

Bachelor's/Master's Thesis

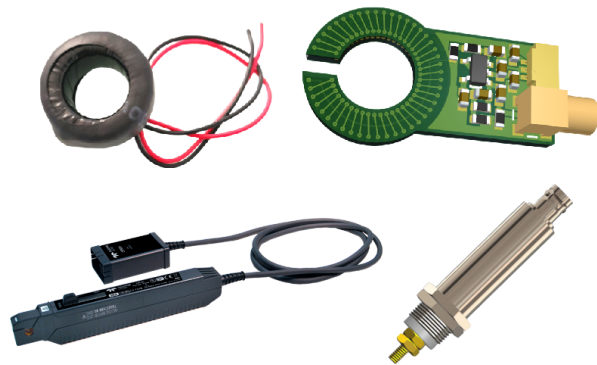
High-bandwidth current measurement in wide bandgap power semiconductors

The high switching speeds of wide bandgap (WBG) power semiconductor switches based on gallium nitride (GaN) and silicon carbide (SiC) make the characterization of these devices a complex task. In particular, current measurement remains challenging due to the need for a high bandwidth, potential free sensing technique with low insertion inductance (small sensing device dimensions).

The aim of this work is to review the different techniques available (coaxial current sensing resistor, compensating current transducer, Rogowsky coil, etc.) through a literature study. The most promising approaches will then be compared in practice.

For this purpose, a wide band gap semiconductor test cell (half-bridge circuit) is to be built. This test cell can then be used to benchmark and possibly improve the selected sensing methods.

Working language: English or German



Research Questions

- What are the different current sensing techniques available and their advantages and limitations?
- Which of those methods is suitable for current measurement in wide bandgap power semiconductor devices?

Tasks

- Literature and internet research on different current sensing techniques.
- Theoretical comparison of their advantages, and limitations for their use in power semiconductor circuits.
- Design and development of a test circuit to compare the different methods experimentally.
- Experimental verification and possible improvement of the best suitable sensing approaches.

Contact

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