March 2025 Standards Summary Session

Additional Information

- For more information on the Standards Business Unit and the standards development process, please visit https://www.esda.org/standards/standards-working-groups/#references > Standards Development Presentation.

- A copy of these slides will be posted on our website https://www.esda.org/standards/standards-working-groups/#references > Standards Activity Summaries.

- For more information on recent WG activities, please visit https://www.esda.org/standards/standards-working-groups > Committees Drop Down Menu.

WG 3 - Ionization

Published Documents

- ANSI/ESD STM3.1-2024 - Ionization
- ANSI/ESD SP3.3-2016 - Periodic Verification of Air Ionizers
- ANSI/ESD SP3.4-2016 - Periodic Verification of Air Ionizers Using a Small Test Fixture
- ANSI/ESD SP3.5-2020 - Air Assist Bar Ionizers, Soft X-Ray (Photon) Ionizers, Room Ionization Alternatives, and Non-Airflow Alpha Ionizers

Summary of discussions/activities/document reviews during the most recent WG meeting:

- Reviewed a proposal to simplify STM3.1 – some concerns were raised.
- Designed an experimental plan to determine if the current requirements for CPMs are sufficient to provide repeatable results in a single-lab environment.

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WG 3 - Ionization

- Three users will perform testing in parallel:
  - One user will test one SSDC blower with three CPMs from the same manufacturer
  - The second user will test one SSDC blower with several versions of CPM’s
  - Third user will test one SSDC blower with several CPM designs (field meter type and voltage follower type)
  - This team will coordinate testing and compare results.
- After this testing, Carl will convene the working group in a Zoom meeting to discuss the results and plan additional experiments.

WG 28 - ESA

Published Documents

- ESD TR28.0-01-25 Electrostatic Attraction – to be published April 2025

Summary of discussions/activities/document reviews during the most recent WG meeting:

- The changes made by the working group during Zoom meetings to ESD TR28 were reviewed.
- The Working Group Chair will submit the document to Standards Management for formatting, final review by TAS, and publication.

WG 4 – Worksurface

Currently published documents

- ANSI/ESD STM4.1, "Worksurfaces – Resistance Measurements" (2017)
- ESD TR4.0-01-02, "Survey of Worksurfaces and Grounding Mechanisms" (2002)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- ESD WIP4.1 Worksurface – Resistance Measurements (Including Shelving and Mobile Equipment)
  - The working group reviewed the STDCOM comments that had been received as the date of the meeting. The review period closed on March 13th.
  - The comments received were editorial and most of the comments received were accepted by the working group.

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WG 4 – Worksurface

- Technical Report (TR) Conveyors – Resistance Measurement
  - This had been put on hold. Overview of the status of this TR was shown.
  - General organization of the document has been initiated.
  - Still need to add some pictures of the conveyors.
  - The TR will be sent to working group members only to review and comment.
  - The working group members will need pick 3 concerns after a brainstorming list is put together that need to be addressed.

WG 97 – Footwear/Flooring

Currently published documents

- ANSI/ESD STM97.1-2015 - Footwear/Flooring System – Resistance Measurement in Combination with a Person
- ANSI/ESD STM97.2-2016 - Footwear/Flooring System – Voltage Measurement in Combination with a Person

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The Working Group reviewed the Industry Comments received on DSTM97.1 Footwear/Flooring System – Resistance Measurement in Combination with a Person. The working group reviewed all the comments that were received.
  - Several of the comments that were regarding boilerplate statements which cannot be changed.
  - Several of the industry comments were technical and will be looked at for the next revision of this document after this has been published.
  - A few of the comments received either general or editorial and these the WG accepted.

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WG 97 – Footwear/Flooring

- The Working Group started the review of the Technical Advisory Sub-committee (TAS) Comments received on WIP97.2 Footwear/Flooring System – Voltage Measurement in Combination with a Person.
  - WIP97.2 has been updated to the new format for testing and reporting.
  - A high-level overview of the document with the new format was shown.
  - The working group started reviewing TAS comments. Many of these comments were covered by the reformatting of the document to the new boilerplate format.
  - WIP97.2 document will be sent out to the working group members for a quick review once finalized.

WG 5 – Device Testing

Currently published documents

- ANSI/ESD SP5.0-2023 - Reporting ESD Withstand Levels on Datasheets

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Review of failure criteria within the JS-001 and JS-002 docs
  - A final version is going out for WG5 member review – target to send to JWGs (HBM/CDM) by 6/25
- Technical report on curve tracing
  - Reviewed writing team brainstorming ideas for an outline and collected additional brainstorming ideas from WG
  - Targeting to set up an offline call to meet with the writing team and start assigning writing sections

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WG 5 – Device Testing

- ATE testing only at the beginning/end of step stressing & step stressing risks
  - Reviewed a proposed wording during the WG meeting – no additional feedback
  - Plan to send out a version to all WG5 members for review
  - Follow-up/closure planned in the June meeting series
- Walk on topics
  - Question from the team regarding HBM testing at very high levels such as 8kV
  - WG believes the reasons for the request are related to IEC 61000-4-2 alignment – which is not correct
  - Discussion started on what may be done to address the issue – follow-up planned for June

JWG HBM

Currently published documents

- ANSI/ESDA/JEDEC JS001-2023 - Human Body Model (HBM) – Device Level
- ESD JTR001-01-12 – User Guide of ANSI/ESDA/JEDEC JS-001 Human Body Model Testing of Integrated Circuits
- ANSI/ESD SP5.1.3-2022 - Human Body Model (HBM) – A Method for Randomly Selecting Pin Pairs
- ANSI/ESD SP5.1.4-2024 – Random Supply Sampling (two-channel tester)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- JTR-001 comments adjudication
  - STDCOM comments to be adjudicated in a virtual meeting
  - Target is to finalise document and submit to JEDEC BOD meeting in mid-May.

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JWG HBM

- SP5.1.1 and SP5.1.2.
  - These were withdrawn some time ago and are no longer available.
  - There are still fixtures in use which were designed using these SPs.
  - Discussion about whether they can be made available again.
- Spurious (secondary) current pulse
  - It has been reported that these are more likely when stressing at voltages below 1kV.
  - Discussion about the possible causes of this.
  - WG to investigate.

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JWG HBM

- JS001 Next Full Revision Parking lot items discussed and agreed:
  - Using previously stressed parts: adopted wording defined in WG5.0.
  - Definition: “positive clamp test socket” to be created.
  - Allowance for shorted supply pins to all be connected to one tester channel.
  - Bandwidth of the 500 ohm resistor.
  - Classification of pins which are DC shorts or opens but still non-supply pins.
  - Re-qualification required if a test system is re-located.
  - Pin pair used for fixture validation.
  - Avoiding a known failure by changing the testing table or pin classifications.
- JWG to hold a virtual meeting on April 08 to discuss the survey responses:
  - Supply pin group, shorted supply pin group, shorted non-supply pin set
  - Cloned IO definition, methodology applicability, ATE to confirm failure

CDM JWG

Currently published documents

- ANSI/ESDA/JEDEC JS-002-2022 – Joint Standard - Charged Device Model (CDM) – Device Level
  - 2024 update draft finished ESDA approvals – now at JEDEC awaiting BoD vote needed for publication.
- ESDA/JEDEC Joint Technical Report - JTR002-01 CDM User Guide. 2024 update to be published when JS-002-2024 is published.
- ANSI/ESD SP5.3.1 – Contact CDM (50 ohm)
- ANSI/ESD SP5.3.3 – Low Impedance Contact CDM (LICCDM)
- CC-TLP SP5.3.4-2022 – Capacitively Coupled Transmission Line Pulsing as an Alternative CDM Characterization Method
- ESD TR5.3.1-01-18 - Contact Charged Device Model (CCDM) Versus Field Induced CDM (FICDM) A Case Study

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Bare Die TR Update – Adjudication of review comments is going on
- CC-TLP Round Robin Experiment: further results presented – requires a more detailed analysis of the measurement parameter in order to minimize peak current variations
- AEC 3-zap vs. 1-zap CDM; WG needs to approach the owner of the Q100 document in order to from a group to edit the document
- LICCDM: LICCDM is necessary to address low voltage testing (complements FICDM); it is planned to raise it to an STM (writing team will be formed)

WG 5.5 – Transmission Line Pulse (TLP)

Currently published documents

- ANSI/ESD STM5.5.1-2022, the standard test method for (VF-)TLP
- ESDTR5.5-04-23, the user and application guide for (VF-)TLP
- ESDTR5.5-05-20, technical report on transient analysis with TLP
- 3 older technical reports

Summary of discussions/activities/document reviews:

- TR on Statistical Application of TLP
  - Presented document status, submitted paper to 2025 Symposium and collaboration with University of Texas at Dallas

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WG 5.5 – Transmission Line Pulse (TLP)

- SP on Transient Analysis with VF-TLP
  - Presented document status and submitted paper to 2025 Symposium
  - Leonardo presented additional L/C measurements from ST on VF-TLP calibration board using different scope/probe configurations
    - Available data for 3 different combinations of scope bandwidth/sampling rate values, using 4 different options of probe types.
    - In general, the expected impact of scope/probe configurations has been observed.
    - Good discussion on data. Defined additional measurements on different labs to further analyze some surprising aspects.
  - Kathy presented S-parameter measurements of DUTs on VF-TLP calibration board
    - Good data discussion. Additional measurements will be performed and results will be de-embedded.

WG 7 - Flooring

Currently published documents

- ANSI/ESD STM7.1-2020 – Flooring Systems – Resistive Characterization
- ESD TR7.0-01-23 – Protective Flooring Systems

Summary of discussions/activities/document reviews during the most recent WG meeting.

- A revision of STM7.1 was generated based on decisions made at the last meeting. That draft was circulated to the group for comments to be adjudicated at this meeting.

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WG 7 - Flooring

- The group comments included a number of items that needed to be discussed by the group. At this meeting we completed discussion on many of those comments including
  - Agreeing to remove the meter allowed for Acceptance Testing
  - Keeping the title of Acceptance Testing as is (as opposed to changing to Qualification of Installed or Applied Flooring System)
  - Moving sections of meter and test descriptions to appropriate sections to be consistent with other Factory test standards (such as 97.1)
  - Discussed at length a note regarding the effect of poorly isolated test leads interacting with the flooring system to give erroneous results
  - Reworded description of # of test locations required for Acceptance Testing
- There are still 5 or 6 comments requiring group discussions. It was agreed to have a virtual meeting within the next month so that the draft can be completed for submission to TAS for their comments, with the hope of adjudicating TAS comments at the June meeting.

WG 11- Packaging

Currently published documents:

- ANSI/ESD S11.4 – Bags
- ANSI/ESD STM11.11 and 11.12 – Surface and Volume Resistance
- ANSI/ESD STM11.13 – Two-Point Probe
- ANSI/ESD S541 – Packaging
- ANSI/ESD STM11.31 – Bags – Discharge Shielding

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Reviewed all TAS comments for WIP541. A few minor changes need to be made to the figures, and then the document can be submitted.
- Began reviewing comments on WIP11.31. This was not completed.

WG 13 – Hand Tools

Currently published documents

- ANSI/ESD S13.1-2019 - Electrical Soldering/Desoldering Hand Tools
- ESD TR13.0-01-99 - EOS Safe Soldering Iron Requirements

Summary of discussions/activities/document reviews during the most recent WG meeting.

- S13.1 – Reviewed the need to update this document now that it is in the 5year review.
- TR13.0-02 – Discussed continued work and updating for the document. Specifically, the need to update it with two test methods. No updates were done on the document shared at the meeting.

WG 14 – System Level

Currently published documents

- **TR14.01** Calculation of Uncertainty Associated With Measurement of Electrostatic Discharge (ESD) Current (Formally TR-07-00)
- **TR14.02** System Level Electrostatic Discharge (ESD) Simulator Verification (Formally SP14.1)
- **SP14.5** Near Field Immunity Scanning - Component/Module/PCB Level (EMC/ESD Scanning)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The 5 year review of SP14.5 EMC Scanning document was discussed
  - It was noted that 7 copies of the 2021 version were purchased outside of "bundle" purchases.
    - A question was asked whether we should contact these users of the document, to ask them whether they see issues with document?
  - Feedback from a member, is that nothing is lacking in the document, but we may need a better way of advertising the method, stating that this document is available and how to use it.
  - Document will be sent to Members for review and comment on a 30-day review cycle.
  - Once comments are received, the next steps will be determined
    - Teleconferences needed?
    - Update the document or resubmit as is?

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WG 14 – System Level

- Industry Council Survey on System Level Direct PIN ESD (SL-DPE) also known as Direct Pin Injection testing
  - We reviewed the Survey Results Summary provided by the Industry Council to determine where the WG should go with this test method.
  - It was noted that the Industry Council will be working on a White Paper highlighting the survey results and they've asked whether WG14 had members that could assist. They've also asked that the Survey Results be provided to the EMC Society TC5 members to see if system integrators would be able to provide inputs on the testing method.
  - It was decided we need to wait for input from the Council on the direction for the test method before moving forward.
  - This will be discussed again at the next meeting series, a decision will be made to either move forward with a CDE/Direct Pin Injection test method or, have the WG go dormant.
- Additional information on the System Level Direct PIN ESD (SL-DPE) test method
  - Although the IEC61000-4-2 standard states that this method should not be used directly on connector pins, device manufacturers are being asked to provide test levels on external connection pins
  - Discussing Direction Pin Injection testing, brings up the question as to whether CDE (Cable Discharge Event) are simply just another stimulus type of Direct Pin Injection testing?

WG 15 – Gloves

Currently published documents

- ANSI/ESD STM15.1-2019 - Methods for Resistance Measurement of Gloves and Finger Cots
- ESD TR15.0-01-99 - ESD Glove and Finger Cots

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Focused on the 5-year review of ANSI/ESD STM15.1.
- Review has been completed through the main body of the document and the next meeting will focus on completing the Annex reviews.
- Discussion in the meeting on options to verify the setup before starting testing. WG will need to determine the best options to address this and add it to WIP15.1 as part of this update.

WG 17 – Process Assessment

Currently published documents

- ANSI/ESD SP17.1, "Process Assessment Techniques" (2020)
- ANSI/ESD SP10.1, "Automated Handling Equipment (AHE)" (2016)
- ESD TR17.0-01-15, "For ESD Process Assessment Methodologies in Electronic Production Lines – Best Practices Used in Industry" (2015)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- ANSI/ESD SP17.1 Rev. 2:
  - Discussion of TAS review including comments accepted by IEC TC101 WG5, total 214 comments
  - Approximately 30 technical comments are still open; further adjudication in virtual meeting(s). Plan to send it back to TAS in May 2025.
- ANSI/ESD SP17.2 "Process Assessment of Electrical Disturbances":
  - Need to re-discuss the scope and contents of the SP document.

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WG 17 – Process Assessment

- TR17.0-02 “Measurements and Detection of ESD Events”: currently on hold due to missing contributions.
- Technical Report on Application of ANSI/ESD SP17.1:
  - Will be a teaching document on how to accomplish ANSI/ESD SP17.1 assessments
  - Reviewed and agreed on the basic outline of the document content and the timeline
  - Document timeline:
    - Draft of contributions to be discussed in June 2024 Meeting Series
    - WG review will start in December 2025.
- Slide set “How to use SP17.1”: The script is 90% complete; the next steps are to complete it and create a voice-over.

WG 18 – EDA

Currently published documents

- ESD TR18.0-01-14 ESDA Technical Report for ESD Electronic Design Automation Checks
- ESD TR18.0-02-20 ESDA Technical Report for Latch-Up Electronic Design Automation

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Biweekly virtual meetings
- Adjudicating TAS comments on ESD TR18.0-01
- Contribution in advanced packaging item
  - Participation in last meetings of ESDA Advanced Packaging Task Team
  - Sharing of TR content on Advanced Packaging EDA item
  - Planned possible WG 18 contribution on EDA aspects in future heterogeneous/3D integration documents
- TR18.0-01 addendum – a separate document summarizing ESD EDA checks and referencing the TR (former TR appendices)

WG 19 – High Reliability

Currently published documents

- ESD TR19.0-01-22 Protection of High-Reliability Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Continued working on new standard practice document.

WG 26 – System Level ESD Models

Currently published documents

- ESD TR26.0-01-23 – Behavioral IC Modeling to Perform System Level ESD Simulations – General Description and Trends
- ESD TR26.0-02-24 – Quasistatic Model Definition – Building Model

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Presentation of measurements needed for TR26.02 revised
  - CAN application: with and without Common Mode Choke
    - Interesting combinations of TVS and ICS presented
  - USB3 application with a snapback IC: measurements are complete but need to be redone, something was not okay. Simulation of application needs to be redone.

Manufacturing Task Team

Currently published documents

(no document – decisions included in other documents and ESDA Style Manual)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Discussion of scope limits in ESD control documents (upper limit): Consensus that the scope limit should reflect the capability of the measurement method and should not be linked to ANSI/ESD S20.20. Next steps:
  - WGs need to determine the appropriate range.
  - Give feedback on the discussion to TAS for the final decision.
- Discussion on Annex A ("Verification of Measurement Set-up"): Consensus that Annex A is "Normative", although the verification is only recommended, not required.
  - Next steps: Change in all upcoming documents (where applicable).

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Manufacturing Task Team

- Discussion on including serial numbers in the reporting section. Tendency of Manufacturing TT members said that the serial number should stay as a recommendation, not a requirement.
  - Feedback to TAS for final decision.
- New boilerplate changes are displayed and discussed. No concerns.
  - Next steps: Change in all upcoming documents (where applicable).

Our next meeting is during the meeting series on June 2-6, 2025, in Sparks, NV. The full meeting schedule is available on the website under Events.