Special Issue

Sensing and Reliability Challenges in Next-Generation Power Electronic Energy Systems and Related Applications

Message from the Guest Editors

Power electronic systems are becoming smaller, faster, and more tightly integrated as they underpin modern energy applications such as renewable energy conversion, electric transportation, railway traction, and medium- to high-voltage power infrastructures. While these advances enable higher efficiency and power density, they also push converters closer to their physical limits, where electromagnetic interference, thermal stress, parasitic effects, and accelerated aging become critical concerns. Increasing compactness and integration reduce the space and accessibility available for sensors, and conventional measurement and monitoring approaches often struggle due to limited bandwidth, harsh electromagnetic environments, and restricted access to internal states. This Special Issue focuses on rethinking sensing, measurement, and modeling for compact, high-frequency, and high-power power electronic systems, aiming to improve system observability, enable reliable diagnostics and prognostics, and support safe operation across renewable energy interfaces, transportation systems, smart grids, and energy storage systems. For more information, please visit here.

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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