



2025 IEEE 4th International Conference

on

Smart Technologies for Power, Energy and Control (STPEC 2025)

December 10-13, 2025

Department of Electrical and Electronics Engineering,
National Institute of Technology Goa, Goa, India



Special Session 08 (SS08)

DC-DC Power Converters: Innovative Circuits, Advanced Control and its applications in Electric Vehicles

Organized and co-chaired by:

- Dr. Dharavath Kishan, NIT Surathkal, Karnataka, India
- Dr. Sashidhar Sampathirao, IIT Goa, Goa, India
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Call for Papers

• Technical Outline of the Session:

Advancements in EV technology are closely linked to progress in renewable energy integration and power converters, vital for efficient voltage and current control in systems like hybrid vehicles, satellites, aerospace, and microgrids. Innovative DC-DC converter designs and control strategies have led to intelligent, high-performance systems. Key parameters such as efficiency, power density, stability, and compactness are critical for system reliability. Emerging converter topologies emphasize optimal component placement for high voltage conversion from low-power sources, often using AI. This session invites experts to discuss DC-DC converter design, modelling, control, cost-effectiveness, and sustainability to drive innovation in electric mobility.

• Topic of the Session includes, but are not limited to:

- Isolated and Non-isolated DC-DC Converters for EV Battery Charging
- High gain DC-DC converters
- Various converter types including multiport, multilevel, switched inductor, and switched capacitor converters for EV Battery Charging.
- Development of new control strategies or algorithms for DC-DC converters for EV Battery Charging.
- Exploration of Z Source-based DC-DC converters, hybrid converters, and other innovative designs.
- Power loss calculations and thermal analysis for DC-DC converters.
- Analysis of cost, reliability, and stress in DC-DC converter systems.
- Design and development of high-power density and voltage DC-DC converters for EV Battery Charging.
- Survey and analysis of different topologies in DC-DC converters for EV Battery Charging.
- Optimization of DC-DC converter design and control.

• Important Dates:

- Special Session Paper Submission Due : June 15, 2025
- Notification of Paper Acceptance : July 31, 2025
- Camera Ready Paper Submission Due : August 31, 2025
- Regular Registration Due : October 30, 2025

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