

2) Protection against electrostatic breakdown

There have been problems concerning electrostatic destruction of electronic devices since the 2nd World War. Those are closely related to the advancement made in the field of semiconductor devices; this is, with the development of semiconductor technology, new problems in electrostatic destruction have arisen. This situation, perhaps, can be understood by recalling the case of MOS FET.

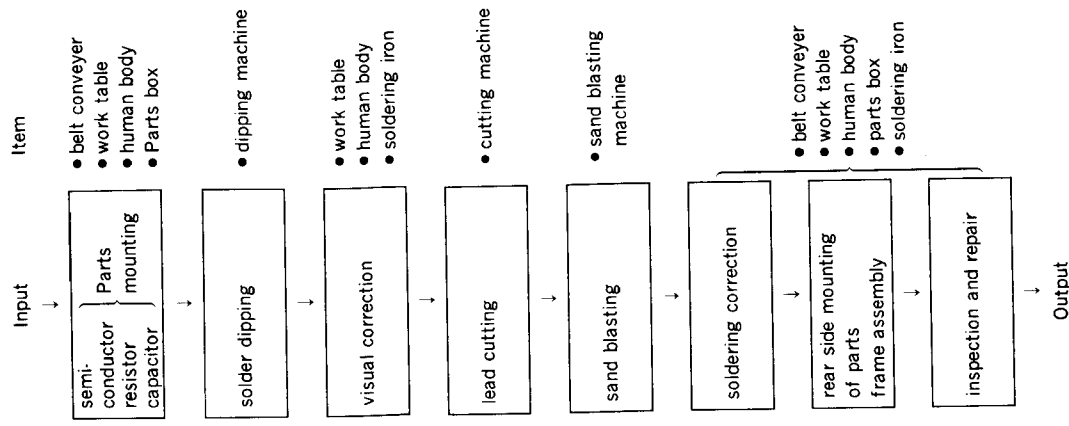
Electrostatic destruction is again drawing people's attention as we are entering the era of LSI, VLSI, and ULSI. Here are our suggestions for preventing such destruction in the device fabrication process.

Factors causing electrostatic generation in manufacture process

A number of dielectric materials are used in manufacture process. Friction of these materials with the substrate can generate static electricity which may destroy the semiconductor device.

Factors that can cause electrostatic destruction in the manufacture process are shown below:

Causes of electrostatic destruction of semiconductor parts in manufacture process



Handling precautions for the prevention of electrostatic destruction

Explained below are procedures that must be taken in fabrication to prevent the electrostatic destruction of semiconductor devices.

The following basic rules must be obeyed.

- ① Equalize potentials of terminals when transporting or storing.
- ② Equalize the potentials of the electric device, work bench, and operator's body that may come in contact with the semiconductor device.
- ③ Prepare an environment that does not generate static electricity.

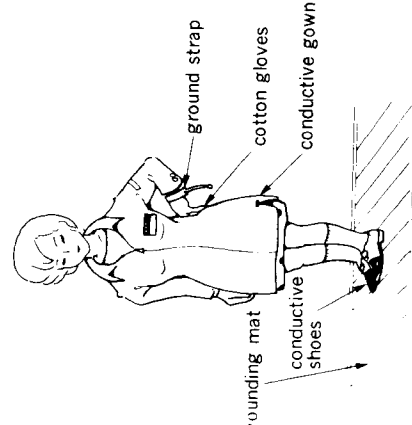
One method is keeping relative humidity in the work room to about 50%.

Operator

(1) Clothes

Do not use nylon, rubber and other materials which easily generate static electricity. For clothes, use cotton, or antistatic-treated materials. Wear gloves during operation.

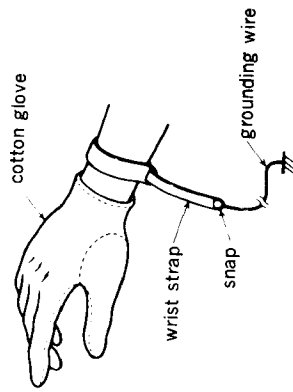
protective clothing for static electricity



(2) Grounding of operator's body

The operator should connect the specified wrist strap to his arm.

example of grounding band

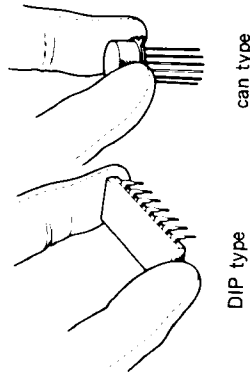


When using a copper wire for grounding, connect a 1MΩ resistance in series near the hand for safety.

(3) Handling of semiconductor device

Do not touch the lead. Touch the body of the semiconductor device when holding. Limit the number of handling times to a minimum. Do not take the device out of the magazine or package box unless it is absolutely necessary.

holding of semiconductor device



Equipment and tools

(1) Grounding of equipment and tools

Ground the equipments and tools that are to be used. Check insulation beforehand to prevent leakage.

[Check point]

- measuring instrument
- conveyor
- electric deburr brush
- carrier
- solder dipping tank
- lead cutter
- shelves, and racks