ESD Sensitivity Classification Levels

Different devices have different levels of sensitivity to electrostatic discharge, or ESD. Thus, there needs to be a way to distinguish ESD-sensitive devices from those which are not as vulnerable to ESD. Each of the ESD models used in ESD sensitivity testing has its own classification system for categorizing devices according to their ESD sensitivity.

The ESD sensitivity of a device is usually specified in terms of the highest ESD test voltage that it passes and the lowest ESD test voltage that it fails per ESD model. Thus, ESD sensitivity is often expressed as a range of ESD voltage that a device can safely be subjected to for each of the ESD models. The following tables present the ESD sensitivity classification levels defined by the ESD Association for each ESD model.

Table 1. ESDS Component Sensitivity Classification - Human Body Model
(Per ESD STM5.1-1998*)

Class	Voltage Range
Class 0	< 250 volts
Class 1A	250 volts to < 500 volts
Class 1B	500 volts to < 1,000 volts
Class 1C	1000 volts to < 2,000 volts
Class 2	2000 volts to < 4,000 volts
Class 3A	4000 volts to < 8000 volts
Class 3B	> = 8000 volts

Table 2. ESDS Component Sensitivity Classification - Machine Model
(Per ESD STM5.2-1999*)

Class	Voltage Range
Class M1	< 100 volts
Class M2	100 volts to < 200 volts
Class M3	200 volts to < 400 volts
Class M4	> or = 400 volts

Table 3. ESDS Component Sensitivity Classification - Charged Device Model
(Per ESD STM5.3.1-1999*)

Class	Voltage Range
Class C1	<125 volts
Class C2	125 volts to < 250 volts
Class C3	250 volts to < 500 volts
Class C4	500 volts to < 1,000 volts
Class C5	1,000 volts to < 1,500 volts
Class C6	1,500 volts to < 2,000 volts
Class C7	=>2,000 volts

*Reference: www.esda.org

A complete ESD characterization of every new product prior to its release is highly recommended. Complete ESD characterization consists of subjecting the device to ESD testing for all of the three ESD models, i.e., HBM, CDM, MM. Data for one ESD model can not be substituted for those of the other ESD models, since good ESDS test results for one model doesn't necessarily mean that the test results will also be good for the other ESD models. Thus, a company that takes its ESD program seriously must equip itself with ESD tester(s) capable of performing the required ESD tests for each of the test models.

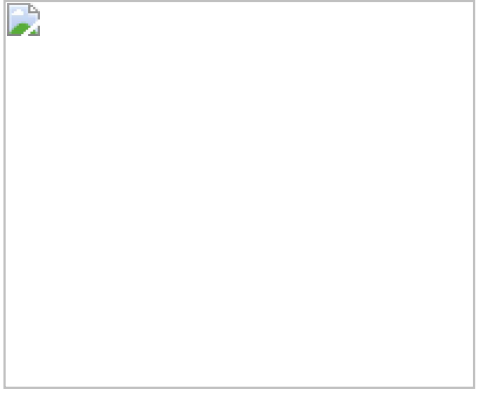

Figure 1. Examples of ESD Testers

See also: What is ESD?; ESD Models; ESD Test Waveforms; ESD Failures; ESD Standards; ESD Controls; ESD Audit Checklist; The Triboelectric Series

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