Program Manager Certification

ESDA ROAD MAP

The Route to ESD Control

ESDA Roadmap

The purpose of the Roadmap is to project the impact of technology scaling in the semiconductor industry.

To develop the Roadmap, ESD device and design experts collaborated from several major corporations. The projections they formulated are based on industry trends and technology constraints and are not representative solely of the design methods used at their respective companies.

Current advances in electronic device process speed and capability are dramatically outpacing the ability to design in ESD protection for the devices. Major device manufacturers are predicting that device sensitivies will fall well below the current threshold levels by the year 2010.

ESDA Roadmap

Companies involved in electronics manufacturing must be prepared to handle these devices or significant losses could occur. Strong understanding of the ESD control capability of the factory, will be required in order to maintain process yields in the near future.

The ESD Association has developed an education program that will provide the ESD program manager with the knowledge to develop an effective control program.

To download a pdf of the Technology Roadmap, visit www.esda.org.

Program Manager

The ten course program provides the attendee with the information required to successfully implement an ESD control program in the factory. The student can take any one course, or all ten courses, to broaden their capabilities in ESD management.

Upon completion of all courses, and the successful completion of an exam, the attendee can also achieve Program Manager Certification from the ESD Association. Program Manager Certification demonstrates a very strong knowledge in the area of ESD control.

A casual approach to ESD control will no longer be effective as technology progresses. Make sure that your factory has the people with the right knowledge to maintain production yields at the highest levels.

Program Manager

Program Manager designation was developed for individuals that are involved in designing, implementing, managing and auditing ESD control programs in their facilities.

The following courses are offered every year at Symposium and at other times throughout the year. An attendee may receive credit for having taken any of the required Program Manager classes if the class was taken in 2003 or later. Included on the following pages are Program Manager course descriptions along with check boxes in the bottom right hand corner. Use the check boxes to help you keep track of your course completion status. Additional information may be obtained at http://www.esda.org/programmanager.html.

Course Listings

- ESD Program Development & Assessment (ANSI/ESD S20.20 Seminar) (2-day course)
- ESD Basics for the Program Manager (full-day course)
- How To's of In-Plant ESD Auditing and Evaluation Measurements (full-day course)
- Air Ionization: Issues and Answers (half-day course)
- Packaging Principles for the Program Manager (half-day course)
- ESD Standards Overview for the Program Manager (half-day course)
- Device Technology and FA Overview (half-day course)
- Electrostatic Calculations for the ESD Engineer (half-day course)
- Cleanroom Considerations for the Program Manager (half-day course)
- System Level ESD/EMI: Testing to IEC and Other Standards (half-day course)

S20.20 Seminar

ANSI/ESD S20.20

This is a two-day course as follows:
Day 1 deals with how to develop an ESD control program. The topics covered are: Training, audit requirements, grounding related to the facility as well as personnel, protected area requirements and packaging.

Day 2 provides information on how to assess an ESD control program based on ANSI/ESD S20.20. These tools could be used to assess any ESD program.

Learning Outcome
This course will provide guidance on how to implement an ESD program, select the ESD control elements used as part of the ESD control program and how to assess if the controls are adequate for the devices being handled.

The student will be able to use the knowledge gained to establish an ESD control program based on the most sensitive device being handled in any facility. The student will also be able to audit any ESD process to determine a program's adequacy.

ESD Basics

for the Program Manager

This is a one-day course. The course is divided into three sections:

- **Section A** describes how static electricity is created.
- **Section B** explains the various ways that ESD sensitive devices can be damaged.
- **Section C** provides general information on how to protect ESD sensitive devices during handling and product assembly.

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Learning Outcome

The student will get a thorough orientation into ESD and its effects on ESD sensitive devices. This class should be considered a pre-requisite for any person who wishes to take any of the other program manager classes.

How to's

How To's of Inplant ESD Auditing and Evaluation Measurements

This is a full-day course designed to support ANSI/ESD S20.20 compliance verification requirements. It reviews the evaluation and audit measurement procedures required for an S20.20 compliant ESD program. This course is an ESDA certification requirement for program managers who are working toward professional ESD certification

Learning Outcome

Anyone who takes this course will learn how to properly measure any item used to control static charge. The measurement techniques can be applied to measuring product as part of the product qualification process and will also provide guidance on how to establish measurement protocols for periodic verification or process auditing.

Air Ionization

Air Ionization – Issues and Answers

This half-day course describes the uses of air ionization in handling static charges on insulators or isolated conductors in a manufacturing process. It also addresses the major types of ionization systems, their use and the test methods used to verify ionization effectiveness.

Learning Outcome

The student will be able to determine when ionization should be used to handle static electricity and what type of ionization system will best meet process needs.

Packaging

Principles for the Program Manager

This is a half-day course that provides an overview of the basics of ESD protective packaging used for shipping and storage of ESD susceptible items. It addresses the test methods used to evaluate potential packaging materials, packaging design considerations and the role of packaging in an overall ESD control program using ANSI/ESD S541 as a guide.

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Learning Outcome

The student will learn how to develop an ESD protective packaging strategy based on the sensitivity of the devices being handled and the ESD threats in the handling and shipping environments.

Standards

ESD Standards

Overview for the Program Manager

This is a half-day course that has been designed to provide an overview of how ESD standards are developed by the ESD Association to meet the needs of the electronics industry.

This overview tutorial provides a general review of all the ESD Association documents and should be particularly helpful to program manager candidates just prior to taking the comprehensive exam.

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Learning Objectives:

The student will get a good understanding of the standards and other documents that have been published by the ESD Association and how they can be used to develop and support an ESD control program.

FA

Device Technology

and Failure Analysis Overview

This half-day course is designed to give a broad overview of ESD device technology, the ways circuit designers protect against ESD, and the failure analysis techniques that are likely to be encountered in reports about ESD failures. It is meant to provide program managers with a background on what designers and failure analysis engineers actually do, by imparting a broad, but not in-depth, understanding of the above areas of the ESD world. The topics covered include the three most common ESD models, characteristics of ideal ESD protection, typical ESD protection schemes, key characteristics of ESD protection, failure analysis flow, and failure analysis tools and their uses.

Learning Outcome

After completing this course you should be able to understand the basics of device protection design and some of the trade-offs inherent in that process. You should also be familiar with some of the most commonly used failure analysis techniques that can help identify failing circuit components- in other words "what does a semiconductor manufacturer do with the units I return for failure analysis?"

Calculations

Electrostatic

Calculations for the ESD Engineer

This half-day course focuses on the basic calculations and techniques of use to the Program Manager and the ESD engineer. The content is at the introductory College pre-calculus and introductory college physics level set in the context of electrostatic discharge and its effects. Topics covered include the electric force, the electric field and Coulombs law, electric potential and voltage. Gauss' Law is discussed as it relates to the electric field, induction and the Faraday cup. The capacitance in Q = CV is used to explain charge sharing. RC decay is discussed as it relates to ESD discharge from humans, devices, wrist straps and materials. After completing this course, the attendee should leave with a proper understanding of the differences among the calculations for peak current, power, energy and threshold voltage for a simple device.

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Learning Outcome

The Course provides the student with working knowledge of the physics of static electricity and electrostatic discharge. The skills learned will provide and indiciduyal with a better understanding of electrostatics.

Cleanroom

Cleanroom

Considerations for the Program Manager

This half-day course will address how the needs for ESD control and process cleanliness can work together.

Cleanrooms and clean environments are required for the manufacture of many products that have exacting contamination control requirements to achieve defined yield and reliability targets. Clean manufacturing environments are required for the production of items such as semiconductors, hard-disk drives, flat panel displays, and materials for the pharmaceutical industry.

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Many of the products that require clean processes are also susceptible to ESD.

Learning Outcome

The course will provide an overview on clean manufacturing requirements and items that need to be considered if the clean environment requires ESD controls.

System Level

ESD/EMI: Testing to IEC and Other Standards

This half-day course is intended to help those tasked with testing products to IEC and other system level ESD standards by providing detailed information on IEC 61000-4-2, the most widely used standard, and highlighting the harmonization and differences between IEC, ANSI, Telcordia, and some automotive ESD standards.

Learning Outcome

Those attending this course will understand the requirements for system level ESD/EMI testing.

ESDA

About the ESD Association

Founded in 1982, the ESD Association is a not for profit, professional organization dedicated to furthering the technology and understanding of electrostatic discharge. The Association sponsors educational programs, develops ESD standards, holds an annual technical symposium, and fosters the exchange of technical information among its members and others.