

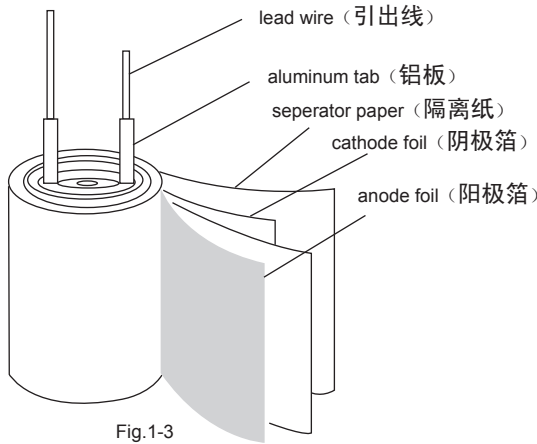


ALUMINUM ELECTROLYTIC CAPACITORS

TECHNICAL NOTE

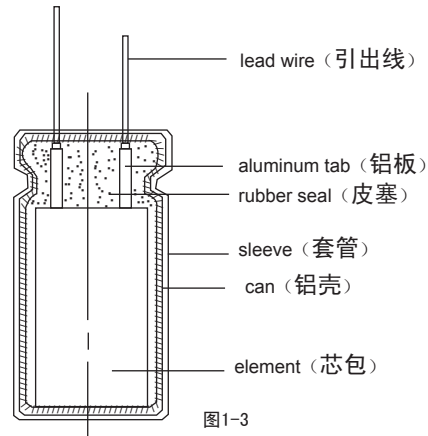
Structure of aluminum electrolytic capacitors

The aluminum electrolytic capacitor is mainly composed of an inside element, which is made up of an anode foil, a cathode foil and separator paper wound together and impregnated with an electrolyte, external terminals, which are connected to tabs drawn from anode and cathode foils, a can and sealing materials.



铝电解电容器的结构

铝电解电容器主要是由含浸有电解液的芯包(由阳极箔片、阴极箔片、电解纸卷绕而成)、引出端(通过引出条和阳极箔、阴极箔铆接在一起)、铝壳以及封口材料共同构成



1-2 Equivalent Circuit of the Capacitor

The electrical equivalent circuit of the aluminum electrolytic capacitor is as presented in Fig.1-4

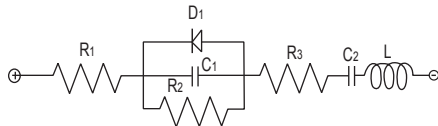


Fig. 1-4

- R1: Resistance of terminal and electrode
- R2: Resistance of anode oxide film and electrolyte
- R3: Insulation resistance because of defective anodic oxide film
- D1: Oxide semiconductor of anode foil
- C1: Capacity of anode foil
- C2: Capacity of cathode foil
- L: Inductance caused by terminals, electrodes, etc.

1-2 电容器的等效电路

电容器的等效电路图可由下图1-4表示

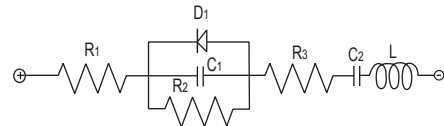


图 1-4

- R1: 电极和引出端子的电阻
- R2: 阳极氧化膜和电解质的电阻
- R3: 损坏的阳极氧化膜的绝缘电阻
- D1: 具有单向导电性的阳极氧化膜
- C1: 阳极箔的容量
- C2: 阴极箔的容量
- L : 电极及引线端子等所引起的等效电感量

1-3 Basic Electrical Characteristics

1-3-1 Capacitance:

The capacitance of capacitor is determined as AC capacitance by measuring its impedance. As the AC capacitance depends on frequency, voltage and other measuring methods. The capacitance of an aluminum electrolytic capacitor shows smaller values as a measuring frequency increases.

Measuring temperature as well as frequency effects the capacitance. As the measuring temperature decreases, the capacitance shows smaller values.

On the other hand, DC capacitance, which can be determined by measuring the charge when a DC voltage is applied, shows a slightly larger value than AC capacitance at a normal temperature and has the flatter characteristic over the temperature range.

1-3 基本电气特性

1-3-1 电容量

电容器的容量由测量交流容量时所呈现的阻抗决定。交流电容量随频率、电压以及测量方法的变化而变化。铝电解电容器的容量随频率的增加而减小。

和频率一样，测量时的温度对电容器的容量有一定的影响。随着测量温度的下降，电容量会变小。

另一方面，直流电容量可通过施加直流电压而测量其电荷得到，在常温下直流容量比交流稍微的大一点，并且具有更优越的稳定特性。