Basic knowledge of the tantalum capacitor

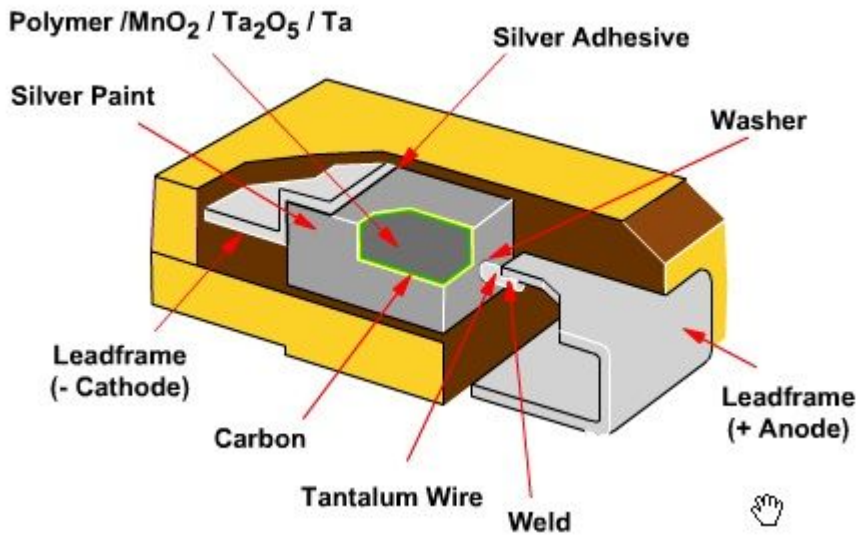
tantalum capacitor manufacturer

After the application of tantalum capacitors, aluminum electrolytic capacitor has been found to exist in the application of short service life, not resistant to high temperature (military requirements up to 125 ° C), the problem such as capacitance change with temperature is obvious, tantalum capacitor, forced people to seek the good performance of tantalum electrolytic capacitor is a kind of good performance of capacitors.Tantalum capacitors with solid and liquid two forms of the cathode.

The structure of the tantalum capacitor

The ductility of aluminum is very good, can be very thin aluminum foil rolling, therefore, aluminum electrolytic capacitor corrosion Yang pole, the cathode foil to expand effective area of electrode.Tantalum capacitor is used will become a porous tantalum powder by sintering of tantalum block as anode, will through a porous tantalum block surface oxidation to form of tantalum pentoxide dielectric (relative dielectric number 27).Such as cathode is manganese dioxide solid tantalum capacitors, and will serve as the cathode of manganese dioxide and tantalum pentoxide dielectric close contact, through the lead electrode forming tantalum capacitor.The structure of the tantalum capacitor is shown as follows,

Like aluminum electrolytic capacitors, tantalum capacitors are polar capacitor, only allowed in the condition of single polarity, absolutely do not allow the reverse polarity using tantalum electrolytic capacitor, current/voltage curve as follows:



Basic solid tantalum capacitors by tantalum powder (the anode), oxide film (cannot exist independently of tantalum powder), manganese dioxide, silver powder, graphite, epoxy resin, lead.

The first step: tantalum powder and organic solvent mixed together, according to certain shape pressure molding, embedded tantalum wire at the same time.

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Step 2: under vacuum environment of high temperature over 2000 degrees, will be mixed organic solvent of tantalum powder in vacuum sintering into similar Yu Haimian state, at the same time and really lead together.

Step 3: major foam sponge into the electrolysis in phosphoric acid solution, the oxidation surface is generated after the tantalum pentoxide.Tantalum pentoxide dielectric constant is very high, at around 27, high performance of aluminum electrolytic capacitor (dielectric constant approximately 7) 3 oxidation 2 aluminium media.

Fourth step: add the manganese nitrate of liquid tantalum block, and then the hot points in the environment of water vapor (catalyst), broken down into manganese dioxide and nitrogen dioxide.Manganese nitrate adsorption, manganese dioxide generated can be fully adsorption of the countless holes inside the cavernous tantalum block.If here using solid manganese dioxide directly, will not be able to achieve this effect, that is why the manganese dioxide can only get the reason in the process of manufacturing.If use PPY/PEDT solid polymers, due to its low melting point, you can directly to its melting and then put it in.

Step 5: the last will and silver graphite coated on the surface of the manganese dioxide, reduce its the ESR, enhance its conductivity.

Step 6: add lead people outside, and then by epoxy resin encapsulation.