EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Kolink Enclave 700W

Lab ID#: KL19700092
Receipt Date: Jul 31, 2019
Test Date: May 8, 2019

Report:
Report Date: Aug 22, 2019

DUT INFORMATION

Brand	Kolink
Manufacturer (OEM)	Kolink
Series	Enclave
Model Number	KL-G700FM
Serial Number	KOL-018-0619000003
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	
Rated Frequency (Hz)	50-60
Rated Power (W)	700
Type	ATX12V
Cooling	120mm Rifle Bearing Fan (EFS-12E12H)
Semi-Passive Operation	✗
Cable Design	Fully Modular

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				

CABLES AND CONNECTORS

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

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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

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	88.970%
Efficiency With 10W (≤500W) or 2% (>500W)	58.362
Average Efficiency 5VSB	79.465%
Standby Power Consumption (W)	0.0877852
Average PF	0.990
Avg Noise Output	21.60 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A

230V

Average Efficiency	90.939%
Average Efficiency 5VSB	77.715%
Standby Power Consumption (W)	0.1389440
Average PF	0.952
Avg Noise Output	22.06 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

HOLD-UP TIME & POWER OK SIGNAL (230V)

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

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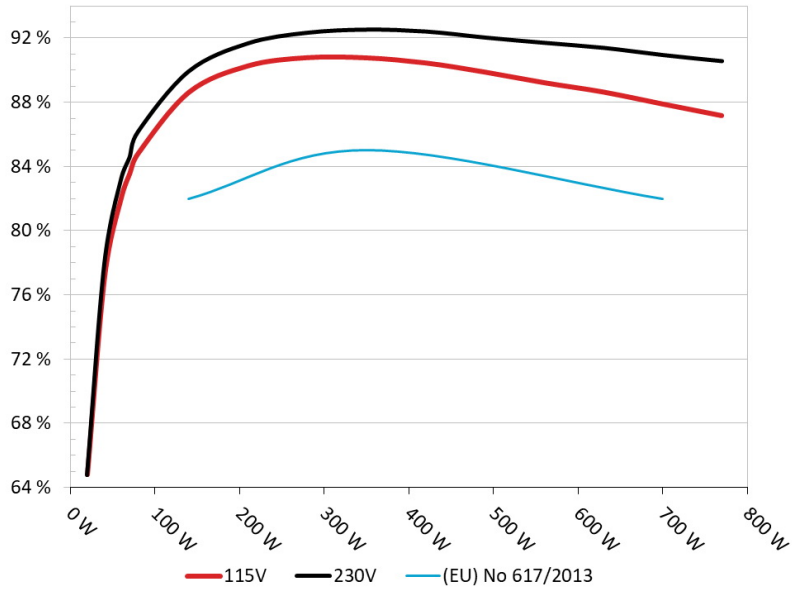
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Kolink KL-G700FM
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

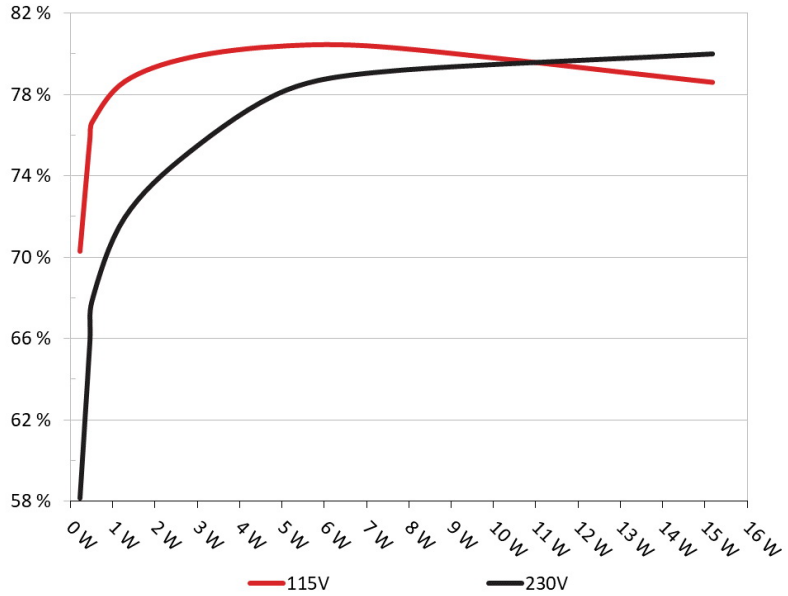


INFO

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: Kolink KL-G700FM
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

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5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

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

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

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

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115V

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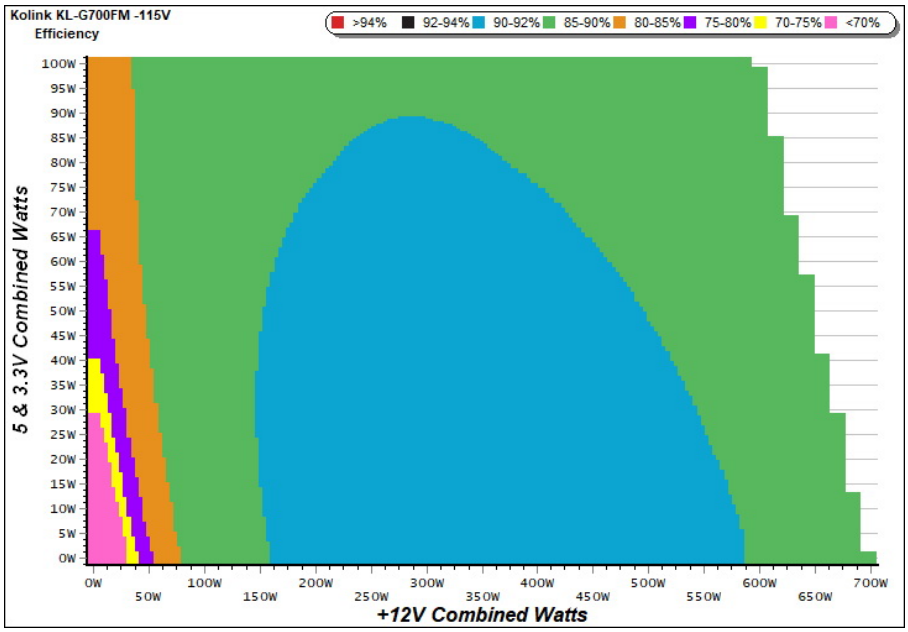
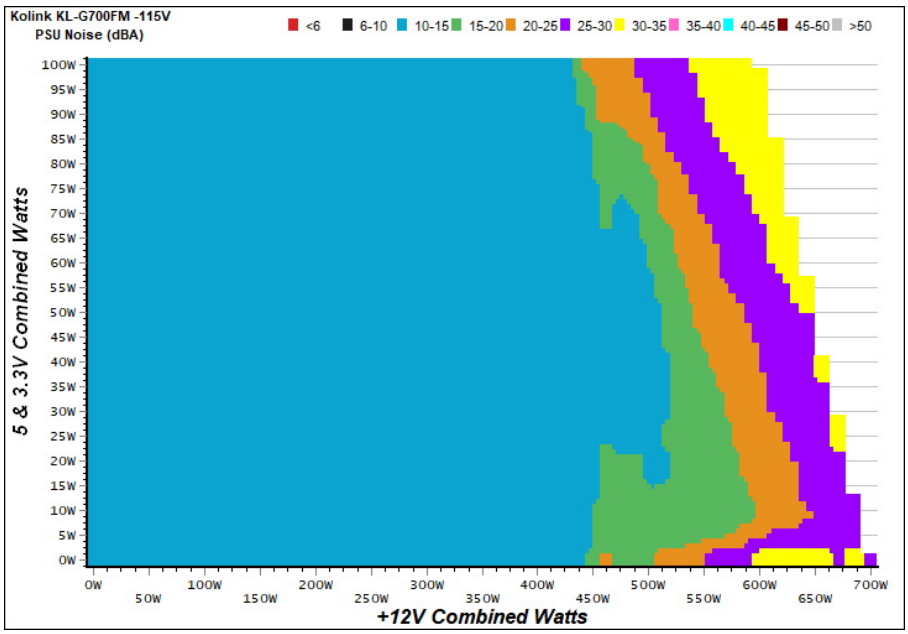
EFFICIENCY GRAPH 115V



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

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

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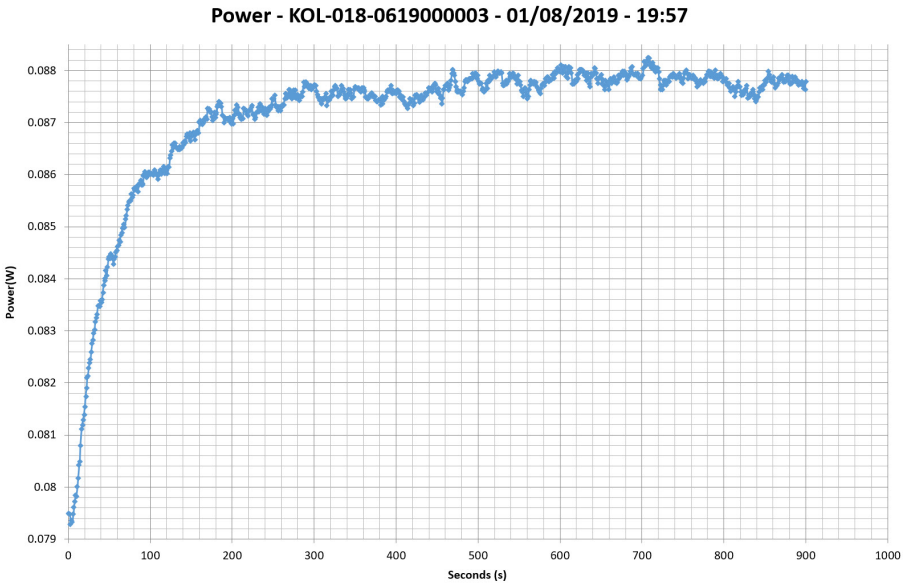
VAMPIRE POWER -115V



INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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10-110% 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

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20-80W 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

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

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230V

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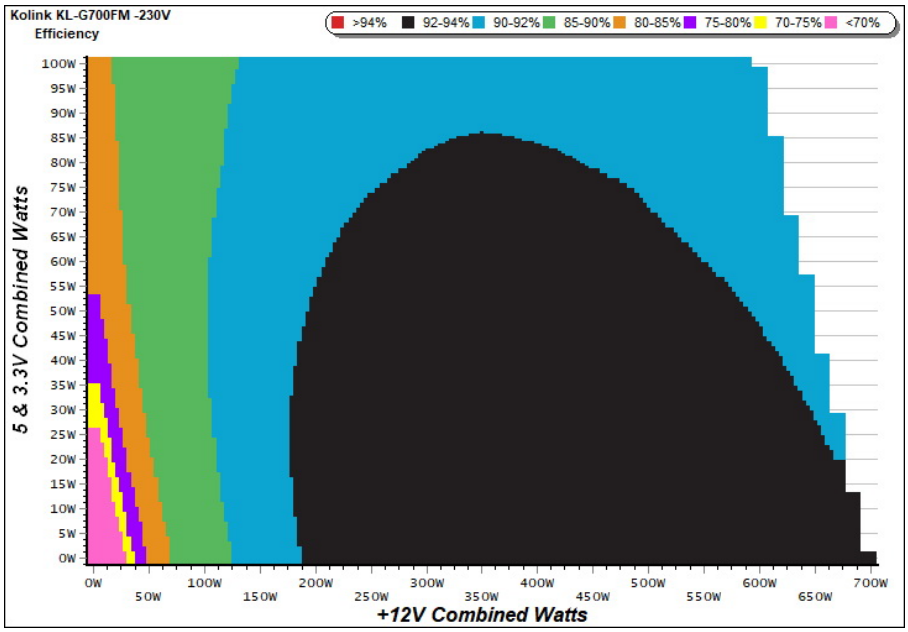
EFFICIENCY GRAPH 230V



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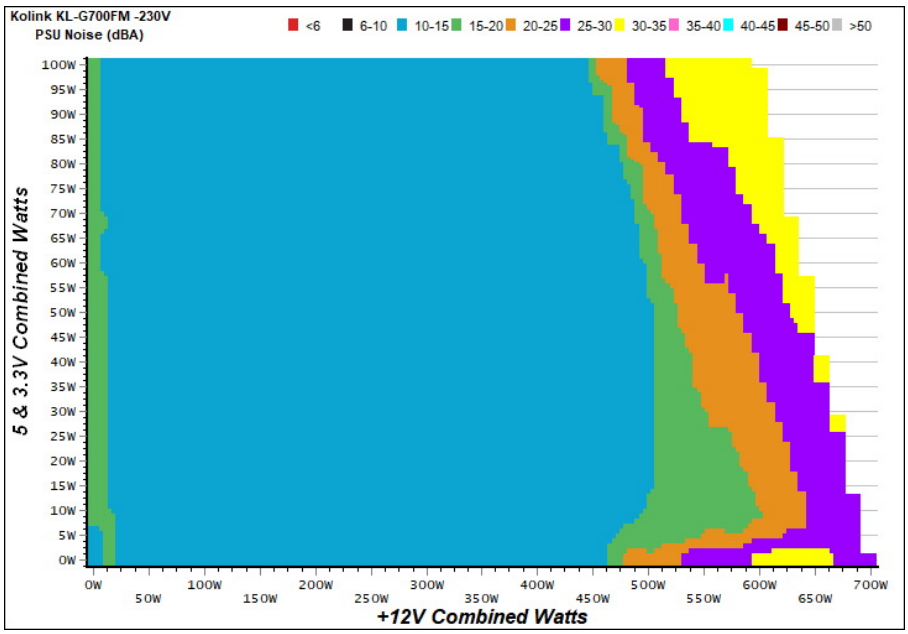
NOISE GRAPH 230V



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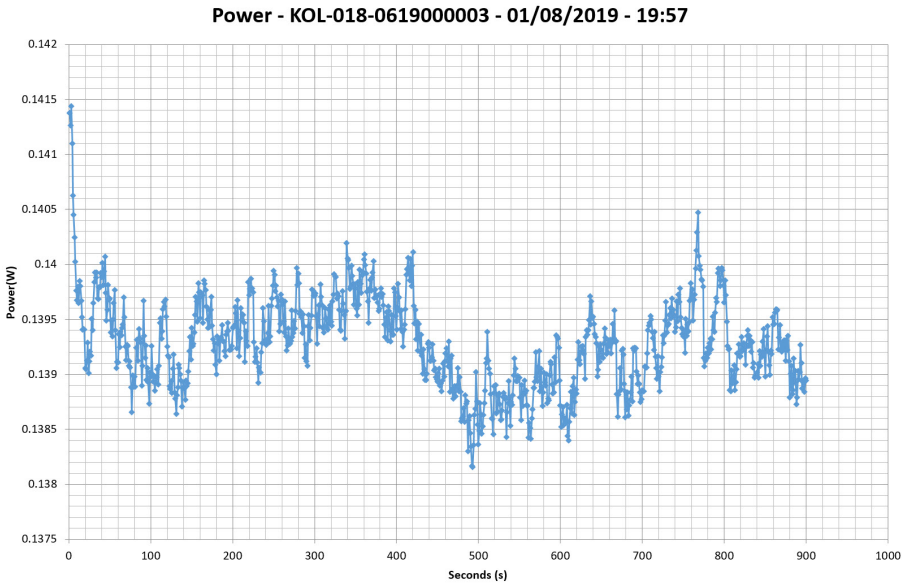
VAMPIRE POWER -230V



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Kolink Enclave 700W

10-110% LOAD TESTS 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

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Kolink Enclave 700W

20-80W LOAD TESTS 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

RIPPLE MEASUREMENTS 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
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

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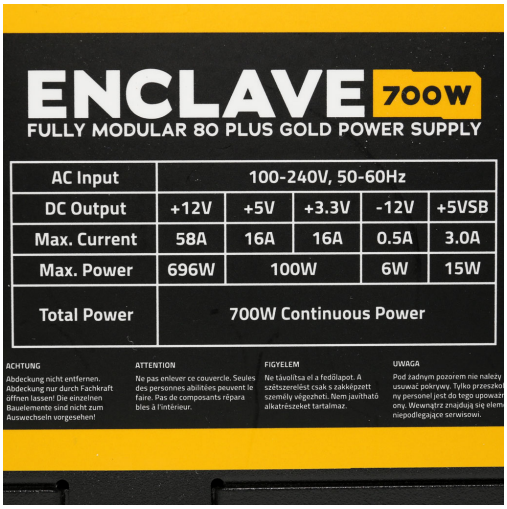
Kolink Enclave 700W

Top side



Power specifications label

CERTIFICATIONS 115V

CYBENETICS GOLD

CYBENETICS A

CERTIFICATIONS 230V

CYBENETICS GOLD 230v

CYBENETICS A 230v