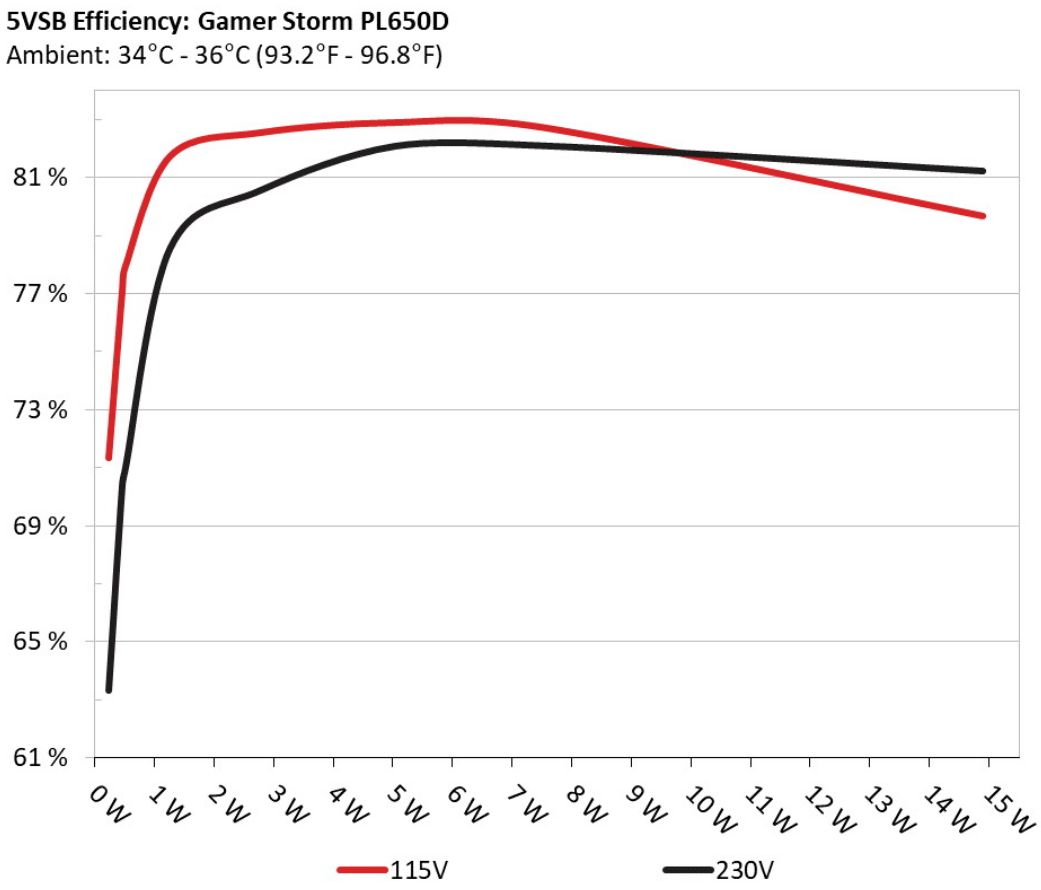
Informational. Not part of the ETA or LAMBDA rating.

Indicative Performance



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)

115V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.041A	0.211	68.954%	0.030
	5.107V	0.306		115.20V
2	0.087A	0.442	75.685%	0.058
	5.107V	0.584		115.20V
3	0.541A	2.759	79.925%	0.265
	5.096V	3.452		115.18V
4	1.001A	5.091	77.892%	0.371
	5.085V	6.536		115.18V
5	1.501A	7.613	77.692%	0.427
	5.072V	9.799		115.18V
6	2.500A	12.617	75.370%	0.482
	5.046V	16.740		115.19V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.228W	63.341%	0.013
	5.056V	0.36W		230.45V
2	0.09A	0.455W	70.397%	0.023
	5.054V	0.647W		230.42V
3	0.55A	2.773W	80.563%	0.116
	5.04V	3.44W		230.41V
4	1A	5.028W	82.083%	0.191
	5.026V	6.127W		230.4V
5	1.5A	7.519W	82.102%	0.257
	5.011V	9.159W		230.4V
6	3.001A	14.896W	81.232%	0.369
	4.964V	18.339W		230.39V

Protection Features

Protection Features	
OCP (Cold @ 27°C)	12V: 72.6A (134.44%), 12.01V 5V: 28.5A (142.5%), 5.105V 3.3V: 29.1A (145.5%), 3.292V 5VSB: 4.1A (136.67%), 4.928V
OCP (Hot @ 43°C)	12V: 70.2A (130%), 12.01V 5V: 28.1A (140.5%), 5.105V, 135.57mV ripple 3.3V: 28.5A (142.5%), 3.294V 5VSB: 4A (133.33%), 4.925V
OPP (Cold @ 26°C)	750.79W (115.51%)
OPP (Hot @ 43°C)	790.2W (121.57%)
OTP	✓ (110°C @ +12V heat sink)
SCP	12V to Earth: ✓ 5V to Earth: ✓ 3.3V to Earth: ✓ 5VSB to Earth: ✓ -12V to Earth: ✓
PWR_OK	Accurate but lower than 16ms
NLO	✓
Fan Failure Protection	✗
SIP	Surge: MOV Inrush: NTC Thermistor & Bypass relay

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	3.595A	1.963A	1.992A	0.997A	65.01	82.817%	1052	24.8	40.16°C	0.968
	12.073V	5.096V	3.313V	5.016V	78.498				44.37°C	115.14V
20%	8.212A	2.946A	2.991A	1.2A	129.97	87.3%	1059	25.2	40.73°C	0.976
	12.065V	5.094V	3.31V	5.002V	148.881				45.32°C	115.13V
30%	13.181A	3.438A	3.492A	1.404A	194.979	88.394%	1064	25.4	41.21°C	0.98
	12.057V	5.092V	3.308V	4.988V	220.579				46.29°C	115.11V
40%	18.163A	3.93A	3.993A	1.609A	260.069	88.523%	1070	25.6	41.8°C	0.985
	12.049V	5.09V	3.306V	4.974V	293.785				47.4°C	115.1V
50%	22.801A	4.915A	4.995A	1.816A	325.069	88.078%	1226	29.0	42.26°C	0.989
	12.041V	5.088V	3.304V	4.958V	369.069				48.29°C	115.07V
60%	27.408A	5.902A	5.999A	2.001A	389.502	87.46%	1536	36.0	42.68°C	0.991
	12.033V	5.085V	3.301V	4.944V	445.354				49.21°C	115.06V
70%	32.086A	6.89A	7.005A	2.233A	454.914	86.716%	1830	40.6	43.37°C	0.992
	12.024V	5.082V	3.298V	4.928V	524.608				50.43°C	115.04V
80%	36.770A	7.876A	8.011A	2.34A	519.706	85.845%	2021	43.3	43.83°C	0.993
	12.015V	5.079V	3.295V	4.915V	605.401				51.85°C	115.02V
90%	41.862A	8.372A	8.504A	2.448A	585.137	84.93%	2095	44.3	44.25°C	0.993
	12.007V	5.077V	3.293V	4.903V	688.958				53.25°C	115V
100%	46.699A	8.868A	9.027A	3.079A	649.999	83.774%	2104	44.4	45.79°C	0.994
	11.998V	5.075V	3.29V	4.873V	775.897				55.88°C	114.98V
110%	51.411A	9.858A	10.128A	3.085A	714.639	82.49%	2106	44.4	46.54°C	0.994
	11.988V	5.073V	3.288V	4.863V	866.335				57.46°C	114.97V
CL1	0.116A	11.842A	12.012A	0A	101.307	81.221%	1096	25.9	40.29°C	0.983
	12.058V	5.084V	3.305V	5.028V	124.734				48.73°C	115.14V

CL2	0.116A	19.692A	0A	0A	101.397	80.431%	1094	25.9	40.33°C	0.982
	12.064V	5.078V	3.315V	5.036V	126.066				46.94°C	115.14V
CL3	0.116A	0A	19.989A	0A	67.391	75.261%	1063	25.3	40.24°C	0.977
	12.062V	5.1V	3.301V	5.032V	89.541				46°C	115.14V
CL4	54.084A	0A	0A	0A	649.746	84.711%	2095	44.2	45.33°C	0.994
	12.014V	5.09V	3.3V	4.988V	767.024				58.99°C	114.98V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
10%	3.594A	1.962A	1.992A	0.997A	64.998	84.25%	1056	25.1	40.33°C	0.84
	12.075V	5.097V	3.313V	5.017V	77.151				44.53°C	230.37V
20%	8.208A	2.945A	2.991A	1.2A	129.939	88.918%	1060	25.2	40.71°C	0.922
	12.066V	5.094V	3.31V	5.002V	146.135				45.22°C	230.36V
30%	13.178A	3.438A	3.492A	1.404A	194.954	90.309%	1065	25.4	41.14°C	0.94
	12.058V	5.092V	3.307V	4.988V	215.872				46.17°C	230.36V
40%	18.160A	3.93A	3.994A	1.609A	260.048	90.583%	1073	25.5	41.84°C	0.956
	12.050V	5.09V	3.305V	4.974V	287.084				47.36°C	230.36V
50%	22.797A	4.915A	4.996A	1.815A	325.035	90.341%	1185	28.3	42.18°C	0.961
	12.042V	5.088V	3.303V	4.959V	359.787				48.28°C	230.35V
60%	27.394A	5.901A	6A	2A	389.355	89.907%	1505	35.2	42.63°C	0.967
	12.034V	5.085V	3.3V	4.944V	433.063				49.17°C	230.34V
70%	32.070A	6.888A	7.006A	2.232A	454.766	89.391%	1775	39.8	43.08°C	0.972
	12.025V	5.083V	3.297V	4.928V	508.743				50.14°C	230.33V
80%	36.754A	7.874A	8.013A	2.34A	519.559	88.796%	1989	43.0	43.75°C	0.975
	12.016V	5.079V	3.294V	4.915V	585.112				51.89°C	230.32V
90%	41.850A	8.371A	8.505A	2.448A	585.032	88.136%	2097	44.3	44.69°C	0.977
	12.008V	5.077V	3.292V	4.903V	663.78				53.78°C	230.32V
100%	46.695A	8.866A	9.028A	3.079A	649.948	87.268%	2107	44.5	45.75°C	0.979
	11.998V	5.076V	3.29V	4.872V	744.758				55.79°C	230.33V

110%	51.407A	9.855A	10.132A	3.085A	714.618	86.552%	2102	44.4	46.85°C	0.98
	11.989V	5.074V	3.286V	4.863V	825.656				57.7°C	230.32V
CL1	0.116A	11.826A	12.015A	0A	101.311	82.588%	1105	26.3	40.5°C	0.905
	12.057V	5.091V	3.304V	5.028V	122.67				49.31°C	230.39V
CL2	0.116A	19.656A	0A	0A	101.401	81.819%	1092	25.9	40.22°C	0.906
	12.062V	5.087V	3.315V	5.036V	123.934				45.16°C	230.4V
CL3	0.116A	0A	19.999A	0A	67.395	76.373%	1060	25.2	41.34°C	0.859
	12.061V	5.099V	3.3V	5.032V	88.246				44.76°C	230.4V
CL4	54.096A	0A	0A	0A	649.823	88.256%	2088	44.2	45.88°C	0.978
	12.012V	5.087V	3.299V	4.987V	736.301				58.89°C	230.34V

The results above are not used in the certification process

20-80□□□□□

115V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.230A	0.49A	0.498A	0.198A	20.007	68.97%	1037	24.6	36.57°C	0.927
	12.079V	5.098V	3.315V	5.048V	28.999				39.65°C	115.16V
40W	2.707A	0.687A	0.697A	0.298A	40.004	78.524%	1041	24.7	37.14°C	0.96
	12.077V	5.098V	3.314V	5.043V	50.943				40.46°C	115.15V
60W	4.185A	0.883A	0.896A	0.397A	60.003	82.728%	1045	24.7	38.71°C	0.965
	12.075V	5.098V	3.314V	5.038V	72.531				42.25°C	115.15V
80W	5.660A	1.08A	1.096A	0.497A	79.971	85.359%	1049	24.8	39.41°C	0.982
	12.073V	5.097V	3.313V	5.032V	93.69				43.34°C	115.14V

The results above are not used in the certification process

230V

□□	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
20W	1.230A	0.49A	0.498A	0.198A	20	68.884%	1032	24.5	36.52°C	0.607
	12.081V	5.099V	3.314V	5.049V	29.035				39.62°C	230.39V
40W	2.706A	0.687A	0.697A	0.297A	39.997	79.322%	1038	24.6	37.78°C	0.762
	12.079V	5.098V	3.313V	5.044V	50.427				41.08°C	230.38V
60W	4.184A	0.883A	0.896A	0.397A	59.995	84.105%	1046	24.7	38.79°C	0.829
	12.076V	5.098V	3.313V	5.038V	71.334				42.38°C	230.37V
80W	5.658A	1.079A	1.096A	0.497A	79.95	86.591%	1050	24.8	39.02°C	0.865
	12.074V	5.097V	3.312V	5.033V	92.329				42.82°C	230.37V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.13mV	9.85mV	8.04mV	9.02mV	Pass
20% Load	13.38mV	10.71mV	8.09mV	9.53mV	Pass
30% Load	14.50mV	11.53mV	8.59mV	9.99mV	Pass
40% Load	16.13mV	12.09mV	9.31mV	10.60mV	Pass
50% Load	16.49mV	13.01mV	9.81mV	11.51mV	Pass
60% Load	20.15mV	14.08mV	10.48mV	12.58mV	Pass
70% Load	20.40mV	15.91mV	10.99mV	12.99mV	Pass
80% Load	21.78mV	16.17mV	16.12mV	13.60mV	Pass
90% Load	23.00mV	16.88mV	16.43mV	14.37mV	Pass
100% Load	33.00mV	19.95mV	18.49mV	17.69mV	Pass
110% Load	37.77mV	20.82mV	20.49mV	19.01mV	Pass
Crossload1	15.69mV	16.05mV	18.28mV	10.17mV	Pass
Crossload2	13.74mV	16.17mV	9.61mV	10.39mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	13.74mV	10.81mV	20.14mV	8.05mV	Pass
Crossload4	36.43mV	16.76mV	12.83mV	13.04mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.29mV	7.96mV	6.46mV	6.22mV	Pass
20% Load	11.65mV	8.31mV	6.46mV	7.90mV	Pass
30% Load	13.64mV	9.39mV	6.81mV	7.49mV	Pass
40% Load	14.40mV	10.56mV	6.81mV	8.15mV	Pass
50% Load	14.91mV	10.71mV	7.63mV	9.22mV	Pass
60% Load	17.25mV	11.53mV	7.98mV	9.63mV	Pass
70% Load	17.76mV	12.34mV	9.26mV	10.09mV	Pass
80% Load	20.05mV	13.87mV	14.95mV	11.16mV	Pass
90% Load	21.57mV	14.33mV	15.11mV	10.80mV	Pass
100% Load	30.95mV	18.24mV	17.39mV	13.92mV	Pass
110% Load	35.87mV	18.01mV	19.16mV	15.47mV	Pass
Crossload1	13.17mV	14.44mV	17.81mV	7.56mV	Pass
Crossload2	11.86mV	14.08mV	8.24mV	8.10mV	Pass
Crossload3	11.65mV	8.73mV	18.87mV	5.66mV	Pass
Crossload4	33.50mV	13.48mV	10.27mV	9.25mV	Pass

The results above are not used in the certification process

Gamer Storm PL650D





Top side Power specifications label

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