

The reason of LSI ESD damage

Electrostatic Discharge (ESD)

Discharge current flows into LSI

Failure mechanism

Generation
of heat

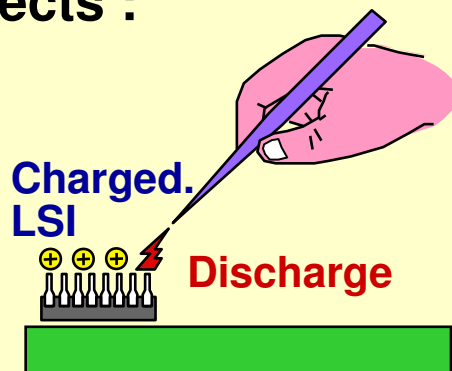
Melting

Generation of
high voltage

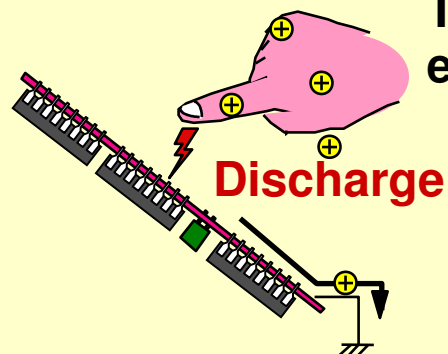
Dielectric breakdown

Metallic objects :

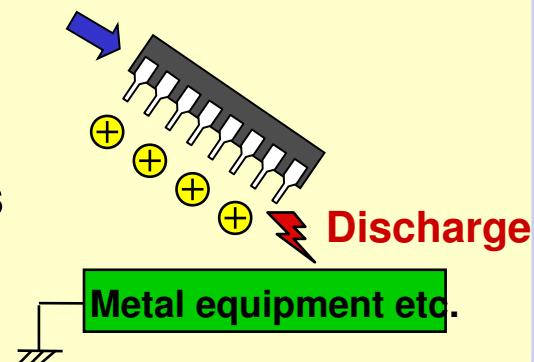
Tweezers,
Pliers,
Screwdriver,
IC socket,
etc.



Charged conductor : Human body Tools etc.



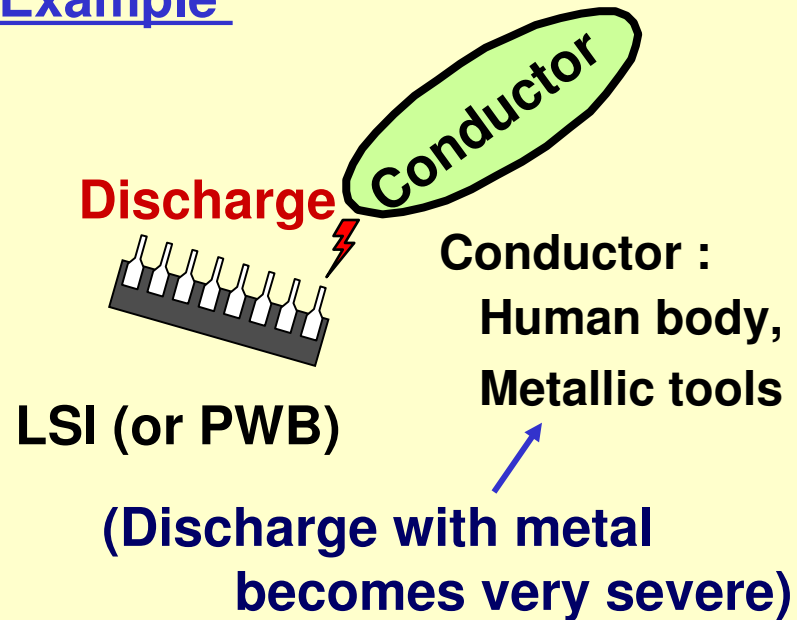
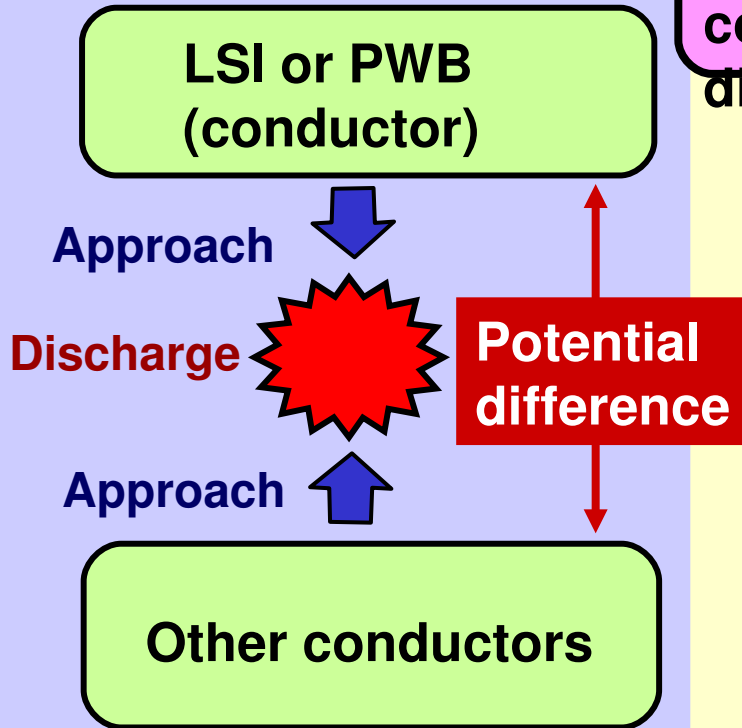
Charged Object: LSI, Boards



The cause of electrostatic discharge

Electrostatic discharge occur between conductors having potential difference.

Example



The cause (1) of electrostatic charging

Triboelectrification

LSI,
PWB,
Human body,
Metallic tools
(Conductors)

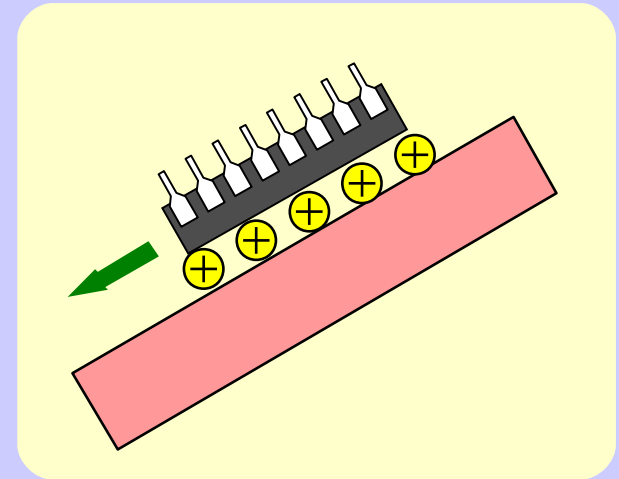


Charge
↓
Discharge
&
Electrostatic
induction

Insulating
material



Charge
↓
Electrostatic
induction



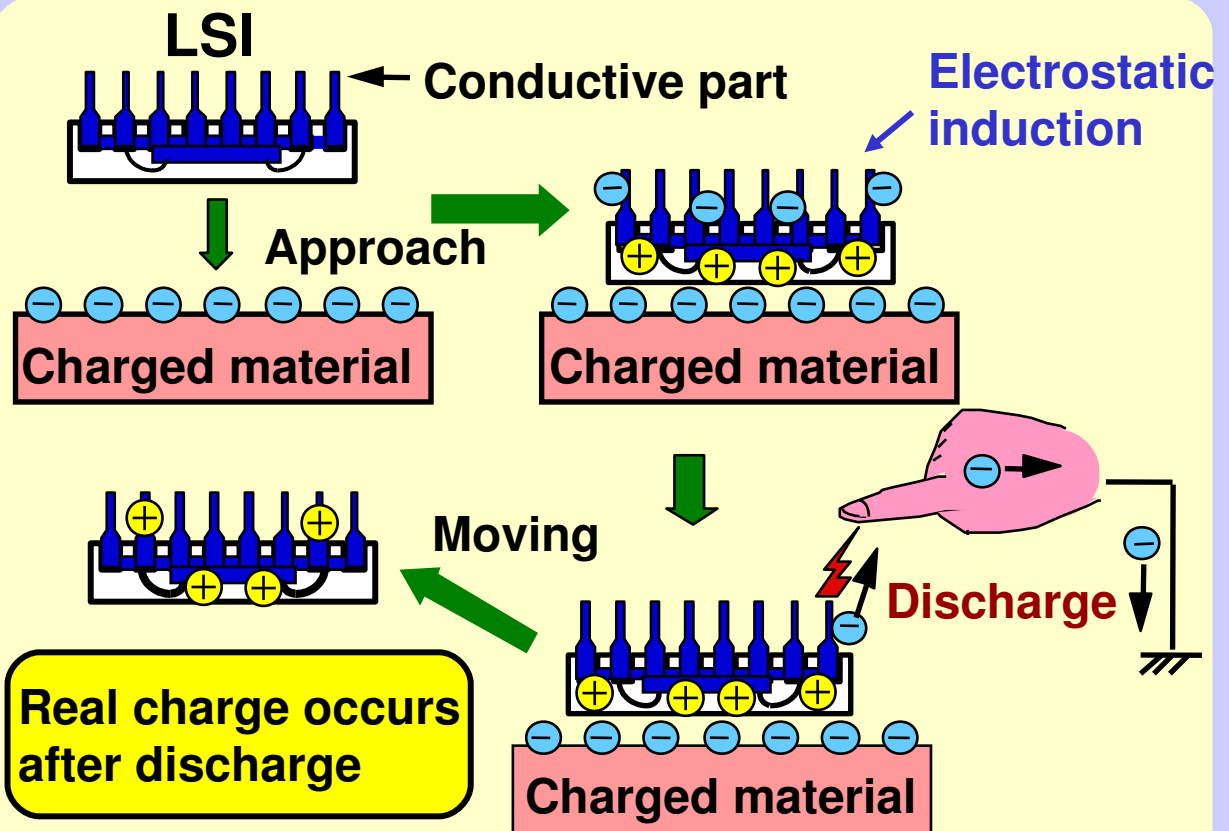
The cause (2) of electrostatic charging (Example of charge of LSI)

The conductors near the charged material is charged by electrostatic induction

LSI, PWB, human body, and metallic tools near any charged material

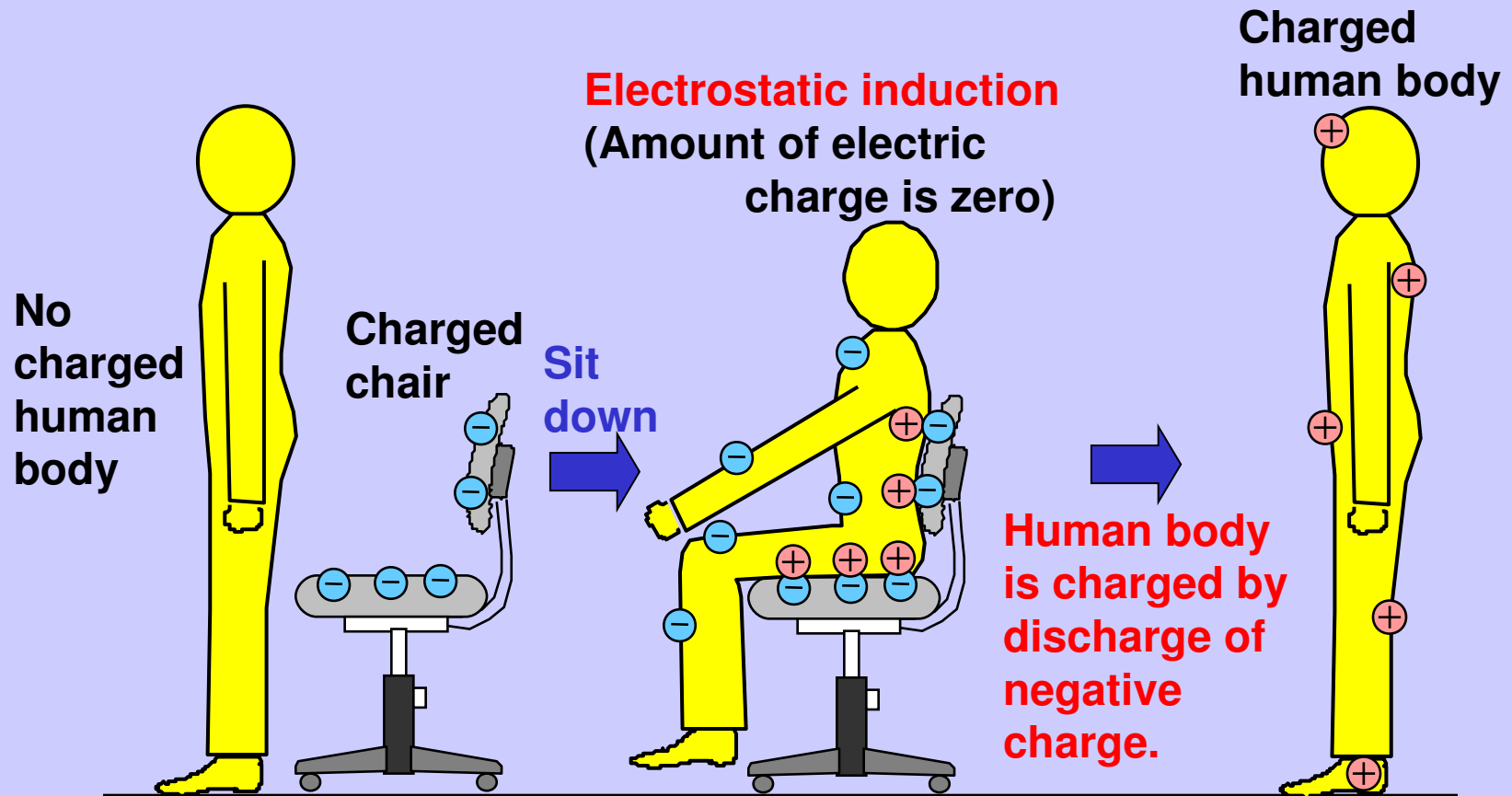
Generation of electrostatic induction

Electrostatic induction



The cause (2) of electrostatic charging (Example of human body)

Example of human body sit on the charged chair



The cause (3) of electrostatic charging

Direct charging by other charged conductors

If the charged conductor touches another conductor, it will be charged.

LSI, PWB, and tools



Charge and discharge will be occurred at the same time.

