Kolink Enclave 600W

Serial Number #CK033

Lab ID KL19600056

Certification ID 25742

Test Result Report ID: 19PS742A

Certificate Issue Date: Jun 28, 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	Kolink
Model	Enclave 600W
OEM/ODM	Kolink
Serial Number	#CK033
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	
Rated Frequency (Hz)	50-60

Rated Power (W)	600
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	KL19600056
Date of receipt	Nov 6, 2019
Testing Date	Jun 14, 2019
Report Issued Date	Jun 28, 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	18-20AWG	No

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	16	16	48	3	0.5
	Watts	103		576	15	6
Total Max. Power (W)		600				

Parts Description

General Data	
Manufacturer (OEM)	Kolink
PCB Type	Double Sided
Primary Side	
Transient Filter	5x Y caps, 3x X caps, 2x CM chokes
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, 390uF, 2000h @ 105°C, LG)
Main Switchers	4x Great Power GPT10N50AD (500V, 9.7A, 0.7Ohm)
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 PSMN2R6-40YS (40V, 100A @ 100°C, 5.3mOhm @ 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: 10x Teapo (1-3,000h @ 105°C, SC), 1x CapXon (2-5,000h @ 105°C, KF) Polymers: CapXon
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	ErP Lot 6 2010: ✓ ErP Lot 6 2013: ✓ ErP Lot 3 2014 & CEC: Partially
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.686%
Average Noise Output (>1450 Load Combinations)	22.32dBA
Average PF (>1450 Load Combinations)	0.986
Efficiency With 10W (≤500W) or 2% (>500W) Load	56.837%
Standby Power Consumption	0.0999W
Non-Accredited	
12V Ripple (Full Load)	46.31mV
5V Ripple (Full Load)	19.71mV
3.3V Ripple (Full Load)	18.10mV
5VSB Ripple (Full Load)	16.75mV
12V Load Regulation	1.22%
5V Load Regulation	2.73%
3.3V Load Regulation	3.87%
5VSB Load Regulation	3.63%
Inrush Current	39.019A

230V		
Accredited		
Average Efficiency (>1450 load combinations)	90.512%	
Average Noise Output (>1450 Load Combinations)	23.19dBA	
Average PF (>1450 Load Combinations)	0.933	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1422W	
Non-Accredited		
12V Ripple (Full Load)	47.09mV	
5V Ripple (Full Load)	18.81mV	
3.3V Ripple (Full Load)	16.01mV	
5VSB Ripple (Full Load)	15.67mV	
12V Load Regulation	1.17%	
5V Load Regulation	2.69%	
3.3V Load Regulation	3.78%	
5VSB Load Regulation	3.59%	
Inrush Current	88.193A	
Hold-Up Time & PWR_OK Signal	19.80ms	
AC Loss to PWR_OK Hold Up Time	15.40ms	
PWR_OK Inactive to DC Loss Delay	4.40ms	
OPP (0.00°C / 0.00°C)	133.22%	-

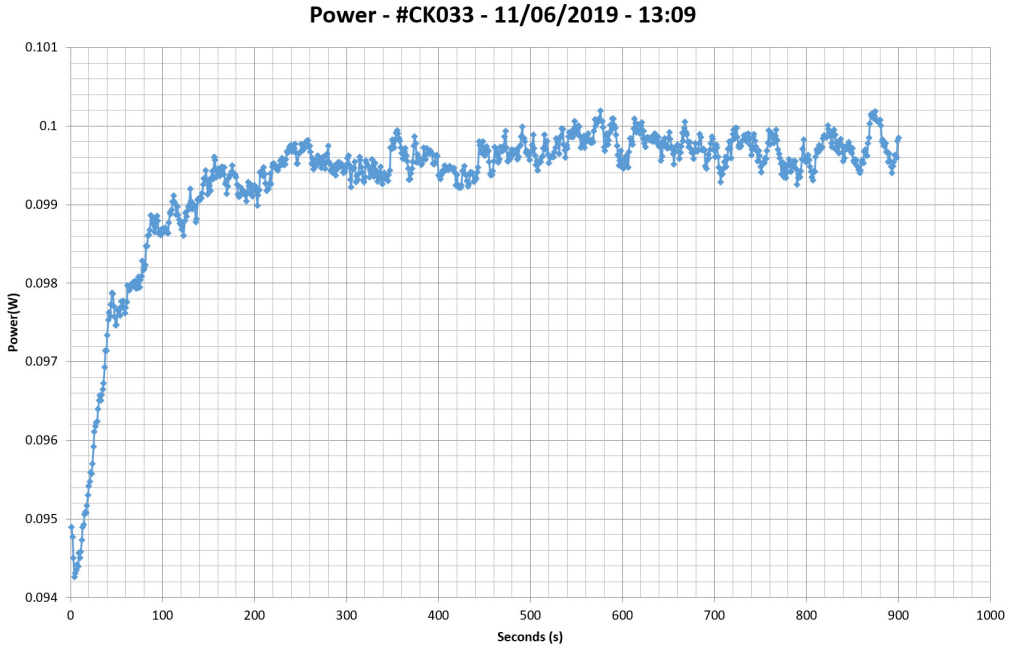
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	19.8
AC Loss to PWR_OK Hold Up Time (ms)	15.4
PWR_OK Inactive to DC Loss Delay (ms)	4.4

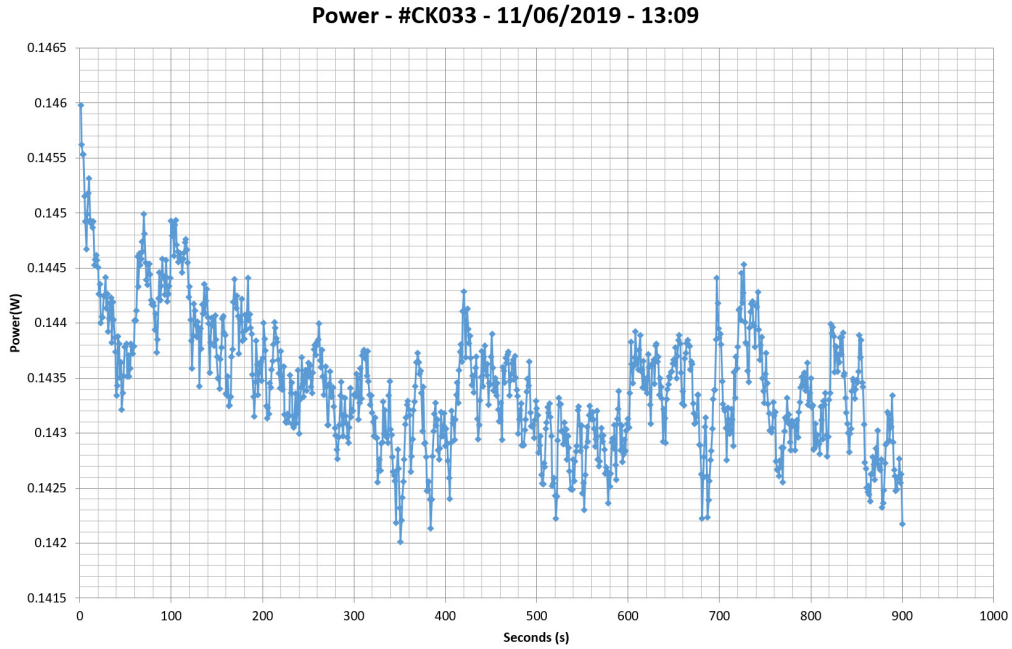
Vampire Power

Graphs

115V

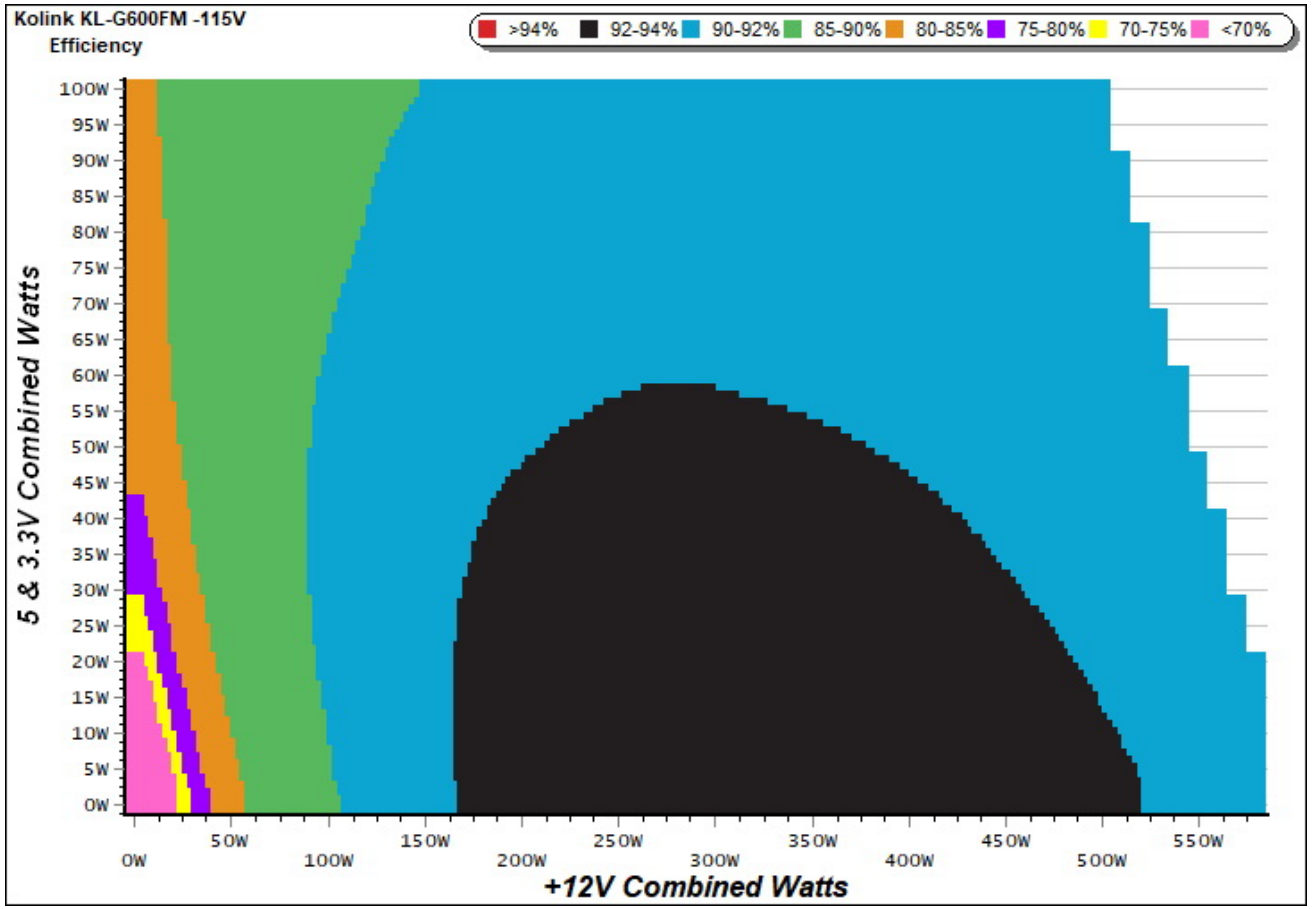


230V



Efficiency Graph

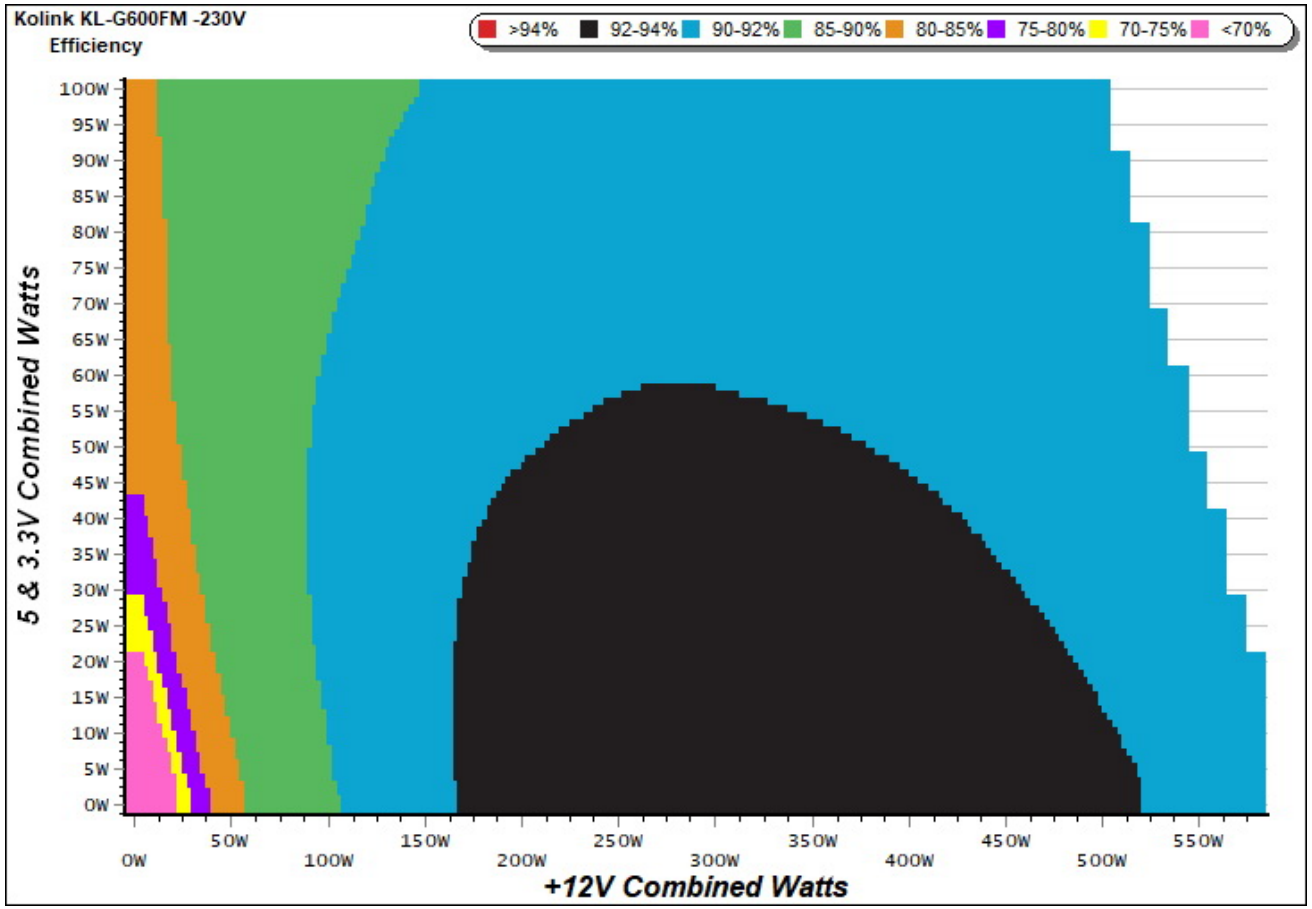
115V



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

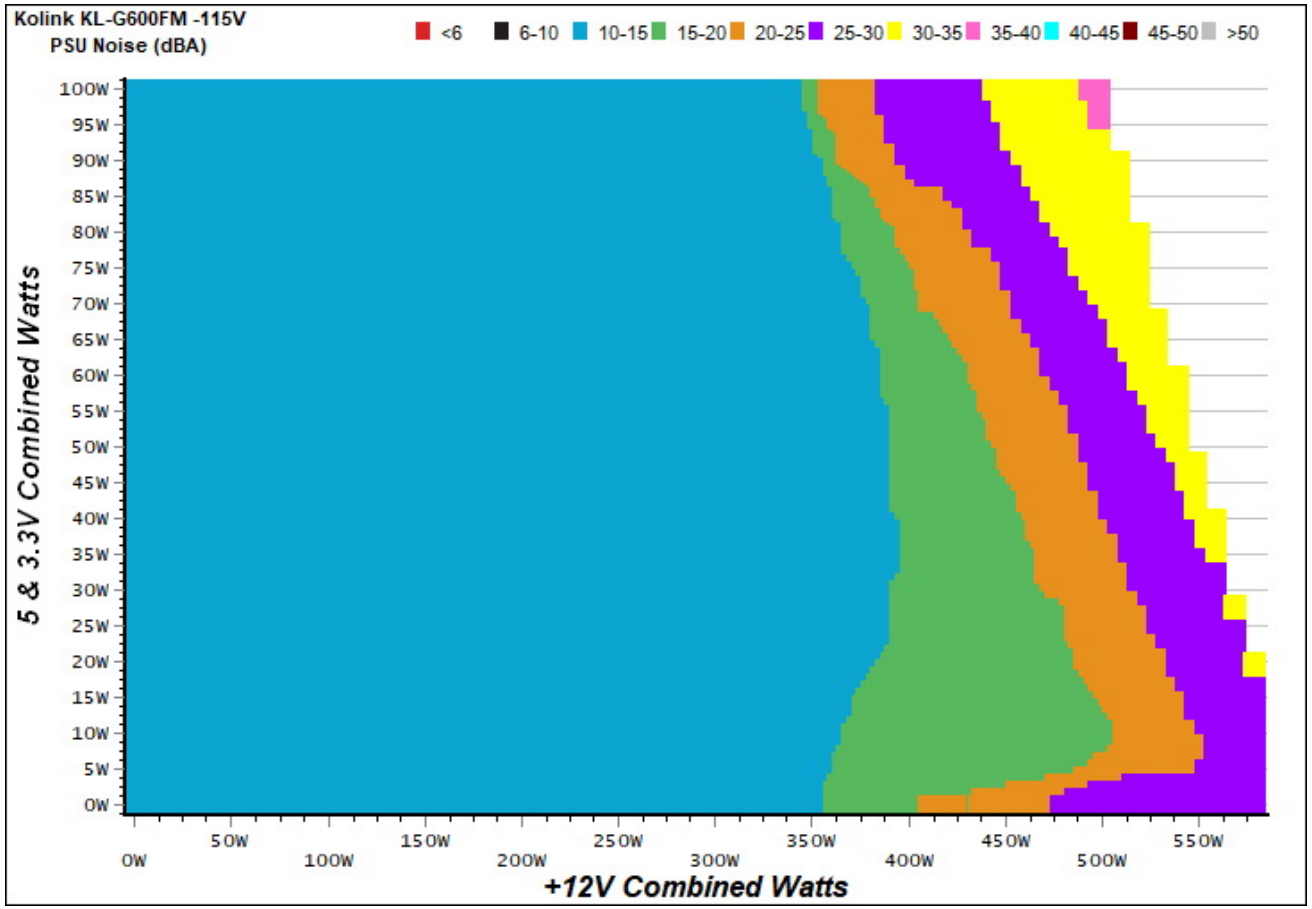


INFO

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

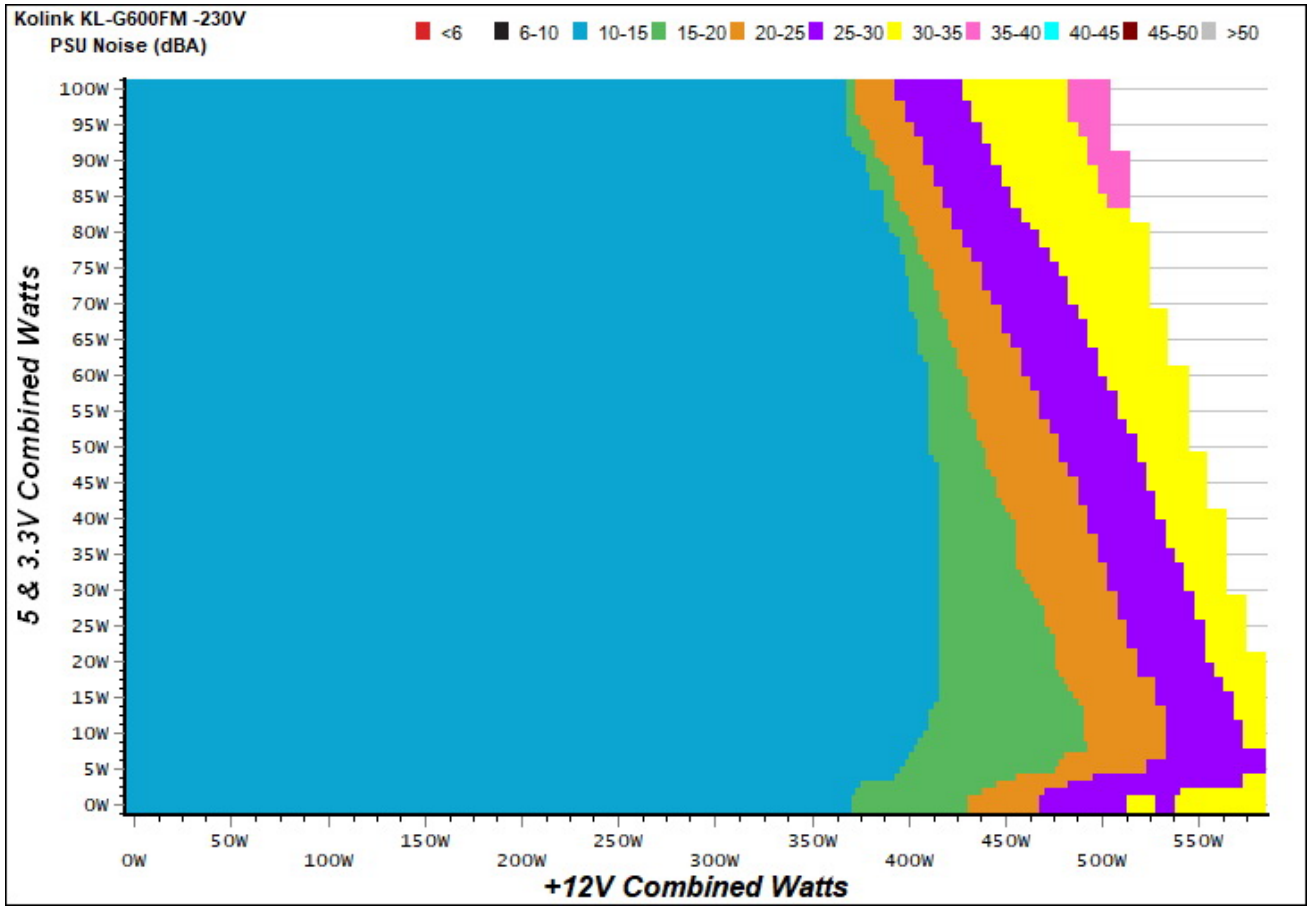
115V



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.

230V

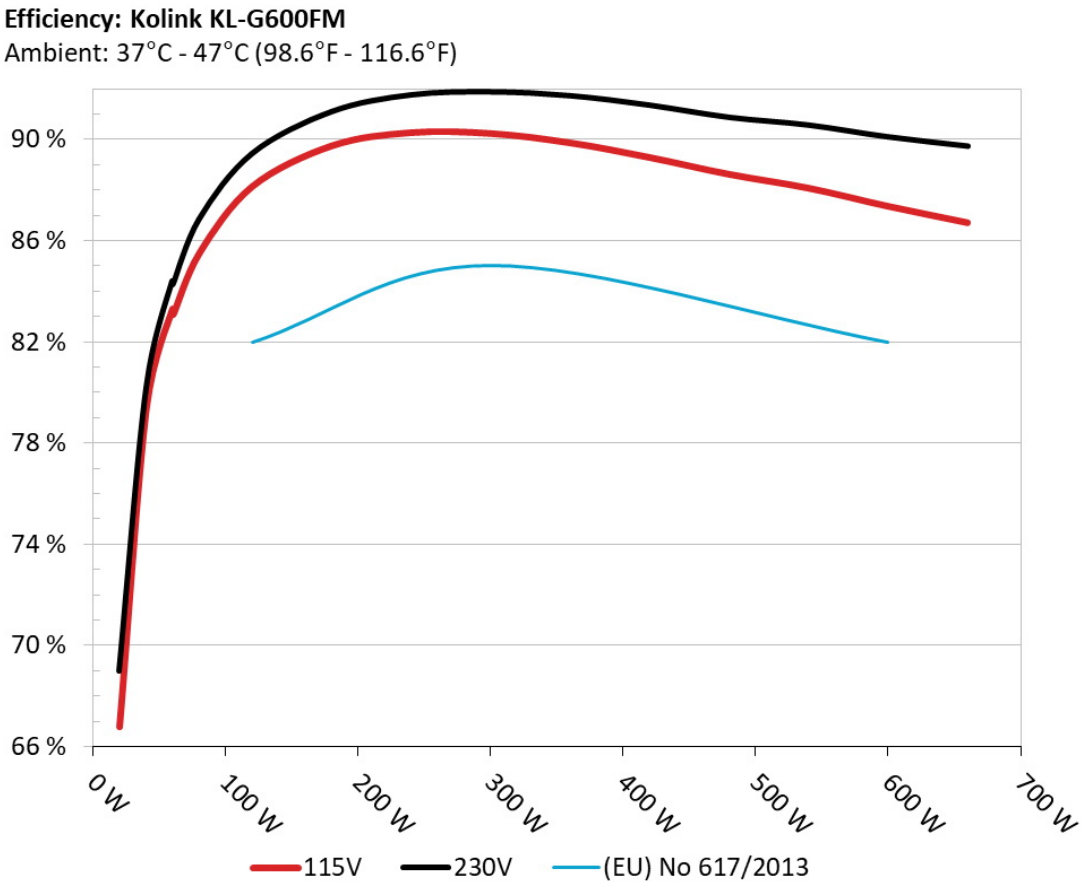


INFO

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

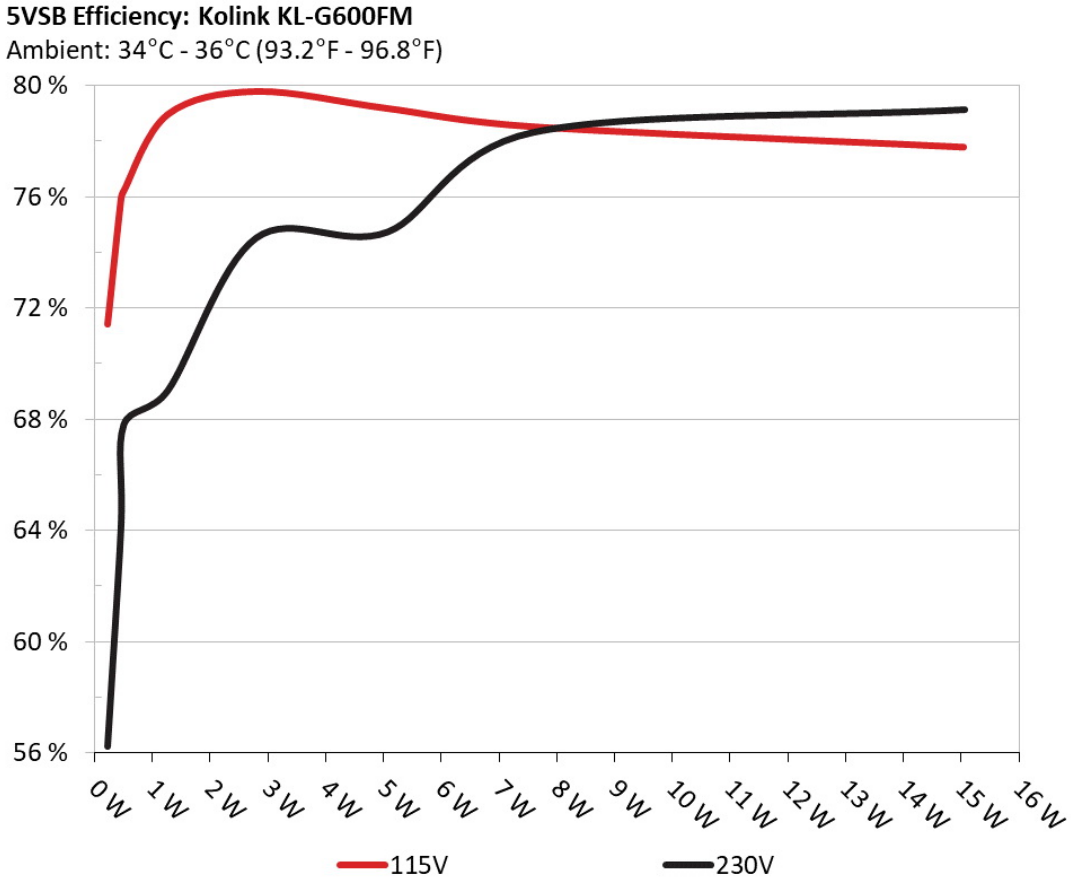
Efficiency under high ambient temperature



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	0.230	71.429%	0.045
	5.101V	0.322		115.13V
2	0.090A	0.460	75.908%	0.082
	5.099V	0.606		115.13V
3	0.550A	2.798	79.806%	0.312
	5.086V	3.506		115.13V
4	1.000A	5.074	79.195%	0.393
	5.073V	6.407		115.13V
5	1.500A	7.590	78.539%	0.436
	5.059V	9.664		115.13V
6	3.001A	15.051	77.803%	0.493
	5.016V	19.345		115.13V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	56.235%	0.017
	5.101V	0.409		230.27V
2	0.090A	0.460	64.067%	0.030
	5.099V	0.718		230.27V
3	0.550A	2.798	74.534%	0.141
	5.086V	3.754		230.28V
4	1.000A	5.075	74.753%	0.222
	5.074V	6.789		230.28V
5	1.500A	7.590	78.336%	0.276
	5.059V	9.689		230.28V
6	3.001A	15.054	79.152%	0.364
	5.017V	19.019		230.27V

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	3.171A	1.982A	1.951A	0.988A	60.152	83.084%	767	14.5	40.08°C	0.957
	12.156V	5.048V	3.382V	5.063V	72.399				43.62°C	115.13V
2	7.326A	2.982A	2.940A	1.189A	119.852	88.137%	770	14.7	40.75°C	0.986
	12.140V	5.033V	3.369V	5.047V	135.984				44.72°C	115.12V
3	11.853A	3.487A	3.425A	1.391A	179.747	89.740%	774	14.8	41.12°C	0.982
	12.127V	5.021V	3.357V	5.032V	200.297				45.57°C	115.12V
4	16.393A	3.996A	3.945A	1.595A	239.757	90.265%	778	14.9	41.76°C	0.985
	12.112V	5.008V	3.344V	5.016V	265.615				46.46°C	115.12V
5	20.613A	5.010A	4.955A	1.800A	299.851	90.232%	783	15.0	42.43°C	0.989
	12.096V	4.993V	3.330V	5.000V	332.312				47.55°C	115.12V
6	24.845A	6.030A	5.972A	2.008A	359.949	89.862%	993	22.7	42.63°C	0.991
	12.080V	4.977V	3.316V	4.983V	400.556				48.54°C	115.12V
7	29.060A	7.057A	7.000A	2.216A	419.663	89.288%	1447	33.1	43.09°C	0.993
	12.063V	4.961V	3.300V	4.965V	470.012				49.25°C	115.12V
8	33.356A	8.091A	8.034A	2.426A	480.178	88.618%	1831	39.6	43.75°C	0.994
	12.045V	4.945V	3.285V	4.948V	541.851				50.31°C	115.12V
9	37.986A	8.620A	8.556A	2.431A	539.485	88.077%	1848	39.9	44.25°C	0.995
	12.030V	4.932V	3.272V	4.938V	612.516				51.47°C	115.12V
10	42.465A	9.155A	9.118A	3.057A	599.903	87.358%	1857	40.1	45.53°C	0.995
	12.014V	4.917V	3.258V	4.909V	686.717				53.63°C	115.12V
11	47.522A	9.177A	9.149A	3.063A	659.932	86.709%	1864	40.2	46.61°C	0.996
	11.999V	4.905V	3.246V	4.899V	761.089				55.54°C	115.12V
CL1	0.147A	12.001A	11.999A	0.000A	101.948	83.153%	832	16.1	42.78°C	0.986
	12.127V	5.000V	3.347V	5.062V	122.603				47.65°C	115.13V

CL2	48.010A	1.002A	1.001A	1.000A	591.238	88.456%	1857	40.1	45.39°C	0.995
	12.039V	4.957V	3.287V	4.989V	668.399				53.88°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	3.171A	1.981A	1.953A	0.988A	60.151	84.284%	765	14.3	40.45°C	0.764
	12.155V	5.048V	3.382V	5.063V	71.367				44.17°C	230.27V
2	7.327A	2.982A	2.937A	1.189A	119.850	89.456%	768	14.5	40.80°C	0.876
	12.140V	5.033V	3.368V	5.046V	133.976				45.20°C	230.27V
3	11.856A	3.485A	3.427A	1.391A	179.748	91.115%	771	14.7	41.42°C	0.919
	12.125V	5.020V	3.356V	5.031V	197.275				46.20°C	230.27V
4	16.397A	3.995A	3.946A	1.595A	239.767	91.777%	774	14.8	41.68°C	0.941
	12.110V	5.007V	3.344V	5.016V	261.250				47.15°C	230.26V
5	20.614A	5.012A	4.956A	1.801A	299.848	91.898%	781	14.9	42.25°C	0.955
	12.095V	4.992V	3.329V	4.999V	326.283				48.37°C	230.27V
6	24.849A	6.031A	5.973A	2.008A	359.948	91.745%	903	19.4	42.52°C	0.964
	12.078V	4.977V	3.315V	4.982V	392.334				49.24°C	230.27V
7	29.065A	7.057A	6.999A	2.216A	419.661	91.372%	1371	31.1	43.09°C	0.970
	12.061V	4.961V	3.300V	4.965V	459.290				50.20°C	230.27V
8	33.360A	8.094A	8.036A	2.426A	480.171	90.887%	1830	39.6	43.57°C	0.973
	12.043V	4.944V	3.285V	4.947V	528.316				51.47°C	230.27V
9	37.990A	8.623A	8.559A	2.432A	539.476	90.586%	1847	39.9	44.97°C	0.977
	12.028V	4.931V	3.272V	4.937V	595.540				53.05°C	230.27V
10	42.468A	9.157A	9.119A	3.058A	599.894	90.117%	1858	40.1	45.93°C	0.979
	12.013V	4.916V	3.257V	4.908V	665.686				54.40°C	230.27V
11	47.524A	9.178A	9.153A	3.064A	659.920	89.753%	1865	40.2	46.63°C	0.980
	11.998V	4.905V	3.245V	4.898V	735.262				55.49°C	230.27V
CL1	0.147A	12.003A	11.998A	0.000A	101.942	84.333%	831	16.1	42.52°C	0.862
	12.126V	4.999V	3.347V	5.062V	120.881				48.58°C	230.27V

CL2	48.016A	1.002A	1.002A	1.000A	591.216	91.210%	1858	40.1	46.12°C	0.979
	12.037V	4.956V	3.287V	4.988V	648.191				54.08°C	230.27V

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	1.199A	0.494A	0.471A	0.196A	19.678	66.807%	774	14.8	0.856
	12.159V	5.063V	3.395V	5.094V	29.455				115.13V
2	2.448A	0.991A	0.974A	0.394A	40.085	79.449%	765	14.3	0.930
	12.162V	5.055V	3.389V	5.085V	50.454				115.13V
3	3.630A	1.487A	1.449A	0.591A	59.538	83.290%	764	14.2	0.956
	12.156V	5.050V	3.384V	5.075V	71.483				115.13V
4	4.883A	1.984A	1.952A	0.790A	79.933	85.504%	765	14.3	0.970
	12.150V	5.044V	3.379V	5.066V	93.484				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	1.192A	0.494A	0.471A	0.196A	19.600	69.012%	754	14.0	0.551
	12.166V	5.063V	3.395V	5.094V	28.401				230.27V
2	2.447A	0.988A	0.974A	0.394A	40.053	80.217%	754	14.0	0.686
	12.160V	5.055V	3.388V	5.084V	49.931				230.27V
3	3.630A	1.485A	1.449A	0.591A	59.524	84.416%	757	14.0	0.761
	12.155V	5.050V	3.384V	5.075V	70.513				230.27V
4	4.883A	1.984A	1.954A	0.790A	79.934	86.867%	761	14.2	0.814
	12.149V	5.044V	3.378V	5.066V	92.019				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	17.8 mV	9.6 mV	10.8 mV	12.0 mV	Pass
20% Load	25.4 mV	10.7 mV	11.2 mV	12.4 mV	Pass
30% Load	33.3 mV	11.2 mV	12.0 mV	11.8 mV	Pass
40% Load	36.8 mV	11.7 mV	11.0 mV	12.2 mV	Pass
50% Load	35.9 mV	13.1 mV	11.9 mV	12.8 mV	Pass
60% Load	30.0 mV	15.9 mV	12.4 mV	12.8 mV	Pass
70% Load	27.7 mV	15.2 mV	13.3 mV	13.4 mV	Pass
80% Load	27.1 mV	17.3 mV	15.2 mV	15.5 mV	Pass
90% Load	30.5 mV	18.0 mV	15.4 mV	15.6 mV	Pass
100% Load	46.3 mV	19.7 mV	18.1 mV	16.8 mV	Pass
110% Load	50.6 mV	20.9 mV	16.7 mV	18.9 mV	Pass
Crossload 1	29.8 mV	15.1 mV	16.3 mV	16.3 mV	Pass
Crossload 2	45.5 mV	16.3 mV	13.9 mV	16.6 mV	Pass

The results above are not used in the certification process

230V

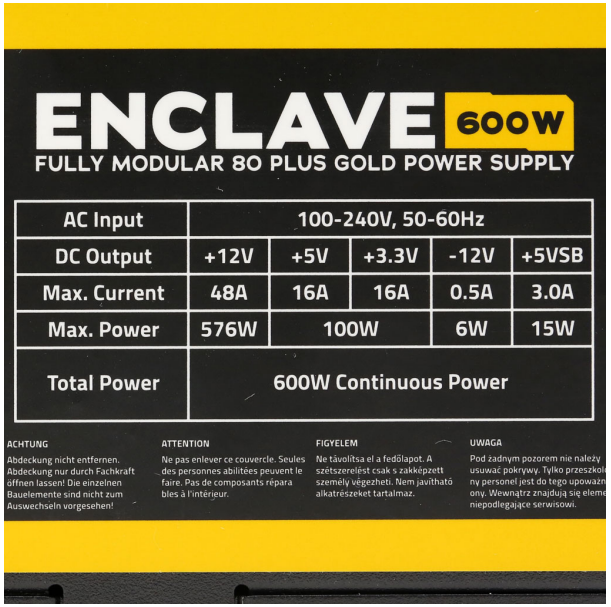
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	22.2 mV	9.7 mV	11.2 mV	12.1 mV	Pass
20% Load	30.7 mV	10.4 mV	10.8 mV	12.2 mV	Pass
30% Load	39.8 mV	11.1 mV	11.2 mV	12.3 mV	Pass
40% Load	46.3 mV	11.6 mV	11.0 mV	12.9 mV	Pass
50% Load	41.5 mV	12.6 mV	11.5 mV	13.6 mV	Pass
60% Load	33.1 mV	14.0 mV	12.4 mV	12.5 mV	Pass
70% Load	29.3 mV	15.3 mV	13.2 mV	13.5 mV	Pass
80% Load	29.7 mV	16.2 mV	14.9 mV	14.2 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	31.2 mV	17.5 mV	14.6 mV	16.1 mV	Pass
100% Load	47.1 mV	18.8 mV	16.0 mV	15.7 mV	Pass
110% Load	49.9 mV	19.6 mV	18.3 mV	16.7 mV	Pass
Crossload 1	35.3 mV	14.8 mV	15.6 mV	17.3 mV	Pass
Crossload 2	46.0 mV	15.2 mV	12.7 mV	15.9 mV	Pass

The results above are not used in the certification process

Kolink Enclave 600W

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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