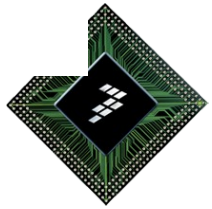
ESD – Electro Static Discharge



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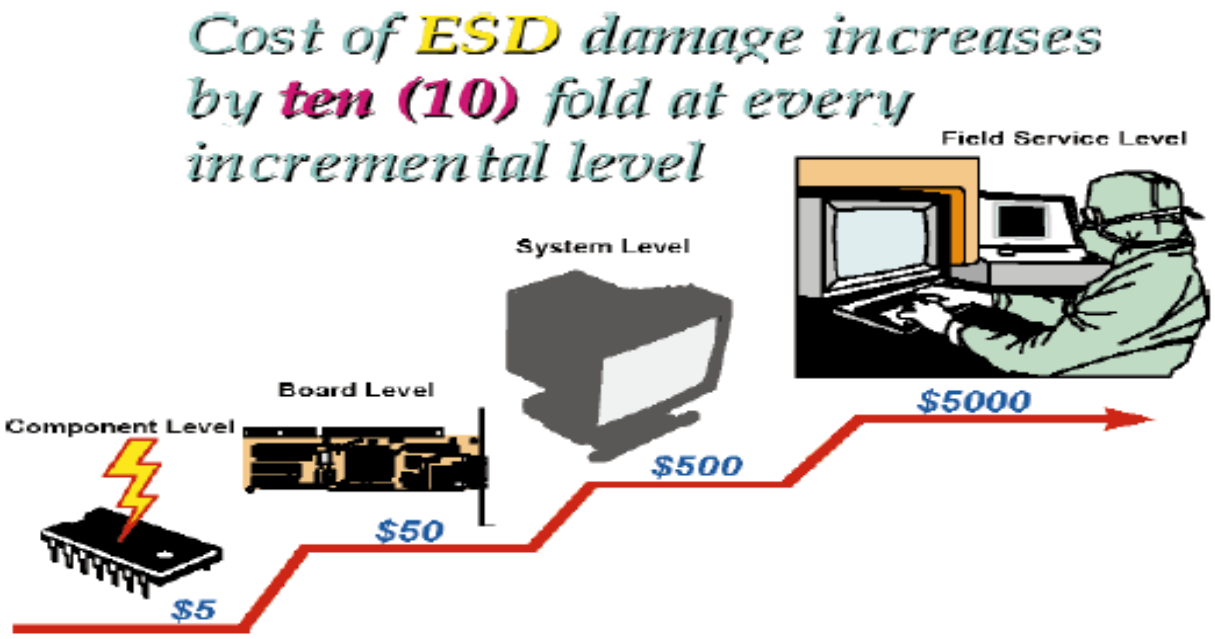
ESD

Electrostatic discharge (ESD) costs the electronics industry millions of dollars annually in damaged and degraded parts. A study in Semiconductor Reliability News estimated that approximately 60% of device failure are EOS/ESD caused.



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What Is ESD ?

The contact and separation of materials creates a static charge. An example of a common electrostatic event occurs when a charged individual discharges to a doorknob.

The contact and separation of feet when walking across a floor creates a charge on the individual. The discharge to the doorknob is an example of an Electrostatic Discharge (ESD). The simple act of walking across a floor can generate 15,000 volts of static electricity.

Human Awareness Levels

* We feel the discharge if it greater than 3500 volts.
* We hear the discharge if is greater than 5000 volts.
* We see the discharge if is greater than 8000 volts.
* By comparison, integrated circuits that are used to make elec tronic circuit boards can be damaged by voltages as low as 100 to 1000 volts.

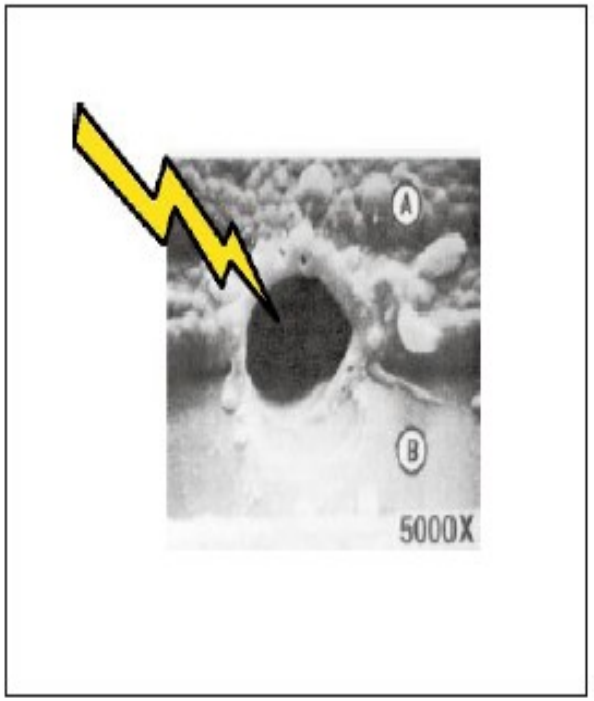
Typical Electrostatic Voltages

Event	Voltages at Relative Humidity		
Walking Across Carpet	35,000	15,000	7,500
Walking Across Vinyl Floor	12,000	5,000	3,000
Motions of Individuals Not Grounded	6,000	800	400
Remove Bubble Pack from Package	26,000	20,000	7,000

Typical Electrostatic Voltages

Once a charge is generated, a charge can be induced from one object on to another. This is called charge transfer. The damage is a result of energy shifting from one charged object to another object.

Static sensitive devices are subject to damage or degradation from



Where do you need static protection ?

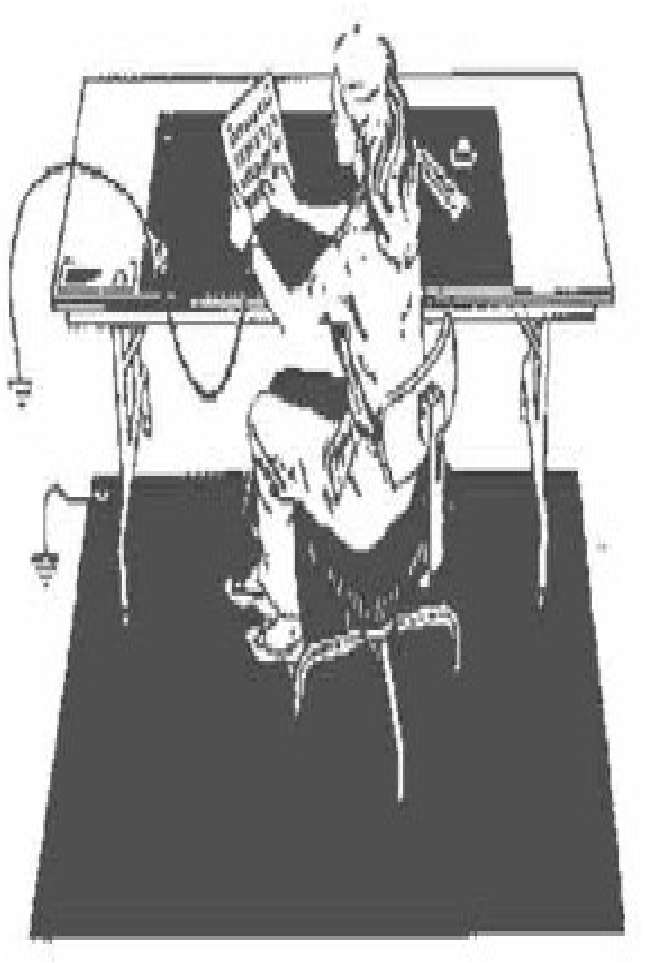
* Incoming inspection and test
* Stores and storage
* Transfer carts
* Kitting
* Manual and automated insertion
* Wave soldering
* Equipment assembly and test
* Packaging and shipping
* Repair stations

What Can I Do?

AT THE WORK STATION

Static-free workstation Includes:

1. Static Control Surface
2. Floor Mat
3. Wrist Strap and/or Continuous Monitor System
4. Ionized Air (if needed)



Prevention of Charge Generation:

Wrist strap systems remove charge as it is generated by the individual. The wrist strap removes two types of charge - triboelectric charges that are created when materials come together and separate and changes in body capacitance.

Dissipation of Charge:

Dissipation is a slower but efficient removal of charges. An example would be a dissipative table mat or tabletop material. The material removes charge yet is not conductive enough to interfere with the "powering up" a circuit board.

Neutralization of Charge:

The terminology used to describe the effect ionization will have on non-conductors. An example of a non-conductor would be a foam coffee cup. It can accumulate several thousand volts, and because the non-conductor cannot be grounded - it must be neutralized through the introduction of ionized air.

Shielding for Electrostatic Fields:

The correct packaging used to safeguard static sensitive devices during transportation and storage must possess at least one layer of near metallic conductivity.

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