



Signal Integrity and Radiated Emission of High-Speed Digital Systems

Spartaco Caniggia, Francescaromana Maradei

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Before putting digital systems for information technology or telecommunication applications on the market, an essential requirement is to perform tests in order to comply with the limits of radiated emission imposed by the standards.

This book provides an investigation into signal integrity (SI) and electromagnetic interference (EMI) problems. Topics such as reflections, crosstalk, switching noise and radiated emission (RE) in high-speed digital systems are covered, which are essential for IT and telecoms applications. The highly important topic of modelling is covered which can reduce costs by enabling simulation data to demonstrate that a product meets design specifications and regulatory limits. According to the new European EMC directive, this can help to avoid the expensive use of large semi-anechoic chambers or open area test sites for radiated emission assessments. Following a short introduction to signalling and radiated interference in digital systems, the book provides a detailed characterization of logic families in terms of static and dynamic characteristic useful for modelling techniques. Crosstalk in multi-coupled line structures are investigated by analytical, graphical and circuit-based methods, and techniques to mitigate these phenomena are provided. Grounding, filtering and shielding with multilayer PCBs are also examined and design rules given.

- Written by authors with extensive experience in industry and academia.
- Explains basic conceptual problems from a theoretical and practical point of view by using numerous measurements and simulations.
- Presents models for mathematical and SPICE-like circuit simulators.
- Provides examples of using full-wave codes for SI and RE investigations.
- Companion website containing lists of codes and sample material.

Signal Integrity and Radiated Emission of High-Speed Digital Systems is a valuable resource to industrial designers of information technology, telecommunication equipment and automation equipment as well as to development engineers. It will also be of interest to managers and designers of consumer electronics, and researchers in electronics.

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