PDC speaker:

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PDC (Professional Development Course)

System-Level Predictive EMI/EMC Modeling – A Tutorial

Summary

This tutorial covers predictive modeling methodologies in designing semiconductor IC products to meet stringent electromagnetic compatibility (EMC) regulatory standards for critical safety end applications (e.g., automotive, space, and industrial). The material is delivered by leveraging the pedagogical approach of the 3W's (Why, When, and What) to 1H (How). Whenever appropriate, the impact of predictive modeling will be demonstrated on real-world IC and package/system designs. The learning objectives are multifold — a comprehensive understanding of EMC modeling fundamentals, selecting the optimal modeling approach based on the problem at hand, and the ability to interpret the modeling result. Finally, the benefits of system-level EMC predictive modeling will be discussed when implemented early in the design flow to achieve high-performance, cost-effective EMC-compliant products.

Course Outline

- Basic EMI/EMC definitions and concepts
- EMI/EMC specifications and regulatory standards
- Noise sources, coupling, and propagation mechanisms
- Fundamentals and governing equations of EMC modeling
- Signal and power integrity components of EMC
- System co-design components (IC + Package + PCB system) of EMC
- CEM Modeling techniques – strengths and gaps
- EMC modeling, simulation, analysis, and validation
- Passives modeling
- System-level EMI/EMC methodologies
- Driving guidelines through modeling and silicon validation
- EMC best practices and lessons learned