HANDLING NOTES
TRIMMER POTENTIOMETERS

<Series of cermet trimmers in common>

1. Notes for storage

Careful attention must be paid when the components are stored.

Environmental temperature, humidity, etc. might affect the solderability of the terminals and the function of the package. Listed below are notes to be observed.

- Under extremely high temperature and humid conditions, the quality decay of the package materials will be accelerated. It is recommended the components are stored in the room at the temperature below 25 °C and with the relative humidity below 75 %.
- The environmental air must be free from corrosive gases such as sulphide gas.
- Exposure to the direct sunlight and dust must be avoided.
- Handle carefully to avoid deformation of terminals.
- Please use the potentiometers within one year from the delivery.
- Please do not open the smallest unit of package before use.

2. Sealed construction

The structure of our trimmers is designed to withstand flux and cleaning solvents used in the soldering and cleaning process.

This sealed structure is also effective for dust and moisture as well, but its capability is not limitless due to inside moving parts.

The following are not recommended.

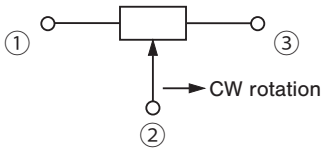
- Environmental air with sulphide gas, corrosive gas or reducing gas
- Rapid cooling of solvents
- Long time damping into solvents (especially at high temperature)
- Environmental air with high humidity

3. Terminal layout

With all our trimmer potentiometers, the resistance value between the terminal No.1 and 2 increases when the rotor or the shaft is turned in CW direction.

However, as there are 2 different pin terminal layouts depending on the series of trimmer potentiometers as shown below, the terminal layout should be noted when using.

1) Terminal No.1 is located at the CCW (left) end;
   RJ series (RJ-4, RJ-5, RJ-6, RJ-9 and RJ-13)
   TM-7
   CT series (CT-6, CT-94, CT-9 and CT-20)
   ST-2, ST-5, ST-7, SM-31/32, SM-42/43 and FT-63
2) Terminal No.3 is located at the CCW (left) end;
   ST-32 and ST-4



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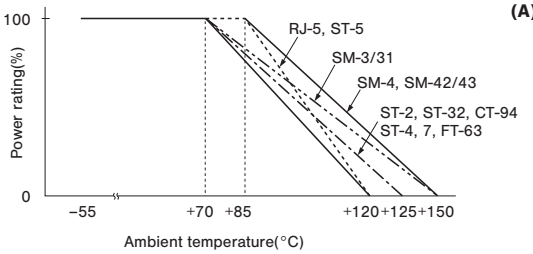
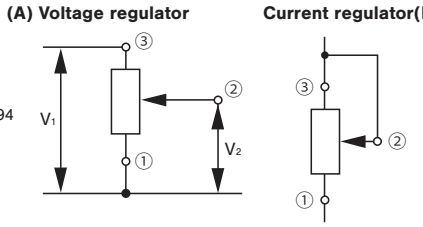
4. Power rating

The power rating should be derated as per Fig. 1 when an ambient temperature exceeds 70°C (85°C).
Trimmer potentiometers can be used as voltage regulators as shown in Fig. 2 (A) or as current regulators (rheostats) as shown in (B). For cermet trimmer potentiometers, use for voltage regulation will result in more stable performance.

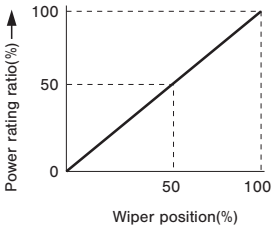
For use as a current regulator as shown in Fig. 2 (B), or when current flow is high, reduce the power depending on the position of the wiper as shown in Fig.3.



[Fig.1]



[Fig.2]



[Fig.3]

5. Soldering conditions

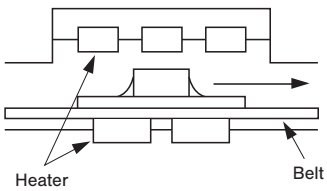
1) SMD type in common

● Infrared reflow soldering

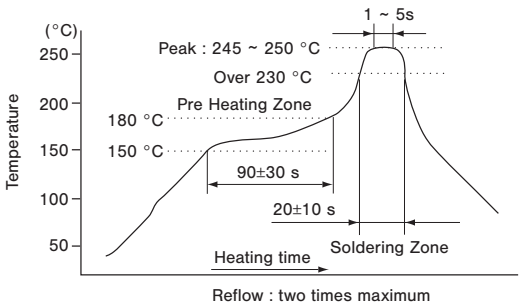
The temperature profile shown below is recommended for reflow soldering, but it is subject to soldering conditions, such as soldering temperature, preheat temperature, specific gravity of flux, belt speed etc. Please make sure before use if your soldering conditions are appropriate.

In case of infrared heater, the absorption rate varies depending on color, material etc of the object. The extent of heating varies accordingly, which please note.

Reflow soldering



Recommended profile for lead-free soldering

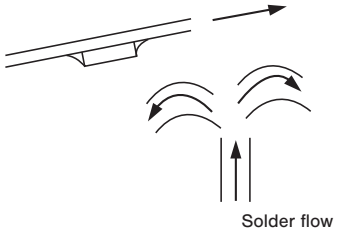


<Series of cermet trimmers in common>

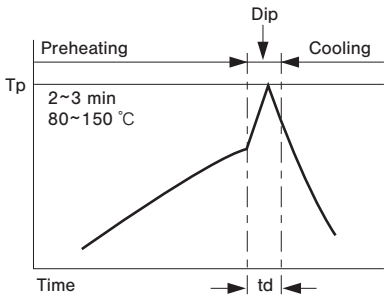
● Flow soldering

The temperature profile shown below is recommendable in the flow soldering process, but it may not be suitable in case of high mounting density or depending on equipment.

Flow soldering



Recommended profile for lead-free soldering



● Manual soldering

Soldering shall be done at 350°C(lead-free for 3 seconds [max.].) The iron tip must not be touched to the housing resin, but only to the terminal.

● Flux

Depending on flux to be applied, markings may, though a rare case, disappear or fade out at soldering. Please make sure before its use.

2) Through hole type in common

Soldering shall be done at 245 ~ 260°C for 3 ~ 5 seconds per one time. The total time of application must not exceed 10 seconds.

The product itself shall be away from the soldering bath. Otherwise, the product components may be distorted by the heat, which may cause performance deterioration.

3) Multiturn adjustment models in common

Avoid soldering or applying the heat to the trimmer potentiometer when the wiper is positioned at either end of the mechanical travel where the stress is applied to the clutch spring.

If the heat is applied to the trimmer potentiometers at such positions, the clutch spring will be weakened due to thermal fatigue of the plastic material, causing the malfunction in rotation.

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6. Cleaning

Cleaning subsequent to soldering must be done after components are cooled to the room temperature below 30°C. The solvent might penetrate into the inside of trimmer if they are immersed in it without being cooled.

Also, confirmation of stability of trimmer temperature must be done before going to next process because trimmers themselves may be rapidly cooled by the heat of evaporation when cleaning solvents evaporate. the products can not apply for special cleaning such as vacuum (decompression) cleaning. Do not use special clearing.

7. Cleaning solvents

Cermet trimmers are can be washed. Chlorofluoro carbon (CFC) and 1, 1, 1-Trichloroethane is Ozone layer destroying substance and the International Agreement for their total abolishment has been made.

We recommend the following as substitute for them.

CLEAN THROUGH 750HS [Kao Corporation]
PINE ALPHA ST-100S [ARAKAWA CHEMICAL INDUSTRIES, LTD.]
Water cleaning
Alcohol

※ It is not suitable for hydrocarbon series clearliquid.

8. Cleaning method

Main cleaning methods for cermet trimmers are shown in the table below. When the cleaning time is too long, the rotational torque can vary due to the expansion of O-ring. After cleaning, dry sufficiently before adjustment.

For vacuum (decompression) cleaning, be caution do not mix 2 different liquids.

Cleaning method

○ Possible ×: Not possible

Method	Dipping	Ultrasonic	Vapor	Showering	Brushing
Applicability	○	○	○	○	×
Time	Approx. 2 minute				—
Note	—				Marking ink will be removed

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9. Combination of cleaning methods

Possible combination of cleaning methods for trimmers is shown below. In this case, the cleaning time should be approximately 1 minute respectively.

Trimmers themselves may be rapidly cooled in the latent heat of evaporation and may inhale the cleaning solvent in case of internal air shrinkage of trimmer.

Next cleaning should be waited until confirmation of enough stability of trimmer temperature after the first cleaning.

- Dipping (1 minute) + Vapor (1 minute)
- Ultrasonic (1 minute) + Dipping (1 minute)
- Showering (1 minute) + Vapor (1 minute)

※ The above can change depending on conditions, and thus check before actual cleaning.

10. Coating and potting

If the trimmer potentiometer is coated or potted, the movable parts (rotor and shaft) may lock, making readjustment difficult.

Further, if coating or potting is made, make sure that the hardening temperature does not exceed 120°C.

Do not use coating or potting material containing the following substances:

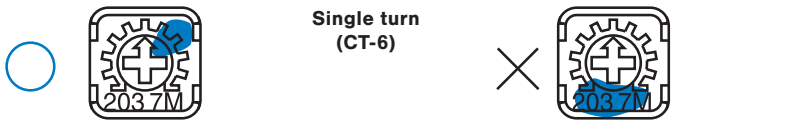
- Methylene chloride
- Thinner
- Acetone
- Xylene

11. Tamper proof seal

For models with the resistance value and production date code printed on the adjustment surface perform tamper proof seal avoiding the part. (See the sketch below.)

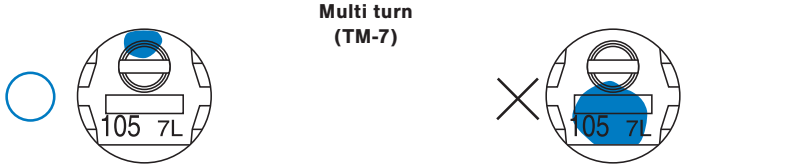
A minimum amount of tamper proof seal material with high viscosity should be applied since readjustment may become difficult after tamper proof seal is per-formed.

Tamper proof seal



Small amount is applied away from driver groove and printed part.

Printed area can not be read.



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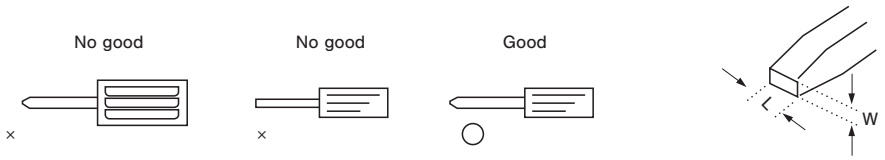
12. Circuit board hole diameter
<Reference values>

- RJ-4, RJ-5, RJ-6 ····· φ 0.7 ~φ 0.9 mm
- CT-6, FT-63, TM-7 ····· φ 0.75 ~φ 0.95 mm
- RJ-9, CT-94, CT-9, CT-20 ····· φ 0.8 ~φ 1.0 mm
- ST-4EC ····· φ 0.9 ~φ 1.1 mm
- RJ-13 ····· φ 1.0 ~φ 1.2 mm

※ Please note the above hole diameters are reference values.

13. Screwdriver to use

For adjustment, use a screwdriver whose tip fits an adjustment slot. When a screwdriver as one with too large a grip or with too small tip is used, the rotation stopper or adjustment slot of the trimmer may be damaged.



		Adjustment slot dimensions Unit : mm (W × L × D)	Adjustment driver tip thickness (Reference values) Unit : mm		
			Tip (W)	Tip thickness (L)	Grooves
Single turn	ST-2	0.35 × 1.5 × 0.3	0.3 ~ 0.35	1.4	− screwdriver
	ST-32	0.5 × 1.9 × 0.45	0.2 ~ 0.4	1.5 ~ 1.7	−, + screwdriver
	ST-42	0.6 × 2.3 × 0.5	0.3 ~ 0.5	1.6 ~ 2.0	−, + screwdriver
	ST-4				− screwdriver
	RJ-4	0.6 × 2.5 × 0.8		1.8 ~ 2.3	
	CT-6	0.6 × 2.6 × 1.6			−, + screwdriver
	FT-63	0.7 × 3.0 × 1.6	0.4 ~ 0.5	2.6 ~ 2.9	
	RJ-6	0.5 × 2.6 × 0.8	0.3 ~ 0.4	1.8 ~ 2.3	− screwdriver
	RJ-13	0.7 × 5.0 × 1.0	0.5	4.0	
Multiturn	SM-3/31	0.4 × 1.3 × 0.3	0.2 ~ 0.3	0.9 ~ 1.2	
	SM-42/43	0.56 × φ1.5 × 0.5	0.2 ~ 0.4	1.2 ~ 1.4	
	ST-7	0.5 × 1.8 × 0.5	0.3 ~ 0.4	1.6 ~ 1.9	
	ST-5	0.6 × φ1.6 × 0.8		1.3 ~ 1.6	
	RJ-5				
	TM-7	0.6 × φ2.5 × 0.7	0.3 ~ 0.5	1.8 ~ 2.3	
	CT-94	0.6 × φ2.3 × 0.8		1.6 ~ 2.0	
	CT-9				
	RJ-9				
	CT-20	0.6 × φ2.5 × 0.8		1.8 ~ 2.3	

〈Recommended screwdrivers〉

ST-32 : VESSELCeramic adjustment driver No.9000 (⊖ 1.8 × 30)

ST-32、ST-42 : 〃 No.9000 (⊕ 0 × 30) The driver shave off the head about 0.2 mm.

ST-2 : ENGINEER INC., DA-54

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14. Electrical adjustment range
Avoid using trimmer with its wiper set at either CW or CCW end. The end of the electrical adjustment range for cermet trimmer potentiometers is the overlapping area where the resistor and the conductor are in direct. The resistance here changes irregularly. Use the trimmer potentiometer in the 10 % to 90 % electrical adjustment range.

15. Strength of terminals
Handle carefully; the force or bending, twisting, etc. to the terminals might be the cause of terminal break.

16. Mechanical loading
The trimmer shall not be used with any mechanical load applied on the body of the trimmer.

17. Caution for the use of high frequency circuit
Our trimmers are not specially designed for the use of high frequency circuit.
Please consult with our sales office or sales agent for such application.

"HANDLING NOTES" is the one to prevent the accident and the performance deterioration beforehand.
Please make consideration of it.