Universität Stuttgart

Institut für Robuste Leistungshalbleitersysteme

MA/BA/FA

Sensor-less measurement of the junction temperature of GaN/SiC devices

Motivation:

- Power devices are considered as most fragile component in overall system and nearly 60% of the failures are thermally induced. In particular, information of junction temperature can prove significantly useful especially in important applications like electric vehicles, wind turbines, etc.
- Current state-of-the-art uses external sensors to measure the device temperature which has following drawbacks:
  - Less dynamic
  - Bulky circuit and difficult assembly
  - Low accuracy

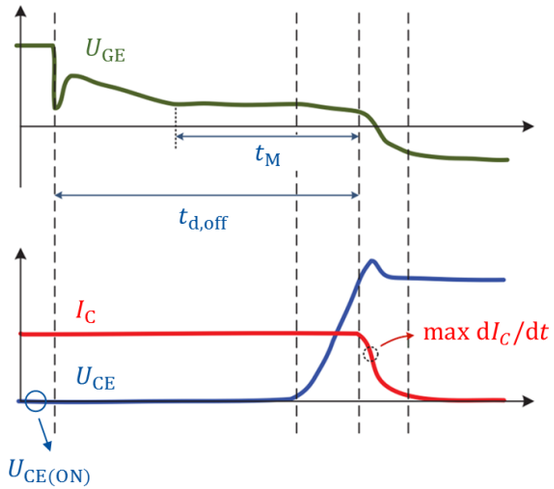
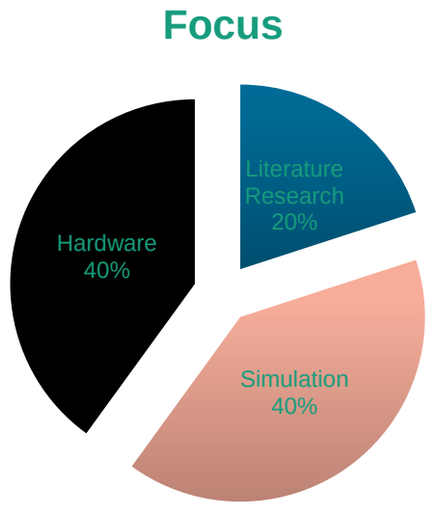


Fig: Temperature Sensitive Electrical Parameters (TSEP)

Goal:

- Use of the existing electrical parameters (threshold voltage, internal gate resistance, etc.) to measure junction temperature
- Development of state-of-the-art prototype to measure junction temperature of the transistor without using external temperature sensor like PT100
- Criteria-based determination of junction temperature-dependent electrical parameters



Contact: Kanuj Sharma, M.Sc.
Pfaffenwaldring 47, Room 1.305
Email: kanuj.sharma@ilh.uni-stuttgart.de
Tel: +49 (0)711 / 685 60833