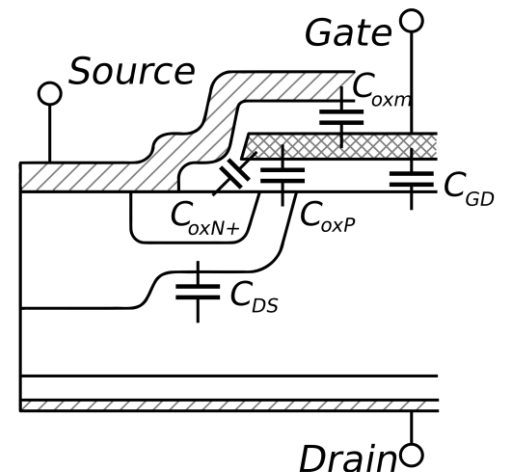


# Master Thesis

## Measurement of SiC-Power MOSFET Characteristics



### Motivation

The increasing demand on efficiency in switched mode power supplies has led to new technologies on the power MOSFET market. New materials like Silicon-Carbide (SiC) and Gallium-Nitride (GaN) can provide incredibly small on-resistances while the unipolar nature of modern power MOSFETs has led to very fast switching times. The latest devices on the market can sustain up to 1200 V and turn off drain currents of 150 A in a few hundred nanoseconds. Needless to say, measuring the output characteristics of such a device can be a quite challenging task.

### Research Questions

- How can the output characteristics of SiC- or GaN-MOSFET at high drain-source-voltages and drain-currents be measured?
- Where are the limits to these measurements?
- How can this information be used to build simple Spice-models for these kinds of power devices?

### Approach/ Methodology:

- Literature research on measurement methods
- Development of a measurement system for SiC and GaN devices
- Development of a simple behavioral model for a SiC MOSFET in LTspice

### Organisational Matter

- Start: as soon as possible
- Workplace: EAM & IFE at TU Graz
- Outcome: written master thesis

### Supervisors

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