



# TRANSMISSION LINE THEORY, DIFFERENTIAL PAIRS, SIGNAL INTEGRITY IN HDI BOARDS AND HIGH-FREQUENCY/RF DESIGNS SEMINAR

Azitech ApS hereby invites you to a unique PCB seminar focusing on Transmission line theory, Differential pairs, Signal integrity in HDI boards and High-frequency/RF designs. Your instructor for this event will be the dynamic speaker Zachariah Peterson, a well-known PCB design expert, electronics design consultant and founder of Northwest Engineering Solutions, an innovative design and manufacturing house for advanced electronic products.



## VENUE

Clarion Hotel, Denmark  
24th -25th of October 2023  
€ 600 excl. hotel



## SIGN UP

You can sign up at:

**[Azitech.dk/Events](https://azitech.dk/Events)**

If you have any questions or want more information please call Nina Andersen at tel: +45 69 66 33 18 or write an email to [na@azitech.dk](mailto:na@azitech.dk)

## TOPICS YOU WILL LEARN ABOUT

### Differential pair/high-speed interface design

- Basics of differential pairs
- Myths and facts
- Termination and coupling
- Impedance
- Differential crosstalk
- Mode conversion
- Differential vias vs. single-ended vias

### Signal integrity in HDI boards

- Overview of HDI stackups
- HDI routing practices
- HDI vs. ultra-HDI
- Impedance penalties
- Crosstalk penalties
- Comparison – thin layers vs. thick layers
- Comparison – Dk values
- Comparison – via transitions
- Connector/signal launch footprints

### Fundamental transmission line theory

- Basics of transmission lines
- Derivation of quasi-TEM lines from Maxwell's equations
- Including losses and wideband interconnect design
- Lossless impedance equations
- Lossless to lossy transformations
- Single-ended to differential transformations
- Via design, stubs
- Equations for impedance (how they are derived, etc.)

### High-frequency/RF design

- RF fundamentals
- Stackups and transmission lines (PTFE vs. hybrid)
- Power and PCB layout for RF/mixed-signal systems
- Impedance matching networks and losses in different frequency ranges
- Noise, power budgets, and routing
- Vias and stubs for RF vs. digital
- Oscillators and power amplifiers
- Bias tees
- Power dividers
- Phased arrays and other phase-sensitive devices
- Substrate integrated waveguides
- Patch antennas, slot antennas, coax-fed antennas

