

*A 1-day training class with
Dr. Eric Bogatin, Signal Integrity Evangelist*

BDPSI: Best Design Practices for Signal Integrity

Build your engineering intuition

Now with hands on labs!

If you are going to take just one signal integrity class, Essential Principles of SI should be the one. In this 1-day class, you will learn an efficient process to design signal integrity problems out of your next product, right from the beginning.

This process is based on identifying the six families of signal integrity problems, their root cause and the design guidelines which eliminate these problems. You will learn the nine essential principles of how signals interact with interconnects which will strengthen your engineering intuition.

In this introductory class, the math is stripped away to reveal the underlying truth of how interconnect design decisions affect signal quality. The most essential principles of signal integrity are introduced and applied to solve signal integrity problems related to:

• Characteristic impedance, return current	• Ground bounce and cross talk
• Reflections	• Bandwidth
• Inductance	• Terminations, routing and topology
• Impedance	• PDN and EMI
• Lossy lines and rise time degradation	• Differential pairs

Design guidelines are illustrated with examples of measurements and simulations using structures such as IC packages, connectors, printed circuit boards and cables.

Now with hands on labs!

The most common answer to all signal integrity questions is “it depends”. The way we answer it depends questions is by putting in the numbers. While this class introduces many rules of thumb and approximations, sometimes, to get a good answer requires a simulation. This is why numerical simulation tools are essential.

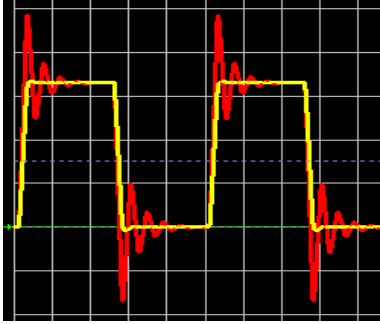
By special arrangement, we give you access to Mentor Graphics HyperLynx to run hands on labs we created specifically for this class. These labs illustrate the design principles and allow you to explore design space with virtual prototypes, on your own, after the class.

No previous simulation experience is necessary. Even if you have never done any simulation before, you will find the labs we have created easy to use and help you immediately apply the principles you learn in class to your next design.



How Do I Register?

Online at www.beTheSignal.com,
info@beTheSignal.com for questions and group discounts.
Schedule is online at www.beTheSignal.com



*A 1-day training class with
Dr. Eric Bogatin, Signal Integrity Evangelist*

BDPSI: Best Design Practices for Signal Integrity

Build your engineering intuition

Class Outline

01 Designing SI Problems Out of Your Product

- The process: root cause analysis and design tradeoffs
- Applying the Youngman Principle
- The first five principles
- Habits: always follow these design guidelines if it is free

02 Re-thinking Interconnects: the Secrets to Transmission Lines

- The instantaneous impedance all signals see
- Characteristic impedance and transmission lines
- Differential pairs
- Return currents in transmission lines

03 ISI, Eye Diagrams, Reflections and Terminations

- Root cause of ringing
- ISI and reflections
- The real story about terminations and which is the right one to use
- Routing and the highest data rate possible

04 Cross Talk and Ground Bounce

- Cross talk in busses: why is NEXT so different from FEXT?
- Estimating NEXT, FEXT
- Total inductance of the return path and ground bounce
- Reducing ground bounce by design

05 Lossy Lines, ISI, Eyes and Equalization

- Rise time degradation
- Conductor and dielectric losses
- Estimating interconnect bandwidth and highest data rate possible
- Equalization

06 PDN, Impedance and EMC Design

- Impedance and the PDN
- Why a flat impedance profile
- The real source of radiated emissions
- Reducing radiated emissions in boards and connectors

Visit www.beTheSignal.com