December 8, 2022 | Issue 29

IEEE POWER ELECTRONICS SOCIETY
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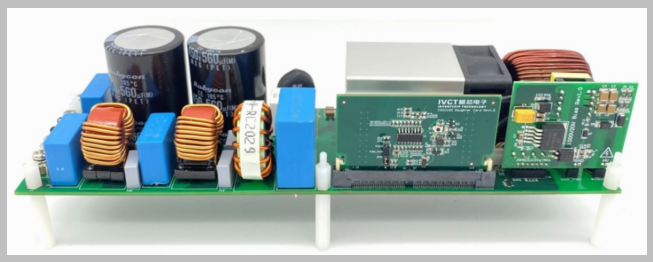
Products Newsletter

IEEE Power Electronics Magazine



Although, totem-Pole PFC topology is widely used in high-density and high-efficiency power supply designs, engineers are still facing many challenges, such as PFC current reversing, lightning surge, current harmonics, and AC crossover current spikes. Currently, there is no single control that can solve all these design issues. In the September 2022 issue of *IEEE Power Electronics Magazine*, the article "**Totem-Pole PFC Reliability and Performance Improvement with Advanced Controls**" by Zhong (John) Ye, Danyang Zhu, and Hailong Yang, provides comprehensive solutions to these issues by using a novel CCM totem-pole PFC analog controller. A 2.5 kW SiC-based totem-pole PFC prototype is built to demonstrate the robustness and performance improvement with the proposed solution.

Also, read Bob White's "White Hot" column "Which Came First?" and get a better understanding of the puzzle "which comes first, innovations in devices or innovations in circuits." It runs in two parts. In **Part I**, September 2022, p.96, the columnist discusses the history of power electronics with an emphasis on the effect of each major advance in devices.

IEEE Power Electronics Letters

In the **December 2022** issue, 13 TPEL Letters are published, covering recent attention in robust converter operation, new converter circuits, advanced component analysis, modelling and design, etc. Here are two interesting works.

- "**Data-Driven Iterative Learning Predictive Control for Power Converters**," by Wenjie Wu, Lin Qiu, Xing Liu, Feng Guo, Jose Rodriguez, Jien Ma, and Youtong Fang. This novel composited method features enhanced robustness of the power converters under unmodelled dynamics and parameter

mismatch.
• "**Alternate Filter Structures for Circulating Current and Conducted Noise Mitigation**," by Ripun Phukan and Rolando Burgos. This paper offers enlightenment on how magnetic integration technique can positively affect the converter common-mode filter design with different topological variants.

You can still **submit** your TPEL Letter for the Special Section on Patent Related Short Articles. The manuscripts submission deadline has been extended to December 15, 2022. For more information, contact Yunwei Ryan Li, TPEL Letter Editor-in-Chief (EIC): **yunwei.li@ualberta.ca**.

IEEE PELS-Tube: Educational Videos on Power Electronics

One of IEEE Power Electronics Society's finest researchers and teachers, Prof. Gerald Hurley, *Fellow*, has provided a very short tutorial about high frequency transformers. Short, easy to understand, and fully reviewed by anonymous experts (like a journal paper). IEEE PELS-Tube is the place for only the best power electronics teaching for short videos < 20 min. **https://ieeepelstube.org/**

IEEE Transactions on Power Electronics (TPEL)

The **January 2023** issue of TPEL is now available online. Be sure to check out these highlighted articles selected by TPEL editors.
• "**An Encrypted On-Chip Power Supply With Random Parallel Power Injection and Charge Recycling Against Power/EM Side-Channel Attacks**" by Kang Wei, Jin Woong Kwak, and D. Brian Ma. This paper focuses on the synergy between cybersecurity and PMIC.
• "**Analysis and Experimental Investigation of High-Frequency Magnetic Flux Distribution in Mn-Zn Ferrite Cores**" by Marcin Kącki, Marek S. Ryłko, John G. Hayes, and Charles R. Sullivan. This paper discusses the geometry impact of magnetic core losses.

TPEL will have three special sections published in October of 2023.
1. Advanced WPT Systems with High Efficiency and Misalignment Tolerance Characteristics
2. Multilevel Converters as an Enabler for Grid Modernization
3. Switched Capacitor Converters (SCCs)

The Call for Papers can be accessed on the TPEL **website**. March 31, 2023 is the manuscript submission deadline.

IEEE Open Journal of Power Electronics (OJPEL)

For its next collection of papers, OJPEL is featuring papers based on multilevel converters as an enabler of highly efficient grids.

- "**Modular Multilevel Converter Switching Frequency Harmonics Analysis and Suppression Through Cell Voltage Control**" by Lu Wang, Yanjun Shi, Matthew Bosworth, Dionne Soto, and Michael Steurer.
- "**A Single Stage Common Ground Three-Level PV Inverter With Integrated Power Decoupling**" by Yinglai Xia, Jinia Roy, and Raja Ayyanar.
- "**Energy Pulsation Reduction in Modular Multilevel Converters Using Optimized Current Trajectories**" by Dennis Braeckle, Patrick Himmelmann, Lutz Gröll, Veit Hagenmeyer, and Marc Hiller.

OJPEL has more papers that are a part of this collection. Be sure to check out the PELS social media pages to see Part 2!

IEEE Transactions on Transportation Electrification (TTE)

The December 2022 **issue** of TTE includes a special issue on Electrified Aircraft Technologies. The special issue features a review article on topics eVTOLs and excellent original research publications in the areas of More Electric Aircrafts, electric propulsion, and key enabling technologies.

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

For its December 2022 issue, **JESTPE** is featuring two special issues. One is based on emerging converter topology, operation, and design technologies. The second is based on partial power conversion and its emerging applications. Be sure to take a look at the papers that make up these special issues and the other included papers when they are published this month.

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