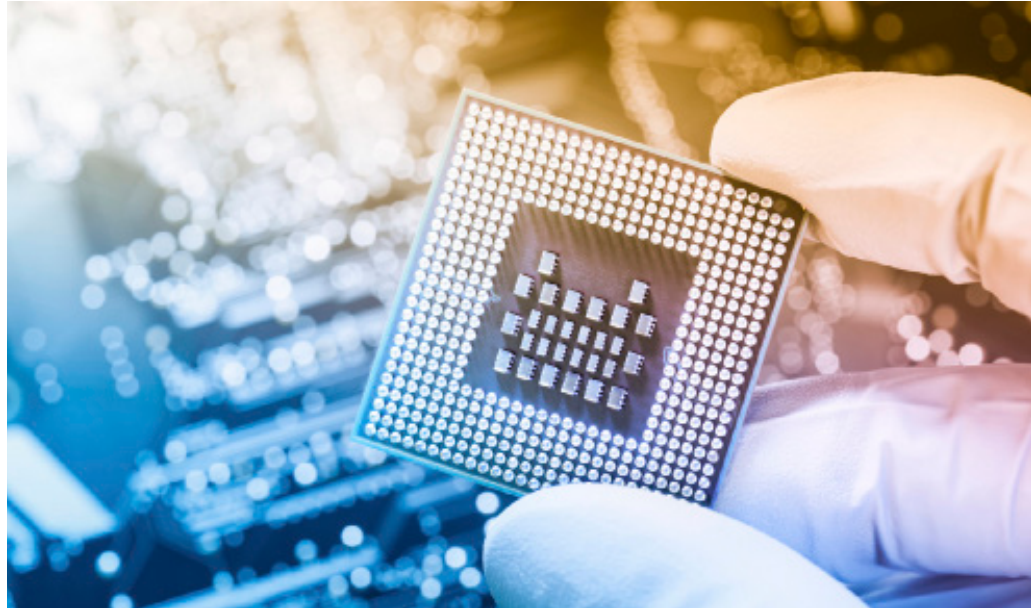


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About EOS/ESD Association, Inc.™

EOS/ESD Association, Inc.™ (ESDA) is a professional voluntary association dedicated to advancing the theory and practice of electrical overstress (EOS) and electrostatic discharge (ESD) avoidance. Founded in 1982, the Association has grown from fewer than 100 members to more than 2,000 members throughout the world. From an initial emphasis on the effects of ESD and EOS on electronic components, the Association has broadened its horizons to include static solutions for industries such as automotive, textiles, plastics, web processing, clean rooms, and graphic arts.

To meet the needs of a continually changing environment, the Association is chartered to expand ESD and EOS awareness through standards development, educational programs, local chapters, publications, technical tutorials, certification programs, and symposia. The principal activity of the Association is providing education. By actively sponsoring and encouraging various educational programs and activities, the Association provides ESD professionals with the knowledge and tools needed to meet the challenges of ESD in their companies.

Although founded and headquartered in the United States, EOS/ESD Association, Inc.™ has a strong international membership from more than 30 countries throughout the world. International members serve on the Association standards committees, present technical papers at the annual EOS/ESD Symposium and Factory Symposium, and provide communication links with similar associations in other countries.

With the increasing need for global harmonization in the area of standards, the international focus of the ESD Association is vitally important. EOS/ESD Association, Inc.™ has the responsibility of representing the interests of the United States at the International Electrotechnical Commission (IEC) in the area of electrostatics.

Index

Documents.....	3-15
Standard Subscription Programs..	16
Enterprise Wide licenses.....	16-17
Symposia Proceeding.....	18
ESD Compliance Posters.....	19
ESDA Online Academy.....	20-22
Order Form.....	23

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CHARGED BOARD EVENTS (CBE)**ESD TR25.0-01-16 ESD Association Technical Report for Electrostatic Discharge Sensitivity Testing - Charged Board Event (CBE)**

While no industry standard currently exists for CBE testing, this technical report aims to fill the gap of knowledge for its various aspects. Trying to standardize the CBE stress testing procedure will be very challenging because PCB designs and layouts vary significantly and each PCB may have several tens to hundreds of potential discharge points.

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This document establishes the procedure for testing, evaluating, and classifying devices and microcircuits according to their susceptibility (sensitivity) to damage or degradation by exposure to a defined field-induced charged device model (CDM) electrostatic discharge (ESD). All packaged semiconductor devices, thin-film circuits, surface acoustic wave (SAW) devices, optoelectronic devices, hybrid integrated circuits (HICs), and multi-chip modules (MCMs) containing any of these devices are to be evaluated according to this standard. The devices shall be assembled into a package similar to that expected in the final application to perform the tests. This CDM document does not apply to socketed discharge model testers.

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DOCUMENTS

ESD TR5.3.1-01-18 ESD Association Technical Report for Electrostatic Discharge Sensitivity Testing - Contact Charged Device Model (CCDM) Versus Field Induced CDM (FICDM) A Case Study

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IEC TS 61340-5-4:2021 Electrostatics - Part 5-4: Protection of electronic devices from electrostatic phenomena - Compliance verification.

Technically equivalent to ESD TR53™-01.

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Provides guidance that can be used for developing, implementing, and monitoring an electrostatic discharge control program in accordance with ANSI/ESD S20.20. This handbook applies to activities that include manufacturing, processing, assembling, installing, packaging, labeling, servicing, testing, inspecting, or otherwise handling electrical or electronic parts, assemblies, and equipment susceptible to damage by electrostatic discharges greater than or equal to 100 volts human body model (HBM), 200 volts charged device model (CDM), and exposure to charged isolated conductors.

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The document addresses the necessary interaction between IP design with top level design, foundries, and electronic design automation (EDA) vendors. Based on the key parameters and the categorization and applications of typical IP blocks, the essential rules are discussed. Aspects of EDA design system to facilitate integration of IP blocks is addressed, as well as the need for ESD characterization data.

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IEC 61340-4-3:2017 Electrostatics - Part 4-3: Standard test methods for specific applications - Footwear

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Describes a test method for determining the electrical resistance of footwear (shoes, slippers or booties) used in the control of electrostatic potential on people.

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IEC 61340-4-9:2016 Electrostatics - Part 4-9: Standard test methods for specific applications - Garments

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Provides test methods for evaluating the electrical resistance of garments that contain surface conductive or dissipative components or materials used in the electronics industry for the control of electrostatic discharge.

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GLOSSARY**ESD ADV1.0-2024 (replaces ESD ADV1.0-2017) ESD Association Advisory for Electrostatic Discharge Terminology Glossary of Terms**

Definitions and explanations of various terms used in Association Standards and documents are covered in this Advisory. It also includes other terms commonly used in the electronics industry.

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ESD ADV1.0-2017 ESD Association Advisory for Electrostatic Discharge Terminology Glossary of Terms

Definitions and explanations of various terms used in Association Standards and documents are covered in this Advisory. It also includes other terms commonly used in the electronics industry.

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GLOVES AND FINGER COTS**ANSI/ESD STM15.1-2019 ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items - Methods for Resistance Measurement of Gloves and Finger Cots**

This document provides test procedures for measuring the intrinsic electrical resistance of gloves and finger cots, as well as their electrical resistance, together with personnel as a system. The system test provides data that are relevant to the user's specific environment and application.

ISBN: 1-58537-314-1 ; 23 Pages; Available

Order#: ANSI/ESD STM15.1-2019

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ESD TR15.0-01-99 ESD Association Technical Report for Glove and Finger Cots

This technical report reviews the existing known industry test methods for the qualification of ESD protective gloves and finger cots.

10 Pages; Available

Order#: ESD TR15.0-01-99

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GROUNDING**ANSI/ESD S6.1-2019 ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items - Grounding**

This standard specifies the parameters, materials, equipment, and test procedures necessary to choose, establish, verify, and maintain an electrostatic discharge (ESD) control grounding system for use within an ESD protected area (EPA) for protection of ESD susceptible items. This standard also specifies the criteria for establishing ESD bonding for the protection of ESD susceptible items in field service or other remote operations.

ISBN: 1-58537-315-X; 23 Pages; Available

Order#: ANSI/ESD S6.1-2019

Hardcopy \$165.00 - List / \$135.00 - Member

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HANDLERS**ANSI/ESD SP10.1-2016 ESD Association Standard Practice for Automated Handling Equipment (AHE)**

Provides testing and data reporting procedures for the evaluation of ESD ground integrity in AHE and for the evaluation of charge generation and accumulation on devices in AHE. These methods evaluate newly installed and existing equipment by verifying the equipment's existing ground paths and by determining if charge on ESD-sensitive devices (ESDS) can be detected.

ISBN: 1-58537-287-0; 25 Pages; Available

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ESD TR10.0-01-02 ESD Association Technical Report for Measurement and ESD Control Issues for Automated Equipment Handling of ESD Sensitive Devices Below 100 Volts

This document provides guidance and considerations that an equipment manufacturer should use when designing automated handling equipment for these low voltage sensitive devices.

11 Pages; Available

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HAND TOOLS**ANSI/ESD S13.1-2019 ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items - Electrical Soldering/Desoldering Hand Tools**

This standard provides electrical soldering/desoldering hand tool test methods for measuring current leakage, tip to ground reference point resistance, and tip voltage.

ISBN: 1-58537-317-6; 19 Pages; Available

Order#: ANSI/ESD S13.1-2019

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ESD TR13.0-01-99 ESD Association Technical Report for EOS Safe Soldering Iron Requirements

This technical report discusses soldering iron requirements that must be based on the sensitivity of the most susceptible devices that are to be soldered.

19 Pages; Available

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HEALTHCARE**ESD TR29.0-01-24 (brand new document) ESD Association Technical Report for the Protection of Electrostatic Discharge Susceptible Items – Guidance for Control of Electrostatic Hazards in Healthcare Facilities**

This document provides specifications for flooring, footwear, materials, and equipment used in healthcare facilities to reduce electrostatic charge accumulation and electrostatic discharge (ESD) risk for personnel and equipment as well as risk of contamination cause by electrostatic attraction (ESA). It addresses the risk of ESD causing damage to electronic equipment, corruption of electronic records, and shocks to personnel. It also addresses the risk of ESA causing contaminants to be attracted to surfaces. Finally, it provides background on the risk of ESD causing an ignition of flammables. Mitigation of this last risk is outside of the scope of this document and the reader is referred to other standards for that guidance.

62 pages; Available

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IEC 61340-6-1:2018 - Part 6-1: Electrostatic control for Healthcare - General requirements for facilities

This document provides technical requirements and recommendations for controlling electrostatic phenomena in healthcare facilities, which includes requirements for equipment, materials, and products used to control static electricity.

25 Pages; Available

Order# IEC 61340-6-1

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HIGH RELIABILITY**ESD TR19.0-01-22 ESD Association Technical Report for the Development of an Electrostatic Discharge Control Program for High-Reliability Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)**

This document provides best practices to be used for defining, establishing, implementing, and maintaining an ESD control program for electronic items used in high-reliability applications.

21 pages; Available

Order#: ESD TR19.0-01-22

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HUMAN BODY MODEL (HBM)**ANSI/ESDA/JEDEC JS-001-2023 ESDA/JEDEC Joint Standard for Electrostatic Discharge Sensitivity Testing - Human Body Model (HBM) - Device Level**

This standard establishes the procedure for testing, evaluating, and classifying devices and microcircuits according to their susceptibility (sensitivity) to damage or degradation by exposure to a defined human body model (HBM) electrostatic discharge (ESD). All packaged semiconductor devices, thin film circuits, acoustic wave devices, optoelectronic devices, hybrid integrated circuits (HICs), discrete, and multi-chip modules (MCMs) containing any of these devices as well as unpackaged singulated bare die, and die which are still part of a wafer are to be evaluated according to this standard.

This document is also available for complimentary download (registration required) from our website www.esda.org.

ISBN: 1-58537-343-5; 56 pages; Available

Order#: ANSI/ESDA/JEDEC JS-001-2023

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IEC 60749-26:2018 Semiconductor devices - Mechanical and climatic test methods - Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)

[Technically equivalent to ANSI/ESDA/JEDEC JS-001.](#)

Establishes the procedure for testing, evaluating, and classifying components and microcircuits according to their susceptibility (sensitivity) to damage or degradation by exposure to a defined human body model (HBM) electrostatic discharge (ESD).

*108 Pages; Available
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ANSI/ESD SP5.1.3-2022 ESD Association Standard Practice for Electrostatic Discharge Sensitivity Testing - Human Body Model (HBM) Testing - Device Level - A Method for Randomly Selecting Pin Pairs

This standard practice establishes an alternative method for selecting pin pairs used in human body model testing as described in ANSI/ESDA/JEDEC JS-001. NOTE: The results obtained by applying this standard practice may or may not be identical to the results obtained by applying ANSI/ESDA/JEDEC JS-001 using Table 2A or Table 2B.

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ESDA/JEDEC JTR001-01-12 ESDA/JEDEC Joint Technical Report User Guide of ANSI/ESDA/JEDEC JS-001 Human Body Model Testing of Integrated Circuits

This technical report describes the technical changes made in ANSI/ESDA/JEDEC JS-001-2011 (contained in the new 2012 version) and explains how to use those changes to apply HBM (Human Body Model) tests to IC components.

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HUMAN METAL MODEL (HMM)**ESD SP5.6-2019 ESD Association Standard Practice for Electrostatic Discharge Sensitivity Testing - Human Metal Model (HMM) - Component Level**

This document establishes a test method for stressing pins of electrical components that will be connected to external ports of a system to provide a figure of merit (the onset of physical damage) for survivability of the tested pin from electrically induced physical damage due to electrostatic discharge events (ESD) events.

*ISBN: 1-58537-316-8; 32 Pages; Available
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ESD TR5.6-01-09 ESD Association Technical Report for Human Metal Model (HMM)

This technical report addresses the need for a standard method of applying the IEC contact discharge waveform to devices and components.

*15 pages; Available
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IONIZATION**ANSI/ESD STM3.1-2015 ESD Association Standard Test Method for Ionization**

Provides test methods and procedures for evaluating and selecting air ionization equipment and systems (ionizers).

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IEC 61340-4-7:2017 Electrostatics - Part 4-7: Standard test methods for specific applications - Ionization

[Technically equivalent to ANSI/ESD STM3.1.](#)

Provides test methods and procedures for evaluating and selecting air ionization equipment and systems (ionizers).

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ANSI/ESD SP3.3-2016 ESD Association Standard Practice for Periodic Verification of Air Ionizers

This standard practice provides test methods and procedures for periodic verification of the performance of air ionization equipment and systems (ionizers).

ISBN: 1-58537-292-7; 23 Pages; Available

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ANSI/ESD SP3.4-2016 ESD Association Standard Practice for Periodic Verification of Air Ionizer Performance Using a Small Test Fixture

This standard practice provides a test fixture example and procedures for performance verification of air ionization used in confined spaces where it may not be possible to use the test fixtures defined in ANSI/ESD STM3.1 or ANSI/ESD SP3.3.

ISBN: 1-58537-291-9; 17 Pages; Available

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ANSI/ESD SP3.5-2020 ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items - Test Methods for Air Assist Bar Ionizers, Soft X-Ray (Photon) Ionizers, Room Ionization Alternatives, and Non-Airflow Alpha Ionizers

This document describes ionization qualification and periodic verification test methods for types of ionizers and room ionization alternatives, which are not delineated in ANSI/ESD STM3.1 or ANSI/ESD SP3.3.

ISBN: 1-58537-320-6; 24 Pages; Available

Order#: ANSI/ESD SP3.5-2020

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ESD TR3.0-01-02 ESD Association Technical Report for Alternate Techniques for Measuring Ionizer Offset Voltage and Discharge Time

This technical report investigates measurement techniques to determine ion balance and charge neutralization time for ionizers.

11 Pages; Available

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ESD TR3.0-02-05 ESD Association Technical Report for Selection and Acceptance of Air Ionizers

This document reviews and provides a guideline for creating a performance specification for the four ionizer types contained in ANSI/ESD STM3.1: room (systems), laminar flow hood, worksurface (e.g. blowers), and compressed gas (nozzles & guns).

17 pages; Available

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IMMUNITY SCANNING**ANSI/ESD SP14.5-2021 ESD Association Standard Practice for Electrostatic Discharge Sensitivity Testing - Near Field Immunity Scanning - Component/Module/PCB Level**

This document establishes a test method for immunity scanning of ICs, modules, and PCBAs. Results from near-field immunity scanning relate to the system level behavior but cannot predict system level performance using the IEC 61000-4-2 test method. The reason is that variations exist in coupling paths between injection points and local current densities and associated fields coupled into traces or ICs.

This test method focuses on soft failures, such as bit errors and upsets, keeping in mind that fast pulses can also cause latch-up. The document will guide the user in identifying the root causes of ESD induced soft failures in components, such as ICs, modules, and PCBAs, for debugging and quality control purposes.

ISBN: 1-58537-327-3; 38 Pages; Available

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MACHINE MODEL (MM)**ESD SP5.2-2019 ESD Association Standard Practice for Electrostatic Discharge (ESD) Sensitivity Testing - Machine Model (MM) - Component Level**

This document establishes a test method for characterizing a component's reaction to MM waveform stimulus.

ISBN: 1-58537-310-9; 22 Pages; Available

Order#: ESD SP5.2-2019

Hardcopy \$165.00 - List / \$135.00 - Member

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ESDA/JEDEC JTR5.2-01-15 - ESDA/JEDEC Joint Technical Report for Discontinuing Use of the Machine Model for Device ESD Qualification

The document's purpose is to provide the necessary technical arguments for strongly recommending no further use of this model for IC qualification.

11 pages; Available

Order#: ESDA/JEDEC JTR5.2-01-15

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OHMMETERS**ESD TR50.0-02-99 ESD Association Technical Report for High Resistance Ohmmeters--Voltage Measurements**

This technical report discusses a number of parameters that can cause different readings from high resistance meters when improper instrumentation and techniques are used and the techniques and precautions to be used in order to ensure the measurement will be as accurate and repeatable as possible for high resistance measurement of materials.

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PACKAGING**ANSI/ESD STM11.11-2022 ESD Association Standard Test Method for Protection of Electrostatic Discharge Susceptible Items - Surface Resistance Measurement of Planar Materials**

This standard test method defines the test procedure, equipment, sample preparation, and conditioning needed to achieve reproducible surface resistance measurements.

ISBN: 1-58537-344-3; 19 Pages; Available

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ANSI/ESD STM11.12-2021 ESD Association Standard Test Method for Protection of Electrostatic Discharge Susceptible Items - Volume Resistance Measurement of Planar Materials

This standard test method provides test methods for measuring the volume resistance of static dissipative planar materials used in the packaging of ESD sensitive devices and components.

ISBN: 1-58537-325-7; 18 Pages; Available

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ANSI/ESD STM11.13-2021 ESD Association Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items - Two-Point Resistance Measurement

This document is intended for measuring materials with a resistance of greater than or equal to 1.0×10^4 ohms and less than 1.0×10^{11} ohms.

ISBN: 1-58537-299-4; 19 pages; Available

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ANSI/ESD STM11.31-2018 ESD Association Standard Test Method for Evaluating the Performance of Electrostatic Discharge Shielding Materials - Bags

This document evaluates the attenuation ability of electrostatic discharge shielding bags.

ISBN: 1-58537-305-2; 16 Pages; Available

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IEC 61340-4-8:2014 (Bags) Electrostatics - Part 4-8: Standard test methods for specific applications - Electrostatic discharge shielding - Bags

Technically equivalent to ANSI/ESD STM11.31.

Provides a test method for evaluating the performance of electrostatic discharge shielding bags tested according to the requirements of IEC 61340-5-3.

30 Pages; Available

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ANSI/ESD S11.4-2022 ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items - Static Control Bags

This standard establishes performance limits for bags that are intended to protect electronic parts and products from damage due to static electricity and moisture during common electronic manufacturing industry transport and storage applications.

ISBN # 1-58537-348-6; 16 pages; Available

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ANSI/ESD S541-2019 ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items - Packaging Materials

This standard defines the packaging properties needed to protect electrostatic discharge susceptible (ESDS) electronic items through all phases of production, transport, and storage. Packaging requirements are defined to support the ESD control program requirements stated in ANSI/ESD S20.20. Test methods are referenced for the evaluation of ESD protective packaging and packaging materials. Required limits are provided.

ISBN: 1-58537-318-4; 31 Pages; Available

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IEC 61340-5-3: 2022 Electrostatics - Part 5-3: Protection of electronic devices from electrostatic phenomena - Properties and requirements classification for packaging intended for electrostatic discharge sensitive devices

[Technically equivalent to ANSI/ESD S541.](#)

Defines the ESD protective packaging properties required to protect ESD sensitive devices (ESDSs) through all phases of production, rework and maintenance, transport, and storage.

52 Pages; Available

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ESD ADV11.2-1995 ESD Association Advisory for the Protection of Electrostatic Discharge Susceptible Items - Triboelectric Charge Accumulation Testing

Provides guidance in understanding the triboelectric phenomenon and relates current information and experience regarding tribocharge testing as used in static control for electronics.

ISBN: 1-878303-63-5; 44 Pages; Available

Order #: ESD ADV11.2-1995

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IEC TR 61340-5-5: 2018 Part 5-5: Protection of electronic devices from electrostatic phenomena - Packaging systems used in electronic manufacturing

This part of IEC 61340 discusses packaging material requirements for electrostatic discharge sensitive items (ESDS) as well as non-ESDS which can apply to packaging materials such as embossed carrier tape, trays, tubes (stick magazines), rails and others used in back end line processing and parts handling where test methods described in other standards are, for the most part, inadequate. Issues related to electrostatic charge generation, electrostatic attraction and repulsion are included. The recommendations and discussions within this document can also be applicable to other types of packaging that cannot be evaluated by other means.

38 Pages; Available

Order# IEC TR 61340-5-5

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PROCESS ASSESSMENT**ANSI/ESD SP17.1-2020 ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items - Process Assessment Technique**

This document describes a set of methodologies, techniques, and tools that can be used to characterize a process where ESD sensitive (ESDS) items are handled. The process assessment covers risks by charged personnel, ungrounded conductors, charged ESDS items, and ESDS items in an electrostatic field.

ISBN: 1-58537-319-2; 56 Pages; Available

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IEC PAS 61340-5-6:2022 Electrostatics - Part 5-6 : Protection of electronic devices from electrostatic phenomena - Process assessment techniques

[Technically equivalent to ANSI/ESD SP17.1.](#)

Describes a set of methodologies, techniques, and tools that can be used to characterize a process where ESD sensitive (ESDS) items are handled.

58 Pages; Available

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ESD TR17.0-01-15 ESD Association Technical Report for ESD Process Assessment Methodologies in Electronic Production Lines - Best Practices used in Industry.

This technical report gives the reader examples of "best practices" of process assessment methodologies and test methods.

64 Pages; Available

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SEATING**ANSI/ESD STM12.1-2019 ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items - Seating - Resistance Measurement**

This document provides test methods for measuring the electrical resistance of seating used for the control of electrostatic charge. This standard test method provides test methods for the qualification of seating prior to installation or application.

ISBN: 1-58537-313-3; 19 Pages; Available

Order#: ANSI/ESD STM12.1-2019

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STATIC ELECTRICITY**ESD TR50.0-01-99 ESD Association Technical Report - Can Static Electricity Be Measured?**

This report gives an overview of fundamental electrostatic concepts, electrostatic effects, and most importantly of electrostatic metrology, especially what can and what cannot be measured.

36 Pages; Available

Order#: ESD TR50.0-01-99

Hardcopy \$20.00 - List / \$12.00 - Member

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SUSCEPTIBLE DEVICE CONCEPTS**ESD TR50.0-03-03 ESD Association Technical Report for Voltage and Energy Susceptible Device Concepts, Including Latency Considerations**

This technical report contains information to promote an understanding of the differences between energy and voltage susceptible types of devices and their sensitivity levels.

26 Pages; Available

Order#: ESD TR50.0-03-03

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SYMBOLS**ANSI/ESD S8.1-2021 ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items - Symbols**

This document covers the ESD susceptibility, ESD protective, and ESD common point ground symbols.

ISBN: 1-58537-324-9; 15 pages; Available

Order#: ANSI/ESD S8.1-2021

Hardcopy \$165.00 - List / \$135.00 - Member

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SYSTEM LEVEL ESD**ESD TR14.0-01-00 ESD Association Technical Report for Calculation of Uncertainty Associated with Measurement of Electrostatic Discharge (ESD) Current**

This technical report provides guidance on measuring uncertainty based on an uncertainty budget.

18 Pages; Available

Order#: ESD TR14.0-01-00

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ESD TR14.0-02-13 ESD Association Technical Report for System Level Electrostatic Discharge (ESD) Simulator Verification

This technical report was developed to define a measurement system and fixtures that can be used to make measurements of the discharge current from ESD simulators and other sources.

19 Pages; Available

Order#: ESD TR14.0-02-13

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Electronic \$20.00 - List / \$12.00 - Member

ESD TR26.0-01-23 ESD Association Technical Report for Behavioral IC Modeling to Perform System Level ESD Simulations - General Description and Trends

This document introduces a methodology for creating behavioral models of integrated circuit (IC) inputs and outputs and electrostatic discharge (ESD) protection devices for use in the simulation of ESD events that strike external connections of electronic systems. These models provide a framework for ESD simulation without revealing proprietary information about the components and provide a method for exchanging information between component manufacturers and original equipment manufacturers (OEM).

41 Pages; Available

Order#: ESD TR26.0-01-23

Hardcopy \$20.00 - List / \$12.00 - Member

Electronic \$20.00 - List / \$12.00 - Member

ESD TR26.0-02-24 (brand new document) ESD Association Technical Report for Quasistatic Model Definition – Building Models

This document addresses how to create simple, quasistatic model files that describe the basic properties of electronic components appropriate for system-level ESD simulation.

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ESD TR5.5-04-23 ESD Association Technical Report for Electrostatic Discharge Sensitivity Testing - Transmission Line Pulse (TLP) - User and Application Guide

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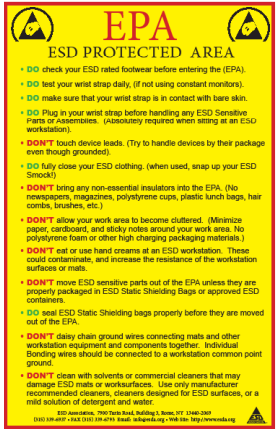
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