

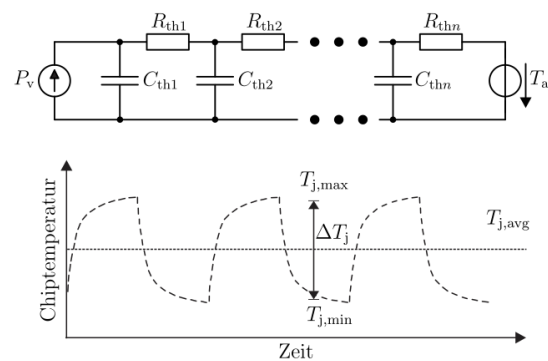
# Thermal Modeling in a Power Hardware in the Loop System

Bachelor's/Master's Thesis

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**Abstract**—The temperature of semiconductors is essential for the analysis of power electronic reliability. Therefore, thermal simulations are of great importance for the prediction of lifetimes and the evaluation of lifetime prolonging control methods. A Power Hardware In the Loop (PHIL) system is able to simulate hardware in real time and can be connected to real hardware. But a thermal simulation is still missing in the PHIL system.



**Background**—In PLECs thermal simulations are embedded into the software. Thermal characteristics of semiconductors can be easily loaded and the thermal simulation is automatically fed by the data from the electrical simulation. In an OPAL-RT PHIL system these features are still missing. Therefore, this B.Sc. thesis focuses on the creation and evaluation of a thermal simulation in the OPAL-RT PHIL system. This simulation should be compared to a thermal simulation in PLECs.

*Objectives:*

- Create a thermal simulation in an OPAL-RT PHIL system
- Comparison with a thermal simulation in PLECs
- Evaluate the limitations of the thermal simulations

*Type of the Work:*

- Simulations
- Laboratory

*Language of the Thesis:*

- German or English

*Connected Project:*

Title of the project

