

# Medium Power Film Capacitors



## FRC (RoHS Compliant)



### PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F2 = in accordance with NF F 16-101).

### STANDARDS

- IEC 61071-1, IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E

High capacity DC-Link Capacitor consists of wound metallized Polypropylene film, cylindrical plastic casing sealed with thermosetting resin. This capacitor is suitable for use in DC filter circuits, Solar Inverter, Industrial Inverter.

### APPLICATIONS

- Power supplies.
- UPS System.
- Power converters.
- Solar Inverter.

### HOT SPOT CALCULATION

See Hot Spot Temperature, page 2.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{\text{th}}$$

with  $P_d$  (Dielectric losses) =  $Q \times \text{tg}\delta_0$   
 $Q \times \text{tg}\delta_0 \Rightarrow [ \frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f ] \times \text{tg}\delta_0$   
 $\text{tg}\delta_0$  (tan delta)  
For polypropylene,  $\text{tg}\delta_0 = 2 \times 10^{-4}$  for frequencies up to 1MHz and is independent of temperatures.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where  $C_n$  in Farad     $I_{\text{rms}}$  in Ampere     $f$  in Hertz  
 $V$  in Volt     $R_s$  in Ohm     $\theta$  in °C  
 $R_{\text{th}}$  in °C/W

### WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to +105°C

### LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 5% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 5% decrease.

### HOW TO ORDER

**FRC**



Series

**A**



Case Size

**6**



Dielectric  
6 = Polypropylene

**K**



Voltage Code

- J = 500V
- I = 400V
- Q = 600V
- A = 700V
- B = 800V
- C = 900V
- K = 1000V
- P = 1200V
- L = 1500V

**0475**



Cap EIA Code  
0475 = 4.7µF

**K**



Tolerances  
J = ±5%  
K = ±10%

**4**



Lead Type  
4 = 4 Leads

**L**



Lead Length  
L = 8mm  
C = 4 mm



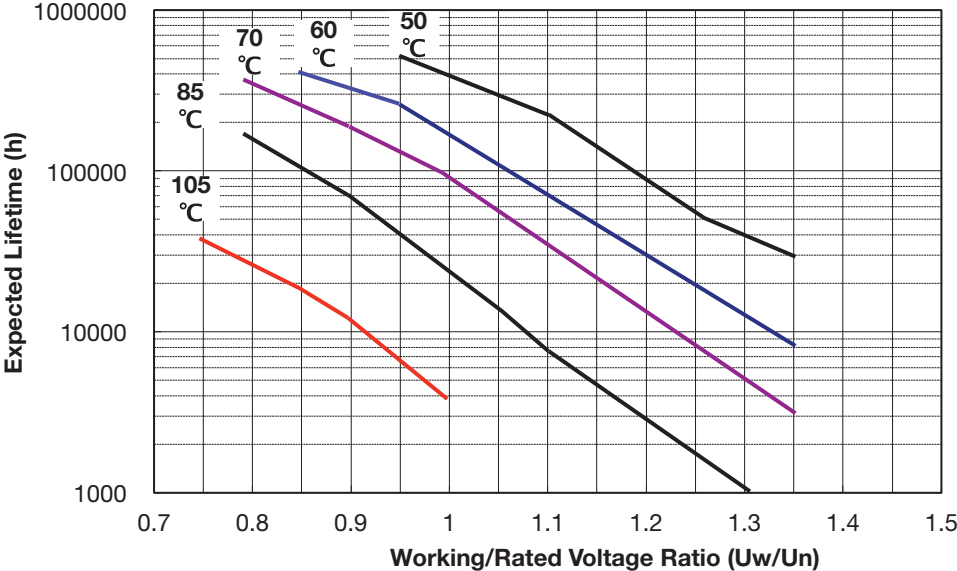
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FRC (RoHS Compliant)



## LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE

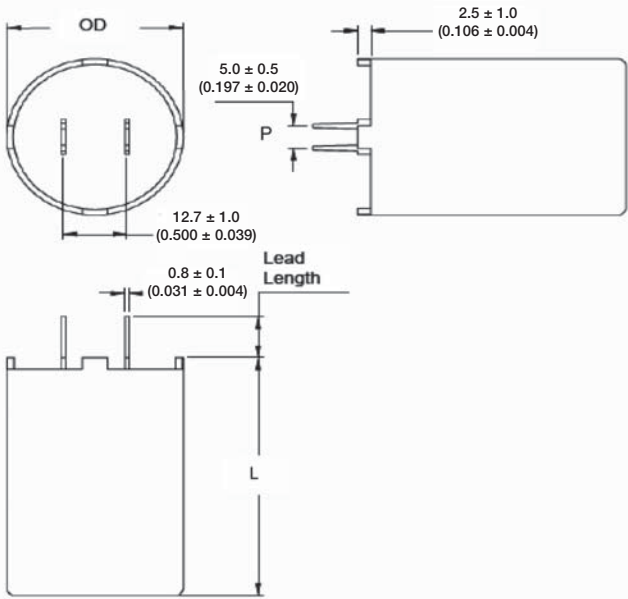
Expected Lifetime Curves (FRC Series)



### DIMENSIONS: millimeters (inches)

AVX Case Ref	L	OD	P1
A	54 (2.126)	36 (1.417)	5.1 (0.201)

### GENERAL DESCRIPTION



# Medium Power Film Capacitors



## FRC (RoHS Compliant)

### POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed principally for high and medium power DC filtering applications.

### ELECTRICAL CHARACTERISTICS

Climatic category	40/100/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V <sub>n</sub> dc
Capacitance range C <sub>n</sub>	4.7µF to 35µF
Capacitance Tolerances:	±5%, ±10%
Rated DC voltage V <sub>n</sub> dc	400V to 1500 V
Dielectric:	Polypropylene
Insulation Resistance:	>3,000 MΩ.µF/C after 1 minute electrification @ 100 Vdc & 25°C
Lifetime (ΔC/C < 5%):	100,000hrs @ U <sub>r</sub> & 70°C

### RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (µF)	Rated Voltage (V)	AVX Part No.	OD ±2 (mm)	L ±2 (mm)	I rms (A)	R <sub>s</sub> (mΩ)	V/µs (Volt/sec)	I Peak (A)	ESL (nH)	R <sub>th</sub> (°C/W)	Packaging Method	
<b>V<sub>n</sub>dc = 400-1500V Voltage Code: A, B, C, J, I, K, L, P, Q</b>											<b>Qty</b>	<b>Box Dimension (mm)</b>
4.7	1500	FRCA6L0475K4L	36.0	54	13.0	17.0	70.0	329.0	40.0	5.2	20	350*170*80
7.5	1200	FRCA6P0755K4L	36.0	54	14.0	15.0	60.0	450.0	40.0	5.1	20	350*170*80
10.0	1000	FRCA6K0106K4L	36.0	54	15.5	14.0	50.0	500.0	40.0	4.5	20	350*170*80
13.5	900	FRCA6C1355K4L	36.0	54	16.0	13.0	40.0	540.0	40.0	4.5	20	350*170*80
15.0	800	FRCA6B0156K4L	36.0	54	16.5	12.0	40.0	600.0	40.0	4.6	20	350*170*80
20.0	700	FRCA6A0206K4L	36.0	54	17.0	12.0	35.0	700.0	40.0	4.3	20	350*170*80
30.0	400	FRCA6I0306K4L	36.0	54	22.0	8.0	30.0	900.0	40.0	3.9	20	350*170*80
30.0	600	FRCA6Q0306K4L	36.0	54	18.5	11.0	30.0	900.0	40.0	4.0	20	350*170*80
35.0	500	FRCA6J0356K4L	36.0	54	20.0	10.0	25.0	875.0	40.0	3.8	20	350*170*80

\* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.  
 Values outside this standard range may be available – please contact AVX for any special requirements.  
 AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.