Kolink Enclave 700W

Serial Number KOL-018-0619000003

Lab ID KL19700092

Certification ID 25789

Test Result Report ID:

Certificate Issue Date: Aug 22, 2019

Scheme: ETA-EMI PSU

115V 230V

Scheme: LAMBDA PSU

115V 230V

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	Kolink
Model	Enclave 700W
OEM/ODM	Kolink
Serial Number	KOL-018-0619000003
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	
Rated Frequency (Hz)	50-60

Rated Power (W)	700
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 (EFS-12E12H)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	KL19700092
Date of receipt	Jul 31, 2019
Testing Date	May 8, 2019
Report Issued Date	Aug 22, 2019
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 (500mm)	1	1	18-22AWG	No
4+4 pin EPS12V (650mm)	1	1	18AWG	No
6+2 pin PCIe (600mm+100mm)	2	4	18AWG	No
SATA (450mm+120mm+120mm)	2	6	20AWG	No
SATA (450mm) / 4 pin Molex (+120mm+120mm)	2	2 / 4	20AWG	No

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	16	16	58	3	0.5
	Watts	100		696	15	6
Total Max. Power (W)		700				

Parts Description

General Data	
Manufacturer (OEM)	Kolink
PCB Type	Double Sided
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x GBU1506 (600V, 15A @ 100°C)
APFC MOSFETS	2x Infineon IPA50R190CE (550V, 15.7A @ 100°C, 0.19Ohm)
APFC Boost Diode	1x Infineon IDH06G65C6 (650V, 6A @ 145°C)
Hold-up Cap(s)	1x Teapo (420V, 560uF, 2,000h @ 105°C, LG)
Main Switchers	4x Great Power GPT13N50D (500V, 13A, 0.49Ohm)
APFC Controller	On Semiconductor NCP1654
Resonant Controllers	Champion CM6901T6
Topology	Primary side: Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nexperia PSMN1R4-40YLD (40V, 214A @ 100°C, 2.65mOhm @ 175°C)
5V & 3.3V	DC-DC Converters:4x Excelliance MOS EMB09N03HR (30V, 35A @ 100°C, 9.5mOhm) PWM Controllers: ANPEC APW7159
Filtering Capacitors	Electrolytics: 7x Teapo (1-3,000h @ 105°C, SC), 3x Teapo (2,000h @ 105°C, SH),1x Asia'x (105°C, TMX) Polymers: 8x Teapo
Supervisor IC	IN1S313I-DAG & UTC393
Fan Model	DWPH EFS-12E12H (120mm, 12V, 0.50A, Rifle Bearing Fan)
5VSB Circuit	

Rectifier	1x MBR2045CT SBR (45V, 20A)
Standby PWM Controller	Infineon ICE2QR4765

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)	88.970%
Average Noise Output (>1450 Load Combinations)	21.60dBA
Average PF (>1450 Load Combinations)	0.990
Efficiency With 10W (≤500W) or 2% (>500W) Load	58.362%
Standby Power Consumption	0.0878W
Non-Accredited	
12V Ripple (Full Load)	53.94mV
5V Ripple (Full Load)	-
3.3V Ripple (Full Load)	-
5VSB Ripple (Full Load)	20.51mV
12V Load Regulation	1.00%
5V Load Regulation	-
3.3V Load Regulation	-
5VSB Load Regulation	3.49%
Inrush Current	26.122A

230V		
Accredited		
Average Efficiency (>1450 load combinations)		90.939%
Average Noise Output (>1450 Load Combinations)		22.06dBA
Average PF (>1450 Load Combinations)		0.952
Efficiency With 10W (≤500W) or 2% (>500W) Load		-
Standby Power Consumption		0.1389W
Non-Accredited		
12V Ripple (Full Load)		55.73mV
5V Ripple (Full Load)		-
3.3V Ripple (Full Load)		-
5VSB Ripple (Full Load)		16.42mV
12V Load Regulation		0.95%
5V Load Regulation		-
3.3V Load Regulation		-
5VSB Load Regulation		3.43%
Inrush Current		75.327A
Hold-Up Time & PWR_OK Signal		22.00ms
AC Loss to PWR_OK Hold Up Time		18.00ms
PWR_OK Inactive to DC Loss Delay		4.00ms
PSU Timings: T1 (20% / 100%)	60.0ms	60.0ms
PSU Timings: T3 (20% / 100%)	128.0ms	128.0ms
OPP (0.00°C / 0.00°C)	134.19%	-

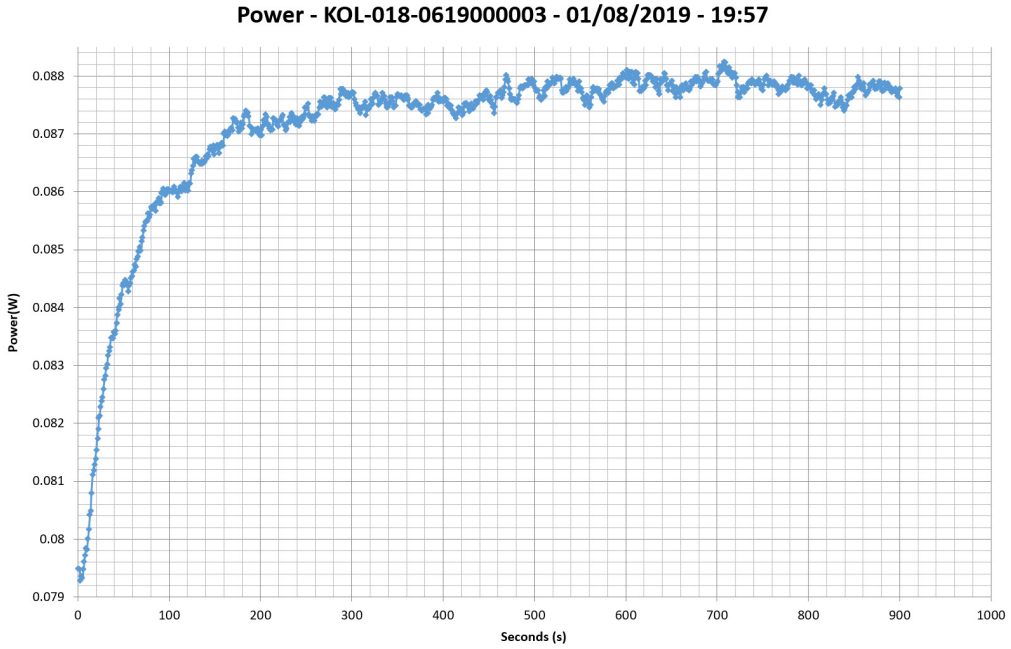
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	22
AC Loss to PWR_OK Hold Up Time (ms)	18
PWR_OK Inactive to DC Loss Delay (ms)	4

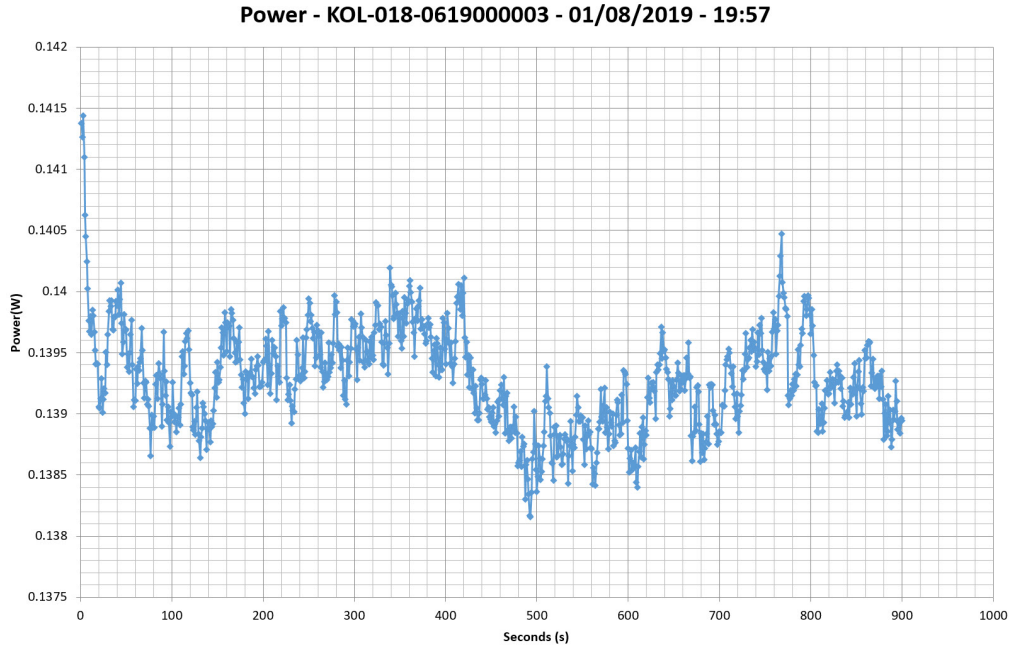
Vampire Power

Graphs

115V

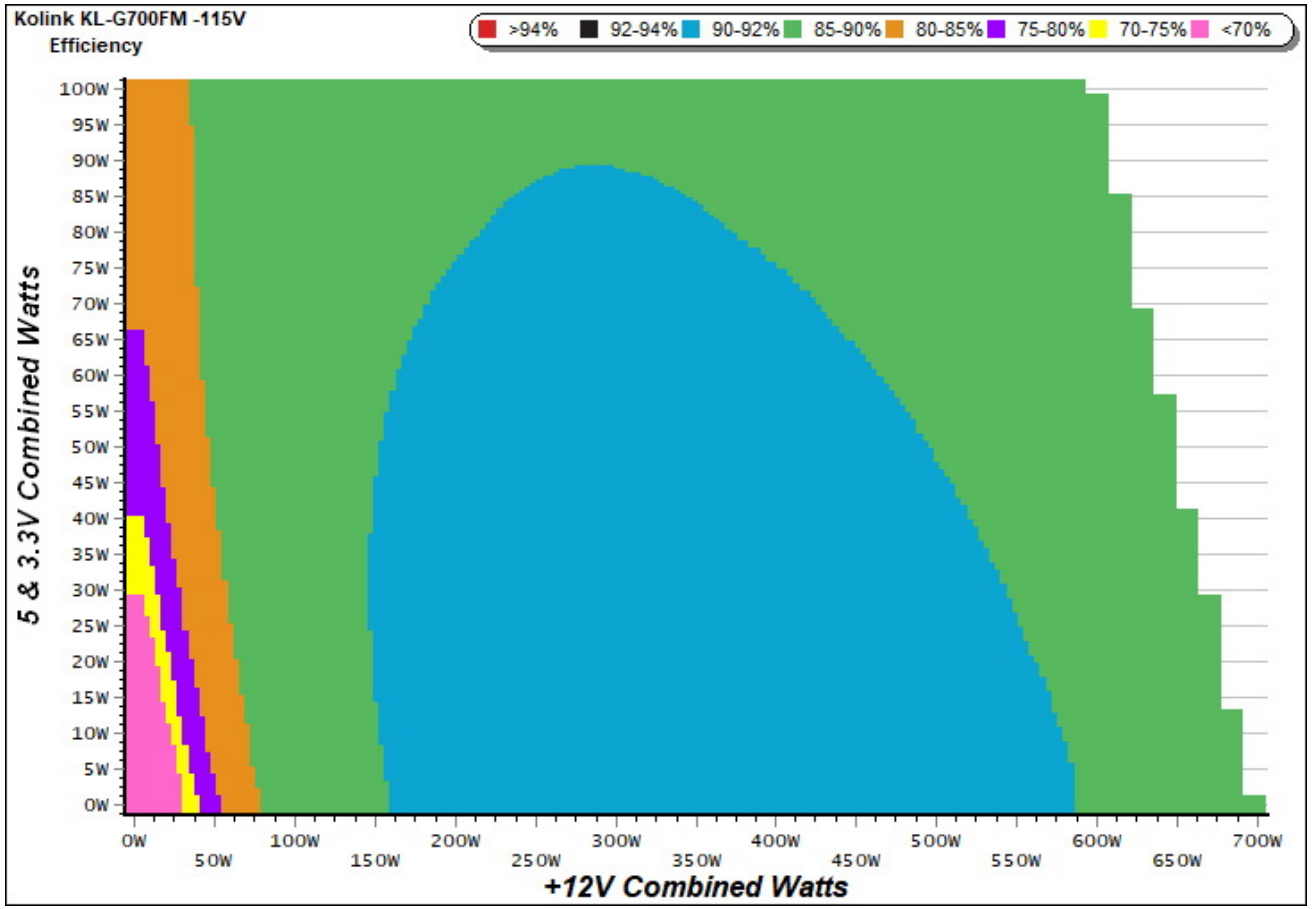


230V



Efficiency Graph

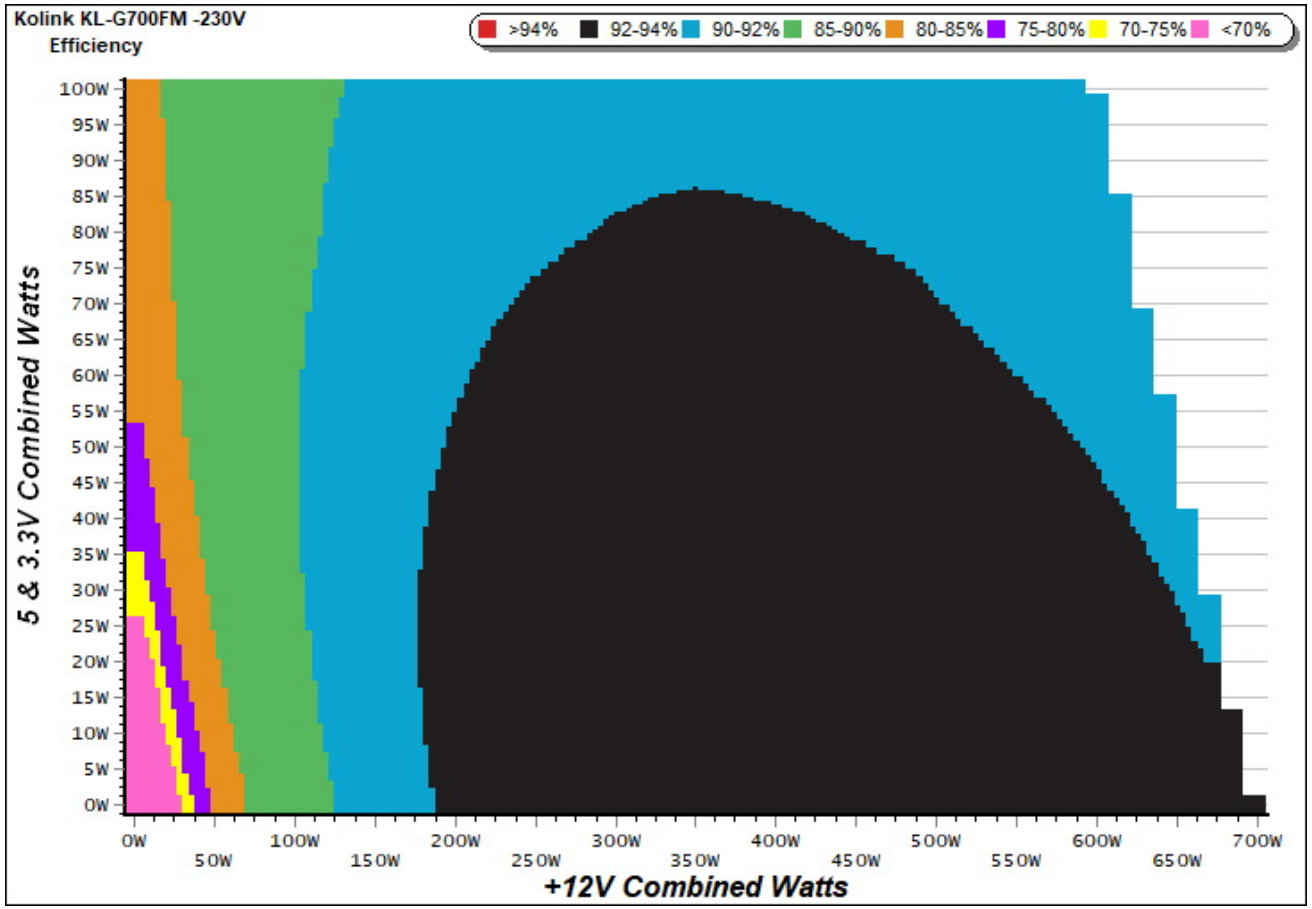
115V



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

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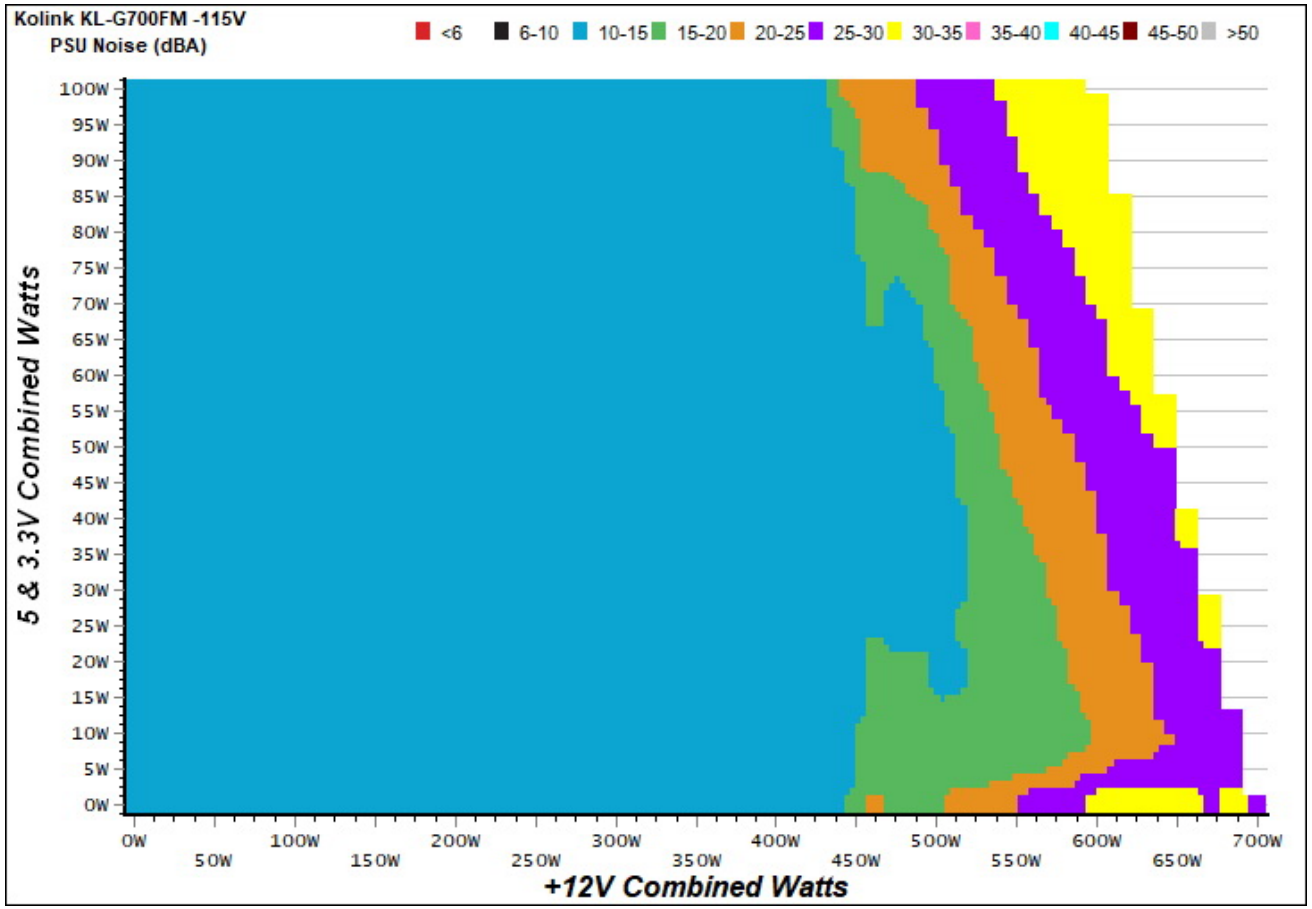
Noise Graph

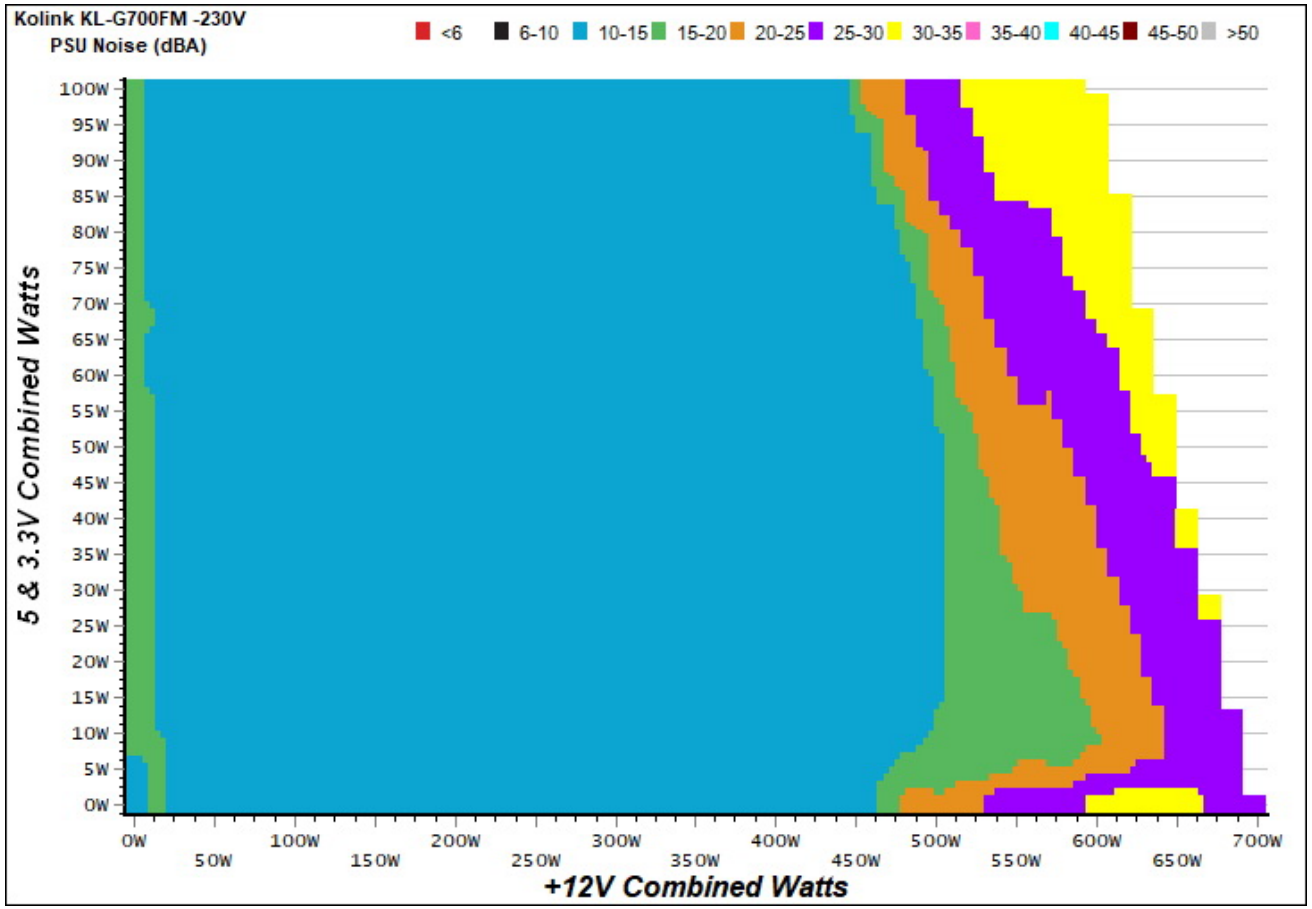
115V



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

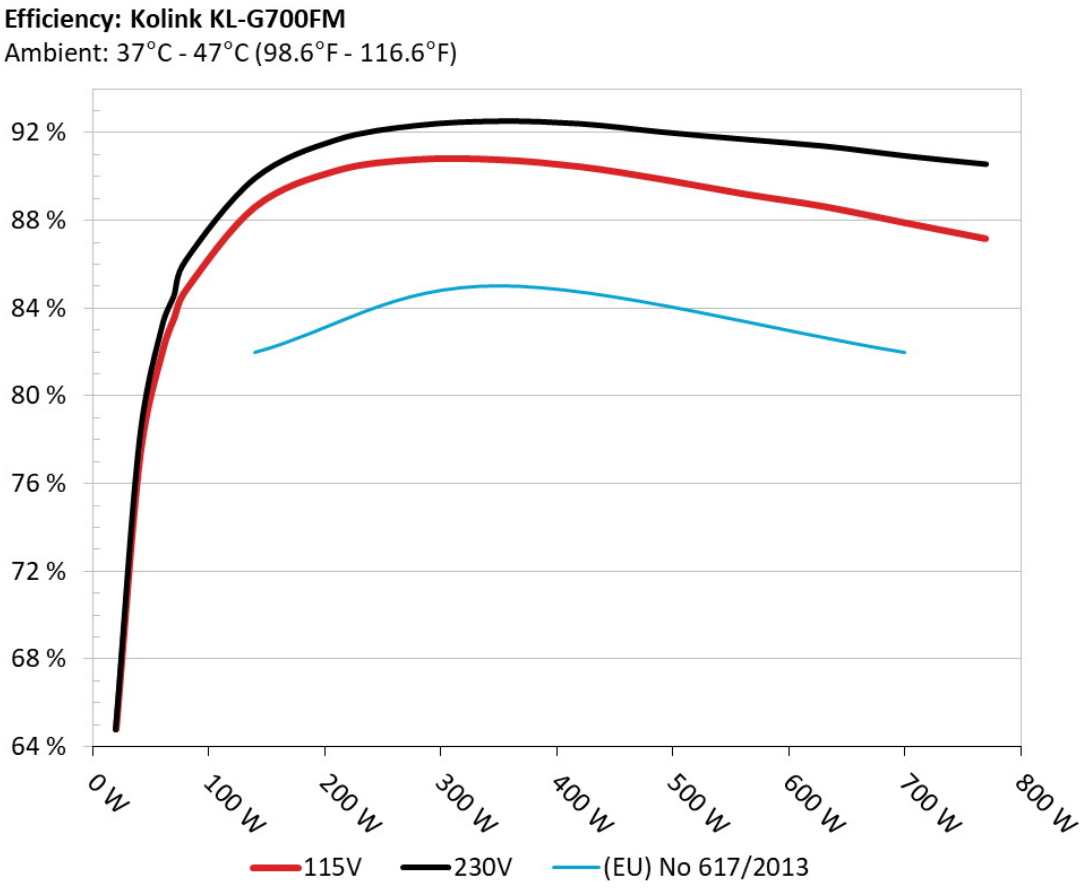


INFO

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.

Indicative Performance

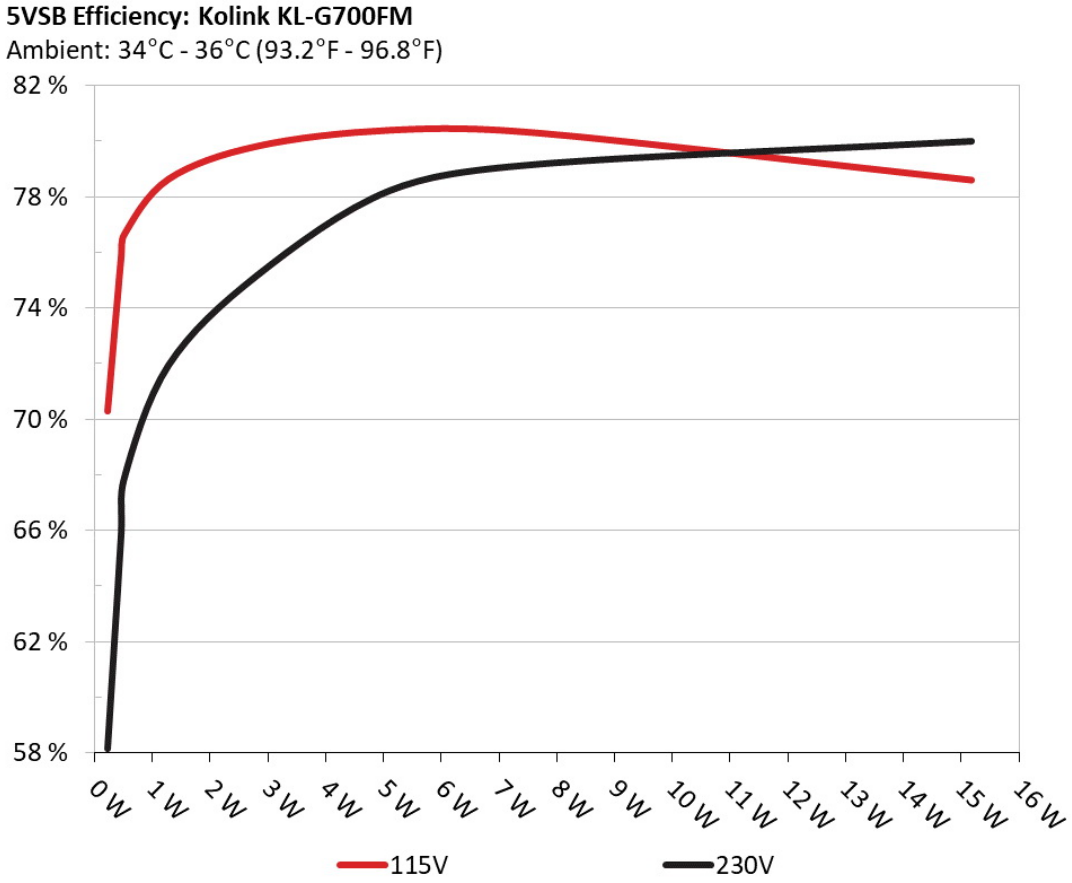
Efficiency under high ambient temperature



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	0.232	70.303%	0.044
	5.142V	0.330		115.13V
2	0.090A	0.463	75.777%	0.080
	5.141V	0.611		115.13V
3	0.550A	2.821	79.825%	0.308
	5.128V	3.534		115.14V
4	1.000A	5.116	80.402%	0.388
	5.115V	6.363		115.14V
5	1.500A	7.653	80.304%	0.431
	5.101V	9.530		115.14V
6	3.001A	15.180	78.608%	0.486
	5.059V	19.311		115.13V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.232	58.145%	0.016
	5.142V	0.399		230.26V
2	0.090A	0.463	65.767%	0.028
	5.141V	0.704		230.26V
3	0.550A	2.821	75.187%	0.136
	5.128V	3.752		230.26V
4	1.000A	5.116	78.238%	0.210
	5.115V	6.539		230.26V
5	1.500A	7.653	79.183%	0.268
	5.101V	9.665		230.25V
6	3.001A	15.180	80.013%	0.360
	5.059V	18.972		230.26V

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
1	3.931A	1.996A	1.942A	0.980A	69.792	83.551%	770	14.7	40.04°C	0.976
	12.253V	5.020V	3.400V	5.105V	83.532				43.12°C	115.13V
2	8.904A	2.998A	2.925A	1.179A	139.906	88.618%	772	14.8	40.35°C	0.987
	12.240V	5.007V	3.388V	5.090V	157.875				44.16°C	115.13V
3	14.214A	3.504A	3.406A	1.379A	209.829	90.256%	777	14.8	41.21°C	0.986
	12.229V	4.996V	3.377V	5.075V	232.482				46.02°C	115.13V
4	19.531A	4.015A	3.922A	1.581A	279.821	90.768%	781	14.9	41.82°C	0.990
	12.217V	4.984V	3.366V	5.060V	308.280				47.61°C	115.13V
5	24.533A	5.032A	4.921A	1.784A	349.917	90.757%	786	15.1	42.26°C	0.993
	12.204V	4.971V	3.354V	5.044V	385.553				49.09°C	115.13V
6	29.548A	6.054A	5.928A	1.990A	420.047	90.436%	807	15.6	42.85°C	0.995
	12.191V	4.958V	3.341V	5.028V	464.468				50.39°C	115.13V
7	34.579A	7.081A	6.943A	2.196A	490.153	89.868%	1382	31.6	43.55°C	0.996
	12.176V	4.944V	3.328V	5.011V	545.412				51.75°C	115.12V
8	39.619A	8.118A	7.967A	2.403A	560.274	89.206%	1802	40.0	43.75°C	0.996
	12.162V	4.930V	3.314V	4.995V	628.066				52.25°C	115.12V
9	45.062A	8.646A	8.480A	2.408A	629.994	88.627%	1822	39.7	44.65°C	0.997
	12.149V	4.918V	3.303V	4.985V	710.836				53.44°C	115.12V
10	50.285A	9.178A	9.028A	3.027A	700.033	87.879%	1831	39.6	45.41°C	0.997
	12.137V	4.905V	3.290V	4.957V	796.591				54.63°C	115.12V
11	56.107A	9.197A	9.059A	3.033A	770.037	87.155%	1841	39.8	46.70°C	0.997
	12.125V	4.895V	3.280V	4.948V	883.524				56.33°C	115.12V
CL1	0.154A	12.004A	12.000A	0.000A	102.115	82.771%	814	15.8	42.02°C	0.989
	12.233V	4.980V	3.371V	5.111V	123.370				49.09°C	115.14V

CL2	58.024A	1.002A	1.001A	1.000A	718.340	88.497%	1832	39.6	45.60°C	0.997
	12.151V	4.935V	3.313V	5.029V	811.712				54.47°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
1	3.932A	1.993A	1.941A	0.980A	69.784	84.540%	766	14.3	40.10°C	0.807
	12.253V	5.019V	3.400V	5.105V	82.546				42.91°C	230.28V
2	8.903A	2.998A	2.923A	1.179A	139.895	89.923%	771	14.7	40.73°C	0.908
	12.241V	5.007V	3.388V	5.089V	155.572				44.01°C	230.28V
3	14.213A	3.504A	3.405A	1.380A	209.819	91.662%	774	14.8	41.23°C	0.944
	12.229V	4.996V	3.377V	5.075V	228.906				45.17°C	230.28V
4	19.529A	4.015A	3.921A	1.581A	279.817	92.324%	778	14.9	41.82°C	0.963
	12.218V	4.985V	3.366V	5.060V	303.081				46.52°C	230.28V
5	24.533A	5.031A	4.921A	1.785A	349.918	92.515%	783	15.0	42.03°C	0.974
	12.204V	4.971V	3.354V	5.044V	378.230				47.92°C	230.28V
6	29.546A	6.054A	5.924A	1.990A	420.044	92.401%	797	15.5	42.54°C	0.979
	12.192V	4.958V	3.342V	5.028V	454.586				49.24°C	230.28V
7	34.577A	7.083A	6.939A	2.196A	490.159	92.024%	1458	33.2	43.14°C	0.983
	12.177V	4.944V	3.328V	5.011V	532.644				50.46°C	230.28V
8	39.618A	8.119A	7.967A	2.404A	560.272	91.694%	1739	39.0	43.52°C	0.986
	12.162V	4.930V	3.314V	4.995V	611.023				51.74°C	230.28V
9	45.062A	8.645A	8.479A	2.408A	629.985	91.384%	1816	39.7	44.19°C	0.987
	12.149V	4.918V	3.303V	4.985V	689.383				52.86°C	230.28V
10	50.279A	9.177A	9.028A	3.027A	700.024	90.936%	1830	39.6	45.41°C	0.987
	12.138V	4.906V	3.291V	4.957V	769.798				54.38°C	230.28V
11	56.107A	9.197A	9.056A	3.033A	770.034	90.555%	1841	39.8	46.53°C	0.988
	12.125V	4.896V	3.280V	4.947V	850.345				56.42°C	230.27V
CL1	0.153A	12.004A	12.000A	0.000A	102.105	83.900%	818	15.9	42.00°C	0.879
	12.233V	4.980V	3.371V	5.110V	121.698				47.66°C	230.28V

CL2	58.023A	1.003A	1.001A	1.000A	718.389	91.647%	1830	39.6	45.01°C	0.987
	12.152V	4.934V	3.313V	5.029V	783.861				54.68°C	230.28V

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])	PF/AC Volts
1	1.187A	0.495A	0.470A	0.195A	19.654	64.779%	764	14.2	0.866
	12.263V	5.035V	3.414V	5.136V	30.340				115.13V
2	2.431A	0.996A	0.967A	0.390A	40.105	77.165%	767	14.5	0.941
	12.259V	5.028V	3.408V	5.127V	51.973				115.13V
3	3.602A	1.495A	1.441A	0.586A	59.559	82.000%	768	14.5	0.964
	12.256V	5.023V	3.403V	5.119V	72.633				115.13V
4	4.848A	1.994A	1.943A	0.783A	80.006	84.820%	767	14.5	0.975
	12.251V	5.019V	3.399V	5.110V	94.324				115.13V

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])	PF/AC Volts
1	1.187A	0.496A	0.469A	0.195A	19.652	64.764%	745	13.6	0.567
	12.261V	5.035V	3.413V	5.135V	30.344				230.27V
2	2.431A	0.994A	0.969A	0.390A	40.097	77.940%	756	14.0	0.702
	12.258V	5.028V	3.407V	5.126V	51.446				230.27V
3	3.602A	1.496A	1.440A	0.586A	59.556	83.149%	761	14.2	0.779
	12.255V	5.023V	3.403V	5.118V	71.626				230.28V
4	4.848A	1.994A	1.942A	0.783A	79.999	86.165%	764	14.2	0.829
	12.251V	5.018V	3.399V	5.109V	92.844				230.27V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.4 mV	9.0 mV	12.0 mV	15.6 mV	Pass
20% Load	15.6 mV	9.2 mV	11.9 mV	14.8 mV	Pass
30% Load	16.5 mV	9.6 mV	12.7 mV	15.0 mV	Pass
40% Load	18.8 mV	10.1 mV	12.6 mV	14.3 mV	Pass
50% Load	22.0 mV	11.1 mV	13.5 mV	15.6 mV	Pass
60% Load	23.8 mV	10.9 mV	14.5 mV	15.0 mV	Pass
70% Load	27.2 mV	11.9 mV	15.5 mV	16.2 mV	Pass
80% Load	29.7 mV	12.8 mV	16.5 mV	16.5 mV	Pass
90% Load	33.0 mV	13.6 mV	18.6 mV	16.9 mV	Pass
100% Load	53.9 mV	14.7 mV	19.7 mV	20.5 mV	Pass
110% Load	59.2 mV	17.6 mV	21.7 mV	19.1 mV	Pass
Crossload 1	19.1 mV	10.0 mV	14.0 mV	15.2 mV	Pass
Crossload 2	54.7 mV	13.4 mV	18.0 mV	18.9 mV	Pass

The results above are not used in the certification process

230V

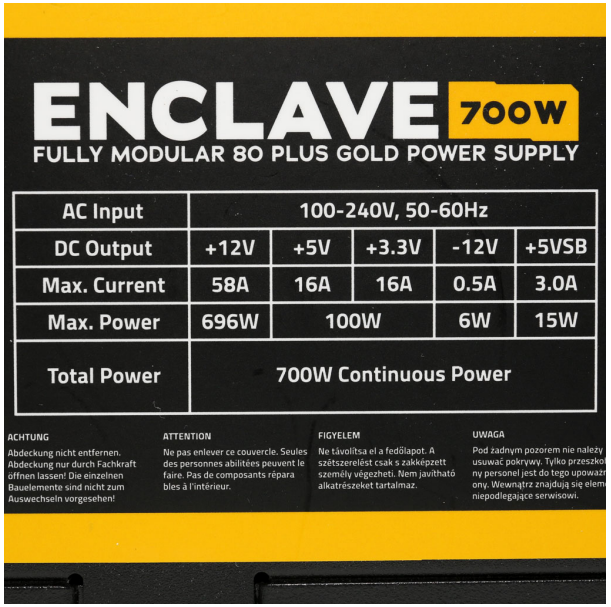
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.0 mV	8.9 mV	15.8 mV	14.6 mV	Pass
20% Load	14.0 mV	8.8 mV	15.5 mV	14.7 mV	Pass
30% Load	18.3 mV	9.0 mV	15.8 mV	14.9 mV	Pass
40% Load	20.7 mV	10.5 mV	16.9 mV	14.5 mV	Pass
50% Load	25.0 mV	9.8 mV	16.5 mV	14.7 mV	Pass
60% Load	25.9 mV	10.4 mV	15.2 mV	14.4 mV	Pass
70% Load	28.5 mV	10.7 mV	16.5 mV	15.4 mV	Pass
80% Load	31.0 mV	11.2 mV	17.3 mV	15.4 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	32.8 mV	12.4 mV	18.1 mV	15.7 mV	Pass
100% Load	55.7 mV	14.4 mV	19.1 mV	16.4 mV	Pass
110% Load	60.3 mV	15.6 mV	21.4 mV	17.1 mV	Pass
Crossload 1	20.4 mV	9.4 mV	16.4 mV	15.2 mV	Pass
Crossload 2	54.7 mV	13.4 mV	19.7 mV	15.9 mV	Pass

The results above are not used in the certification process

Kolink Enclave 700W

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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