

Guest Editorial

Special Section on Ultrawide/Wide Bandgap Device, Packaging, Control, EMI, and Applications for Power Electronics

POWER electronics is a key enabling technology for fast-growing and plurality of emerging applications that necessitate advancements in semiconductor devices, packaging, control, and switching technologies that define new performance boundaries. Fast emerging ultra/widebandgap power-electronic devices, owing to their superior properties, are deemed to be game-changing technologies that are creating and propelling new and prospective applications aside from advancing the existing applications. To do so, new power device, packaging, control, switching, and triggering techniques need to be explored. Additional open questions remain on the dynamic characteristics, power losses, stability, reliability, robustness, and conditional monitoring of such advanced power devices, and their application spaces and new capabilities that can be brought to power electronics. Finally, to mitigate the detrimental impacts of power-electronics-related radiative and conductive electromagnetic-interference effects associated with rapid-switching power devices, measurement and diagnostic approaches, and suppression techniques needs further exploration and practical solutions. This Special Section on Ultrawide/Wide Bandgap Device, Packaging, Control, EMI, and Applications for Power Electronics in IEEE TRANSACTIONS ON POWER ELECTRONICS (TPEL) provides a collection of publications encompassing some of the challenges highlighted above with potential solutions to overcome them.

The Special Section Guest Editors would like to thank the authors for sharing their contributions and the reviewers for their dedicated efforts in providing valuable comments and suggestions on each article. We would also like to thank every Special Section Guest Editor for their hard work, as well as the team of Special Section Guest Associate Editors listed as follows.

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Finally, the Special Section Guest Editors would also like to thank Prof. Yaow-Ming Chen, Editor-in-Chief, TPEL, for his great support, and Mary Beth Schwartz, TPEL Administrator, for her highly supportive assistance throughout the process.

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Member-at-Large for IEEE PELS, since 2023. He was the Chair for the IEEE PELS Technical Committee on Sustainable Energy Systems from 2015 to 2020. He was the General Chair for IEEE PEDG Conference in 2023 and was the General Co-Chair for IEEE Energy Conversion Congress & Exposition (ECCE) in 2024.

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