



## Hybrid Silicon-SiC Inverter – Combining the Best of Both Worlds

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### Abstract:

SiC MOSFET get more and more attractive also for medium and high power inverters. There well known advantages are low switching losses and low on-state voltage at low current. But silicon IGBT still offer a better cost to chip area ratio. The combination of Si-IGBT and SiC-MOSFET will lead to a better performance than pure silicon inverters with less SiC chip area than full-SiC solutions. This might lead to a superior performance cost ratio, especially for high power inverters with large chip area. In this paper, different two level and three level hybrid topologies are investigated. The switching behavior of these Si-SiC-hybrids is experimental investigated, the maximum output power and the efficiency is compared with full Si and full SiC inverters.

### Curriculum Vitae:



Hans-Günter Eckel received the Dipl.-Ing. degree from the TU Braunschweig, Germany in 1989 and the Ph.D. degree from the University Erlangen-Nürnberg in 1997. He had over ten years of experience in the development of traction converters with Siemens, Nuremberg, when he joined the University of Rostock in 2008, where he is a Professor for Power Electronics and Electrical Drives.

His research activities include characterization of and gate drive for high power, high voltage semiconductors, control of multi-level inverters and the analysis of power electronic coupled loads and sources in the grid.

He has published over 200 technical papers in these areas. He is an IEEE senior member, member of the EPE ISC and the PCIM advisory board.

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