



Wir bringen Forschung  
auf Top-Niveau voran –  
und uns selbst.

Veränderung startet mit uns.

## Thesis or internship “Automation of a power cycling test bench for lifetime analyses of wide-bandgap power modules”

The use of wide-bandgap power semiconductors made of silicon carbide (SiC) and gallium nitride (GaN) promises many advantages over semiconductors made of silicon, including reduced switching losses, higher switching frequency and improved power density. Power modules with GaN or SiC power semiconductors require new module concepts with adapted assembly and interconnection technology to exploit the full potential of the semiconductors. These new types of power modules must meet the high reliability requirements for electromobility, aviation and industry. To investigate the aging of power modules, accelerated life tests with high temperature swings are carried out using a pulsed DC current. Such a power cycling test bench for lifetime analyses of wide-bandgap power modules is to be automated using Python. For this purpose, associated sources, measuring instruments and microcontrollers must be integrated. After the test conditions have been successfully implemented, the first test runs are to be carried out and evaluated.



Quelle: Mentor

For our group “Power Converter Units” we are looking for a student assistant with the opportunity to write a thesis.

### What you do with us

- You conduct literature research and look at the normative requirements.
- Your tasks include automating a power cycling test bench for lifetime analyses of wide-bandgap power modules using Python.
- You integrate associated sources, measuring instruments and microcontrollers into the automated test.
- You define the test conditions and implement them in the automated measurement.
- You investigate the aging and thermo-mechanical fatigue of a new type of power module through test runs on the automated test bench.
- You create a final documentation.

### What you bring with you

- You are studying electrical engineering, power electronics or a comparable subject.
- You have already gained practical experience in the areas of automation and measurement technology.
- You are a team player and have a committed and independent way of working.
- You have very good knowledge of German or English.

**Focus:** Automation, software, power electronics  
**Start:** As soon as possible  
**Duration:** 6 months  
**Supervisor:** Dennis Wöhrle, M.Sc.  
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