Kolink Continuum 1500W

Serial Number KLC1500PL174400120

Lab ID 252

Certification ID 25252

Test Result Report ID:

Certificate Issue Date: Dec 20, 2018

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	Continuum 1500W
OEM/ODM	Enhance Electronics
Serial Number	KLC1500PL174400120
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	16-8
Rated Frequency (Hz)	50-60

Rated Power (W)	1500
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	140mm Double Ball-Bearing Fan (D14BH-12)
Semi-Passive Operation	✓
Cybenetics Testing Information	
Lab ID	252
Date of receipt	Dec 11, 2018
Testing Date	Dec 17, 2018
Report Issued Date	Dec 20, 2018
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 (600mm)	1	1	16-22AWG	No
4+4 pin EPS12V (710mm)	2	2	16AWG	No
6+2 pin PCIe (610mm+100mm)	4	8	16-18AWG	No
6+2 pin PCIe (610mm)	4	4	16AWG	No
SATA (610mm+140mm+140mm+140mm)	2	8	18AWG	No
4 pin Molex (610mm+150mm+150mm+150mm)	2	8	18AWG	No

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	22	125	3	0.3
	Watts	120		1500	15	3.6
Total Max. Power (W)		1500				

Parts Description

General Data	
Manufacturer (OEM)	Enhance Electronics
Platform Model	-
Primary Side	
Transient Filter	4x Y caps, 4x X caps, 2x CM chokes, 1x MOV, 1x CM02X
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x Shindengen LL25XB60 (600V, 25A @ 113°C)
APFC MOSFETS	4x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14Ohm)
APFC Boost Diode	2x CREE C3D10060A (600V, 10A @ 153°C)
Hold-up Cap(s)	3x Nichicon (450V, 560uF, 2000h @ 105°C, GL)
Main Switchers	4x Infineon IPP60R099C6 (650V, 24A @ 100°C, 0.099Ohm)
Driver ICs	2x Silicon Labs Si8230BD
APFC Controller	Champion CM6502S & CM03X Green PFC controller
LLC Resonant Controller	Champion CM6901T6X
Topology	Primary side: Full-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	16x Infineon BSC014N04LS (40V, 100A @ 100°C, 1.4mOhm)
5V & 3.3V	2x DC-DC Converters
Filtering Capacitors	Electrolytics: Rubycon (6-10,000h @ 105°C, ZLH), Sun' con (105°C), Nippon Chemi-Con (4000-1000h @105°C, KY) Polymers: Unicon (UPH, 2,000h @ 125°C)
Supervisor IC	SITI PS223 (OVP, UVP, OCP, SCP, OTP)
Fan Model	Yate Loom D14BH (140mm, 12V, 0.7A, 2800 RPM, 140 CFM, 48.5 dBA, Double Ball Bearing)
5VSB Circuit	

Rectifier	1x PFR10V45CT SBR (45V, 10A)
Standby PWM Controller	Sanken STR-A6062H

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	ErP Lot 3/6 2010: ✓ ErP Lot 3/6 2013: ✓ ErP Lot 3/6 2014, CEC: Partially
(EU) No 617/2013 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	90.081%
Average Noise Output (>1450 Load Combinations)	43.73dBA
Average PF (>1450 Load Combinations)	0.984
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.1118W
Non-Accredited	
12V Ripple (Full Load)	23.48mV
5V Ripple (Full Load)	18.10mV
3.3V Ripple (Full Load)	20.13mV
5VSB Ripple (Full Load)	9.68mV
12V Load Regulation	0.84%
5V Load Regulation	1.99%
3.3V Load Regulation	3.27%
5VSB Load Regulation	3.98%
Inrush Current	30.601A

230V		
Accredited		
Average Efficiency (>1450 load combinations)	92.214%	
Average Noise Output (>1450 Load Combinations)	43.67dBA	
Average PF (>1450 Load Combinations)	0.949	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.1760W	
Non-Accredited		
12V Ripple (Full Load)	23.72mV	
5V Ripple (Full Load)	18.13mV	
3.3V Ripple (Full Load)	20.47mV	
5VSB Ripple (Full Load)	9.69mV	
12V Load Regulation	0.86%	
5V Load Regulation	1.99%	
3.3V Load Regulation	3.27%	
5VSB Load Regulation	3.98%	
Inrush Current	56.913A	
Hold-Up Time & PWR_OK Signal	15.00ms	
AC Loss to PWR_OK Hold Up Time	13.90ms	
PWR_OK Inactive to DC Loss Delay	1.10ms	
OPP (0.00°C / 0.00°C)	-	-

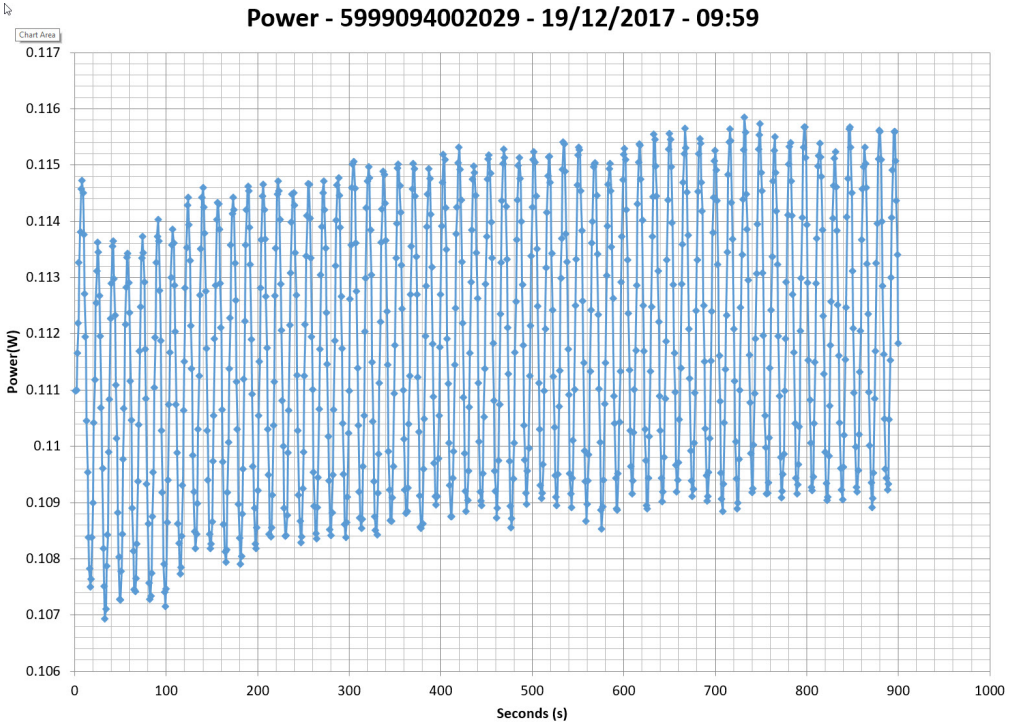
Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	15
AC Loss to PWR_OK Hold Up Time (ms)	13.9
PWR_OK Inactive to DC Loss Delay (ms)	1.1

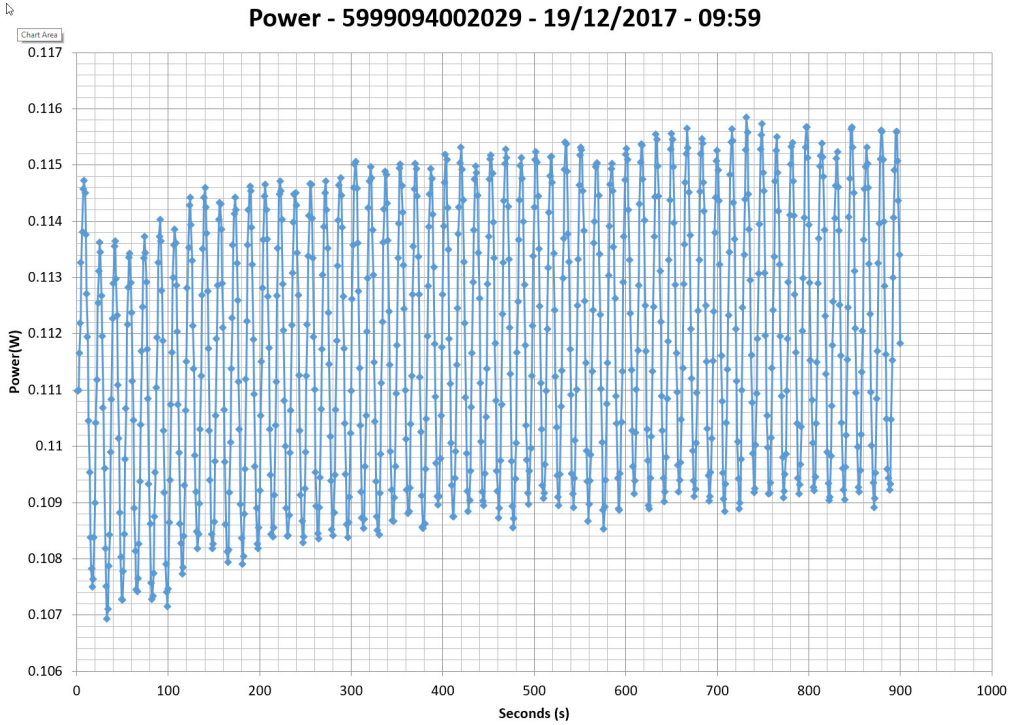
Stromverbrauch im Ruhezustand

Graphs

115V

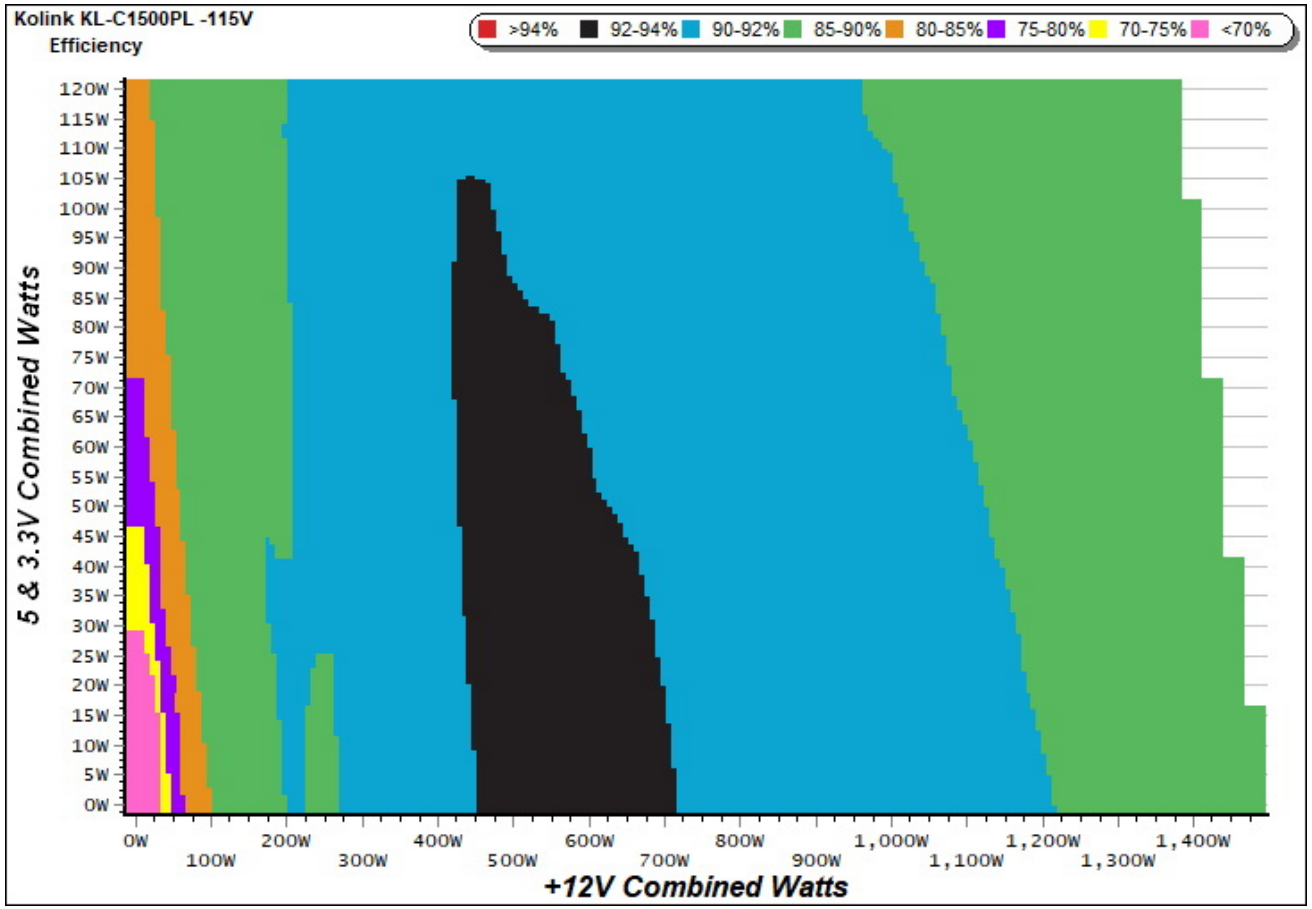


230V



Efficiency Graph

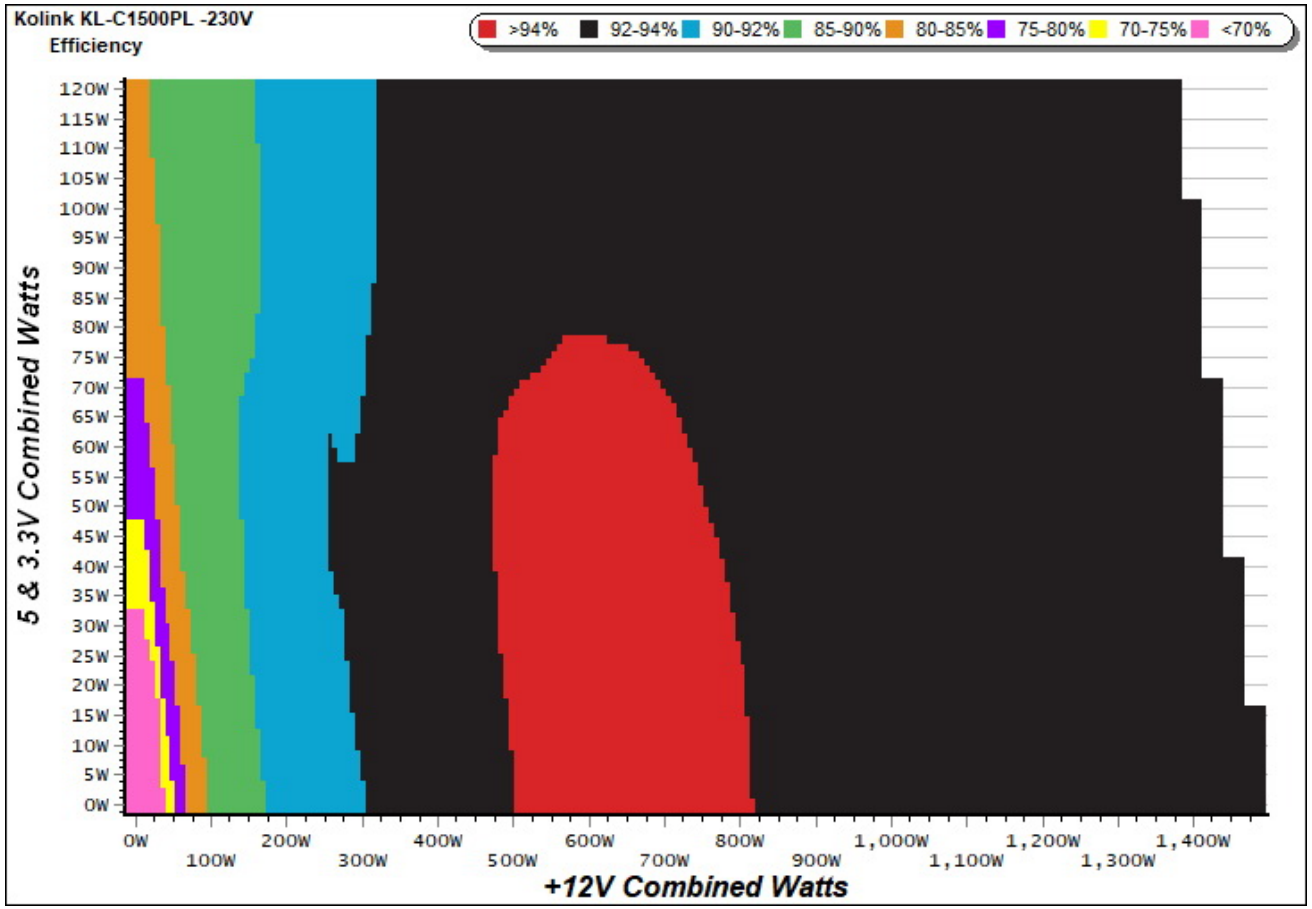
115V



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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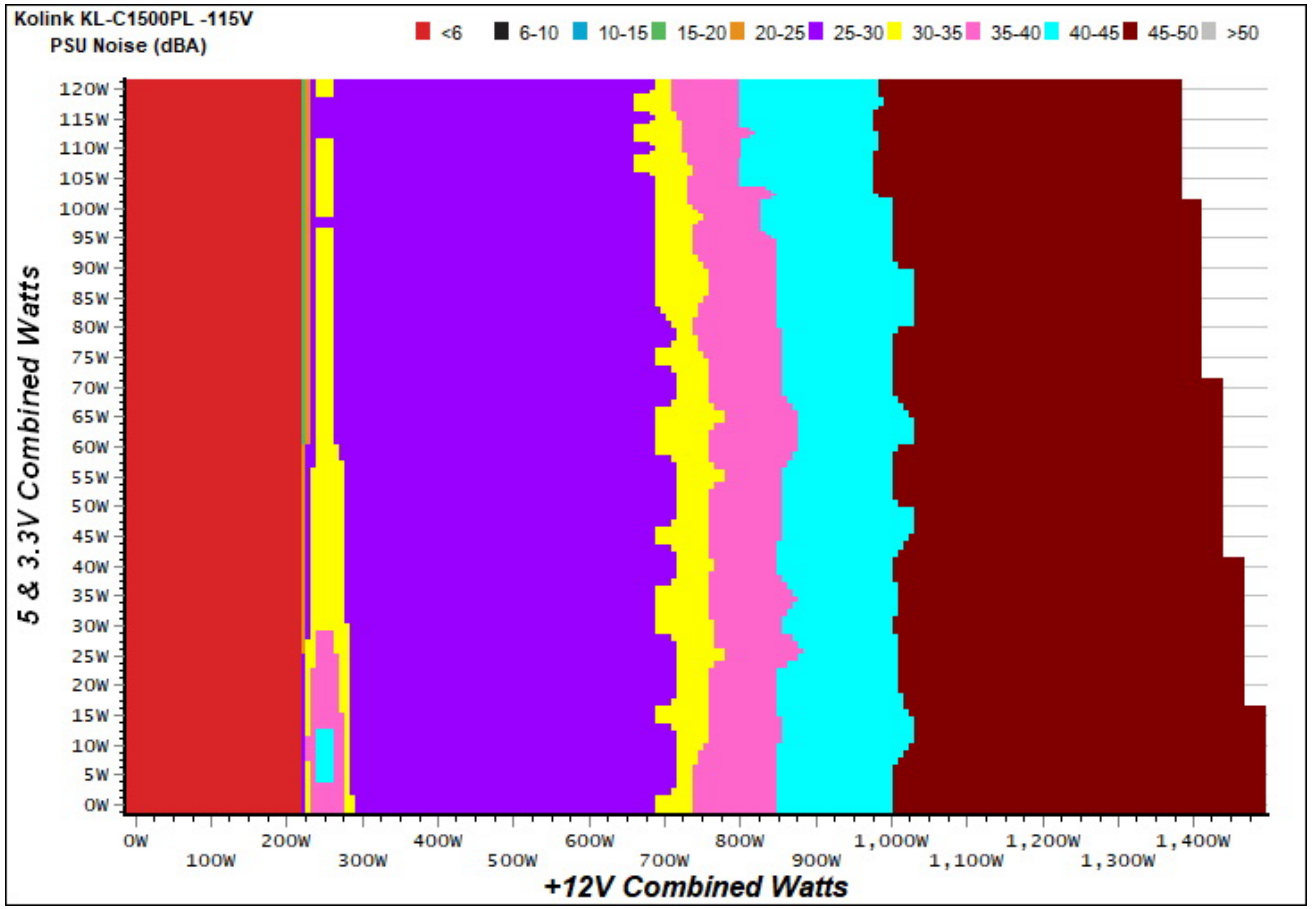
Noise Graph

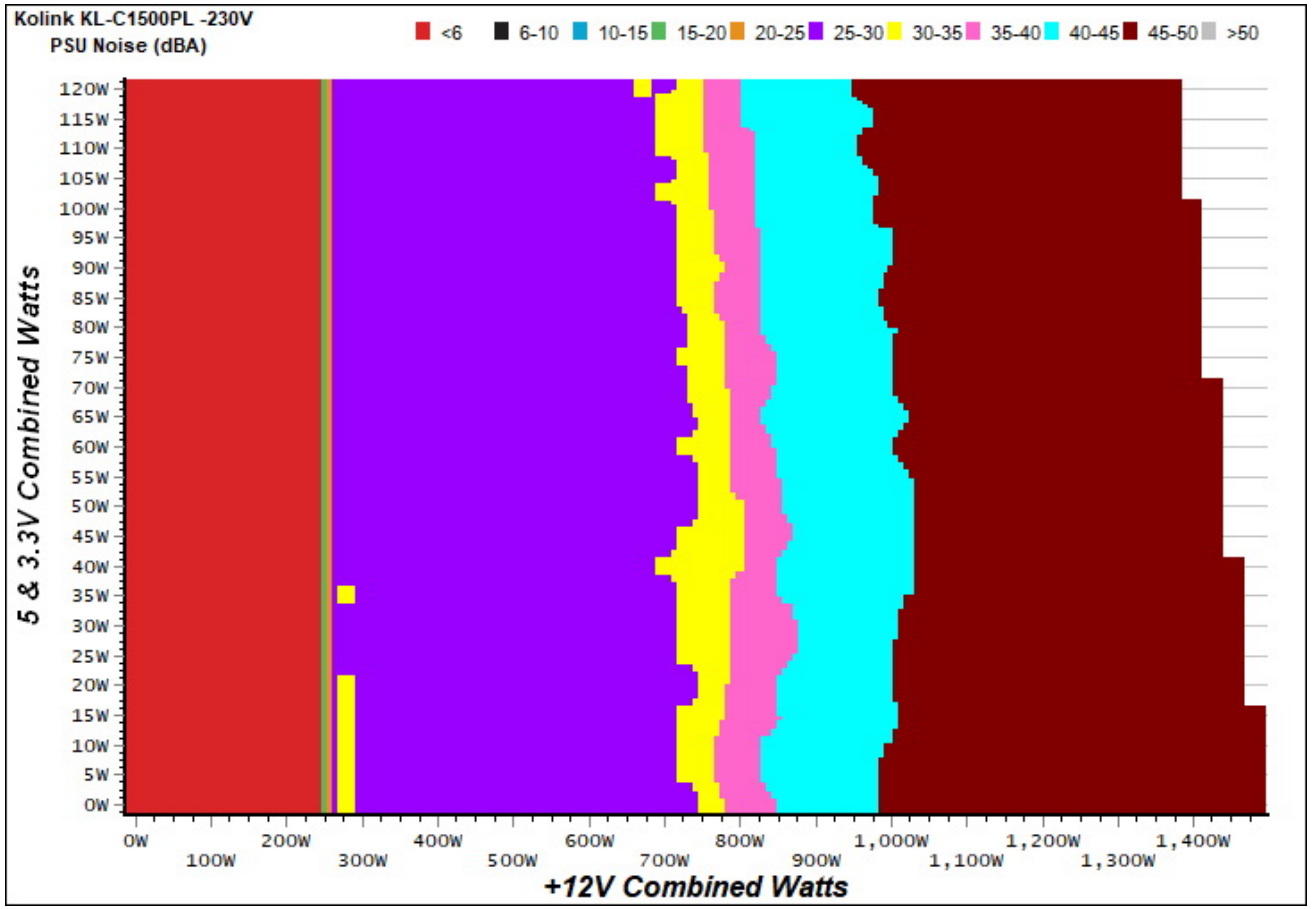
115V



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

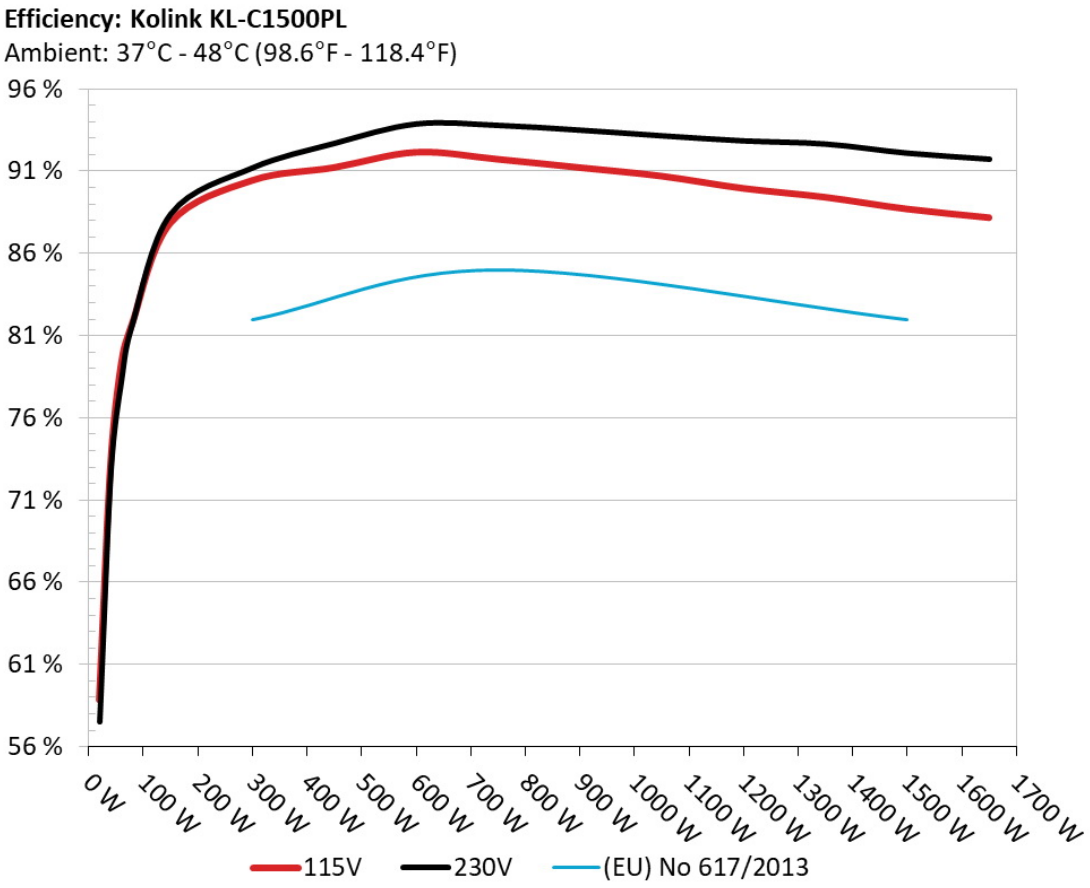


INFO

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

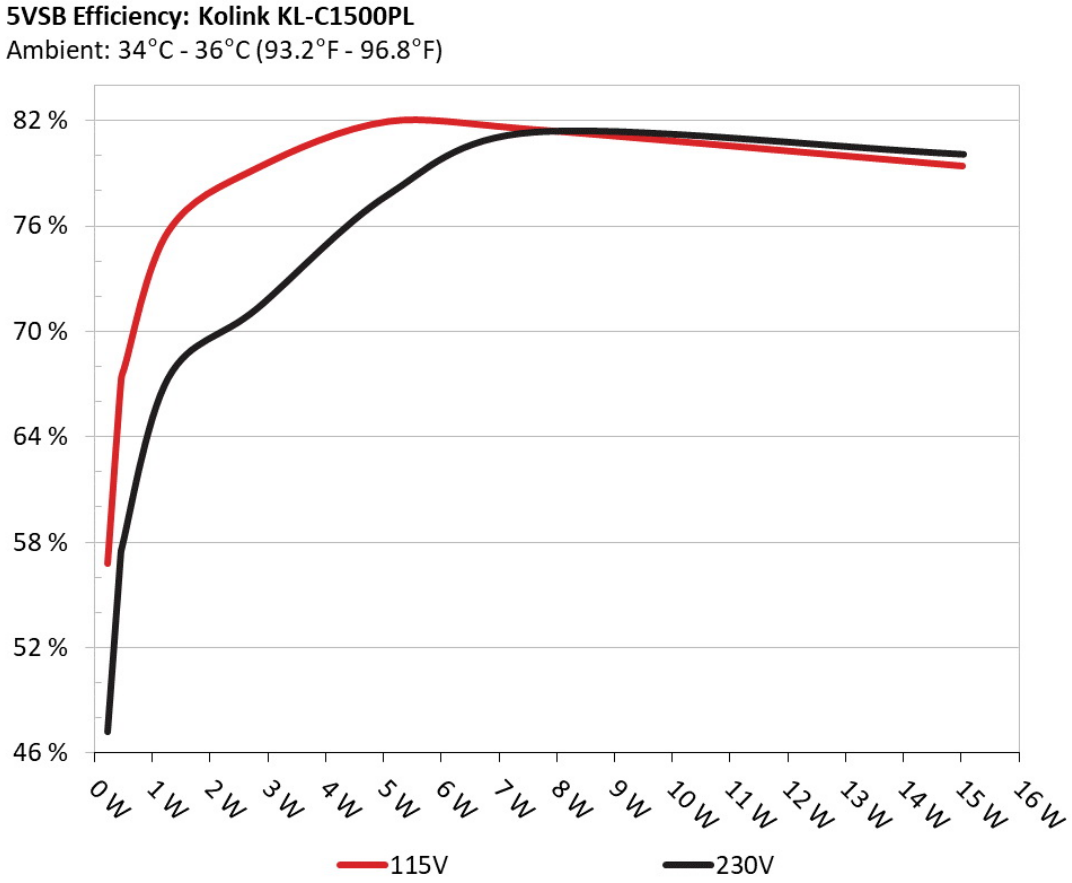
Efficiency under high ambient temperature



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	0.231	56.757%	0.021
	5.136V	0.407		115.27V
2	0.090A	0.462	67.151%	0.035
	5.134V	0.688		115.28V
3	0.550A	2.813	79.306%	0.168
	5.114V	3.547		115.27V
4	1.000A	5.096	81.982%	0.268
	5.096V	6.216		115.27V
5	1.500A	7.614	81.520%	0.355
	5.076V	9.340		115.26V
6	3.000A	15.032	79.438%	0.494
	5.011V	18.923		115.25V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	47.239%	0.008
	5.137V	0.489		230.75V
2	0.090A	0.462	57.391%	0.013
	5.134V	0.805		230.75V
3	0.550A	2.813	71.287%	0.061
	5.115V	3.946		230.74V
4	1.000A	5.096	77.790%	0.099
	5.097V	6.551		230.74V
5	1.500A	7.615	81.322%	0.138
	5.076V	9.364		230.74V
6	3.000A	15.041	80.061%	0.247
	5.014V	18.787		230.73V

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	10.486A	1.969A	1.984A	0.983A	149.517	87.838%	0	<6.0	44.64°C	0.977
	12.199V	5.077V	3.325V	5.090V	170.219				37.96°C	115.77V
2	22.065A	2.961A	2.988A	1.183A	299.648	90.432%	1155	31.8	38.57°C	0.981
	12.180V	5.065V	3.312V	5.074V	331.353				45.60°C	115.56V
3	34.012A	3.461A	3.481A	1.384A	449.611	91.215%	1390	36.8	39.13°C	0.988
	12.161V	5.056V	3.302V	5.057V	492.912				46.44°C	115.46V
4	45.957A	3.963A	4.007A	1.587A	599.661	92.144%	1442	38.1	39.37°C	0.980
	12.152V	5.047V	3.292V	5.040V	650.786				46.90°C	115.36V
5	57.635A	4.964A	5.030A	1.792A	749.841	91.721%	1843	43.3	39.88°C	0.982
	12.134V	5.036V	3.280V	5.023V	817.522				47.70°C	115.15V
6	69.327A	5.971A	6.060A	1.998A	899.916	91.214%	2160	46.9	40.98°C	0.986
	12.118V	5.025V	3.268V	5.006V	986.595				49.18°C	115.02V
7	81.029A	6.981A	7.096A	2.205A	1050.045	90.695%	2310	49.5	42.16°C	0.990
	12.106V	5.014V	3.256V	4.989V	1157.776				50.52°C	114.77V
8	92.650A	7.997A	8.139A	2.415A	1200.222	89.948%	2310	49.5	43.53°C	0.992
	12.108V	5.003V	3.244V	4.971V	1334.353				52.24°C	114.62V
9	104.572A	8.511A	8.657A	2.419A	1349.925	89.407%	2320	49.5	45.86°C	0.993
	12.120V	4.994V	3.235V	4.962V	1509.870				54.67°C	114.47V
10	116.182A	9.028A	9.212A	3.047A	1499.936	88.691%	2320	49.5	46.02°C	0.994
	12.138V	4.985V	3.225V	4.925V	1691.190				55.13°C	114.21V
11	128.320A	9.040A	9.229A	3.051A	1649.822	88.167%	2320	49.5	47.61°C	0.995
	12.158V	4.979V	3.218V	4.916V	1871.253				57.08°C	114.06V
CL1	0.735A	14.002A	13.997A	0.000A	125.184	81.838%	2290	49.4	44.10°C	0.979
	12.204V	5.025V	3.276V	5.125V	152.966				47.33°C	115.78V

CL2	125.006A	1.000A	0.998A	1.000A	1533.121	88.672%	2320	49.5	46.73°C	0.995
	12.158V	5.021V	3.262V	5.021V	1728.983				53.87°C	114.18V

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	10.489A	1.970A	1.984A	0.982A	149.572	88.379%	0	<6.0	43.55°C	0.873
	12.201V	5.076V	3.325V	5.090V	169.240				38.25°C	230.76V
2	22.066A	2.962A	2.989A	1.183A	299.669	91.178%	1220	34.1	38.59°C	0.936
	12.180V	5.065V	3.312V	5.074V	328.665				44.05°C	230.75V
3	34.012A	3.463A	3.482A	1.384A	449.619	92.663%	1345	36.2	38.72°C	0.955
	12.161V	5.055V	3.301V	5.057V	485.219				44.31°C	230.47V
4	45.956A	3.964A	4.010A	1.587A	599.656	93.842%	1442	38.1	38.92°C	0.965
	12.152V	5.046V	3.291V	5.041V	639.004				44.73°C	230.54V
5	57.631A	4.966A	5.031A	1.792A	749.803	93.755%	1785	43.1	39.50°C	0.969
	12.134V	5.035V	3.280V	5.024V	799.751				45.64°C	230.53V
6	69.331A	5.972A	6.060A	1.998A	899.887	93.466%	2140	46.4	40.04°C	0.971
	12.117V	5.024V	3.267V	5.006V	962.795				46.94°C	230.42V
7	81.036A	6.983A	7.096A	2.205A	1050.046	93.123%	2290	49.4	41.28°C	0.976
	12.105V	5.013V	3.255V	4.989V	1127.593				48.39°C	230.39V
8	92.663A	7.998A	8.142A	2.414A	1200.189	92.814%	2310	49.5	42.57°C	0.977
	12.106V	5.002V	3.243V	4.971V	1293.113				50.01°C	230.28V
9	104.590A	8.513A	8.660A	2.419A	1349.939	92.621%	2320	49.5	44.10°C	0.978
	12.118V	4.993V	3.234V	4.963V	1457.489				51.74°C	229.99V
10	116.205A	9.031A	9.211A	3.047A	1499.977	92.069%	2320	49.5	45.85°C	0.979
	12.136V	4.984V	3.224V	4.925V	1629.196				53.82°C	229.98V
11	128.301A	9.043A	9.230A	3.052A	1649.981	91.703%	2330	49.6	46.75°C	0.982
	12.161V	4.978V	3.217V	4.916V	1799.270				55.18°C	230.02V
CL1	0.747A	14.003A	14.000A	0.000A	125.346	81.993%	2310	49.5	44.60°C	0.855
	12.204V	5.025V	3.276V	5.125V	152.874				46.72°C	230.92V

CL2	125.054A	1.002A	0.999A	1.000A	1533.339	92.269%	2320	49.5	45.98°C	0.980
	12.155V	5.020V	3.261V	5.021V	1661.820				51.40°C	229.98V

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	1.171A	0.489A	0.477A	0.195A	19.378	58.837%	0	<6.0	0.841
	12.210V	5.088V	3.338V	5.129V	32.935				115.94V
2	2.419A	0.982A	0.987A	0.391A	39.819	73.010%	0	<6.0	0.906
	12.208V	5.086V	3.334V	5.121V	54.539				115.91V
3	3.598A	1.474A	1.469A	0.587A	59.308	79.177%	0	<6.0	0.954
	12.207V	5.083V	3.332V	5.111V	74.906				115.89V
4	4.842A	1.968A	1.982A	0.784A	79.697	81.720%	0	<6.0	0.957
	12.206V	5.080V	3.329V	5.102V	97.525				115.86V

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	1.177A	0.491A	0.479A	0.195A	19.474	57.551%	0	<6.0	0.407
	12.214V	5.088V	3.337V	5.130V	33.838				230.84V
2	2.425A	0.983A	0.987A	0.391A	39.903	72.724%	0	<6.0	0.573
	12.211V	5.085V	3.334V	5.121V	54.869				230.84V
3	3.601A	1.475A	1.470A	0.587A	59.362	78.295%	0	<6.0	0.680
	12.210V	5.082V	3.331V	5.112V	75.818				230.82V
4	4.846A	1.968A	1.982A	0.784A	79.753	81.741%	0	<6.0	0.759
	12.208V	5.079V	3.328V	5.102V	97.568				230.63V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.3 mV	7.6 mV	7.3 mV	4.3 mV	Pass
20% Load	8.3 mV	9.7 mV	8.9 mV	4.7 mV	Pass
30% Load	11.5 mV	9.6 mV	9.1 mV	5.3 mV	Pass
40% Load	17.7 mV	11.2 mV	10.7 mV	5.9 mV	Pass
50% Load	17.9 mV	12.0 mV	12.2 mV	6.4 mV	Pass
60% Load	19.6 mV	13.5 mV	14.1 mV	7.3 mV	Pass
70% Load	20.8 mV	15.0 mV	18.4 mV	8.1 mV	Pass
80% Load	21.7 mV	15.2 mV	17.4 mV	8.6 mV	Pass
90% Load	22.4 mV	16.6 mV	18.8 mV	9.1 mV	Pass
100% Load	23.5 mV	18.1 mV	20.1 mV	9.7 mV	Pass
110% Load	24.3 mV	18.9 mV	21.4 mV	10.2 mV	Pass
Crossload 1	8.5 mV	12.6 mV	13.3 mV	31.3 mV	Pass
Crossload 2	23.0 mV	15.9 mV	17.0 mV	7.3 mV	Pass

The results above are not used in the certification process

230V

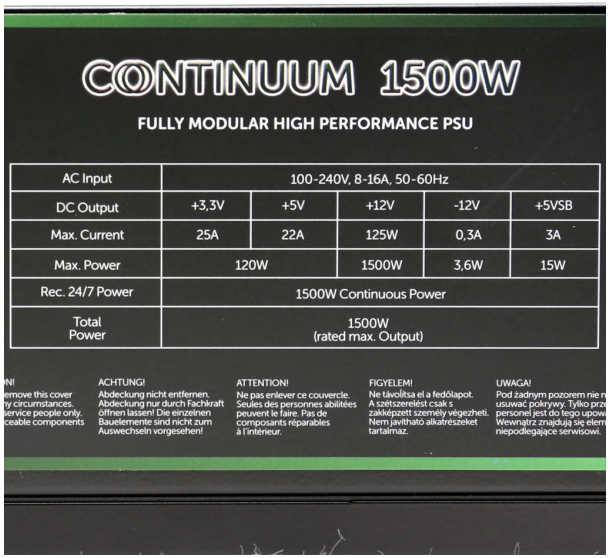
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	4.4 mV	7.9 mV	7.6 mV	4.3 mV	Pass
20% Load	7.7 mV	9.0 mV	9.1 mV	4.9 mV	Pass
30% Load	13.7 mV	10.3 mV	9.4 mV	5.5 mV	Pass
40% Load	19.4 mV	11.7 mV	10.5 mV	5.8 mV	Pass
50% Load	18.4 mV	12.7 mV	12.4 mV	6.7 mV	Pass
60% Load	19.6 mV	13.7 mV	15.2 mV	7.2 mV	Pass
70% Load	21.3 mV	15.0 mV	18.7 mV	7.9 mV	Pass
80% Load	22.4 mV	16.0 mV	17.5 mV	8.6 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	22.6 mV	16.9 mV	18.7 mV	9.1 mV	Pass
100% Load	23.7 mV	18.1 mV	20.5 mV	9.7 mV	Pass
110% Load	25.2 mV	19.2 mV	21.5 mV	10.3 mV	Pass
Crossload 1	8.3 mV	12.6 mV	12.9 mV	30.8 mV	Pass
Crossload 2	23.7 mV	15.6 mV	16.9 mV	7.0 mV	Pass

The results above are not used in the certification process

Kolink Continuum 1500W

Top side



Power specifications label

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern

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