

ANSI/ESD SP17.1-2020

ESD Association Standard Practice

ANSI/ESD SP17.1-2020



*For the Protection of Electrostatic
Discharge Susceptible Items –*

Process Assessment Techniques

*Electrostatic Discharge Association
7900 Turin Rd., Bldg. 3
Rome, NY 13440*

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*ESD Association Standard Practice for
the Protection of Electrostatic Discharge
Susceptible Items –
Process Assessment Techniques*

Approved November 17, 2020
EOS/ESD Association, Inc.



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FOREWORD

This standard practice¹ describes a set of methodologies, techniques, and tools that can be used to characterize a process where ESD sensitive (ESDS) items are handled. This document's procedures are meant to be used by those possessing knowledge and experience with electrostatic measurements.

This document provides methods to determine the level of ESD risk that remains in the process after ESD protective equipment and materials are implemented.

These test methods' objective is to identify if potentially damaging ESD events are occurring or if significant electrostatic charges are generated on people, equipment, materials, components, or printed circuit board assemblies (PCBA) even though there are static control measures in place.

Sensitivities of items are characterized by industry-standard ESD testing and rated by their withstand voltages. This document is intended to provide methods to determine whether items of a given withstand voltage are at risk in the process.

The wide variety of ESD protective equipment and materials and the environment in which these items are used may require test setups different from those described in this document. Users of this standard practice may need to adapt the test procedure and setups described in Annex A to produce meaningful data for the user's application.

Organizations performing these tests will need to determine if on-going process characterization is necessary, and if so, the time interval between observations. It may also be important to make these observations when new products are introduced or when process changes occur. Examples of process changes may include tools, fixtures, equipment, new items/products, and additional manufacturing steps.

The topics below are not addressed in this document:

- Program Management: see ANSI/ESD S20.20 Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
- Compliance Verification: see ESD TR53-01 Compliance Verification of ESD Protective Equipment and Materials
- Troubleshooting: ESD TR53-01
- ESD Program Certification: see ANSI/ESD S20.20 Certification Program at www.esda.org

This document was designated ANSI/ESD SP17.1-2020 and approved on November 17, 2020.

¹ **ESD Association Standard Practice:** A procedure for performing one or more operations or functions that may or may not yield a test result. Note, if a test result is obtained it may not be reproducible.

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ESD Association Standard Practice for the Protection of Electrostatic Discharge Susceptible Items – Process Assessment Techniques**1.0 PURPOSE, SCOPE, LIMITATION, AND EXPERIENCE LEVEL REQUIRED****1.1 Purpose**

The purpose of this document is to describe 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.

1.2 Scope

This document applies to activities that manufacture, process, assemble, install, package, label, service, test, inspect, transport, or otherwise handle electrical or electronic parts, assemblies, and equipment susceptible to damage by electrostatic discharges. This document does not apply to electrically initiated explosive items, flammable liquids, or powders. The document does not address program management, compliance verification, troubleshooting, or program manager/coordinator certification. In this version of the document, risks due to electromagnetic sources that produce AC fields are not considered.

1.3 Limitation

No detailed description of the processes and measurement techniques is given. An example of a simple risk assessment of a discharge from a charged human body is described in Annex D.

Due to the sampling nature in this document's procedures, deficiencies may exist that are not detected at the time the measurements are made. The measurements described are valid only at the time the measurements are made and may or may not change with time.

NOTE: Environmental parameters such as temperature and relative humidity (RH) may significantly impact the measurement results.

1.4 Experience Level Required

The procedures in this document are for use by personnel possessing advanced knowledge and experience with electrostatic measurements. The interpretation of the results from the measurements described in this document requires significant experience and knowledge of the physics of ESD and the process.

2.0 REFERENCED PUBLICATIONS

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

ESD ADV1.0, ESD Association Glossary of Terms²

ANSI/ESD S20.20, For the Development of an Electrostatic Discharge Control Program for – Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)²

IEC61340-5-1, Electrostatics–Part 5-1: Protection of Electronic Devices from Electrostatic Phenomena – General Requirements³

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³ IEC – International Electrotechnical Commission, www.iec.ch