## Anex

Deepcool PN1200M

| Lab ID\#: DC12002412 |  |
| :--- | :--- |
| Receipt Date: Mar 29, 2024 |  |
| Test Date: Apr 12, 2024 |  |
| DUT IN F OR MATION |  |
| Brand | Deepcool |
| Manufacturer (OEM) | CWT |
| Series | PN-M |
| Model Number | PNC00M-FC |
| Serial Number | 2024000025 |
| DUT Notes |  |

Report: 24PS2412A
Report Date: Apr 15, 2024

| DUT SPECIFICATIONS |  |
| :--- | :--- |
| Rated Voltage (Vms) | $100-240$ |
| Rated Current (Arms) | $15-7$ |
| Rated Frequency (Hz) | $50-60$ |
| Rated Power (W) | 1200 |
| Type | ATX12V |
| Cooling | 135 mm Fluid Dynamic Bearing Fan <br> (HA13525H12SF-Z) |
| Semi-Passive Operation | $x$ |
| Cable Design | Fully Modular |

## TEST EQUIPMENT

|  | Chroma 63601-5 x2 <br> Chroma 63600-2 <br> Electronic Loads <br>  <br>  <br>  <br>  |
| :--- | :--- |
| AC Sources | Chro-80-80 $\times 10$ |

## Anex

Deepcool PN1200M

## RESULTS

| Temperature Range $\left({ }^{\circ} \mathrm{C} /{ }^{\circ} \mathrm{F}\right)$ | $30-32 / 86-89.6$ |
| :--- | :---: |
| ErP Lot 3/6 Ready | $\checkmark$ |
| (EU) No 617/2013 Compliance | $\checkmark$ |
| ALPM (Altemative Low Power Mode) compatible | $\checkmark$ |
| ATX v3.1 PSU Power Excursion | $\checkmark$ |


| $\mathbf{1 1 5} \mathbf{~ V}$ |  |
| :--- | :--- |
| Average Efficiency | $88.040 \%$ |
| Efficiency With 10W ( $\leq 500 \mathrm{~W}$ ) or 2\% ( $>500 \mathrm{~W}$ ) | 75.306 |
| Average Efficiency 5VSB | $78.313 \%$ |
| Standby Power Consumption (W) | 0.0376000 |
| Average PF | 0.988 |
| Avg Noise Output | $33.42 \mathrm{~dB}(\mathrm{~A})$ |
| Efficiency Rating (ETA) | GOLD |
| Noise Rating (LAMBDA) | Standard++ |


| $\mathbf{2 3 0 V}$ |  |
| :--- | :--- |
| Average Efficiency | $90.320 \%$ |
| Average Efficiency 5VSB | $77.522 \%$ |
| Standby Power Consumption (W) | 0.0858000 |
| Average PF | 0.965 |
| Avg Noise Output | $32.34 \mathrm{~dB}(\mathrm{~A})$ |
| Efficiency Rating (ETA) | GOLD |
| Noise Rating (LAMBDA) | Standard++ |


| POWER SPECIFICATIONS |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Rail |  | $\mathbf{3 . 3 V}$ | $\mathbf{5 V}$ | $\mathbf{1 2 V}$ | $\mathbf{5 V S B}$ |
|  | Max. Power | Amps | 22 | 22 | 100 |

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

| Hold-Up Time (ms) | 15.2 |
| :--- | :--- |
| AC Loss to PWR_OK Hold Up Time (ms) | 13 |
| PWR_OK Inactive to DC Loss Delay (ms) | 2.2 |

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## CABLES AND CONNECTORS

| Modular Cables |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Description | Cable Count | Connector Count (Total) | Gauge | In Cable Capacitors |
| ATX connector $20+4$ pin (540mm) | 1 | 1 | 18AWG | No |
| $4+4$ pin EPS12V ( 700 mm ) | 2 | 2 | 16AWG | No |
| 6+2 pin PCle ( 550 mm ) | 3 | 3 | 16AWG | No |
| $12+4$ pin PCle ( 600 mm ) (600W) | 1 | 1 | 16-24AWG | No |
| SATA ( $450 \mathrm{~mm}+120 \mathrm{~mm}+120 \mathrm{~mm}+120 \mathrm{~mm}$ ) / 4-pin Molex ( +120 mm ) | 2 | 8/2 | 18AWG | No |

## Anex

| General Data |  |
| :---: | :---: |
| Manufacturer (OEM) | CWT |
| Platform | CSZ |
| PCB Type | Double-Sided |
| Primary Side |  |
| Transient Filter | 4 X Y caps, $1 \times \mathrm{X}$ caps, $2 \times$ CM chokes, $1 \times$ MOV |
| Inrush Protection | 1x NTC Thermistor SCK-207R0 ( 7 Ohm @ $25^{\circ} \mathrm{C}$ ) \& Relay |
| Bridge Rectifier(s) | $2 \times$ WNB2560M (600V, 25A @ $127^{\circ} \mathrm{C}$ ) |
| APFC MOSFETs | 3 x Infineon IPW60R099P6 (650V, 24A @ 100 ${ }^{\circ} \mathrm{C}, \mathrm{Rds}$ (on): 0.0990hm) |
| APFC Boost Diode | 1x OnSemi FFSP1665A (650V, 16A @ 135 ${ }^{\circ} \mathrm{C}$ ) |
| Bulk Cap(s) | 1x Rubycon (420V, 820uF , 2000h @ 105 ${ }^{\circ} \mathrm{C}$, MXE) |
| Main Switchers | $2 \mathrm{Infineon} \mathrm{IPW60R099P6} \mathrm{(650V}, \mathrm{24A} \mathrm{@} \mathrm{100}{ }^{\circ} \mathrm{C}, \mathrm{Rds}$ (on): 0.0990hm) |
| APFC Controller | Champion 6500UNX \& $1 \times$ Sync Power SPN5003 (No load consumption FET) |
| Resonant Controller | Champion CU6901VAC |
| Topology | Primary side: APFC, Half-Bridge \& ШС converter Secondary side: Synchronous Rectification \& DC-DC converters |
| Secondary Side |  |
| +12V MOSFETs | 10x Infineon BSC014206NS (60V, 152A @ 100 ${ }^{\circ} \mathrm{C}$, Rds(on): 1.45 mOhm ) |
| 5 V \& 3.3V | DC-DC Converters: $2 x$ UBIQ QM3054M6 (30V, 61A @ $100^{\circ} \mathrm{C}$, Rds(on): 4.8mOhm) \& $2 x$ UBIQ QN3107M6N (30V, 70A @ $100^{\circ} \mathrm{C}$, Rds(on): 2.6 mOhm ) <br> PWM Controller(s): uPI-Semi uP3861P |
| Filtering Capacitors | Electrolytic: <br> 1x Elite ( 2,000 @ $105^{\circ} \mathrm{C}, \mathrm{PF}$ ), <br> $7 x$ Chengx ( $6-10000$ @ $105^{\circ} \mathrm{C}, \mathrm{GR}$ ), <br> Polymer: 15x Apaq , 10x Elite , 2 x |
| Supervisor IC | Weltrend WT7502 (OVD ,PGO, UVD, ) |
| Fan Model | Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan) |
| 5VSB/12VSB Circuit |  |
| Low Side Rectifier | Chongqing-Pingwei-Tech R1MF |
| Standby PWM Controller | On-Bright OB2365T |

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

| Test \# | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 0.045A | 0.226W | 70.368\% | 0.032 |
|  | 5.03 V | 0.321W |  | 114.89 V |
| 2 | 0.09A | 0.453W | 75.12\% | 0.059 |
|  | 5.028 V | 0.603W |  | 114.88 V |
| 3 | 0.55A | 2.755 W | 79.087\% | 0.267 |
|  | 5.01 V | 3.483W |  | 114.88 V |
| 4 | 1A | 4.992W | 78.93\% | 0.356 |
|  | 4.992V | 6.325 W |  | 114.87V |
| 5 | 1.5A | 7.459W | 78.991\% | 0.417 |
|  | 4.972V | 9.443W |  | 114.87V |
| 6 | 3A | 14.736W | 76.815\% | 0.494 |
|  | 4.912 V | 19.184W |  | 114.87 V |

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

| Test \# | 5VSB | DC/AC (Watts) | Efficiency | PF/AC Volts |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 0.045A | 0.226W | 58.182\% | 0.011 |
|  | 5.03 V | 0.389w |  | 229.95 V |
| 2 | 0.09A | 0.453W | 66.157\% | 0.02 |
|  | 5.028 V | 0.686W |  | 229.94 V |
| 3 | 0.55A | 2.755W | 76.797\% | 0.101 |
|  | 5.009 V | 3.587 W |  | 229.94 V |
| 4 | 1A | 4.992W | 78.095\% | 0.168 |
|  | 4.991V | 6.392W |  | 229.94 V |
| 5 | 1.5A | 7.458W | 78.607\% | 0.228 |
|  | 4.971V | 9.489W |  | 229.94 V |
| 6 | 3A | 14.734W | 78.847\% | 0.324 |
|  | 4.911V | 18.686W |  | 229.94 V |

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## Anex

## 115 V




## Anex

Deepcool PN1200M

## VAMPIRE POWER -115V

Detailed Results

|  | Average | Min | Limit Min | Max | Limit Max | Result |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mains Voltage RMS: | 114.87 V | 114.81 V | 113.85 V | 114.92 V | 116.15 V | PASS |
| Mains Frequency: | 60.00 Hz | 59.98 Hz | 59.40 Hz | 60.02 Hz | 60.60 Hz | PASS |
| Mains Voltage CF: | 1.419 | 1.417 | 1.340 | 1.422 | 1.490 | PASS |
| Mains Voltage THD: | 0.16 \% | 0.09 \% | N/A | 0.29 \% | 2.00 \% | PASS |
| Real Power: | 0.038 W | 0.033 W | N/A | 0.042 W | N/A | N/A |
| Apparent Power: | 10.067 W | 10.050 W | N/A | 10.089 W | N/A | N/A |
| Power Factor: | 0.004 | N/A | N/A | N/A | N/A | N/A |

## 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

10-110\% LOAD TESTS 115V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC <br> (Watts) | Efficiency | Fan <br> Speed <br> (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC <br> Volts |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10\% | 8.089A | 1.981A | 1.973A | 1.005 A | 119.997 | 83.724\% | 406 | <6.0 | $40.18^{\circ} \mathrm{C}$ | 0.983 |
|  | 12.164V | 5.05 V | 3.346 V | 4.977 V | 143.322 |  |  |  | $44.44{ }^{\circ} \mathrm{C}$ | 114.83V |
| 20\% | 17.192A | 2.974A | 2.963A | 1.21A | 239.961 | 89.402\% | 408 | <6.0 | $40.91^{\circ} \mathrm{C}$ | 0.99 |
|  | 12.160V | 5.045 V | 3.342 V | 4.96V | 268.409 |  |  |  | $45.49{ }^{\circ} \mathrm{C}$ | 114.79 V |
| 30\% | 26.623A | 3.472A | 3.461A | 1.417A | 359.237 | 90.594\% | 408 | <6.0 | $41.25^{\circ} \mathrm{C}$ | 0.983 |
|  | 12.139 V | 5.041V | 3.338 V | 4.942 V | 396.539 |  |  |  | $46.3{ }^{\circ} \mathrm{C}$ | 114.76 V |
| 40\% | 36.165A | 3.972A | 3.959A | 1.615A | 479.623 | 90.648\% | 409 | <6.0 | $41.74{ }^{\circ} \mathrm{C}$ | 0.986 |
|  | 12.123V | 5.037 V | 3.334 V | 4.953 V | 529.102 |  |  |  | $47.27^{\circ} \mathrm{C}$ | 114.71V |
| 50\% | 45.343A | 4.97A | 4.956A | 1.823A | 599.352 | 90.217\% | 409 | <6.0 | $42.29{ }^{\circ} \mathrm{C}$ | 0.989 |
|  | 12.104V | 5.032 V | 3.33 V | 4.937V | 664.347 |  |  |  | $48.31{ }^{\circ} \mathrm{C}$ | 114.67V |
| 60\% | 54.616A | 5.97A | 5.955A | 2A | 719.721 | 89.498\% | 776 | 17.4 | $42.89{ }^{\circ} \mathrm{C}$ | 0.991 |
|  | 12.085 V | 5.027 V | 3.325 V | 4.921 V | 804.178 |  |  |  | $49.45^{\circ} \mathrm{C}$ | 114.62 V |
| 70\% | 63.859A | 6.971A | 6.958A | 2.244A | 839.588 | 88.715\% | 1165 | 30.5 | $43.19{ }^{\circ} \mathrm{C}$ | 0.992 |
|  | 12.065 V | 5.022 V | 3.32 V | 4.902 V | 946.387 |  |  |  | $50.2{ }^{\circ} \mathrm{C}$ | 114.58 V |
| 80\% | 73.198A | 7.971A | 7.962A | 2.353A | 959.548 | 87.848\% | 1567 | 40.5 | $43.83{ }^{\circ} \mathrm{C}$ | 0.993 |
|  | 12.045 V | 5.018 V | 3.315 V | 4.889 V | 1092.29 |  |  |  | $51.98^{\circ} \mathrm{C}$ | 114.54V |
| 90\% | 82.880A | 8.475A | 8.455A | 2.461A | 1079.31 | 86.863\% | 1987 | 48.6 | $44.57^{\circ} \mathrm{C}$ | 0.994 |
|  | 12.027V | 5.014 V | 3.311 V | 4.876 V | 1242.547 |  |  |  | $53.61{ }^{\circ} \mathrm{C}$ | 114.49 V |
| 100\% | 92.332A | 8.981A | 8.98A | 3.1A | 1199.35 | 85.799\% | 2216 | 49.4 | $45.98{ }^{\circ} \mathrm{C}$ | 0.994 |
|  | 12.018 V | 5.011V | 3.307 V | 4.839 V | 1397.855 |  |  |  | $56.15^{\circ} \mathrm{C}$ | 114.44V |
| 110\% | 101.695A | 9.99A | 10.084A | 3.107A | 1319.957 | 84.562\% | 2219 | 49.4 | $46.95^{\circ} \mathrm{C}$ | 0.995 |
|  | 12.013 V | 5.005 V | 3.302 V | 4.829 V | 1560.943 |  |  |  | $57.89{ }^{\circ} \mathrm{C}$ | 114.39V |
| CL1 | 0.114 A | 14.393A | 14.316A | OA | 121.298 | 78.052\% | 412 | <6.0 | $41.66^{\circ} \mathrm{C}$ | 0.986 |
|  | 12.167V | 5.016 V | 3.332 V | 5.008 V | 155.41 |  |  |  | $53.65{ }^{\circ} \mathrm{C}$ | 114.83V |
| CL2 | 0.114 A | 21.993A | OA | OA | 111.317 | 75.405\% | 411 | <6.0 | $41.02^{\circ} \mathrm{C}$ | 0.985 |
|  | 12.176V | 4.998 V | 3.346 V | 5.015 V | 147.623 |  |  |  | $51.94{ }^{\circ} \mathrm{C}$ | 114.83V |
| CL3 | 0.114 A | OA | 21.826A | OA | 73.982 | 71.227\% | 410 | <6.0 | $41.13^{\circ} \mathrm{C}$ | 0.975 |
|  | 12.174V | 5.029 V | 3.326 V | 5.012 V | 103.866 |  |  |  | $52.68^{\circ} \mathrm{C}$ | 114.84 V |
| CL4 | 99.768A | OA | 0A | 0A | 1199.907 | 86.387\% | 2215 | 49.4 | $45.78{ }^{\circ} \mathrm{C}$ | 0.994 |
|  | 12.027V | 5.027 V | 3.319 V | 4.98 V | 1389.008 |  |  |  | $58.03{ }^{\circ} \mathrm{C}$ | 114.45V |

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## Anex

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## 20-80W LOAD TESTS 115V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC <br> Volts |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20W | 1.221A | 0.494A | 0.493A | 0.199A | 19.998 | 73.233\% | 400 | <6.0 | $36.59^{\circ} \mathrm{C}$ | 0.836 |
|  | 12.160 V | 5.057V | 3.348 V | 5.019 V | 27.311 |  |  |  | $39.71{ }^{\circ} \mathrm{C}$ | 114.88V |
| 40W | 2.688A | 0.692A | 0.69A | 0.299A | 39.999 | 79.199\% | 402 | <6.0 | $37.6^{\circ} \mathrm{C}$ | 0.929 |
|  | 12.157V | 5.056 V | 3.348 V | 5.014 V | 50.505 |  |  |  | $40.9^{\circ} \mathrm{C}$ | 114.87V |
| 60W | 4.156A | 0.89A | 0.887A | 0.399A | 59.999 | 82.436\% | 403 | <6.0 | $38.38^{\circ} \mathrm{C}$ | 0.967 |
|  | 12.155 V | 5.055 V | 3.348 V | 5.008 V | 72.784 |  |  |  | $42.07^{\circ} \mathrm{C}$ | 114.86 V |
| 80W | 5.616A | 1.089A | 1.084A | 0.5A | 79.946 | 83.092\% | 405 | <6.0 | $39.38^{\circ} \mathrm{C}$ | 0.976 |
|  | 12.166 V | 5.053 V | 3.348 V | 5.002V | 96.214 |  |  |  | $43.24{ }^{\circ} \mathrm{C}$ | 114.85V |


| RIPPLE MEASUREMENTS 115V |  |  |  | 5VSB | Pass/Fail |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Test | 12V | 5V | 3.3V |  |  |
| 10\% Load | 12.74mV | 12.88mV | 13.39mV | 7.95 mV | Pass |
| 20\% Load | 12.48 mV | 12.83 mV | 13.60 mV | 8.88 mV | Pass |
| 30\% Load | 14.59 mV | 12.98 mV | 13.65 mV | 10.53 mV | Pass |
| 40\% Load | 15.67 mV | 13.35 mV | 14.38 mV | 10.17 mV | Pass |
| 50\% Load | 15.47 mV | 16.43 mV | 15.00 mV | 11.36 mV | Pass |
| 60\% Load | 17.73mV | 25.19 mV | 18.20 mV | 12.75 mV | Pass |
| 70\% Load | 17.53 mV | 29.26 mV | 18.87 mV | 13.73mV | Pass |
| 80\% Load | 18.82 mV | 20.14 mV | 16.08 mV | 15.28 mV | Pass |
| 90\% Load | 20.21 mV | 19.73 mV | 16.70 mV | 15.74 mV | Pass |
| 100\% Load | 28.72 mV | 21.16 mV | 19.28 mV | 20.68 mV | Pass |
| 110\% Load | 28.76 mV | 23.06 mV | 19.58mV | 21.42 mV | Pass |
| Crossload1 | 14.94mV | 15.31 mV | 15.85 mV | 7.93 mV | Pass |
| Crossload2 | 15.26 mV | 22.57 mV | 13.44 mV | 9.19 mV | Pass |
| Crossload3 | 14.85 mV | 13.60 mV | 19.08mV | 9.03 mV | Pass |
| Crossload4 | 27.39 mV | 19.26 mV | 18.68mV | 10.42 mV | Pass |

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## Anex

## 230V




## Anex

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## VAMPIRE POWER -230V

Detailed Results

|  | Average | Min | Limit Min | Max | Limit Max | Result |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mains Voltage RMS: | 229.94 V | 229.88 V | 227.70 V | 230.00 V | 232.30 V | PASS |
| Mains Frequency: | 50.00 Hz | 49.99 Hz | 49.50 Hz | 50.01 Hz | 50.50 Hz | PASS |
| Mains Voltage CF: | 1.417 | 1.416 | 1.340 | 1.419 | 1.490 | PASS |
| Mains Voltage THD: | 0.17 \% | 0.14 \% | N/A | 0.23 \% | 2.00 \% | PASS |
| Real Power: | 0.086 W | 0.076 W | N/A | 0.123 W | N/A | N/A |
| Apparent Power: | 34.054 W | 34.026 W | N/A | 34.086 W | N/A | N/A |
| Power Factor: | 0.002 | N/A | N/A | N/A | N/A | N/A |

## 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

10-110\% LOAD TESTS 230V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC <br> (Watts) | Efficiency | Fan <br> Speed <br> (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC <br> Volts |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10\% | 8.087A | 1.981A | 1.972A | 1.005A | 119.985 | 84.533\% | 406 | <6.0 | $40.4{ }^{\circ} \mathrm{C}$ | 0.903 |
|  | 12.165V | 5.049 V | 3.346 V | 4.977V | 141.937 |  |  |  | $44.62{ }^{\circ} \mathrm{C}$ | 229.92V |
| 20\% | 17.190A | 2.974A | 2.962A | 1.21 A | 239.944 | 90.536\% | 408 | <6.0 | $40.85^{\circ} \mathrm{C}$ | 0.956 |
|  | 12.161V | 5.044 V | 3.342 V | 4.96 V | 265.027 |  |  |  | $45.36{ }^{\circ} \mathrm{C}$ | 229.9 V |
| 30\% | 26.617A | 3.472A | 3.46A | 1.416A | 359.174 | 92.312\% | 408 | <6.0 | $41.37{ }^{\circ} \mathrm{C}$ | 0.97 |
|  | 12.140V | 5.04 V | 3.338 V | 4.943 V | 389.087 |  |  |  | $46.41{ }^{\circ} \mathrm{C}$ | 229.88 V |
| 40\% | 36.160A | 3.972A | 3.959A | 1.615A | 479.565 | 92.735\% | 408 | <6.0 | $41.64{ }^{\circ} \mathrm{C}$ | 0.976 |
|  | 12.123V | 5.036 V | 3.334 V | 4.954 V | 517.136 |  |  |  | $47.15^{\circ} \mathrm{C}$ | 229.86 V |
| 50\% | 45.337A | 4.97A | 4.955A | 1.823A | 599.297 | 92.656\% | 409 | <6.0 | $42.41{ }^{\circ} \mathrm{C}$ | 0.979 |
|  | 12.105V | 5.031 V | 3.33 V | 4.938 V | 646.798 |  |  |  | $48.51{ }^{\circ} \mathrm{C}$ | 229.84 V |
| 60\% | 54.614A | 5.97A | 5.956A | 2A | 719.71 | 92.242\% | 864 | 21.1 | $42.7^{\circ} \mathrm{C}$ | 0.98 |
|  | 12.086 V | 5.026 V | 3.325 V | 4.922V | 780.245 |  |  |  | $49.38^{\circ} \mathrm{C}$ | 229.83 V |
| 70\% | 63.856A | 6.971A | 6.959A | 2.244 A | 839.576 | 91.732\% | 1211 | 31.6 | $43.36{ }^{\circ} \mathrm{C}$ | 0.983 |
|  | 12.065 V | 5.022 V | 3.32 V | 4.903 V | 915.254 |  |  |  | $50.39^{\circ} \mathrm{C}$ | 229.81V |
| 80\% | 73.203A | 7.973A | 7.964A | 2.352A | 959.576 | 91.169\% | 1570 | 40.6 | $43.74{ }^{\circ} \mathrm{C}$ | 0.984 |
|  | 12.045 V | 5.017 V | 3.315 V | 4.889 V | 1052.519 |  |  |  | $51.8^{\circ} \mathrm{C}$ | 229.79 V |
| 90\% | 82.894A | 8.477A | 8.458A | 2.462A | 1079.372 | 90.573\% | 1965 | 49.4 | $44.05^{\circ} \mathrm{C}$ | 0.985 |
|  | 12.026 V | 5.014 V | 3.31V | 4.875V | 1191.706 |  |  |  | $53.16^{\circ} \mathrm{C}$ | 229.77V |
| 100\% | 92.350A | 8.983A | 8.984A | 3.1A | 1199.396 | 89.858\% | 2215 | 49.4 | $45.23^{\circ} \mathrm{C}$ | 0.986 |
|  | 12.016 V | 5.01V | 3.306 V | 4.839V | 1334.777 |  |  |  | $55.24{ }^{\circ} \mathrm{C}$ | 229.74 V |
| 110\% | 101.720A | 9.992A | 10.088A | 3.107A | 1320.004 | 89.11\% | 2215 | 49.4 | $46.25^{\circ} \mathrm{C}$ | 0.986 |
|  | 12.011V | 5.004 V | 3.301 V | 4.828 V | 1481.329 |  |  |  | $57.13^{\circ} \mathrm{C}$ | 229.72V |
| CL1 | 0.115A | 14.397A | 14.319A | OA | 121.3 | 79.472\% | 410 | <6.0 | $41.87{ }^{\circ} \mathrm{C}$ | 0.91 |
|  | 12.166 V | 5.015 V | 3.331 V | 5.008 V | 152.632 |  |  |  | $57.31{ }^{\circ} \mathrm{C}$ | 229.93 V |
| CL2 | 0.114 A | 21.996A | OA | OA | 111.323 | 76.351\% | 409 | <6.0 | $41.25^{\circ} \mathrm{C}$ | 0.905 |
|  | 12.175V | 4.998 V | 3.346 V | 5.015V | 145.803 |  |  |  | $57.22^{\circ} \mathrm{C}$ | 229.92V |
| CL3 | 0.114 A | OA | 21.834A | OA | 73.983 | 71.618\% | 408 | <6.0 | $40.35^{\circ} \mathrm{C}$ | 0.847 |
|  | 12.172V | 5.029 V | 3.325 V | 5.012V | 103.306 |  |  |  | $55.37{ }^{\circ} \mathrm{C}$ | 229.93 V |
| CL4 | 99.805A | OA | OA | OA | 1199.976 | 90.501\% | 2214 | 49.4 | $45.21{ }^{\circ} \mathrm{C}$ | 0.986 |
|  | 12.023 V | 5.028 V | 3.318 V | 4.979V | 1325.937 |  |  |  | $61.93{ }^{\circ} \mathrm{C}$ | 229.74 V |

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

## 20-80W LOAD TESTS 230V

| Test | 12V | 5V | 3.3V | 5VSB | DC/AC <br> (Watts) | Efficiency | Fan Speed (RPM) | PSU Noise (dB[A]) | Temps (In/Out) | PF/AC <br> Volts |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20W | 1.220A | 0.494A | 0.493A | 0.199A | 19.991 | 70.89\% | 399 | <6.0 | $36.71{ }^{\circ} \mathrm{C}$ | 0.448 |
|  | 12.159 V | 5.057 V | 3.347 V | 5.02 V | 27.967 |  |  |  | $39.83^{\circ} \mathrm{C}$ | 229.96 V |
| 40W | 2.688 A | 0.692A | 0.69A | 0.299A | 39.993 | 79.044\% | 401 | <6.0 | $37.45^{\circ} \mathrm{C}$ | 0.652 |
|  | 12.158V | 5.056 V | 3.348 V | 5.014 V | 50.595 |  |  |  | $40.83{ }^{\circ} \mathrm{C}$ | 229.95 V |
| 60W | 4.156A | 0.89A | 0.887A | 0.399A | 59.993 | 82.408\% | 402 | <6.0 | $38.57^{\circ} \mathrm{C}$ | 0.76 |
|  | 12.155 V | 5.054 V | 3.348 V | 5.008 V | 72.799 |  |  |  | $42.22^{\circ} \mathrm{C}$ | 229.94 V |
| 80W | 5.614 A | 1.089 A | 1.084 A | 0.5A | 79.934 | 83.562\% | 404 | <6.0 | $39.08^{\circ} \mathrm{C}$ | 0.835 |
|  | 12.166V | 5.052 V | 3.348 V | 5.002 V | 96.817 |  |  |  | $42.93{ }^{\circ} \mathrm{C}$ | 229.93 V |


| RIPPLE MEASUREMENTS 230V |  |  |  | 5VSB | Pass/Fail |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Test | 12V | 5V | 3.3V |  |  |
| 10\% Load | 12.42 mV | 11.90 mV | 13.75mV | 9.03 mV | Pass |
| 20\% Load | 13.41 mV | 13.14 mV | 14.22 mV | 9.09 mV | Pass |
| 30\% Load | 14.59 mV | 13.14 mV | 15.00 mV | 9.40 mV | Pass |
| 40\% Load | 14.23 mV | 13.60 mV | 13.44 mV | 9.39 mV | Pass |
| 50\% Load | 15.98mV | 14.68 mV | 14.01 mV | 9.96 mV | Pass |
| 60\% Load | 17.79 mV | 28.44 mV | 18.00 mV | 10.48 mV | Pass |
| 70\% Load | 17.43 mV | 29.57 mV | 19.91 mV | 14.19 mV | Pass |
| 80\% Load | 18.77 mV | 19.63 mV | 18.72 mV | 13.21 mV | Pass |
| 90\% Load | 20.16 mV | 19.06 mV | 18.41 mV | 13.78 mV | Pass |
| 100\% Load | 28.06 mV | 21.30 mV | 19.66 mV | 16.78 mV | Pass |
| 110\% Load | 30.86 mV | 22.49 mV | 19.35 mV | 18.94 mV | Pass |
| Crossload1 | 13.64 mV | 16.23 mV | 15.81mV | 8.47 mV | Pass |
| Crossload2 | 15.26 mV | 24.57 mV | 12.98mV | 9.34 mV | Pass |
| Crossload3 | 13.72 mV | 13.35 mV | 18.72 mV | 9.34 mV | Pass |
| Crossload4 | 27.84 mV | 18.74 mV | 17.93 mV | 11.13 mV | Pass |

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## EFFICIENCY AND NOISE LEVEL CERTIFICATIONS



Power specifications label

## CERTIFICATIONS 115V



Aristeidis Bitziopoulos
Lab Director


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