

Product Storage, Usage Conditions & Handling Precautions

(1) Product Storage

Follow the directions noted below when storing the product.

1. Do not store the product in a location where it will be exposed to water, direct sunlight or corrosive gases. Avoid exposure to condensation and store in an environment that has constant temperature and humidity levels.

(Recommended normal temperature and normal humidity : 5 to 30°C, 45 to 75%)

2. When humidifying the environment during the dry season to maintain a constant humidity level, rust can develop on the product lead if tap water is used due to the chlorine content. First boil the water or use pure water to ensure that chlorine is not present in the water.

3. When there is a sudden change in temperature during storage or product transport, condensation occurs on the product and causes a change in color or corrosion on the product.

4. When storing, make sure that there is no load being applied directly onto the product.

5. When the product will be stored for a long period of time, insert silica gel into moisture barrier packaging or into an airtight container to ensure that it is stored in a dry environment. When using the product after being stored for a long period of time, be sure to check the solderability before use.

6. When stacking and temporarily storing the product in cardboard packaging, ensure that the product is stacked in the same direction as prescribed. If the product in cardboard packaging is stacked in a format different from what is prescribed (upside down or on its side), an unexpected load may be applied to the product and cause the product to break or become damaged. The number of levels that a product in cardboard packaging can be stacked varies according to the product.

In addition to the directions noted above, please pay attention to the following for products that use moisture barrier packaging when shipped.

7. Make sure the product is stored so that the moisture barrier package does not get broken nor becomes damaged.

8. When opening and using a product with a moisture barrier package, be sure to use the product within the prescribed time. Please note that the prescribed time varies according to the product.

9. When temporarily storing any unused products after opening the packaging, insert a desiccant into the moisture barrier packaging, reseal the package and store, or store the unused products in an environment where a desiccator is being used to maintain low humidity. In addition, be careful when using a desiccant because it has a limit to the amount of moisture it can hold or absorb.

10. Do not use a product after the prescribed time has been exceeded, because the absorption of moisture can cause poor mounting onto substrates. After the prescribed time has been exceeded, it is possible to remove the moisture that has been absorbed in the product through heat treatment. However, if the product undergoes heat treatment after being packaged at the time of shipment, the packaging becomes distorted by the heat. Therefore, the product must first be transferred to a heat resistant tray or aluminum magazine which can withstand heat treatment.

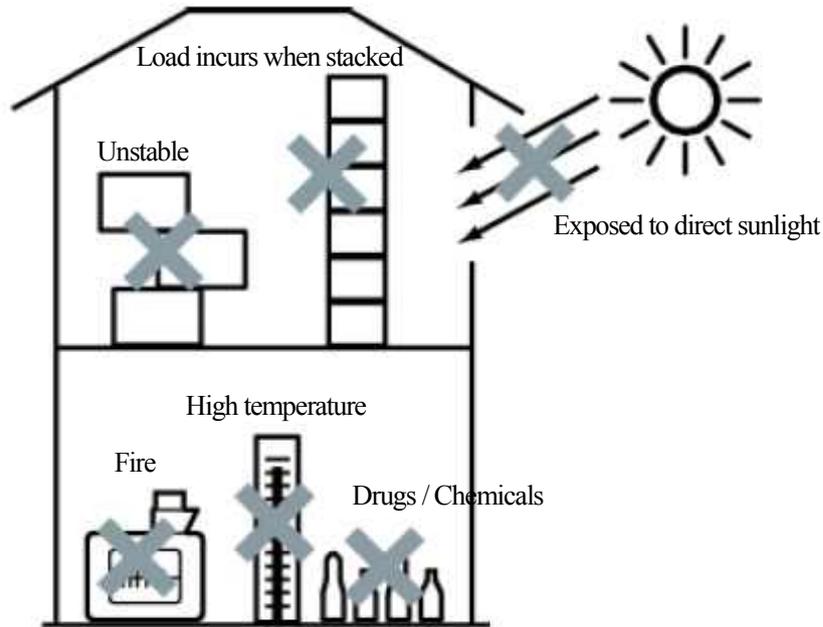


Figure 36 - Example of poor storage conditions/location

(2) Static Electricity Countermeasures

When removing the semiconductor product from the packaging and handling it by itself, pay attention to the precautions noted below while performing working tasks. There are “Static electricity warning” indicators that are displayed depending on the product. Pay particular attention when handling products with these indicators.

1. To avoid building an electrical charge, keep the humidity level between 40 to 60% for the work area.
2. Make sure the devices, workbenches, chairs, jigs and tools set up inside the work area are grounded.
3. Place an antistatic mat on the floor of the work area and on the surface of the workbench. If the resistance value changes because the surface of the antistatic mat becomes dirty, for example, then clean the mat accordingly.
4. When there are places of concern where an electrical charge may build up inside the work area, use a ground (or use an ionizer when necessary for the places where a ground is not possible) to ensure that there is no buildup of an electrical charge.
5. When setting up a monitor inside the work area, select a monitor that is not susceptible to building up an electrical charge or treat the monitor surface with an antistatic agent.

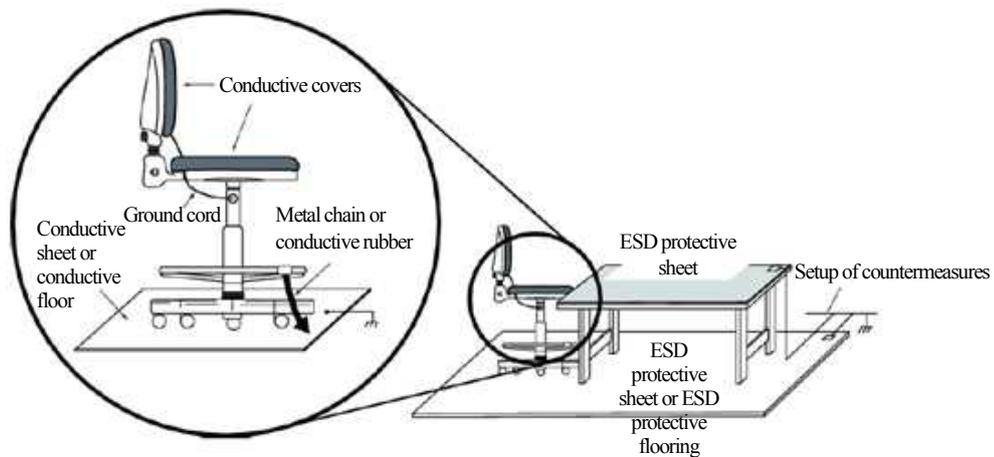
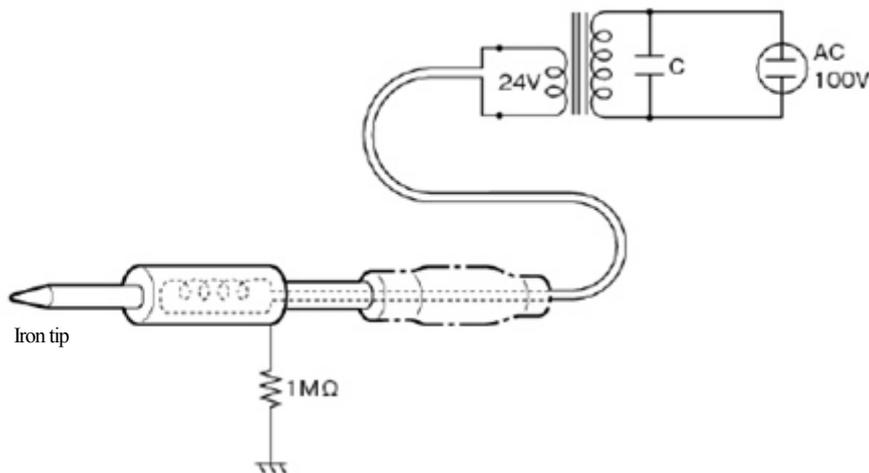


Figure 37 – Example of countermeasures for workbenches and work area

6. When items come into contact with the product (such as the component on the mounter that picks up the product, tweezers, or a soldering iron) only use items that have been treated with an antistatic agent, that are grounded or that are made from a material that does not hold an electrical charge. In addition, only use a soldering iron that has a low voltage (12 to 24 V).



The hand soldering tool must have a tip that does not leak nor produce any induced potential, and in certain cases it is desirable to be grounded.

Figure 38 – Ground for soldering iron

7. When the product has an electrical charge and comes into contact with metal, the product may become damaged due to a sudden electric discharge. When the product carries an electrical charge, take steps to avoid a sudden electric discharge.

8. The worker must wear antistatic clothes and antistatic shoes, and while working, he or she must also wear an antistatic wrist strap to safely ground his or her body. In addition, when the worker must use gloves or finger cots to prevent contamination, use gloves or finger cots that have been treated with an antistatic agent.

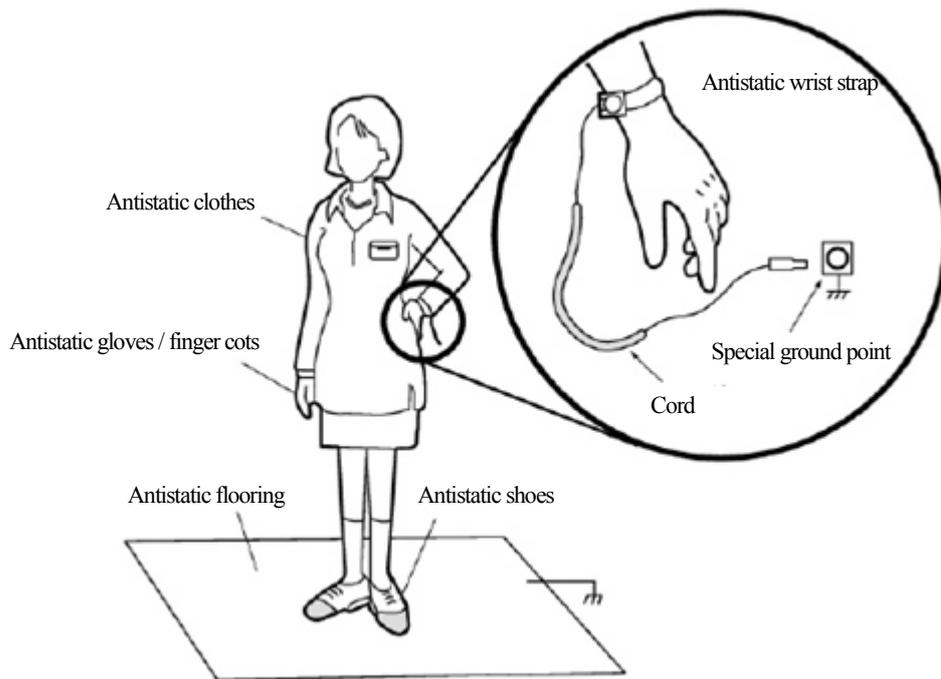


Figure 39 – Example of countermeasures used by worker

9. We recommend that you periodically measure the electrical charge inside the work area to make sure that there is no electrical charge buildup.

10. When using a shelf to store the product or a cart to transport it, pay attention to the electrical charge that builds up on the shelf or cart.

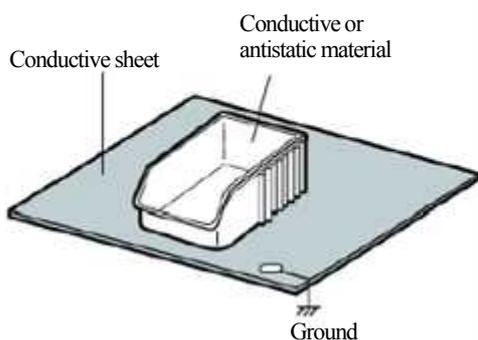


Figure 40 – Example of countermeasures for parts box

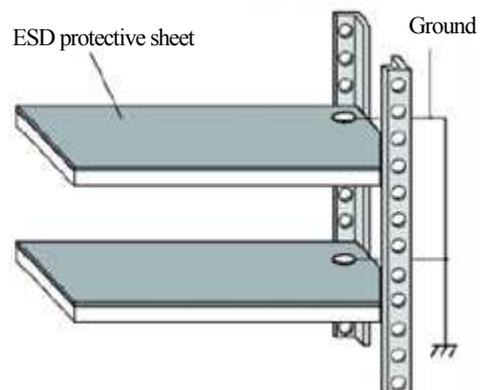


Figure 41 – Example of countermeasures for protective shelf

(3) Prevention of Overvoltage & Overcurrent Damage

Other factors besides static electricity can cause a voltage or current to be applied that exceeds the product's overload capacity and damage (overvoltage and overcurrent damage) the product. Various causes can lead to overvoltage and overcurrent damage, and identifying and troubleshooting those causes is extremely difficult.

1. Is there anything with a high voltage that is close to the product?
2. Is there a ground fault or electrical leak from any of the surrounding devices?
3. Is there any impact from an external surge such as a lightning surge?
4. Is there an overvoltage or overcurrent when the product is operated or during product testing?
5. Is there a surge that occurred on the circuit?
6. When connecting to a probe on an oscilloscope for measuring are there any malfunctions such as, the load capacity becoming greater or noise occurring?
7. When an electric load has built up on the circuit's capacitor and that electric load has discharged, is it the cause of the damage?

After ,when contacting us regarding a product where this type of damage may have occurred, please send the product and include as many details as possible concerning the surrounding circumstances or the operating conditions at the time of the failure or damage.

(4) Countermeasures Against Product Impact, Stress & Vibration

There is a risk that the product or packaging may become damaged due to impact, stress or vibrations that exceed a certain level. Therefore, be careful when handling or transporting the product.

1. If there is excessive impact or stress applied when the product is picked up while being mounted on a board or during the mounting, the product may become damaged. Therefore, manage and handle the product appropriately.
2. There is an internal chip near the center of the mold resin. Even if no problem is visible on the exterior of the product, product stress can cause damage to the internal chip. Therefore, handle with care.

(5) Other Usage Conditions

Follow the directions noted below on the usage conditions.

1. When corrosive gases exist or are emitted, they can impact the characteristics of the product and cause a product defect.
2. The product is not designed to account for radiation or cosmic rays. The product may not operate properly due to the impact from radiation or cosmic rays.
3. When subjected to an intense electric or ferromagnetic field, it may impact the characteristics of the product and cause the product to not operate properly.
4. When there is an external light (such as ultraviolet light or sunlight), it may cause the product to not operate properly depending on the intensity or amount of light.

5. When dust, oil or other contaminants are present, it may impact the characteristics of the product and cause the product to not operate properly.

6. The mold resin that is used in the product is designed to account for flame resistance. However this is not a guarantee. When the product is damaged due to an overvoltage or overcurrent, or when there is flammable material that is nearby, there is the danger of catching fire. In addition, if the product ignites, toxic gases may also be emitted. Use the product in accordance with the product standards and specifications. Do not use or set up any product near burning materials, pyrogenic substances, firebombs or flammable materials.