

ABOUT OUR SPEAKER

ERIC RECEIVED HIS BS IN PHYSICS FROM MIT AND MS AND PHD 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 6 BOOKS ON SIGNAL INTEGRITY AND INTERCONNECT DESIGN (AND ONE SF NOVEL) AND OVER 200 PAPERS. HIS LATEST BOOK, SIGNAL AND POWER INTEGRITY-SIMPLIFIED, WAS PUBLISHED IN 2009 BY PRENTICE HALL. HE HAS TAUGHT OVER 5,000 ENGINEERS IN THE LAST 20 YEARS. CLASS DESCRIPTIONS AND MANY OF HIS PAPERS AND COLUMNS ARE POSTED ON HIS WWW.BETHE SIGNAL.COM WEB SITE.



THE PROGRAM: BY DR. ERIC BOGATIN

WHICH IS BETTER IN DIFFERENTIAL PAIR DESIGN: TIGHTLY OR LOOSELY COUPLED DIFFERENTIAL PAIRS? IS THE RETURN CURRENT OF ONE LINE REALLY CARRIED IN THE OTHER? IS CROSS TALK REALLY REDUCED BY TIGHTLY COUPLING THE LINES IN A PAIR? DIFFERENTIAL PAIRS PROLIFERATE IN ALL INTERCONNECTS TRANSPORTING SIGNALS IN THE 500 MBPS AND ABOVE, SO LAYOUT IS CRITICAL. IN THIS TALK, ALL WILL BE MADE CLEAR.

YOU KNOW YOU NEED DECOUPLING CAPACITORS ON YOUR PCB TO MINIMIZE RAIL COLLAPSE, BUT HOW MANY DO YOU NEED AND WHAT VALUES? SHOULD THEY ALL BE THE SAME VALUE OR ONE OF EACH VALUE YOU CAN FIND? SHOULD YOU USE 1 PER POWER PIN, OR 10? HOW CAN YOU MINIMIZE THE COST OF THE PDN? IN THIS TALK, WE WALK THROUGH THE DETAILS OF HOW TO BRING THE PDN IMPEDANCE BELOW THE TARGET IMPEDANCE ACROSS THE ENTIRE BANDWIDTH OF INTEREST.

S-PARAMETERS HAVE BECOME THE DEFACTO STANDARD FOR HIGH FREQUENCY CHARACTERIZATION OF INTERCONNECTS. THEY HAVE A WEALTH OF INFORMATION, BUT THE GOOD STUFF IS OFTEN BURIED DEEP BEHIND CONFUSING FORMALISM, SPECIALIZED RF TERMS AND COMPLEX MATHEMATICS. THIS TALK SHOWS HOW TO MINE VALUABLE INFORMATION FROM S-PARAMETERS THROUGH NUMEROUS SIGNAL INTEGRITY APPLICATION EXAMPLES.

WHEN DESIGNING INTERCONNECTS, WE SPEND MORE TIME FOCUSING ON THE SIGNAL PATHS THAN THE RETURN PATHS, YET THE RETURN PATH DESIGN WILL AFFECT SIGNAL QUALITY EVEN MORE THAN THE SIGNAL PATH. THE IMPACT FROM THE TWO MOST COMMON SOURCES OF RETURN PATH DISCONTINUITIES, GAPS AND VIAS, WILL BE EXPLORED IN THIS TALK.

IEEE EMC Society Huntsville Chapter
C/o Tom Perry
PO Box 9129
Huntsville, AL 35812

HUNTSVILLE IEEE EMC 2010

ADVANCED PROGRAM AND REGISTRATION FORM



THE HUNTSVILLE CHAPTER
OF
THE IEEE ELECTROMAGNETIC COMPATIBILITY (EMC)
SOCIETY PROUDLY PRESENTS

SI AND EMC: A TWISTED PAIR

EXPLORING PCB DESIGN PRINCIPLES
FOR DIFFERENTIAL SIGNALS, POWER
DELIVERY NETWORKS, S-PARAMETERS
AND GROUND BOUNCE

DR. ERIC BOGATIN

BOGATIN ENTERPRISES, LLC
OLATHE, KS

TUESDAY APRIL 20, 2010

AT THE

**VON BRAUN CENTER
700 MONROE STREET
HUNTSVILLE, AL**

WWW.VONBRAUNCENTER.COM

PROGRAM OUTLINE

TIME	EVENT
7:30 AM	CHECK-IN / REGISTRATION / EXHIBITS / BREAKFAST
8:30 AM	WELCOME / 1ST TECHNICAL SESSION PRACTICAL DIFFERENTIAL PAIR DESIGN LEARN ALL OF THE RIGHT PRINCIPLES TO OPTIMIZE THE DIFFERENTIAL PAIRS IN YOUR PRODUCTS. MANY MISCONCEPTIONS WILL BE CLEARED UP AS WELL.
10:00 AM	BREAK / EXHIBITS / REFRESHMENTS
10:30 AM	2ND TECHNICAL SESSION SELECTING CAPACITORS FOR THE PDN WALK THROUGH THE DETAILS OF HOW TO SELECT CAPACITOR VALUES TO BRING YOUR PDN IMPEDANCE PROFILE BELOW THE TARGET IMPEDANCE ACROSS THE ENTIRE BANDWIDTH OF INTEREST.
12:00 PM	LUNCH / EXHIBITS
1:00 PM	3RD TECHNICAL SESSION S-PARAMETERS FOR SI APPLICATIONS SEE WHAT S-PARAMETERS REALLY ARE AND HOW TO MINE VALUABLE INFORMATION FROM THEM THROUGH NUMEROUS SIGNAL INTEGRITY APPLICATION EXAMPLES.
2:30 PM	BREAK / EXHIBITS / REFRESHMENTS
3:00 PM	4TH TECHNICAL SESSION BOUNCING OUT GROUND BOUNCE LEARN HOW A "POOR" RETURN CURRENT PATH WILL RESULT IN SIGNAL DEGRADATION AND GROUND BOUNCE.
4:30 PM	WRAP-UP - QUESTIONS / CLOSING COMMENTS
5:00 PM	TEXTBOOK SIGNING / EXHIBITS / RECEPTION (NO ALCOHOL)

FEE SCHEDULE

IEEE MEMBERS, RECEIVED BY APRIL 14TH**	\$150
IEEE MEMBERS, AFTER APRIL 14TH OR AT THE DOOR*	\$200
NON - IEEE MEMBER ADDITIONAL CHARGE	\$50
STUDENTS (FULL TIME) / UNEMPLOYED / RETIRED ATTENDEES	\$75
OPTIONAL TEXT#: <u>SIGNAL INTEGRITY SIMPLIFIED</u> BY DR. ERIC BOGATIN, BOOK ORDERS MUST BE RECEIVED BY APRIL 14TH AND PICKED UP ON SITE AT EVENT. **	\$70
TUTORIAL RECORD, WITH ADVANCED REGISTRATION	FREE

* PLEASE CONTACT TOM PERRY TO CONFIRM REGISTRATION AVAILABILITY AND DO NOT MAIL AFTER APRIL 14TH, 2010.

** LIMIT OF 3 BOOKS PER ATTENDEE

THE BOOK IS NOT A REQUIREMENT FOR THE LECTURE

REGISTRATION WILL BE CONFIRMED ON A FIRST COME, FIRST SERVED BASIS.

THE EXHIBITION

A LARGE EXHIBIT OF EMC PRODUCTS AND SERVICES WILL BE OPEN DURING REGISTRATION, LUNCH, ALL BREAKS AND THE RECEPTION. EMC PRODUCT/SERVICE VENDORS PLEASE REGISTER ONLINE AT WWW.HUNTSVILLEEMC.ORG OR CONTACT GLENN SHELBY AT GLENN.SHELBY@IEEE.ORG OR 256.544.0694 TO RESERVE EXHIBIT SPACE.

HOTEL INFORMATION

GO TO THE VON BRAUN CENTER WEBSITE:
WWW.VONBRAUNCENTER.COM
 CLICK ON THE EVENT PLANNER LINK AND THEN THE HOTEL LINKS.

The registration fee includes one copy of the event proceedings for pick up at the event, breakfast, refreshments, lunch, and reception. The organizing committee reserves the right to substitute speakers, restrict size, or to cancel the event. In the event EMC 2010 is canceled by the organizing committee, registration fees only will be fully refunded. Individuals canceling their registration prior to April 9th will receive a full refund. No refunds will be made to individuals who cancel their registration after April 9th. Substitutions are allowed.

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 SCHOOL: _____
 (PLEASE ATTACH COPY OF STUDENT ID TO OBTAIN STUDENT RATE)

REGISTRATION TOTALS

REGISTRATION FEE: \$ _____
 NUMBER OF BOOKS (MAX THREE): _____
 TOTAL FOR BOOKS: \$ _____
 CHECK ENCLOSED AMOUNT: \$ _____
 CHECKS PAYABLE TO: IEEE HUNTSVILLE SECTION EMC CHAPTER
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REGISTRATION METHODS

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