

## IEEE Power Electronics Magazine



In the last 10 years or so, wide bandgap (WBG) semiconductors have made significant progress that has resulted in rapid miniaturization with improved efficiency of power converters. Concurrently, the improvements in passive components, especially magnetics, such as inductors and transformers, have not kept pace with these advancements. While advances in WBG devices have certainly improved circuit efficiency and power density, the bottleneck now lies with magnetic components, with magnetics accounting for more than 30% of the cost and more than 30% of the loss in almost all power converters. Consequently, magnetics design has become a critical issue for power electronics as trends towards high efficiency and high-power-density continue. In the September 2023 issue of *IEEE Power Electronics Magazine*, the article “**Unveiling the Microworld Inside Magnetic Materials via Circuit Models**” by

Han (Helen) Cui, Saurav Dulal, Sadia Binte Sohid, Gong Gu, and Leon M. Tolbert, overcomes the limits set by bulky and lossy magnetic components by proposing 1) radically new magnetic design techniques and 2) novel magnetic materials with improved properties. The new magnetic material modeling is capable of predicting component behavior.

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## IEEE Transactions on Power Electronics (TPEL)

① The **November 2023 issue** of TPEL is now available online. It features three Special Sections, complete with editorials.

- Special Section on Advanced WPT Systems With High Efficiency and Misalignment Tolerance Characteristics
- Special Section on Multilevel Converters as an Enabler for Grid Modernization
- Special Section on Switched Capacitor Converters (SCCs)

Here are two highlighted papers from the Special Sections.

1. “**Characterization and Mitigation of Dimensional Effects on Core Loss in High-Power High-Frequency Converters**,” by Ahmed Nabih, Feng Jin, Rimon Gadelrab, Fred. C. Lee, and Qiang Li. This paper demystifies the geometry impact and wave propagation in magnetic core loss.
2. “**Control Design of Grid Synchronization Systems for Grid-Tied Power Converters Using Symmetrical Optimum Method: A Comprehensive Reference**,” by Saeed Golestan, Josep M. Guerrero, Juan C. Vasquez, Abdullah M. Abusorrah, Vinod Khadkikar, and Jose Rodriguez. This paper presents rich design insights on grid-tied power converters and control.

② As of September 1, 2023, all TPEL submissions must have a primary email address that is institutional. This measure is to protect our authors. Examples of institutional emails

include those from an academic institution, a government agency, a company, or IEEE. Papers that do not meet this requirement will not be entered into the review process. We thank you for your assistance with this submission update.

## IEEE Power Electronics Letters

❶ The editorial team of TPEL Letters announces a Call for Letters: Special Section on Power Electronics Technologies for Transforming Electrical Grids. Manuscripts can be submitted through [ScholarOne](#). January 31, 2024 is the Manuscript Submissions Deadline. To access the Call PDF, click [here](#).

❷ In the **October 2023 issue** of TPEL, we are delighted to present 20 Letters on recent advancements in the field of power electronics. Several emerging topics are addressed in this issue, such as talkative power electronics, wireless ultrasonic motor drive, machine-learning-based control, and high-voltage press-pack IGBTs and IGCTs. Two intriguing Letters from the issue are highlighted below.

1. “**Abnormal Turn-ON Phenomenon of Large-Size and High-Voltage Reverse Blocking IGCT**,” by Chunpin Ren, Jiapeng Liu, Jinpeng Wu, Jianhong Pan, Biao Zhao, Zhanqing Yu, and Rong Zeng. This work advances the fabrication of 8-kV reverse-blocking integrated gate-commutated thyristor (RB-IGCT) devices. An abnormal turn-on phenomenon within 8-kV RB-IGCT is revealed, analyzed, and mitigated in simulations and experimental tests.

2. “**Efficient Talkative Power Conversion With Quasi-Square-Wave Zero-Voltage Switching Hysteretic Current Control**,” by Stefan Mönch, Carsten Kuring, Xiaomeng Geng, Peter A. Hoehner, Marco Liserre, Rüdiger Quay, and Sibylle Dieckerhoff. This interdisciplinary work proposes a modified analog hysteresis current control method for power converters. The method enables both data transmission through a wide range of modulation amplitudes and efficient quasi-square-wave zero-voltage switching. Experimental tests on a half-bridge GaN converter validate the performance of the method.

## IEEE Open Journal of Power Electronics (OJPEL)

Looking for some interesting papers that feature machines and magnetics? Take a look at the following articles that have been published in OJPEL.

1. “**Open Phase Fault Tolerant Control of Multi Three Phase Machines**” by Jayakrishnan Harikumar, Giampaolo Buticchi, Michael Galea, and Patrick Wheeler.

2. “**Collaborative Mid-Point Voltage Regulation in Low-Switching-Frequency MPC for Three-Level NPC Inverters Fed Dual Three-Phase PMSM Drives**” by Minrui Gu, Zheng Wang, Congjian Wen, and Zhixiang Zou.

3. “**Core Loss Calculation of Symmetric Trapezoidal Magnetic Flux Density Waveform**” by Sobhi Barg and Kent Bertilsson

For more published papers, visit OJPEL [online](#).

## IEEE Transactions on Transportation Electrification (TTE)

The editorial team of *IEEE Transactions on Transportation Electrification (TTE)* is pleased to announce a **Call for Papers: Special Issue on Electrified Ship Technologies**. The full paper submission deadline is January 31, 2024. The expected publication date is September 2024. All manuscripts must be submitted through [Manuscript Central](#).

## IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE)

JESTPE is looking to recruit new editors and associate editors starting service in 2024. If you are interested in this volunteering opportunity, please [email](#) JESTPE Editor-in-Chief, Prof. Tsorng-Juu (Peter) Liang, along with your name, Curriculum Vitae, keywords, and any previous experience serving on an editorial board.



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