Functional Polymer Capacitors **FPCAP**

Solid Electrolytic Capacitors with Functional Polymer

FPCAP RE Series

Calculation formula of lifetime

In general, calculation formula of lifetime of capacitors is appeared as follows. FPCAP RE's calculation formula of lifetime is same as usual capacitors.

$$L_X = L_0 \times 10^{(T_0 - T_X)/20}$$

Where,

L_X (Hrs)　　=Life expectance in actual use
L_0 (Hrs)　　=Life time
T_0 (105°C)　=Maximum operating temperature (105°C)
T_X (°C)　　=Temperature of capacitor in actual use

On the other hand, temperature Tx adds the circumference temperature T as the capacitor temperature and the generating temperature ΔT by ripple current.

$$T_X = T + \Delta T$$

T (°C)　= Ambient temperature
ΔT (°C) = generating temperature

Furthermore, the generating temperature ΔT by the ripple current is proportional to ripple current, and is shown by the following formula. When applying the maximum permissible ripple current Io to FPCAP RE, the generating temperature ΔT is about 20°C at inside of capacitor. All large capacitance types of RE serve as this temperature in general.

$$\Delta T = (I / I_0)^2 \times \Delta T_0$$

I (A rms) = Ripple current in actual use

I_0 (A rms) = Maximum permissible ripple current

ΔT_0 (°C)　= Generated temperature value by maximum permissible ripple current
　　　　　[About 20 (°C)]

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