TOPICS OF INTEREST

1. Advanced Power Semiconductors

1.1 High Power Semiconductors
1.2 MOSFETs, IGBTs, FREDs & Schottkys
1.3 Power Modules and Power Hybrids
1.4 SiC Devices 1.5 GaN Devices
1.6 Other Wide Bandgap Devices
1.7 Power Supply Control IC and Power Management ICs
1.8 Gate Driver and Device Protection
1.9 IPM and Power Electronic Building Blocks

2. Packaging and Reliability

2.1 Packaging and Interface Technologies
2.2 Advanced Cooling Systems
2.3 Thermal Management and Simulations
2.4 Power Electronic Components Reliability and Life Time Prediction
2.5 Power Embedding 2.6 High Power Density Designs
2.7 Design Automation and Methodology

3. Passive Components and Integration

3.1 Higher Frequency and Low Loss Materials & Techniques for Inductors and Capacitors
3.2 Planar Inductors and Transformers and Thin Film Magnetic Component
3.3 Filters and Passive Integration

4. AC/DC Converter

4.1 High Efficiency/High Density Power Converters/Inverters
4.2 Resonant and Quasi Resonant Topologies for Power Supplies
4.3 Stand-alone Power Supplies (Adapters) and on-Board Supplies
4.4 New Topologies (Single Switch, Phase Shift, ZVS, ZCS, ZVZCS)

5. DC/DC Converter

5.1 DC/DC Converter Topologies for Enhanced Efficiency and Control
5.2 Synchronous Rectification
5.3 Smart Battery Management Concepts
5.4 Point of Load Converters
5.5 New Topologies for Distributed Power Supply Systems (Single or Multi- Stage Architecture, ZVS, ZCS, ZVZCS)

6. Digital Power Conversion

6.1 PMBus and other Digital Power Control Protocols
6.2 Digital Control for Power Converters
6.3 Advantages of Digital Power Conversion and Associated Challenges
6.4 System on a Chip (SOC)
6.5 Energy Harvesting

7. Motor Drive & Motion Control

7.1 Home Appliances
7.2 Small Power Motor "General Purpose Drive" with Highly Sophisticated Control Strategies and Low-Cost Solutions
7.3 New Converter/Inverter Types for Single- and Three Phase Systems
7.4 Advanced Motor Concepts for Industrial Application and Traction Drives
7.5 New Control Architectures DSP, Microcontroller or FPGA
7.6 Advanced Sensor Concepts for Motor Drives
7.7 Intelligent Motion Control and Architecture

8. High Frequency Power Electronic Converters and Inverters

8.1 Thermal Design, Packaging and EMI Issues
8.2 Sensors Specific to Power Electronics (e.g. Voltage, Current, Power, Frequency, Phase, Temperature)
8.3 Techniques to Reduce Switching Losses to Improve Efficiency and Reduce Size and Weight
8.4 Wireless Power Transfer

9. Automotive Power Electronics and Electrified Transportation

9.1 Hybrid / Electric Vehicle
9.2 MOSFET, IGBT and SiC Modules in Motor Traction and Propulsion Applications
9.3 DC/DC Conversion in Transportation Systems
9.4 Bidirectional DC/DC Converters
9.5 Electronics for Powertrain and Power Management
9.6 Energy Storage and Management, including Battery Types, Super Capacitors and Fly Wheels
9.7 DC Circuit Breaker
9.8 Charging Station Technology

10. System Reliability

10.1 Reliability and Health Management of Power Electronic Components and Systems
10.2 Fail-safe and Fault-tolerant Applications
10.3 Redundancy Concepts in Power Electronics
10.4 Life Cycle Design and Cost Analysis

11. Power Quality Solutions

11.1 UPS Systems and Inverters
11.2 Active Power Filter (APF), DVR, SVG
11.3 Energy Storage System (Battery Technologies, Flywheel, Super (ultra) Capacitors)
11.4 Harmonics and Power Factor Correction
11.5 Electromagnetic Compatibility and Immunity

12. Smart Grid Power Electronics

12.1 Grid Inverter Control
12.2 Battery Charging and V2G
12.3 Energy Storage System and Control
12.4 Micro-Grid
12.5 Solid State Transformers
12.6 Medium Voltage Multilevel Converters

12.7 Modular Multilevel Converters
12.8 Novel Converter Topologies
12.9 Wind Energy Systems
12.10 Solar and Photovoltaic Energy Systems
12.11 Communication, Cyber Security and Artificial Intelligence

13. Power Electronics in Transmission Systems

13.1 FACTS
13.2 Converters for Offshore/Onshore HVDC Links
13.3 Power Generation, Transmission and Distribution
13.4 DC Grids
13.5 HVDC Systems
13.6 Digital Twin for Transmission Equipment

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