



When using aluminum electrolytic capacitors, pay strict attention to the following :

Polarized aluminum electrolytic capacitors.

If you should reverse the polarities of aluminum electrolytic capacitors, it would lead to short-circuited circuitry and many further results in an explosion if the unit were kept energized. We offer units of ϕ 8 or more with safety vent design as the standard type in order to prevent possible accidents that may take place if the unit should be connected with its polarities. Small-size capacitors (ϕ 5 ~ ϕ 6) with safety vents are available on request. It is advisable to the use non-polar capacitors for a DC circuit where the polarity is reserved.

Do not apply any over-voltage exceeding the rated voltage (surge voltage for a short period) to the capacitor.

When applying ripple current to the capacitor, be very careful not to allow the peak voltage value (a value obtained by adding the ripple voltage to the DC voltage) to exceed the rated voltage. Application of any voltage higher than the rated value would lead to shortened service life of the capacitor or would even destroy the unit in a short period. However, the unit may withstand extremely short application of surge voltage.

Ascertain the operating temperature range.

Use the electrolytic capacitors according to the specified operating temperature range. Usage at room temperature will ensure longer life.

Reverse voltage

The reverse voltage shall not exceed 2V. (The sum of DC voltage peak ripple voltage shall not exceed-2V.)

tan δ /E.S.R.

The maximum value of tan δ is specified in each table which is measured at 120Hz and 20°C, unless otherwise specified. E.S.R. can be obtained from the following formula.

$$E.S.R. = \tan \delta / 2 \pi . f . C.$$

Where: f = measurement frequency in Hz

C = measurement capacitance value in F

Electrolytic capacitor is not suitable for circuits in which charge + discharge are frequently repeated

If used in circuits, in which charge and discharge are frequently repeated, the capacitance value may drop, or the capacitor may be damaged. Please consult our engineering department for assistance in these applications.

Do not allow any higher ripple current than rated to flow through capacitor.

If any ripple current higher than the rated value is to flow through a capacitor, excessive heat will be generated and

the capacitance reduced with resultant shortened life. We offer high ripple resistant capacitors especially designed for use with high ripple current on request.

Ripple current

The capacitor should be used within specified permissible ripple current in each standard products table. (The sum of DC voltage and voltage shall not exceed the rated DC working voltage.)

The specified maximum permissible ripple current is defined at + 85°C and 120Hz, unless otherwise specified. In other condition of ambient temperature and frequency, ripple current multiplied by following multiplier can be applied as maximum permissible ripple current.

Temperature	40°C	60°C	70°C	85°C	105°C
Multiplier	1.9	1.5	1.3	1.0	0.6

Frequency	60HZ	120Hz	300Hz	1KHz	10KHz	100KHz
Multiplier	0.7	1.0	1.1	1.3	1.4	1.4

When you see a capacitor after prolonged storage.

- a) Do not store capacitors at a high temperature or in high humidity. Store the capacitors indoors and a temperature of 5~35°C and a humidity of 70% R.H.
- b) Store the capacitors in places free from water, oil or salt water.
- c) Store the capacitors in places free from toxic gasses (hydrogen sulfide, sulfurous acid, chlorine, ammonium, etc.)
- d) Store the capacitors in places free from ozone, ultraviolet rays or radiation.
- e) Keep capacitors in the original package.
- f) When the capacitor is stored for a long time without applying voltage, Leakage current tends to increase. This returns to normal by applying the rated voltage to the capacitor before use.
- g) It is recommended to apply D.C. working voltage to the capacitor for 30 minutes through 1K Ω of protective series resistor, if it is stored more than 6 months..

Be careful of temperature and time when soldering.

When soldering a printed circuit board with various components, care must be taken that the soldering temperature is not too high and that the dipping time is not too long. Otherwise, there will be adverse effects on the electrolytic capacitor. In the case of small sized electrolytic capacitor, nothing abnormal will occur if dipping is performed at less than 260°C for less than 10 seconds.