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## The PCIM Conference Awards 2025: Award winners provide fresh ideas for the future

**Stuttgart, 6 May 2025. This year’s winners of the PCIM Conference Awards were announced during the opening ceremony of the PCIM Conference. This year, the PCIM Conference Awards for Best Paper, Young Engineer, and Young Researcher were given to five authors from academia and industry. With their innovative ideas, this year’s winners are setting new standards in the industry and driving forward next-generation technology.**

The awards recognize both young talents and established experts who are driving technological advances and new approaches in the industry. This year, the international advisory board of the PCIM Conference, chaired by Prof. Leo Lorenz (ECPE), selected the award-winning papers from more than 450 submissions.

### Outstanding research papers and innovations

Besides reflecting the current challenges and trends in power electronics, this year’s awards also provide impetus for future developments in energy technology, power semiconductor technology, and smart systems integration. The quality and relevance of the submissions were particularly high, underscoring the forward-looking nature of the industry. The award-winning papers not only contribute to the further development of the technology, but also boost the award winners’ reputations in the international power electronics industry.

### Best Paper Award – rigorous scientific quality in power electronics

The Best Paper Award was won by three outstanding papers that offered innovative solutions and in-depth scientific findings. The award-winning papers deal with key technologies and pioneering approaches that advance the efficiency, sustainability, and performance of power electronics systems. This year’s winners, who are all at the forefront of their discipline, propose practical solutions to the challenges facing the industry.

The winning papers were as follows:

* **Hironori Akiyama, MIRISE Technologies, Japan**

Low-Loss Active Gate Driver with Surge Voltage Detection for SiC MOSFET

* **Michael Basler, Fraunhofer IAF, Germany**

Highly-Integrated 1200 V GaN-Based Monolithic Bidirectional Switch

* **Bastian Korthauer, ETH Zurich, Switzerland**

Improved Insulation Design of Medium-Frequency Transformers Using a Semiconductive Coil Former

### Young Engineer Award – young talent providing fresh impetus

The Young Engineer Award was presented to a young engineer whose paper demonstrated technical sophistication and a fresh approach. The award-winning project is an example of how digital technologies and system innovations can open up new opportunities for power electronics.

This year’s winner was **Martin Schiestl from Infineon Technologies, Austria,** for his paper “Compact Highly Integrated 1kW Peak Motor Drive”

### Young Researcher Award – research contributing to the future of power electronics

This time, the Young Researcher Award was presented to an outstanding young scientist (under the age of 30) whose research has made a significant contribution toward the further development of power electronics. The award encourages academic debate on forward-looking topics and continued research in power electronics, and lays the foundation for the technological innovations of the future.

The winner of this award was **Lena Köhler, Fraunhofer IISB, Germany,** with her paper on “Machine Learning and Digital Twins for RUL Prediction of DC Semiconductors Circuit Breakers”

Presenting the awards at the award ceremony and opening of the PCIM Conference 2025 were Prof. Leo Lorenz and this year’s conference sponsors Littelfuse, Mitsubishi Electric, Semikron Danfoss, and Wolfspeed. Each winner also receives a €1,000 prize.

**Abstracts of the best papers from the PCIM Conference 2025**

**Hironori Akiyama, MIRISE Technologies, Japan**

Low-Loss Active Gate Driver with Surge Voltage Detection for SiC MOSFET

We propose a new Active Gate Control method to improve the trade-off between switching loss and surge voltage. This method can control the surge voltage to a constant level by detecting the surge voltage and adjusting the gate current. Therefore, switching loss can be reduced with increasing the switching speed until the surge voltage approaches the limit. Experimental results demonstrate that surge voltage can be controlled, leading to a reduction in switching loss by 36 % to 52 %.

**Michael Basler, Fraunhofer IAF, Germany**

Highly Integrated 1200 V GaN-Based Monolithic Bidirectional Switch

This work presents a highly-integrated GaN-based monolithic bidirectional switch (MBDS) with blocking voltage beyond 1200 V. In addition to the MBDS, the GaN power IC also includes two intrinsic free-wheeling diodes for an improved single-gate self-control characteristic, two integrated gate drivers, current sense-FET, temperature sensor, and substrate network in case the design is realized in a GaN-on-Si technology.

**Bastian Korthauer, ETH Zurich, Switzerland**

Improved Insulation Design of Medium-Frequency Transformers Using a Semiconductive Coil Former

This paper proposes the use of semiconductive materials in the manufacturing of coil formers for medium-frequency transformers. By employing these materials, the common-mode component of the electric field – introduced by the series connection of converter modules on the medium voltage side – can be effectively shielded, enabling a significantly simplified insulation design. The proposed concept is validated through FEM simulation and breakdown experiments.

**Abstract of the Young Engineer Award paper from the PCIM Conference 2025**

**Martin Schiestl, Infineon Technologies, Austria**

Compact Highly Integrated 1kW Peak Motor Drive

A highly integrated high power density design of a motor drive utilizing an integrated GaN power stage as well as a novel current sensing IC is presented. In combination with the newest microcontroller generation a power density of 3.3kW/in3 at 100kHz switching frequency is reached. Insights in the design is given as well as measurement results are presented. The design enables further innovation due to higher integration in applications regarding E-bikes, scoooters, robotics and power tools.

**Abstract of the Young Researcher Award paper from the PCIM Conference 2025**

**Lena Köhler, Fraunhofer IISB, Germany**

Machine Learning and Digital Twins for RUL Prediction of DC Semiconductors Circuit Breakers

Within this paper a new solution approach employing a digital twin enabling digital services for failure indicator-based RUL estimation of DC Semiconductor Circuit Breakers using machine learning is presented and initial results are discussed. In addition, the concept for a novel setup for testing the new services with real world mission profiles is presented.

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| Mesago Messe Frankfurt GmbH / Arturo Rivas Gonzalez |

For more information about the expo and conference and to secure your ticket, visit [pcim.en](https://pcim.mesago.com/events/en.html).

PCIM Expo & Conference

International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy, and Energy Management.

The PCIM Expo & Conference runs from 6 – 8 May 2025.

#### Press information and photo material:

[[[Presse - PCIM](https://pcim.mesago.com/nuernberg/en/press.html)](https://pcim.mesago.com/nuernberg/en/press.html)](https://pcim.mesago.com/events/de.html)

#### Website links:

[PCIM – Hub for Power Electronics](https://pcim.mesago.com/nuernberg/de.html)

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#### Background information on Mesago Messe Frankfurt GmbH

Mesago, founded in 1982 and located in Stuttgart, specializes in exhibitions and conferences on various topics of technology. The company belongs to the Messe Frankfurt Group. Mesago operates internationally and is not tied to a specific venue. With around 160 members of staff Mesago organizes events for the benefit of more than 3,300 exhibitors and over 110,000 trade visitors, conference delegates and speakers from all over the world. Numerous trade associations, publishing houses, scientific institutes and universities work with Mesago closely as advisers, co-organizers and partners. ([mesago.com](https://corporate.mesago.com/events/en.html))

#### Background information on Messe Frankfurt

[www.messefrankfurt.com/background-information](https://www.messefrankfurt.com/frankfurt/en/press/boilerplate.html)

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