



October 16, 2020 | Issue 6

IEEE Power Electronics Magazine

The September 2020 issue of *IEEE Power Electronics Magazine* presents **two** new developments in silicon carbide (SiC) power MOSFETs.

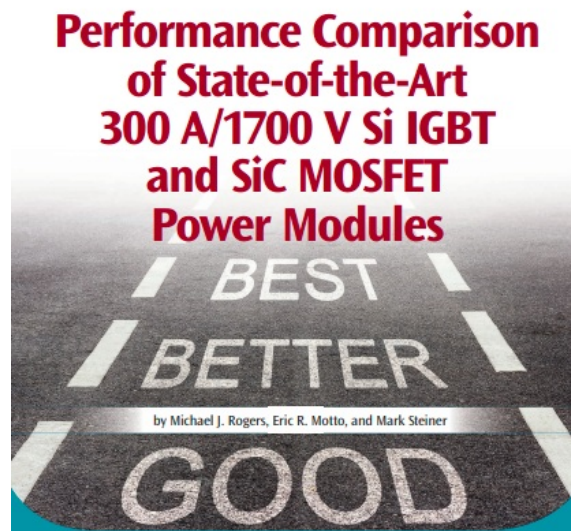
[Streamlined SiC Development With a Total System Solution: Marching Toward A New Paradigm](#) by Kevin Speer, Nitesh Satheesh, Avinash Kashyap, and Serge Bontemps

To help power electronics designers adopt SiC technology, Microchip authors present a total system solution, combining a top-performing SiC MOSFET with an ultra-low inductance package and a sophisticated SiC gate driver.

[Performance Comparison of State-of-the-Art 300 A/1700 V Si IGBT and SiC MOSFET Power Modules](#) by Michael J. Rogers, Eric R. Motto, and Mark Steiner

Unveils a new commercially available SiC MOSFET module that surpasses the performance of latest silicon technology.

Read the issue from cover to cover today: [https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=6570649!](https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=6570649)



Recently, Mitsubishi Electric began the rollout of second generation silicon carbide (SiC) technology in 1200 V and 1700 V class power modules. These new modules, shown in Figure 1, provide greater efficiency and higher power density than previous SiC generations as well as the latest silicon (Si) technology, which enables new capabilities in energy, transportation, and medical applications.

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9889 of 9889 articles | 16 September 2020

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Figure 2 illustrates the dramatic reduction in losses and improvements in efficiency achieved by adopting advanced processing technologies and optimized device structures to power semiconductor devices. This figure also shows the diminishing returns as the fundamental physical properties of Si began to limit the magnitude of improvement that was achievable. For example in the first ten years of IGBT development from the first generation to the fifth Generation, typical inverter losses were cut in half. In the latest ten years from 2010 until today, IGBT losses were only reduced by about 20%. This is one of the main motivations

IEEE Transactions on Power Electronics (TPEL)

The November 2020 issue presents **95** papers with the latest research in power electronics!
<https://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=9151915&punumber=63>

November Highlighted Papers:

[Design of a GaN-Based Interleaved Nine-Level Flying Capacitor Multilevel Inverter for Electric Aircraft Applications](#)

Tomas Modeer, Nathan Pallo, Thomas Foulkes, Christopher B. Barth, and Robert C. N. Pilawa-Podgurski

[Impact on ZVS Operation by Splitting Inductance to Both Sides of Transformer for 1-MHz GaN Based DAB Converter](#)

Yudi Xiao, Zhe Zhang, Michael A. E. Andersen, and Kai Sun

November Papers with Active/Multimedia Content

[High-Frequency Voltage and Current Sense Circuits for Inductive Power Transfer Systems](#) by Guodong Zhu and Dawei Gao includes head-turning video demonstrations of their circuits.

[Evolutionary Design Automation of High Efficiency Series Resonant Converter for Photovoltaic Systems](#) by Mohammed Sami Mohammed and Revna Acar Vural provides **two** forms of media: optimization data of SRC automation design according to each selected optimization technique as well as simulation code files.

IEEE Transactions on Power Electronics Letters

For the November 2020 issue, *TPEL Letters* features 9 short articles covering new ideas and interesting developments in the areas of power converter PWM and control, semiconductor devices, fault tolerant operation and reliability. All TPEL Letters undergo rigorous expert reviews and have the same impact factor as regular papers, while featuring rapid review and publication time.

Please enjoy reading those short articles here:

<https://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=9151915&punumber=63>

IEEE Open Journal of Power Electronics (OJ-PEL)

As the IEEE Open Journal of Power Electronics (OJ-PEL) nears the end of its inaugural year--a year hallmarked by massive success--it already has nearly **40** articles published in IEEE Xplore: [read the entire catalog of articles from IEEE OJPEL today!](#)

Have you seen our **tutorial paper** published in September?

[A Tutorial and Review Discussion of Modulation, Control and Tuning of High-Performance DC-DC Converters Based on Small-Signal and Large-Signal Approaches](#)

Santanu Kapat and Philip T. Krein

In coming months, OJ-PEL will feature collections of our articles as social media posts to help our readers track the latest trends in the research or dive in-depth to a certain research topic. The first collection will include articles in the broad area of design methods in power electronics. Be sure to check out and follow IEEE PELS' social media pages to find out which articles will be included in this first collection and be alerted when more collections are posted!

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Last but not least, don't forget the IEEE PELS hashtag! [#ieeepelspubs](#)

IEEE Journal of Emerging and Selected Topics in Power Electronics

Congratulations to the 2019 Prize Paper Award Winners!

First Place Prize Paper Award Winner

[99% Efficient 10kV SiC-Based 7 kV/400 V DC Transformer for Future Data Centers](#)

Daniel Rothmund, Thomas Guillod, Dominik Bortis, *June 2019*

Second Place Prize Paper Award Winners

[A High Frequency Inverter for Variable Load Operation](#)

Weston D. Braun and David J. Perreault, *June 2019*

[Highly Efficient, Full ZVS, Hybrid, Multilevel DC/DC Topology for Two-Stage Grid-Connected 1500-V, PV System With Employed 900-V SiC Devices](#)

[Transient Behaviors of Multiscale Megawatt Power Electronics Systems--Part I: Characteristics and Analysis](#)

Zhengming Zhao, Don Tan, and Kai Lai, *January 2019*

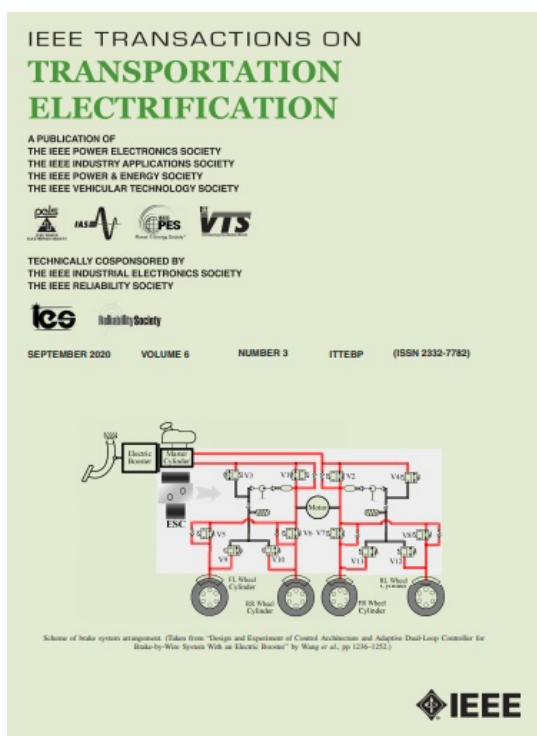
Special Issue Announcement

Three billion people around the world live in severe energy poverty, including 1.1 billion who live completely off-grid. Power electronics is one of the key technologies to address real life issues in energy access and utilization, water supply, rural transportation, etc. for the developing economies. JESTPE is excited to announce its invitation for authors to submit their original work to

Call for Papers: [Special Issue on Emerging Applications of Power Electronics in Developing Countries](#)

- Submission deadline March, March 31, 2021
- Scheduled Publication September 2021

IEEE Transactions on Transportation Electrification (TTE)



TTE is focused on components, sub-systems, systems, standards, and grid interface technologies related to power and energy conversion, propulsion, and actuation for all types of electrified vehicles including on-road, off-road, off-highway, and rail vehicles, airplanes, and ships.

TTE has **one of the fastest times to first decision**, with an **impact factor of 5.44** for 2019 and a **5-year impact factor of 6.276**. Prospective authors are invited to submit original contributions or survey papers, including papers published in a Conference Record or Conference Proceedings of a conference sponsored by any of the sponsoring IEEE societies of TTE (PELS, IAS, PES, VTS, IES, and RS). Have a look at our latest current issue:

[September 2020 IEEE TTE issue](#)

The journal currently has an open call for papers on **“Special Issue on Novel Hybrid and Electric**

Powertrain Architectures” with a *submission deadline of February 2021*. More information is available at <https://www.ieee-pels.org/publications/ieee-transactions-on-transportation-electrification> about this and other upcoming special issues.

Volunteers Needed: Digital Education Initiatives

IEEE Power Electronics Society (PELS) has several major initiatives to expand our web-based education material and provide more PELS membership benefits. A few of the larger, new activities include:

1. Creating a library of short video tutorials on various topics of PELS interest
2. Developing web-based power electronics courses and modules of longer length
3. Cataloging and describing existing web based power electronic education material

It should be enjoyable and have high impact to our PELS. If interested, please fill out the

survey/sign-up sheet: [1-minute survey](#).

Did you miss our past Newsletters?

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<https://www.ieee-pels.org/publications/products>

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