Course Outline

ADVANCE ESD TRAINING COURSE

Enhance your skills on ESD

Objectives

To ensure the participants fully understand ESD as well as ANSI ESD S20.20 revision 2021 requirements.

Course Description

The course begins with an introduction to ESD. Advancement in the field of electronics has made gadgets more compact, faster and cheaper. This has resulted in indirectly resulted in electronic components that are becoming more and more sensitive to ESD. Fundamentals of ESD covers the important concepts of ESD such as concepts of Faraday caging, laws of induction etc. These concepts are critical in order to understand how ESD becomes a threat to our electronic industries. Armed with the important concepts of ESD, the course then focus on how to prevent and protect ESD sensitive components.

Recommended participants

This is open to all level of staff such as Technicians, Supervisors, Engineers, Officers, Managers, etc.

Duration

This is 2 full days training which begins at 9.00am until 5.00pm.

Course Structure

The course is practically orientated with numerous examples and demos in order to help the attendees understand the course. Participants are encouraged to participate and ask questions during the session. A pre and post tests will be held in order to assess the performance of the class. It is recommended that the size of the class be 25 or less participants in order to enable enough attention and time allocation for the subject matter to be well understood. Each participant will be provided a handout.

Course Outline

1.Introductory Session

1. What is ESD?
2. Definition of ESD
3. Why is ESD event often ignored?
4. Concept of “cradle to grave” requirement
5. What is the confusion of EOS over ESD?
6. Differences between EOS and ESD
7. Importance of ESD
8. Difference between catastrophic versus latent failure
9. What worsens ESD as technology advances?

2.Fundamentals of ESD

1. Basics of static electricity
2. Effects of grounding on insulators versus conductors
3. Concepts of Faraday cage
4. Law of induction
5. Charge suppression
6. Basic grounding requirements
7. Relationship of charge,capacitance and voltage
8. Methods of electrostatic voltage generation (contact and contactless methods)
9. Triboelectric series
10. Effects of humidity on ESD charges
11. Helmoltz method of generating ESD charges
12. How ESD damages sensitive components?
13. Component/board direct and indirect charging
14. Concept of virtual grounding
15. ESD device susceptibility
16. Level of sensitivity of device, board and system versus voltages
17. How does dielectric breakdown and meltdown occurs?
18. How to distinguish between EOS and ESD failures?
19. Common causes of ESD
20. Human negligence and poor ESD controls
21. Proliferation of automated systems without proper ESD control considerations
22. First case study of ESD damage caused by trim and form machine
23. Second case study of ESD damage caused by plastic pick and place suction cup

3.ESD prevention and protection

1. Understand your product sensitivities
2. ESD Event Detection
3. Classification of product sensitivities
4. Human Body Model -Charge Device Model
5. Machine Model -IEC 801-2 system model
6. ESD protection schemes employed by integrated circuits
7. Eliminate any potential electrostatic voltage sources
8. Role of materials in ESD protection
9. Classification of material ie conductive, dissipative and insulative materials
10. How is surface resistivity measured?
11. Surface resistance and resistivity classifications
12. Surface resistivity versus discharge times
13. Resistivity scale
14. How to control unavoidable electrostatic voltage sources?
15. Theory of ionization
16. Concept of Faraday Shielding
17. Use of antistaticity chemical agents

4.ESD Control Program

1. Primary ESD controls which are absolutely necessary in order to ensure minimum ESD control
2. Secondary ESD controls which are additional controls which will assist in further minimizing potential ESD damage
3. How to accurately measure charges using Faraday Cup?
4. Advantages and disadvantages of ESD shoes, booties and heelstraps
5. Use of wrist straps and safety requirements
6. Conductive smocks
7. Conductive flooring
8. How to install an ESD protective workstation
9. Use of air ionizers
10. Requirements of ESD protective chairs
11. Grounding of carts and trolleys
12. Static safe packaging and handling material requirements
13. Review of verification devices:
14. How to implement a 7 steps ESD control in your facility?

5.ESD Testing & Measurements per ANSI ESD TR-53

6.Hands on training in classroom and on production line

7.ANSI ESD S20.20 Revision 2021 standard review.

Program Schedule

Day/Time	Day 1	Day 2
9am-10.30am	Module 1	Module 3
10.30am-11.30am	Module 1	Module 3
11.30am-12.30pm	Lunch	Lunch
12.30pm-1.30pm	Module 2	Module 4
1.30pm-2.30pm	Module 2	Module 4
2.30pm-4pm	Module 2	Summary,Q&A

Testimonials

"Course was very good and easy to understand"

-**Purchasing Manager from SMT Technologies Sdn Bhd**-

"Gained new knowledge about ESD, ESD Standards, ESD application and prevention"

-Business Manager FromSMC Automation (M) Sdn. Bhd-

"Learn a lot about ESD control program and ESD measurement methods per ANSI ESD TR-53"

-**Quality Engineer from Panasonic Automotive Systems (M) Sdn.**-

About Elite Indigo

Elite Indigo Consulting provides corporate training to the semiconductor and manufacturing industries. With a humble beginning of one founding member with passion and desire to share his 20 years of experiences in Smart Manufacturing for global manufacturing facilities, now, we have a strong and competent team of 20 members, all aligned with company mission, vision and core values.

Our Mission

"Transform Data into Insights - Leap Forward"

Our Vision

Be a Global Trusted Advisor in the Areas of Skills Development, Consultancy & Software Solutions specialising in Semiconductor & Manufacturing industries.

Our Core Values

TRUST

"A culture of self, team and clients trust"

PASSION

"Do what we love and love what we do"

EXCELLENCE

"If it's worth doing, it's worth doing it well"