

## Anex

Antec HCG850 Gold (Sample #2)

Lab ID#: 353

Receipt Date: -

Test Date: -

Report:

Report Date: Apr 18, 2018

DUT INFORMATION	
Brand	Antec
Manufacturer (OEM)	Seasonic
Series	HCG Gold
Model Number	HCG850 Gold (Sample #2)
Serial Number	HCG850GSN180903132
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	12-6
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Type	ATX12V
Cooling	120mm Fluid Dynamic Bearing Fan (HA1225H12F-Z)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70	3	0.3
	Watts	100		840	15	3.6
Total Max. Power (W)		850				

CABLES AND CONNECTORS				
Modular Cables				
Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	18-22AWG	Yes
4+4 pin EPS12V (660mm)	2	2	18AWG	Yes
6+2 pin PCIe (680mm+80mm)	3	6	18AWG	Yes
SATA (460mm+110mm+110mm+110mm)	2	8	18AWG	No
SATA (460mm+110mm)	1	2	18AWG	No
4 pin Molex (460mm+120mm+120mm)	1	3	18AWG	No
4 pin Molex (350mm+120mm)	1	2	18AWG	No
FDD Adapter (+110mm)	1	1	22AWG	No
AC Power Cord (1370mm) - C13 coupler	1	1	18AWG	-

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 1/9

## Anex

Antec HCG850 Gold (Sample #2)

General Data	
Manufacturer (OEM)	Seasonic
Platform Model	FX
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CM02X
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	2x GBU1508 (800V, 15A @ 100°C)
APFC MOSFETS	2x Infineon IPW50R190CE (550V, 15.7A @ 100°C, 0.190hm)
APFC Boost Diode	1x STMicroelectronics STTH8S06D (600V, 8A @ 125°C)
Hold-up Cap(s)	1x Nichicon (400V, 680uF, 2000h @ 105°C, GG)
Main Switchers	4x UTC GPT13N50DG (500V, 13A @ 100°C, 0.490hm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901T6X
Topology	Primary side: Full-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Nexperia PSMN2R6-40YS (40V, 100A @ 25°C, 2.8mOhm)
5V & 3.3V	DC-DC Converters: 6x Infineon BSC0906NS (30V, 40A @ 100°C, 4.5mOhm) PWM Controller: Anpec APW7159
Filtering Capacitors	Electrolytics: Chemi-Con (1-5,000 @ 105°C, KZE), Chemi-Con (4-10,000 @ 105°C, KY), 2x Nichicon (2-5,000 @ 105°C, HD), 1x Rubycon (3-6,000 @ 105°C, YXG) Polymers: Chemi-Con, FPCAP
Supervisor IC	Weltrend WT7527V (OVP, UVP, OCP, SCP, PG)
Fan Model	Hong Hua HA1225H12F-Z (120mm, 12V, 0.58A, 2200 RPM, Fluid Dynamic Bearing)
5VSB Circuit	
Standby PWM Controller	Excelliance EM8569

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 2/9

## Anex

Antec HCG850 Gold (Sample #2)

RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.842
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	77.308
Standby Power Consumption (W) -115V	0.0484557
Standby Power Consumption (W) -230V	0.0814728
Average PF	0.986
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	32.96
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard++

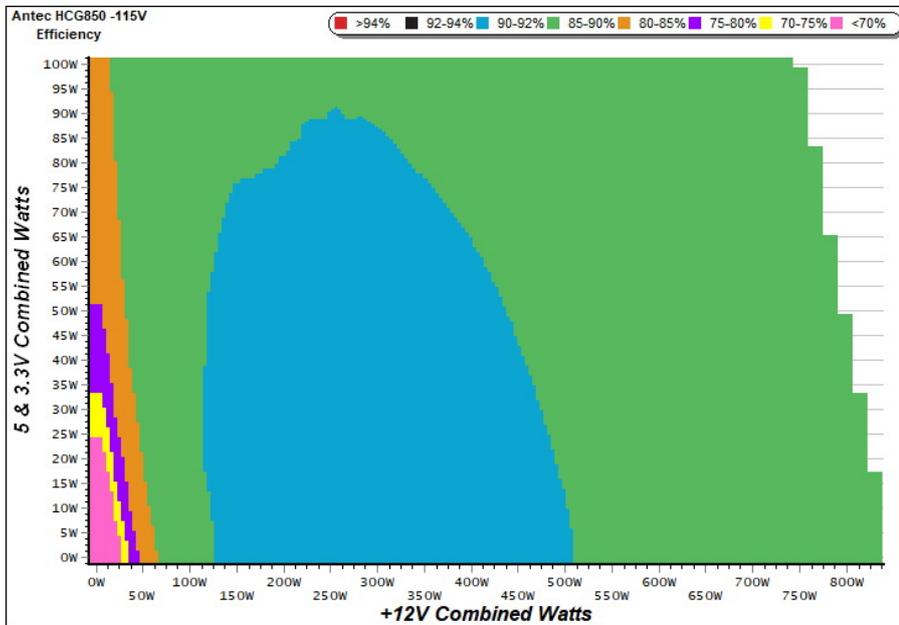
TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 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	

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 3/9

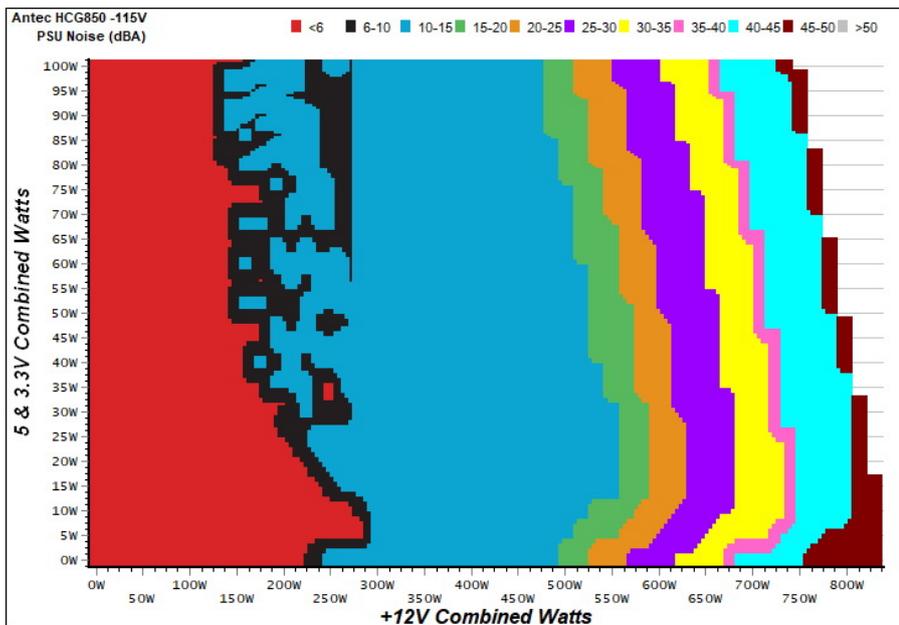
### EFFICIENCY GRAPH



#### 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

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

## Anex

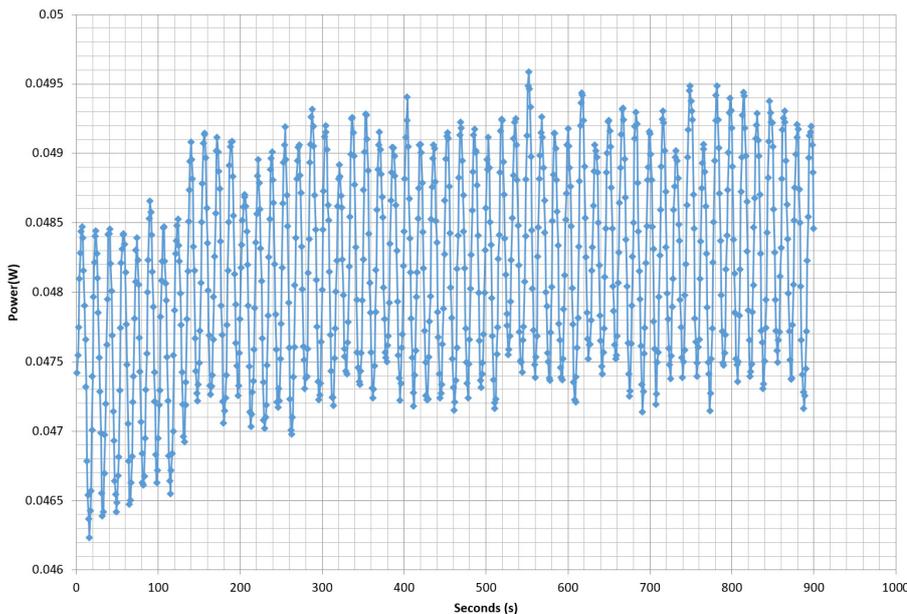
## Antec HCG850 Gold (Sample #2)

5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	69.085%	0.025
	5.128V	0.273		115.37V
2	0.090A	0.462	74.880%	0.043
	5.127V	0.529		115.37V
3	0.550A	2.815	80.040%	0.166
	5.117V	3.517		115.35V
4	1.000A	5.108	80.289%	0.214
	5.107V	6.362		115.36V
5	1.500A	7.644	79.418%	0.260
	5.095V	9.625		115.35V
6	3.000A	15.163	77.612%	0.338
	5.054V	19.537		115.34V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	60.950%	0.013
	5.128V	0.379		230.93V
2	0.090A	0.462	68.142%	0.023
	5.127V	0.678		230.93V
3	0.550A	2.814	76.467%	0.116
	5.116V	3.680		230.75V
4	1.000A	5.107	77.579%	0.190
	5.106V	6.583		230.92V
5	1.500A	7.644	77.920%	0.251
	5.095V	9.810		230.92V
6	3.000A	15.181	77.320%	0.353
	5.060V	19.634		230.91V

## VAMPIRE POWER -115V

Power - HCG850GSN180903132 - 12/04/2018 - 10:51



### INFO

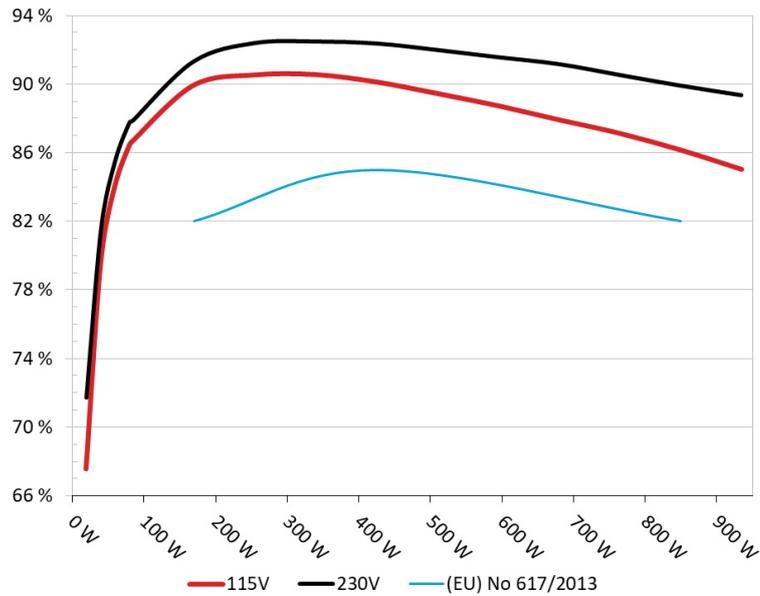
This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

### EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

**Efficiency: Antec HCG850**  
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

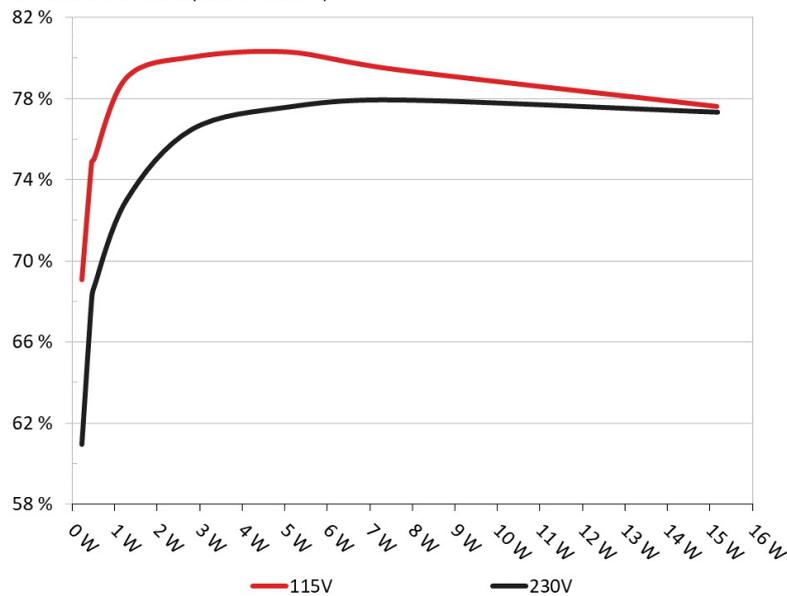


#### INFO

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: Antec HCG850**  
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

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

## Anex

## Antec HCG850 Gold (Sample #2)

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	5.225A	1.985A	1.990A	0.981A	84.861	86.711%	0	<6.0	45.45°C	0.968
	12.108V	5.037V	3.315V	5.099V	97.866				38.87°C	115.26V
2	11.436A	2.979A	2.990A	1.179A	169.366	89.944%	480	9.6	39.15°C	0.988
	12.107V	5.037V	3.313V	5.089V	188.301				46.26°C	115.15V
3	18.046A	3.476A	3.472A	1.379A	254.484	90.550%	505	11.3	40.61°C	0.990
	12.107V	5.035V	3.311V	5.078V	281.041				48.12°C	115.14V
4	24.658A	3.972A	3.989A	1.579A	339.689	90.571%	512	11.5	41.23°C	0.990
	12.105V	5.035V	3.310V	5.067V	375.051				48.93°C	115.01V
5	30.938A	4.968A	4.986A	1.780A	425.012	90.140%	518	11.6	42.14°C	0.990
	12.105V	5.034V	3.309V	5.056V	471.503				50.17°C	114.89V
6	37.157A	5.963A	5.986A	1.983A	509.526	89.468%	732	19.4	42.88°C	0.990
	12.103V	5.033V	3.308V	5.044V	569.505				51.12°C	114.87V
7	43.443A	6.959A	6.989A	2.186A	594.810	88.750%	1020	27.5	43.24°C	0.991
	12.101V	5.030V	3.305V	5.034V	670.207				52.00°C	114.75V
8	49.731A	7.957A	7.991A	2.391A	680.169	87.928%	1545	37.5	44.28°C	0.991
	12.100V	5.029V	3.304V	5.021V	773.550				53.41°C	114.71V
9	56.422A	8.456A	8.480A	2.394A	765.114	87.137%	2092	47.3	45.66°C	0.992
	12.098V	5.028V	3.302V	5.014V	878.058				55.10°C	114.57V
10	62.844A	8.956A	8.999A	3.005A	849.895	86.166%	2115	49.0	45.93°C	0.992
	12.096V	5.027V	3.301V	4.994V	986.351				55.84°C	114.43V
11	69.859A	8.957A	9.004A	3.008A	934.671	85.043%	2135	49.1	46.41°C	0.993
	12.095V	5.026V	3.299V	4.988V	1099.054				56.72°C	114.39V
CL1	0.146A	12.001A	12.000A	0.000A	101.949	84.996%	515	11.5	43.10°C	0.980
	12.110V	5.034V	3.314V	5.109V	119.946				52.14°C	115.22V
CL2	70.004A	1.002A	1.003A	1.000A	860.169	86.526%	2125	49.1	45.40°C	0.992
	12.096V	5.031V	3.302V	5.048V	994.120				55.15°C	114.42V

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

## Anex

Antec HCG850 Gold (Sample #2)

### 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	1.192A	0.496A	0.481A	0.195A	19.527	67.577%	0	<6.0	0.754
	12.108V	5.039V	3.317V	5.122V	28.896				115.35V
2	2.451A	0.992A	0.996A	0.391A	39.971	79.614%	0	<6.0	0.890
	12.108V	5.034V	3.313V	5.116V	50.206				115.32V
3	3.635A	1.489A	1.477A	0.587A	59.404	84.016%	0	<6.0	0.942
	12.108V	5.035V	3.314V	5.110V	70.706				115.30V
4	4.893A	1.986A	1.992A	0.784A	79.851	86.441%	0	<6.0	0.965
	12.108V	5.037V	3.314V	5.104V	92.376				115.27V

### RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	9.0 mV	5.2 mV	4.3 mV	4.1 mV	Pass
20% Load	13.4 mV	6.2 mV	4.9 mV	4.3 mV	Pass
30% Load	16.7 mV	7.2 mV	5.7 mV	4.7 mV	Pass
40% Load	15.8 mV	7.7 mV	6.5 mV	5.1 mV	Pass
50% Load	14.0 mV	9.0 mV	7.4 mV	6.1 mV	Pass
60% Load	13.2 mV	9.6 mV	8.0 mV	6.5 mV	Pass
70% Load	13.9 mV	10.4 mV	8.5 mV	7.1 mV	Pass
80% Load	14.6 mV	11.2 mV	10.6 mV	7.6 mV	Pass
90% Load	15.6 mV	11.9 mV	10.8 mV	8.2 mV	Pass
100% Load	19.4 mV	13.5 mV	12.0 mV	11.7 mV	Pass
110% Load	25.5 mV	14.1 mV	12.2 mV	13.1 mV	Pass
Crossload 1	10.6 mV	11.9 mV	10.2 mV	4.0 mV	Pass
Crossload 2	20.5 mV	8.7 mV	7.0 mV	8.9 mV	Pass

All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case

PAGE 8/9

## Anex

Antec HCG850 Gold (Sample #2)

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

Hold-Up Time (ms)	20.90
AC Loss to PWR_OK Hold Up Time (ms)	16.30
PWR_OK Inactive to DC Loss Delay (ms)	4.60



Top side



Power specifications label

## CERTIFICATIONS



All data and graphs included in this test report can be used by any individual on the following conditions:

- > It should be mentioned that the test results are provided by Cybenetics
- > The link to the original test results document should be provided in any case