03.10.2022

Master's thesis: Design of EMC Evaluation System for Battery Monitoring ICs

This work is aiming for the development and implementation of an electromagnetic compatibility (EMC) evaluation system for battery monitoring integrated circuits (ICs).

Battery packs, consisting of up to hundreds of individual battery cells, are used to power electric vehicles. Each battery cell has to be monitored continuously by a battery management system in order to ensure safe and efficient vehicle operation. During vehicle operation the load current of the battery pack generates noise on each battery cell. This noise might influence the performance of the battery monitoring ICs.

In order to be able to evaluate the EMC of a battery monitoring IC, a hardware demonstrator should be designed and implemented. The demonstrator should inject a real-world noise profile into a standard battery cell. Different noise profiles were already measured during electric vehicle operation. Results will help in the design of future battery monitoring IC.

During your thesis, we expect you to acquire knowledge and perform dedicated tasks:

- Learn about **batteries** and battery monitoring methods
- Improve your skills in **mixed-signal power electronics** hardware design, layout, and circuit simulation
- Design, build, and evaluate a working **hardware prototype**
- Evaluate performance of battery monitoring ICs under noise conditions
- Document your results by writing and submitting your Master's thesis

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