Application Notes for Conductive Polymer Aluminum Solid Electrolytic Capacitor Type ACA

Capacitors should only be specified after confirming operating conditions and performance requirements.

1. Operating Voltage

Aluminum Capacitor shall be operated at the rated voltage or lower. Over rated voltage applied even for a short time may cause short failure.
When designing the circuit, the equipment's required reliability must be considered and appropriate voltage derating must be performed.

2. Application that contain AC Voltage

Special attention to the following 3 items.
(1) The sum of the DC bias voltage and the positive peak value of the AC voltage should not exceed the rated voltage.
(2) Reverse voltage should not exceed the allowable values of the negative peak AC voltage (refer page3)
(3) Ripple voltage should not exceed the allowable values.

3. Reverse Voltage

Special attention to the polar character.
Reverse Voltage should not be applied.

4. Permissible Ripple Voltage

Permissible ripple current and voltage is determined by the following formula and influenced by P max value and ESR standard value. Please consult us in case of different frequency.

$$P=I^2\times ESR \text{ or } P=\frac{E^2\times ESR}{Z^2}$$

Permissible ripple current $I_{max}=\sqrt{\frac{P_{max}}{ESR}}$ (A_{rms})

Permissible ripple voltage $E_{max}=\sqrt{\frac{P_{max}}{ESR}}\times Z=I_{max}\times Z$ (V_{rms})

I_{max}	Permissible current at regulated frequency.
E_{max}	Permissible voltage at regulated frequency.
P_{max}	Permissible power less. (W)
ESR	ESR valule at regulated frequency. (Ω)
Z	Impedance at regulated frequency. (Ω)

Permissible power loss for each case.

Case size	P_{max} (watt)	
	Ceramic board	Glass epoxy board
4D	0.110	0.072
6D	0.150	0.085
8D	0.165	0.100

Note: Above values are measured at 0.6^t ceramic board-mounting and 0.8^t glass epoxy board mounting in free air and may be changed depending on the kind of board, packing density, and air convection condition. Please consult us if calculated power loss value is different from above list of P max value.

5. Leakage current

Leakage current can be increased by heat and mechanical stress of soldering. Turning on electricity decreases leakage current.

6. Non Polar Connection

Aluminum Solid Electrolytic Capacitor cannot be used as a non-polar unit.

7. Soldering

7.1. Pre-heating

To obtain optimal reliability, lowering the heat shock during the soldering process is favorable. Capacitors should be pre-heated at 130-160°C for approximately 60 seconds.

7.2. Soldering

The body of the capacitor should not exceed 240°C during soldering.
(1) Reflow Soldering
Reflow soldering is a process in which the capacitors are mounted on a printed board with solder paste. Two methods of Reflow Soldering: Direct and Atmospheric Heat
· Direct Heat (Hot plate)
· Atmospheric Heat
a) Near and Far IR Ray
b) Convection Oven
Vapor Phase Soldering and Flow Soldering are not recommended.
(2) 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 capacitor's terminals, and the temperature of the soldering iron should never exceed 350°C. The application of the iron should not exceed 3 seconds and 30 watt.
(3) Please consult us for other methods.

8. Solvent Cleaning

Cleaning by organic solvent may damage capacitor's appearance and performance. However, our capacitors are not effected even when soaked at 20-30°C 2-propanol for 5 minutes. When introducing new cleaning methods or changing the cleaning term, please consult us.

9. Ultrasonic cleaning

Ultrasonic cleaning under severe condition may break terminals. Also, from an electrical characteristics aspect, it is unfavorable. Therefore, please do not use ultrasonic cleaning if possible. If the Ultrasonic cleaning process will be used, please note the following.
(1) The solvent should not be boiled. (Lower the ultrasonic wave output or use solvent with the high boiling point.)
(2) The recommended wattage is less than 0.5 watts per cm^2.
(3) The cleaning time should be kept to a minimum. Also, samples must be swang in the solvent. Please consult us.

10. Storage

Capacitors should be tightly sealed in moisture prevention bag and stored with supplied reel.