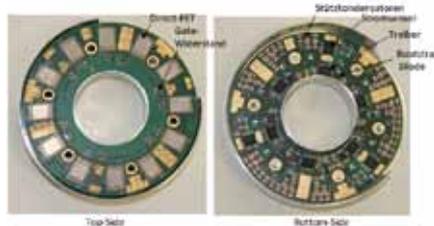


UNIVERSITY OF KASSEL

The Centre of Competence for Distributed Electric Power Technology (KDEE) was founded to offer a concentration point for the development of innovative technical designs within the university, enabling the transference of solutions at both device and system level to the industry. In terms of topics and personnel it operates in close connection with the chair of Electric Power Supply Systems (EVS). Power electronics-based converters are the most flexible and dynamic equipments for energy management in the current and future electrical grid. Their construction and control requires specialized knowledge, which will be concentrated and pursued on the long term. Hence, the KDEE will act as a partner for industrial and public-funded projects not only on the fundamental research level but also on industrial-oriented applications.

Teaching and research activities at the department EVS are focused not only on facilities and systems for electrical power supply but also on the development of power electronic components and devices for such systems. These include the development of methods to use renewable energy sources (e. g. solar energy, small-hydro power, biogas and wind) as well as power electronic converters for automotive applications. A close cooperation exists with the former "Institute for

Solar Energy Technology" (ISET e. V.), today: Fraunhofer IWES (Institute for Wind Energy and Energy System Technology), which was founded 1988 by the former head of the EVS department Prof. Werner Kleinkauf as well as with SMA Solar Technology which has been a spin-off company of EVS/University of Kassel. With currently about 30 employees, EVS and KDEE form a powerful research group focused on the topic of energy supply systems at the University of Kassel, diverse research possibilities and wide-ranging study contents.



Multiphase inverter for direct integration in motor housing operating at 140°C ambient temperature



Inverter board for direct integration on Pedelec

Main research areas:

Power electronic converters allow conditioning of energy with high flexibility and efficiency. This enables the integration of different energy sources and storages in a common energy system.

The main research areas of KDEE are:

- Power electronic converters for distributed and renewable energy applications, especially solar, wind power
- Automatized characterization of highly efficient power electronic semiconductors (Si, SiC, GaN) and also of magnetic materials (with precision calorimeter and high power amplifiers)
- Design of innovative magnetic components for highly efficient and compact power electronics
- Power electronic solutions (e.g. FACTS) for the grid integration of renewable energy sources
- Power electronics in automotive applications (e-car, hybrid car, auxiliary drives)



Highly efficient and compact three-phase fast battery charger (5kW/L with low-cost standard semiconductor devices within ECPE Project)