Condition of soldering for Leaded type Diodes HANDLING PRECAUTIONS

1. Handling precautions

● **Absolute maximum ratings**

Every semiconductor regulates its absolute maximum ratings and as it is described in JIS7032,
It is not even allowed to exceed its maximum ratings even for a moment. Furthermore, if there is two value exceeding the absolute maximum ratings at the same time, it will definetly lead to breakdown of components.
It may work properly right after but, it will certainly shorter the life time.

● **Derating**

The reliability of semiconductor devices are always affected by electrical, mechanical and environmental stress. Therefore, the design of device is made based on the its purpose of application and derating to the absolute maximum rating will be defined by evaluating each stress depending on the required reliability. The following table shows generally recommended standard dreating design.

Example of derating design standard

Derating factor		Diode	Note
Temp.	T/J	Below 110°C (Tj=Below 60°C)	For high reliability
	Ambient temperature	− (Ta=0 to 45°C)	For high reliability
	Others	Consumption power, T/A heat radiation Tj=P×θja+Ta	
Humidity	Relative humidity	40 to 80% RH	
	Others	In case of moisture resulting from sudden temp. change, implement corting PCB.	
Voltage	Voltage	Max. rating × below 0.8 (Max. rating × below 0.5)	
	Over voltage	Inplement protection for overload including ESD.	
Current	Average current	I_O × below 0.5 (I_O × below 0.25)	For high reliability
	Peak current	I_F (peak) × below 0.8	
Power	Average power	P × 0.5 (Especially in zener diodes)	
Pulse	Area of safe operation	Not to exceed the absolute Max. ratings on each individual data sheet	
	Surge	below I_F (Surge)	

● **Mounting electrical devices on PCB.**

(1) Pitch of the PCB must be in accordance with the terminal pitch of the device.
In case it is not accordance, reliabilit will be spolied during the mountering and soldering, or after soldering by mechanical stress.
(2) Do not pull the terminal too strongly when inserting the device terminal to the hole of circuit board.

● **Lead forming of terminals**

(1) In case of lead forming, chuck the lead first and form by setting the body free shown in Fig.1.
However, do not bend over 90°C.
(2) Ribbon terminal must not be bent to the direction of thicker side as shown in Fig.2.
(3) Do not repeat the bending.

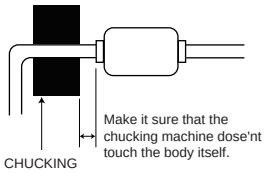


Fig.1

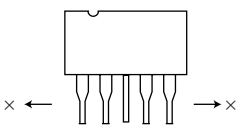


Fig.2

● **Others notification**

(1) Regarding position of diodes on PCB, please do not mount the diode close to high current resistor and even close to heat elements. It may generate the over heat to its components.
And please desigh diodes not to have surge current, electrical shock so that it will not affect diode itself.

(2) Do not storage diodes in the following places:
- High temp. or High humidity.
- Where corrosive gas would occur.
- Where mechanical stress or vibration exists.
- Where electrostatic charges are possible.

(3) When transporting diodes, keep vibration to a minimum. Diode die may then be destroyed by ESD.
So please take care of handling.

(4) Please avoid a condition that the diode is wet with dew. Especially, some bias loaded into the glass sealed diode covered with dew, there is possibility that air-tight condition in the diode is deteriorated.
We recomend that the diode be used under the condition of RH=20 to 80%.

(5) In case of using the coating resin for the PCB, pay attention to the mechanical stress from the resin hardening or the thermal expansion, shrinkage at temperature changes. There is a possibility of unexpected mechanical stress in case that the resin has the high coefficient of thermal expansion or hardness.

2. Handling precautions for soldering

(1) Do not use strong acid or alkali flux, since it may lead to corrosion of lead, and affects characteristic of the component.
Please enforce soldering after confirming flux is fully dry.

(2) In case of quickly applying high temperature to a diode in dip soldering, apply a pre-heat to the diode body which minimizes the temperature change at this operation.

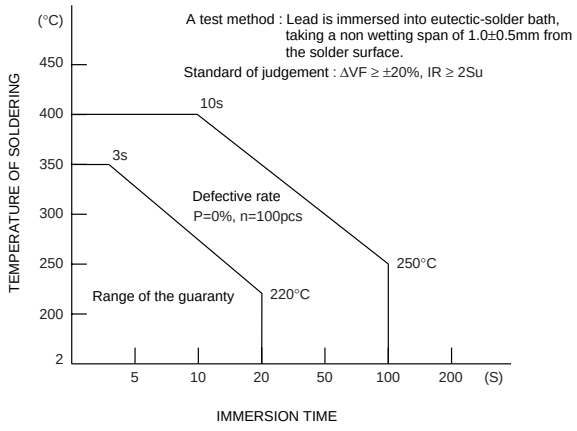
(3) For flux washing after soldering, use the washing solvent for semiconductor.

(4) Do not be stuck flux liquid to glass body of diode, or glass body maight have high temperature graduation ration, and then have crack or brekage because some area have high temperature from solder bath (soldering iron) at soldering and the other area have low temperature from flux vaporate cooling. In case of being stuck flux liquid, implement soldering after fully dry flux vapor with below 80°C degree condition.

(5) Use the solder iron which has no leakage at the top of iron and have earth operation because leakage might cause damage by overload to diode.

3. Handling precaution for soldering

(1) Soldering proof temperature range is until 260°C degree for 10 sec. (Full soldering), and 350°C degree for 10 sec. (solder iron) with more than 1mm distance. But this is the worst condition which be allowed to our leadless diode. So from the reliability point of view, we recommend lower and shorter soldering condition as much as it can be.



Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).
Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.
In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.