

The result of experience gained in the treatment of semiconductor devices shows that not only distinctive nature of the diodes but also application conditions (e.g.: circuit, mounting and environmental conditions, ...etc.) would affect the reliability of diodes. In order to get a higher reliability of application of diodes, please pay attention to the following points on system design, handling and storage.

A. Maximum Ratings

In any circumstance, the absolute maximum ratings should not be exceeded, even shortly. If a device works over its absolute maximum ratings, it might immediately be degraded or broken. Even if it could continue to work, its lifetime would decline considerably. Please use devices within the absolute maximum ratings at all times. For a more reliable system design, the derating usage of the diodes is recommended.

The analysis result of failure mode of diodes in user lines and markets shows that over voltage and over current are main cause of failures.

B. Caution on mounting

1. Lead forming and cutting

When diodes are mounted onto a circuit board, the excessive mechanical stress may destroy the diodes, shorten the lifetime or produce cracks on the body in the worst case. It should be noted that the effect of these cracks might become apparent only later and could result in the failure of the diodes.

(a) When bending the lead wires, please hold them securely between the body and the point to be bent with a pair of pliers. Then bend them, holding the open end of the lead with your fingers, so as to avoid any bending stress put on the body (See FIG. I).

The same consideration should be paid when many devices are simultaneously bent using lead forming machines (See FIG. II).

(b) The bend in the lead wires should be made away from the end of the body (See FIG. III).

(c) Do not bend the leads more than 90°.

(d) Avoid sudden forces on the leads or body.

(e) When forming and cutting by automatic machines, excessive force should not be applied to the body of

the diode. The tension from leads to body must be limited within 1Kg weight in such processing.

2. Soldering

Because semiconductor devices are sensitive to excessive junction temperatures, designers should pay special attention to the layout of equipment and ensure that there is adequate space between the heat-generating components and semiconductor devices. Furthermore, please pay attention to the following points in soldering process:

(a) Do not let soldering iron touch the body directly (See FIG. IV(a)).

(b) Please avoid any force on the body or leads during or immediately after soldering.

(c) The soldering point should be over 3mm away from the end of the body (See FIG. IV(b)).

(d) Use of strong acid or alkali might corrode the lead wires.

(e) Do not pull the lead wires by force when inserting diodes into printed circuit boards (See FIG. IV(c)).

(f) Do not adjust the position of an already soldered device by pushing, pulling or twisting the body.

(g) Avoid fast cooling after soldering.

3. Molding

If the diode bodies are molded directly with immoderately hardened resin, the diodes might happen to break because of a change in environmental temperature. Diode bodies are recommended to be molded with buffercoat resin in order to absorb the stress between mold resin and diode body.

C. Storage

It is better to store semiconductor devices in the following ways to prevent deterioration in their electrical characteristics, solderability, and appearance, and breakage.

(a) Devices should be stored in an ambient temperature of 5~30°C and in relative humidity of 40~60%.

(b) Devices should be stored in a clean environment, free from dust and reactive gas.

(c) Devices should be stored in a container which does not induce static electricity.

(d) Care should be taken not to allow condensation during storage caused by quick temperature change.

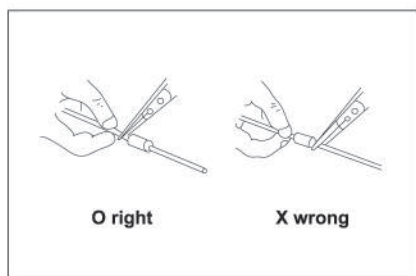


FIG. I - Caution in Bending the Lead Wires

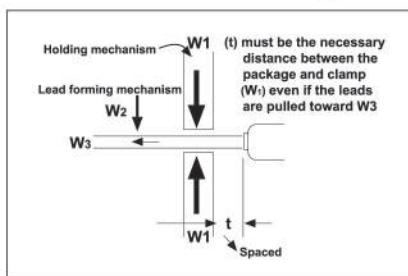


FIG. II - Caution in Bending the Lead Wires Using a Mould

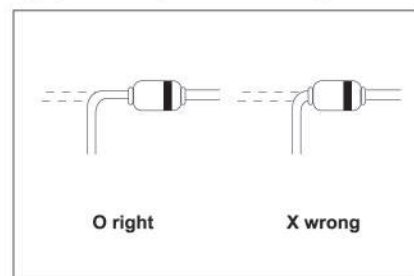


FIG. III - Caution in Bending Point

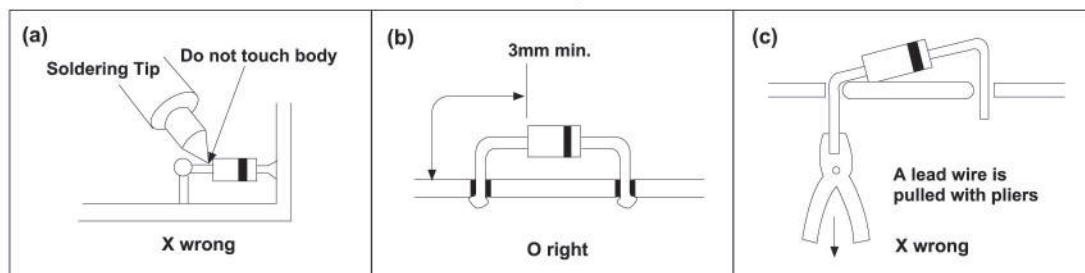


FIG. IV - Cautions in Soldering