

Bodo's Power Systems®

Electronics in Motion and Conversion

May 2018

A high-speed train is shown from a high-angle perspective, traveling along a set of tracks. The train is white with a red front. In the foreground, a large, dark blue ABB IGBT module is mounted on a metal structure. The background shows a cityscape with buildings and cranes under a clear sky.

ABB 3300V TSPT+ IGBT module
Highest current density and robustness

10th Anniversary of the International Conference on Integrated Power Electronics Systems – CIPS 2018

Between 20 and 22 March Stuttgart welcomed the 10th International Conference on Integrated Power Electronics Systems (CIPS), organised by VDE and ECPE in the frame of the ECPE Annual Event 2018. Since the first CIPS in 1999, this biennial conference has been focused on the integration of hybrid and mechatronic systems with high power density and systems' or components' operational behaviour and reliability, respectively.

*By Prof. Andreas Lindemann (Univ. of Magdeburg),
Prof. Nando Kaminski (Univ. of Bremen), CIPS Technical Chairs*

The number of high quality submissions and 350+ participants, both the highest number ever in this conference series, has emphasised the major interest of the international power electronics community in these topics. Again, CIPS had a good mixture of participants from industry, research institutes and academia and provided an excellent forum for scientific exchange and networking. The peer-reviewed contributions are available in the proceedings and will be accessible via digital libraries.

One trend became apparent at CIPS 2018: New power semiconductor devices based on the wide band-gap materials silicon carbide (SiC) and gallium nitride (GaN) fertilise the development of system integration as well as non-standard applications. Those fast switching devices require packaging solutions and circuit components which contribute only small parasitic elements, e.g. stray inductances, and avoid issues due to electromagnetic interference (EMI). Furthermore, they impose the necessity to implement additional measures, processes and tests to ensure a suitable reliability. This is a precondition for their use in conventional but also new applications of power electronic systems, which require e.g. high power density, reliable operation under harsh conditions such as high temperature, and of course lowest cost. Figure 1 shows an example of the impressive research results presented at CIPS 2018: The power supply by ETH Zürich offers a remarkably high power density of 14.8 kW/l. The excellent mixture of CIPS contributions from industry as well as from universities and research institutes proves that the hot topic of integrated power electronic systems is dealt with in science, industrial research and product development. While the technology is mature enough for industrial use, substantial further research is required to cope with future challenges.

During the conference dinner speech, Prof. Eckhard Wolfgang, who is together with Prof. Dieter Silber Honorary Chairman of CIPS, reflected the history of CIPS at the occasion of its decadal jubilee. During the closing ceremony Christina DiMarino of the Center of Power Electronics Systems (CPES) received the CIPS Young Engineer Award sponsored by ECPE for her paper "Fabrication and Characterization of a High-Power-Density, Planar 10 kV SiC MOSFET Power Module".

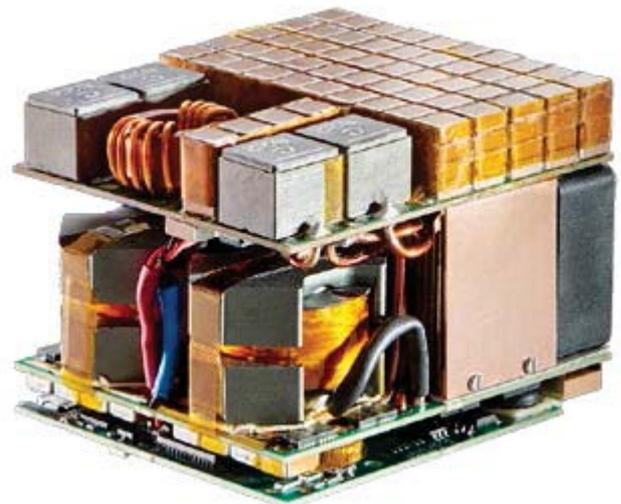


Figure 1: Little Box 2 by PES at ETH Zürich (figure courtesy of ETH Zürich)

Bianca Böttge of Fraunhofer Institute for Microstructure of Materials and Systems (IMWS) received the best poster award sponsored by the VDE for presenting her work "Novel specimen design to test engineering plastics for power electronic applications". Afterwards, the General Chairmen Prof. Leo Lorenz and Thomas Harder from ECPE together with the Technical Chairmen Prof. Andreas Lindemann, Otto-von-Guericke-Universität Magdeburg, and Prof. Nando Kaminski, Universität Bremen, expressed their sincere thanks to the topic chairs, the reviewers, the authors, the organisers and all others who had contributed to the success of CIPS 2018. Finally, the next CIPS conference was announced: It will take place in spring 2020.

www.ecpe.org