SIGNAL INTEGRITY IN PCB DESIGN

DESCRIPTION

This 2-day workshop is aimed at developers who want to implement high-speed interfaces between semiconductor components and to design complex high-speed circuits at board level. The course is designed for developers, who do not only design schematics, but also systems and layout.

Participants will learn to judge when signal integrity is important and relevant in order to interpret, for example, IBIS models and to select appropriate termination procedures. Signal reflection and crosstalk effects are described and demonstrated by simulation, with examples typical for PCB structures. How to implement high-speed buses, including clock design, loading and signal termination as well as the power distribution and bypassing design are further main topics.

In an optional trainings module (3 day course) the workshop participants will cover details of solving potential Signal Integrity problems on high-speed memory interfaces and serial transceiver links

AGENDA – 2 days

- Introduction
- Introduction to Signal Integrity
- Chip-to-Chip Timing Memory Controllers
- IBIS Models for SI Simulation
- Transmission Lines
- Reflection
- Crosstalk
- SI-Analysis on System Level
- Power Integrity
- Board Layout Guidelines
- Signal Integrity Measurement Techniques
- Course Summary

AGENDA – optional module (3 days)

- Signal Integrity of High-Speed Memory Interfaces
- Signal Integrity on Serial Transceiver Links
- Design guidelines to overcome potential SI problems on serial link interfaces

TARGET GROUP

Hardware Design and CAD Engineers, who want to avoid SI problems on PCBs

PREREQUISITES

Basic knowledge of hardware design

DURATION

2 days standard workshop
3 days with additional module

LANGUAGES

English or German

COURSE TARGETS

- Understand circuit timing relationships
- Learn basics of IBIS simulation
- Understand reflection and crosstalk effects on PCBs
- Learn how to overcome reflection and crosstalk effects
- Apply for knowledge to more complex circuits

COSTS

€ 1.250,00 per participant*
Standard 2 day workshop

€ 1.850,00 per particpant*
Extended 3 day workshop

www.trias-mikro.com

**Including training materials, lunch and refreshments*

TRIAS mikroelektronik GmbH | Moerser Landstraße 408 | Krefeld | Germany
Telefon: +49 [0] 2151.953.01-0 | Telefax: +49 [0] 2151.953.01-15 | E-Mail: info@trias-mikro.com | **www.trias-mikro.com**

TRIAS mikroelektronik GmbH

TRAINER

Dr.- Ing. Jürgen Wolde

studied theoretical electrical engineering graduated with a degree in engineering. He then completed his doctorate in the field of electromagnetic compatibility to become a Doctor of Engineering. This followed the transition into the communications engineering industry, where he worked at Alcatel until 2005. The scope ranged from ASIC design for products, to assembly designs and complex research designs using FPGA-based boards. Collaboration on a variety of studies and research projects and management activities rounded off the range of applications.

He has been self employed since 2006 and has become a long-time partner of PLC2, TRIAS and other companies, where he works as a technical trainer worldwide. Jürgen Wolde is also the co-author of numerous presentations and scientific publications as well as co-owner of several patents.

ADDITIONAL COURSE

- **Design and validation of DDR interfaces on PCBs**

TRIAS mikroelektronik GmbH

Moerser Landstraße 408
D-47802 Krefeld

+49 [0] 2151.95 301-0

+49 [0] 2151.95 301-15

info@trias-mikro.com

www.trias-mikro.com