Dielectric

介 质

Many different materials and plastic films may be used as a dielectric.
许多材料和有机薄膜都可以作为电容介质。
The main dielectrics used in Kwoktran products are:
国灿电容主要介质采用：
(I) Polyester 聚乙酯 ; (II) Polypropylene 聚丙烯
The use of different dielectrics gives different characteristics and behaviour to the capacitors:
使用不同的介质将给电容器带来不同的特性及性能：
different dielectric types are adopted as a function of the design needs and foreseen application characteristics.
根据设计功能的需求和预计的应用特性来采用不同的介质型号。

1. A comparison of the main characteristics of the above mentioned plastic films is shown in the following table:
1. 上述两种有机薄膜介质主要特性对比如下表：

Comparative table of plastic film dielectric main characteristics (typical values) 有机薄膜介质主要特性参数对比表（典型值）				
Characteristic 特 性	Polyester 聚乙酯	Polycarbonate 聚碳酸酯	Polypropylene 聚丙烯	Polystyrene 聚苯乙烯
Relative dielectric costant (25°C, 1kHz) 相对介质常数	3.3	2.8	2.2	2.5
Max. working temperature (° C) 最大工作温度	125	150	100(110*)	70
Loss factor ($x10^{-4}$, 1kHz/100kHz) 损耗因素（DF)	50/220	10/100	2/10	2/3
Insulation resistance (MΩ x μF, +20°C) 绝缘电阻	30	50	300	300
Temperature coefficient (ppm/°C) 温度系数	-	+150	-200	-150
Dielectric strength (V/μm) 介质强度	250	180	400	150
Water absorption (% in weight) 吸水率	0.2	0.3	≦0.01	0.1
Density (g/cm3) 密度	1.4	1.21	0.91	1.05

Notes: (I) Polyester =**KT**(according to IEC 60062)=**CL** (according to GB of China)
(II) Polypropylene =**KP**(according to IEC 60062)=**CBB** (according to GB of China)

* Special base film for high temperature applications 聚丙烯高温（110℃）应用时需使用特别的耐高温基膜.

2. 典型特性、应用、以及特性曲线
Typical Properties, Applications and typical graphs

典型特性
聚酯薄膜
- 工作温度范围宽
- 介电常数大
- 自愈特性好
- 容积比大
- 稳定性好

聚丙烯薄膜的特性
- 损耗极低
- 介质吸收系数低
- 绝缘电阻高
- 频率特性好
- 自愈特性好
- 稳定性好

典型应用
聚酯薄膜电容器
- 隔直和耦合
- 旁路
- 退耦
- 滤波
- 定时
- 低脉冲电路
- 振荡电路

聚丙烯薄膜电容器
- 高频脉冲应用
- 大电流场合
- 交流场合
- 高稳定的定时场合
- 开关电源系统和彩电行业
- 照明行业
- 工控行业
- 高 Q 滤波

Typical Properties
Polyester Film
- Very wide operating temperature range
- High dielectric constant
- Excellent self-healing properties
- Very good ratio box size/capacitance
- Good stability

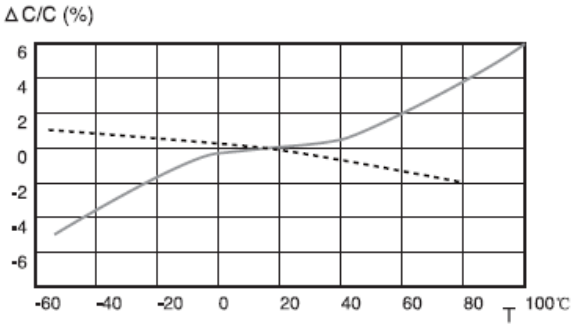
Polypropylene Film
- Very low dissipation factor
- Very low dielectric absorption
- Very high insulation resistance
- Good behaviour in frequency
- Excellent self-healing properties
- Very good stability

Typical Applications
Polyester Film Capacitors
- Blocking and Coupling
- By-passing
- Decoupling
- Filtering
- Timing
- Low pulse circuits
- Oscillator circuits

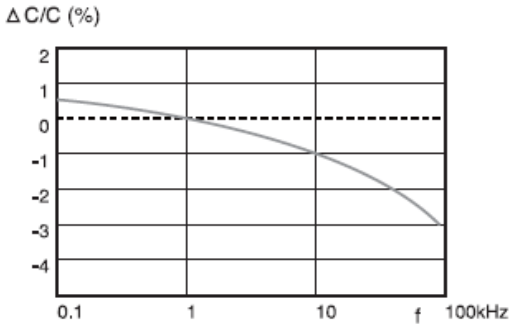
Polypropylene Film Capacitors
- High frequency, pulse applications
- High current
- A.C.applications
- Timing with high stability
- SMPS and TV set
- Lighting
- Industrial
- Filtering high Q

• Typical Graphs

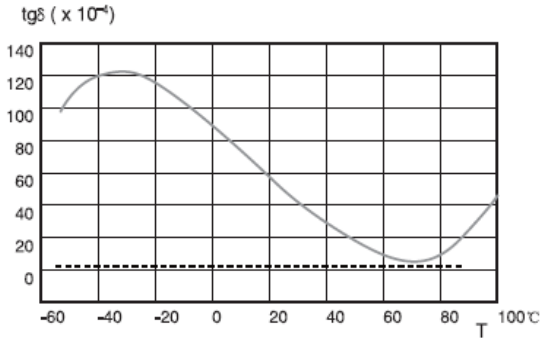
• 特性曲线



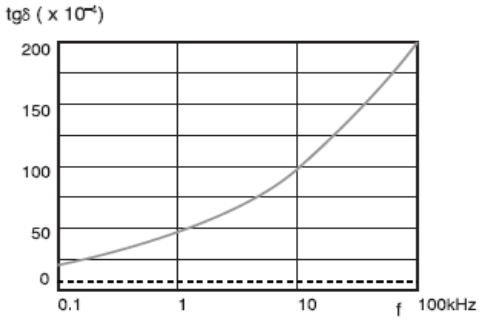
Capacitance vs. temperature at 1kHz



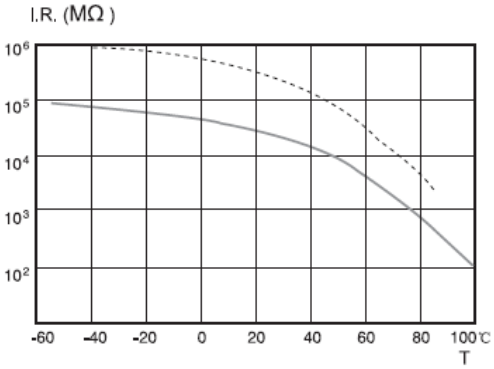
Capacitance vs. frequency (Room temperature)



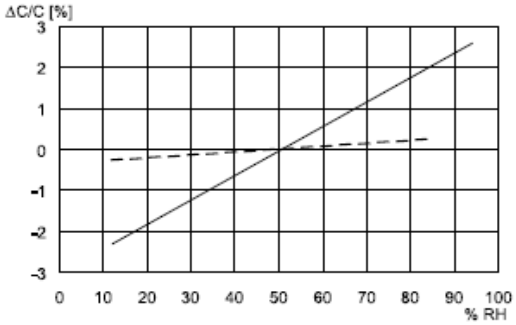
Dissipation factor vs. temperature at 1kHz



Dissipation factor vs. frequency (Room temperature)



I.R. vs. temperature



Capacitance change vs. relative humidity (RH)

---------聚丙烯薄膜（Polypropylene Film)

———聚酯薄膜（Polyester Film)

If you need a further information , please contact to technical division.