Peer review of
Hardware Optimization of an IVT Measurement System for Battery Management

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Basic Information:

- Your subgroup number: 19
- Subgroup number of the group you are reviewing: 8

Overall Assessment:

This research proposal on "Hardware Optimization of an IVT Measurement System for Battery Management" is well-structured and logically organized. The focus on comparing various measurement principles and their impact on power consumption and volume is highly relevant in the context of battery management systems. The proposed methodology, which includes simulation, PCB design, and quantitative measurement, is comprehensive. Overall, this research proposal demonstrates a clear research plan and potential to make some contributions to the field of battery management technology.

Clarity and Coherence:

The proposal's writing is clear and well-organized, making it easy to follow. The research questions and problem statement are clear and concise. The proposal's structure containing several aspects enhances its clarity and coherence. The aims and objectives are well-defined and logically connected to the research questions, ensuring that the research goals align with addressing the identified problem. There is one point maybe you can demonstrate more in the introduction part, which is that you only mentioned that the currently used module is expensive and occupies a lot of space. But what are the advantages in performance of it that may cost a lot commercially. You may want to reach the similar performance and can decrease the costs with some principles.

Overall, the proposal effectively communicates its purpose and approach, making it a well-structured and comprehensible document.

Research Questions or Hypotheses:

It is really a good point that you list out the significant performance figures so that your evaluation will be clearer and more convincing.

The research questions are specific and well-framed. But there is a suggestion for the first question "What high-current PCB design principles can be used to optimise IVT performance?". From my perspective, it would be better to be like "What impact will high-current PCB design principles have on IVT performance?", so that you can compare quantitative measurement results with different principles and make the research more reasonable.

Literature Review:

The literature review in this research proposal demonstrates a good starting point for understanding the context of the research and are up-to-date. It covers modern current and voltage sensing solutions in electric vehicle batteries, providing a general overview. It effectively introduces measurement methods like Open-Circuit Voltage (OCV) and the hall-effect, which are likely to be relevant in the project.

Methodology:

The proposed research methods and tools appear to be well-suited for addressing the research questions regarding measurement principles and their impact on volume and power consumption. Specific methodologies mentioned in the proposal are Simulation and Quantitative Measurement, Literature Review, PCB Design with KiCAD, Keysight's Advanced Design System, Manufacturing and Testing. The proposed research methods and tools align well with the research questions and objectives, offering a robust approach to investigate your research questions.

Milestones:

The timeline list out your tasks clearly and can be realized for completing the research.

Significance and Contribution:

This research proposal is significant because it addresses a pressing real-world problem in the context of electric vehicles and renewable energy systems while offering the potential to advance knowledge and practical applications in the field of battery management. Although it is just a student project now, if the members go deeper into the research, the findings could lead to more efficient and sustainable battery management solutions, benefiting both the industry and the environment.

References and Citations:

The references are all reachable and are relevant with the research topic. The formatting and layouts are standardized as well.

Writing and Presentation:

The whole proposal is in good writing quality with rigorous and precise phrasing and accurate grammar.

Ethical Considerations:

The ethical considerations are addressed adequately but you may also pay attention with the safety of all the documents and citations and also make sure to use the real and accurate data.

The members' contribution are reasonably arranged.

Additional Comments:

There is one suggestion that you can use serial numbers or bulleted lists to make your layout better organized. For example, in Ethics and equal opportunities part, you can list the ethics and member's contribution separately, but I supposed maybe you are limited by the requirement of number of pages.