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

Zalman EBT 750W

Lab ID#: 126
Receipt Date: May 31, 2018
Test Date: Jun 13, 2018

Report:
Report Date: Jun 15, 2018

DUT INFORMATION

Brand	Zalman
Manufacturer (OEM)	Sirfa
Series	EBT
Model Number	ZM750-EBT
Serial Number	20756F1000642
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	750
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (RL4Z S1352512H)
Semi-Passive Operation	✗
Cable Design	Semi Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	62.5	3	0.3
	Watts	120		750	15	3.6
Total Max. Power (W)		750				

CABLES AND CONNECTORS

Native Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (510mm)	1	1	18-22AWG
4+4 pin EPS12V (660mm)	1	1	18AWG
6+2 pin PCIe (510mm+150mm)	1	2	18AWG
Modular Cables			
6 pin PCIe (+510mm)	2	2	18AWG
SATA (465mm+150mm+150mm+150mm)	2	8	18AWG
4 pin Molex (460mm+150mm+150mm)	1	3	18AWG
4 pin Molex (460mm+150mm+150mm) / FDD (+150mm)	1	3 / 1	18-22AWG

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Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CMD02X
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	1x
APFC MOSFETS	2x Infineon IPP50R140CP (550V, 15A @ 100°C, 0.14 Ohm)
APFC Boost Diode	1x CREE C3D08060A (600V, 8A @ 152°C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400V, 470uF, 2000h @ 105°C, KMQ)
Main Switchers	2x Infineon IPA50R190CE (550V, 11.7A @ 100°C, 0.19 Ohm)
APFC Controller	Infineon ICE3PCS01
Switching Controller	Infineon ICE2HS01G
Topology	Primary side: Half-Bridge & LLC Resonant Converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x IRFB743PbF (40V, 180A @ 100°C, 2.0 mOhm)
5V & 3.3V	DC-DC Converters: 8x Infineon IPD060N03L G (30V, 50A @ 100°C, 6 mOhm) PWM Controller: Anpec APW7159
Filtering Capacitors	Electrolytics: Teapo (105°C) Polymers:Teapo
Supervisor IC	SITI PS223 (OVP, UVP, OCP, SCP, OTP)
Fan Model	Globe Fan RL4Z S1352512H (135mm, 12V, 0.33A, 1550 RPM, Sleeve Bearing)
5VSB Circuit	
Standby PWM Controller	A6069H

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓ ErP Lot 6 2013: ✓ ErP Lot 3 2014: Partially
(EU) No 617/2013 Compliance	✓

115V

Average Efficiency	88.066%
Efficiency With 10W (≤500W) or 2% (>500W)	0.000
Average Efficiency 5VSB	77.610%
Standby Power Consumption (W)	0.0788790
Average PF	0.996
Avg Noise Output	33.39 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	S++

230V

Average Efficiency	89.993%
Average Efficiency 5VSB	75.318%
Standby Power Consumption (W)	0.1645990
Average PF	0.974
Avg Noise Output	33.45 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	S++

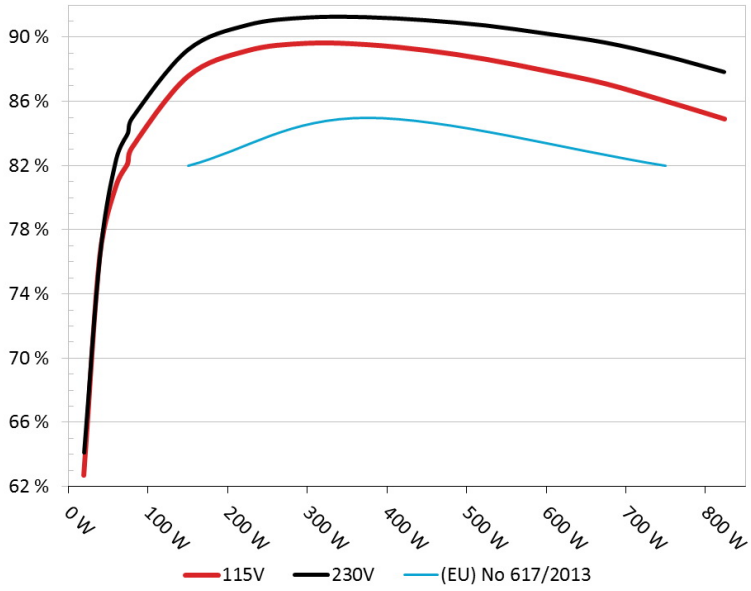
TEST EQUIPMENT

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 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Zalman ZM750-EBT
Ambient: 37°C - 46°C (98.6°F - 114.8°F)

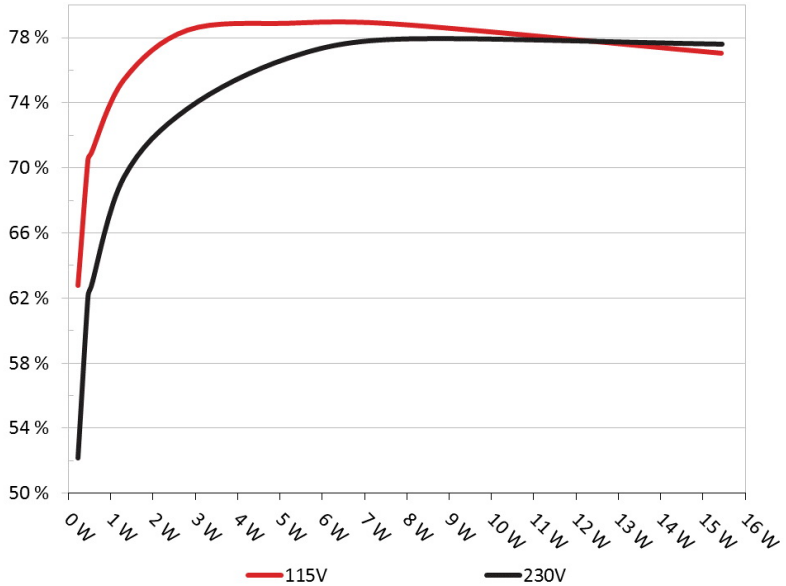


INFO

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: Zalman ZM750-EBT
Ambient: 34°C - 36°C (93.2°F - 96.8°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	0.042A	0.216	62.791%	0.049
	5.187V	0.344		115.18V
2	0.087A	0.452	70.515%	0.088
	5.186V	0.641		115.18V
3	0.542A	2.808	78.458%	0.271
	5.179V	3.579		115.14V
4	1.002A	5.184	78.880%	0.319
	5.173V	6.572		115.15V
5	1.502A	7.759	78.828%	0.343
	5.167V	9.843		115.16V
6	3.002A	15.440	77.042%	0.381
	5.144V	20.041		115.17V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.216	52.174%	0.018
	5.187V	0.414		230.43V
2	0.087A	0.453	62.140%	0.031
	5.186V	0.729		230.44V
3	0.542A	2.808	73.643%	0.143
	5.179V	3.813		230.43V
4	1.002A	5.184	76.743%	0.210
	5.174V	6.755		230.43V
5	1.502A	7.759	77.909%	0.255
	5.167V	9.959		230.43V
6	3.001A	15.448	77.605%	0.320
	5.147V	19.906		230.43V

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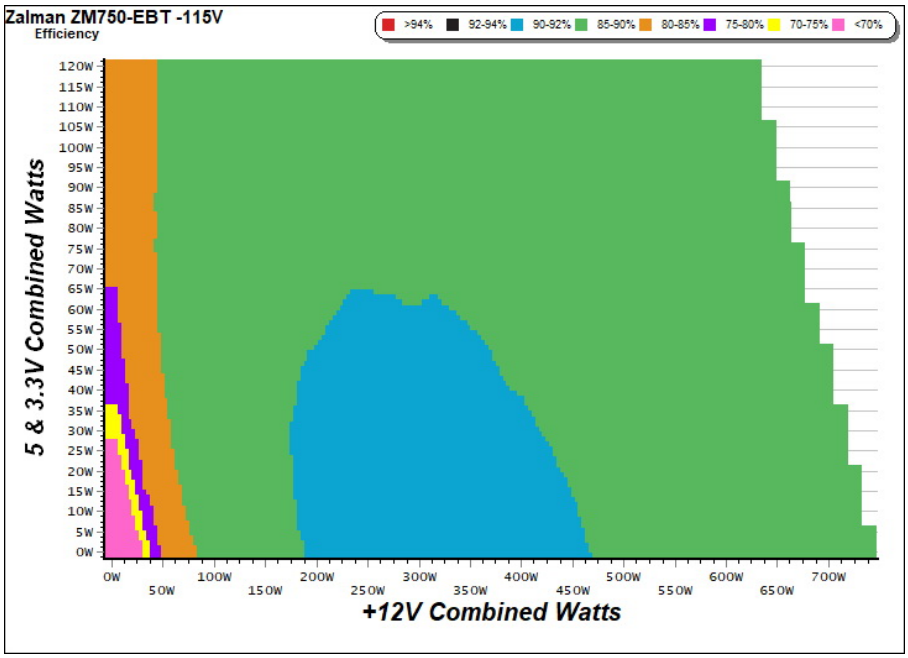
115V

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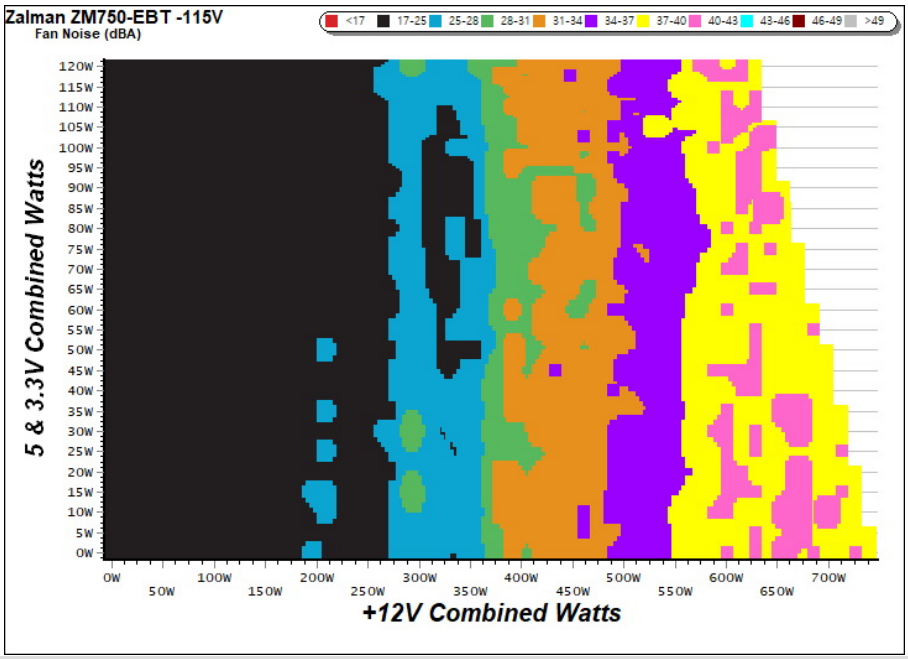
EFFICIENCY GRAPH 115V



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

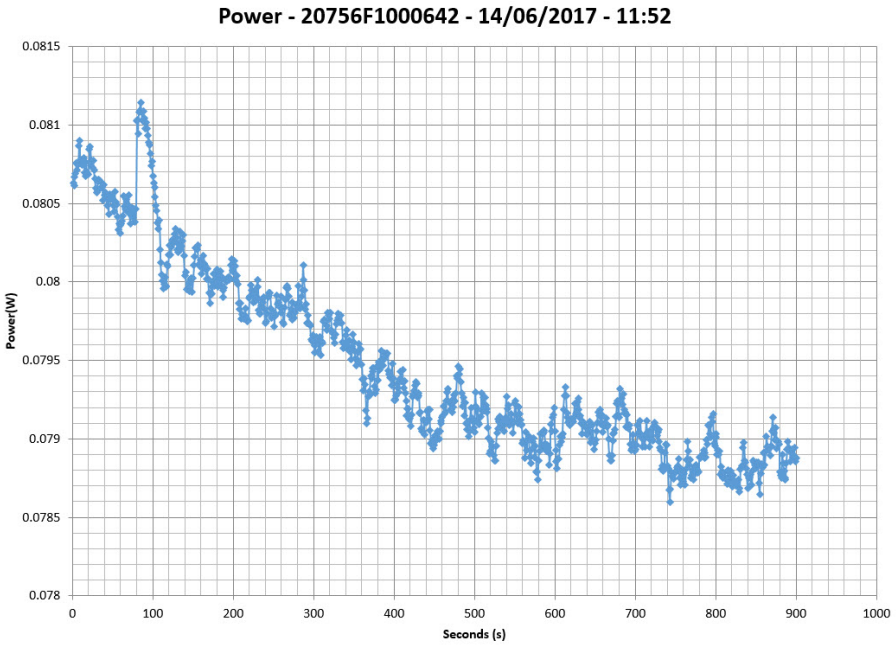


INFO

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

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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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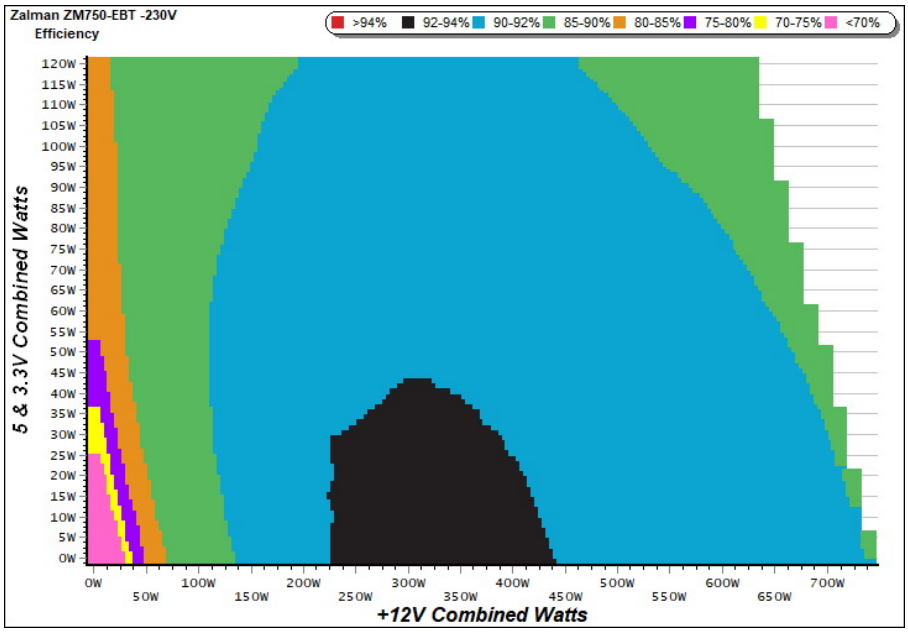
230V

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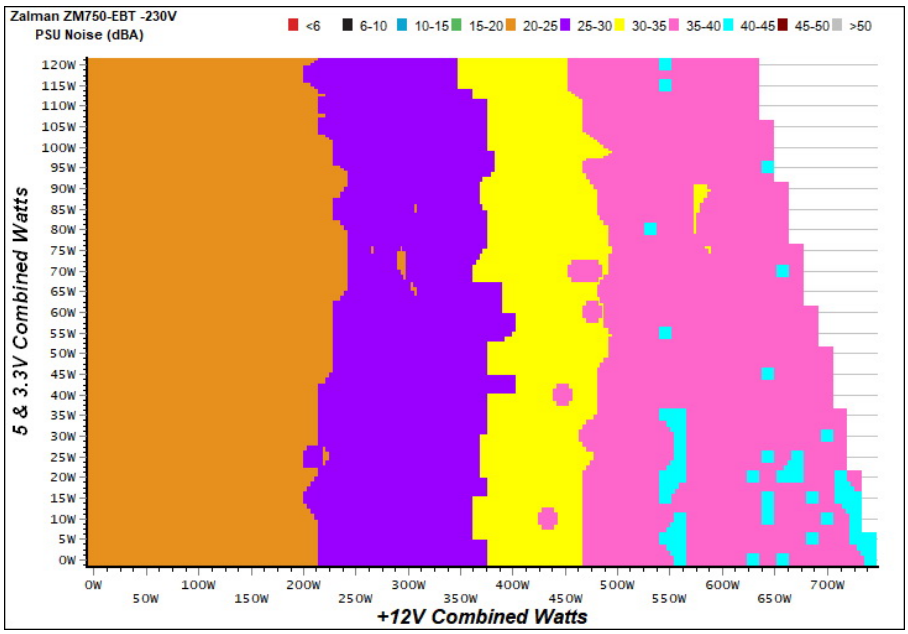
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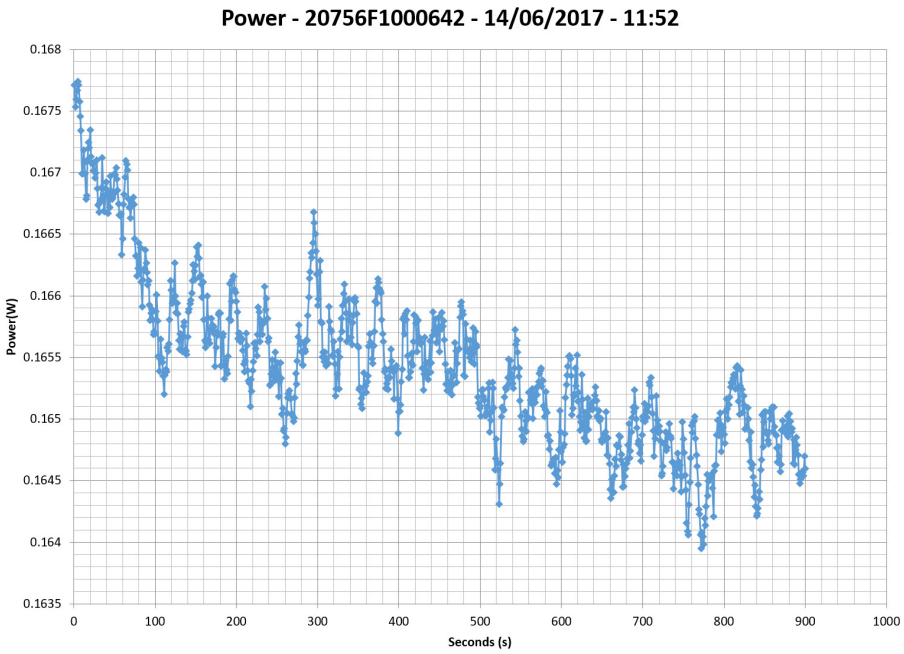


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Zalman EBT 750W



Top side



Power specifications label

CERTIFICATIONS 115V



CERTIFICATIONS 230V





Aris Mpitsiopoulos
Lab Director

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