HHK: High-frequency, high-current components

Project

High-frequency, high-current components for use in medical technology and photovoltaic inverters in the MW class (HHK)
Funding: ES1LES2-58; Project time frame: 2014-2017
Embedded power electronics for a 3-phase PV inverter with 125 kW

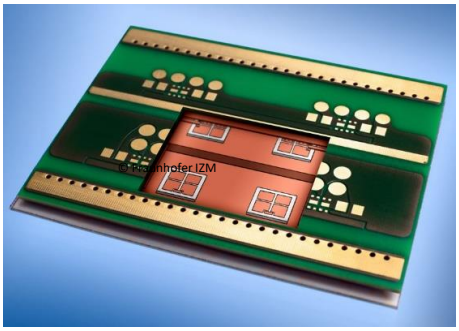
Integrated SiC power package

- 4x 25mm2 SiC MOSFETs/switch
- Booster stage on top of the package
- Low inductance primary DC link inductance <2nH

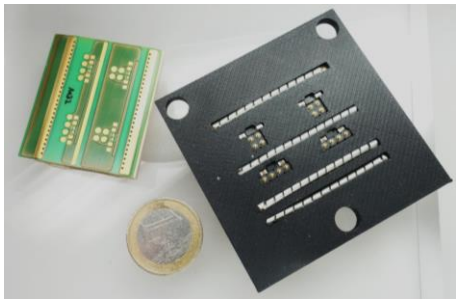
Performed tasks

- Project management
- Concept proposal based on project partner requirements
- Static thermal design (Solidworks)
- Electro-magnetic design of the module, switching cell and gate driver (LTSpice, FastHenry, Altium Designer)
- Study on different booster solutions and their integration with isolated driver (bipolar vs. MOSFET)
- Design for panel level manufacturing and design alignment with manufacturing teams
- Electrical quality control during manufacturing
- Demonstrator integration design
- Final tests

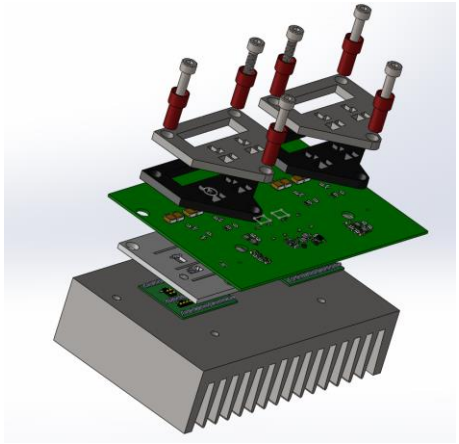
Visualization of the PCB embedded SiC MOSFETs



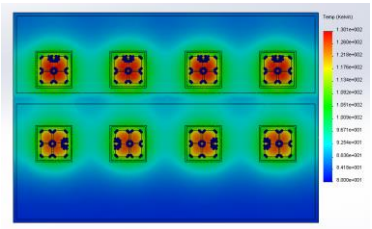
Smart frame integration



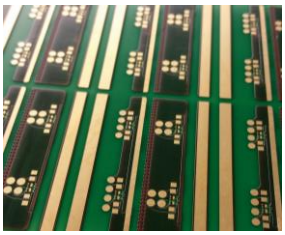
System Integration design



Thermal design



Panel level manufacturing



Splitted DC link design: L_{σ_DClink}<2nH



all images: © Fraunhofer IZM