# EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

## Anex

Corsair RM850x

Lab ID#: 79
Receipt Date: -
Test Date: -

Report:
Report Date: Jan 4, 2018

## DUT INFORMATION

| | |
|---|---|
| Brand | Corsair |
| Manufacturer (OEM) | Channel Well Technology |
| Series | RMx |
| Model Number | RM850x |
| Serial Number | 16447135000017590888 |
| DUT Notes | CP-9020093 - Retested on 11/10/2017 |

## DUT SPECIFICATIONS

| | |
|---|---|
| Rated Voltage (Vrms) | 100-240 |
| Rated Current (Arms) | 12-6 |
| Rated Frequency (Hz) | 47-63 |
| Rated Power (W) | 850 |
| Type | ATX12V |
| Cooling | 135mm Rifle Bearing Fan (NR135L) |
| Semi-Passive Operation | ✓ |
| Cable Design | Fully Modular |

## POWER SPECIFICATIONS

| Rail | | 3.3V | 5V | 12V | 5VSB | -12V |
|---|---|---|---|---|---|---|
| Max. Power | Amps | 25 | 25 | 70.8 | 3 | 0.8 |
| | Watts | 150 | | 850 | 15 | 9.6 |
| 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 (600mm) | 1 | 1 | 18-20AWG | Yes |
| 4+4 pin EPS12V (650mm) | 2 | 2 | 18AWG | Yes |
| 6+2 pin PCIe (600mm+150mm) | 3 | 6 | 18AWG | Yes |
| SATA (520mm+115mm+115mm) | 2 | 6 | 18AWG | No |
| SATA (505mm+115mm+115mm+115mm) | 1 | 4 | 18AWG | No |
| 4 pin Molex (450mm+100mm+100mm+100mm) | 2 | 8 | 18AWG | No |
| FDD Adapter (+100mm) | 1 | 1 | 20AWG | No |
| AC Power Cord (1430mm) - C13 coupler | 1 | 1 | 16AWG | - |







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| General Data | |
|---|---|
| Manufacturer (OEM) | CWT |
| **Primary Side** | |
| Transient Filter | 6x Y caps, 2x X caps, 2x CM chokes, 1x MOV |
| Inrush Protection | NTC Thermistor |
| Bridge Rectifier(s) | 2x GBJ1510 (700V, 15A @ 100°C) |
| APFC MOSFETS | 2x Vishay SiHF22N60E (650V, 13A @ 100°C, 0.18 Ohm ) |
| APFC Boost Diode | 1x Power Intergrations QH08TZ600 (600V, 8A @ 150°C) |
| Hold-up Cap(s) | 2x Nichicon (400V, 470uF eachor 940uF combined, 2000h @ 105°C, GG) |
| Main Switchers | 2x Vishay SiHG20N50C<br>(560V, 11A @ 100°C, 0.27Ohm) |
| APFC Controller | Infineon ICE3PCS01G - CM03X |
| Switching Controller | Infineon ICE2HS01G |
| Topology | Primary side: Half-Bridge & LLC Resonant Controller<br>Secondary side: Synchronous Rectification & DC-DC converters |
| **Secondary Side** | |
| +12V MOSFETS | 6x Inte ational Rectifier IRFH7004TRPBF (40V, 164A @ 100°C, 1.4 mOhm) |
| 5V & 3.3V | DC-DC Converters: 4x QM3004D (30V, 40A @ 100°C, 8.5 mOhm)<br>2x QM3006D (30V, 57A @ 100°C, 5.5 mOhm)<br>PWM Controller: Anpec APW7159 |
| Filtering Capacitors | Electrolytics: Nippon Chemi-Con (1-5,000 @ 105°C, KZE), Nippon Chemi-Con (4-10,000 @ 105°C, KY), Nippon Chemi-Con (5-6,000 @ 105°C, KZH)<br>Polymers: Fpcap |
| Supervisor IC | Weltrend WT7502 (OVP, UVP, SCP, PG), LM358 |
| Fan Model | NR135L (12V, 0.22A, Rifle Bearing) |
| **5VSB Circuit** | |
| Rectifier | SD04N65A FET, QM3004D FET, MBRU2045CT SBR (45V, 20A @ 125°C) |
| Standby PWM Controller | On-Bright OB5269CP |







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| RESULTS | |
|---|---|
| Temperature Range (°C /°F) | 30-32 / 86-89.6 |
| Average Efficiency | 88.315 |
| Efficiency With 10W (≤500W) or 2% (>500W) Load -115V | 0.000 |
| Average Efficiency 5VSB | 81.310 |
| Standby Power Consumption (W) -115V | 0.0439193 |
| Standby Power Consumption (W) -230V | 0.0806408 |
| Average PF | 0.993 |
| ErP Lot 3/6 Ready | ✓ |
| (EU) No 617/2013 Compliance | ✓ |
| Avg Noise Output | 19.95 |
| Efficiency Rating (ETA) | PLATINUM |
| Noise Rating (LAMBDA) | A+ |

| TEST EQUIPMENT | | |
|---|---|---|
| Electronic Loads | Chroma 6314A x2<br>63123A x6<br>63102A<br>63101A | Chroma 63601-5 x2<br>Chroma 63600-2<br>63640-80-80 x10<br>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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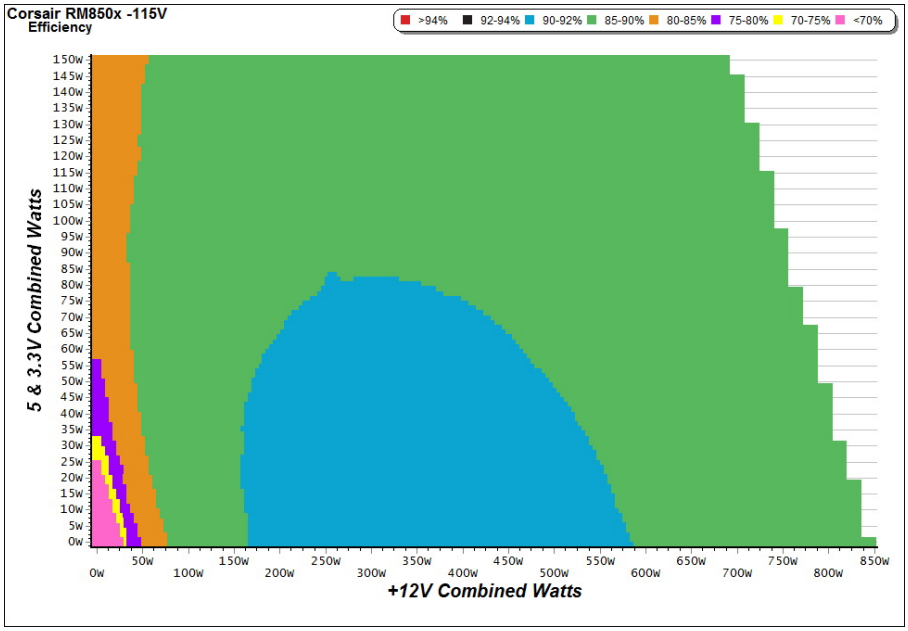
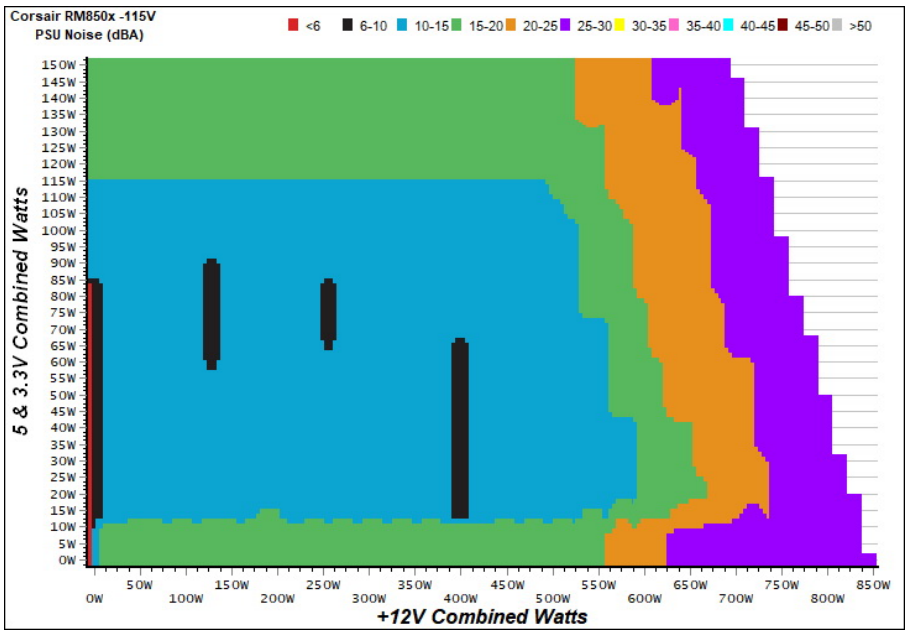
## EFFICIENCY GRAPH




### 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*

## Anex

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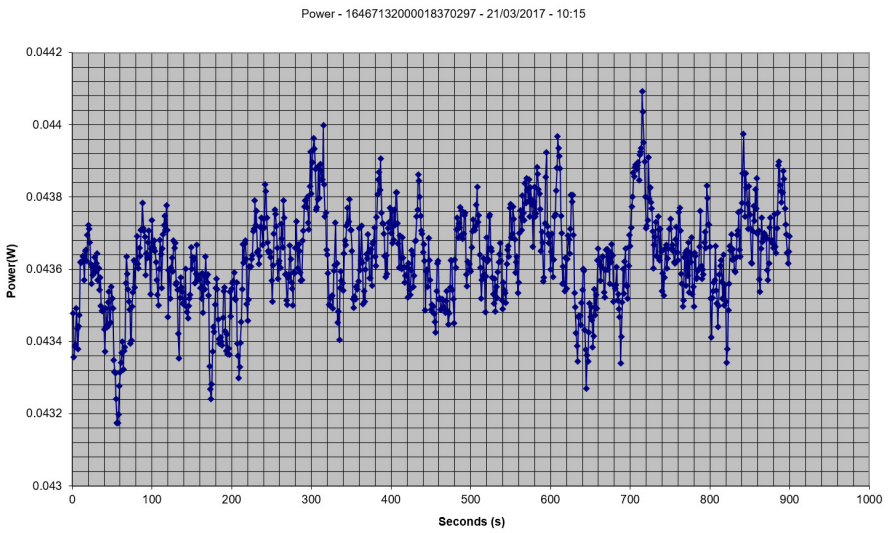
### 5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.041A | 0.210 | 69.767% | 0.030 |
| | 5.077V | 0.301 | | 115.06V |
| 2 | 0.087A | 0.441 | 76.034% | 0.057 |
| | 5.075V | 0.580 | | 115.06V |
| 3 | 0.532A | 2.693 | 81.879% | 0.246 |
| | 5.064V | 3.289 | | 115.05V |
| 4 | 3.001A | 15.015 | 80.782% | 0.445 |
| | 5.003V | 18.587 | | 115.04V |

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

| Test # | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
|---|---|---|---|---|
| 1 | 0.042A | 0.210 | 60.694% | 0.011 |
| | 5.076V | 0.346 | | 230.11V |
| 2 | 0.087A | 0.441 | 69.778% | 0.019 |
| | 5.075V | 0.632 | | 230.13V |
| 3 | 0.532A | 2.692 | 79.387% | 0.097 |
| | 5.064V | 3.391 | | 230.13V |
| 4 | 3.001A | 15.015 | 80.553% | 0.316 |
| | 5.003V | 18.640 | | 230.12V |

### VAMPIRE POWER -115V



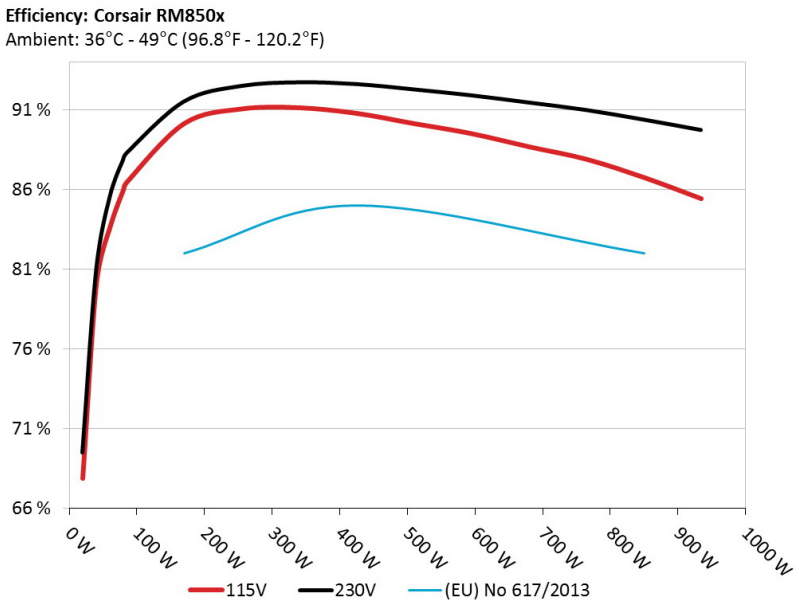

**INFO**

*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*

## Anex

Corsair RM850x

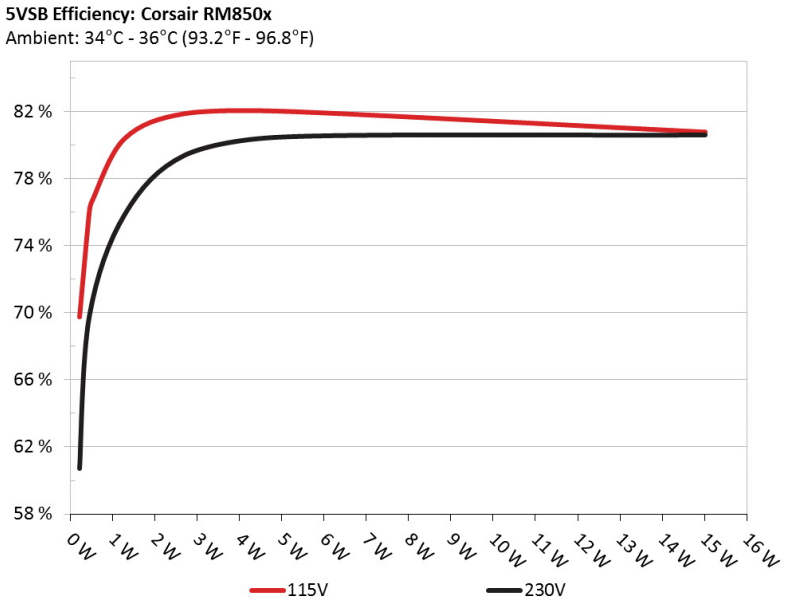
## EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE




**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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## Anex

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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 | 5.242A | 1.985A | 1.995A | 0.996A | 84.812 | 86.449% | 0 | <6.0 | 45.31°C | 0.969 |
| | 12.062V | 5.034V | 3.307V | 5.013V | 98.106 | | | | 39.46°C | 115.07V |
| 2 | 11.523A | 2.979A | 2.994A | 1.196A | 169.695 | 90.130% | 0 | <6.0 | 47.15°C | 0.989 |
| | 12.048V | 5.031V | 3.303V | 5.008V | 188.279 | | | | 41.10°C | 115.08V |
| 3 | 18.180A | 3.483A | 3.513A | 1.398A | 254.911 | 91.046% | 0 | <6.0 | 47.64°C | 0.994 |
| | 12.036V | 5.028V | 3.300V | 5.001V | 279.980 | | | | 41.33°C | 115.07V |
| 4 | 24.835A | 3.980A | 4.000A | 1.601A | 339.755 | 91.119% | 0 | <6.0 | 48.63°C | 0.996 |
| | 12.022V | 5.025V | 3.298V | 4.995V | 372.868 | | | | 41.99°C | 115.07V |
| 5 | 31.164A | 4.977A | 5.004A | 1.802A | 424.649 | 90.768% | 0 | <6.0 | 50.18°C | 0.996 |
| | 12.007V | 5.021V | 3.294V | 4.989V | 467.840 | | | | 43.39°C | 115.07V |
| 6 | 37.509A | 5.977A | 6.014A | 2.006A | 509.665 | 90.127% | 633 | 10.9 | 45.52°C | 0.997 |
| | 11.994V | 5.018V | 3.291V | 4.984V | 565.495 | | | | 61.47°C | 115.07V |
| 7 | 43.865A | 6.985A | 7.024A | 2.208A | 594.661 | 89.499% | 658 | 12.7 | 44.35°C | 0.997 |
| | 11.981V | 5.015V | 3.288V | 4.977V | 664.436 | | | | 60.76°C | 115.06V |
| 8 | 50.233A | 7.986A | 8.038A | 2.410A | 679.579 | 88.675% | 843 | 20.4 | 44.64°C | 0.997 |
| | 11.968V | 5.010V | 3.284V | 4.972V | 766.368 | | | | 61.45°C | 115.06V |
| 9 | 57.055A | 8.485A | 8.564A | 2.411A | 764.601 | 87.892% | 943 | 24.5 | 45.29°C | 0.997 |
| | 11.954V | 5.007V | 3.281V | 4.970V | 869.931 | | | | 62.97°C | 115.06V |
| 10 | 63.636A | 9.000A | 9.059A | 3.026A | 849.468 | 86.751% | 1071 | 28.0 | 46.95°C | 0.997 |
| | 11.939V | 5.004V | 3.278V | 4.953V | 979.202 | | | | 66.21°C | 115.05V |
| 11 | 70.843A | 9.007A | 9.065A | 3.030A | 934.401 | 85.420% | 1282 | 34.4 | 48.97°C | 0.997 |
| | 11.923V | 5.001V | 3.276V | 4.950V | 1093.889 | | | | 68.80°C | 115.05V |
| CL1 | 0.099A | 18.027A | 18.003A | 0.003A | 150.752 | 82.474% | 811 | 19.1 | 46.13°C | 0.989 |
| | 12.033V | 5.012V | 3.288V | 5.068V | 182.788 | | | | 59.02°C | 115.09V |
| CL2 | 70.794A | 1.003A | 1.003A | 1.001A | 858.821 | 87.104% | 1103 | 28.7 | 47.20°C | 0.997 |
| | 11.943V | 5.015V | 3.289V | 4.995V | 985.976 | | | | 65.50°C | 115.06V |







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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 | 1.209A | 0.491A | 0.482A | 0.197A | 19.662 | 67.884% | 0 | <6.0 | 0.843 |
| | 12.077V | 5.038V | 3.310V | 5.033V | 28.964 | | | | 115.07V |
| 2 | 2.447A | 0.990A | 0.996A | 0.395A | 39.810 | 80.078% | 0 | <6.0 | 0.936 |
| | 12.073V | 5.036V | 3.309V | 5.028V | 49.714 | | | | 115.07V |
| 3 | 3.682A | 1.478A | 1.512A | 0.596A | 59.874 | 83.612% | 0 | <6.0 | 0.954 |
| | 12.069V | 5.035V | 3.307V | 5.023V | 71.609 | | | | 115.07V |
| 4 | 4.908A | 1.985A | 1.993A | 0.797A | 79.794 | 85.974% | 0 | <6.0 | 0.966 |
| | 12.064V | 5.034V | 3.307V | 5.019V | 92.812 | | | | 115.07V |

### RIPPLE MEASUREMENTS

| Test | 12V | 5V | 3.3V | 5VSB | Pass/Fail |
|---|---|---|---|---|---|
| 10% Load | 4.8 mV | 5.4 mV | 6.7 mV | 3.3 mV | Pass |
| 20% Load | 5.2 mV | 5.1 mV | 6.3 mV | 3.5 mV | Pass |
| 30% Load | 5.9 mV | 5.2 mV | 6.4 mV | 3.8 mV | Pass |
| 40% Load | 6.4 mV | 5.4 mV | 6.7 mV | 4.8 mV | Pass |
| 50% Load | 6.3 mV | 5.7 mV | 7.3 mV | 4.7 mV | Pass |
| 60% Load | 7.2 mV | 5.8 mV | 8.3 mV | 5.7 mV | Pass |
| 70% Load | 7.7 mV | 5.8 mV | 8.8 mV | 6.2 mV | Pass |
| 80% Load | 8.0 mV | 5.7 mV | 9.7 mV | 6.6 mV | Pass |
| 90% Load | 8.6 mV | 6.0 mV | 9.5 mV | 7.1 mV | Pass |
| 100% Load | 10.7 mV | 5.9 mV | 10.0 mV | 8.1 mV | Pass |
| 110% Load | 13.9 mV | 6.4 mV | 9.8 mV | 9.6 mV | Pass |
| Crossload 1 | 7.3 mV | 5.9 mV | 8.0 mV | 5.8 mV | Pass |
| Crossload 2 | 11.0 mV | 7.0 mV | 8.7 mV | 8.5 mV | Pass |







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| HOLD-UP TIME & POWER OK SIGNAL (230V) | |
|---|---|
| Hold-Up Time (ms) | 29.4 |
| AC Loss to PWR_OK Hold Up Time (ms) | 21.8 |
| PWR_OK Inactive to DC Loss Delay (ms) | 7.6 |


*Top side*


*Power specifications label*

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