

# Medium Power Film Capacitors



## FFVE/FFVI (FFWE/FFWI RoHS Compliant)

DC FILTERING



**Not RoHS Compliant**



Please select correct termination style.

### GENERAL DESCRIPTION

The FFV capacitor is specifically designed for DC filtering, low reactive power.

The series uses a non-impregnated metallized polypropylene or polyester dielectric, which features a controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

The FFV special design gives this series a very low level of stray inductance (18 nH to 40 nH).

Furthermore, the performance levels of the FFVE capacitor makes them a very interesting alternative to electrolytic technology, because they can withstand much higher levels of surge voltage, very high rms current ratings, and longer lifetimes.

### PACKAGING MATERIAL

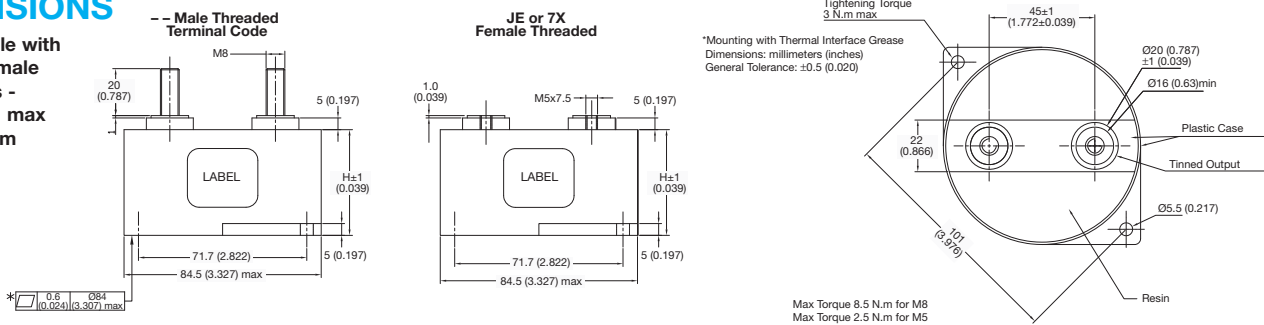
Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F1 = in accordance with NF F 16-101).

FFVE capacitors meet the Level 2 requirement of the fire behavior standard NF F 16-102.

### DIMENSIONS

Also available with threaded female connections - M5 x 7.5mm max Torque 2.5Nm



### HOW TO ORDER

<b>FFVE</b>	<b>4</b>	<b>H</b>	<b>0187</b>	<b>K</b>	<b>--</b>
<b>Series</b>	<b>Dielectric</b>	<b>Voltage Code</b>	<b>Capacitance Code</b>	<b>Capacitance Tolerances</b>	<b>Terminal Code</b>
FFVE = Standard FFVI = Standard FFWE = RoHS Compliant FFWI = RoHS Compliant	4 = Polyester 6 = Polypropylene	H = 300V I = 400V J = 500V K = 600V A = 700V B = 800V C = 900V	L = 1000V (FFVE/FFWE) L = 1100V (FFVI/FFWI) U = 1200V N = 1900V	0 + pF code 0187 = 180µF 0356 = 35µF etc.	K = ±10%  -- or J7 = Male Threaded JE or 7X = Female Threaded
See Ratings and Part Reference Tables for details					

### HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

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

with  $P_d$  (Dielectric losses) =  $Q \times tg\delta_0$   
 $Q \times tg\delta_0 \Rightarrow [ \frac{1}{2} \times C_n \times (V_{peak\ to\ peak})^2 \times f ] \times tg\delta_0$   
 $tg\delta_0$  (tan delta)  
 For polypropylene,  $tg\delta_0 = 2 \times 10^{-4}$  for frequencies up to 1MHz and is independent of temperatures. For polyester,  $tg\delta_0$  values are shown in graph 4 on page 3.

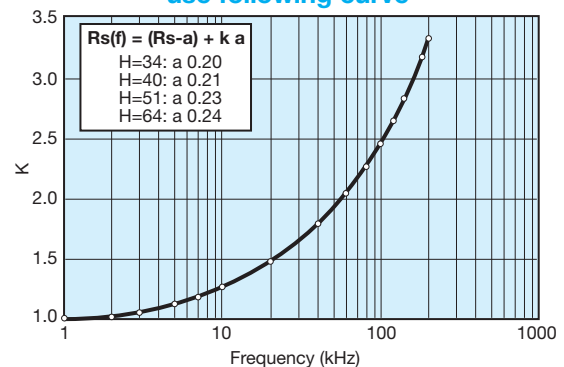
$$P_t \text{ (Thermal losses)} = R_s \times (I_{rms})^2$$

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

$\theta_{case}$  = bottom center of case

### Rs(f) vs FREQUENCY

For frequency higher than 1 kHz use following curve



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### ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYESTER DIELECTRIC

Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	100µF to 400µF
Capacitance tolerance	±10%
Rated DC voltage	300 to 400 V
Test voltage between terminals @ 25°C	1.5 x V <sub>n</sub> dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polyester

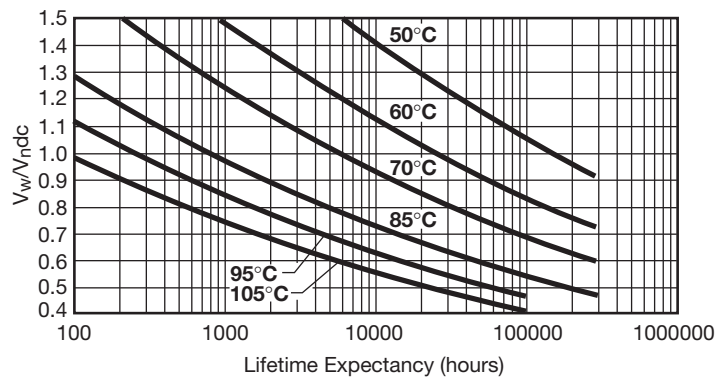
### RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
<b>V<sub>n</sub>dc 300 volts (Voltage Code H)</b>							
FFVE4H0187K--	180	34 (1.339)	100	18	0.8	4.7	300
FFVE4H1956K--	195	34 (1.339)	100	18	0.8	4.4	300
FFVE4H0257K--	250	40 (1.575)	100	25	0.6	5.2	350
FFVE4H0357K--	350	51 (2.008)	100	32	0.8	7.2	420
FFVE4H0407K--	400	51 (2.008)	110	32	0.8	7.1	420
<b>V<sub>n</sub>dc 400 volts (Voltage Code I)</b>							
FFVE4I0107K--	100	34 (1.339)	80	18	0.7	4.7	300
FFVE4I0127K--	120	34 (1.339)	100	18	0.6	4.1	300
FFVE4I0157K--	150	40 (1.575)	100	25	0.7	5.0	350
FFVE4I0187K--	180	51 (2.008)	80	32	1.0	8.5	420
FFVE4I0227K--	220	51 (2.008)	100	32	0.9	7.2	420

\*Change "--" to "JE" for female connectors M5 x 7.5mm

Dimensions millimeters (inches)

### LIFETIME EXPECTANCY FFVE POLYESTER



V<sub>w</sub>: permanent working or operating DC voltage.



# Medium Power Film Capacitors



## FFVE/FFVI (FFWE/FFWI RoHS Compliant)

DC FILTERING

### ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYPROPYLENE DIELECTRIC

Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	12µF to 220µF
Capacitance tolerance	±10%
Rated DC voltage	600 to 1900 V
Test voltage between terminals @ 25°C	1.5 x V <sub>n</sub> dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

### RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

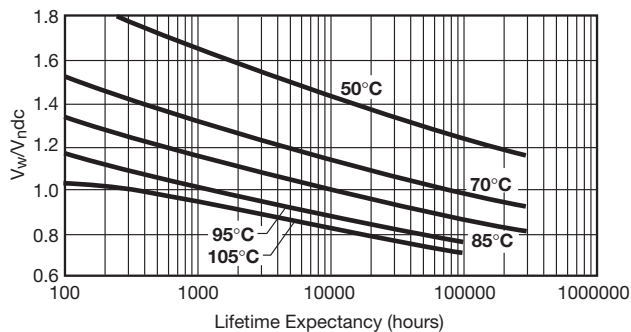
Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
<b>V<sub>n</sub>dc 600 volts (Voltage Code K)</b>							
FFVE6K0256K--	25	34 (1.339)	90	18	0.7	4.3	300
FFVE6K0107K--	100	40 (1.575)	100	25	0.6	4.8	350
FFVE6K0157K--	150	51 (2.008)	110	32	0.9	6.9	420
FFVE6K0227K--	220	64 (2.520)	100	40	1.0	8.4	500
<b>V<sub>n</sub>dc 800 volts (Voltage Code B)</b>							
FFVE6B0666K--	66	40 (1.575)	100	25	0.7	4.7	350
FFVE6B0107K--	100	51 (2.008)	90	32	1.0	6.7	420
FFVE6B0147K--	140	64 (2.520)	100	40	1.3	8.4	500
<b>V<sub>n</sub>dc 900 volts (Voltage Code C)</b>							
FFVE6C0126K--	12	34 (1.339)	70	18	0.9	4.4	300
FFVE6C0386K--	38	34 (1.339)	100	18	1.6	3.9	300
FFVE6C0476K--	47	40 (1.575)	100	25	0.8	4.6	350
FFVE6C0706K--	70	51 (2.008)	100	32	1.2	6.7	420
FFVE6C0107K--	100	64 (2.520)	90	40	1.1	8.2	500
<b>V<sub>n</sub>dc 1000 volts (Voltage Code L)</b>							
FFVE6L0666KJ7	66	40 (1.575)	70	25	1.5	5.1	350
FFVE6L0107KJ7	100	51 (2.008)	64	32	2.0	7.3	420
FFVE6L0147KJ7	140	64 (2.520)	51	40	2.5	9.2	500
<b>V<sub>n</sub>dc 1200 volts (Voltage Code U)</b>							
FFVE6U0476KJ7	47	40 (1.575)	66	25	1.7	4.9	350
FFVE6U0706KJ7	70	51 (2.008)	59	32	2.4	7.2	420
FFVE6U0107KJ7	100	64 (2.520)	49	40	2.9	8.9	500
<b>V<sub>n</sub>dc 1900 volts (Voltage Code N)</b>							
FFVE6N0156KJ7	15	40 (1.575)	73	25	1.1	5.2	350
FFVE6N0246KJ7	24	51 (2.008)	73	32	1.3	6.5	420
FFVE6N0356KJ7	35	64 (2.520)	67	40	1.6	8.4	500

\*Change "--" to "JE" for female connectors M5 x 7.5mm  
 \*Change "J7" to "7X" for female connectors M5 x 7.5mm

Dimensions millimeters (inches)

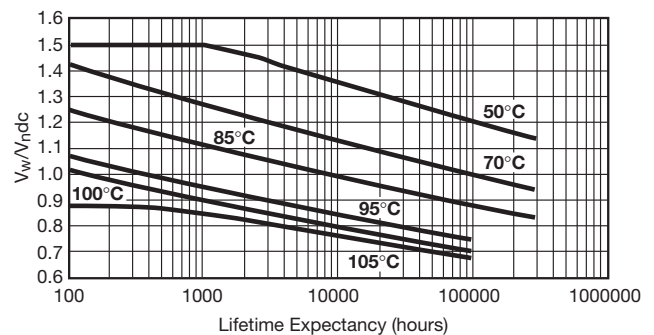
### LIFETIME EXPECTANCY FOR FFVE POLYPROPYLENE

-- and JE



V<sub>w</sub>: permanent working or operating DC-voltage.

J7 and 7X



V<sub>w</sub>: permanent working or operating DC-voltage.



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### ELECTRICAL CHARACTERISTICS – FFVI/FFWI POLYPROPYLENE DIELECTRIC

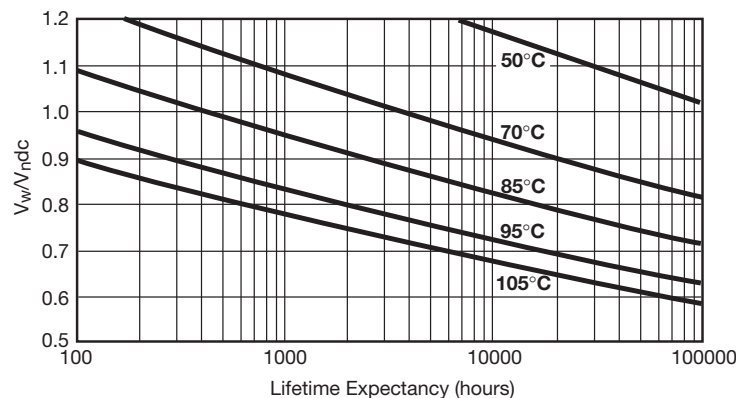
Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	47µF to 275µF
Capacitance tolerance	±10%
Rated DC voltage	500 to 1100V
Test voltage between terminals @ 25°C	1.25 x $V_{Ndc}$ 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

### RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
<b><math>V_{Ndc}</math> 500 volts (Voltage Code J)</b>							
FFVI6J1256K--	125	40 (1.575)	90	25	0.6	5.0	350
FFVI6J0207K--	200	51 (2.008)	90	32	0.8	6.7	420
FFVI6J2756K--	275	64 (2.520)	90	40	0.9	8.7	500
<b><math>V_{Ndc}</math> 700 volts (Voltage Code A)</b>							
FFVI6A0107K--	100	40 (1.575)	100	25	0.6	4.8	350
FFVI6A0157K--	150	51 (2.008)	100	32	0.9	6.9	420
FFVI6A0227K--	220	64 (2.520)	100	40	1.0	8.4	500
<b><math>V_{Ndc}</math> 900 volts (Voltage Code C)</b>							
FFVI6C0666K--	66	40 (1.575)	100	25	0.7	4.7	350
FFVI6C0107K--	100	51 (2.008)	90	32	1.0	6.7	420
FFVI6C0147K--	140	64 (2.520)	100	40	1.3	8.4	500
<b><math>V_{Ndc}</math> 1100 volts (Voltage Code L)</b>							
FFVI6L0476K--	47	40 (1.575)	100	25	0.8	4.6	350
FFVI6L0706K--	70	51 (2.008)	100	32	1.2	6.7	420
FFVI6L0107K--	100	64 (2.520)	90	40	1.1	8.2	500

Dimensions millimeters (inches)

### LIFETIME EXPECTANCY FOR FFVI



$V_w$ : permanent working or operating DC-voltage.

