Polymer capacitors

Aluminum polymer electrolytic capacitors are the latest evolutionary step in improving the properties of aluminum electrolytic capacitors to make them more like a film capacitor.

Aluminum Polymer capacitors have the following features:

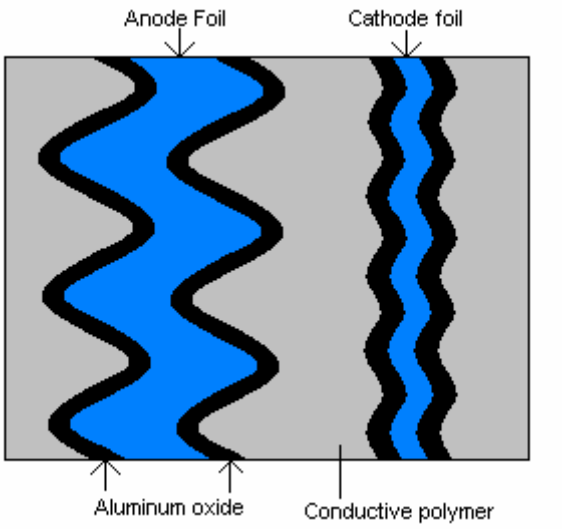
1. Low ESR and impedance.
2. Temperature stable.
3. Small size.
4. Environmentally friendly.
5. High Capacitance.
6. Fire resistant.
7. Vibration resistant.
8. Available in radial lead and surface mount.

Aluminum Polymer capacitors are used in:

1. Motherboards
2. Power supplies
3. AC/DC converters
4. CPU's
5. DC/DC converters
6. Decoupling circuits
7. LCD Monitors

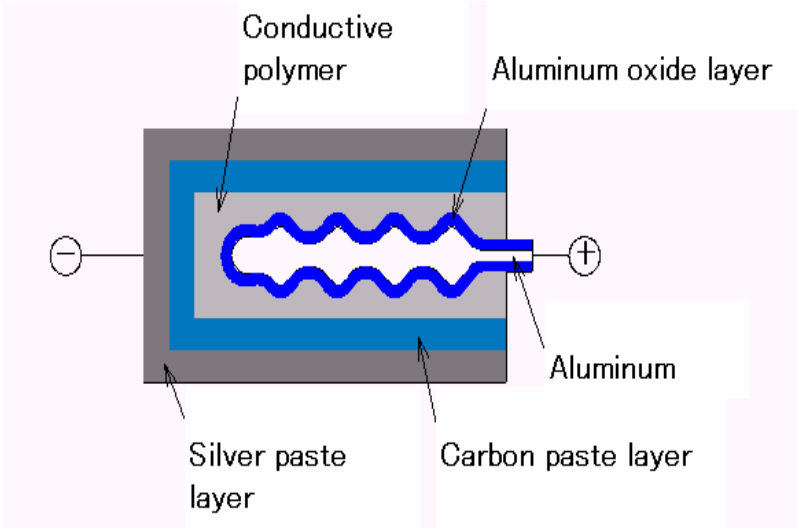
Polymer capacitors are produced using a couple of manufacturing techniques that are very different from one another.

Surface mount Can type and Radial lead Polymer capacitors are produced in a similar manner to standard aluminum electrolytic capacitors. The main difference is the liquid electrolyte being replaced by a conductive polymer.



Surface mount chip style polymer capacitors are produced in an entirely different manner. These capacitors are produced using a stacking technique.

With this technique, strips of anode foils coated with conductive polymer, carbon paste and silver paste then are stacked together.



With the liquid electrolyte being replaced by a solid polymer material the capacitors are very stable when exposed to temperature changes that would have standard aluminum electrolytic capacitors changing by as much as 40%.

The conductive polymer material allows these capacitors have substantially lower ESR values compared to standard aluminum electrolytic capacitors. This lower ESR allows these capacitors to handle ripple currents that significantly greater that their aluminum and tantalum counter parts.

The life expectancy of these capacitors is significantly greater than other electrolytic capacitors.

Aluminum electrolytic	Aluminum Polymer
$L2=L1*(Vr/Vo)*2^{x}$	$L2=L1*10^{x}$

Where

$$X=\frac{Tm-Ta-\Delta T}{2}$$

L2= Life expectancy at operating conditions.
L1= Life rating of capacitor.
Vr= Rated voltage of capacitor.
Vn= Operating voltage in application.
Tm= Maximum temperature rating of capacitor.
Ta= ambient temperature of application.
ΔT= Temperature rise due to applied ripple current.