

A **1-day** Signal Integrity Class from
Bogatin Enterprises, a LeCroy Company

SPSI: S-Parameters for SI

Unlock the secrets of S-Parameters for Signal Integrity Applications

Now with hands on labs!

This one-day class, designed and offered by Signal Integrity Evangelist **Dr. Eric Bogatin**, shows you how to unlock the power of S-Parameters for signal integrity applications. In a 4 port measurement, there are more than 400 different S-Parameter terms, including single ended, differential, frequency domain and time domain formats, either as step response or impulse response. Each term tells another piece of the interconnect's story.

This class enables you to tap into the secrets locked inside S-Parameters and walks through the details of interpreting the measured or simulated results of 1-port, 2-port, and 4-port S-Parameters as single ended, differential in the frequency domain and the time domain. Topics include:

The value of Insertion and return loss
Single ended and differential S-parameters
How to extract characteristic impedance and differential impedance
Identifying mode conversion problems and solutions
The ten item check list to evaluate all S-parameters
The four most important patterns you will see and what they tell you

What You'll Gain

By learning the secrets of S-Parameters, you'll walk away from this class with the skills you need to instantly interpret the behavior of a differential channel buried in their S-Parameters revealing their important properties.

Now with hands on labs!

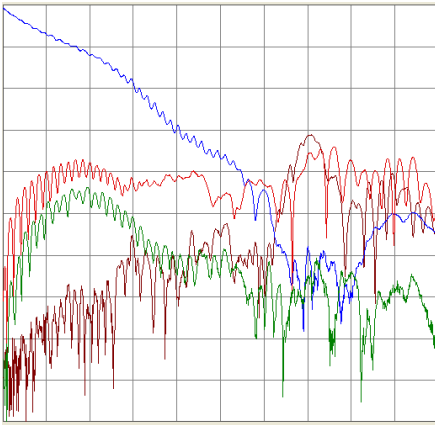
Unique to this class is a hands on lab. We give you a copy of QUCS, a powerful and easy to use S-parameter viewer and simulator. It runs on any computer with a Windows OS. We show you how to use it to extract valuable information from any Touchstone file and even how to simulate S-parameters. The software and all the touchstone files are yours to keep.

No previous experience is necessary. Even if you have never done any simulation before, you will find this an incredibly easy to use tool. The labs are home work exercises. Bring your laptop if you want to start the labs during class.



How Do I Register?

Online at www.beTheSignal.com
or email eric@beTheSignal.com for questions.



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Class Outline

Principles of S-parameters for SI Applications

- The secret to understanding S-parameters
- S-parameters and touchstone files
- Common applications
- Return loss, ports and the time domain response
- Return loss and characteristic impedance
- Hands-on-lab: a touchstone viewer for 1, 2, 4 port, single-ended, simulating S-parameters of simple circuits

Insertion and Return Loss

- Ripples in return and insertion loss
- Attenuation and insertion loss
- Stub resonances and insertion loss
- Hi Q Resonances and insertion loss
- Hands-on-lab: return and insertion loss in uniform transmission lines, extract characteristic impedance, impact from series and stub discontinuities, TDR response

Differential S-parameters

- The secret to minimize confusion
- Converting from single ended to differential S-parameters
- Differential impedance from return loss
- Mode conversion
- Hands-on-lab: a touchstone viewer for 1, 2, 4-port differential S-parameters, simulating differential S-parameters, asymmetry and mode conversion

Data mining S-parameters

- Channel to channel cross talk
- Channel behavioral models
- The top ten check list
- Time domain vs frequency domain, Single-ended vs differential
- Hands-on-lab: 12 channel S-parameters

Visit www.BeTheSignal.com