

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 be 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

DERATING FACTOR		DIODE	NOTE
TEMP.	T/J	BELOW 110°C (Tj=BELOW 60°C)	For high reliability
	T/A OF DIODE	– (Ta=0 to 45°C)	For high reliability
	OTHERS	CONSUMPTION POWER, T/A HEAT RADIATION $T_j = P \times \theta_{ja} + T_a$	
HUMIDITY	RELATIVE TEMP.	40 to 80% RH	
	OTHERS	IN CASE OF MOISTURE RESULTING FROM SUDDEN TEMP CHANGES, INPLEMENT COATING PCB.	
VOLTAGE	VOLTAGE	MAX. RATING \times BELOW 0.8 (MAX. RATING \times BELOW 0.5)	
	OVER VOLTAGE	INPLEMENT PROTECTION FOR OVERLOAD INCLUDING ESD.	
CURRENT	AVERAGE CURRENT	$I_o \times$ BELOW 0.5 ($I_o \times$ BELOW 0.25)	For high reliability
	PEAK CURRENT	I_F (peak) \times BELOW 0.8	
POWER	AVERAGE POWER	$P \times 0.5$ (ESPECIALLY IN ZENER DIODES)	
PULSE	ASO	NOT EXCEED ABSOLUTE MAX. RATINGS ON EACH INDIVIDUAL DATA SHEET	
	SURGE	BELOW I_F (Surge)	

●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

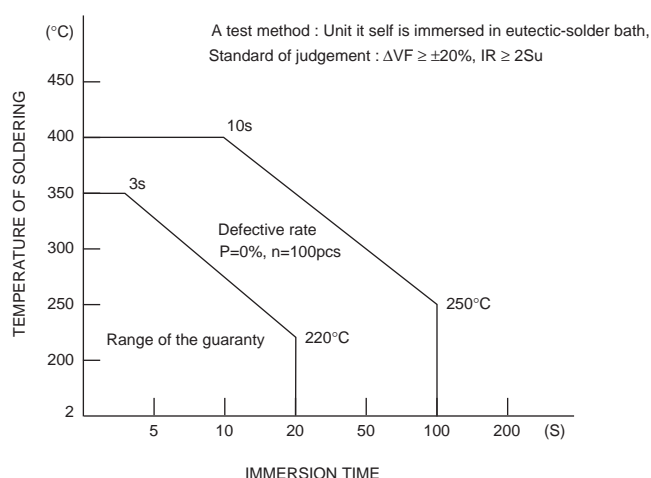
- (1) Regarding PCB component lay-out, do not put diodes near high voltage resistors etc, which may generate heat to diode, nor in high density board. When design the PCB, implement protection for the diode from electrical damage like surge, ESD and so on.
- (2) Do not store diodes in the following places:
 - 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.



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