ASUS ROG-STRIX-650G

K7YEKG007689ZAB

Lab ID AS19650103

Certification ID 25808

Test Result Report ID: 19PS808A

Certificate Issue Date: Jul 9, 2019

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



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	ASUS
Model	ROG-STRIX-650G
OEM/ODM	Seasonic
Serial Number	K7YEKG007689ZAB
Product Specifications	
Manufacturer-Provided Information	
□□□□ (Vrms)	100-240
□□□□ (Arms)	9-4.5
□□□□ (Hz)	47-63

□□□□ (W)	650
Operating Temperature (Continuous Full Load) (°C)	
□□	ATX12V
□□□□	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
□□	140mm Double Ball-Bearing Fan (FB14025BH)
□□□□□	✓ (selectable)
Cybenetics Testing Information	
Lab ID	AS19650103
Date of receipt	Aug 27, 2019
Testing Date	Apr 9, 2019
Report Issued Date	Jul 9, 2019
□□□□□	RSSS03-650G1
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

□□□□ (Non-accredited measurements)

□□□□□				
□□	□□□□	□□□□□□	Gauge	In Cable Capacitors
ATX □□ 20+4 pin (610mm)	1	1	18-22AWG	□
4+4 pin EPS 12V □□ (1000mm)	2	2	18AWG	□
6+2pin PCIe□□ (680mm+80mm)	2	4	18AWG	□
SATA□□ (450mm+115mm+115mm+115mm)	1	4	18AWG	□
SATA□□ (410mm+150mm+150mm+150mm)	1	4	18AWG	□
□ 4pin Molex□□ (450mm+120mm+120mm)	1	3	18AWG	□
AC Power Cord (1400mm) - C13 coupler (EU)	1	1	18AWG	-

AC Power Cord (1370mm) - C13 coupler (British)	1	1	18AWG	-

□□□□

□		3.3V	5V	12V	5VSB	-12V
□□□□	□□	20	20	54	3	0.3
	□	100		648	15	3.6
□□□□□ (W)		650				

Parts Description

General Data	
Manufacturer (OEM)	Seasonic
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x Discharge IC
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU1006 (600V, 10A @ 100°C)
APFC MOSFETS	2x Infineon IPA50R190CE (500V, 15.7A @ 100°C, 0.19Ohm)
APFC Boost Diode	1x NXP BYC8-600 (600V, 8A @ 109°C)
Hold-up Cap(s)	1x Hitachi (400V, 470uF, 2,000h @ 105°C, HU)
Main Switchers	4x Champion GPT10N50ADG (500V, 9.7A, 0.7Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controllers	Champion CM6901T6
Topology	Primary side: Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nexperia PSMN2R6-40YS (40V, 100A @ 100°C, 3.7mOhm @ 100°C)
5V & 3.3V	DC-DC Converters:4x ON Semiconductor NTMFS4C028N (30V, 12.3A @ 80°C, 4.73mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytics: 3x Nippon Chemi-Con (105°C, W), 5x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 5x Nichicon (4-10,000h @ 105°C, HE),1x Rubycon (3-6,000h @ 105°C, YXG) Polymers: 25x FPCAP
Supervisor IC	Weltrend WT7527V (OCP, OVP, UVP, SCP, PG
Fan Model	Everflow FB14025BH (135mm, 12V, 0.60A, Ball Bearing Fan)

5VSB Circuit	
Rectifier	1x PFC P10V45SP SBR (45V, 10A)
Standby PWM Controller	Excelliance MOS EM8569

Test Results

Temperature & Compliance Info

□□□□ (°C /°F)	28-32 / 82.4-89.6
□□ ErP Lot3/6□□	✓
□□ (EU) No 617/2013□□	✓

Performance Summary

115V

Accredited	
□□□□ (>1450 load combinations)	88.856%
Average Noise Output (>1450 Load Combinations)	21.29dBA
PF□□□ (>1450 Load Combinations)	0.984
Efficiency With 10W (≤500W) or 2% (>500W) Load	61.197%
□□□□□□	0.0562W
Non-Accredited	
12V Ripple (Full Load)	26.64mV
5V Ripple (Full Load)	9.24mV
3.3V Ripple (Full Load)	17.75mV
5VSB Ripple (Full Load)	12.19mV
12V Load Regulation	0.10%
5V Load Regulation	0.76%
3.3V Load Regulation	0.90%
5VSB Load Regulation	2.88%
Inrush Current	46.528A

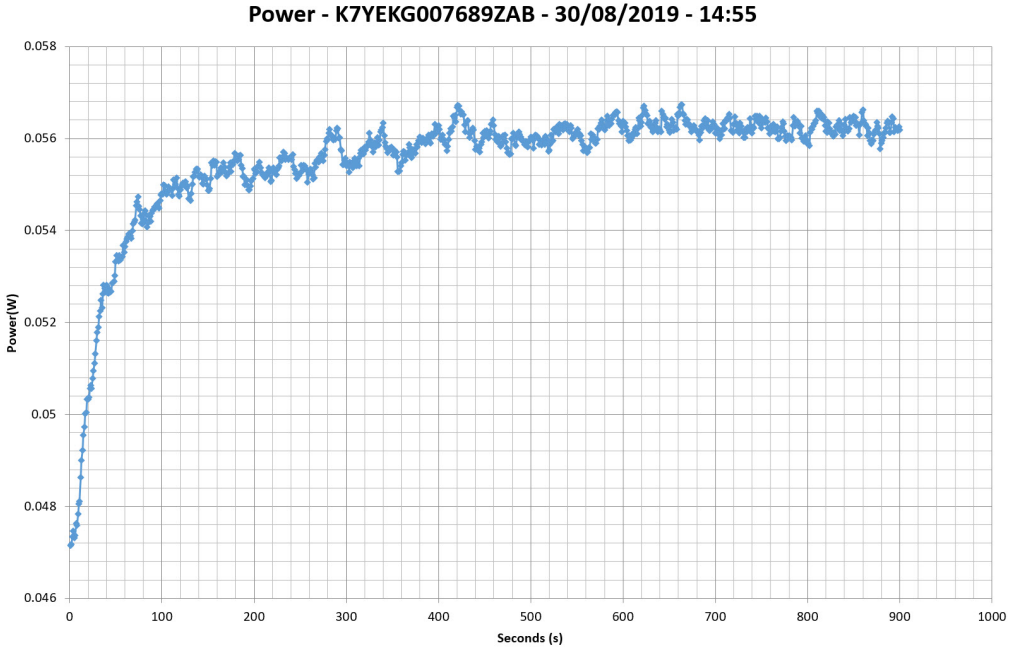
230V		
Accredited		
□□□□ (>1450 load combinations)		90.935%
Average Noise Output (>1450 Load Combinations)		20.59dBA
PF□□□ (>1450 Load Combinations)		0.934
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
□□□□□□		0.0782W
Non-Accredited		
12V Ripple (Full Load)		26.67mV
5V Ripple (Full Load)		8.49mV
3.3V Ripple (Full Load)		18.84mV
5VSB Ripple (Full Load)		11.41mV
12V Load Regulation		0.21%
5V Load Regulation		0.86%
3.3V Load Regulation		1.05%
5VSB Load Regulation		2.91%
Inrush Current		56.045A
□□□□ & PG□□		20.50ms
AC Loss to PWR_OK Hold Up Time		16.70ms
PWR_OK Inactive to DC Loss Delay		3.80ms
PSU Timings: T1 (20% / 100%)	76.0ms	84.0ms
PSU Timings: T3 (20% / 100%)	306.0ms	306.0ms
OPP (0.00°C / 0.00°C)	132.37%	-

□□□□ & PG□□

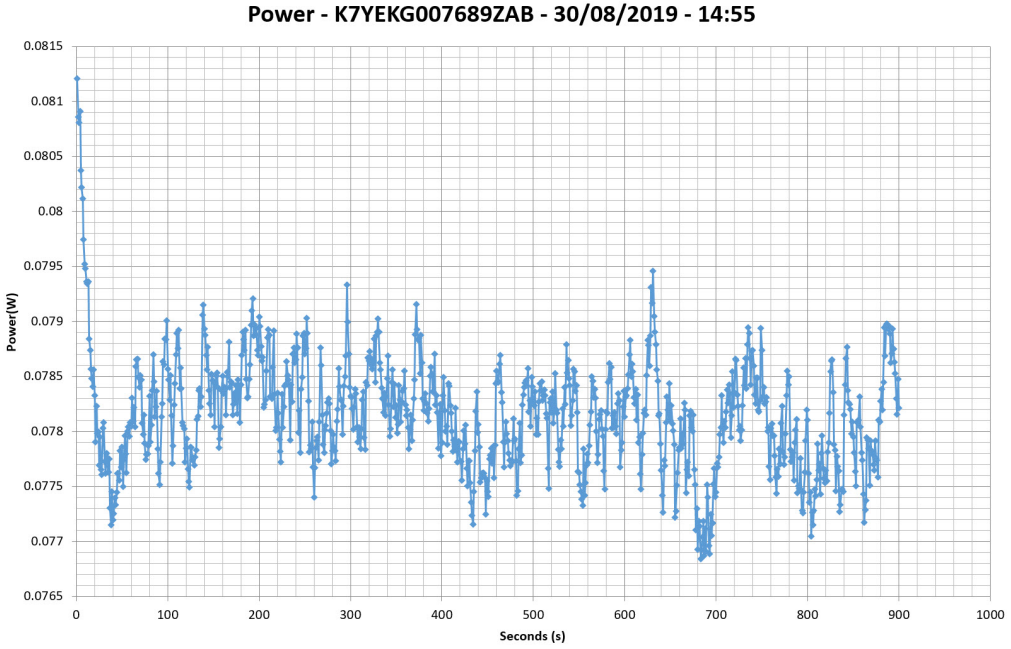
Hold-Up Time (ms)	20.5
AC Loss to PWR_OK Hold Up Time (ms)	16.7
PWR_OK Inactive to DC Loss Delay (ms)	3.8

Graphs

115V



230V



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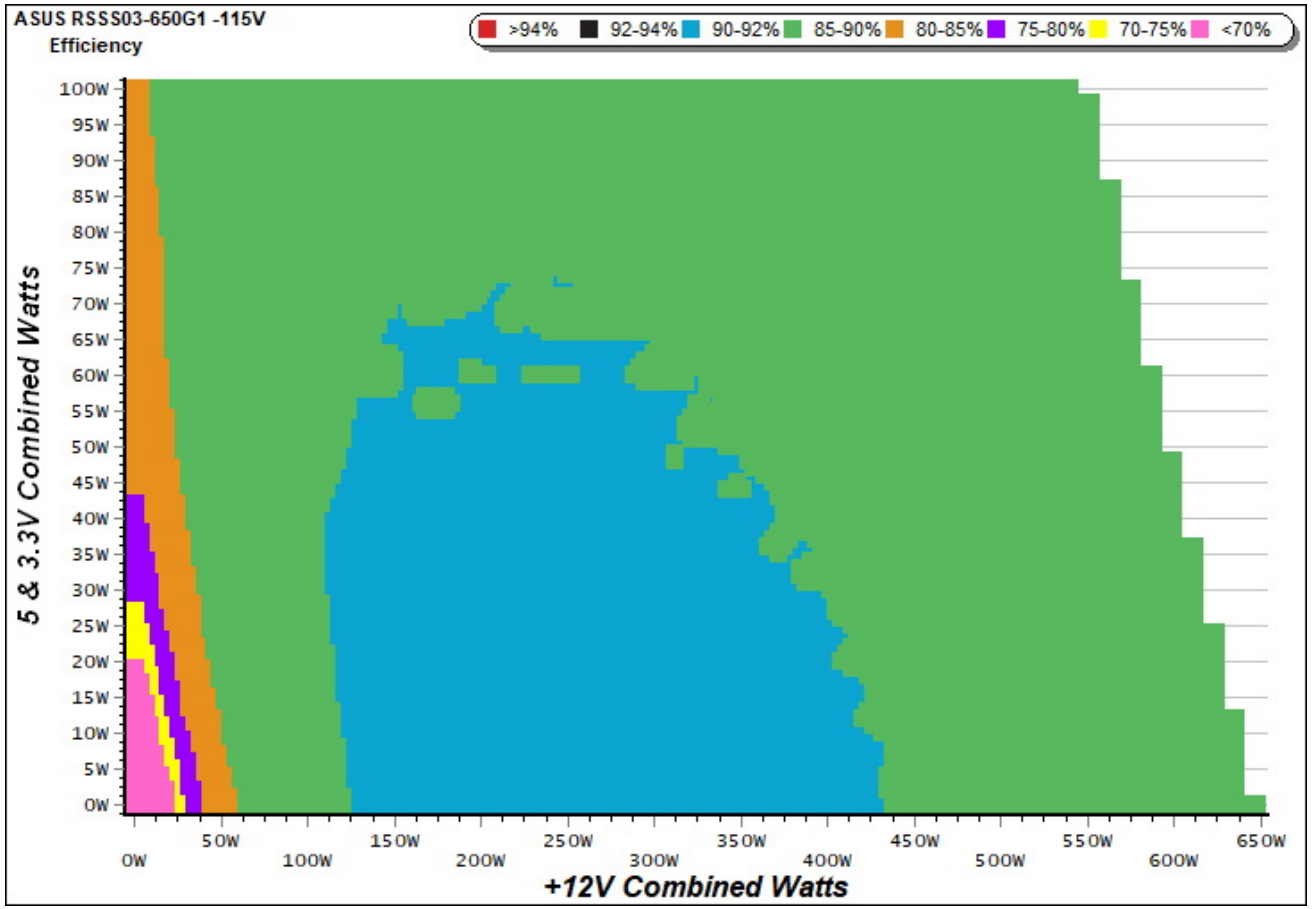
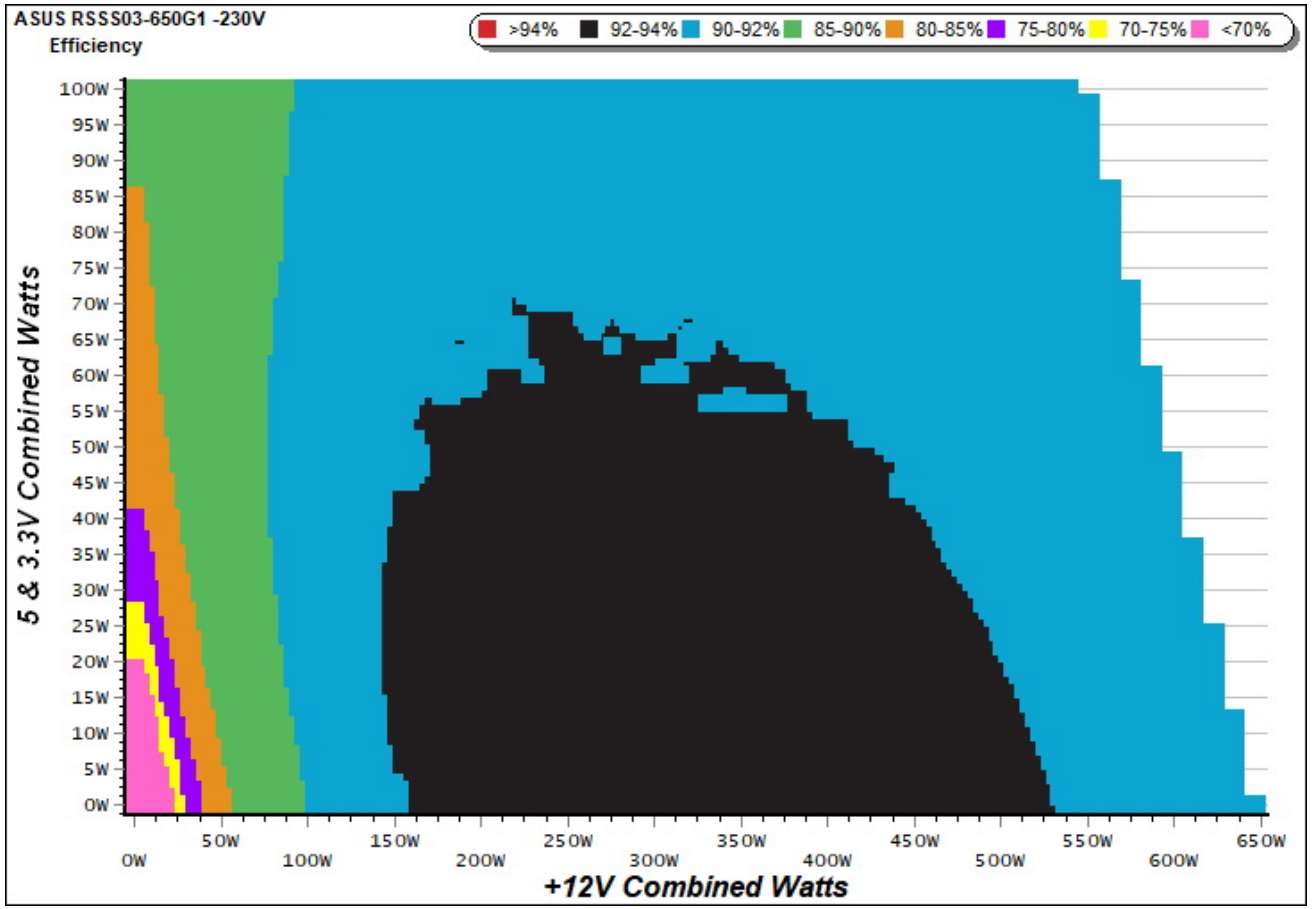
115V



□□

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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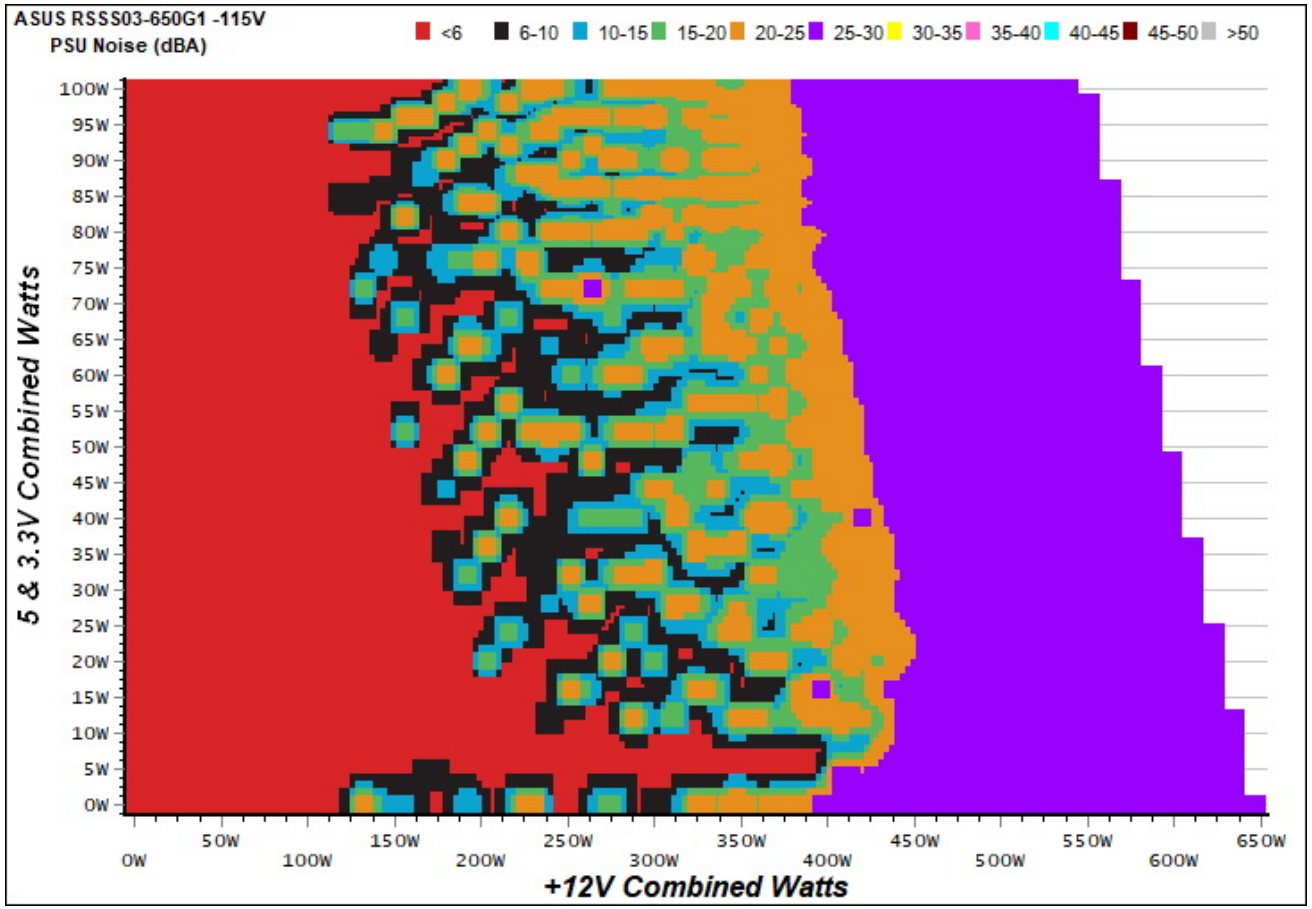
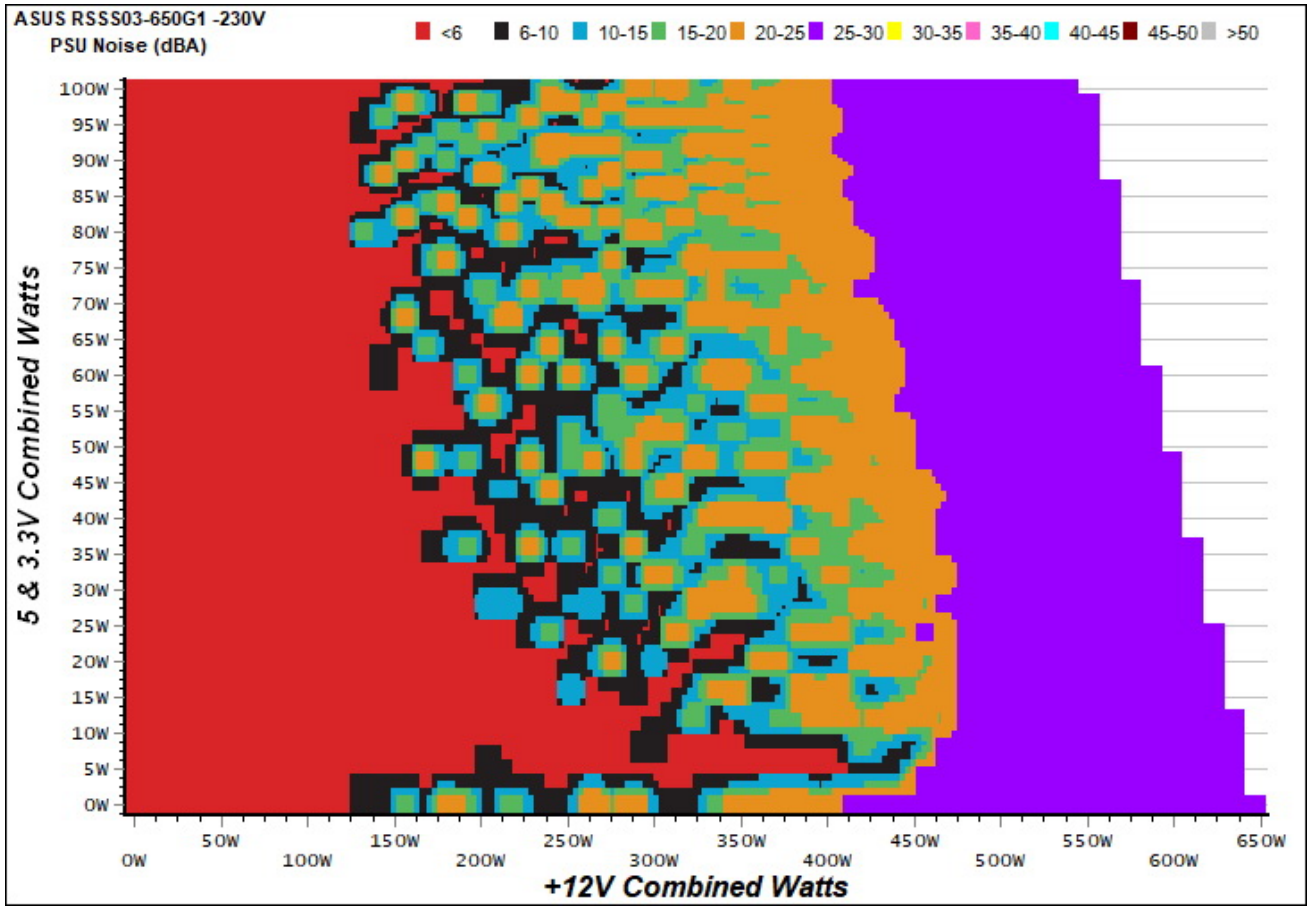
115V



□□

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%	0 RPM · <6.0 dB(A) · 45.1 °C	0 RPM · <6.0 dB(A) · 45.1 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 46.6 °C	0 RPM · <6.0 dB(A) · 46.6 °C	fan off in both
50%	684 RPM · 19.6 dB(A) · 42.2 °C	684 RPM · 19.6 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	1459 RPM · 40.1 dB(A) · 45.8 °C	1459 RPM · 40.1 dB(A) · 45.8 °C	**+0.0 dB(A)**

230V

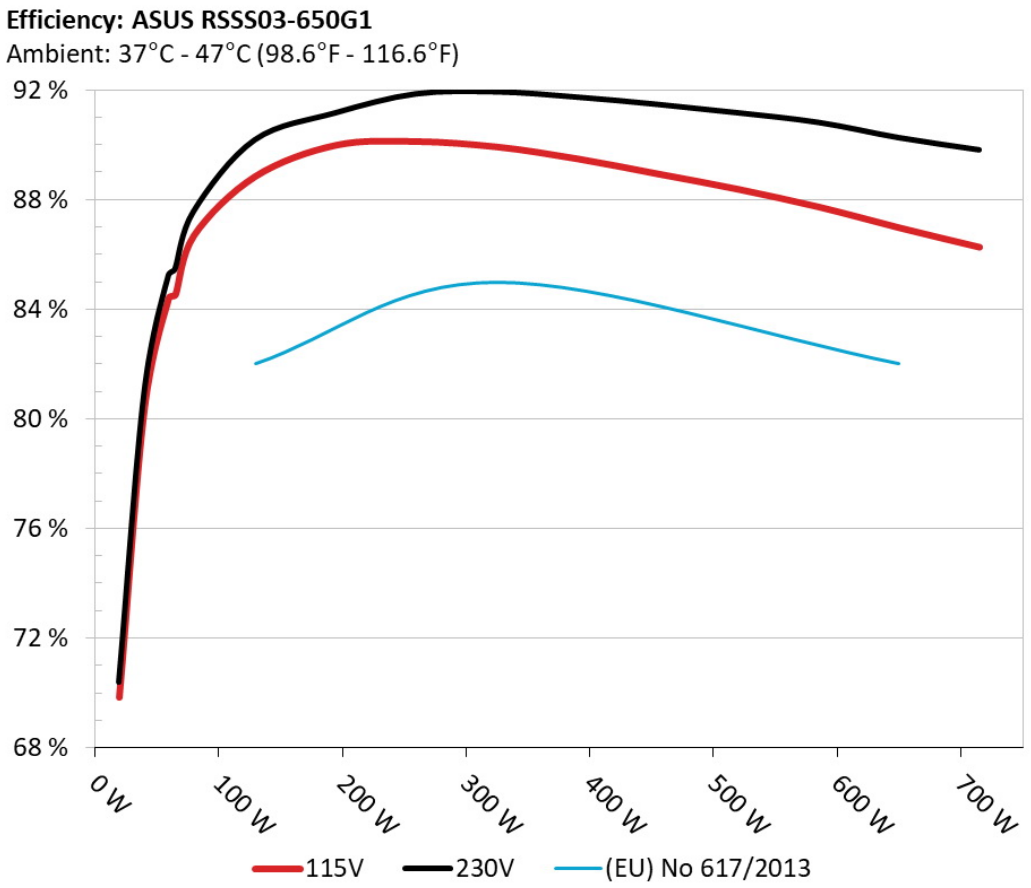
Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	0 RPM · <6.0 dB(A) · 44.8 °C	0 RPM · <6.0 dB(A) · 44.8 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 45.8 °C	0 RPM · <6.0 dB(A) · 45.8 °C	fan off in both
50%	708 RPM · 20.3 dB(A) · 42.2 °C	708 RPM · 20.3 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	1499 RPM · 40.6 dB(A) · 46.0 °C	1499 RPM · 40.6 dB(A) · 46.0 °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.

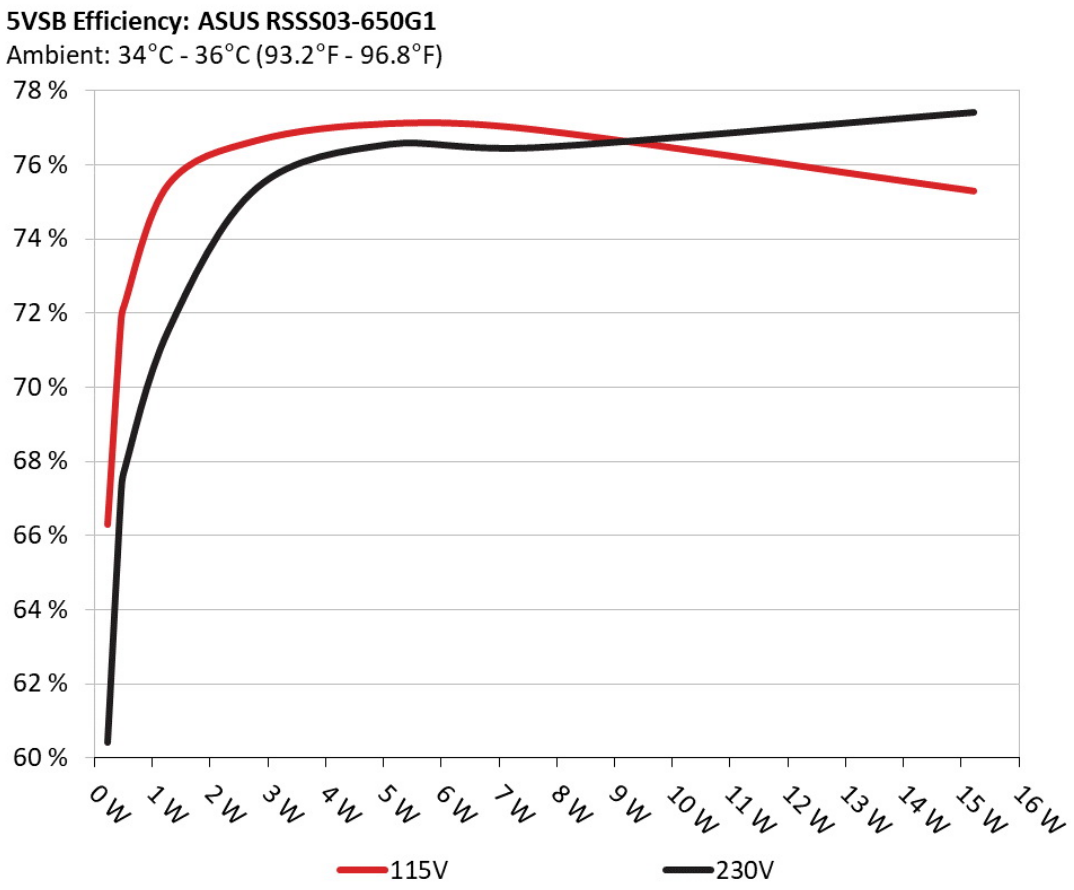
Informational. Not part of the ETA or LAMBDA rating.

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	0.045A	0.232	66.286%	0.057
	5.138V	0.350		115.17V
2	0.090A	0.463	71.783%	0.101
	5.137V	0.645		115.17V
3	0.550A	2.820	76.672%	0.334
	5.126V	3.678		115.17V
4	1.000A	5.118	77.125%	0.403
	5.116V	6.636		115.17V
5	1.500A	7.660	76.954%	0.438
	5.105V	9.954		115.16V
6	3.000A	15.209	75.303%	0.483
	5.069V	20.197		115.16V

230V

□□ #	5VSB	DC/AC (□)	□□	PF/AC □□
1	0.045A	0.232	60.417%	0.012
	5.138V	0.384		230.37V
2	0.090A	0.463	67.101%	0.034
	5.136V	0.690		230.37V
3	0.550A	2.820	75.381%	0.160
	5.126V	3.741		230.36V
4	1.000A	5.118	76.548%	0.240
	5.116V	6.686		230.36V
5	1.500A	7.659	76.460%	0.296
	5.105V	10.017		230.36V
6	3.000A	15.218	77.406%	0.371
	5.072V	19.660		230.36V

Supplementary Tests (For Reference)

10-110%□□□□

115V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.583A	1.999A	1.989A	0.980A	65.022	84.513%	0	<6.0	45.07°C	0.951
	12.116V	5.006V	3.318V	5.106V	76.937				39.34°C	115.18V
2	8.137A	3.002A	2.987A	1.178A	129.511	88.832%	0	<6.0	46.60°C	0.977
	12.117V	5.001V	3.315V	5.093V	145.794				40.53°C	115.18V
3	13.088A	3.504A	3.473A	1.378A	194.639	89.971%	331	7.6	40.97°C	0.986
	12.120V	4.997V	3.312V	5.080V	216.336				47.45°C	115.18V
4	18.041A	4.005A	3.988A	1.579A	259.865	90.109%	813	24.6	41.38°C	0.988
	12.120V	4.995V	3.310V	5.068V	288.389				48.30°C	115.18V
5	22.665A	5.009A	4.990A	1.781A	325.164	89.909%	684	19.6	42.23°C	0.990
	12.118V	4.992V	3.307V	5.055V	361.659				49.54°C	115.17V
6	27.225A	6.018A	5.994A	1.984A	389.684	89.481%	852	25.5	42.76°C	0.991
	12.116V	4.988V	3.304V	5.042V	435.492				50.62°C	115.17V
7	31.848A	7.025A	6.999A	2.189A	454.998	88.928%	862	25.8	43.48°C	0.991
	12.116V	4.985V	3.301V	5.027V	511.645				52.08°C	115.17V
8	36.469A	8.034A	8.005A	2.394A	520.308	88.363%	891	26.6	43.67°C	0.992
	12.117V	4.980V	3.298V	5.014V	588.833				53.20°C	115.17V
9	41.492A	8.544A	8.499A	2.398A	585.237	87.722%	1157	33.6	44.23°C	0.992
	12.116V	4.976V	3.295V	5.005V	667.147				54.40°C	115.17V
10	46.258A	9.055A	9.024A	3.011A	650.084	86.964%	1459	40.1	45.82°C	0.993
	12.114V	4.971V	3.291V	4.983V	747.529				56.73°C	115.17V
11	51.618A	9.064A	9.036A	3.016A	714.922	86.257%	1784	45.3	46.60°C	0.993
	12.112V	4.967V	3.287V	4.974V	828.832				58.28°C	115.17V
CL1	0.158A	12.002A	12.001A	0.000A	101.506	84.522%	366	8.5	42.55°C	0.972
	12.131V	4.993V	3.305V	5.103V	120.094				49.90°C	115.19V

CL2	54.024A	1.003A	1.001A	1.000A	667.674	87.431%	1562	41.6	46.07°C	0.993
	12.112V	4.978V	3.297V	5.042V	763.658				57.03°C	115.17V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	□□ (□□ /□□)	PF/AC □□
1	3.576A	1.999A	1.988A	0.979A	64.921	85.440%	0	<6.0	44.76°C	0.752
	12.115V	5.005V	3.317V	5.106V	75.984				40.14°C	230.35V
2	8.131A	3.002A	2.987A	1.178A	129.424	90.167%	0	<6.0	45.78°C	0.880
	12.117V	4.999V	3.313V	5.092V	143.538				40.56°C	230.35V
3	13.084A	3.505A	3.473A	1.378A	194.636	91.151%	768	22.8	41.42°C	0.925
	12.124V	4.996V	3.310V	5.079V	213.531				46.92°C	230.37V
4	18.037A	4.008A	3.991A	1.579A	259.837	91.844%	785	23.6	41.52°C	0.946
	12.121V	4.993V	3.307V	5.067V	282.912				47.54°C	230.37V
5	22.661A	5.013A	4.993A	1.781A	325.111	91.918%	708	20.3	42.16°C	0.958
	12.118V	4.989V	3.304V	5.053V	353.698				48.64°C	230.37V
6	27.221A	6.021A	5.999A	1.985A	389.625	91.727%	850	25.4	42.59°C	0.966
	12.116V	4.985V	3.300V	5.040V	424.768				49.69°C	230.38V
7	31.849A	7.031A	7.005A	2.190A	454.965	91.462%	862	25.8	43.01°C	0.971
	12.115V	4.980V	3.297V	5.025V	497.435				50.72°C	230.38V
8	36.470A	8.041A	8.019A	2.395A	520.282	91.152%	891	26.6	43.40°C	0.975
	12.116V	4.975V	3.293V	5.011V	570.786				51.77°C	230.37V
9	41.493A	8.552A	8.513A	2.399A	585.201	90.803%	1136	33.2	44.04°C	0.978
	12.115V	4.971V	3.289V	5.003V	644.475				53.51°C	230.38V
10	46.259A	9.066A	9.039A	3.013A	650.064	90.247%	1499	40.6	45.97°C	0.980
	12.113V	4.966V	3.286V	4.980V	720.317				56.16°C	230.39V
11	51.619A	9.072A	9.050A	3.018A	714.889	89.803%	1784	45.3	46.63°C	0.982
	12.111V	4.962V	3.283V	4.972V	796.066				57.91°C	230.39V
CL1	0.154A	12.002A	12.000A	0.000A	101.394	85.549%	0	<6.0	48.32°C	0.850
	12.131V	4.990V	3.303V	5.102V	118.521				42.09°C	230.39V

CL2	54.023A	1.002A	1.000A	1.000A	667.540	90.848%	1550	41.2	45.91°C	0.981
	12.110V	4.976V	3.295V	5.041V	734.789				56.16°C	230.39V

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 □□
1	1.209A	0.501A	0.480A	0.195A	19.747	69.854%	0	<6.0	0.787
	12.106V	5.016V	3.326V	5.131V	28.269				115.18V
2	2.460A	1.000A	0.994A	0.391A	40.098	80.381%	0	<6.0	0.907
	12.108V	5.009V	3.321V	5.124V	49.885				115.18V
3	3.651A	1.499A	1.477A	0.587A	59.627	84.391%	0	<6.0	0.945
	12.110V	5.008V	3.320V	5.116V	70.656				115.18V
4	4.904A	2.000A	1.989A	0.783A	80.013	86.680%	0	<6.0	0.963
	12.113V	5.006V	3.318V	5.109V	92.309				115.18V

The results above are not used in the certification process

230V

□□ #	12V	5V	3.3V	5VSB	DC/AC (□)	□□	□□□□ (RPM)	□□□□□□□ (dB[A])	PF/AC □□
1	1.201A	0.500A	0.479A	0.195A	19.643	70.390%	0	<6.0	0.491
	12.108V	5.015V	3.325V	5.131V	27.906				230.37V
2	2.452A	1.000A	0.993A	0.390A	39.995	80.935%	0	<6.0	0.623
	12.109V	5.008V	3.320V	5.124V	49.416				230.35V
3	3.644A	1.498A	1.474A	0.587A	59.524	85.203%	0	<6.0	0.728
	12.110V	5.007V	3.319V	5.116V	69.861				230.35V
4	4.896A	1.999A	1.989A	0.783A	79.908	87.554%	0	<6.0	0.796
	12.113V	5.005V	3.317V	5.109V	91.267				230.35V

The results above are not used in the certification process

□□□□

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.4 mV	5.7 mV	11.1 mV	8.4 mV	Pass
20% Load	15.7 mV	5.5 mV	11.5 mV	9.2 mV	Pass
30% Load	18.7 mV	6.0 mV	12.3 mV	10.5 mV	Pass
40% Load	21.0 mV	7.0 mV	12.5 mV	10.0 mV	Pass
50% Load	22.7 mV	7.1 mV	13.7 mV	9.5 mV	Pass
60% Load	20.2 mV	7.2 mV	14.3 mV	10.1 mV	Pass
70% Load	19.5 mV	7.0 mV	14.1 mV	9.8 mV	Pass
80% Load	19.3 mV	7.0 mV	16.0 mV	11.1 mV	Pass
90% Load	20.0 mV	7.6 mV	18.1 mV	11.5 mV	Pass
100% Load	26.6 mV	9.2 mV	17.8 mV	12.2 mV	Pass
110% Load	30.3 mV	8.9 mV	18.1 mV	12.5 mV	Pass
Crossload 1	17.8 mV	8.4 mV	17.2 mV	10.3 mV	Pass
Crossload 2	27.4 mV	6.9 mV	13.3 mV	11.4 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.9 mV	5.5 mV	11.9 mV	8.7 mV	Pass
20% Load	15.6 mV	5.9 mV	18.0 mV	12.5 mV	Pass
30% Load	18.5 mV	6.1 mV	12.2 mV	9.2 mV	Pass
40% Load	20.7 mV	6.5 mV	13.1 mV	9.4 mV	Pass
50% Load	23.0 mV	7.7 mV	14.6 mV	10.6 mV	Pass
60% Load	20.2 mV	7.0 mV	14.3 mV	11.5 mV	Pass
70% Load	19.7 mV	7.2 mV	26.8 mV	24.0 mV	Pass
80% Load	20.1 mV	7.1 mV	18.3 mV	12.8 mV	Pass





Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	20.8 mV	7.4 mV	16.8 mV	10.0 mV	Pass
100% Load	26.7 mV	8.5 mV	18.8 mV	11.4 mV	Pass
110% Load	29.9 mV	8.6 mV	18.9 mV	11.4 mV	Pass
Crossload 1	17.0 mV	8.2 mV	18.4 mV	10.5 mV	Pass
Crossload 2	26.9 mV	7.4 mV	14.2 mV	10.5 mV	Pass

The results above are not used in the certification process

ASUS ROG-STRIX-650G

Top side

Power specifications label

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