

Forschungs- Bachelorarbeit/ (B.Sc. or Study Thesis): Short Circuit Protection of Wide-Bandgap Devices

Wide-Bandgap materials Gallium-Nitride (GaN, SiC) offers several unique electrical and thermal features, which lead to reduced switching times and on-state resistance leading to benefits at system level in the form of higher efficiency and power density.

Current research in the field of GaN power devices has its main focus on improving their efficiency, however, aspects of reliability and robustness aren't fully understood yet. For this reason, very fast short circuit detection for GaN transistors is necessary to enable its wide usage even in high-reliability applications.

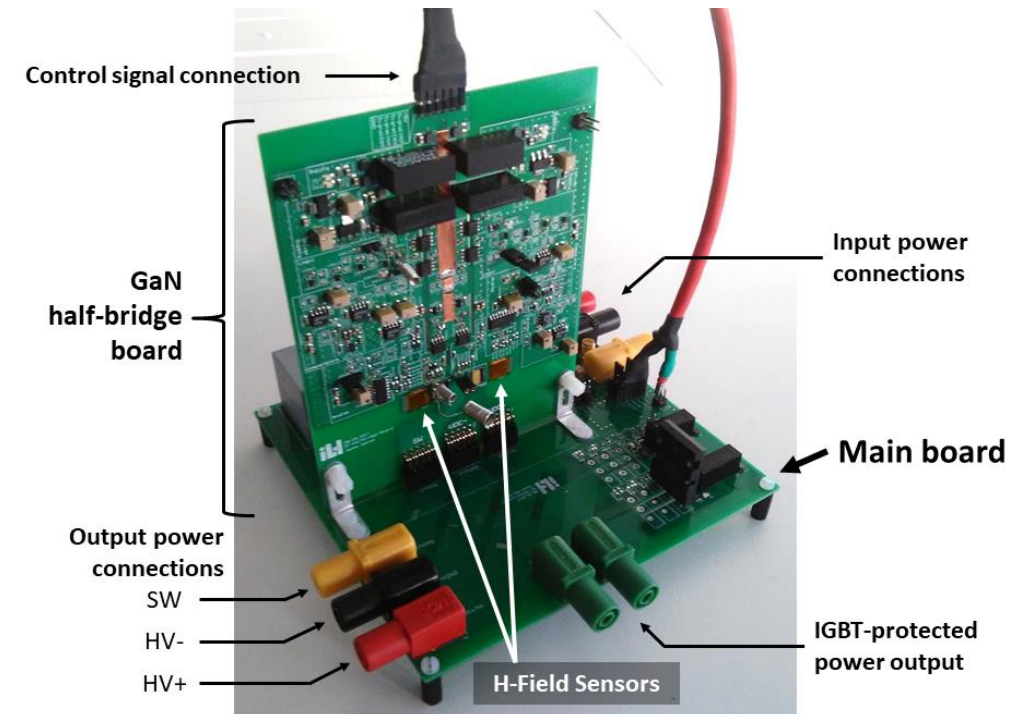
The goal of this Thesis is to implement and test a short-circuit protection method.

Main Topics:

- Development of schematic and layout
- Implementation of test rig
- Experimental verification of the short circuit protection

Prerequisites:

- Good knowledge of power semiconductors.
- Experience with following software:
 - Schematic capture and layout (z.B. KiCAD / Eagle / Altium)
 - Circuit simulation (z.B. PSpice / LT Spice)
 - Data processing with Matlab
- Practical experience building circuits
- Practical experience with high voltage desirable



Short circuit protection circuit designed by J. Walter (Masterarbeit (2017))

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