

JEDEC STANDARD

Requirements for Handling Electrostatic-Discharge-Sensitive (ESDS) Devices

JESD625C

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JEDEC SOLID STATE TECHNOLOGY ASSOCIATION



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REQUIREMENTS FOR HANDLING ELECTROSTATIC-DISCHARGE-SENSITIVE (ESDS) DEVICES

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REQUIREMENTS FOR HANDLING ELECTROSTATIC-DISCHARGE-SENSITIVE (ESDS) DEVICES

(From JEDEC Board ballot JCB-22-33, formulated under the cognizance of JEDEC JC-14.1 Committee on Reliability Test Methods for Packaged Devices and JEDEC JC-13 Government Liaison.)

1 Scope

This standard applies to devices susceptible to damage by electrostatic discharge greater than 100 volts human body model (HBM) and 200 volts charged device model (CDM). Processes that include items susceptible to lower withstand voltages may require additional control elements or adjusted limits. Processes designed to handle items with a lower ESD withstand voltage can still claim compliance to this standard. Device sensitivity to ESD is determined by test methods for Human Body Model (ANSI/ESDA JEDEC JS-001) and Charged Device Model (ANSI/ESDA JEDEC JS-002) or equivalent.

1.1 Applicable Users

- a) Semiconductor Manufacturers - from wafer processing through shipment of finished devices.

NOTE Some requirements of this standard are not applicable prior to probe. Prior to probe, the manufacturer should take appropriate ESD precautions to minimize damage to devices.

- b) Semiconductor Processing/Testing Facilities - from receipt through shipment of finished devices. The requirements apply to all ESDS devices until they are considered scrap.

NOTE ESDS Device Distributors and Users may use this standard or ANSI/ESD S20.20

1.2 Applicable Device Types

The device types for which these requirements are applicable include, but are not limited to, ESD-sensitive discrete and integrated circuit semiconductors, hybrids, multi-chip modules, optoelectronic devices, thin film passive devices and any device identified as ESD sensitive by the suppliers.

1.3 Personnel Safety

The procedures and equipment described in this document may expose personnel to hazardous electrical conditions. Users of this document are responsible for selecting equipment that complies with applicable laws, regulatory codes and both external and internal policy. Users are cautioned that this document cannot replace or supersede any requirements for personnel safety. Ground fault circuit interrupters (GFCI) and other safety protection should be considered wherever personnel might come into contact with electrical sources. Electrical hazard reduction practices should be exercised and proper grounding instructions for equipment shall be followed.

2 Technical References

Unless otherwise specified, the following documents of the latest issue, revision, or amendment, form a part of this standard to the extent specified herein.

ANSI/ESD-S1.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Wrist-Straps
ANSI/ESD-S6.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Grounding
ANSI/ESD-S8.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Symbols
ANSI/ESD-S13.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Electrical Soldering/Desoldering Hand Tools
ANSI/ESD-S541	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Packaging Materials
ANSI/ESD-STM2.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Garments – Resistive Characterization
ANSI/ESD-STM3.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Ionization
ANSI/ESD-STM4.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items - Worksurfaces – Resistance Measurements
ANSI/ESD-STM7.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Floor Materials – Resistive Characterization of Materials
ANSI/ESD-STM9.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Footwear – Resistive Characterization
ANSI/ESD-STM11.11	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Surface Resistance Measurements of Planar Materials
ANSI/ESD-STM12.1	ESD Association Standard for the Protection of Electrostatic Discharge Susceptible Items – Seating – Resistance Measurement
ANSI/ESD-STM97.1	ESD Association Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items – Footwear/Flooring System – Resistance Measurement in Combination with a Person

2 Technical References (cont'd)

ANSI/ESD-STM97.2	ESD Association Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items – Footwear/Flooring System – Voltage Measurement in Combination with a Person
ANSI/ESD-SP9.2	Standard Practice for the Protection of Electrostatic Discharge Susceptible Items – Foot Grounders – Resistive Characterization
ANSI/ESDA/JEDEC JS-001	Human Body Model (HBM) Electrostatic Discharge (ESD) Sensitivity Testing Standard
ANSI/ESDA/JEDEC JS-002	Field Induced Charged Device Model Test Method for Electrostatic Discharge Withstand Threshold for Microelectronic Devices
ESD TR20.20	ESD Association Technical Report – Handbook for the Development of an Electrostatic Discharge Control Program for the Protection of Electronic Parts, Assemblies and Equipment
ESD TR53-01	ESD Association Technical Report for the Protection of Electrostatic Discharge Susceptible Items – Compliance Verification of ESD Protective Equipment and Materials
JESD471	Symbol and Label for Electrostatic Sensitive Devices
MIL-STD-129	Marking for Shipment and Storage

3 Terms and Definitions

For the purpose of this standard the following definitions apply.

auxiliary ground: A separate supplemental ground conductor for use other than general equipment grounding.

charged device model (CDM): An ESD stress model that approximates the discharge event that occurs when a charged component is quickly discharged to another object at a different electrostatic potential through a signal pin or terminal as specified in ANSI-ESD-JEDEC JS-002.

conductive material: A material that has a surface resistance less than 1×10^4 ohms or a volume resistance less than 1×10^4 ohms.

NOTE A conductive material is not necessarily low charging.

conductive worksurface: A surface whose material is made of conductive material such as stainless steel typically found in a cleanroom.

NOTE Reference Table 2.

electrostatic charge: Electric charge at rest.

electrostatic discharge (ESD): The transfer of electrostatic charge between bodies or surfaces that are at different electrostatic potentials.

ESDS device: Electrostatic-discharge-sensitive device.

electrostatic field: Lines of force surrounding an electrically charged object.

equipment ground: The entire low-impedance path (electrically equivalent to the equipment grounding conductor) from a piece of electrical equipment to a hard-ground electrode (e.g., the third wire (typically green) terminal of a receptacle).

ESD control item: Any fabricated or purchased item that provides some form of protection of ESDS devices from damage due to ESD during handling in manufacturing shipment or field use.

ESD ground: The point, electrodes, bus bar, metal strips, or other system of conductors that form a path from a statically charged person or object to ground.

EPA: A defined location with the necessary materials, tools, and equipment capable of reducing static electricity to a level that minimizes damage to ESD susceptible items.

ESD protected workstation: A work position with the necessary materials, tools and equipment capable of controlling static electricity to a level that minimizes damage to ESD susceptible items.

ESD protective packaging: A packaging system that provides electrostatic discharge protection and limits triboelectric charging to levels that do not result in device damage.