

## Anex

Enermax EPF500AWT

Lab ID#: 50  
Receipt Date: -  
Test Date: -

Report:

Report Date: Jan 26, 2018

DUT INFORMATION		DUT SPECIFICATIONS	
Brand	Enermax	Rated Voltage (Vrms)	100-240
Manufacturer (OEM)	Enermax	Rated Current (Arms)	10
Series	Platimax D.F.	Rated Frequency (Hz)	47-63
Model Number	EPF500AWT	Rated Power (W)	500
Serial Number		Type	ATX12V
DUT Notes		Cooling	139mm Twister Bearing Fan (ED142512W-CA)
		Semi-Passive Operation	X
		Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	16	25	41	2.5	0.3
	Watts	103		492	12.5	3.6
Total Max. Power (W)		500				

CABLES AND CONNECTORS			
Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (535mm)	1	1	18-20AWG
4+4 pin EPS12V (645mm)	2	2	18AWG
6+2 pin PCIe (550mm+150mm)	2	4	18AWG
SATA (450mm+155mm+155mm+155mm)	2	8	18AWG
4 pin Molex (450mm+150mm+150mm)	2	6	18AWG
FDD Adapter (+105mm)	1	1	20AWG

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General Data	
Manufacturer (OEM)	Fortech Electronics
Platform Model	Similar with Segotep ZP500P-SG
Primary Side	
Transient Filter	4x Y caps, 3x X caps, 2x CM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	2x
APFC MOSFETS	1x Infineon IPW60R099C6 (650V, 24A @ 100°C, 0.0990hm)
APFC Boost Diode	1x SiCSCS210AG (650V, 10A @ 133°C)
Hold-up Cap(s)	1x Chemi-Con (400V, 330uF, 2000h @ 105°C, KMR)
Main Switchers	2x Fairchild FDPF20N50FT (500V, 12.9A @ 100°C, 0.260hm)
Combo APFC/PWM Controller	Champion CM6502S
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Sinopower SM4021NA (40V, 100A @ 100°C, 1.6mOhm)
5V & 3.3V	DC-DC Converters: 4x Sinopower SM3116NAU (30V, 48A @ 100°C, 9.0mOhm) PWM Controller: 2x ANPEC APW7073A
Filtering Capacitors	Electrolytics: Chemi-Con (1-5,000 @ 105°C, KZE), Chemi-Con (4-10,000 @ 105°C, KY) Polymers: Man Yue (Samxon) X-CON ULR, Enesol
Supervisor IC	InfinnoST9S313-SAG (OVP, UVP, SCP, PG)
Fan Model	Enermax ED142512W-CA (139mm, 12V, 0.25A, Twister Bearing)
5VSB Circuit	
Standby PWM Controller	TNY278PN

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	90.554
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	79.518
Standby Power Consumption (W) -115V	0.0590832
Standby Power Consumption (W) -230V	0.1400000
Average PF	0.976
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	22.05
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A

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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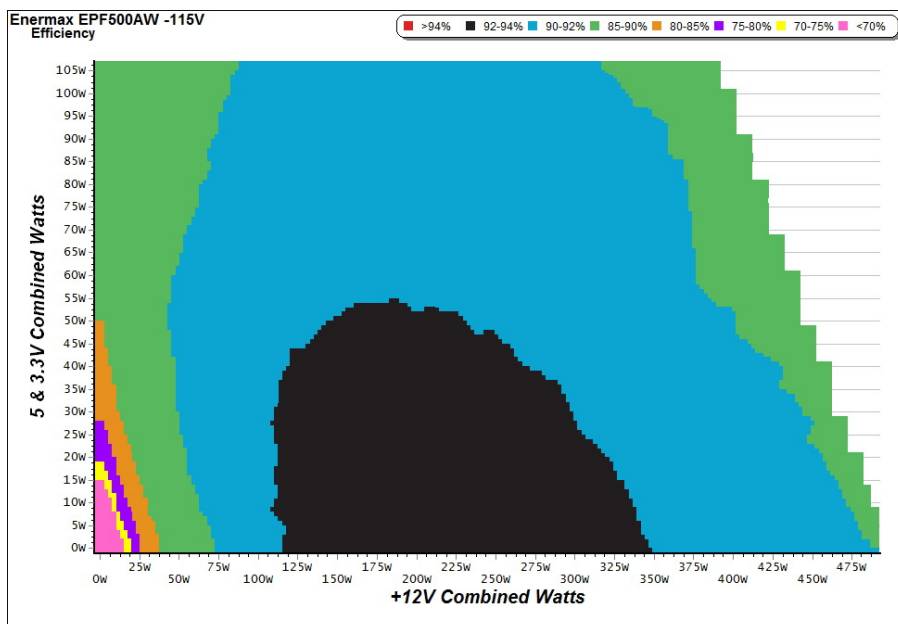
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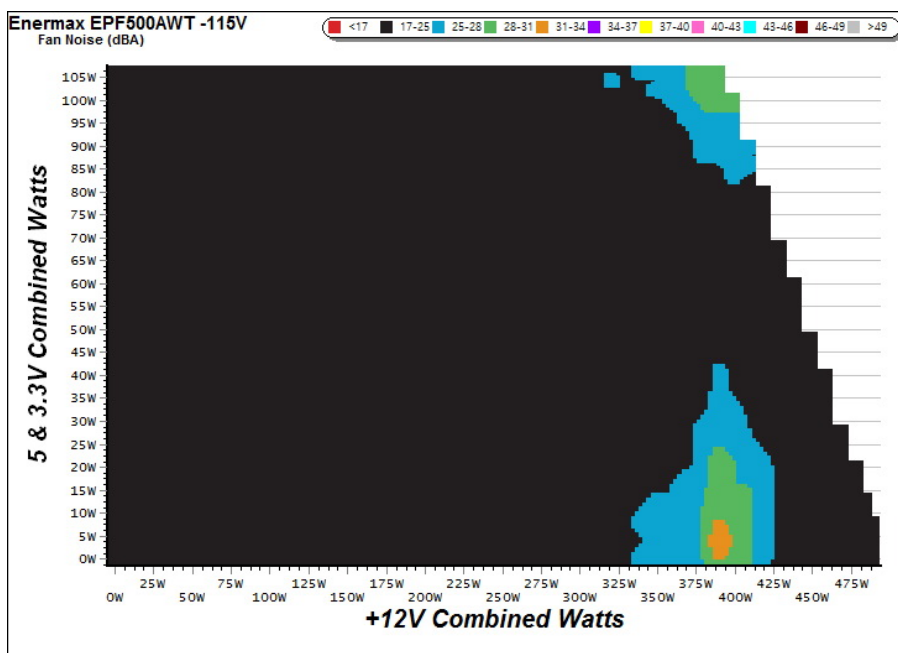
## EFFICIENCY GRAPH



### 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



### 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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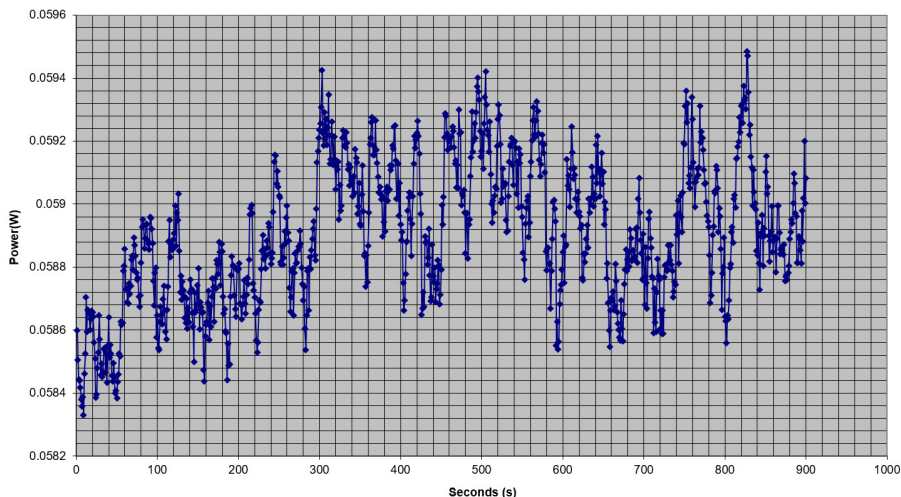
Enermax EPF500AWT

5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.047A	0.242	69.341%	0.029
	5.147V	0.349		115.08V
2	0.093A	0.479	75.791%	0.053
	5.146V	0.632		115.08V
3	0.552A	2.833	81.245%	0.228
	5.133V	3.487		115.08V
4	2.502A	12.703	78.423%	0.421
	5.077V	16.198		115.07V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.048A	0.247	55.756%	0.011
	5.148V	0.443		230.21V
2	0.093A	0.479	65.616%	0.019
	5.147V	0.730		230.21V
3	0.552A	2.834	76.990%	0.089
	5.134V	3.681		230.21V
4	2.502A	12.703	78.817%	0.270
	5.077V	16.117		230.21V

## VAMPIRE POWER -115V

Power - 4713157722294 - 24/01/2017 - 15:15



### 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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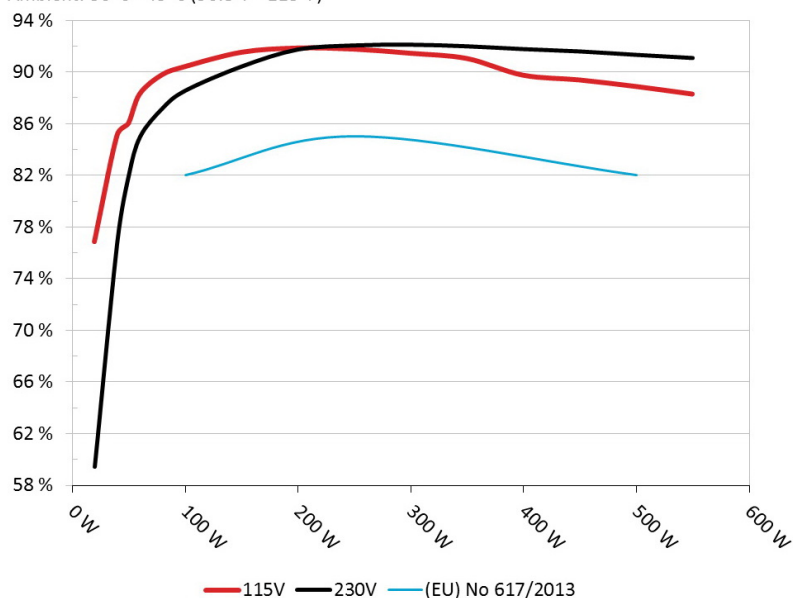
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### EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

#### Efficiency: Enermax EPF500AWT

Ambient: 36°C - 45°C (96.8°F - 113°F)



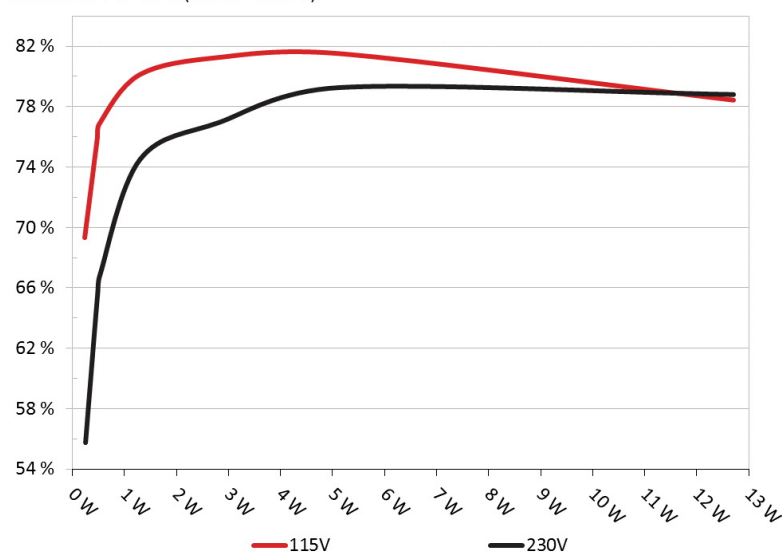
#### INFO

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: Enermax EPF500AWT

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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### 10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	2.323A	1.973A	1.963A	0.976A	49.776	86.006%	580	20.8	37.07°C	0.930
	12.140V	5.066V	3.358V	5.109V	57.875				41.44°C	115.05V
2	5.679A	2.958A	2.952A	1.177A	99.758	90.413%	580	20.8	38.46°C	0.963
	12.135V	5.059V	3.348V	5.094V	110.336				43.09°C	115.04V
3	9.384A	3.465A	3.470A	1.376A	149.914	91.522%	580	20.8	39.29°C	0.972
	12.130V	5.052V	3.340V	5.080V	163.801				44.16°C	115.04V
4	13.081A	3.963A	3.959A	1.576A	199.768	91.853%	600	21.4	39.20°C	0.973
	12.124V	5.045V	3.333V	5.066V	217.487				44.62°C	115.04V
5	16.445A	4.970A	4.964A	1.781A	249.787	91.768%	720	24.5	39.58°C	0.976
	12.118V	5.034V	3.322V	5.051V	272.194				45.44°C	115.06V
6	19.806A	5.971A	5.975A	1.985A	299.700	91.446%	920	31.7	40.27°C	0.981
	12.113V	5.024V	3.313V	5.036V	327.734				46.44°C	115.05V
7	23.178A	6.981A	6.990A	2.191A	349.729	91.042%	930	32.1	41.48°C	0.985
	12.107V	5.017V	3.303V	5.021V	384.142				48.22°C	115.07V
8	26.542A	7.991A	8.013A	2.396A	399.654	89.748%	940	32.3	41.99°C	0.990
	12.104V	5.007V	3.293V	5.005V	445.307				50.47°C	115.07V
9	30.346A	8.502A	8.558A	2.402A	449.682	89.381%	940	32.3	42.92°C	0.992
	12.097V	4.999V	3.282V	4.995V	503.106				53.08°C	115.08V
10	34.101A	9.028A	9.064A	2.504A	499.564	88.876%	940	32.3	43.77°C	0.994
	12.092V	4.989V	3.276V	4.984V	562.091				54.59°C	115.08V
11	38.249A	9.038A	9.080A	2.512A	549.573	88.290%	940	32.3	44.78°C	0.995
	12.088V	4.983V	3.269V	4.976V	622.462				59.10°C	115.08V
CL1	0.099A	12.011A	12.003A	0.005A	101.674	86.913%	940	32.3	43.57°C	0.966
	12.139V	5.038V	3.327V	5.107V	116.984				50.52°C	115.08V
CL2	40.958A	1.003A	1.001A	1.003A	508.577	89.619%	940	32.3	44.27°C	0.994
	12.090V	5.012V	3.301V	5.048V	567.489				57.19°C	115.08V

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## 20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.207A	0.491A	0.475A	0.191A	19.73	76.855%	580	20.8	0.844
	12.142V	5.074V	3.367V	5.139V	25.67				115.06V
2	2.429A	0.978A	0.980A	0.386A	39.72	85.084%	580	20.8	0.918
	12.139V	5.070V	3.361V	5.129V	46.68				115.06V
3	3.660A	1.473A	1.485A	0.586A	59.88	88.300%	580	20.8	0.940
	12.138V	5.066V	3.359V	5.120V	67.81				115.05V
4	4.878A	1.973A	1.965A	0.781A	79.77	89.794%	580	20.8	0.961
	12.136V	5.063V	3.354V	5.111V	88.84				115.05V

## RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.0 mV	9.4 mV	9.1 mV	9.7 mV	Pass
20% Load	21.0 mV	10.8 mV	11.4 mV	9.8 mV	Pass
30% Load	23.7 mV	13.8 mV	12.8 mV	10.8 mV	Pass
40% Load	26.0 mV	16.4 mV	14.0 mV	19.3 mV	Pass
50% Load	28.7 mV	18.4 mV	15.3 mV	14.3 mV	Pass
60% Load	30.5 mV	19.2 mV	17.0 mV	15.8 mV	Pass
70% Load	33.1 mV	18.6 mV	18.5 mV	17.6 mV	Pass
80% Load	37.9 mV	23.9 mV	20.2 mV	19.0 mV	Pass
90% Load	38.9 mV	26.6 mV	21.3 mV	19.3 mV	Pass
100% Load	41.6 mV	29.5 mV	25.4 mV	21.3 mV	Pass
110% Load	43.0 mV	29.8 mV	26.5 mV	21.4 mV	Pass
Crossload 1	29.3 mV	16.6 mV	19.9 mV	11.5 mV	Pass
Crossload 2	34.8 mV	23.7 mV	20.9 mV	15.4 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	18.40
AC Loss to PWR_OK Hold Up Time (ms)	16.26
PWR_OK Inactive to DC Loss Delay (ms)	2.14



## CERTIFICATIONS



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