



ALUMINUM ELECTROLYTIC CAPACITOR

鋁質電解電容器

CAUTION FOR PROPER USE OF ALUMINUM ELECTROLYTIC
CAPACITORS

鋁質電解電容器使用注意事項

When the following types of electrical loads indicated below are applied to Aluminum Electrolytic Capacitors, rapid deterioration of electrical property occurs:

若下列之電子回路負載應用于鋁質電解電容上，將會快速發生電容器電氣性能的破壞：

- Rated ripple current is exceeded 負載紋波電流超出額定紋波電流
- Reverse voltage, over-voltage and AC voltage exceeding the rated limits
負載直流電壓極性反，負載直流電壓超出額定限制，應用於超出額定限制之交流電壓回路
- The leakage current of the capacitor is so high to produce heat
- 電容器漏電流過大所產生之高溫
- Sever charge and discharge cycles 間斷的充放電循環
- Poor connected to device circuits 電子回路接解不良

At such time, sever heat is generated, gas is so emitted, then electrolyte leaks from the sealing area, and pressure relief vent operated due to internal pressure.

上述情況發生時電容器內溫將升高并產生氣體，電解液將會從封口部分滲漏，壓力釋放裝置會由于內部壓力而啟動。

In the worst case, explosion or ignition may occur, and along with destruction of the capacitor combustibles may burst out.

在最壞的情況下電容器可能發生爆破或著火之情形，并且可能將其周邊可燃物一起毀損。

The lifetime(L) of a capacitor is estimated by the following fundamental formula.

下列基礎公式用于估算電容器使用壽命 (L)

$$L=L_0 \times 2^{(T_0 - T) / 10} \times 2^{(\Delta T_0 - \Delta T_1) / 5}$$

Where

this figure might be different by series

此數字可能因各系列不同

L_0 =Guaranteed life at Temperature 規定溫度之電容器保證壽命

L=Expected life at Temperature 預估電容器使用壽命

T_0 =Maximun operating Temperature 規定最高工作溫度

T=Actual operating Temperature 實際工作溫度

ΔT_0 =Temperature rise due to Maximum permissible ripple current heating ($\Delta T_0=5^\circ\text{C}$)

負載最大允許紋波電流使電容器上昇的溫度

ΔT_1 =Temperature rise due to actual ripple current heatin

Δ 負際負載紋波電流使電容器上昇的溫度

系列	系数值
SM5,SH5, NPM5, NPH5	60
SM7,SH7, NPM7, NPH7	50
SHK5, SHK7	30
SM,SH, NPM, NPH	20
LEH,LRH	15
LRF	5



1. The fundamental formula applies only to the range of an ambient temperature from +40°C to the Maximum rated operating temperature of capacitors, and means that every 10°C rise in the ambient temperature halves the lifetime of the capacitors.
以上基礎公式僅適用於周邊環境從+40°C至額定最高工作溫度之溫度範圍內，意既周邊環境溫度每增加 10°C，電容器壽命就會遞減二分之一。
2. If ripple current multipliers due to temperature or frequency are described in the catalogs and product Specifications, note the following before using them.
如果在目錄或產品說明書中有敘述由于溫度或頻率所產生的紋波電流倍數，請在使用電容器前記錄下列事項：
 - 2.1 Even if the capacitors are used at lower ambient temperature than the maximum rated operating temperature, the temperature multipliers should not be used to obtain permissible ripple currents exceeding the rated permissible ripple current prescribed in the catalogs or products specifications.
即使電容器使用在低于最大額定工作溫度下之環境溫度內，上述壽命公式亦并不適用於電容器實際應用紋波電流超過目錄或產品說明書中所記載之紋波電流值。
 - 2.2 Applying a ripple current higher than the rated limit to the capacitors comes to cancel out the extension of lifetime which ought to be obtained by using the capacitors at the low ambient temperature, and also the lifetime of the capacitors cannot be estimated using the formula given herein.
當實際應用于電容器之紋波電流值高于限定值時，在低溫工作環境所應獲得之電容器延長壽命將被抵銷，并且電容器壽命亦不能使用上述公式估算。