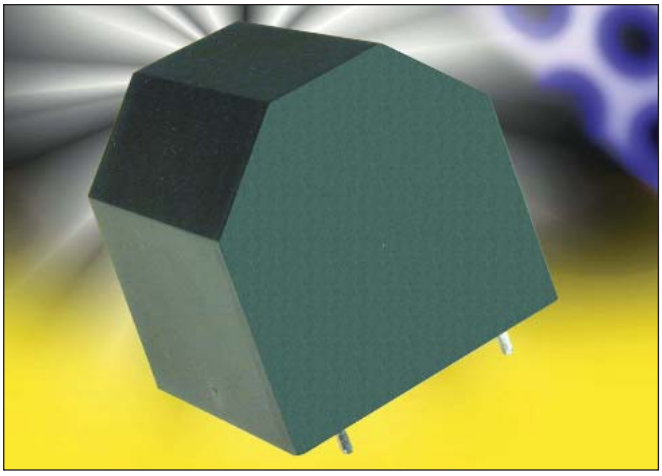
Medium Power Film Capacitors

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.

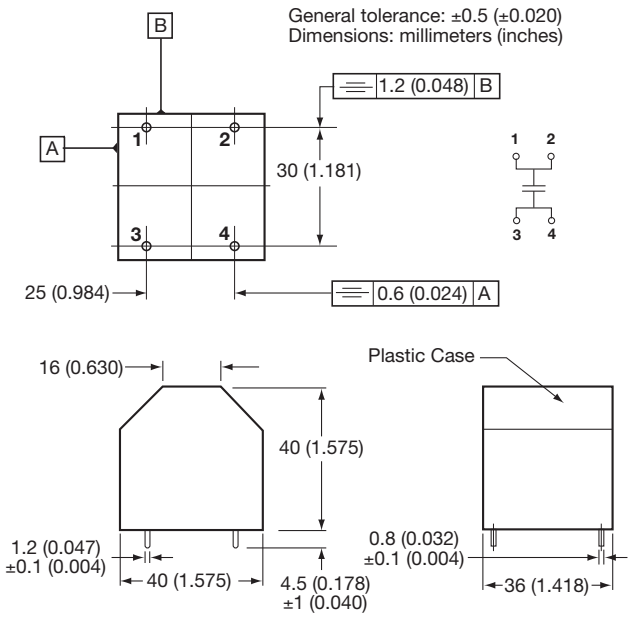
PACKAGING MATERIAL

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.

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

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

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

$\Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times tg\delta_0$

$tg\delta_0$ (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 (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, θ in °C
R_{th} in °C/W, R_{th} : R_{th} case/hot spot in °C/W

Medium Power Film Capacitors

FFV3 (RoHS Compliant) for Low Voltage Applications

HOW TO ORDER

FFV3	4	D	K	– –
Series	**Dielectric** 4 = Polyester 6 = Polypropylene	**Voltage Code** D = 75Vdc E = 100Vdc F = 160Vdc H = 300Vdc I = 400Vdc J = 500Vdc A = 700Vdc C = 900Vdc L = 1100Vdc	**Capacitance Tolerances** K = ±10%	**Lead Styles** – – = Standard **Consult Factory for Special Options**

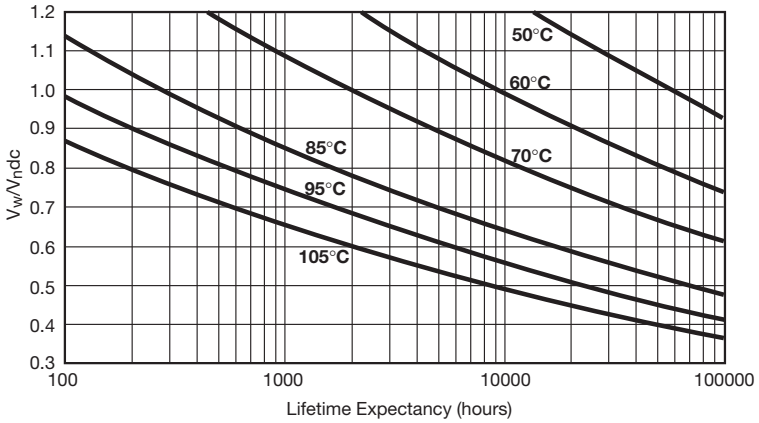
ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_n$dc during 10s
Test voltage between terminals and case @ 25°C “	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	30µF to 160µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	75 to 400 V
Dielectric	polyester
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	$I_{rms\ max.}$ (A)	$(I^2t)_{10\ shots}$ (A^2s)	$(I^2t)_{1000\ shots}$ (A^2s)	R_s (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc = 75 V Vrms = 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
$V_n$dc = 100 V Vrms = 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
$V_n$dc = 160 V Vrms = 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
$V_n$dc = 300 V Vrms = 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
$V_n$dc = 400 V Vrms = 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



Vw = Permanent working or operating DC voltage.

Medium Power Film Capacitors

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

DC FILTERING

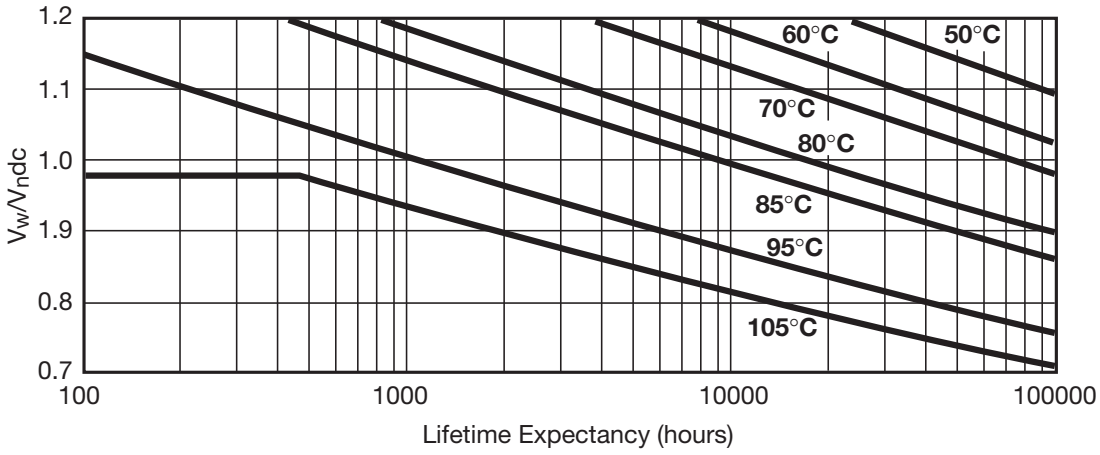
ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

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

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	$I_{rms\ max.}$ (A)	$(I^2t)_{10\ shots}$ (A^2s)	$(I^2t)_{1000\ shots}$ (A^2s)	R_s (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc = 500 V Vrms = 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
$V_n$dc = 700 V Vrms = 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
$V_n$dc = 900 V Vrms = 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
$V_n$dc = 1100 V Vrms = 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



Vw = Permanent working or operating DC voltage.