

The ESD Association newsletter, for everyone with an interest in the understanding and control of electrostatic discharge.



THRESHOLD™

Volume 21, No. 8

May / June 2006

News bits

Symposium 4 months away

The EOS/ESD Symposium continues to take shape as we move into the final stages of preparation and organization. See page 1 for a summary of this year's symposium schedule.

Device/Design Seminar set for Germany

The ESD Association will hold a Device/Design Seminar in Munich, Germany, May 22-23, at the Fraunhofer Institute for Reliability and Microintegration IZM, followed on May 24 by an ESD Testing and Characterization Program. See page 7 for more information.

2006 Research Grant

The ESD Association Board of Directors is pleased to announce the competition for research grants for 2006-2007. See page 5 for more information.

Certification tutorials

The ESD Association has scheduled Certification tutorials in Palm Springs, CA. See page 10 for details.

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28th Annual EOS/ESD Symposium

Tucson, Arizona, USA, September 10-15, 2006

Create a customized Symposium experience

The EOS/ESD Symposium continues to be the best source for ESD information and solutions. Attendees will be able to customize their Symposium experience to concentrate on their specific areas of interest.

Tutorials

A full three-day program of educational tutorials provides opportunities for in-depth exploration of specific topic areas. Featuring basic, intermediate, and advanced courses, the tutorial program is organized along parallel tracks to allow attendees to easily create an individual

educational experience in specific categories of interest. Attendees may select courses from any track.

Track Designation

The TFAS track designation indicates those tutorials that are part of Track 1: ESD Test, Failure Analysis, and Systems. The FMEC track designation indicates those tutorials that are part of Track 2: Factory, Materials, and ESD Control. The DDT track designation indicates those tutorials that are part of Track 3: Device, Design, and Technology.

Continued on page 2

EOS/ESD Symposium and Exhibits Program and Schedule Summary

September 10-15, 2006
Westin La Paloma, Tucson, Arizona

Sunday, September 10

Registration Opens
ANSI/ESD S20.20 Seminar, Part 1
Tutorials

Monday, September 11

Registration
ANSI/ESD S20.20 Seminar, Part 2
Tutorials
Welcome Reception (Exhibit Hall)
Exhibits Open (6:00 PM-9:00 PM)

Tuesday, September 12

Registration
Awards Breakfast
Plenary Session, *Consumer Connectivity Solutions*
Exhibits

Tuesday, September 12 (continued)

Technical Sessions
Workshops
Professional and Technical Women's Reception

Wednesday, September 13

Registration
Technical Sessions
Exhibits
Association Luncheon & Annual Meeting
Workshops

Thursday, September 14

Registration
Technical Sessions
Tutorials

Friday, September 15

Program Manager Exam

Symposium

Create your symposium experience

Continued from page 2

Technical Tracks

Track 1

ESD Test, Failure Analysis, and Systems (TFAS)

If you need to understand failure models, troubleshoot ESD failures, test for or evaluate component ESD susceptibility, or develop systems or protection schemes, you will find the following tutorials, technical sessions and workshops of special interest:

Tutorials

Sunday

- System Level ESD/EMI (Part 1 & 2)

Monday

- Troubleshooting On-Chip ESD Failures
- Device Testing - Component Level

Thursday

- EOS/ESD Failure Models and Mechanisms
- Device Technology and FA Overview
- Electrostatic Calculations for the ESD Engineer
- TLP Systems Design and Very Fast TLP Applications
- TLP Measurements: Parametric Analyzer for ESD On-Chip Protection

Technical Sessions

- 4A Novel On-Chip ESD
- 5B TLP/HBM/CDM Testing: Testers and Methodology

Workshops

- B1 ESD Troubleshooting and Testing Practices
- C1 System Level Stress and the Impact on ESD Device Protection

Track 2

Factory, Materials, and ESD Control (FMEC)

Targeted to those responsible for the factory floor, standards, material selection, or ESD program management, this track

Continued on page 6

Symposium Registration and Fees

Save by registering early!

You can save time and money by registering in advance. Save hundreds of dollars by registering early. Attendees who take advantage of bundled fees and full-time students will save even more.

Advance registration fees are valid only if received no later than **July 28, 2006**. Registrations received after this date will be processed at the on-site fees.

To register, use the registration form in the program you will receive in the mail in June, download the form from the ESD Association website, www.esda.org, or contact ESDA headquarters by phone at 315-339-6937, fax at 315-339-6793, or email at info@esda.org.

Symposium

	Advance Fees On or Before July 28, 2006	On-Site Fees After July 28, 2006
ESD Association Members	\$495	\$695
Non-Members	\$595	\$695

Tutorials-Member Prices

	Advance Fees On or Before July 28, 2006	On-Site Fees After July 28, 2006
Sunday (Full Day)	\$475	\$575
Sunday (C1 or C2)	\$275	\$375
Monday (Full Day)	\$475	\$575
Thursday (Full Day)	\$475	\$575
Thursday (Half Day, AM or PM)	\$275	\$375

Tutorials-Non-Member Prices

	Advance Fees On or Before July 28, 2006	On-Site Fees After July 28, 2006
Sunday (Full Day)	\$575	\$675
Sunday (C1 or C2)	\$375	\$475
Monday (Full Day)	\$575	\$675
Thursday (Full Day)	\$575	\$675
Thursday (Half Day, AM or PM)	\$375	\$475

Student Fees

50% discount for full-time students. Proof of enrollment required. Student fees apply only to Symposium or Tutorial registration and do not apply to Bundled Fees.

Bundled Fees (Symposium + 3 full days of tutorials)

	Advance Fees On or Before July 28, 2006	On-Site Fees After July 28, 2006
ESD Association Members	\$1,725	\$2,110
Non-Members	\$1,815	\$2,110

\$20.20 Seminar (Limited to first 30 registrants)

	Advance Fees On or Before July 28, 2006	On-Site Fees After July 28, 2006
ESD Association Members	\$1,495	\$1,595
Non-Members	\$1,595	\$1,595

DESCO Industries Inc.

3651 Walnut Avenue, Chino, CA 91710
Tel: 909-627-8178 Fax: 909-627-7449 www.descoindustries.com
ESD CONTROL PRODUCTS: Charleswater, CMG, Desco, EMIT, Menda, ESD Systems.com, Protective Pak, Semtronics, Statguard Flooring

Conductive Containers, Inc.

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Manufacturer of CORSTAT conductive corrugated products and ESD safe thermoformed plastic designs for shipping, storage & handling.

From the president

Association news

Cast Your Vote and Be Counted



Kay Adams

Have you returned your ballot yet for the selection of the 2007 ESDA directors? Perhaps it's still sitting there on your desk. Take a minute and make your selection. This is your ESDA and your chance to make your voice

heard.

The people who have been nominated and agreed to have their names put onto the ballot are making a commitment to serve the ESDA for the next 3 years - at a minimum. They are volunteering their own personal time, as well as time provided by

their generous employers, to work on projects and committees that keep our Association working and growing. This can only be characterized as "a labor of love".

This can only be characterized as "a labor of love".

The ESDA is a non-profit association, incorporated in the state of New York, but make no mistake about this - it is a business. A business requires leadership for it to flourish and meet its objectives and goals. Without the strength provided by these elected directors, as well as the many volunteers who give their time, we cannot accomplish our goal to "Serve Industry".▲

Website updates

2006 Symposium Program

The EOS/ESD Symposium Program is now available as a downloadable pdf on our homepage. Be sure to check it out at www.esda.org. Also, view an updated list of exhibitors who have reserved space at the 2006 Symposium (www.esda.org/exhibits.html).

ESDA Web Link Logo

The main page of the website now offers a downloadable pdf of the ESDA Web Link logo. This logo can be used on websites as a link to the ESD Association website. The logo may not be placed by products or services, or in any way which could imply product, process or services endorsement. The logo can be found at www.esda.org. ▲

Symposium

2006 Plenary session: Consumer Connectivity Solutions



Win Maung

As consumer appetite for multimedia content at home and on the road grows, the need to provide connectivity solutions to network consumer electronic devices is increasing rapidly and broadly. Digital Interface such as Firewire™ (IEEE-1394),

USB and HDMI are being integrated into the smallest MP3 player to the largest HDTV. Consumer applications demand a unique set of requirements such as ease of use, interoperability, lower power consumption and higher data throughput while keeping implementation cost low. How do these requirements impact circuit design? What kind of challenges do they present to designs using smaller silicon process technology? What are the trends of these interfaces? How does ESD protection fit in the picture? This talk will address these questions as well as provide a general overview of consumer connectivity solutions.

Win Maung is a Senior Member of Technical Staff at Texas Instruments, Dallas, leading the product development team

providing IP solutions to ASIC Backplane. Prior to this, Win led the product development team in Connectivity Solutions for over 5 years. He has been working in the interface circuits since he joined Texas Instruments in 1993. Win has held various engineering management positions in product engineering, characterization, applications and development of a wide range of interface products from RS232 and SCSI to USB and Firewire™. Win graduated from Southern Methodist University in Dallas where he performed research in superconductor thin film device fabrication and applications such as lossless transmission lines and Josephson junctions.▲

3M

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Manufacturer of static control permanent flooring, wrist/heel straps, static shielding bags, & testing/monitoring equipment

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Email: floor@vpiflooring.com

www.vpiflooring.com

Manufacturer of static control flooring

ESD Certified Professional-Device/Design

Description

This certification was created for device-design engineers.

Benefits to the Individual

- Demonstrates knowledge, experience and competency.
- Encourages self-development and continuing education.
- A check in the "plus" column in performance reviews, career advancement, and new employment opportunities.

Requirements

- Begin official file with ESD Association Headquarters
- Complete pre-requisite courses
- Pass an in-depth examination
- Maintain certification with continuing education

Required Minimum Prerequisite Courses

The following courses are offered every year at Symposium and at other times throughout the year. If an attendee completed these courses in 2003 or after, they may be applied to the Device/Design Certification.

- ESD On-Chip Protection in Advanced Technologies (full-day)
- System Level ESD/EMI: Testing to IEC and other Standards (half-day)
- On-Chip ESD Protection in RF Technologies (half-day)
- SPICE-Based ESD Protection Design Utilizing Diodes and Active MOSFET Rail Clamp Circuits (half-day)
- EOS/ESD Failure Models and Mechanisms (half-day)
- Circuit Modeling and Simulation for On-

Chip Protection (quarter-day)

- Latch-up Physics and Design (quarter-day)
- Troubleshooting On-Chip ESD Failures (half-day)
- Transmission Line Pulse Measurements: Parametric Analyzer for ESD On-Chip Protection (quarter-day)
- CDM Design and Characterization (quarter-day)
- Impact of CMOS Technology Scaling on ESD HCPH (quarter-day)
- Device Testing--IC Component Level: HBM, CDM, MM, and TLP (half-day)

Please Note:

The ESD Association regularly offers the Device/Design Seminar, a two-day course that fulfills the requirements for the following of the above courses:

- ESD On-Chip Protection in Advanced Technologies
- SPICE-Based ESD Protection Design Utilizing Diodes and Active MOSFET Rail Clamp Circuits
- EOS/ESD Failure Models and Mechanisms
- CDM Design and Characterization

Examination

The examination will be held annually during Symposium week, beginning in 2007. The examination will be open book and will consist of multiple choice and essay questions. The essay portion of the exam will be graded by two individuals.

Continuing Education

There is a requirement to take additional classes to maintain certification. Further information will follow regarding this portion of the requirements for certification.

Registration

To obtain certification, you must initiate an official file in your name at the ESD Association Headquarters. Please complete the PDF registration form and send it with a \$50 payment to the:

ESD Association
7900 Turin Road, Bldg 3
Rome, NY 13440 USA

Or fax your registration form and payment to: 315-339-6793. ▲



*Leo G. Henry PhD
Electronic Polymers, Inc.*

TREK, INC.

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Tel: 585-798-3140 Fax: 585-798-3106
Web: www.trekinc.com

Designer and manufacturer of instrumentation and sensors for measuring surface voltage, ionizer performance, and surface resistivity

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Cleanroom products, topical antistats, floor finishes and coatings, static detection meters, monitors, computer cleaning products

Association

2006 ESDA Research Grants

The ESD Association Board of Directors is pleased to announce the competition for research grants for 2006-2007. The details are given below.

Who Should Apply?

Any academic professor or researcher who may wish to conduct exploratory work in the field of ESD.

What Is The Grant Value?

The research grant will be \$10,000 U.S. for a one-year subsidy of any advanced research work in ESD. The grant money can be used in conjunction with any other sponsored research grant for ESD work.

When Is the Grant Period?

The winner will be announced during Sep-

tember 2006. The research work period is between October 1st, 2006 and September 30th, 2007.

What Is Expected?

The outcome of the research should advance the fundamental understanding of ESD knowledge. The work could be in any field of ESD including device/design, materials, test methods, or factory control methods.

What Are The Restrictions?

The granted money should be solely used for ESD research. The researchers are required to first publish the outcome of the work at the ESD Symposium before submitting to any professional journal.

How Is The Application Made?

The process is simple. Send an email to info@esda.org indicating that you are applying for the Research Grant. A clear outline of the title, purpose, approach, and the expected outcome of the work must be included. Normally the application is expected to include a 500 word summary on how the proposed work would advance the understanding of ESD. The summary should indicate how the research relates to the ESD Technology Roadmap (available at www.esda.org).

When Is the Deadline For Application?

All applications must be received by June 30th 2006 to be considered. Please send the proposals to the ESD Association. ▲

Education

3rd Annual ESD Forum Event- Philippines

For the third year in a row, the ESD Association has provided tutorials and plenary speakers for the annual ESD Forum event that took place in the Philippines in March 2006. This year, Ron Gibson (Celestica, Toronto, Ontario, Canada), John Kinnear, Jr. (IBM), and Stephen Halperin (SH&A/Prostat), traveled to the Philippines to deliver four of our Program Manager related tutorials. Ron and John taught the 2-day ESD Program Development and Assessment course (ANSI/ESD S20.20 Seminar), while Steve taught How To's of In-Plant ESD Auditing and Evaluation Measurements, Packaging Principles for the Program Manager, and ESD Standards Overview for the Program Manager. The ESD Association local chapter in the Philippines has been very active in putting together a learning experience for all those that attend this annual conference.

Since the beginning of the ESD Forum in the Philippines in 2003, the ESD Committee of ASEMEP (Association of Semiconductor and Electronics Manufacturing Engineers of the Philippines) has tried to add new things to entice people to attend. Of major importance are the tutorials that the ESD Association offers as part of the Program Manager Course curriculum. Interest in the Program Manager Certification is high in the Philippines as well as other areas in Asia.

This year, the ESD Committee of the Philippines offered something called the "ESD Olympics". If you get a chance, ask John Kinnear or Steve Halperin about this event. Apparently it was a big hit but no other information is available at this time. Those are always the best events!

Our own Steve Halperin, even though a pretty well- schooled international traveler,

learned a couple things on this trip that he would like to share. Always, Always Always, make sure to take important things with you in a carry-on bag, just in case your luggage is misplaced for 5 days. It is more than a little difficult to give a plenary lecture to the gathered masses and teach 3 tutorials in the same clothes you wore when you got off the plane. Rinsing out clothes in the sink and living out of the toiletry bag you received on the plane is tough duty for a work-week. Having at least one extra change of clothes allows you to get one set reasonably dry before you have to put them on again. The rest of the 3 week international trip apparently went fine after the luggage showed-up, just in time to depart for Singapore. ▲

Wolfgang Warmbier

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Tel: 49-7731-86880 Fax: 49-7731-868832
www.warmbier.com
ISO 9002 certified for advice, supply and manufacturing of static control materials and systems

Monroe Electronics

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Email: electrostatics@monroe-electronics.com
www.monroe-electronics.com
Full line manufacturer of static measurement equipment

Certification

ESD Certified Professional-Program Manager



David E. Swenson
Professional Education
Business Unit Manager

Description

The ESD Association offers a professional certification for ESD control program managers. This program is intended for individuals that are involved in designing, implementing, managing, and auditing ESD control programs in their facilities.

Benefits to the Individual

- Demonstrates knowledge, experience and competency.
- Encourages self-development and continuing education.
- A check in the "plus" column in performance reviews, career advancement, and new employment opportunities.

Requirements

- Begin official file with ESD Association Headquarters
- Complete pre-requisite courses
- Pass an in-depth examination
- Maintain certification with continuing education

Examination

The examination will be held annually during Symposium week. The examination will be open book and will consist of mul-

multiple choice and essay questions. The essay portion of the exam will be graded by two individuals.

2006 Exam Notice

The ESD Association is offering the ESD Certified Professional-Program Manager certification exam in conjunction with our annual symposium, on Friday, September 16, 2006. To take this exam an official registration filing fee of \$50.00 and a registration form must be completed and submitted to ESDA Headquarters. You must have taken all of the required courses (unless you qualify for the NARTE certified exemption) and have your eligibility verified by the ESDA. An exam fee of \$30 will be applicable.

The ESDA is offering NARTE certified ESD engineers the opportunity to take the ESD Certified Professional-Program Manager exam without having to take all of the required courses. Simply show your current NARTE card, pay the exam fee and take the exam. Please note that the Program Manager exam does cover additional areas and may be more difficult than the NARTE exam.

Continuing Education

There is a requirement to take additional classes to maintain certification. Further information will follow regarding this portion of the requirements for certification.

Registration

To obtain certification, you must initiate an official file in your name at the ESD Association Headquarters. Please complete the PDF registration form and send it with a \$50 payment to the:

ESD Association
7900 Turin Road, Bldg 3
Rome, NY 13440 USA

or fax your registration form and payment to: 315-339-6793. ▲

Symposium

Continued from page 2

track offers sessions and activities specifically focused on the information and resources needed to address and solve ESD problems.

Tutorials

Sunday

- ESD Basics for the Program Manager

Monday

- Ionization: Issues and Answers
- How To's of In-Plant ESD Survey and Evaluation Measurements
- Packaging Principles for the Program Manager

Thursday

- ESD Standards Overview for the Program Manager
- Cleanroom Considerations for the Program Manager
- ESD Control for Extremely Sensitive Devices

Technical Sessions

- 2B Magneto-resistive Devices (GMR/TMR)
- 4B Factory and Materials
- 5B TLP/HBM/CDM: Testing

Workshops

- A.1 ESD Control and Design for Extremely Sensitive Class 0 Devices
- B.2 Automated ESD Rule Verification and EDA Tools.
- B.3 Controlling ESD in Automated Process Equipment
- B.4 Advanced Topics in ESD Auditing
- C.3 Cleanrooms/ESD/Ionization Guidelines and Considerations

Track 3

Device, Design, and Technology (DDT)

Advancing and changing technologies continually challenge designers and users of sensitive devices to seek new EOS/ESD solutions. At this year's Symposium, explore the latest research and information on device technologies.

Continued on page 7

Static Solutions Inc.

331 Boston Post Rd.-East, Marlboro, MA 01752 USA

Tel: 508-480-0700 Fax: 508-485-3353 www.staticsolutions.com

Worldwide manufacturer of patented ESD Cleanroom products, including Ohm-Stat™ combination/resistivity meters, Ohm-Shield™ coatings/floor finishes/paints, Ohm-Cide™ EPA cleaners, Stat-o-Flex™ Class Zero wriststrap, and Ultimat™ Class Zero out-gassing rubber.

Saint-Gobain Advanced Ceramics

1225 Aero Plaza Drive, Colorado Springs, CO 80916

Tel: 719-637-8714 Fax: 719-380-5591 Stanley.C.Smith@saint-gobain.com

Manufacturer of Cerastat™ ESD ceramics products to customers' prints: tools, fixtures, wear parts for data storage and other electronic industries

Symposium

continued from page 6

Customize your symposium experience

Tutorials

Sunday

- ESD On-Chip Protection in Advanced Technologies
- System Level ESD/EMI

Monday

- RF On-Chip ESD Protection Design and Test
- SPICE-Based ESD Protection Design
- Troubleshooting On-Chip ESD Failures
- Circuit Modeling and Simulation for On-Chip Protection
- Latchup Physics and Design
- Impact of CMOS Technology Scaling on ESD HCPH
- CDM Design and Characterization

Thursday

- EOS/ESD Failure Models and Mechanisms
- Device Technology and FA Overview

Technical Sessions

- 1A ESD Failure Case Studies
- 1B Modeling and Simulation of On-Chip ESD Latch-up Effects
- 2A On-Chip ESD Protection for HV CMOS and Bipolar
- 3A System Level
- 5A Modeling and Simulation of On-Chip ESD Latch-up Effects

Workshops

- A.2 CDM at the Nanoscale Frontier
- C2 Layout for ESD and Latchup Robustness
- C4 ESD Protection Considerations in High Voltage Technologies ▲

Education

Device/Design Seminar set for Germany

The ESD Association will hold a Device/Design Seminar in Munich, Germany, May 22-23, at the Fraunhofer Institute for Reliability and Microintegration IZM, followed on May 24 by an ESD Testing and Characterization Program presented by the Fraunhofer Institute for Reliability and Microintegration IZM. This program will include the following sessions:

ESD Qualification Testing

Discuss how to apply HBM, MM, and CDM standard test methods, how high pin count works, and the limitations of CDM.

ESD Characterization

Discover how to gain accurate insight into the electrical behavior of protection elements and of elements to be protected.

ESD Failure Reproduction and Alternative Models

This session looks at ESD failures and how to reproduce them, including aspects of system level HBM, cable discharge event, and charged board model.

Lab Experience

Gain an understanding of characterization equipment and methods. Send devices that you would like to discuss at the May 24 session to IZM, with a brief description. IZM will pre-test and discuss them at the session but reserves the right to select cases of general interest. Printed data will be provided only to the individuals who sent devices.

Instructors

Horst Gieser is head of the Analysis & Test of Integrated Systems (ATIS) department at the Fraunhofer-Institute for Reliability and Microintegration, Munich branch. He received his diploma in electrical engineering and his Ph.D. from the Technical University of Munich. He has authored and co-authored more than 50 publications, including two books, mainly in the field of electrostatic discharge. Three of them received awards at international conferences. Currently, he is chairing the ESD Forum e.V., a German non-profit association that supports the exchange of experience in this complex subject by means of a bi-annual symposium called ESD-Forum.

Heinrich (Henry) Wolf received his diploma in electrical engineering from the Technical University of Munich (TUM), Germany in 1994. He joined the Chair of Integrated Circuits at TUM as a member of the scientific staff working on ESD related issues. In 1999 he joined the Fraunhofer-Institute for Reliability and Microintegration (IZM). He was involved in the investigation of ESD phenomena in the CDM time domain for CMOS and Smart Power Technologies. Furthermore, he has published information on the development of ESD test methods and tester characterization. Currently he is also working in the field of RF-characterization and parameter extraction.

For more information about this program or to register, download a flyer in PDF format from the ESD Association website, www.esda.org.▲

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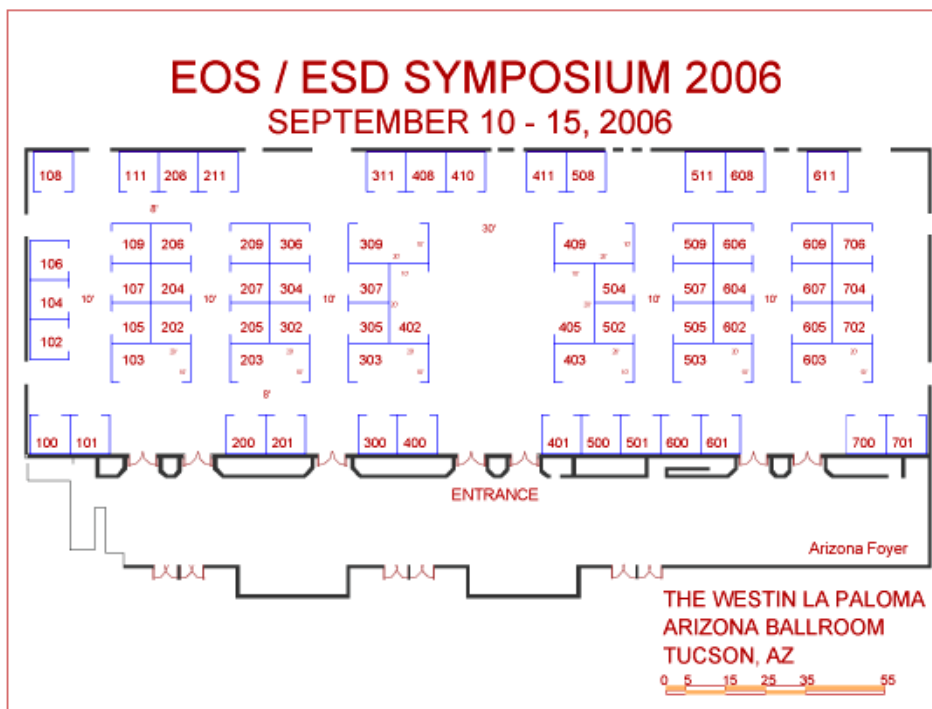
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Symposium

Exhibit at the 2006 EOS/ESD Symposium

At least 40 exhibitors have already committed to the 2006 EOS/ESD Symposium. There is still good space available. To reserve your space and for information on exhibiting, contact Lisa Pimpinella, ESD Association, 7900 Turin Road, Building 3, Rome, NY 13440; phone, 315-339-6937; or fax, 315-339-6793. Below is a list of the current exhibitors with their booth numbers.

Exhibitors	Booth Number	Exhibitors	Booth Number
3M	Booth 403	Monroe Electronics	Booth 401
ACL, Inc.	Booth 408	NRD LLC	Booth 209
Associated/ACC	Booth 309	Nippon Fusso, USA, Inc.	Booth 102
Barth Electronics, Inc.	Booth 503	Noveon Static Control	Booth 500
Botron Co., Inc.	Booth 700	NOVX Corporation	Booth 409
CCI-Conductive Containers, Inc.	Booth 311	Oryx Instruments	Booth 305, 307
Century Container	Booth 508	PRF Industrial, LLC	Booth 501
Ciba Specialty Chemicals	Booth 202	Prostat Corporation	Booth 203
Credence Technologies, Inc.	Booth 304	RTP Company	Booth 600
Desco Industries	Booth 402	SCC	Booth 103
Dou Yee Enterprises, Ltd.	Booth 409	Shenzhen Zizone Industrial Co, Ltd.	Booth 200
Electro-Tech Systems, Inc.	Booth 410	SIMCO an ITW Co.	Booth 303
Electronic Polymers, Inc.	Booth 100, 101	Static Solutions	Booth 201
FLEXCO	Booth 505	STATICO	Booth 306
H.C. Starck, Inc.	Booth 507	Stephen Halperin & Assoc./Prostat Corp.	Booth 203
HANWA Electronic	Booth 511	TDI, International, Inc.	Booth 509
Hyperion Catalysis	Booth 502	Tech Wear Inc.	Booth 601
ION Systems	Booth 405	Tek Stil Concepts, Inc.	Booth 611
ITW Richmond Technology	Booth 207	Thermo Electron Corp.	Booth 300, 400
Kreha Corporation of America	Booth 504	Trek Inc.	Booth 603
		VPI	Booth 205
		Vidaro Corp.	Booth 411



ProLine

10 Avco Rd., Haverhill, MA 01835
Tel: 800-739-9067 Fax: 978-374-4885
www.1proline.com Email: Bench@1proline.com
Manufactures ESD modular and ergonomic workstations

Molded Fiber Glass Tray Co.

6175 US Highway 6, Linesville, PA 16424
Tel: 800-458-6050 Fax: 814-683-4504 email: info@mfgtray.com
Manufacturer of static dissipative and conductive
trays and containers for static protection of sensitive parts.

Education

ESD On Campus Program

by Steven H. Voldman, IBM Microelectronics

Spring Semester Universiti Sains Malaysia

ESD on Campus arrived in Penang, Malaysia to the sounds, and sights of a land filled with diversity in food, culture and of course semiconductor corporations. Waking up in Penang, Malaysia starts with the Muslim Call to Prayer broadcasted across Penang at 6:10 am. The morning breakfast consists of Indian, Chinese, and Malay delicacies - before the visit to the Universiti Sains Malaysia (translated University of Science Malaysia). The morning greeting language switches from English, to Malay, to Mandarin, and other Chinese dialects (e.g., Hokkien). Selamat pagi! Zao on! Good morning sir! ... the morning has begun in Penang! Business cards are passed over the coffee cups filled with strong coffee from the region. Sales men and women flashing cards, selling everything from electronics to CDs, and components...What are the businesses in Penang? Motorola, Intel, Alterra, Silterra, BenQ, and Avago, the list goes on, all working on assembly, packaging, shipping, to RF product applications. What is being produced? Everything from digital CMOS, RF walkie-talkies, to Gallium Arsenide RF applications. The menu of corporations and what they are working on, is as wide as the foods of Malaysia - all interested and hungry to learn about ESD. All having some ESD issue in manufacturing to RF components.

The "ESD on Campus" arrived on this campus to visit faculty in the Department of Physics at the Universiti Sains Malaysia to discuss the value of electrostatic discharge (ESD) protection and the value of teaching these materials for the employees and workers in the semiconductor industry in Penang, Malaysia - - the Pearl of the Orient. As one enters the campus, it consists of Mosques side-by-side with different departments such as the Department of Physics. In this visit, we had the

opportunity to meet with physics faculty, such as Professor Rosie Teh, and show them educational materials and books on ESD that may be of interest to teach in the future. Also serving as a host, was Professor Yuen Kah Hay who assisted in introducing faculty in sister departments.

When we began the ESD on Campus program, little did I believe we would be venturing from one minute, such varied places as, the University of Illinois, Taipei, Stanford University and Malaysia. With the new ESD on Campus program, the ESD BoD hopes to visit many more colleges, and university campuses where interest in ESD will help the industry in its local region. ▲

Association

Volunteer Spotlight

May/June's volunteer spotlight is Brent Beamer. Brent is chairman of Packaging Standards Development Work Group and of Wrist Strap Standards Development Work Group. He is a member of STDCOM and Work Surfaces and Footwear Standards Development Work Groups. He has served as chair of the Nominations Committee, Director of the ESD Association Board and a Marketing Committee member.

Educational and professional background:

For over a decade, Brent Beamer has worked in the field of static control product development for SCC and previously with Baxter International. As Technical Director for SCC's ESD Products Division, he has responsibility for ESD product development, quality assurance, and SCC's laboratories. Brent has authored articles, papers, and tutorials about ESD for indus-

try publications, the EOS/ESD Symposium, and the British Electrostatic Control Association. His degree in electronics is from Indiana State University. He holds patents in both electronics and packaging.

Brent was recognized for his work with the ESD Association with the 2003 Joel P. Weidendorf Memorial Award.

In 2006, Brent received the Distinguished Committee Service Award from the IPC for his contributions to the development of IPC/JEDEC J-STD-033B, Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices.

Personal information, interests, and hobbies:

Brent and his wife Carolyn live in Cary, North Carolina. Cary, dubbed the "Containment Area for Relocated Yankees" by native North Carolinians, is a family oriented suburb of the Research Triangle Park (RTP) between Raleigh and Durham. Carolyn is the warranty service administrator for Honeywell Roofing. "We are stereotypical DINKS" (dual income - no kids) says Brent. "We both work too much, talk a lot about toys, and our dog Murphy thinks she's a person." Brent and Carolyn spend a lot of sunny weekends driving in their convertible. "The destination, whether it's a restaurant, friends, or the beach, is less important than just escaping for awhile", says Carolyn. Brent and Carolyn also enjoy cooking. Brent prepares the main course and Carolyn is a master at deserts. If reading can be a hobby, then Brent is a charter member as he is usually reading two books, three newspapers and trade periodicals at the same time. Carolyn has picked up the reading habit and is working on a way to read and crochet at the same time. Brent has lived in many parts of America, with time in Mississippi, Indiana, Chicago, Los Angeles, and North Carolina. He says "It seems like I take the best part of each place with me. Especially California; that's were I met Carolyn."▲

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Standards

2006 June
Meeting Schedule

June 8-13, 2006
Wyndham Hotel
Palm Springs, CA

Thursday	
TAS	8:00 AM- 5:00 PM
Tutorials	
Latch-up	8:30 AM- 10:00 AM
TLP Measurements	10:30 AM- Noon
System Level	1 :00 PM - 4:30 PM
Friday	
TAS	8:00-5:00
WG-3, Ionization	8:00-Noon
WG-97.1 & 97.2,	8:00-Noon
WG-5, Device Testing	8:00-5:00
WG-10, Handlers	1:00-5:00
Saturday	
TAS	8:00 - 5:00
WG-53, Workstations	8:00-Noon
WG Chair Meeting	5:30 - 6:30
WG-5, Device Testing	8:00-5:00
WG-11, Packaging	1:00-5:00
WG-2, Garments	8:00-Noon
WG Mixer All Invited	6:30-7:30
Sunday	
TAS	8:00 - 5:00
WG-7, Flooring	8:00-Noon
WG-14, ESD Simulators	8:00-Noon
WG-15, Gloves	8:00-Noon
STDCOM	1:00-4:00
EXCom/AAC	6:00-9:00
Monday	
Human Resources	8:00-Noon
Steering Committee	1:00-5:00
Tuesday	
BOD	8:00-5:00

Certification

2006 certification courses

Continuing to offer education as often and as conveniently as possible, the ESD Association has scheduled Certified tutorials in Palm Springs, CA. The three tutorials are scheduled for June 8th at the Wyndham Hotel.

Latch-up Physics and Design
8:30 AM - 10:00 AM

Latch-up continues to be of interest today in advanced CMOS, mixed signal (MS) CMOS, RF CMOS, BiCMOS, and BiCMOS silicon germanium. The latch-up tutorial will provide a discussion on device level latch-up physics, latch-up metrics and design criteria, latch-up test structures, test methods, latch-up measurement techniques, device-level CAD simulation, and new latch-up issues. Both internal and external latch-up phenomena, as well as DC and transient latch-up, will be addressed. Latch-up structures, guard ring physics, and characterization will be discussed in depth. The tutorial will provide examples of discussion on latch-up device level simulation, using latch-up scaling issues as examples. Latch-up process solutions, such as heavily doped buried layers (HDBL) and triple wells will be shown. The tutorial will briefly discuss latch-up standards. The tutorial will end with a discussion on the state-of-the-art latch-up issues and characterization techniques and tools.

TLP Measurements: Parametric Analyzer for ESD On-Chip Protection
10:30 AM - Noon

The Transmission Line Pulse (TLP) technique has often been called the Parametric Analyzer for On-Chip ESD Protection. The TLP system utilizes rectangular pulses at current levels and time scales similar to Human Body Model (HBM) events. The rectangular pulse of a TLP system allows the measurement of cur-

rent-voltage (I-V) curves from which can be extracted a variety of device and circuit parameters. These parameters cannot be measured with the double exponential pulse characteristic of HBM. This tutorial will explore the parameters to be measured with a TLP system and discuss the importance of the parameters in the design of on-chip ESD protection circuits. Circuit elements and circuits that will be discussed include NMOS and PMOS transistors, npn bipolar transistors, diodes, resistors, metal runners, power supply clamps, and even full integrated circuits. The variations in the test structure layouts are important for understanding the properties of the technology will be discussed.

System Level ESD/EMI: Testing to IEC and Other Standards 1:00 PM - 4:30 PM

This tutorial is intended to help those tasked with testing products to IEC and other System level ESD standards by providing detailed information on IEC 61000-4-2, the most widely used standard, and highlighting the harmonization and differences between IEC, ANSI, Telcordia and some automotive ESD standards. We will answer common questions regarding test set-ups, test points and procedures, and address key issues, including: 1. Differences between "verification" and "calibration" and when is each required, the influence of ESDA WG14.1 (TR) on IEC and how it affects the calibration and verification procedures. 2. Test set-up requirements, the test environment, ground connections and return paths and ground plane effects. 3. Testing procedures with demonstration on actual products, how the tester affects test results, problems with test result variations due to simulator influences. 4. What points need to be tested and why, guidance on determining "operator accessible" points and ports, exempted points and ports and what to do around

Continued on page 11

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Certification

Program Manager Brochure



The Program Manager Brochure is now available online at www.esda.org. The Program includes course listings, descriptions, and an overview of the Technology Roadmap.

The purpose of the Roadmap is to project the impact of technology scaling in the semiconductor industry. To develop the Roadmap, ESD device and design experts collaborated from several major corporations. The projections they formulated are based on industry trends and technology constraints and are not representative solely of the design methods used at their respective companies. Current advances in electronic device process speed and capability are dramatically outpacing the ability to design in ESD protection for the devices. Major device manufacturers are predicting that device sensitivities will fall well below the current threshold levels by the year 2010. Companies involved in electronics manufacturing must be prepared to handle these devices or significant losses could occur. Strong understanding of the ESD control capability of the factory will be required in order to maintain process yields in the near future. The ESD Association has developed an education program that will provide the ESD program manager with the knowledge to develop an effective control program. To download a pdf of the Technology Roadmap, visit www.esda.org.

The ten course program provides the attendee with the information required to successfully implement an ESD control program in the factory. The student can take any one course, or all ten courses, to broaden their capabilities in ESD management. Upon completion of all courses, and the successful completion of an exam, the attendee can also achieve Pro-

gram Manager Certification from the ESD Association. Program Manager Certification demonstrates a very strong knowledge in the area of ESD control. A casual approach to ESD control will no longer be effective as technology progresses. Make sure that your factory has the people with the right knowledge to maintain production yields at the highest levels. Program Manager designation was developed for individuals that are involved in designing, implementing, managing and auditing ESD control programs in their facilities. The following courses are offered every year at symposium and at other times throughout the year. An attendee may receive credit for having taken any of the required Program Manager classes if the class was taken in 2003 or later. Additional information may be obtained at <http://www.esda.org/programmanager.html>.

- ESD Program Development & Assessment
- (ANSI/ESD S20.20 Seminar) (2-day course)
- ESD Basics for the Program Manager (full-day course)
- How To's of In-Plant ESD Auditing and Evaluation Measurements (full-day course)
- Air Ionization: Issues and Answers (half-day course)
- Packaging Principles for the Program Manager (half-day course)
- ESD Standards Overview for the Program Manager (half-day course)
- Device Technology and FA Overview (half-day course)
- Electrostatic Calculations for the ESD Engineer (half-day course)
- Cleanroom Considerations for the Program Manager (half-day course)
- System Level ESD/EMI:
- Testing to IEC and Other Standards (half-day course)

Certification

2006 certification courses

Continued from page 10

connectors and connector pins. 5. ANSI and other ESD Standards, the drive toward harmonization with IEC, why standards will probably never be the same as IEC, the scope of different standards. The System Level ESD tutorial will cover several facets of ESD as applied to electronic systems.

About the instructors

Steven H. Voldman PhD, is an IEEE Fellow for "contributions in ESD protection in CMOS, Silicon On Insulator and Silicon Germanium Technology." He is on the ESDA's Board of Directors, is presently a member of IBM's BiCMOS RF Silicon Germanium (SiGe) and RF CMOS development team.

Leo G. Henry PhD, of Electronic Polymers Inc., is an IEEE member. He is on the ESDA's Board of Directors and is the National Tutorial Program Chair, a Standards Working Group Chair, TAS Committee member and a member of the Standards Committee. Henry is an independent ESD-TLP engineering consultant, specializing in Teaching and Testing.

The course is \$275 for association members and \$375 for non-members. Full day courses are \$475 for members and \$575 for non-members. To register for ESDA courses, go to the Register for Upcoming Courses link, www.esda.org/upcomingcourses.html, on the ESDA website and download the PDF registration form. ▲

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Calendar

May 2006

May 22-23

ESD Device/ Design Seminar

Munich, Germany

www.esda.org

June 2006

June 5

ESD North Central Chapter Meeting

Seagate Technology, Bloomington, MN

Host: Kevin Duncan

Technical presentation - "ESD Considerations for Disc Drive Manufacturing"

www.esdnorthcentral.org/nextmeeting.html

June 6-9

ESA 2006 Annual Conference

University of California, Berkeley

(A Joint Meeting of the ESA, IEEE-

IAS, SFE, and IEJ)

www.electrostatics.org

June 7-9

Information Storage Week (ISA) 2006

SRC: June 7-8

Exhibition: June 8-9

International Disk Forum: June 8-9

Tokyo Conference Center

Iidabashi, Tokyo

www.idema.org

contact: adachi@idema.gr.jp

June 8

ESDA Certification Tutorials

Latch-up Physics and Design

TLP Measurements

System Level ESD/EMI: Testing

www.esda.org

June 8-13

Standard Meeting Series

Wyndham Hotel

Palm Springs, CA

www.esda.org

June 13-16

NEPCON Microelectronics

Penang, Malaysia

www.nepconeast.com

July 2006

July 9-14

2006 American Electromagnetics

Symposium (AMEREM)

Hyatt Regency Albuquerque

Albuquerque, NM

<http://www.ece.unm.edu/apsursi2006/>

September 2006

September 7-10

Standard Meeting Series

Tucson, AZ

www.esda.org

September 10-15

ESD Association

Annual Symposium

Westin LaPaloma

Tucson, Arizona

www.esda.org

September 13-14

DISKON USA 2006

Trade Show and Conference

Hyatt Regency Hotel

Santa Clara Convention Center

Santa Clara, CA

www.idema.org

November 2006

IEST Fall Conference 2006

November 5-8

Hilton Garden Inn

Hoffman Estates, Illinois

(near Chicago O'Hare International Airport)

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Threshold

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September/October	Aug. 1
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March/April	Feb. 1
May/June	April 1
July/August	June 1

Threshold Institutional Listings

Space in the Threshold Institutional Listings, which appear at the bottom of newsletter pages, can be purchased for \$600.00 for six consecutive issues. Larger contributions are welcome. No agency fee is granted for soliciting such contributions. Inquiries, or contributions made payable to the ESD Association, should be sent to

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