SURFACE MOUNTED MOLD DIODE HANDLING PRECAUTIONS

1. HANDLING PRECAUTIONS
2. HANDLING PRECAUTIONS FOR SOLDERING
3. RECOMMENDED SAFE TEMPERATURE RANGE FOR SOLDERING
1. Handling Precautions

● Absolute Maximum Ratings
Each Semiconductor type has its own absolute maximum ratings. This is described in JIS7032 as that absolute maximum rating for which the limit value must not be exceeded even for a moment. If it is exceeded even for a moment, the semiconductor can be degraded or destroyed. In other cases, after supplying an excess value to a semiconductor, its life may shortened even if it operates well right after an excess. So keep the system design below maximum ratings.

● Derating
The Reliability of a semiconductor device is heavily influenced by the electrical, mechanical and environmental stress. Therefore, the design’s reliability will be specific to the purpose of the application and derating to the absolute maximum rating will be defined by evaluating each stress depending on the required reliability. The Following table shows the standard generally recommended with respect to reliability test results from device manufacturers.

### EXAMPLE OF DERATING DESIGN STANDARD

<table>
<thead>
<tr>
<th>DERATING FACTOR</th>
<th>DIODE</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMP.</td>
<td>T/J</td>
<td>BELOW 110°C (Tj=BELLOw 60°C)</td>
</tr>
<tr>
<td></td>
<td>T/A OF DIODE</td>
<td>(Ta=0 to 45°C)</td>
</tr>
<tr>
<td></td>
<td>OTHERS</td>
<td>CONSUMPTION POWER, T/A HEAT RADIATION Tj=P×θja+Ta</td>
</tr>
<tr>
<td>HUMIDITY</td>
<td>RELATIVE TEMP.</td>
<td>40 to 80% RH</td>
</tr>
<tr>
<td></td>
<td>OTHERS</td>
<td>IN CASE OF MOISTURE RESULTING FROM SUDDEN TEMP CHANGES, IMPLEMENT COATING PCB.</td>
</tr>
<tr>
<td>VOLTAGE</td>
<td>VOLTAGE</td>
<td>MAX. RATING × BELOW 0.8 (MAX. RATING × BELOW 0.5)</td>
</tr>
<tr>
<td></td>
<td>OVER VOLTAGE</td>
<td>IMPLEMENT PROTECTION FOR OVERLOAD INCLUDING ESD.</td>
</tr>
<tr>
<td>CURRENT</td>
<td>AVERAGE CURRENT</td>
<td>io × BELOW 0.5 (io × BELOW 0.25)</td>
</tr>
<tr>
<td></td>
<td>PEAK CURRENT</td>
<td>Ir (peak) × BELOW 0.8</td>
</tr>
<tr>
<td>POWER</td>
<td>AVERAGE POWER</td>
<td>P × 0.5 (ESPECIALLY IN ZENER DIODES)</td>
</tr>
<tr>
<td>PULSE</td>
<td>ASO</td>
<td>NOT EXCEED ABSOLUTE MAX. RATINGS ON EACH INDIVIDUAL DATA SHEET</td>
</tr>
<tr>
<td></td>
<td>SURGE</td>
<td>BELOW Ir (Surge)</td>
</tr>
</tbody>
</table>

● Mounting of Surface Mount Components
In the case of SMD components, minimize any bending of the board. Stress will directly influence SMD components. Furthermore, screw fasteners or board breaking near the SMD components is also prohibited.

● Other Considerations
1. Regarding PCB component lay-out, do not put diodes near high voltage resistors etc, which may generate heat to diode, nor in high density board. When design the PCB, implement protection for the diode from electrical damage like surge, ESD and so on.
2. Do not store diodes in the following places:
   - High temp. or High humidity.
   - Where corrosive gas is present.
   - Where mechanical stress or vibration exists.
   - Where electrostatic charges are possible.
3. When transporting diodes, keep vibration to a minimum or glass body of diode may be broken. Diode die may then be destroyed by electrostatics.
2. Handling Precautions for Soldering
(1) Do not use a strong acid or alkaline flux, as it might corrode the diode terminations and have negative effect on the diode’s electrical characteristics. Implement soldering after flux is fully dry.
(2) In case of quickly applying high temperature to a diode body as in dip soldering, apply a pre-heat to the diode body which minimizes the temperature change at this operation.
(3) For surface mounted diodes, the PCB condition after soldering has considerable influence on a diode’s reliability, because surface mounted diodes are applied to the PCB directly. Do not use a PCB which is bent or twisted.
(4) For flux washing after soldering, use a washing solvent for semiconductors.
(5) Use a solder iron without AC leakage at the tip of iron. Use a grounded iron because leakage might damage the diode by overload.
(6) When a highly active halogenous (chlorine, bromine, etc.) flux is used, the remainder of flux may negatively affect product performance and reliability. Use the flux with no halogenous.

3. Safe Temperature Range for Soldering
A safe soldering temperature range is up to 260°C degree for 10s (Full soldering) and 350°C degree for 10s (solder iron) with more than 1mm distance from the diode body. But this is the worst condition which is allowed to our leadless diodes. So from a reliability point of view, we recommend lower and shorter soldering conditions as much as can be allowed.
Notice

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co., Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM’s products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

Thank you for your accessing to ROHM product informations. More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/