

PocketPD HW1.1 Thermal Testing

August 08/01/2025

1. Preliminary finding

Thermal imaging of PocketPD HW1.0 reveals that the hottest spot is at the load switch (LM73100s). This is due to internal resistance of the switch when high current passing through

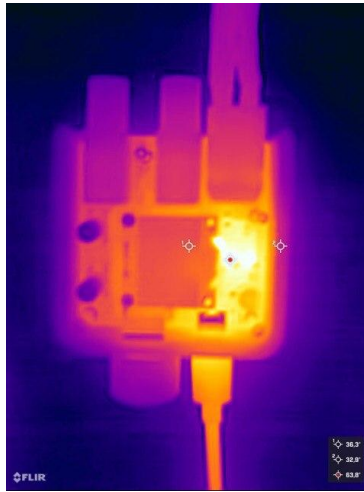


Fig 1: Hot spot location

2. Test setup

- Drill one hole at the lower half of the enclosure. Next to LM73100s.
- Add a glob of thermal paste. We used Arctic MX-4.
- Add K-type thermal couple right on the thermal paste
- Add foam for compression and location fixation
- Close the top lid.

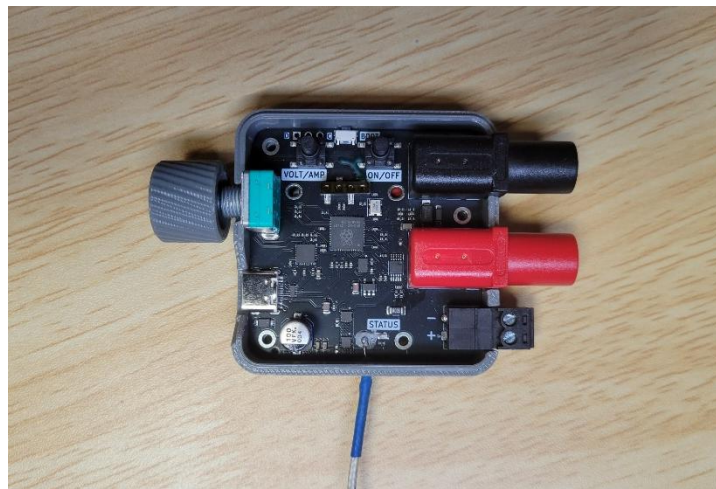


Fig 2: Location of K-type thermocouple

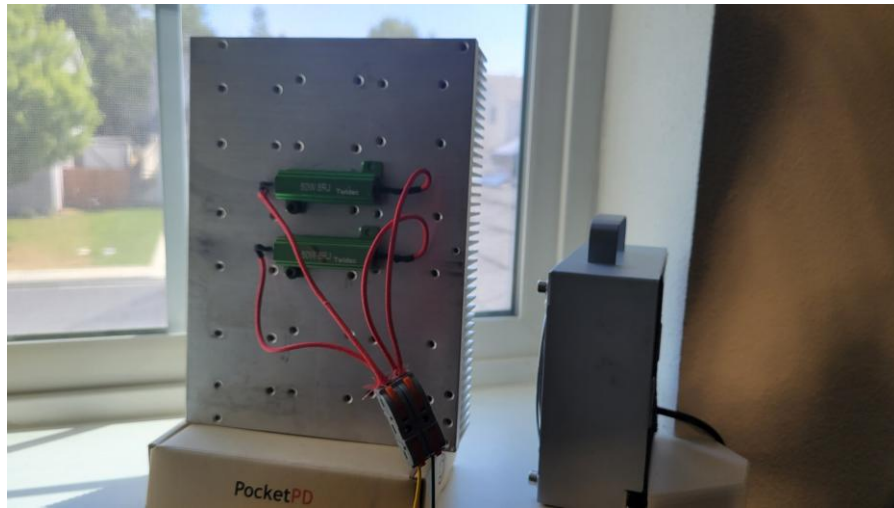


Fig 3: Resistive load, heatsink, and load cooling fan

- Add resistive load of 40 Ω .
 - This will allow us to get max 5A at 20V input for max current testing
- Plug in power, set desire current/voltage

Environment note:

- Ambience temperature $\sim 20^{\circ}\text{C}$
- PocketPD is placed on wooden table, natural convection, no forced air
- Charger: UGREEN Nexode 140W, PD3.1
- Cable: Anker 240W

3. Result

- Low current (1A) for 6 hours. Temperature reading less than 45°C .
- Mid current (3A) for 6 hours. Temperature reading less than 55°C .
- High current (4A) for 6 hours. Temperature reading less than 63°C .
- Max current (5A) for 1 hours. Temperature reading less than 70°C .

We did not perform 6hr max current test due as the charger was getting quite warm. In all test, PocketPD still operate as expected after the test is completed and load cut off.

4. Note

Thermal performance of PocketPD can be improved if placed on metal surface or with additional air movement.

This test result is only for internal evaluation. Unit variation and environmental variation can lead to deviation from the test result. Operating at higher ambience temperature will lead to increase in internal temperature. We do not recommend using max load for extended period of time as that will eventually reduce life time of the component.