EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Gigabyte P450B

Lab ID#: GB45001744
Receipt Date: Sep 7, 2020
Test Date: Nov 6, 2020

Report: 20PS1744A
Report Date: Nov 12, 2020

DUT INFORMATION

Brand	Gigabyte
Manufacturer (OEM)	MEIC
Series	
Model Number	GP-P450B
Serial Number	SN20233G003334
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60
Rated Power (W)	450
Type	ATX12V
Cooling	120mm Rifle Bearing Fan (BK BDH12025S)
Semi-Passive Operation	✗
Cable Design	Fixed cables

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

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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	83.042%
Efficiency With 10W (≤500W) or 2% (>500W)	53.369
Average Efficiency 5VSB	79.374%
Standby Power Consumption (W)	0.0614655
Average PF	0.986
Avg Noise Output	42.14 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	Standard

230V

Average Efficiency	84.693%
Average Efficiency 5VSB	76.032%
Standby Power Consumption (W)	0.1940270
Average PF	0.825
Avg Noise Output	42.38 dB(A)
Efficiency Rating (ETA)	
Noise Rating (LAMBDA)	Standard

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	18	15	36	3	0.3
	Watts	103		432	15	3.6
Total Max. Power (W)		450				

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

Hold-Up Time (ms)	17.4
AC Loss to PWR_OK Hold Up Time (ms)	12.5
PWR_OK Inactive to DC Loss Delay (ms)	4.9

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CABLES AND CONNECTORS

Native Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Caps
ATX connector 20+4 pin (560mm)	1	1	18-22AWG	No
4+4 pin EPS12V (600mm)	1	1	18AWG	No
6+2 pin PCIe (540mm+150mm)	1	2	18AWG	No
SATA (510mm+120mm+120mm)	2	6	18AWG	No
4-pin Molex (510mm+120mm+120mm) / FDD (+120mm)	1	3 / 1	18-22AWG	No

Modular Cables

AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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General Data	-
Manufacturer (OEM)	MEIC
PCB Type	Single Sided
Primary Side	**-**
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor SCK-1R55 (1.5 Ohm)
Bridge Rectifier(s)	1x GBU1006 (600V, without heatsink)
APFC MOSFETs	2x Jilin Sino-Microelectronics JCS18N50F (500V, 11A @ 100°C, Rds(on): 0.27Ohm)
APFC Boost Diode	1x Dyelec SU860
Bulk Cap(s)	1x Teapo (400V, 270uF, 2,000h @ 85°C, LH)
Main Switchers	2x Jilin Sino-Microelectronics JCS18N50F (500V, 11A @ 100°C, Rds(on): 0.27Ohm)
PFC/PWM Combo Controller	Champion CM680BG
Topology	Primary side: APFC, Double Forward Secondary side: Passive Rectification & Group Regulation
Secondary Side	**-**
+12V & 5V SBRs	2x Dyelec SBP30V60CT (60V, 30A) & 1x MBR3045CT (45V, 30A @ 114°C)
3.3V SBR	1x Jinan Jingheng Electronics SR3045LCT (45V, 30A @ 90°C)
Filtering Capacitors	Electrolytic: 4x Chn Cap (3-7,000h @ 105°C, TP), 1x Chn Cap (2-5,000h @ 105°C, TM), 5x YC (105°C, LE), 2x YC (105°C, TH)
Supervisor IC	Weltrend WT7525 (OVP, UVP, OCP, SCP, PG)
Fan Model	BK BDH12025S (120mm, 12V, 0.18A, Hydraulic Bearing Fan)
5VSB Circuit	**-**
Standby PWM Controller	PR6249H

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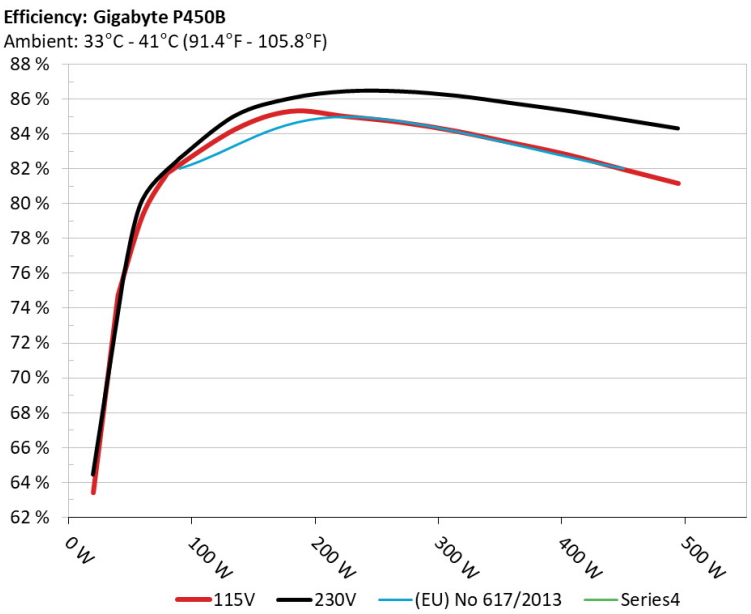
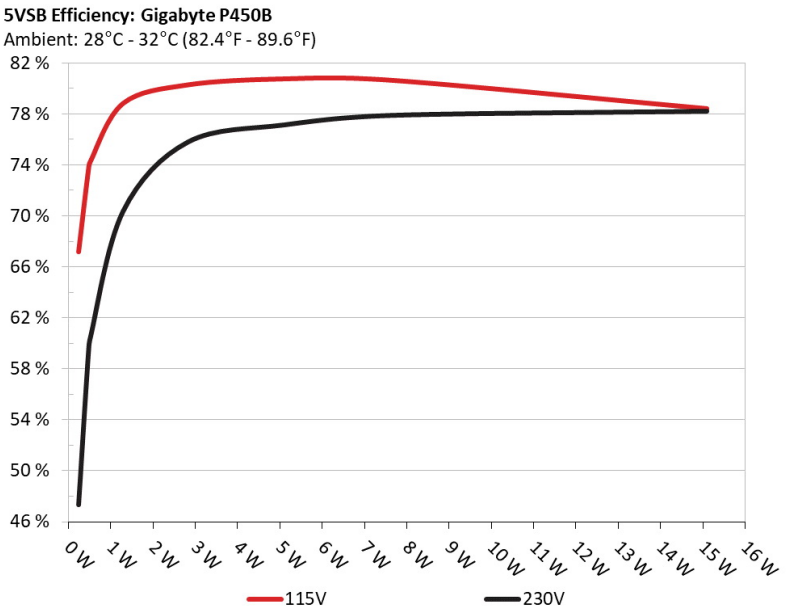
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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Gigabyte P450B

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	67.151%	0.068
	5.140V	0.344		115.12V
2	0.090A	0.462	73.567%	0.116
	5.139V	0.628		115.12V
3	0.550A	2.816	80.251%	0.318
	5.122V	3.509		115.11V
4	1.000A	5.104	80.721%	0.365
	5.106V	6.323		115.12V
5	1.500A	7.630	80.613%	0.391
	5.087V	9.465		115.12V
6	2.999A	15.093	78.389%	0.433
	5.033V	19.254		115.12V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	47.336%	0.030
	5.141V	0.488		230.29V
2	0.090A	0.462	59.231%	0.047
	5.139V	0.780		230.25V
3	0.550A	2.816	75.801%	0.180
	5.122V	3.715		230.25V
4	1.000A	5.105	77.150%	0.248
	5.106V	6.617		230.25V
5	1.500A	7.631	77.891%	0.287
	5.088V	9.797		230.25V
6	2.999A	15.091	78.220%	0.341
	5.032V	19.293		230.26V

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115V

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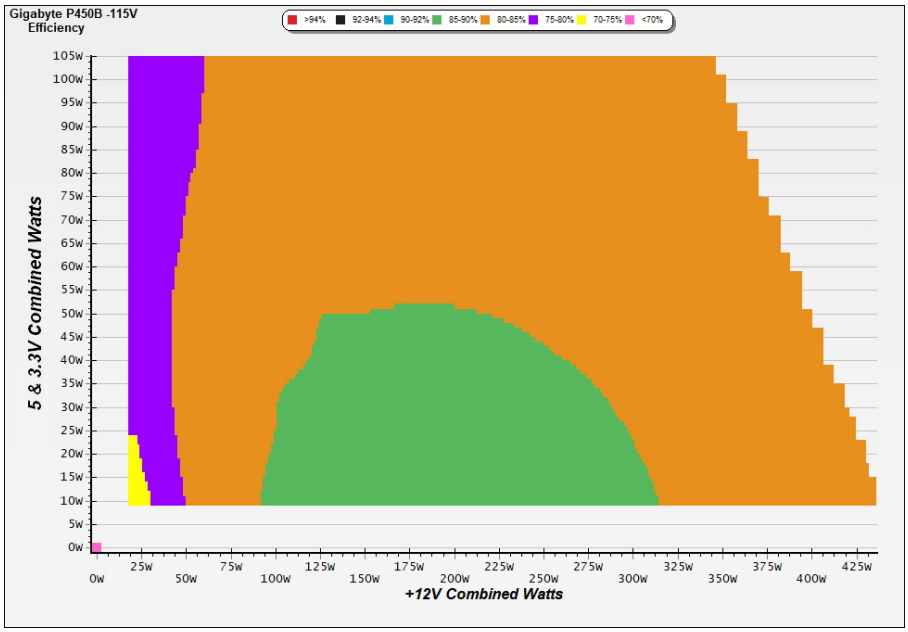
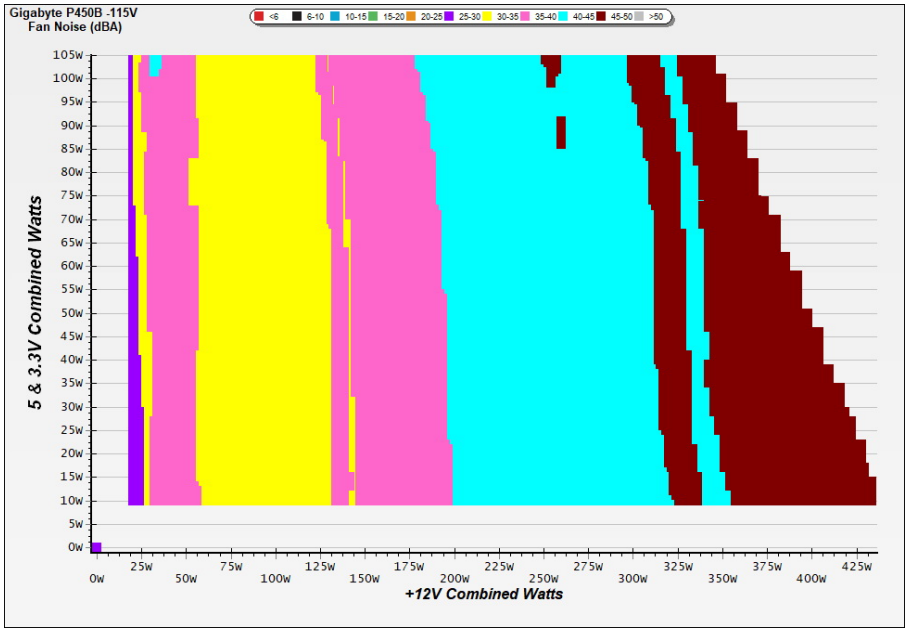
EFFICIENCY GRAPH 115V



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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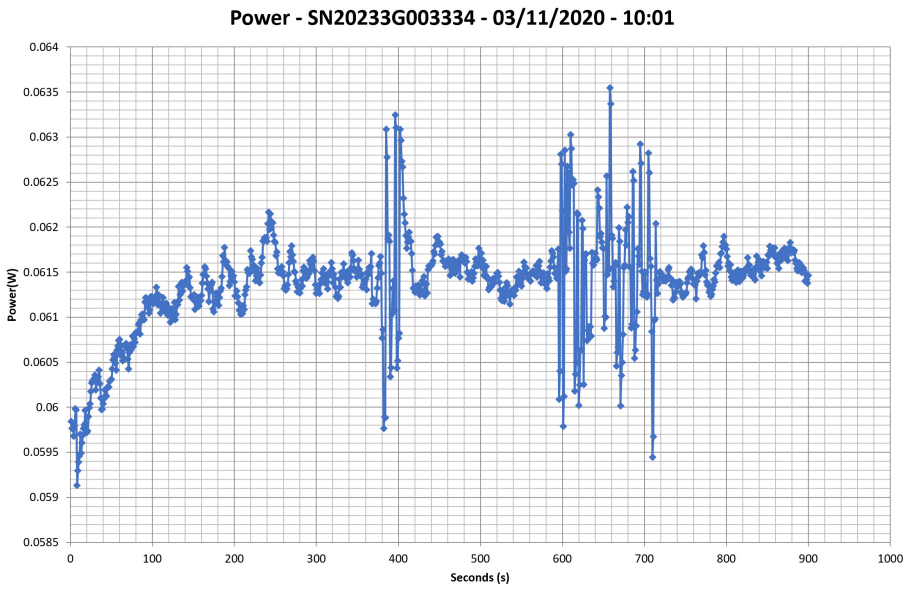
VAMPIRE POWER -115V



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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Gigabyte P450B

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	1.922A	1.956A	1.991A	0.981A	44.954	74.723%	1562	37.1	35.35°C	0.799
	12.151V	5.110V	3.317V	5.098V	60.161				38.20°C	115.18V
2	4.870A	2.944A	2.992A	1.180A	90.014	81.746%	1654	39.8	35.83°C	0.942
	12.138V	5.096V	3.309V	5.084V	110.114				39.00°C	115.17V
3	8.174A	3.434A	3.495A	1.380A	134.996	84.262%	1766	40.7	36.29°C	0.979
	12.106V	5.096V	3.303V	5.071V	160.209				40.38°C	115.17V
4	11.493A	3.926A	4.002A	1.582A	179.988	85.296%	1862	42.3	36.97°C	0.997
	12.076V	5.095V	3.297V	5.057V	211.016				41.48°C	115.16V
5	14.460A	4.921A	5.016A	1.785A	224.973	84.997%	2018	45.3	37.63°C	0.996
	12.066V	5.080V	3.289V	5.043V	264.685				42.95°C	115.17V
6	17.433A	5.923A	6.035A	1.989A	269.956	84.656%	2126	45.1	37.71°C	0.995
	12.055V	5.065V	3.281V	5.028V	318.884				43.82°C	115.16V
7	20.421A	6.931A	7.059A	2.193A	315.016	84.142%	2292	48.2	38.54°C	0.994
	12.042V	5.051V	3.273V	5.013V	374.384				45.61°C	115.15V
8	23.399A	7.949A	8.085A	2.400A	359.994	83.476%	2359	48.4	39.32°C	0.994
	12.034V	5.034V	3.265V	4.999V	431.256				47.35°C	115.15V
9	26.848A	8.446A	8.589A	2.402A	404.733	82.803%	2401	48.3	39.38°C	0.994
	12.003V	5.032V	3.258V	4.993V	488.788				48.04°C	115.15V
10	30.060A	8.947A	9.134A	3.022A	449.566	81.965%	2443	49.0	40.54°C	0.994
	11.972V	5.029V	3.251V	4.963V	548.486				49.53°C	115.14V
11	33.945A	8.926A	9.150A	3.025A	494.375	81.153%	2444	49.0	41.20°C	0.994
	11.922V	5.041V	3.245V	4.957V	609.189				51.04°C	115.14V
CL1	4.000A	11.997A	11.998A	0.001A	147.476	79.132%	2087	44.8	37.89°C	0.987
	12.411V	4.871V	3.283V	5.107V	186.366				42.82°C	115.16V
CL2	36.001A	1.000A	1.000A	1.000A	432.152	82.869%	2389	48.2	40.03°C	0.995
	11.626V	5.276V	3.272V	5.056V	521.489				49.10°C	115.14V

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Gigabyte P450B

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	1.227A	0.484A	0.496A	0.195A	19.986	63.397%	1589	37.3	0.587
	12.093V	5.160V	3.324V	5.132V	31.525				115.17V
2	2.453A	0.972A	0.992A	0.391A	39.976	74.583%	1575	37.0	0.766
	12.098V	5.147V	3.320V	5.121V	53.599				115.18V
3	3.681A	1.461A	1.493A	0.587A	60.005	79.326%	1512	38.0	0.860
	12.103V	5.134V	3.317V	5.111V	75.644				115.18V
4	4.904A	1.950A	1.992A	0.784A	79.954	81.705%	1626	38.3	0.911
	12.105V	5.124V	3.313V	5.101V	97.857				115.18V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	13.30mV	8.10mV	13.50mV	11.90mV	Pass
20% Load	16.40mV	17.30mV	17.00mV	40.60mV	Pass
30% Load	14.70mV	8.90mV	15.30mV	14.40mV	Pass
40% Load	14.40mV	7.80mV	14.80mV	13.90mV	Pass
50% Load	24.90mV	20.70mV	19.70mV	47.90mV	Pass
60% Load	20.10mV	7.60mV	16.50mV	16.40mV	Pass
70% Load	24.40mV	7.90mV	17.80mV	16.60mV	Pass
80% Load	29.90mV	9.30mV	23.00mV	18.70mV	Pass
90% Load	35.20mV	21.70mV	24.30mV	46.30mV	Pass
100% Load	49.20mV	14.80mV	25.50mV	24.00mV	Pass
110% Load	67.30mV	18.00mV	23.60mV	23.60mV	Pass
Crossload1	24.20mV	15.90mV	29.30mV	24.80mV	Pass
Crossload2	58.10mV	11.20mV	11.50mV	16.90mV	Pass

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230V

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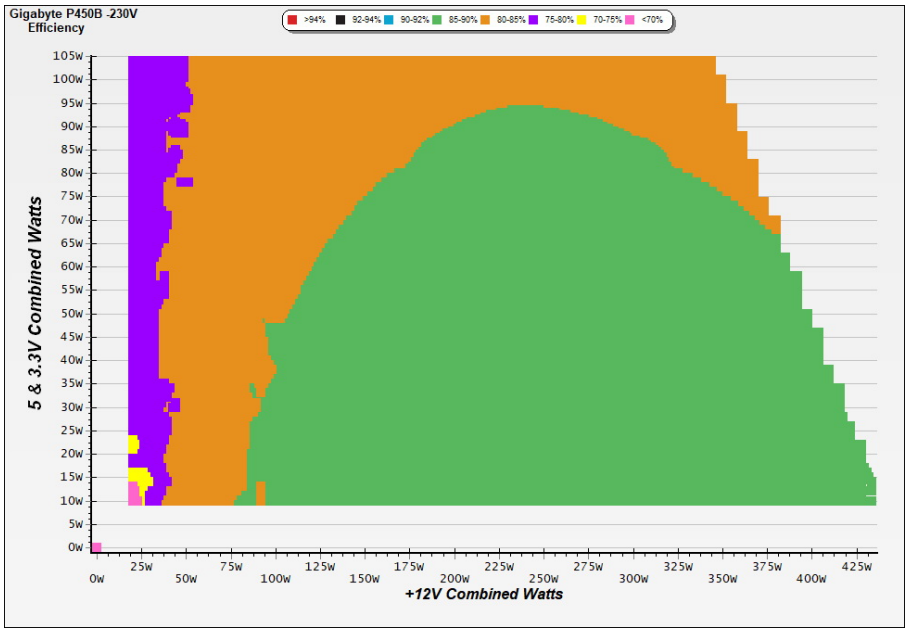
EFFICIENCY GRAPH 230V



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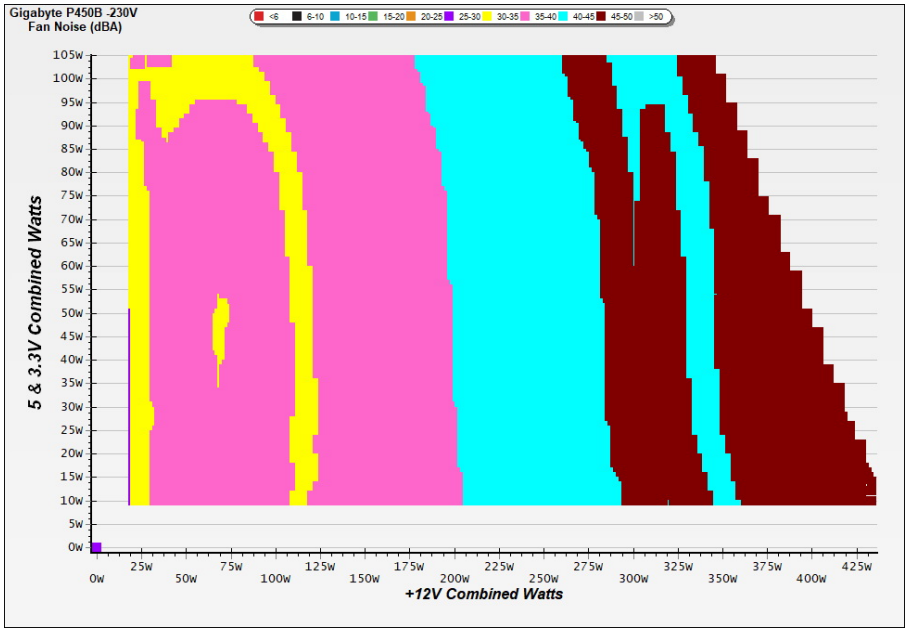
NOISE GRAPH 230V



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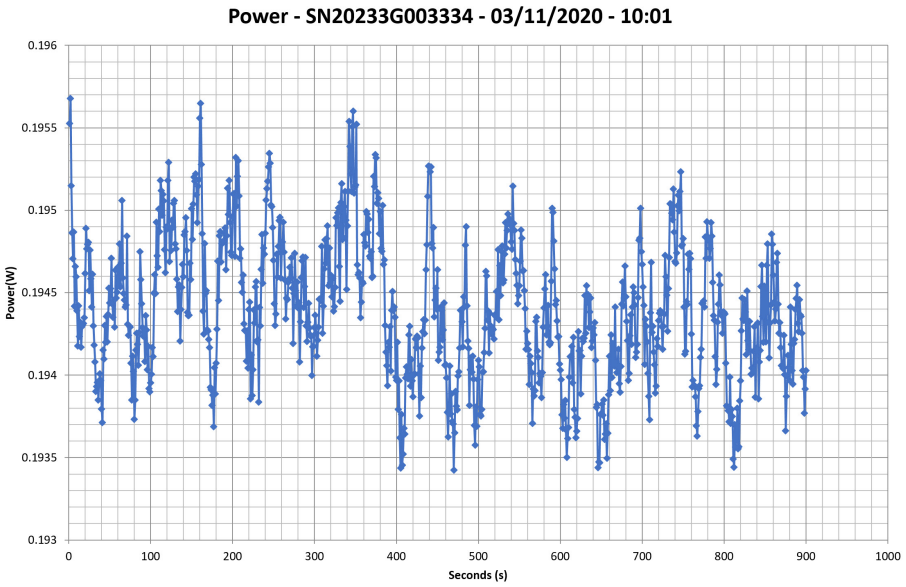
VAMPIRE POWER -230V



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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	1.922A	1.955A	1.989A	0.980A	44.951	74.693%	1699	39.3	35.11°C	0.365
	12.154V	5.112V	3.318V	5.099V	60.181				37.23°C	230.32V
2	4.869A	2.943A	2.991A	1.180A	90.011	82.586%	1681	40.3	35.31°C	0.533
	12.140V	5.097V	3.310V	5.085V	108.990				37.88°C	230.27V
3	8.172A	3.434A	3.497A	1.380A	134.990	85.065%	1795	40.9	36.69°C	0.638
	12.107V	5.097V	3.303V	5.071V	158.691				39.81°C	230.28V
4	11.493A	3.926A	4.003A	1.582A	179.991	86.067%	1853	42.5	37.06°C	0.737
	12.076V	5.095V	3.297V	5.057V	209.129				40.80°C	230.30V
5	14.458A	4.925A	5.019A	1.785A	224.983	86.472%	1989	43.6	37.43°C	0.826
	12.067V	5.078V	3.289V	5.043V	260.179				42.34°C	230.32V
6	17.436A	5.925A	6.037A	1.989A	269.974	86.467%	2160	45.8	37.78°C	0.893
	12.053V	5.065V	3.281V	5.028V	312.229				42.96°C	230.32V
7	20.412A	6.940A	7.058A	2.194A	315.038	86.216%	2134	45.3	38.06°C	0.924
	12.048V	5.045V	3.273V	5.014V	365.405				44.66°C	230.34V
8	23.407A	7.949A	8.086A	2.400A	360.015	85.787%	2336	48.5	38.73°C	0.947
	12.031V	5.033V	3.265V	4.999V	419.660				46.42°C	230.34V
9	26.856A	8.448A	8.593A	2.403A	404.813	85.354%	2401	48.5	39.51°C	0.966
	12.002V	5.030V	3.258V	4.993V	474.278				47.90°C	230.33V
10	30.068A	8.950A	9.132A	3.022A	449.630	84.849%	2428	48.8	40.14°C	0.977
	11.971V	5.028V	3.251V	4.963V	529.920				49.36°C	230.33V
11	33.953A	8.929A	9.149A	3.026A	494.435	84.339%	2436	48.9	40.61°C	0.984
	11.921V	5.039V	3.245V	4.957V	586.250				50.41°C	230.33V
CL1	4.000A	11.999A	11.997A	0.001A	147.471	79.934%	2028	45.4	37.95°C	0.683
	12.411V	4.870V	3.283V	5.106V	184.491				42.33°C	230.34V
CL2	36.004A	1.000A	1.000A	1.000A	432.292	85.653%	2368	48.5	40.48°C	0.973
	11.629V	5.273V	3.273V	5.056V	504.703				49.82°C	230.34V

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Gigabyte P450B

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	1.226A	0.484A	0.496A	0.195A	19.981	64.442%	1322	34.5	0.273
	12.098V	5.160V	3.325V	5.134V	31.006				230.33V
2	2.452A	0.970A	0.994A	0.390A	39.970	75.901%	1487	35.8	0.330
	12.103V	5.148V	3.321V	5.124V	52.661				230.33V
3	3.680A	1.461A	1.491A	0.587A	60.001	80.230%	1566	37.0	0.439
	12.106V	5.136V	3.317V	5.113V	74.786				230.33V
4	4.902A	1.951A	1.991A	0.784A	79.952	82.611%	1569	37.0	0.496
	12.108V	5.125V	3.314V	5.103V	96.781				230.33V

RIPPLE MEASUREMENTS 230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.90mV	7.80mV	13.90mV	12.50mV	Pass
20% Load	13.70mV	8.70mV	14.70mV	13.10mV	Pass
30% Load	14.40mV	7.40mV	15.30mV	13.50mV	Pass
40% Load	14.90mV	7.00mV	14.80mV	13.90mV	Pass
50% Load	16.50mV	8.30mV	15.80mV	15.20mV	Pass
60% Load	19.10mV	6.70mV	16.00mV	15.70mV	Pass
70% Load	21.50mV	8.10mV	17.10mV	17.00mV	Pass
80% Load	23.50mV	7.00mV	20.10mV	18.00mV	Pass
90% Load	29.20mV	9.10mV	21.10mV	18.40mV	Pass
100% Load	35.90mV	11.20mV	21.60mV	21.60mV	Pass
110% Load	47.80mV	11.60mV	21.00mV	23.00mV	Pass
Crossload1	23.20mV	17.50mV	28.80mV	25.50mV	Pass
Crossload2	51.50mV	8.90mV	11.20mV	16.80mV	Pass

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Anex

Gigabyte P450B

Top side

Power specifications label

CERTIFICATIONS 115V

CYBENETICS BRONZE

CYBENETICS STANDARD

CERTIFICATIONS 230V

CYBENETICS STANDARD 230v

Aristeidis Bitziopoulos
Lab Director