EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

EVGA 650 BQ (Sample #2)

Lab ID#: 164
Receipt Date: Aug 15, 2018
Test Date: Aug 21, 2018

Report:
Report Date: Aug 23, 2018

DUT INFORMATION

Brand	EVGA
Manufacturer (OEM)	HEC
Series	BQ
Model Number	
Serial Number	1703560615801533
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	650
Type	ATX12V
Cooling	140mm Teflon Nano-Steel Fan (RL4Z T1352512H)
Semi-Passive Operation	✗
Cable Design	Semi Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	24	20	54	3	0.3
	Watts	130		648	15	3.6
Total Max. Power (W)		650				

CABLES AND CONNECTORS

Captive Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (570mm)	1	1	18-22AWG
4+4 pin EPS12V (620mm)	1	1	18AWG
6+2 pin PCIe (580mm+150mm)	1	2	18AWG
Modular Cables			
6+2 pin PCIe (550mm+150mm)	1	2	18AWG
SATA (500mm+150mm+150mm+150mm)	1	4	18AWG
SATA (500mm+150mm+150mm)	1	3	18AWG
4 pin Molex (550mm+150mm+150mm)+FDD (+150mm)	1	3 / 1	18-20AWG

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

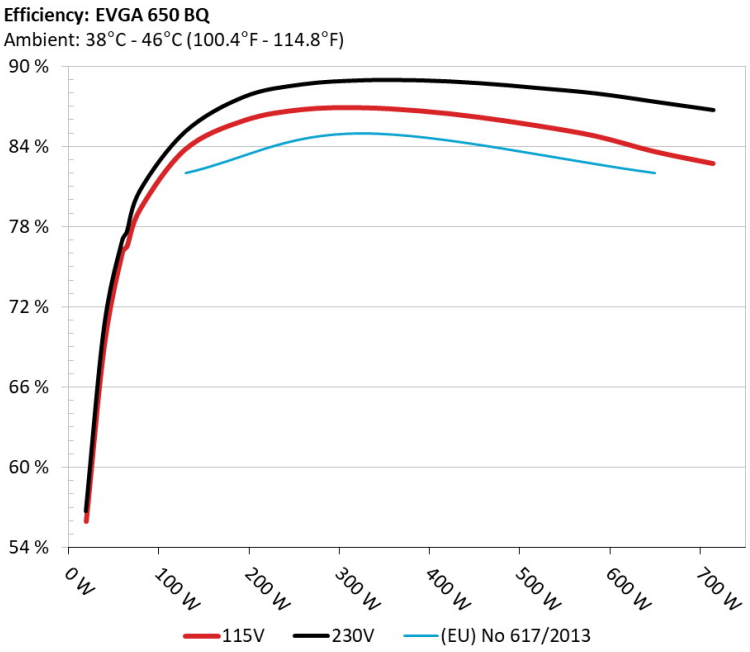
115V

Average Efficiency	84.573%
Efficiency With 10W (≤500W) or 2% (>500W)	0.000
Average Efficiency 5VSB	78.148%
Standby Power Consumption (W)	0.0518008
Average PF	0.987
Avg Noise Output	38.98 dB(A)
Efficiency Rating (ETA)	BRONZE
Noise Rating (LAMBDA)	S+

TEST EQUIPMENT

Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

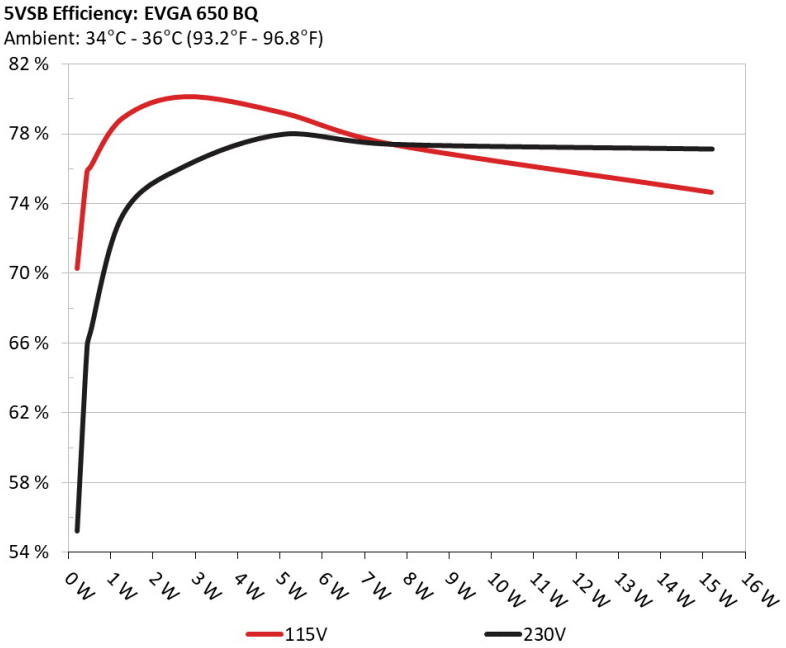
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.213	70.297%	0.043
	5.131V	0.303		115.17V
2	0.087A	0.446	75.850%	0.082
	5.130V	0.588		115.19V
3	0.542A	2.776	80.162%	0.288
	5.122V	3.463		115.17V
4	1.002A	5.119	79.205%	0.350
	5.110V	6.463		115.18V
5	1.501A	7.657	77.422%	0.384
	5.100V	9.890		115.18V
6	3.001A	15.204	74.669%	0.431
	5.066V	20.362		115.18V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.041A	0.212	55.208%	0.017
	5.131V	0.384		230.44V
2	0.087A	0.446	65.782%	0.029
	5.130V	0.678		230.44V
3	0.542A	2.774	76.188%	0.139
	5.120V	3.641		230.45V
4	1.002A	5.119	78.010%	0.212
	5.111V	6.562		230.50V
5	1.501A	7.657	77.422%	0.264
	5.100V	9.890		230.44V
6	3.001A	15.209	77.148%	0.336
	5.068V	19.714		230.44V

115V

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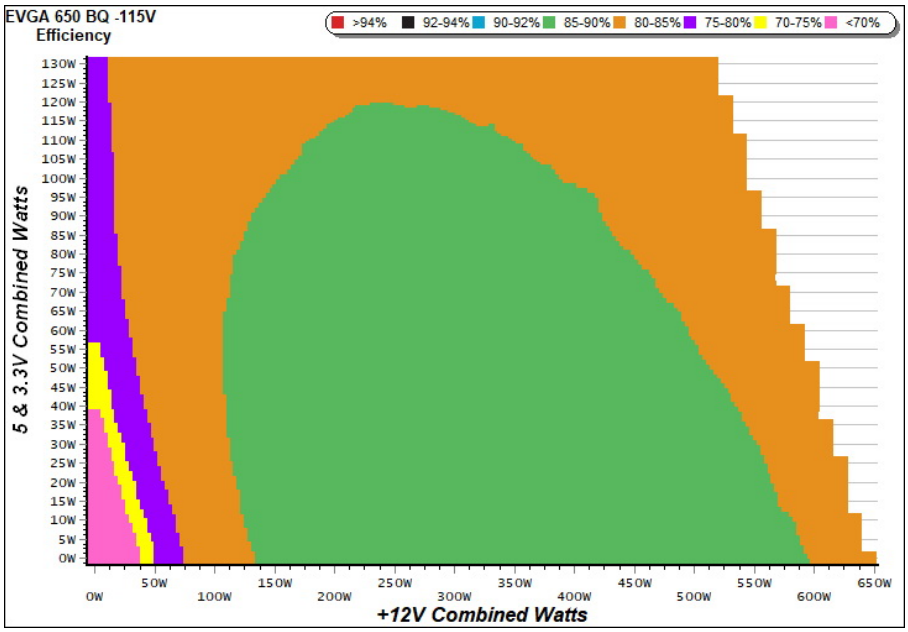
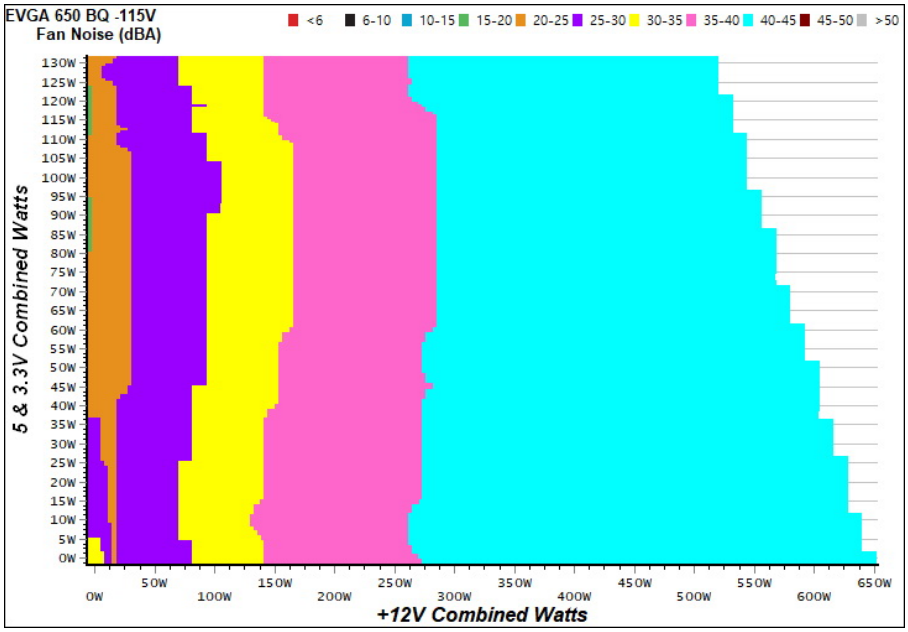
EFFICIENCY GRAPH 115V



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

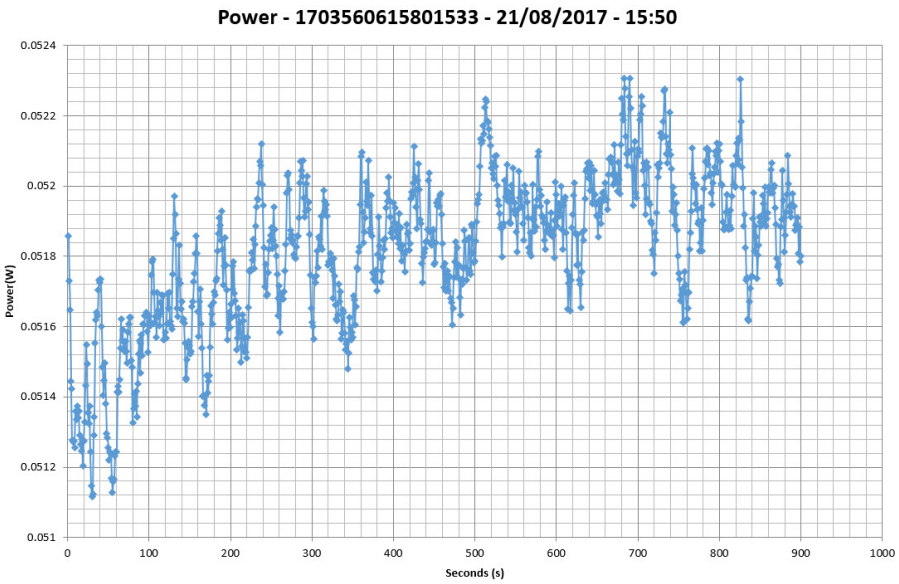
NOISE GRAPH 115V



INFO

The PSU's noise in its entire operational range and under 30-32 °C (+-2 °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

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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COMMISSION REGULATION (EU) NO 617/2013 TESTING 115V

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Top side

Power specifications label

CERTIFICATIONS 115V

CYBENETICS BRONZE

CYBENETICS STANDARD+

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Lab Director