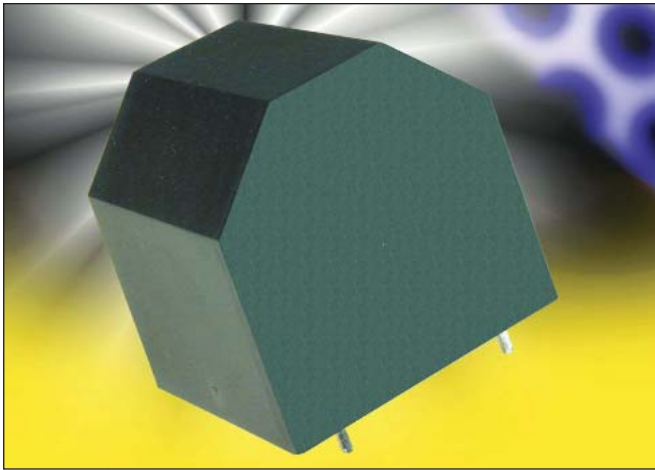


Medium Power Film Capacitors



FFV3 (RoHS Compliant)

DC FILTERING



APPLICATIONS

The FFV3 capacitors are particularly designed for DC filtering, low reactive power.

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
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
- IEC 60384-2: Fixed metallized polyester capacitors

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. Unlike aluminum, electrolytics film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2%, with no risk of short circuit.

Please note that this is theoretical, however, as the capacitor continues to be functional even after this 2% decrease.

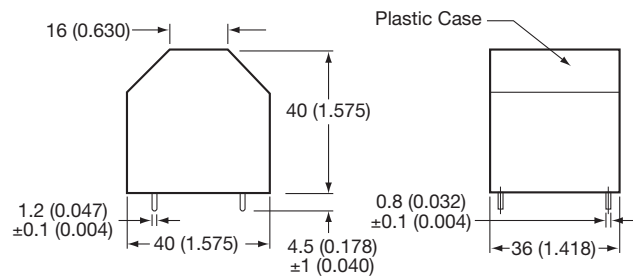
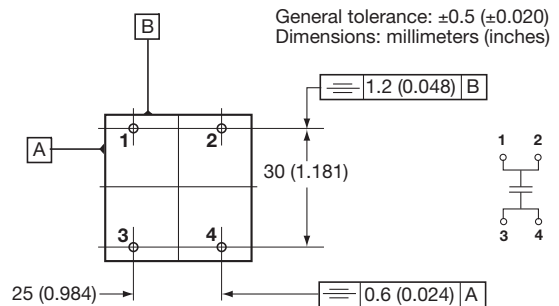
PACKAGING MATERIAL

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).

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

The FFV3 has been designed for printed circuit board mounting.



HOT SPOT CALCULATION

See *Hot Spot Temperature*, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times (R_{\text{th}} + 7.4)$$

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

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$

$$\Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$$

$\text{tg}\delta_0$ (tan delta)

For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

For polyester, $\text{tg}\delta_0$ values are shown in graph 4 on page 3.

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

where

C_n in Farad

V in Volt

R_{th} in °C/W

I_{rms} in Ampere

R_s in Ohm

R_{th} : R_{th} case/hot spot in °C/W

f in Hertz

θ in °C

Medium Power Film Capacitors



FFV3 (RoHS Compliant) for Low Voltage Applications

HOW TO ORDER

FFV3

Series

4

Dielectric

4 = Polyester
6 = Polypropylene

D

Voltage Code

D = 75Vdc J = 500Vdc
E = 100Vdc A = 700Vdc
F = 160Vdc C = 900Vdc
H = 300Vdc L = 1100Vdc
I = 400Vdc

K

Capacitance Tolerances

K = $\pm 10\%$

--

Lead Styles

-- = Standard

Consult Factory
for Special
Options

ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

Climatic category 40/105/56 (IEC 60068)

Test voltage between terminals @ 25°C 1.5 x V_{Ndc} during 10s

Test voltage between terminals and case @ 25°C “ @ 4 kVrms @ 50 Hz during 1 min.

Capacitance range C_n 30 μ F to 160 μ F

Tolerance on C_n $\pm 10\%$

Rated DC voltage V_{Ndc} 75 to 400 V

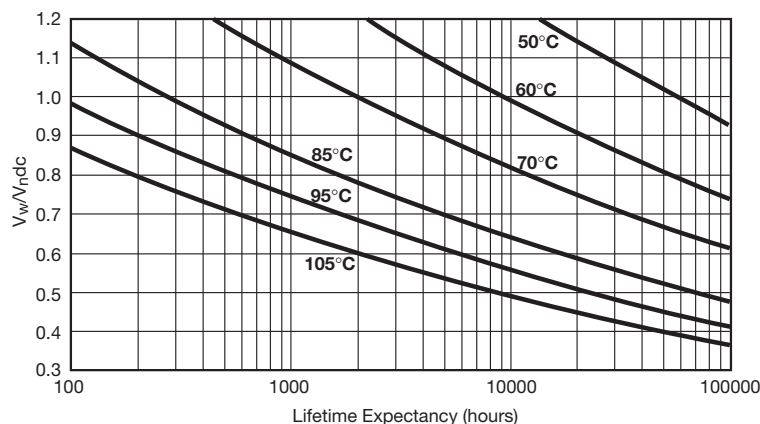
Dielectric polyester

Max Stray Inductance 15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (μ F)	I_{rms} max. (A)	(I_{2t}) _{10 shots} (A ² s)	(I_{2t}) _{1000 shots} (A ² s)	R_s (m Ω)	R_{th} (°C/W)	Typical Weight (g)
$V_{Ndc} = 75$ V $V_{rms} = 45$ v max Voltage Code: D							
FFV34D0137K--	130	23	370	37	0.56	5.60	90
FFV34D0167K--	160	28	560	56	0.47	5.00	90
$V_{Ndc} = 100$ V $V_{rms} = 60$ v max Voltage Code: E							
FFV34E0806K--	80	19	250	25	0.67	6.16	90
FFV34E0107K--	100	24	390	39	0.55	5.42	90
$V_{Ndc} = 160$ V $V_{rms} = 75$ v max Voltage Code: F							
FFV34F0556K--	55	17	180	18	0.77	6.56	90
FFV34F0656K--	65	20	260	26	0.66	5.97	90
$V_{Ndc} = 300$ V $V_{rms} = 90$ v max Voltage Code: H							
FFV34H0406K--	40	20	150	15	2.80	9.58	90
FFV34H0506K--	50	26	230	23	2.25	8.46	90
$V_{Ndc} = 400$ V $V_{rms} = 105$ v max Voltage Code: I							
FFV34I0306K--	30	17	110	11	2.93	9.92	90
FFV34I0406K--	40	23	200	20	2.21	8.41	90

LIFETIME EXPECTANCY vs V_w/V_N AND HOT SPOT TEMPERATURE POLYESTER DIELECTRIC



V_w = Permanent working or operating DC voltage.



Medium Power Film Capacitors



FFV3 (RoHS Compliant) DC for Medium and High Voltage Applications

DC FILTERING

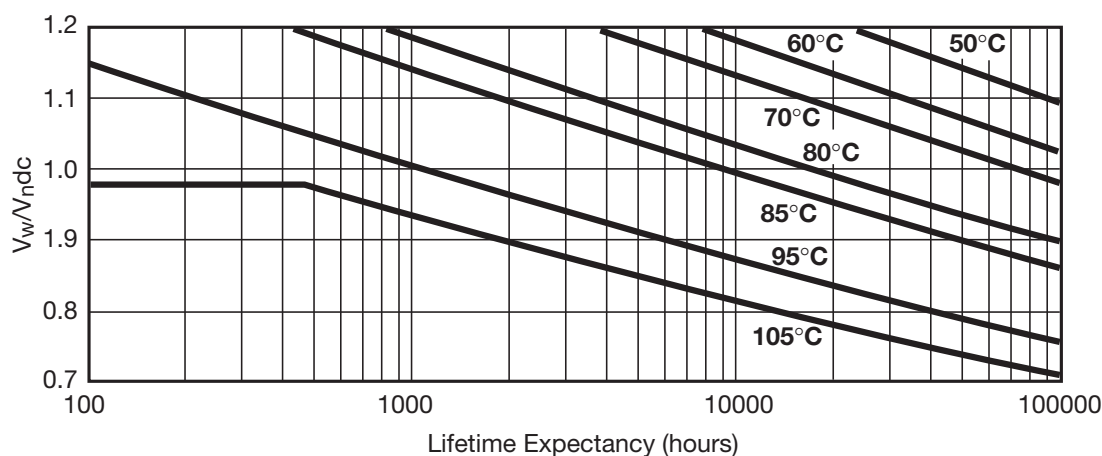
ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V_{ndc} during 10s
Test voltage between terminals and case @ 25°C “	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	6 μ F to 25 μ F
Tolerance on C_n	$\pm 10\%$
Rated DC voltage V_{ndc}	500 to 1100 V
Dielectric	polypropylene
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (μ F)	I_{rms} max. (A)	(I_{2t}) _{10 shots} (A ² s)	(I_{2t}) _{1000 shots} (A ² s)	R_s (m Ω)	R_{th} (°C/W)	Typical Weight (g)
$V_{ndc} = 500$ V $V_{rms} = 105$ v max Voltage Code: J							
FFV36J0206K--	20	27	3200	320	5.88	3.53	90
FFV36J0256K--	25	33	5000	500	4.72	3.14	90
$V_{ndc} = 700$ V $V_{rms} = 120$ v max Voltage Code: A							
FFV36A0146K--	14	21	2000	200	7.34	3.73	90
FFV36A0206K--	20	30	4200	420	5.15	3.05	90
$V_{ndc} = 900$ V $V_{rms} = 150$ v max Voltage Code: C							
FFV36C0106K--	10	19	1600	160	8.21	3.37	90
FFV36C0136K--	13	25	2800	280	6.33	2.91	90
$V_{ndc} = 1100$ V $V_{rms} = 180$ v max Voltage Code: L							
FFV36L0605K--	6	13	800	80	11.4	3.71	90
FFV36L0905K--	9	20	1900	190	7.61	2.92	90

LIFETIME EXPECTANCY vs V_w/V_n AND HOT SPOT TEMPERATURE POLYPROPYLENE DIELECTRIC



V_w = Permanent working or operating DC voltage.