

Dr. Eric Bogatin

President, Bogatin Enterprises, LLC



Dr. Eric Bogatin received his BS degree in physics from MIT, and MS and PhD degrees in physics from the University of Arizona in Tucson. He has held senior engineering and management positions at Bell Labs, Raychem, Sun Microsystems,

Ansoft, and Interconnect Devices. Eric has written five books on signal integrity and interconnect design and over 300 papers. His sixth book is a science fiction novel, Shadow Engineer, available on Amazon.com. Eric is currently a signal integrity evangelist with Bogatin Enterprises, which specializes in signal integrity training and education. He is a distinguished lecturer for the IEEE EMC society and lectures worldwide on signal integrity topics.

Dr. Eric Bogatin - Santa Clara Classes in May

May 17 & 18: Want to get a jump start in your signal integrity career? Consider taking the “Essential Principles of Signal Integrity” class. This foundation building class now has integrated hands on labs. Bring your laptop.

May 20: If you are looking for more specific training on power integrity design, check out the “Power Delivery Networks” class, also with hands on labs.

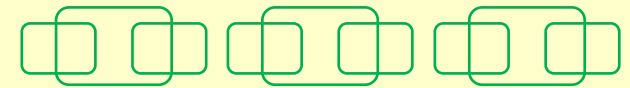
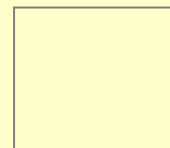
Find more detailed information and registration online: <http://www.bethesignal.net/bogatin/>

Seating is limited and these classes will fill up so sign up early to reserve your seat.

19620 Hale Ave
Morgan Hill, CA 95037



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SCV EMC 2011 Mini Symposium May 19

featuring

Dr. Eric Bogatin



Santa Clara Valley

**Biltmore Hotel
2151 Laurelwood Road
Santa Clara, CA 95054**

Web: www.scvemc.org





A Practical Guide to Measuring and Modeling PDN Components

Registration & Continental Breakfast: 7:00 AM

Morning Session: 8:00 AM - 12:00 PM

Module 1:

Measuring Low impedance with a 2-port VNA

We will introduce the technique of using 2 ports of a VNA to measure impedances lower than a milliohm from 5 Hz to 5 GHz. We apply this technique to a few common PDN components such as voltage regulator modules, capacitors, vias and planes. We will have a VNA in the room and perform live demos of how to perform this measurement and how to interpret the results.

Module 2:

Building Models from S-parameter Measurements

Using the S-parameters from 2-port measurements from the first module, we will demonstrate a very simple technique to build high bandwidth models which can be used in both time and frequency domain simulations. Since we have the actual measured data, we will also show how to assess the bandwidth of the model. This technique will be applied to build models for the VRM, bulk capacitors, MLCC capacitors and via structures.

Lunch: 12:00 PM - 1:30 PM

Afternoon Session: 1:30 PM - 5:00 PM

Module 3:

Interpreting the Complex Behavior of Planes

It is very easy to perform a measurement of a pair of planes, but it is sometimes difficult to interpret the measurements. Sometimes the measurements have artifacts, sometimes they are just complex behavior. In this module we will look at the measured properties of planes and how to interpret the impedance profiles we see, both as self impedance and in terms of transfer impedance. We will see that how we set up the measurement is important in how we interpret the results. Finally, we will answer the question, So what? What do we do with the measurements to help us evaluate PDN performance.

Afternoon Session: 1:30 PM - 5:00 PM (continued)

Module 4:

Interpreting Plane Properties with Capacitors.

When capacitors are added to a board, the impedance properties change. The capacitors influence the impedance at different frequencies and depending on their design features. Sometimes they influence plane resonances, sometimes they do not. Sometimes the position matters, sometimes it does not. In this module, we will explore using measurements and simulations the essential principles of how capacitors influence the impedance of planes, when location matters and how to use this information in guiding PDN design.

Reception: 5:00 PM - 6:00 PM

NOTE: The registration fee includes one copy of the technical program, continental breakfast, lunch, refreshment breaks, and the reception at the conclusion of the event. The organizing committee reserves the right to substitute speakers, restrict size, or to cancel the event and exhibition. In the event the organizing committee cancels this event, registration fees will be fully refunded. Individuals canceling their registration prior to April 29 will receive a full refund. No refunds will be made to individuals who cancel their registration after April 29. Substitutions are allowed. Attendance is limited. Registration will be confirmed on a first come, first served basis.

Registration Form

Registration Rates: Before 4/29 4/29-5/19

- | | | |
|---|-------|-------|
| <input type="checkbox"/> IEEE Member | \$250 | \$275 |
| <input type="checkbox"/> Non-Member | \$275 | \$300 |
| <input type="checkbox"/> Student/Un-Employed* | \$100 | \$125 |

IEEE Membership Number: _____

\$250 for group registration rate (5 or more)

*Full time students only with valid student ID presented on site

Register Online at:
<http://ewh.ieee.org/r6/scv/emc/>

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