



# 41st Annual ELECTRICAL OVERSTRESS/ ELECTROSTATIC DISCHARGE SYMPOSIUM



Sept 15-20, 2019

Riverside Convention Center

Riverside, CA, USA

## CALL FOR PAPERS

**TRACK 1: EOS/ESD in Manufacturing – Control Materials, Technologies, and Techniques**

**Parallel TRACK 2: On-Chip ESD Design, including System Level ESD, Testing, and ESD Case Studies**

**Submission Deadline: February 11, 2019**

### About the “EOS/ESD in Manufacturing” Track

For the third year, “EOS/ESD in Manufacturing” offers a full track of activities dedicated to EOS/ESD in manufacturing – control materials, technologies and techniques. This manufacturing track focuses on a combination of full technical papers, short papers, poster presentations, invited papers, discussion groups and workshops, hands-on demonstration sessions, and practical demonstrations of equipment by current exhibitors.

The Call for Papers describes the offerings and submission requirements. Each abstract submission selects the track, format, and suggested area using the abstract toolkit available on the EOS/ESD Association, Inc. website [www.esda.org](http://www.esda.org).

Parallel Track Options are:

<b>1. EOS/ESD IN MANUFACTURING - CONTROL MATERIALS, TECHNOLOGIES, AND TECHNIQUES</b> <input type="checkbox"/>	<b>2. ON-CHIP ESD DESIGN, INCLUDING SYSTEM LEVEL ESD, TESTING, AND ESD CASE STUDIES</b> <input type="checkbox"/>
<b>SUGGESTED SUBMISSION AREA FROM PAGE 3:</b>	<b>SUGGESTED SUBMISSION AREA FROM PAGE 4:</b>
<b>STUDENT PAPER</b> <input type="checkbox"/>	<b>STUDENT PAPER</b> <input type="checkbox"/>
<b>FULL TECHNICAL PAPER</b> <input type="checkbox"/> CONSIDER THIS SUBMISSION FOR POSTER SESSION <input type="checkbox"/> <b>SHORT TECHNICAL PAPER OR CASE STUDIES</b> <input type="checkbox"/> CONSIDER THIS SUBMISSION FOR POSTER SESSION <input type="checkbox"/> <b>POSTER SESSION</b> <input type="checkbox"/> <b>DISCUSSION GROUP</b> <input type="checkbox"/> <b>WORKSHOP</b> <input type="checkbox"/> <b>HANDS-ON DEMONSTRATION</b> <input type="checkbox"/>	<b>FULL TECHNICAL PAPER</b> <input type="checkbox"/> <b>DISCUSSION GROUP</b> <input type="checkbox"/> <b>WORKSHOP</b> <input type="checkbox"/> <b>POSTER SESSION</b> <input type="checkbox"/>

# EOS/ESD Symposium CALL FOR PAPERS

## TRACK 1: EOS/ESD in Manufacturing – Control Materials, Technologies, and Techniques

## Parallel TRACK 2: On-Chip ESD Design, including System Level ESD, Testing, and ESD Case Studies

**Submission Deadline: February 11, 2019**

### About the EOS/ESD Symposium

EOS/ESD Association, Inc. is sponsoring the 41st Annual Symposium on Electrical Overstress (EOS) and Electrostatic Discharge (ESD) effects. The Symposium is dedicated to the understanding of issues related to electrostatic discharge and electrical transients / overstress, and the application of this knowledge to the solution of problems in consumer, industrial, and automotive applications, including electronic components and manufacturing, as well as in systems, subsystems, and equipment.

### Papers/Contributions

The Technical Program Committee solicits symposium contributions, including data and analysis that advance the state-of-the-art knowledge, enhance or review the general knowledge, or discuss new topics related to EOS/ESD.

### Electronic Submissions

Abstract submissions shall be made electronically via an emailed PDF file to [info@esda.org](mailto:info@esda.org). One file for each submission is required.

### Deadlines

**The abstract submission deadline is Monday, February 11, 2019. Abstracts not meeting guidelines may not be accepted.** The final submission deadline for the finished papers is Friday, June 3, 2019. **ESDA reserves the right to withdraw any paper or presentation that does not meet the guidelines, including deadlines. Your paper MUST be submitted by the deadline.** Final full technical papers will be limited to a maximum of 10 pages - guidelines will be provided after acceptance of the paper.

### Paper Acceptance

The Technical Program Committee accepts unpublished papers for peer review with the understanding that the author will not publish the work elsewhere prior to presentation at the Symposium. Presentation of your work at the earlier International ESD Workshop (IEW) or the Symposium for Manufacturing Issues will not preclude your Annual Symposium abstract submission. The submission must follow guidelines and be expanded significantly in the abstract submission for the EOS/ESD Symposium. Publication of accepted papers in any form prior to presentation at the Symposium may result in the paper being withdrawn from the Symposium Proceedings. Authors must obtain appropriate company and government clearances prior to submitting their abstracts.

### Paper Awards and Recognition

Awards are presented annually for the Symposium Outstanding Paper (selected by Symposium attendees), the Best Paper (selected by the Technical Program Committee), and the Best Student Paper. The Best Paper is considered for presentation at the RCJ EOS/ESD Symposium in Japan. The Outstanding Paper is considered for presentation at the ESD Forum in Germany. Eligible student contributions for the Best Student Paper Award should be marked as such by the authors at the time of abstract submission.

*Accepted full technical papers covering selected topics may be considered for review for invited publications in IEEE Transactions on Device and Materials Reliability (TDMR), IEEE Transactions on Electron Devices, the Microelectronics Reliability Journal, the Journal of Electrostatics, or other appropriate publications.*

Sponsored by EOS/ESD Association, Inc. in cooperation with IEEE.  
Technically co-sponsored by the Electron Devices Society.



## Papers / Presentations / Group Sessions in Track 1. EOS/ESD in Manufacturing – Control Materials, Technologies, and Techniques are solicited in the following areas and formats:

### A. Full Technical Paper

Authors must submit a maximum 50 word abstract and 4-page maximum summary of their work. The summary must clearly state the purpose, results (e.g., data, diagrams, photographs, etc.), and conclusions of the work. Summaries must also include references to prior publications and state how the work enhances existing knowledge. Authors suggest the appropriate technical area related to their submission. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website [www.esda.org](http://www.esda.org).

### B. Short Technical Paper or White Paper with Presentation of Case Studies

Authors must submit a maximum 50 word abstract and 2-page maximum summary of their work. The summary must clearly state the purpose, results (e.g., data, diagrams, photographs, etc.), and conclusions of the work. Summaries must also include references to prior publications and state how the work enhances existing knowledge. Authors suggest the appropriate technical area related to their submission. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website [www.esda.org](http://www.esda.org).

### C. Poster Session

Authors must submit abstracts in the form of a short PowerPoint presentation. After the title slide, the second slide of the presentation should describe the objective and significance in a maximum 200 word summary. The abstract presentation should not exceed 5 additional slides; with representative data and figures that will be the foundation for the longer poster maximum of 24 slides that you plan to present. A formal five minute presentation is given by each author followed by the poster session. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website [www.esda.org](http://www.esda.org).

### D. Workshops and Discussion Groups

Proposals for workshops and discussion groups must be submitted with an abstract describing the proposal. The abstract toolkit is used to indicate participation as a workshop moderator or committee participant. **Workshops** address fundamentals and generally accepted techniques. Topics consider present and future challenges and solutions to problems. **Discussion Groups** address EOS/ESD novel ideas. Ideas consider new developments or common myths dispelled. The discussion should encompass some provocative points of view.

### E. Hands-on Demonstration Sessions

Proposals for hands-on demonstrations of measurement techniques must be submitted with an abstract defining the presentation and measurement. Authors complete a presentation describing the measurement technique followed by a hands-on station for attendees to perform the measurement as described. Application, limitations, and common pitfalls should be discussed. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website [www.esda.org](http://www.esda.org). (Note: ESDA does not provide equipment).

### Track 1 Suggested Submission Areas:

- ESD Packaging and Handling Procedures
- EOS/ESD Detection and Measurement Techniques
- ESD Facility Design, Mitigation in Test and Manufacturing; Ionization
- Manufacturing EOS/ESD Case Studies, Reviews and Analysis
- EOS/ESD Process Assessment
- ESD Control Materials and Use of Antistatic Materials
- ESD Issues in 2.5D & 3D Stacking and TSV
- Control Program Topics (Cost/Benefit Analysis, training, etc.)
- ESD control in Graphic Arts, Explosives & Pyrotechnics, Oil/Petroleum/Biomedical/Chemical Industry
- Standards – Comparison and Analysis

### Contact information for questions or further information:

**EOS/ESD Association, Inc.  
Lisa Pimpinella**

EOS/ESD Association, Inc.  
7900 Turin Road, Building 3  
Rome, NY 13440 USA  
Phone: (+1) 315-339-6937

e-mail: [info@esda.org](mailto:info@esda.org)

**Technical Program Chair  
Wolfgang Stadler**

Intel Deutschland GmbH  
Neubiberg, Germany  
Phone: (+49) 160-8935308

e-mail: [Wolfgang.stadler@intel.com](mailto:Wolfgang.stadler@intel.com)

## Papers / Presentations for Track 2. On-Chip ESD Design track, including System Level ESD, ESD Testing, ESD Case Studies are solicited in the following areas:

### A. Full Technical Paper

Authors must submit a maximum 50 word abstract and 4-page maximum summary of their work. The summary must clearly state the purpose, results (e.g., data, diagrams, photographs, etc.), and conclusions of the work. Summaries must also include references to prior publications and state how the work enhances existing knowledge. Authors suggest the appropriate technical area related to their submission. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website, [www.esda.org](http://www.esda.org).

### B. Workshops and Discussion Groups

Proposals for workshops and discussion groups must be submitted with an abstract describing the proposal. The abstract toolkit is used to indicate participation as a moderator or committee participant. **Workshops** address fundamentals and generally accepted techniques. Topics consider present and future challenges and solutions to problems. **Discussion Groups** address EOS/ESD novel ideas. Ideas consider new developments or common myths dispelled. The discussion should encompass some provocative points of view.

### C. Poster Session

Authors must submit abstracts in the form of a short PowerPoint presentation. After the title slide, the second slide of the presentation should describe the objective and significance in a 200 word maximum summary. The abstract presentation should not exceed 5 additional slides; with representative data and figures that will be the foundation for the longer poster maximum of 24 slides that you plan to present. A formal five minute presentation is given by each author followed by the poster session. Authors are required to use the abstract submission toolkit available on the EOS/ESD Association, Inc. website, [www.esda.org](http://www.esda.org).

## Track 2 Suggested Submission Areas:

### I. Advanced CMOS (Analog/Digital) EOS/ESD and Latch-up

- ESD Issues in Advanced Technologies (Multi-gate, FinFET, SOI, SiGe, Compound, Graphene, nanowire, etc.)
- On-Chip ESD Protection Devices & Techniques in Advanced CMOS Technologies
- IC Design and Layout Issues
- Circuit Simulation of EOS/ESD Events in Advanced CMOS Technologies
- DC/Transient Latch-up Issues and Solutions, Troubleshooting, Simulation
- ESD Issues in 2.5D & 3D Stacking and TSV

### II. ESD Protection in Bipolar, RF, High Voltage and BCD Technologies

- ESD Issues in Bipolar, RF, High Voltage and BCD Technologies and power Technologies (SiC, GaN, etc.)
- On-Chip ESD Protection Devices & Techniques in Bipolar, RF, High Voltage and BCD Technologies
- IC Design and Layout Issues
- Circuit Simulation of EOS/ESD Events in Bipolar, RF, High Voltage and BCD Technologies
- DC/Transient Latch-up Issues and Solutions, Troubleshooting, Simulation
- ESD Circuit Simulation and Co-Design

### III. Numerical Modeling and Simulation for On-Chip ESD Protection

- ESD Device TCAD Simulation
- Simulation Tool and Methodology
- Numerical Modeling and Physics of EOS/ESD Events
- TCAD/Circuit Co-simulation

### IV. EOS/ESD Failure Analysis, Troubleshooting and Case Studies

- EOS/ESD Case Studies, Reviews and Analysis
- EOS/ESD Phenomena in MEMS (Microelectromechanical Systems)
- Failure Analysis Techniques and Interpretations
- EOS/ESD Component Failure Analysis
- Testing of MR/TMR Heads and Ultra-Sensitive Devices
- EOS/ESD Protection for Aircraft, Spacecraft and Avionics

### V. Device Testing: Testers, Methods and Correlation Issues

- Transmission Line Pulse Testing Systems
- Novel EOS/ESD Test Methods
- Novel TLP Measurement Results
- HBM, CDM Tester Issues and Solutions
- Tester Correlation Issues
- Standards – Round-Robin Testing, Results and Analysis

### VI. System Level EOS/ESD/EMC, HMM

- System Level EOS/ESD/EMC Test Methods
- System Level EOS/ESD Modeling and Simulation
- EOS/ESD Simulators, Calibration and Correlation
- Transient ESD/EMI Induced Upset
- Case Studies, Reviews and Analysis
- Standard Test Boards as an Early Measure of Robustness

### VII. Chip/Module/Package EOS/ESD Electronic Design Automation

- Novel EOS/ESD EDA Tools
- ESD Checking and Verification Methodology
- Application of EDA tools for EOS/ESD Failure Analysis, Design and Verification

## Contact information for questions or further information:

**EOS/ESD Association, Inc.**  
**Lisa Pimpinella**

EOS/ESD Association, Inc.  
7900 Turin Road, Building 3  
Rome, NY 13440 USA  
Phone: (+1) 315-339-6937  
e-mail: [info@esda.org](mailto:info@esda.org)

**Technical Program Chair**  
**Wolfgang Stadler**

Intel Deutschland GmbH  
Neubiberg, Germany  
Phone: (+49) 160-8935308  
e-mail: [wolfgang.stadler@intel.com](mailto:wolfgang.stadler@intel.com)