⚠ Safety Precautions (Common precautions for Trimmer Potentiometers)

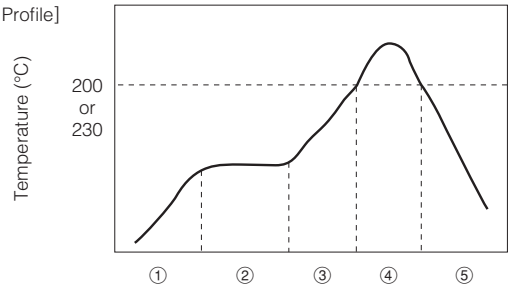
- When using our products, no matter what sort of equipment they might be used for, be sure to make a written agreement on the specifications with us in advance. The design and specifications in this catalog are subject to change without prior notice.
- Do not use the products beyond the specifications described in this catalog.
- This catalog explains the quality and performance of the products as individual components. Before use, check and evaluate their operations when installed in your products.
- When using our Trimmer Potentiometers, please observe the following cautionary items to prevent dangerous accidents and deterioration of device performance.

1. Precautions in mounting

1-1. Perform soldering under the following conditions of SMT Trimmer Potentiometers

● Reflow soldering

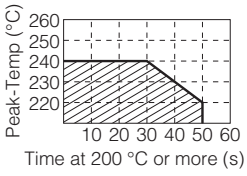
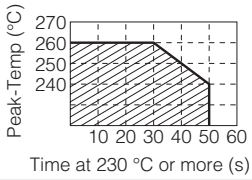
[Reflow Soldering Profile]



①Heat-up zoneⅠ	Room temp. to Preheat zone	30 to 60 s
②Preheat zone	Refer to the following figures	
③Heat-up zoneⅡ	Preheat zone to Melting zone	20 to 40 s
④Melting zone	Peak temp. Refer to the following figures	5 s max.
⑤Cooling zone	Melting zone to 100 °C	1 to 4 °C/s

1. Reflow soldering shall be performed a maximum of two times.
2. In case of reflow soldering, measure actual temperature on the product surface and observe the recommended conditions as described above.
3. If the recommended conditions cannot be satisfied, consult us in advance.
4. The temperature strongly depends on the measuring method of the profile.
5. If the temperature changes due to PWB size, mounting density, etc., check the temperature of each PWB.

Recommended conditions

For Sn/Pb Solder	For Pb-free Solder
②Preheat zone:140 to 160 °C, 60 to 120 s ④Melting zone *	②Preheat zone:140 to 180 °C, 60 to 120 s ④Melting zone
	

✻ Meaning of figure in ④ Melting zone (For Sn/Pb Solder)
If the peak temperature is 240 °C, the time of 200 °C or more is 30 seconds.
If the peak temperature is 230 °C, the time of 200 °C or more is 40 seconds.
If the peak temperature is 220 °C, the time of 200 °C or more is 50 seconds.

● Flow soldering
Flow soldering can not be applied. Reflow soldering or manual soldering can be applied.

● Manual soldering
In case of manual soldering, observe the following conditions.
- · Soldering iron: 20 W max.
- · Temperature of the iron tip: 350 °C max.
- · Dwell time: 3 s max.
- · Resoldering for repair can only be performed once.

● Mounting Notes
- · Solder or flux dissipated on the surface of the element or contact may cause fatal damage.
- · Contact us for cleaning processes.

1-2. Perform soldering under the following conditions of Ceramic Trimmer Potentiometers

<table>
<tr><td>Flow soldering</td><td>When flow soldering, observe the following conditions.
<table>
<tr><th>For Sn/Pb Solder</th><th>For Pb-free Solder</th></tr>
<tr><td>· Preheat : 130 °C max. 60 s max.</td><td>· Preheat : 130 °C max. 60 s max.</td></tr>
<tr><td>· Soldering temperature : 230 to 260 °C</td><td>· Soldering temperature : 240 to 260 °C</td></tr>
<tr><td>· Soldering time : 3 to 5 s</td><td>· Soldering time : 3 to 10 s</td></tr>
<tr><td>· Number of time repetition of soldering : None</td><td>· Number of time repetition of soldering : None</td></tr>
</table>
When soldering under other conditions, consult us in advance</td></tr>
<tr><td>Manual Soldering</td><td>When manual soldering, observe the following conditions.
· Soldering iron: 40 W max.
· Soldering iron tip temperature: 350 °C max.
· Soldering time: 3 s max.
· Strength to terminal: 3 N max.</td></tr>
<tr><td>Prohibitions</td><td>This trimmer potentiometer cannot be washed or cleaned as liquid remaining on it may cause migration, erosion, or irreparable damage.</td></tr>
<tr><td>Cautions</td><td>Before flow soldering, the flux should be thoroughly dried. Otherwise, flux dissipated on the surface of a resistive element, contactor, cap may cause irreparable damage</td></tr>
</table>

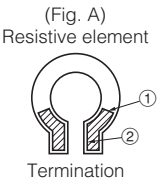
2. Design of PWB's
When designing the land pattern, take the recommended land layout written in the “Product Specifications into consideration.

3. Precautions in mounting
A downward load applied on the trimmer potentiometer shall be a maximum of 5 N. Overload may cause fatal damage from deformation or breakage.

(SMT Trimmer Potentiometers)
After soldering, solder ball or scrap may cause a short between the land pattern, so please use enough insulation.

(Ceramic Trimmer Potentiometers)
Bending or extending the terminal for a clinch can be done only one time.

4. Precautions in adjustment
Adjust downward load applied on the contactor to be a maximum of 5 N.
Overload may cause damage due to deformation or breakage of the adjustment knob. Adjust downward load applied on the contactor vertically. Excessive inclination may cause fatal damage from deformation or breakage of the adjustment knob. When the moving contact is close to the border between the electrically effective and non-effective ranges (①, Fig. A), or the border between the electrically non-effective and open ranges (②, Fig. A), a deviation of the setting value may occur.

(Fig. A)


5. Lockpaint
Avoid applying any lockpaint, otherwise intrusion of the paint may cause contact failure. If lockpaint must be used, avoid using an adhesive which may generate corrosive gas.

2. Precautions in circuit conditions

1. Power rating
   This is the maximum value of electric power that can be continuously applied to all areas of the resistive element at rated ambient temperature. In general, the power rating shall be regulated in accordance with size and type.
   Maintain the power rating or below. Continuous use beyond the power rating may cause degradation of characteristics, smoke generation, or burning.

2. Influence of ambient temperature
   The influence of ambient temperature cannot be neglected.
   Apply the power derated curve to design within the rated conditions.

3. Precautions in mounting conditions

These trimmer potentiometers are not used as sealed types. Avoid using under the following conditions, or device failure may occur.

1. Corrosive gas atmospheres such as Cl_2, H_2S, NH_3, NO_X, SO_2
2. In places with high humidity or condensation.
3. In liquids, water, salt, oil, chemicals, solvents
4. Direct exposure to sunlight
5. In places with high concentrations of dust

4. Storage Notes

Storage under the following condition should be avoided.
Soldering wettability may be impaired.

1. Temperature: less than –10 °C and more than 40 °C. Relative humidity: more than 85 %.
2. Atmospheres of corrosive gas.
3. Storage exceeding 6 months.
4. Direct exposure to sunlight.

Do not store packages under severe load or stress.
Store any opened product in sealed plastic containers to prevent exposure to air, moisture, corrosive gases, etc.

5. For use in equipment requiring high degrees of safety

Although care is taken to ensure trimmer potentiometer quality, short circuits and open circuits are some problems that may occur. Design a circuit which places maximum emphasis on safety, review the affect of any single fault of a potentiometer in advance and perform virtually fail-safe design to ensure maximum safety by:
1. Preparing a protective circuit or a protective device to improve system safety, and
2. Preparing a redundant circuit to improve system safety so that the single fault of a trimmer potentiometer does not cause a dangerous situation.

Please contact us about use in any of the following application.
Vehicles [automobile (except for AV equipment use), train, vessel], traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/gas equipment, rotating equipment, disaster/crime prevention equipment, nuclear apparatus, and machine tools.

For notes on use, the following sources were referenced:

A technical report EIAJ RCR-2191A “Guideline of notabilia for potentiometers for use in electronic equipment” issued by the Japan Electronics and Information Technology Industries Association
(Revised in March 2002)

Refer to this Technical Report for additional details.

<Package markings>
Package markings include the product number, quantity, and country of origin.
In principle, the country of origin should be indicated in English.