

Signal / Power Integrity and High Speed Design

3 Day Course Description

This class will make you familiar with high speed design and signal integrity issues at the board level. The class addresses transmission lines and their effects on digital circuitry and printed circuit boards. Detailed examples from real-world designs are presented to demonstrate the necessity of understanding signal integrity issues and applying sound signal integrity principles to your PCB designs.

With this 3 day class you will gain a better understanding of the following:

- Transmission lines and their effect on digital circuitry
- Printed circuit boards: drivers, receivers, Z_0 , Z_{diff} , stackup
- Termination, topology, timing, parasitics, etc
- Differential pair: routing, timing, crosstalk, common mode, terminating, multi-GHz
- Crosstalk: microstrip vs stripline, forward & reverse, timing & jitter, understanding and preventing
- Power integrity: planes, stackup, capacitors – ESL, size, location, mounting inductance
- Reference planes: ground, power, return currents, splits, crosstalk, stitch caps
- Vias: reference changes, stub lengths, stackup, making high speed vias, impedance
- Connectors: pinouts for high speed return current & crosstalk
- PCB losses: Skin effect, dielectric loss - D_F or $\tan(\delta)$, FWE Fiber Weave Effect, copper roughness, microstrip vs stripline,
- S parameters: what they mean, how they can help
- Testing issues: equipment, probes, test points
- Models: IBIS, drivers, receivers, simulators and accuracy

Audience

- Digital Design Engineers
- ECAD Designers with some high speed experience
- Technicians with High Speed experience
- Those who would like to further their knowledge on Printed Circuit Board Signal Integrity issues.
- No advanced math is needed