

Mounting Instructions for Chip Tantalum Capacitors

Products subject to the instructions : 267,269,271,277,278,279,281

Please refer to the Application Notes for Solid Tantalum Capacitors for a proper guide in the operation and safety procedures required in dealing with Tantalum capacitors.

Matsuo is very concerned with the quality of our components and the quality of our customers' products. Since the mechanical and thermal stress incurred during the assembly process can affect the reliability of the capacitors, it is important to pay close attention to the instructions listed below, and benefit with high reliability products.

1 Recommended Solder Pad Layout

To take advantage of Matsuo's Chip Tantalum capacitor "self alignment" feature, the pad layout dimensions shown on the chart below are recommended. If the terminal slips out of the pad slightly, the capacitor will automatically self-align. Pad dimensions of the cathode and anode must be identical and symmetrical. The amount of solder paste on each pad should be uniform.

RECOMMENDED PAD DIMENSIONS

Fig-4

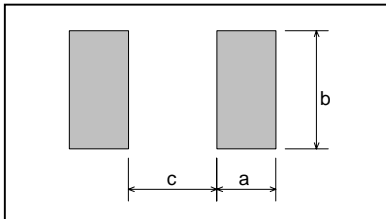


Table-3

inch (mm)

CASE CODE	a		b	c
	Flow soldering	Re-flow soldering		
S	0.087 (2.2)	0.055 (1.4)	0.047 (1.2)	0.035 (0.9)
A	0.118 (3.0)	0.079 (2.0)	0.059 (1.5)	0.059 (1.5)
B	0.126 (3.2)	0.079 (2.0)	0.094 (2.4)	0.071 (1.8)
C3 , C*	0.165 (4.2)	0.094 (2.4)	0.098 (2.5)	0.130 (3.3)
D3 , D*	0.205 (5.2)	0.094 (2.4)	0.106 (2.7)	0.181 (4.6)
E	0.220 (5.6)	0.094 (2.4)	0.150 (3.8)	0.181 (4.6)
H	0.205 (5.2)	0.094 (2.4)	0.106 (2.7)	0.181 (4.6)

*Case code of 267N series, complied with AEC-Q200

When designing your circuit board layout, please refer to the above recommended pad layout dimensions and confirm soldering conditions and their results.

2 Pre-heating

To obtain optimal reliability and solderability conditions, capacitors should be pre-heated at 130-200°C (60-120sec.)

3 Soldering

The body of the capacitor should not exceed 260°C during soldering. Please see the chart below for a guide on recommended conditions. Matsuo's 271N Series does not follow this guideline. As a specialty high heat resistant capacitor, the 271N type can withstand 320°C body heat for 10 seconds. For a complete soldering profile on the 271N Series, please contact the Matsuo Sales Department.

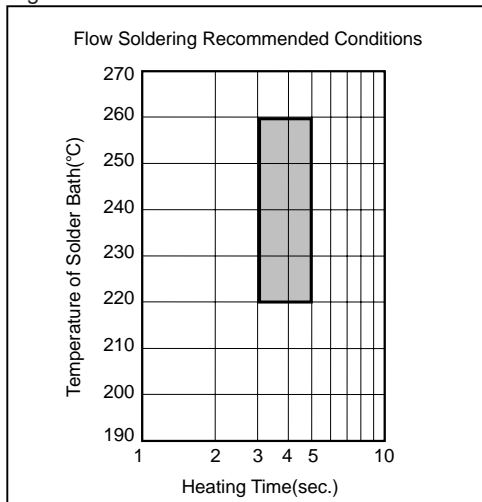
A) Flow Soldering

Flow soldering is accomplished by applying a "Jet stream" where components are to be placed on a substrate.

Although a recommended soldering time is 3 to 5 seconds, Matsuo believes that the shortest possible time is the best.

The highest soldering temperature allowed for all but the 271N Series is 260°C.

Fig-5



B) Reflow Soldering

Reflow soldering is a process in which the capacitors are mounted on a substrate with solder paste. There are two methods of Reflow Soldering, Direct Heat and Atmospheric Heat.

1. Direct Heat

During the Direct Heat method, the capacitor has been positioned on a substrate, which is then placed upon a hot plate. The capacitor maintains a lower temperature than the substrate, which in turn stays at a lower temperature than the hot plate. Please see Fig-6-(1).

2. Atmospheric Heat

a) VPS(Vapor Phase Soldering)

During VPS the substrate is heated by an inert liquid with a high boiling point. The temperature of the capacitor's body and the temperature of the substrate are about the same as the atmosphere. This temperature should be below 240°C Please see the recommended condition in Fig-6-(2).

Fig-6-(1)

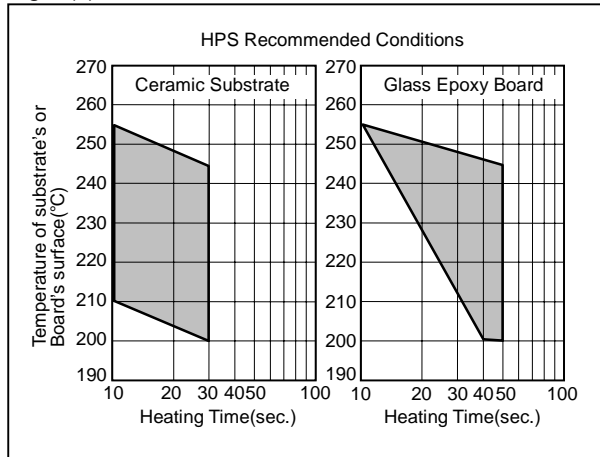
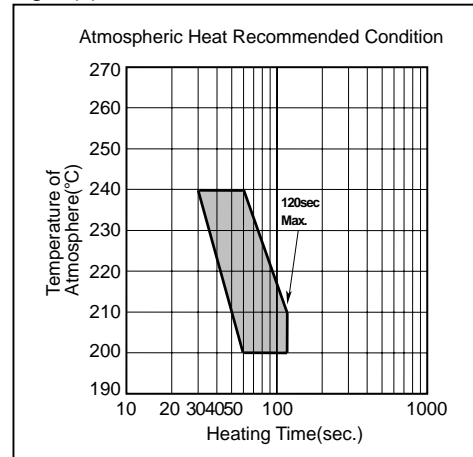


Fig-6-(2)



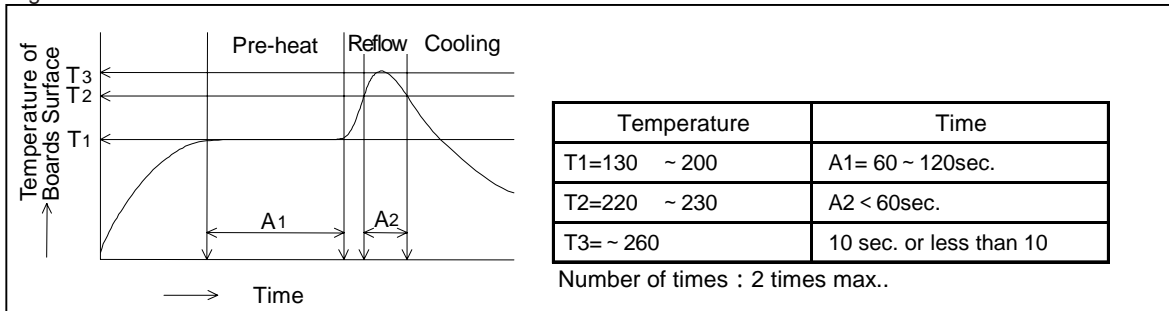
B) Near and Far IR Ray

Due to the heat absorption of the capacitor's body, the internal temperature of the capacitors may be 20-30°C higher than the setting temperature and may exceed 260°C. Temperature control is crucial in maintaining a temperature of 260°C or lower.

C) Convection Oven

An infrared ray is the main source of heat in this process. The temperature of the substrate and the capacitors can be maintained at a similar level by the circulation of heated air, or an inert gas. Fig-7 shows recommended conditions.

Fig-7



C) Soldering with a Soldering Iron

Soldering with a soldering iron cannot be recommended due to the lack of consistency in maintaining temperatures and process times. If this method should be necessary, the iron should never touch the capacitors' terminals, and the temperature of the soldering iron should never exceed 290°C. The application of the iron should not exceed 3 seconds.

4 Ultrasonic Cleaning

Matsuo does not recommend Ultrasonic cleaning. This may cause damage to the capacitors, and may even cause broken terminals. If the Ultrasonic cleaning process will be used, please note the following:

The solvent should not be boiled.

The cleaning time should be kept to a minimum.

The recommended wattage is less than 0.5 watts per cm².

Drying should be done under the capacitors' maximum operating temperature.

