



JACKCON CAPACITOR ELECTRONICS CO.,

RAP SERIES SPECIFICATIONS

METALLIZED POLYPROPYLENE FILM CAPACITOR

GENERAL TECHNICAL DATA

Dielectric :

Polypropylene film

Winding :

non-inductive type.

Leads :

tinned wire.

Protection :

Plastic case, epoxy resin filled.

Box material is solvent resistant and flame retardant according to UL94 V0

ELECTRICAL CHARACTERISTICS

Rated voltage (VR) : 450 Vdc

Category voltage (Vc) : up to +125°C Vc=VR

For temperatures between -40 °C to + 105 °C a decreasing factor of 0.07% per degree °C on the rated voltage VR has to be applied.

Capacitance range : A TYPE 0.76 μF to 0.86 μF
B TYPE 0.90 μF to 1.1 μF

Capacitance values :

E6 series (IEC 63 Norm).

Capacitance tolerances (measured at 1 kHz) :
±5% (J); ±10% (K); ±20%(M).

Total self-inductance (L) : 7 μH
(Lead length-2mm)

Dissipation factor (DF):

0.1% MAXIMUM AT +25 °C AND 1 KHz

B	≤3.5	>3.5
d±0.05	0.5	0.5

All dimensions are in mm

Insulation resistance :**Test conditions**

Temperature : +25°C±5°C

Voltage charge time : 1min

Voltage charge : 450 Vdc

Performance

For VR ≤100 Vdc

≥ 10000MΩ for C ≤0.1 μF (50000MΩ) *

≥ 1000 MΩ for C >0.1 μF (10000 MΩ) *

For VR >100Vdc

≥ 30000 MΩ (50000 MΩ) *

● Typical value

Test voltage between terminations :

480 VDC 2 s at +25°C±5°C

Rated Capacitance : A TYPE 0.76 μF to 0.86 μF
B TYPE 0.90 μF to 1.1 μF

Voltage : 450 Vdc

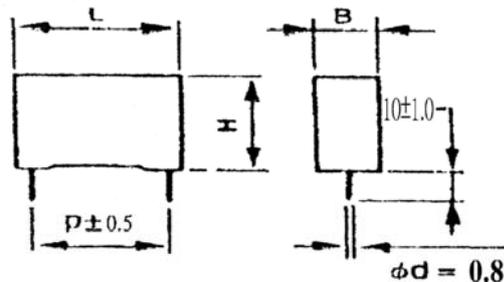
B : 8.00 m/m

H : 19.00 m/m

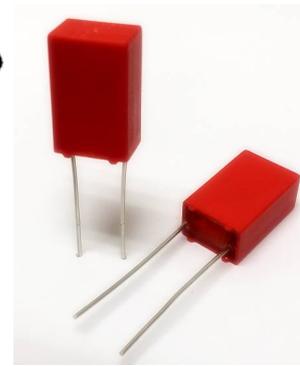
L : 12.50 m/m

P : 10 m/m

Lead cut =



(All dimensions are in ±0.5mm)





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To R&D Enginners :

We can solve the problem (Metallized Polypropylene Film Capacitor explosion on PFC circuit), without using protection (fuse membrane) film

1. **Use safe(fuse membrane) film or not: safe film electrode is very weak and high impedance, if high frequency electric circuit flows in, it is easy burning out the electrode part by part. Finally the device is empty without capacitor electric characteristics. The basic theory of safe film : mark some grids or slash lines on the (alloy/Al) metal layer of metal film. Its function is to do some isolation when high pulse voltage or current flows in the electrode.(it burns in the weakest area -->short time isolation).But when this happens, the burning will last to other metal layers--->the capacitor D value is higher---> failure.**

But the good thing is the capacitor will not explode. Other side effect is switch power on PFC circuit do not provide stable 400VDC voltage--->Mos FET on PFC circuit will burn out.

Actually, you can not use membrane capacitance on this circuit, because it can not endure continuous impact of high frequency and high voltage current, it can use in the short term pulse electric current circuit. (It is not suitable for using in high frequency and high voltage current circuit.

A. Why Metallized film capacitor on market still burns out and explosion: most this kind of device can endure high frequency voltage & current within (10V;10mA),when a high continuous high frequency voltage and current pass through, the electrode on the device will damage a part. The phenomenon is : D value high--->heat-->D:more high-->heat-->and so on ,finally the device burns out.

B. JACKCON also produce "10uF400V;0.47uF1KV"high frequency high voltage capacitor using in induction cooker. The 0.47uF1KVcapacitor parallel connection with induction coil--->produce harmonic vibration--->large morganatic field --->the cooker will be heated by Eddy current. If this kind of capacitor is made by membrane type, when the power of cooker turns on, you can find the cooker output power from100w-->0 w .(this means the cooker can not work).

Good PFC capacitor will not generate heat and it can endure high frequency current impact without D value changing; heating ; burning out. The life of capacitor is better than other part on circuit such as : chemical capacitor(100uF/400V or 150uF/400V); MOS FET SK diode.

Temperature endurance problem: (Metallized Polypropylene Film Capacitors max endurance temp. is above 105°C)

C. Someone may mistake if the chemical capacitor can not endure high temp so it will burn out or explosion: We can realize the PFC circuit problem from some part: if we have a chemical capacitor (permissible voltage 450VDC ; quantity 100uF or 150uF). The device will break out the temp. is around 100°C . Meanwhile the MOS FET, SK parts on circuit is not workable.

D. Why burn out or explosion in high temp. : The reason is as A.

Max endurance voltage problem: (The voltage of PFC Metallized Polypropylene Film Capacitors is around 450~500VDC)

E. We can think of input circuit of PFC: The input voltage is

90vac~240VAC--->bridge rectifier, then attach to the electrode of PFC capacitor. The max DC voltage is less 300 VDC. So PFC capacitor will not burn out due to voltage issue.

1. **The reason of explosion issue: The capacitor is composed by 500~600 layers of metalized film. If the electrode can not endure high current impact, it will discharge --->some spark on plastic film--->burnout or explosion.**
2. **The electrode intensity is like resistor for example: if you need 10W resistor but only use 0.5w, the circuit is easily burnout.**
3. **You must have special tech or process then you can get high reliable and high intensity capacitor.**

F. Current 2 material can make the capacitor

4. **The material is cheap and its process is easy, but low characteristic, the D value is not stable (D value : high) generally its value is $\sim 0.7\%$.**
 - **The loss angle of material is high, it can not increase switching power transfer rate and reduce the noise and stability.**
5. **The material is expensive and process is complicate. But it (D value) is stable according to temp. (D value is around $<0.06\%$)**

* **D simple to say: it represent "when a current pass a capacitor, the current has some loss. if low D means low loss and the current is more stable)**

although Metallized Polypropylene film has low D, but if use the device on PFC circuit (high voltage /current under high frequency), to have a stable D value, you must have additional tech and process to produce high Double Duty capacitor..

- **Theoretically: There is no smoothing capacitors on PFC circuit. But PFC IC need DC working voltage, so it need smoothing capacitors. This device also process the (20KHz~50 KHz) high frequency noise to power source circuit. It can reduce switch power noise and increase transferring rate. If the capacitance value is high --->low PF value. So the recommend capacitance value is at 0.76~0.85uF. When switch power is in low loading mode the PF will high and stable.**
- **Currently, the capacitance is around (0.8~0.86uF), if you want (0.9~1.1uf) we also can provide.**
- **JACKCON has life intensity test machine: if you test 1 time it equals on/off switch power 150 times, the test results is as following:**

1. Taiwan , china, Japan maker --->test 60 times-->D value up-->capacity low-->electric characteristic bad.

2. JACKCON--->test 60000 times-->D value :no change--->capacity no change.

- **If you have any demands please feedback us, we can provide samples for your testing and we can have a discussion.**