Anex

Deepcool DA500

Lab ID#: 452
Receipt Date: -
Test Date: -

Report:
Report Date: Oct 8, 2018

DUT INFORMATION

Brand	Deepcool
Manufacturer (OEM)	Channel Well Technology
Series	DA
Model Number	DA500
Serial Number	1806000402
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	4-8
Rated Frequency (Hz)	47-63
Rated Power (W)	500
Type	ATX12V
Cooling	120mm Rifle Bearing Fan (D12SM-12)
Semi-Passive Operation	✗
Cable Design	Fixed cables

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	18	16	38	2.5	0.3
	Watts	110		456	12.5	3.6
Total Max. Power (W)		500				

CABLES AND CONNECTORS

Captive Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (470mm)	1	1	20AWG	No
4+4 pin EPS12V (580mm)	1	1	18AWG	No
6+2 pin PCIe (470mm+100mm)	1	2	18AWG	No
SATA (410mm+100mm+100mm)+4 pin Molex (+100mm)	1	4	18AWG	No
4 pin Molex (410mm+100mm)+SATA (+100mm+100mm)	2	2 / 2	18AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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General Data	
Manufacturer (OEM)	CWT
Platform Model	GPT500S-A
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x DM chokes, 1x CAP004DG, 1x MOV
Inrush Protection	NTC Thermistor
Bridge Rectifier	GBU1006 (600V, 10A @ 100°C)
APFC MOSFET	Champion GP28S50G (500 V, 28 A @ 150 °C, 0.125 Ohm)
APFC Boost Diode	1x CREE C3D04060A (600V, 4A @ 155°C)
Hold-up Cap(s)	1x CapXon (400V, 270uF, 1000h @ 85 °C, LP)
Main Switchers	2x Silan SVF13N50F (500V, 10A @ 100°C, 0.52Ohm)
Combo APFC/PWM Controller	Champion CM6800TX & CM03X Green PFC controller
Topology	Primary side: Double Forward Secondary side: Passive Rectification & Group Regulation scheme
Secondary Side	
+12V MOSFETS	4x PFC PFR30L60CT (60V, 30A @ 50% Duty Cycle)
5V & 3.3V	5V: 1x PFC PFR30L45CT (45V, 30A @ 50% Duty Cycle) 3.3V: 1x PFC PFR30L30CT (30V, 30A @ 50% Duty Cycle)
Filtering Capacitors	Electrolytics: ChengX (2-4,000 @ 105°C, GR), 2x JunFu (2,000 @ 105°C, WG), 1x Nippon Chemi-Con in 5VSB circuit (16V, 1000uF, 4-10,000 @ 105°C, KY)
Supervisor IC	Infinno ST9S313A-DAG (OVP, UVP, SCP, PG)
Fan Model	Yate Loon D12SM-12 (120mm, 12V, 0.30A, 70.5CFM, 33 dBA, Sleeve Bearing)
5VSB Circuit	
Standby PWM Controller	Power Integrations TNY176PN

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	84.621
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	60.910
Average Efficiency 5VSB	72.616
Standby Power Consumption (W) -115V	0.0953151
Standby Power Consumption (W) -230V	0.2427050
Average PF	0.994
ErP Lot 3/6 Ready	ErP Lot 6 2010: ✓, ErP Lot 6 2013: Partially ErP Lot 3 2014 & CEC: ✗
(EU) No 617/2013 Compliance	✓
Avg Noise Output	22.53
Efficiency Rating (ETA)	SILVER
Noise Rating (LAMBDA)	A

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, 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	

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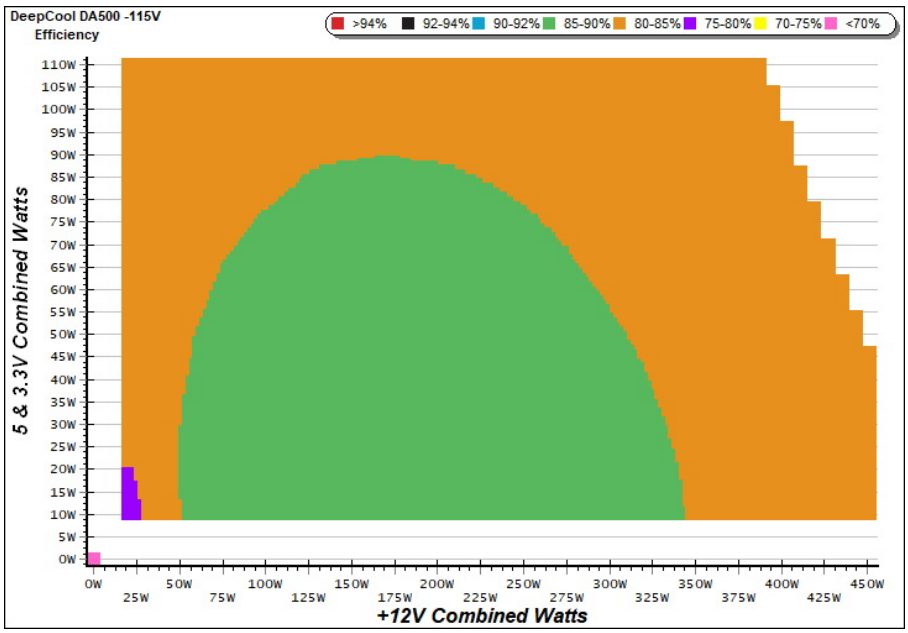
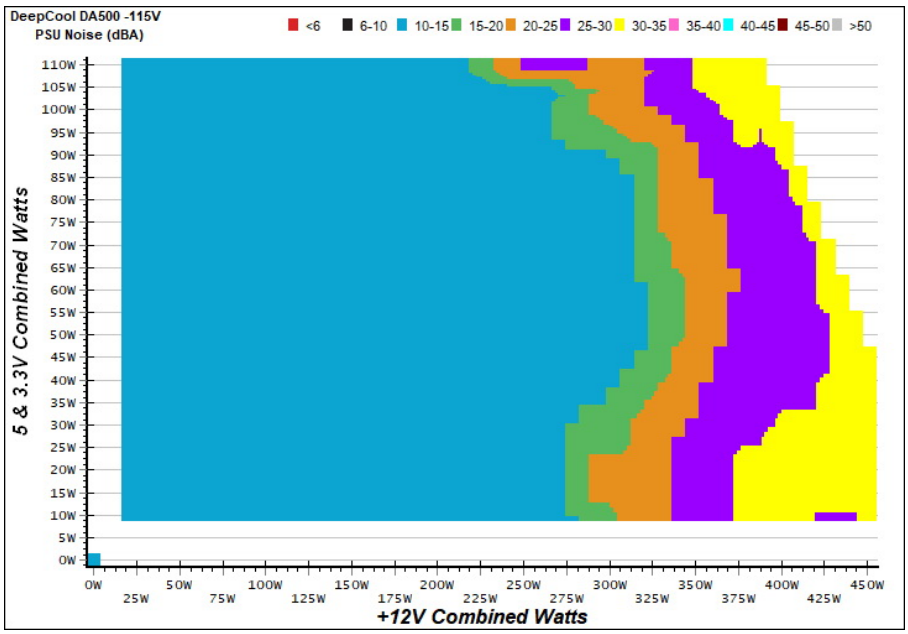
EFFICIENCY GRAPH



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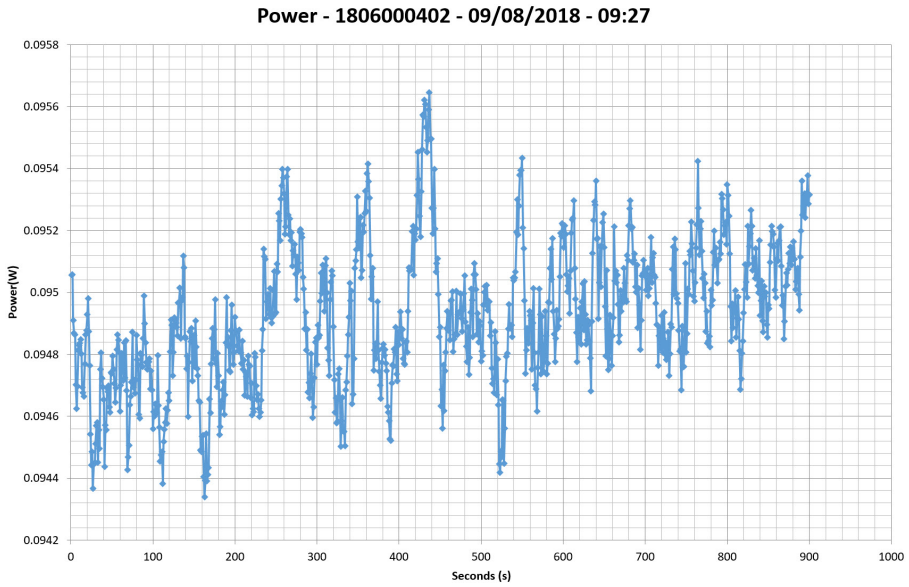
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229	58.568%	0.072
	5.081V	0.391		115.11V
2	0.090A	0.457	66.424%	0.120
	5.080V	0.688		115.11V
3	0.550A	2.789	75.094%	0.318
	5.070V	3.714		115.11V
4	1.000A	5.061	73.733%	0.368
	5.060V	6.864		115.11V
5	1.500A	7.575	73.975%	0.395
	5.049V	10.240		115.12V
6	2.500A	12.570	70.393%	0.428
	5.027V	17.857		115.11V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229	41.712%	0.031
	5.082V	0.549		230.25V
2	0.090A	0.457	53.326%	0.048
	5.081V	0.857		230.25V
3	0.550A	2.789	70.913%	0.181
	5.070V	3.933		230.25V
4	1.000A	5.061	72.674%	0.253
	5.060V	6.964		230.25V
5	1.500A	7.576	73.661%	0.297
	5.050V	10.285		230.26V
6	2.500A	12.570	72.055%	0.344
	5.028V	17.445		230.25V

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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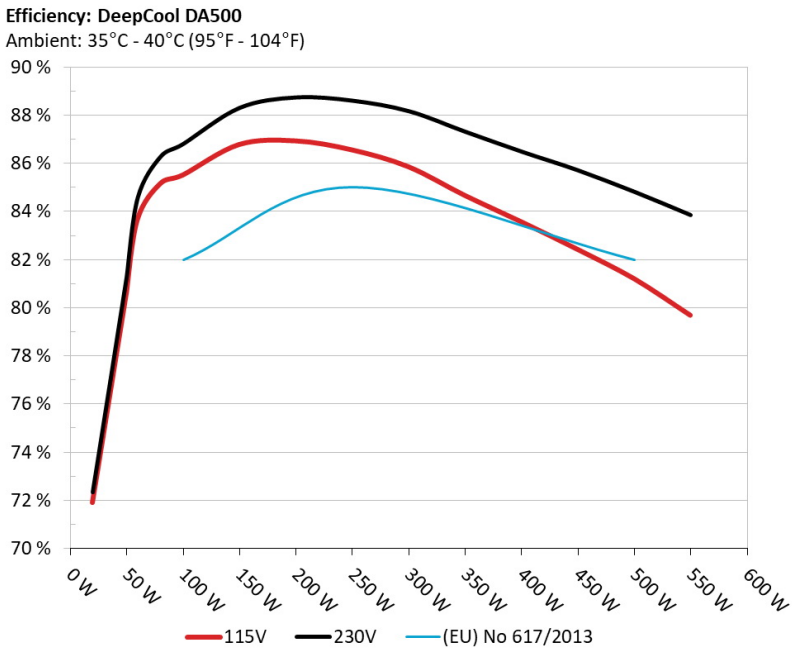
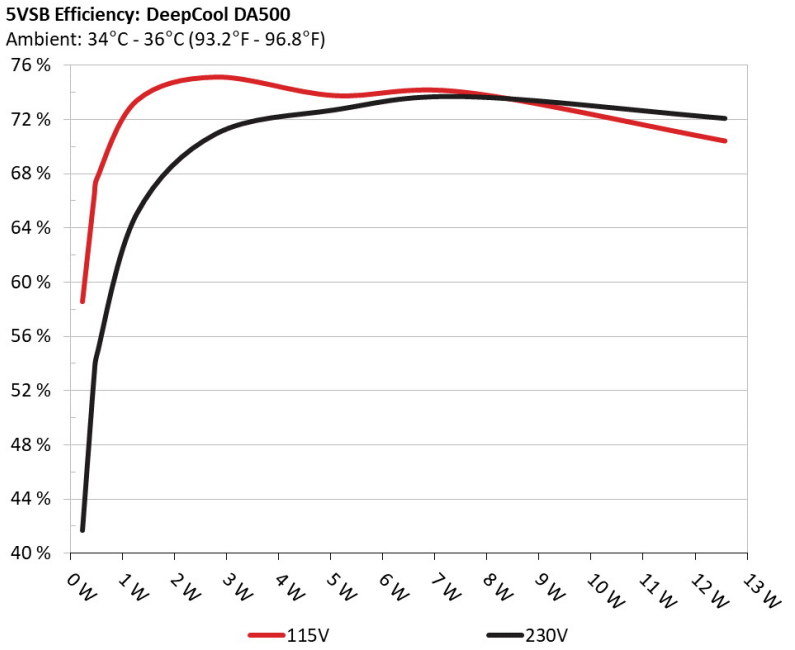
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	2.355A	1.968A	1.946A	0.990A	49.618	80.804%	652	10.6	36.49°C	0.975
	11.902V	5.077V	3.390V	5.051V	61.405				39.66°C	115.10V
2	5.785A	2.961A	2.926A	1.191A	99.691	85.521%	650	10.6	36.72°C	0.983
	11.892V	5.065V	3.382V	5.039V	116.569				40.55°C	115.10V
3	9.582A	3.457A	3.406A	1.392A	149.606	86.785%	646	10.5	37.16°C	0.990
	11.857V	5.062V	3.375V	5.028V	172.386				41.43°C	115.10V
4	13.402A	3.955A	3.917A	1.595A	199.629	86.937%	646	10.5	37.40°C	0.993
	11.822V	5.057V	3.367V	5.017V	229.624				42.89°C	115.10V
5	16.870A	4.956A	4.911A	1.799A	249.752	86.560%	647	10.5	37.76°C	0.995
	11.811V	5.045V	3.359V	5.004V	288.529				44.33°C	115.10V
6	20.350A	5.961A	5.908A	2.004A	299.846	85.860%	690	11.6	38.09°C	0.996
	11.796V	5.032V	3.351V	4.992V	349.227				46.76°C	115.10V
7	23.837A	6.973A	6.908A	2.210A	349.973	84.665%	985	21.1	38.31°C	0.996
	11.783V	5.020V	3.343V	4.979V	413.361				48.09°C	115.11V
8	27.323A	7.991A	7.916A	2.417A	400.080	83.569%	1230	28.4	38.80°C	0.996
	11.773V	5.007V	3.334V	4.966V	478.743				48.95°C	115.10V
9	31.294A	8.496A	8.415A	2.420A	449.799	82.428%	1533	34.8	39.01°C	0.997
	11.737V	5.003V	3.327V	4.958V	545.689				49.72°C	115.11V
10	35.289A	9.002A	8.949A	2.526A	500.120	81.206%	1910	38.4	39.24°C	0.997
	11.701V	4.999V	3.319V	4.949V	615.867				50.58°C	115.11V
11	39.751A	8.993A	8.963A	2.530A	549.751	79.695%	1900	38.3	39.83°C	0.997
	11.636V	5.005V	3.313V	4.942V	689.818				52.61°C	115.11V
CL1	0.141A	13.002A	13.001A	0.000A	108.143	78.621%	624	9.9	37.48°C	0.988
	12.600V	4.822V	3.359V	5.041V	137.550				45.87°C	115.11V
CL2	38.004A	1.001A	0.997A	1.000A	438.509	83.011%	1430	32.7	39.28°C	0.997
	11.209V	5.179V	3.343V	5.005V	528.255				50.00°C	115.11V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.221A	0.488A	0.469A	0.197A	19.486	71.915%	653	10.7	0.930
	11.790V	5.120V	3.397V	5.075V	27.096				115.10V
2	2.500A	0.978A	0.971A	0.395A	39.880	80.637%	647	10.5	0.967
	11.838V	5.101V	3.393V	5.067V	49.456				115.10V
3	3.711A	1.473A	1.442A	0.593A	59.378	83.677%	650	10.6	0.979
	11.854V	5.091V	3.390V	5.060V	70.961				115.10V
4	4.992A	1.965A	1.947A	0.792A	79.791	85.169%	652	10.6	0.984
	11.861V	5.083V	3.386V	5.051V	93.686				115.10V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.9 mV	9.7 mV	13.1 mV	10.5 mV	Pass
20% Load	7.4 mV	9.4 mV	13.5 mV	14.5 mV	Pass
30% Load	7.5 mV	9.8 mV	14.2 mV	10.1 mV	Pass
40% Load	9.3 mV	11.0 mV	14.7 mV	11.3 mV	Pass
50% Load	10.4 mV	11.7 mV	16.6 mV	17.4 mV	Pass
60% Load	13.5 mV	12.7 mV	17.3 mV	11.9 mV	Pass
70% Load	16.2 mV	12.4 mV	18.3 mV	12.3 mV	Pass
80% Load	21.1 mV	11.1 mV	22.9 mV	18.0 mV	Pass
90% Load	29.7 mV	12.2 mV	24.9 mV	20.4 mV	Pass
100% Load	44.5 mV	15.1 mV	30.4 mV	25.5 mV	Pass
110% Load	58.3 mV	17.1 mV	33.6 mV	29.1 mV	Pass
Crossload 1	14.8 mV	18.3 mV	20.4 mV	12.5 mV	Pass
Crossload 2	52.7 mV	17.8 mV	24.9 mV	27.5 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	12.20
AC Loss to PWR_OK Hold Up Time (ms)	8.90
PWR_OK Inactive to DC Loss Delay (ms)	3.30

Top side

Power specifications label

CERTIFICATIONS

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