

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



THRESHOLD™

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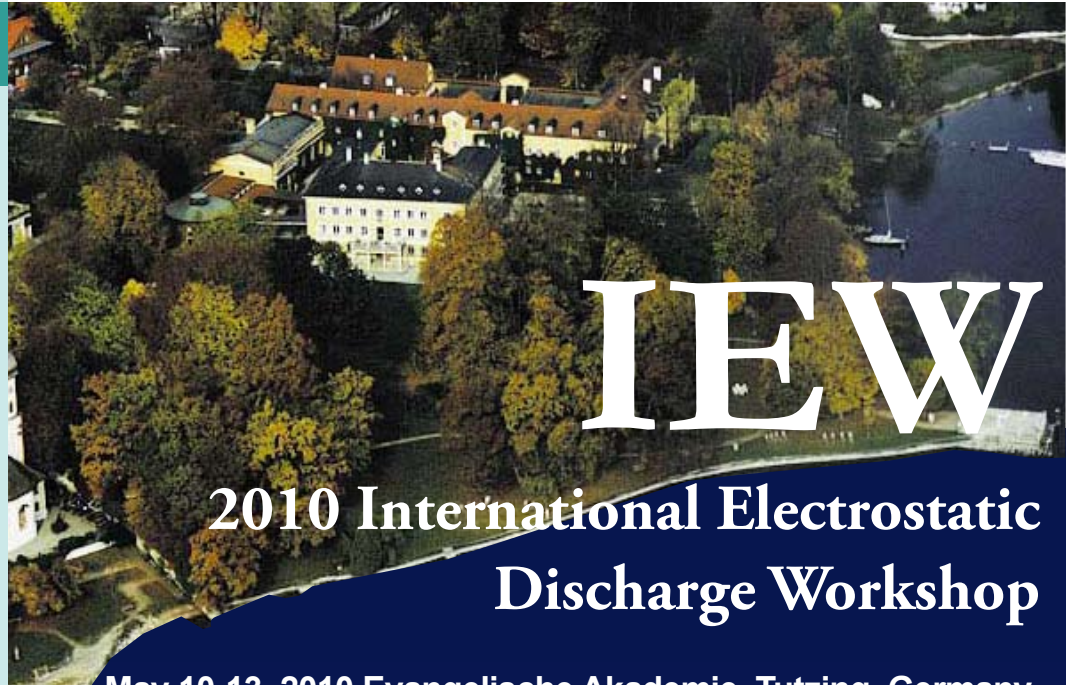
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May 10-13, 2010 Evangelische Akademie, Tutzing, Germany

You are cordially invited to participate in the 2010 International ESD Workshop. The IEW provides a unique environment for envisioning, developing, and sharing ESD design and test technology for present and future semiconductor applications. Here you will closely interact with your peers at technical sessions, moderated discussion groups, poster sessions, seminars, and special interest groups.

This workshop happens in a time of an important paradigm shift in ESD robustness design. Constraints of modern technologies and performance requirements restrict the ability to design practical overall ESD robustness on-chip. At the same time, system ESD requirements have become more demanding. IEW 2010 provides the chance of better alignment between system manufacturers and IC suppliers by discussion and exchange in a relaxed atmosphere of interactive learning. This workshop should be equally beneficial for IC and system ESD designers.

On the shores of Lake Starnberg, 40 kilometers southwest of Munich, lies the Tutzing estate and its 18th century mansion. With its modern conference rooms and facilities, this venue is well suited for the workshop. The on-site single and double bedrooms provide a comfortable stay within the quietness of the private park around the castle. From the balconies and the patios there is a magnificent view of the Bavarian Alps. The spirit of this place encourages thoughtful discussion and intensive interaction.

Come and be inspired!

Register Online by March 29th and Save!

<http://esda.org/onlineregistrations.html>

For more information on IEW turn to page 10

From the President

Inside ESDA....

Donn G. Bellmore

When this issue of Threshold is published, I hope spring will be starting somewhere. It seems like it has been a long, long winter here in New York. My wife Elaine and I, went to Florida for the month of January to get away from the snow and cold. Instead we experienced record freezing temperatures for two weeks before it warmed up to the seasonal temperatures we were looking for.

As we start the spring season, we will have already returned from Sparks, Nevada, where we offered our brand new two-day "ESD Essentials for The Program Manager" Seminar and attended our winter standards meetings series. I have been asked several times lately about what actually happens during these meetings and how does a document in our organization become a standard. I have decided to take this opportunity to answer these questions and also to give you a little background on the organization of the Standards

Business Unit.

First, let's look at the organization of the Standards Business Unit, which is currently comprised of 83 volunteers participating on a number of subcommittees. On January 1st of this year, we welcomed Carl Newberg as the new Standards Business Unit Manager. He is assisted by the ESDA Standards Administrator, Christina Earl. The standards subcommittees include the Standards Committee (STDCOM), the Technical and Administrative Support (TAS) Committee, and a number of standards Working Groups (WGs).

Carl is also the new STDCOM Chair. The committee is currently comprised of 37 volunteer members and is the consensus body responsible for the review and approval of all documents released as Draft Standards for Industry Review and final Standards for publication.

TAS is currently comprised of seven appointed volunteer members and chaired by Fred Tenzer. Members are appointed to this committee by the TAS and STDCOM Chairs. The committee's responsibilities include ensuring the documents are technically correct, and to provide technical and administrative support and assistance to the working groups. While they do not manage or direct the WGs, TAS member's participate in their assigned WGs as members and provide guidance in the development of a standard. More importantly, they act as a liaison between the WG and STDCOM.

There are currently 22 active WGs at this time, including one brand new WG and four WGs that are being reactivated this year for five-year document reviews. I, being a working group member myself (and not biased at all) must say the WGs do most of the work. WGs are made up of volunteers who are interested in a specific area or topic of ESD control or device testing. WG members are responsible for the research, testing, and writing of the documents. Many people participate in these meetings as experts, representing their part of the industry. For a list of the current WGs please visit the ESDA website under "Standards Committee Information". <http://www.esda.org/standardscommittee.html>

OK, this is all well and good, but how is a need identified and then a Standard (S), Standard Test Method (STM), Standard Practice (SP), or a Technical Report (TR) published? Rather than going into the definitions of the various designations here, please refer to the ESDA Website under "Standards and Definitions of Document Designations" for a detailed explanation.

<http://www.esda.org/Designations.html>

A need can be identified by a working group member or an individual contacting the STDCOM Chair. The proposed need is then discussed with TAS members and if agreed to, it is assigned to a current WG or a new WG may be formed. A work statement is then completed by the assigned WG

Continued on page 3

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From the President

Inside ESDA...continued

to identify the scope, purpose, application, and type of document. Once the work statement has been approved by TAS and the Standards Chair, a completed Project Initiation Notification System (PINS) form is filed with ANSI to alert any interested parties that work is to begin.

Once the Working Group starts working on a document, the group decides, with TAS support, what needs to be done. Most projects require research into the area of interest, some data collection and analysis, presentations, numerous discussions, and finally with WG member consensus, a Work In Progress (WIP) document is written. Depending on the complexity of the project, it can take a short time or a few years to write a WIP.

After a WIP has been approved by TAS it is sent to the STDCOM members for a 30-day review and vote. If technical changes are made, the document goes back to the WG for changes and a revote. If no technical changes are made, then a Draft Standard is sent to WG selected Industry Reviewers and a notification placed in ANSI's Standards Action publication for a 45-60 day review and comment period. If technical comments are received and subsequent changes made, the document is brought back to a WIP for revision by the WG and must go through the entire process again. If no technical changes are made then the document is published as a full standard. Please understand that while this is not a complex

process, I have taken the liberty for the sake of being succinct to simplify the description of the process.

Are you an expert or a future expert? Now the question becomes – "Are you interested in attending or becoming a member of a working group?" Standards meetings are held three times a year from Friday through Sunday. Most of the WGs meet face-to-face for 3-4 hours during each meeting series and then continue document work with conference calls in between. Guests are always welcomed at WG and STDCOM meetings. If you are interested in ESDA WGs please contact the ESDA or join us at our next meeting series on June 11 – 13 at the Doubletree Resort, Chicago IL. The meeting schedule will be posted on the ESDA Website in Mid-April. If you are interested in becoming a member of any of the WG committees or STDCOM, you must attend two consecutive meetings as a guest and then request membership through the Standards Administrator for approval by the WG and STDCOM Chairs.

I hope this has answered your questions about the Standards Business Unit and I look forward to seeing new faces at our meeting series in June.



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Association

VOLUNTEER APPEAL

The ESD Association is successful because it is supported by a network of volunteers who carry out our mission and activities. Without volunteers, the ESD Association would accomplish very little. Except for four staff members at our headquarters in Rome, New York, everyone from the President of our organization on down is a volunteer.

ESDA volunteers are motivated to participate for many reasons:

- ▶ To make an important contribution to a technically interesting field
- ▶ To be on the cutting edge of developing new standards
- ▶ To learn about new products
- ▶ To hear about technical ideas early
- ▶ To engage with interesting colleagues
- ▶ Their individual contributions are valued
- ▶ To give meaningful input to the ESDA (draft a standard, perform testing, initiate a new project, be on a panel, serve on the board of directors, etc.)
- ▶ To network with people from different companies, backgrounds and countries
- ▶ They enjoy working hard and having fun

Some volunteers participate because they have great support from their company and can travel to periodic meetings. There may be a business motivation for some and a purely altruistic motivation for others. Some volunteers continue to participate even when company support fluctuates. Volunteering with the ESDA can be rewarding on many levels.

Still, our network of volunteers needs constant renewal as people retire, lose corporate support, or leave the industries we serve. We also strive to expand what we do, which requires more volunteers. We currently have over 100 active volunteers, yet we have some gaps to fill in order to accomplish all of our goals. Anyone can help, and any amount of time provided is very valuable.

The Standards working groups are an important resource for volunteers. This body of volunteers meets three times each year to initiate and draft standards documents. There are currently 22 working groups working on 60 documents. Volunteering for a standards working group is a great place to start making an impact, to demonstrate your abilities, and eventually take on larger and more challenging tasks.

Our annual ESD Symposium is an event that calls for considerable volunteer effort. There are many technical, educational, and social events that must be planned, organized, and executed. Many volunteers are needed to successfully deliver all these events.

We recognize that not everyone can travel regularly to attend these meetings and events. Additionally, given the current economy, the availability of your time may be limited. Still, for those limited in time and travel budgets, there are ways for new volunteers to get involved. All types of volunteers are needed for a wide variety of tasks, large and small. We need volunteers for both technical and nontechnical

tasks; tasks requiring travel; tasks that do not require travel. Every volunteer is valued for their time and effort.

Here are some of our current volunteer needs:

Volunteer Mixer- A volunteer to help plan the volunteer mixer and act as greeter for this social gathering- time requirement less than 10 hours per year

Volunteer Recognition- A volunteer to chair and act as Master of Ceremonies for our Annual Volunteer Recognition Event- time requirement about 10 hours per year

Tutorial and Workshop Monitors- Assist with individual tutorial sessions and workshops at our annual ESD Symposium- one half day minimum time requirement during Symposium week

Corporate Membership- Volunteers to seek out companies to become corporate members

Standards Working Groups- Volunteers to participate in standards development. People from user companies, vendor companies and general interest are all needed. Time requirement is at least 3 weekends per year

Grade Exams- Must be a certified program manager or device design manager. Travel not required. Time requirement is 24 hours over a 2-3 week period in October-November after the test.

Look for this button at www.esda.org



Continued on page 5

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Association

Volunteer Appeal continued from page 4

Vet Exam Questions- Must be a certified program manager or device design manager. Travel not required. Time requirement is a few hours per month.

ESD Symposium- Help out behind the scenes at our annual Symposium. Even if you can't attend, there may be ways to contribute to the planning and organizing stages.

Education and Advanced Topics- Help out by reviewing new courses, seek out speakers for our events, research other industries and technologies, help market our organization to different industries, and submit articles. Plus many more ways to help that are too numerous to list

As you can see, we would value any help that you would care to offer. If there is a specific task that piques your interest, let us know. If you want to volunteer yourself to help out anywhere that we need help, let us know that, too. If you want to volunteer, please contact:

info@esda.org

ESD Association Headquarters

– or –

dpritchard@monroe-electronics.com

Donald L. Pritchard

Human Resources Business Unit

Education

TX Local Chapter Regional Tutorial Program

March 9-10, 2010
3M Innovation Center, Austin, TX

ESD Basics for the Program Manager*

March 9, 2010, 8:30 a.m. - 4:30 p.m.
Instructor: Steve Halperin, Stephen Halperin & Associates, Ltd.

How To's of In-Plant ESD Auditing and Evaluation Measurements*

March 10, 2010, 8:30 a.m. - 4:30 p.m.
Instructor: Steve Halperin, Stephen Halperin & Associates, Ltd.

NC Local Chapter Regional Tutorial Program

April 14-15, 2010
Holiday Inn, Bloomington, MN

Device Design Seminar**

April 14-15, 2010, 8:30 a.m. - 5:00 p.m.
Instructors: Charvaka Duvvury, Texas Instruments; James W. Miller, Freescale

Ionization and Answers for the Program Manager*

April 14, 2010, 8:30 a.m. - 12:00 p.m.
Instructor: Arnold Steinman, Electronics Workshop

Cleanroom Considerations for the Program Manager*

April 14, 2010, 1:00 p.m. - 4:30 p.m.
Instructor: Chris Long, IBM

Packaging Principles for the Program Manager*

April 15, 2010, 8:30 a.m. - 12:00 p.m.
Instructor: David E. Swenson, Affinity Static Control Consulting, LLC

ESD Standards Overview for the Program Manager*

April 15, 2010, 1:00 p.m. - 4:30 p.m.
Instructor: David E. Swenson, Affinity Static Control Consulting, LLC

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NE Local Chapter Regional Tutorial program

May 4-6, 2010, North Reading, MA
Teradyne Conference Center

ESD Program Development & Assessment (ANSI/ESD S20.20 Seminar)*

March 4-5, 2010, 8:30 a.m. - 4:30 p.m.
Instructors: David E. Swenson, Affinity Static Control Consulting, L.L.C.; Carl Newberg, MicroStat Laboratories & Dangelmayer Associates, L.L.C.

Auditing Measurements, Strategies, and Pitfalls

March 6, 2010, 8:30 a.m. - 4:30 p.m.
Instructors: Ted Dangelmayer, Dangelmayer Associates, L.L.C.; Carl Newberg, MicroStat Laboratories & Dangelmayer Associates, L.L.C.

*These classes are part of the ESDA Program Manager Certification curriculum. More details on the Professional Certification Programs offered by ESDA are on our website at www.esda.org/certification.html

** The Device Design Seminar qualifies towards the ESDA Device Design Certification curriculum. More details on the Professional Certification Programs offered by ESDA are on our website at www.esda.org/certification.html

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Volunteer Spotlight

*Tim Maloney**A volunteer with the winning hand!*

Timothy J. Maloney finished his S.B. degree in physics at Massachusetts Institute of Technology (MIT) in 1971. Tim told the ESDA he had the good fortune to have done his senior thesis at MIT with two future Nobel Prize winners - Bill Phillips (Nobel 1997) and Carl Wieman (Nobel 2001). "Carl once told the press something I always suspected. That it's when you do the work that is eventually recognized that you feel the best. I can agree with that. When the breakthrough ESD achievement happens, you just know it will work out well," said Tim. Tim went on to an M.S. in physics from Cornell University, and to a Ph.D. and a postdoc in electrical engineering from Cornell. He was in semiconductor device and equipment research at Varian Associates from 1977-84, where he acquired valuable experience with high voltages and high speed devices. Since 1984, he has been with Intel Corp., Santa Clara, CA, where he has been concerned with integrated circuit ESD protection, CMOS latch-up testing, signal integrity, and system ESD testing. He is now a Senior Principal Engineer at Intel. His Intel Achievement Award (1994) was for his patented ESD protection devices, which were applied to a wide variety of Intel products. He has thirty-one patents, with several more pending.

Tim Maloney is well known in the ESD/TLP Design community for his technology, testing, and equipment breakthrough "*Transmission Line Pulsing Techniques For Circuit Modeling*" published in 1985 in the EOS/ESD Symposium Proceedings and at IRPS. It is the first real paper on TLP use, helping to improve IC designs. It may be the most referenced paper in the History of ESD/TLP Design.

Tim received Best Paper Awards for his contributions to the EOS/ESD Symposium in 1986 and 1990, was General Chairman for the 1992 EOS/ESD Symposium, and was awarded the ESD Association's Outstanding Contributions Award in 1995. He is co-author of a book, "Basic ESD and I/O Design" (Wiley, 1998), and is a Fellow of the IEEE. Tim has been an ESDA Board member since 1999. He has served on several ESDA Standards committees and participates in the new unified ESDA/ JEDEC committees, which extend ESDA influence considerably. He also promoted ESDA's relationship with the IEEE, through the 2007 MOU that authorized posting of Symposium Proceedings on IEEE Xplore. This extends the prestige and influence of the EOS/ESD Symposium, as university students and engineering professionals can study past proceedings and use them in their work.



The Symposium has been, and is, an excellent platform for Tim and his Intel co-authors to organize and publish their ESD-related work. These papers have documented Intel's major ESD-related design and manufacturing practices and results over the last 25 years.

In his spare time Tim enjoys playing bridge. He remembers an ESDA bridge game that took place during the riverboat cruise wrap-up event in New Orleans after the 1989 Symposium. Tim hopes these spontaneous games return to the Symposium some time, perhaps in 2010. It would be impossible to pay tribute to Tim Maloney without also mentioning how he has volunteered to write and perform songs at Symposium events; this is the lighter side of Tim Maloney that ESDA members are so fond of.

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Q&A

“standard test methods for flooring resistance measurements”

Q) We are a manufacturer of ESD flooring. Recently, we supplied one of our contractors with a ESD flooring material that was installed properly. ESD readings were taken and were in the 10E7 to 10E8 range, as required. Our testing procedure has always been to use our 701 Megohmmeter, place the 5 pound contacts firmly on the floor about 3-4' apart, and take the readings while holding the contacts.

Our customer is questioning the need to apply any pressure when taking these readings. When not applying some pressure, the readings are more erratic, causing the customer's concern about the efficiency of the ESD floor. Is there anything in EOS/ESD Association Test procedures that addresses this specific issue?

A) ANSI/ESD S7.1 describes the ESD Association standard test methods for flooring resistance measurements. It can be used for laboratory testing (samples prior to installation), acceptance testing (after installation) and periodic verification (method also appears in ESD TR-53 - Compliance Verification). The 701 instrument with 2 each 5 lb., 2.5 inch diameter electrodes is suitable for making the Acceptance and Periodic Verification measurements. It is not

suitable for making Laboratory level testing as it is an open circuit instrument (measurement voltage drops off as indicated resistance increases). A laboratory grade instrument applies a constant or steady voltage across the measurement range (the 100 volts applied does not drop off).

The 5lb. weight of the contact electrode is meant to be the entire force applied during the measurement. The contact area and weight of the electrode is representative of the ball of the foot of a person standing flat-footed on the floor. The method was originally established in NFPA 56A which is now NFPA 99 - the standard on Health Care Facilities. The methodology was originally established for measuring the electrical resistance of hospital operating room flooring.

Applying additional pressure to the contact electrodes is not described in the standards. If more weight were desired, the electrodes would have been made heavier. By applying more force to the electrodes, the soft face (Shore A 70 durometer hardness) will deform a bit more and make better contact with the floor surface - but this defeats the purpose of having a standard size and weight electrode. Whomever told you to press harder on the electrodes was in error. What

is suggested in this case is to use a laboratory grade instrument for making the floor resistance measurements. In the case of disagreement between the installer and the floor owner, a laboratory grade instrument measurement takes precedence.

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Symposium

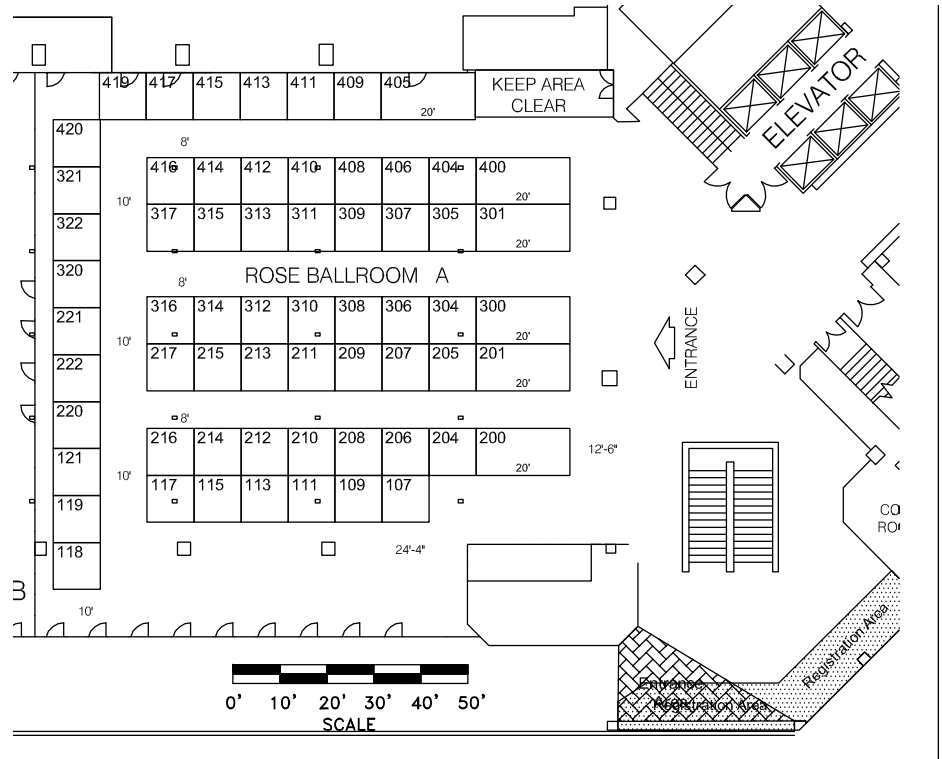
Exhibit at the 2010 EOS/ESD Symposium in Sparks, NV

The EOS/ESD Symposium covers a broad base of interests including industrial, computer, communications, and military electronics; web processing; cleanrooms; semiconductors; MR heads; and electronic systems, components, and equipment.

Five days of tutorials, technical papers, exhibits, workshops, peer networking, and special events provide the information to understand and control EOS and ESD, improve yields and productivity, increase quality and reliability, and control costs.

The symposium is a targeted, concentrated audience of ESD and EOS professionals looking for solutions. This event draws nearly 500 attendees from 30 countries around the world. They come for tutorials, for technical papers, for workshops, for networking...and they come for the exhibits.

Exhibitors have a number of marketing and promotion opportunities available that support the symposium and create company awareness. These opportunities include advertising in the exhibits directory, and sponsoring various symposium events such as lunches, coffee breaks, receptions, and the opening breakfast.



Thirty-two exhibitors have already registered for the 2010 EOS/ESD Symposium. Space is still available and can be reserved by contacting the ESD Association, 7900 Turin Rd, Building 3, Rome, NY 13440, phone 315-339-6937, or fax 315-339-6793.

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ESD on Campus

ESD ON-CAMPUS PROGRAM

The ESD Association On-Campus program foundation is ESD professionals sharing their experiences with students and universities. Since it was first developed in 2005, the on-campus program has focused on promoting ESD research and development and ESD control as a career path. Since its conception, the on-campus program has witnessed the growth of electrical overstress and Electrostatic discharge awareness from manufacturing facilities to college level instruction.

Over the course of the past 4 years ESDA volunteers have traveled around the globe to over 28 colleges and universities giving lectures to groups as large as 200 students. ESDA speakers are often given tours of the universities engineering facilities to witness their research and development of EOS/ESD controls.

Since first visiting universities the ESDA has enjoyed an increase in academia participation at the annual EOS/ESD Symposium. Student authors of technical papers, student attendees wishing to further their education, even university professors becoming involved in working groups and workshops have all become a part of the ESD Association. With the continuation of the on-campus Program the ESDA welcomes this student and university professional participation and the next generation of ESD career professionals.



The Association has elected Kathy Muhonen to the Board as University Programs Chair. Steve Voldman, is the current ESDA On-Campus coordinator and the ESDA University and Academia Outreach coordinator is Charvaka Duvvury. They will work closely together to build on the success of the on-campus program, and continue to stimulate interest from universities and academia, both in the USA and abroad.

Institutions visited by ESD On Campus

University of Central Florida (UCF)

Beijing University

National Tsing Hua University (NTHU)
Taiwan

City University of Hong Kong

Stanford University

University of Buffalo (UB), NY

Arizona State University, AZ

Mahanakorn University of Technology,
Thailand

Chulalongkorn University, Thailand

Kasetsart University, Thailand

Thammasat University, Thailand

Mapua Institute of Technology, Philip-
pines

National University of Singapore (NUS)

Nanyang Technical University

University of Vermont

University of Central Florida (UCF)

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National Taiwan University (NTU),
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To inquire about hosting an On
Campus lecture please contact the
ESD Association at info@esda.org.

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Local Chapters

Quick Links to ESD Local Chapters and affiliated organizations

- ASEMEP ESD Council • aec.asemep.com.ph
- Asociación ESD de Mexico • www.esdmexico.com
- Indian Chapter no website available
- North Central Chapter • www.esdnorthcentral.org
- Northeast Chapter • www.nechapter-esda.org
- Silicon Valley EOS/ESD Society • www.esdiscovery.org
- Southwest Chapter • www.southwestesd.com
- Texas Chapter • www.Centxesdassoc.homestead.com

“Local Sparks”
The Local Chapter Connection



Jan 27, 2010, Terry Welsher, presenting on CBE {Charged Board Event} and non-standard test issues for the Texas Local Chapter

Texas Local Chapter

Terry Welsher explained his presentation’s philosophy, reviewed ESD test procedures, provided a background of “Charged Board Events” (CBE), and explained how CBE is often mistaken for Electrical Over Stress. He showed how the CBE waveform is similar to the ESD Charged Device Model waveform, presented the CBE test results and damage, leading to the Industrial Standard/Best Practices status. His presentation generated intriguing discussion among the attendees.

March 9-10, 2010

The Texas Local Chapter Regional Tutorial program will be held at the 3M Innovation Center in Austin, TX.

Register online at:
<http://esda.org/onlineregistrations.html>

North Central Chapter

April 14-15, 2010

The North Central Local Chapter Regional Tutorial program Holiday Inn, Bloomington, MN

Register online at:
<http://esda.org/onlineregistrations.html>

North East Chapter

May 5-7, 2010

The North East Local Chapter Regional Tutorial program will be held at the Teradyne Conference Center in North Reading, MA

Register online at:
<http://esda.org/onlineregistrations.html>

The activities of local chapters provide both education and networking opportunities on a regular basis. Participating in local chapters provides opportunities to discuss common problems with others who have similar experiences.

As they bring ESD awareness and knowledge to their local areas, these chapters supplement and expand the Association’s effort and become strong allies in the overall mission.

EAG Labs

2710 Wash Ave, Santa Clara, CA 95014

Tel: 408-454-4600 Email: ESD-Services@eaglabs.com
www.eaglabs.com

Component Test Services: HBM,MM,CDM,Latch Up, Failure analysis
Microscopy, ATE Tester rental, Burn-In, Reliability, PCB design.

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Tel: 6003-352-1415 • 867 Rt 12 Westmoreland, NH 03467

IEW

The 2010 IEW at a Glance...

Seminars

CDM Charged Device Model Test: Current Status and Possible Alternatives*Heinrich Wolf, Fraunhofer IZM*

After a review of the current CDM status, including White Paper 2 of the Industry Council, this seminar will discuss and compare the different test methods.

ESD/EMC in an Automotive Environment*Patrice Besse, Freescale*

This seminar will discuss the common and specific ESD/EMC system requirements we need to take into account at the die level. An integrated ESD protection dedicated to the system level stresses will be presented as an example.

ESD-Protection of Advanced RF and Broadband Integrated Circuits and MEMS*Dimitri Linten, IMEC*

This seminar will classify the available techniques and present an overview on the state-of-the-art ESD solutions for both narrowband and wideband RF and mm-wave applications.

ESD-Aspects of FinFETs and other Most Advanced Devices*Christian Russ, Infineon Technologies*

We give an overview of the ESD performance of IC technologies, compare advanced ESD devices in FinFET technology - on SOI and bulk substrate - with planar CMOS devices. We will assess process features introduced to push CMOS further, such as strained silicon or HighK dielectrics.

Keynote and Invited Talks

Design of an ESD Robust Wireless Sensor Chip for Medical Applications*Paul Paddan, Michael Best, Emelita Ferrer, Alan Chi Wai Wong, Derek Wood, Toumaz Technology; Helmut Buchner, and Harald Gossner, Infineon Technologies*

This paper will present the key work on the combination of process and design choices made in the implementation of an ESD protection strategy for the entire chip and the subsequent qualification testing carried out in order to validate the robustness of the device.

Future Challenges of ESD Protection – an Automotive OEM's point of View*Christian Lippert, Audi*

This paper will present a state-of-the-art automotive ESD protection and qualification strategy, the future challenges, and the necessary changes in mind to tackle them.

IC Package Technology Advancements & Challenges for this Decade*Mahadevan Iyer, Texas Instruments*

This talk will address the packaging trends, challenges, and impact of these emerging packaging technologies on IC reliability.

Simulation Based Analysis of ESD Protection Elements on Systemlevel, Best Paper of ESD Forum 2009*Bastian Arndt, Continental Automotive*

This talk presents an effective tool for optimization -- a simulation methodology of the whole electrical path involved during the ESD event from the source of stress to the integrated circuit at risk.

Discussion Groups

Transient Latch-up: How to Test for It? How to Design for It?Moderator: *Wolfgang Stadler, Infineon Technologies*

The discussion topic for this group is; Transient Latch-up (TLU) and how to address it in a systematic manner.

ESD Qualification and ESD Control MethodsModerator: *Reinhold Gaertner, Infineon Technologies*

This group intends to discuss the ESD control methods in existence and what they mean for the new ESD qualification.

Automotive System ESD ProtectionModerator: *Markus Mergens, QPX*

This discussion topic intends to address impact of ESD requirements on the automotive environment.

How Useful and Reliable are TLP Tools?Moderator: *Leo G. Henry, ESD & TLP Consultants*

Let's discuss standard TLP and the Very Fast TLP used to evaluate HBM and CDM performance respectively.

The Complete IEW Program is available online at:



Look for this button on www.esda.org

Continued on page 12

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Manufacturer of static control products

Winifred Int'l Technology Ltd.

399 Cailun Road, Pudong New Area, Shanghai, China

www.winifred-hk.com • e-mail: steve@winifred-hk.com

Leading supplier for ESD and contamination control products, wrist straps, rubber mats, test equipment, Packaging products, clean gloves, garments, chairs, and ionizers.

The 2010 IEW at a Glance... Continued from page 11

Technical Presentations

There are thirty-four Posters and Technical Presentations which cover such topics as; Modeling and Simulation for ESD Design, New Design Tools for ESD, Advanced Device Phenomena, On-Chip ESD Protection Design, Test Methods and Tester Effects, and System Level ESD Issues

Posters

Poster 1.1 – Impact of Difference Between Discharge Methods on CDM ESD Testing

Poster 1.2 – Negative Effects of Air Discharge Suppression on Field-Induced CDM Test Repeatability

Poster 1.3 – Exceptional First CDM Discharge Pulse

Poster 1.4 – Practical Approaches to CDM Test on High Speed and Large Package Devices

Poster 1.5 – ESD Evaluation of 3D SiC Technology Using TSV

Poster 1.6 – Electrical Pulse Stressed Film Resistive Structures

Poster 1.7 – An Integrated Measurement Set-Up to Study the Impact of Atmosphere on ESD in MEMS

Poster 1.8 – Experimental Study of Gated Diode as ESD Protection in FDSOI High-k/Metal Gate 45 nm Node Technology

Poster 2.1 – Engineering Fully Silicided Large Output Driver For Maximum It1

Poster 2.2 – Self-Protection Capability of Integrated Power Arrays

Poster 2.3 – Dual-Direction Protection in Si-Ge BiCMOS Process

Poster 2.4 – Transient Characterization of High Voltage Switching Devices Under ESD Stress

Poster 2.5 – Development and Qualification of ESD Protection Demonstrators Using SCR Structure Compatible with Advanced CMOS Technologies

Poster 2.6 – Consideration of Design Window for ESD Power-Clamp in Next Generation Devices

Poster 2.7 – SCR-Based Power Supply Clamp for Low Leakage Applications

Poster 2.8 – On-Chip ESD Protection with Improved High Holding Current SCR (HHISCR) Achieving IEC 8 kV Contact System Level

Presentations

Presentation A.1 – Insights into Breakdown of High-k/Metal Gate Stacks Under ESD Stress

Presentation A.2 – On the interaction Between Substrate-Triggered ESD Protection Circuits and Embedded Parasitic Elements

Presentation A.3 – On-Chip Protection of RF Pins Against HMM Discharges

Presentation B.1 – Impact of a Decoupling Capacitance on ESD Propagation at System Level: Full Simulation and Measurement Comparison

Presentation B.2 – Designing the System Level ESD Protection Against IEC 61000-4-2 Stress with TLP Data and SPICE Simulation

Presentation B.3 – IC Characterization for ESD System: Is the Human Metal Model the Right Approach?

Presentation C.1 – Impact of Voltage Overshoots on ESD Protection Effectiveness for High Voltage Applications

Presentation C.2 – Cross Domain Protection Analysis and Verification Using Whole Chip ESD Simulation

Presentation C.3 – CDM2 – A New CDM Test Method for Improved Test Repeatability and Reproducibility

Presentation D.1 – Pulse Risettime Effect on Current Filamentary Modes and Interaction of Current Filaments in ESD Protection Devices

Presentation D.2 – Influence of Geometrical Parameters on Time-to-Latch-Up of SCR-Based ESD Protection Structures

Open Poster Session

ESD is a dynamic field and ideas don't always wait for workshop or conference deadlines. If you have exciting new results that you want to share or even a problem that you would like to present to ESD experts, consider an open poster presentation. If you would like to bring an open poster to the workshop contact the poster chair at least one week before the workshop, Natarajan Mahadeva Iyer (natarajanmi@globalfoundries.com). He will provide you with instructions for the preparation of an open poster. All open posters are subject to review by the poster chair to ensure that the poster is appropriate and does not contain information of a sales/marketing rather than technical nature.

For more details on posters at the IEW, see the posters section of the IEW website: http://www.esda.org/IEW_poster.html

Fireside Talk

This year's workshop adds a Tuesday evening fireside talk summarizing the interesting experiences of the Industry Council. *"Are Customers Really from Mars and the Suppliers from Venus?"*



The 2010 IEW Travel and Accommodations



TRANSPORTATION

Tutzing, Germany is located about 40 km south of Munich at the western shore of Lake Starnberger See.

From Munich by Rail

From Munich International Airport take metro (S-Bahn) S1 or S8 to main station (Hauptbahnhof). Change trains there to S6 heading to Tutzing. Leave S6 at the final destination of Tutzing. It takes about 10 minutes to walk from Tutzing station to the Evangelische Akademie via Bahnhofstrasse, Hallberger Allee and Hauptstrasse to Schlossstrasse. Tickets for the S-Bahn can be bought at the information counter of the airport in Terminal 1 next to the escalators to S-Bahn.

It takes about 1 hour 30 minutes by train from the airport to Tutzing.

Train schedules: <http://www.mvv-muenchen.de/en/home/index.html>

From Munich by Car

Exit the airport on motorway A92 heading Munich (München). At junction 4 München/Salzburg take A9 to Munich (München). At the end of the motorway (exit 76) turn right to ring road West (Mittlerer Ring West) following the signs to Garmisch-P. At junction to A95 enter motorway A95 in the direction of Garmisch-Partenkirchen. Take exit to Starnberg. In Starnberg take the B2 federal road towards Weilheim with destination Traubing. In Traubing you turn left and follow the signs guiding you to Tutzing.

It takes about 1 hour 15 minutes by car from the airport to Tutzing.

Car rental: <http://www.munich-airport.de/en/consumer/anab/mietwagen/index.jsp>

IEW ACCOMMODATIONS

IEW attendees pay a package fee which covers the workshop registration, three days of lodging, and meals. Attendees are welcome to bring guests for an additional package fee covering the three days of lodging and meals. Please see the registration form for full details.

The Evangelische Akademie Tutzing offers single and double guest rooms. Some of the rooms are located in the old castle wing and some located in the modern guest house. You can enjoy a wonderful view over Lake Starnberger See and the spacious park surrounding the building. All rooms offer private shower, WC and telephone. The arrangements in some of the guest rooms have been adjusted to the particular needs of handicapped guests.

- No reductions to the package fee will be made for partial stays or unused meals.
- Smoking is permitted outdoors only.
- Arrangements can be made for those with special dietary or physical requirements. Please send your requirements with the registration or email to info@esda.org
- Plan to have lunch before you arrive at the Conference Center on Monday. A list of restaurants near the Academy can be found at: <http://www.tutzing24.de/tourismus/branche.php?a=gastonomie>

FOR YOUR VISIT

Early May usually has nice weather with warm spring days. Warm clothing is recommended when walking in the evening since the nights can be a bit chilly. There are trails at the lake and in the surrounding hills. Sturdy shoes are useful for walking the surrounding areas on Wednesday afternoon. Except for the business-formal dinner on Tuesday night, comfortable, informal dress is encouraged during the conference.

For information on things to do in the surrounding area visit http://esda.org/IEW_travel_accomodations.html.

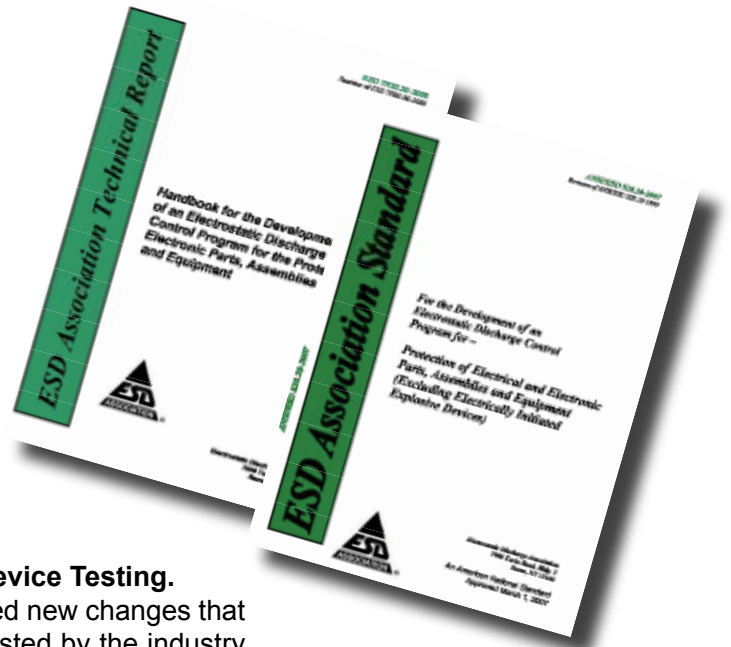


Standards

Standards Update

February 2010 Meeting Series

J.A. Nugget Resort, Sparks, NV



WG2.0 – Garments.

- The working group (WG) adjudicated industry review comments. Technical changes have been made so the document is being brought back to a work-in-progress (WIP) for another Standards Committee (STDCOM) Vote-By-Mail.

- A presentation was given on the worldwide use and view of garments in relation to the current standard test method, as well as, the various garments currently being used.

WG3.0 – Ionization.

- The WG adjudicated the STDCOM Vote-By-Mail comments and will be submitting a revised document to HQ by the end of March. Technical changes have been made so the document will be submitted for another STDCOM Vote-By-Mail.

WG4.0 – Worksurfaces.

- There were no WG members attending the meeting so the guests that were present reviewed S4.1 for a five-year review. The required boilerplate changes were made and comments were added in regards to redesignating the document from a standard to a standard test method. The document will go back to the WG members for revision.

JWG – (HBM) Device Testing.

- The WG reviewed new changes that have been requested by the industry and will be implementing the changes over a two year cycle. The first round of changes are scheduled for completion in October 2010.

- The WG is currently waiting for the industry review comments on the joint draft document.

JWG – (CDM) Device Testing.

- The WG reviewed the ESDA, JEDEC, and Joint WG CDM activities. A joint task force presentation was given by Robert Ashton.

- The following presentations were also given:

- Marty Johnson on CDM waveform analysis.
- Tim Maloney on data convolution and filtering.
- Reinhold Gaertner on analysis of direct charging vs. field induced charging.
- Theo Smedes on pitfalls of CDM calibration.

- Joint task teams have been assembled to research current literature and to begin writing a joint document.

WG5.4 – (TLU) Device Testing.

- The WG discussed new project topics based on comments and inputs received from the 2009 and 2010 IEWs. The WG is looking to develop a new document on transient latch-up. A discussion was held regarding the initiation of a work statement and if a new name should be used.

WG5.5 – (TLP) Device Testing.

- The WG reviewed the VF-TLP round robin data. The data is ready for a statistical analysis. A white paper should be completed by April.

- There were three new projects proposed – Transient TLP and VF-TLP, Longer Pulse TLP, and VF-TLP Round Robin Thorough Analysis.

- A decision was made to start with a literature search and a collection of supporting data on what industry is currently doing prior to submitting a work statement. The information collected will be reviewed at the June meeting.

Continued on page 15

Standards

Standards Update *Continued from page 14***WG5.6 – (HMM) Device Testing.**

- A presentation was given by Robert Ashton on preparing various possible setups to get waveforms without major inconsistencies.

- A round robin is scheduled to be completed prior to the June meeting.

WG7.0 – Flooring.

- The WG completed writing TR7.0-01-06 and the five year review of S7.1. The documents have been submitted to HQ for the Technical Advisory and Support Committee (TAS) to review between meeting series.

- S7.1 will be redesignated as an STM and go to STDCOM for Vote by Mail.

WG9.0 – Footwear.

- The WG reviewed changes that were made to WIP9.2 and the data comparing the ASTM vs. STM97.1 test methods with a metal plate. There was a very close correlation that the WG will be analyzing at the June meeting.

WG10.0 – Handlers.

- The WG reviewed WIP10.2. The document should be submitted to TAS after the June meeting for review.

WG11.0 – Packaging.

- The WG adjudicated industry review comments for DSTM11.13 – Two-Point Resistance. There were no technical changes made so the document will be published prior to the June meeting.

- The WG reviewed round robin data for 11.14 – One-Point Resistance. The data shows the utility of the test method but not the reproducibility and repeatability.

- A new round robin will be planned to validate measurements at 1 volt and using a compliance verification meter.

- The WG began reviewing the packaging section of TR53-01-06 and it will be submitted back to WG53 prior to the June meeting.

- A clarification was made that 11.14 should actually be 11.15.

WG13.0 – Handtools.

- The WG reviewed TAS comments on WIP13.1.

- The results of the round robin testing using only one RF iron was discussed. The WG has confirmed that OKI is the primary manufacturer of RF irons. The WG will include some data using a second RF iron in the analysis.

- Further testing will be completed using a different meter.

- The WG began discussions regarding non-electric hand tools for the development of WIP13.2.

WG14.0 – System Level ESD.

- The WG reviewed WIP14.1 and removed “repeatable” from the definition of a standard practice. The document will be submitted in March for TAS review.

- The WG adjudicated the industry review comments on DSP14.3 and will be making technical changes so the document will go back to a WIP for another STDCOM Vote-By-Mail.

- A discussion was held regarding how DSP14.3 relates to the Current Discharge Event documents and if it should be combined with WIP14.4 or moved in a different direction.

WG15.0 – Gloves.

- The WG reviewed and made changes to WIP15.2. The document will be submitted back to HQ for TAS review.

WG17.0 – Process Assessment.

- This WG is brand new.

- The WG reviewed the current purpose and scope that was developed by TAS last year and some changes were made. A work statement will be submitted after the June meeting series.

- A discussion was held regarding the participants’ current processes and tools being used.

WG53.0 – Compliance Verification.

- The WG reviewed the TAS comments on TR53-01-06 and will finish at the June meeting. The packaging section was given to WG 11 for revision.

- The WG discussed WIP16.1 and has requested direction from TAS.

Calendar

March 9-10, 2010

TX Local Chapter
Regional Tutorial program
3M Innovation Center, Austin, TX
Register online!
<http://esda.org/onlineregistrations.html>

March 25, 2010

Ultra Sensitivity Trends and CDM
Online training
[http://www.esda.org/documents/
UltraSensitivityTrends-March25.pdf](http://www.esda.org/documents/UltraSensitivityTrends-March25.pdf)

April 14-15, 2010

NC Local Chapter
Regional Tutorial program
Holiday Inn, Bloomington, MN
Register online!
<http://esda.org/onlineregistrations.html>

April 20, 2010

Automated Handling
Online training
[http://www.esda.org/documents/
AutomatedHandlingApril20-2010.pdf](http://www.esda.org/documents/AutomatedHandlingApril20-2010.pdf)

May 5-7, 2010

NE Local Chapter
Regional Tutorial program
Teradyne Conference center,
North Reading, MA
Register online!
<http://esda.org/onlineregistrations.html>

May 10 - 13, 2010

IEW International Electrostatic Workshop
Tutzing, Germany
<http://esda.org/IEW.htm>
Register online!
<http://esda.org/onlineregistrations.html>

May 25, 2010

The Good the Bad and the
Improvements in CDM ESD Testing
Online training
[http://www.esda.org/documents/
TheGoodthebadCDMESDtesting5-2010.pdf](http://www.esda.org/documents/TheGoodthebadCDMESDtesting5-2010.pdf)

May 27, 2010

Electrostatic Attraction
Online training
[http://www.esda.org/documents/
ElectrostaticAttraction.pdf](http://www.esda.org/documents/ElectrostaticAttraction.pdf)

June 10-15, 2010

June Meeting Series
Doubletree, Chicago (North Shore), IL

September 30 – October 8, 2010

EOS/ESD Symposium
JA Nugget, Sparks (Reno), NV

Oct 26, 2010

Device Testing- Correlation with Root
Cause Failure Analysis
Online training

Nov 4, 2010

EMC/EMI topic
Online training

Threshold

Threshold™ is published six times a year by the ESD Association, a not-for-profit corporation. It strives for the advancement of theory and practice of electrical overstress avoidance and of allied arts and sciences and the maintenance of a high professional standing among its members and others.

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Threshold™ Publication Schedule

<u>Issue</u>	<u>Deadlines</u>
January/February	Nov. 19
March/April	Feb. 1
May/June	April 1
July/August	June 1
September/October	Aug. 1
November/December	Oct. 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. Listings will also appear in the online calendar. 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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