

Anex

XPG KYBER 650

Lab ID#: AD65002219
 Receipt Date: Aug 3, 2023
 Test Date: Aug 17, 2023

Report: 23PS2219A
 Report Date: Aug 18, 2023

DUT INFORMATION	
Brand	XPG
Manufacturer (OEM)	CWT
Series	KYBER
Model Number	KYBER650GOLD
Serial Number	4N1581012949
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	47-63
Rated Power (W)	650
Type	ATX12V
Cooling	120mm Fluid Dynamic Bearing Fan (DF1202512FDHN)
Semi-Passive Operation	X
Cable Design	Fixed cables

TEST EQUIPMENT	
Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P
Power Analyzers	RS HMC8015, N4L PPA1530, N4L PPA5530
Oscilloscopes	Picoscope 4444, Rigol DS7014, 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, Keithley 2015 - THD
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Isolation Transformer	4kVA

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RESULTS

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

115V

Average Efficiency	88.214%
Efficiency With 10W (≤500W) or 2% (>500W)	63.829
Average Efficiency 5VSB	78.986%
Standby Power Consumption (W)	0.0478000
Average PF	0.976
Avg Noise Output	31.87 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54	3	0.3
	Watts	100		648	15	3.6
Total Max. Power (W)		650				

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

Hold-Up Time (ms)	16
AC Loss to PWR_OK Hold Up Time (ms)	13.4
PWR_OK Inactive to DC Loss Delay (ms)	2.6

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CABLES AND CONNECTORS

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (650mm)	1	1	18-20AWG	No
8 pin EPS12V (670mm) / 4+4 EPS12V (150mm)	1	1 / 1	18AWG	No
6+2 pin PCIe (600mm+150mm)	1	2	18AWG	No
SATA (450mm+150mm+150mm) / 4-pin Molex (150mm)	2	6 / 2	18AWG	No

Modular Cables

AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-
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General Data	-
Manufacturer (OEM)	CWT
PCB Type	Single-Side
Primary Side	-
Transient Filter	2x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK-056 50hm & Relay
Bridge Rectifier(s)	1x GBU15005 (600V, 15A @ 100°C)
APFC MOSFETs	2x Wayon WML28N50C4 (500V, 16A , Rds(on): 0.125Ohm) & 1x Syncpower SPN5003 FET (for reduced the no-load consumption)
APFC Boost Diode	1x CRMICRO CRXI06D065G2(600V, 6A @ 167°C)
Bulk Cap(s)	1x Elite (400V, 470uF, 2000h @ 85°C, GM)
Main Switchers	4x Silan Microelectronics SVF20N50F (500V, 12.6A @ 100°C, Rds(on): 0.27Ohm)
APFC Controller	1x Champion CM6500UNX
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Infineon BSC014N04LS (40V, 100A @ 100°C, Rds(on): 1.4mOhm)
5V & 3.3V	DC-DC Converters: 4x InfineonSPN3006 (30V, 57A @ 100°C, Rds(on): 5.5mOhm) PWM Controller(s): APW7159C
Filtering Capacitors	Electrolytic: 11x Chengx (2-3,000h @ 105°C ,GR) Polymer: 14x CapXon
Supervisor IC	IN1S313I-DAG
Fan Model	Martech DF1202512FDHN (120mm, 12V, 0.42A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Standby PWM Controller	Power Integrations TNY290

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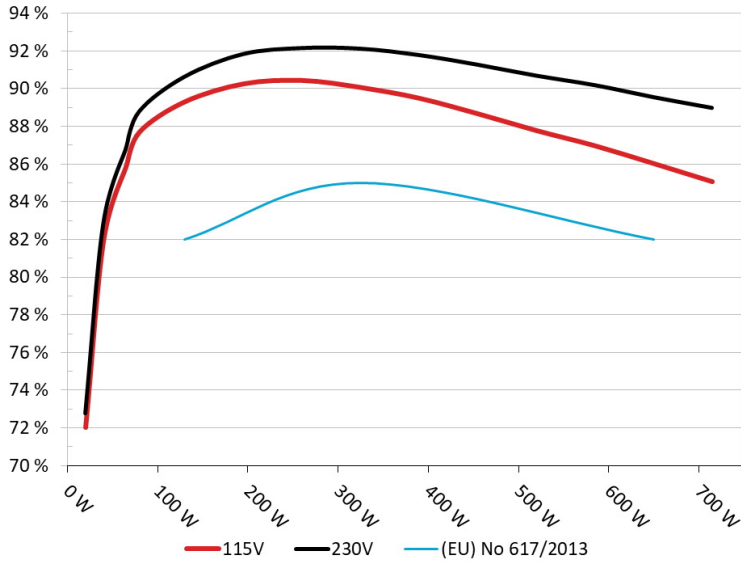
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: XPG KYBER 650

Ambient: 31°C - 40°C (87.8°F - 104°F)



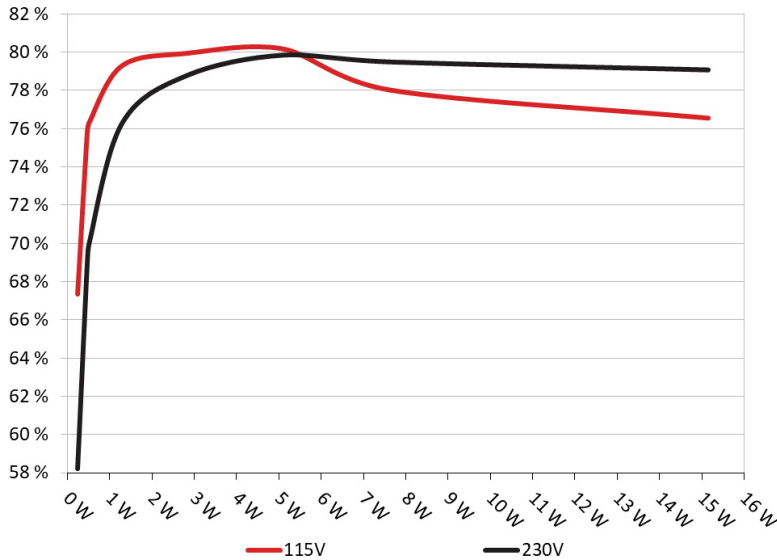
INFO

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: XPG KYBER 650

Ambient: 28°C - 32°C (82.4°F - 89.6°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	0.231W	67.332%	0.029
	5.124V	0.297W		114.87V
2	0.09A	0.461W	75.854%	0.058
	5.123V	0.608W		114.87V
3	0.55A	2.811W	79.938%	0.261
	5.111V	3.517W		114.88V
4	1A	5.1W	80.165%	0.359
	5.099V	6.362W		114.87V
5	1.5A	7.63W	78.013%	0.404
	5.086V	9.781W		114.88V
6	3A	15.146W	76.545%	0.475
	5.048V	19.786W		114.88V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231W	58.215%	0.011
	5.123V	0.397W		229.95V
2	0.09A	0.461W	69.049%	0.019
	5.122V	0.668W		229.94V
3	0.55A	2.811W	78.769%	0.098
	5.111V	3.569W		229.94V
4	1A	5.1W	79.842%	0.163
	5.1V	6.387W		229.94V
5	1.5A	7.632W	79.481%	0.205
	5.088V	9.602W		229.94V
6	3A	15.144W	79.065%	0.315
	5.048V	19.154W		229.94V

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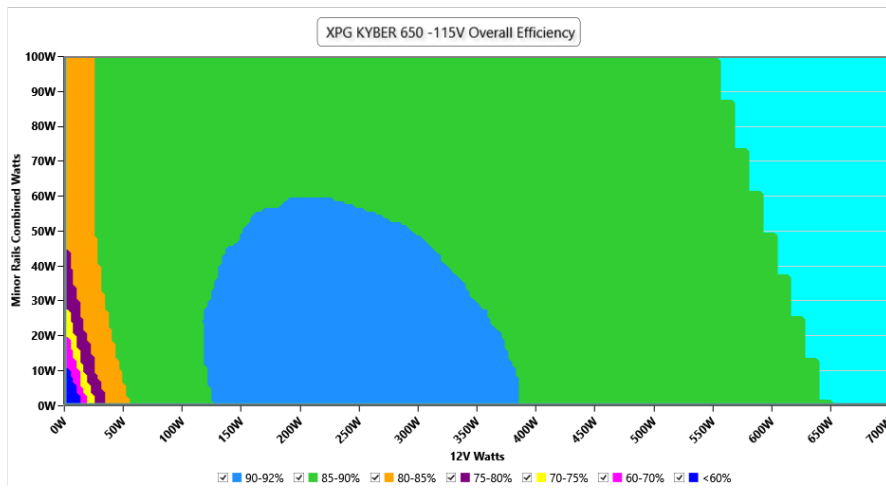
115V

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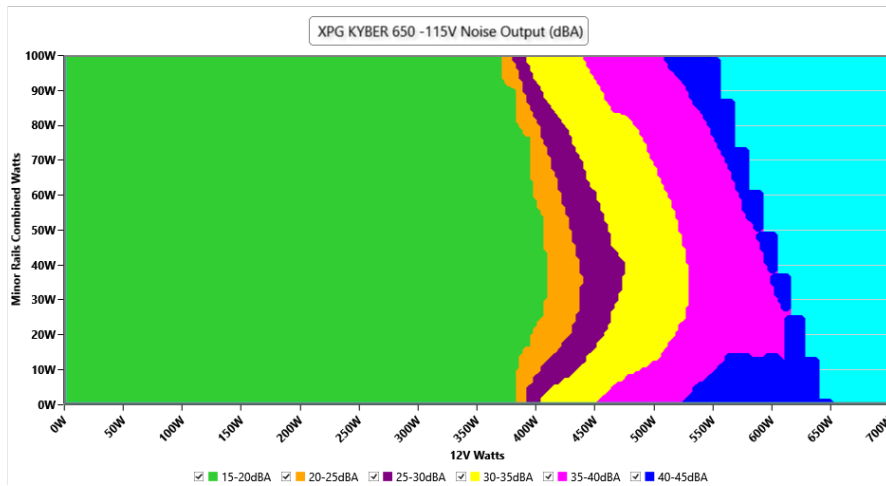
EFFICIENCY GRAPH 115V



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

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.88 V	114.82 V	113.85 V	114.93 V	116.15 V	PASS
Mains Frequency:	59.99 Hz	59.97 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.419	1.417	1.340	1.421	1.490	PASS
Mains Voltage THD:	0.16 %	0.09 %	N/A	0.27 %	2.00 %	PASS
Real Power:	0.048 W	-0.003 W	N/A	0.069 W	N/A	N/A
Apparent Power:	11.388 W	11.363 W	N/A	11.423 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

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
10%	3.592A	1.994A	2.002A	0.983A	65.004	85.723%	893	19.7	34.22°C	0.946
	12.084V	5.015V	3.296V	5.085V	75.83				38.37°C	114.85V
20%	8.204A	2.994A	3.007A	1.184A	129.944	89.309%	898	19.7	34.91°C	0.969
	12.072V	5.012V	3.293V	5.07V	145.502				39.31°C	114.84V
30%	13.174A	3.495A	3.512A	1.385A	194.944	90.261%	901	19.7	35.29°C	0.977
	12.061V	5.008V	3.289V	5.054V	215.978				40.2°C	114.8V
40%	18.160A	3.996A	4.018A	1.588A	260.026	90.44%	905	19.8	35.76°C	0.981
	12.049V	5.005V	3.286V	5.037V	287.512				41.4°C	114.79V
50%	22.806A	5A	5.028A	1.794A	325.027	90.068%	911	20.0	36.26°C	0.98
	12.037V	5.001V	3.282V	5.019V	360.872				42.42°C	114.76V
60%	27.412A	6.004A	6.04A	2A	389.426	89.499%	916	20.3	36.74°C	0.981
	12.024V	4.998V	3.278V	5V	435.117				43.41°C	114.73V
70%	32.105A	7.009A	7.054A	2.209A	454.745	88.671%	1204	29.4	37.35°C	0.981
	12.011V	4.995V	3.275V	4.981V	512.845				44.52°C	114.71V
80%	36.811A	8.002A	8.071A	2.316A	519.5	87.78%	1588	37.2	37.8°C	0.982
	11.998V	4.991V	3.271V	4.966V	591.823				45.61°C	114.68V
90%	41.920A	8.52A	8.569A	2.424A	584.936	86.962%	2008	43.0	38.77°C	0.983
	11.985V	4.988V	3.267V	4.951V	672.632				47.74°C	114.66V
100%	46.781A	9.027A	9.1A	3.047A	649.767	86.023%	2351	46.5	39.45°C	0.984
	11.972V	4.985V	3.264V	4.923V	755.339				49.15°C	114.63V
110%	51.518A	10.039A	10.215A	3.057A	714.402	85.067%	2350	46.5	40.26°C	0.986
	11.959V	4.981V	3.26V	4.908V	839.818				51.15°C	114.6V
CL1	0.115A	12.055A	12.09A	0A	101.288	83.919%	914	20.1	35.07°C	0.964
	12.071V	4.994V	3.283V	5.086V	120.699				40.84°C	114.84V
CL2	0.115A	20.059A	0A	0A	101.366	82.09%	917	20.3	34.78°C	0.965
	12.077V	4.984V	3.297V	5.094V	123.485				40.17°C	114.84V
CL3	0.116A	0A	20.121A	0A	67.396	76.87%	904	19.7	34.72°C	0.953
	12.075V	5.016V	3.28V	5.091V	87.675				39.54°C	114.85V
CL4	54.208A	0A	0A	0A	649.577	87.403%	2159	44.2	39.27°C	0.985
	11.983V	5.006V	3.277V	5.021V	743.207				46.73°C	114.64V

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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])	Temps (In/Out)	PF/AC Volts
20W	1.228A	0.498A	0.5A	0.195A	19.998	72.009%	876	19.3	30.53°C	0.84
	12.093V	5.02V	3.3V	5.116V	27.77				33.62°C	114.88V
40W	2.704A	0.697A	0.7A	0.294A	40	81.991%	880	19.4	31.37°C	0.919
	12.089V	5.019V	3.299V	5.111V	48.786				34.57°C	114.87V
60W	4.181A	0.897A	0.901A	0.392A	60	85.898%	884	19.5	32.24°C	0.944
	12.086V	5.018V	3.298V	5.104V	69.851				35.74°C	114.86V
80W	5.654A	1.096A	1.101A	0.49A	79.948	87.714%	889	19.7	33.21°C	0.955
	12.082V	5.017V	3.297V	5.098V	91.145				36.93°C	114.85V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	16.62mV	17.05mV	15.46mV	13.99mV	Pass
20% Load	20.79mV	18.03mV	15.31mV	14.56mV	Pass
30% Load	24.66mV	19.27mV	17.43mV	19.56mV	Pass
40% Load	26.26mV	19.06mV	18.36mV	18.63mV	Pass
50% Load	23.87mV	20.09mV	18.25mV	19.10mV	Pass
60% Load	24.64mV	23.34mV	17.84mV	20.59mV	Pass
70% Load	25.78mV	23.59mV	19.19mV	22.66mV	Pass
80% Load	29.33mV	25.50mV	20.37mV	26.79mV	Pass
90% Load	32.02mV	26.53mV	21.15mV	25.65mV	Pass
100% Load	43.74mV	27.91mV	22.20mV	26.50mV	Pass
110% Load	47.22mV	29.34mV	24.11mV	28.94mV	Pass
Crossload1	33.91mV	20.80mV	18.79mV	13.40mV	Pass
Crossload2	25.78mV	31.22mV	15.26mV	13.73mV	Pass
Crossload3	27.27mV	19.68mV	22.24mV	13.11mV	Pass
Crossload4	37.20mV	27.88mV	19.19mV	18.32mV	Pass

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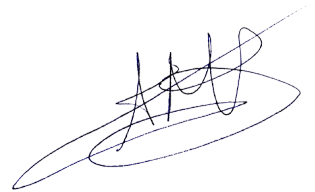


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Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

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