

Medium Power Film Capacitors



FE (RoHS Compliant)

DC FILTERING



The FE series uses a non-impregnated metallized polypropylene dielectric specially treated to have a very high dielectric strength in operating conditions up to 100°C.

The FE has been designed for printed circuit board mounting. FE series performance characteristics make them a viable alternative to aluminum electrolytic technology due to much lower ESR and much higher surge voltage capability (dv/dt).

APPLICATIONS

The FE capacitor is particularly designed for DC filtering, low reactive power.

HOT SPOT CALCULATION

See *Hot Spot Temperature*, page 3.

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

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

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

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

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

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

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

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
- 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

OPERATING TEMPERATURE RANGE

Operating temperature range: -40°C to +100°C

LIFETIME EXPECTANCY

One unique feature of this technology (versus 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 2% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 2% decrease.



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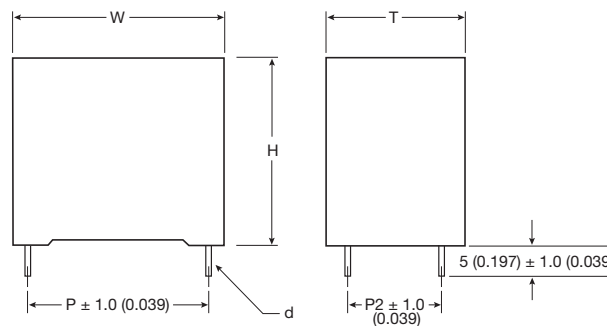
HOW TO ORDER

FE T	27 T	G T	6 T	K T	0685 T	K T	A T
Series FE	Pitch 27 = 27.5 (1.083) 37 = 37.5 (1.476) 52 = 52.5 (2.067)	Case G L H M J N K P	Dielectric 6 = Polypropylene	Voltage J = 550V A = 700V B = 800V C = 900V K = 1000V L = 1100V P = 1200V	Cap µF Code	Tolerance J = ±5% K = ±10% M = ±20%	Pitch P2 A = 10.2 (0.402) B = 20.3 (0.799)



DC FILTERING

DIMENSIONS: millimeters (inches)



millimeters (inches)

Case Size	W	H	T	P	P2	d
G	32.0 (1.260)	37.0 (1.457)	22.0 (0.866)	27.5 (1.083)	10.2 (0.402)	0.80 (0.031)
H	42.5 (1.673)	33.5 (1.319)	22.0 (0.866)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)
J	42.5 (1.673)	37.0 (1.457)	28.0 (1.102)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)
K	42.5 (1.673)	40.0 (1.575)	20.0 (0.787)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)
L	42.5 (1.673)	44.0 (1.732)	24.0 (0.945)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)
M	42.5 (1.673)	45.0 (1.771)	30.0 (1.181)	37.5 (1.476)	20.3 (0.799)	1.20 (0.047)
N	57.5 (2.264)	45.0 (1.771)	30.0 (1.181)	52.5 (2.067)	20.3 (0.799)	1.20 (0.047)
P	57.5 (2.264)	50.0 (1.969)	35.0 (1.378)	52.5 (2.067)	20.3 (0.799)	1.20 (0.047)

POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

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

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Climatic category	40/100/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V _n dc
Capacitance range C _n	3.3µF to 75µF
Tolerance on C _n	±5%, ±10%, ±20%
Rated DC voltage V _n dc	550V to 1200V
Dielectric	Polypropylene
Insulation Resistance:	>3,000 MΩ.µF/C after 1 minute electrification @ 100 Vdc & 25°C
Lifetime (ΔC/C ≤ 5%):	100,000hrs @ Ur & 70°C



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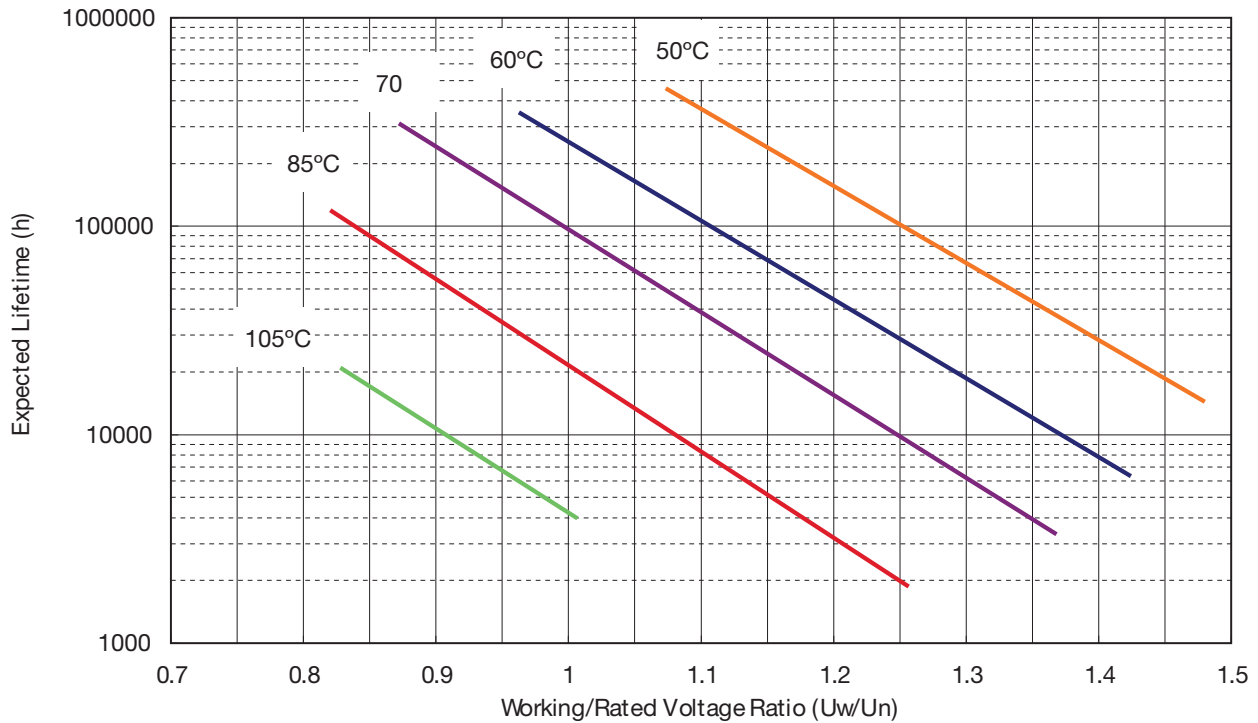
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DC FILTERING

Cap (μ F)	Rated Voltage (V)	AVX Part Number	Case Size	W ± 0.50 (0.020)	H ± 0.50 (0.020)	T ± 0.50 (0.020)	P ± 1.00 (0.039)	P2 ± 1.00 (0.039)	d ± 0.05 (0.002)	dv/dt Volt/usec	I peak Amps	I rms Amps	ESR mOhms	Ls nH	Rth $^{\circ}$ C/W	Packaging Qty.
Voltage V _{dc} 1200V Voltage Code: P																
3.3	1200	FE27G6P0335*A	G	32.0 (1.260)	37.0 (1.457)	22.0 (0.866)	27.5 (1.083)	10.2 (0.402)	0.80 (0.031)	80.0	264.0	8.2	12.5	27.0	17.8	80
4.0	1200	FE27G6P0405*A	G	32.0 (1.260)	37.0 (1.457)	22.0 (0.866)	27.5 (1.083)	10.2 (0.402)	0.80 (0.031)	80.0	320.0	9.0	10.5	27.0	17.6	80
4.7	1200	FE37H6P0475*A	H	42.5 (1.673)	33.5 (1.319)	22.0 (0.866)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)	55.0	258.5	7.3	19.5	30.0	14.4	49
5.0	1200	FE37H6P0505*A	H	42.5 (1.673)	33.5 (1.319)	22.0 (0.866)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)	55.0	275.0	7.5	16.5	30.0	16.2	49
6.8	1200	FE37L6P0685*A	L	42.5 (1.673)	44.0 (1.732)	24.0 (0.945)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)	55.0	374.0	9.0	14.0	30.0	13.2	42
7.5	1200	FE37J6P0755*A	J	42.5 (1.673)	37.0 (1.457)	28.0 (1.102)	37.5 (1.476)	10.2 (0.402)	1.20 (0.047)	55.0	412.5	9.8	11.0	30.0	14.2	35
10	1200	FE37M6P0106*B	M	42.5 (1.673)	45.0 (1.772)	30.0 (1.181)	37.5 (1.476)	20.3 (0.799)	1.20 (0.047)	55.0	550.0	12.0	8.0	35.0	13.0	44
12	1200	FE52N6P0126*B	N	57.5 (2.264)	45.0 (1.772)	30.0 (1.181)	52.5 (2.067)	20.3 (0.799)	1.20 (0.047)	35.0	420.0	10.0	13.5	35.0	11.1	25
15	1200	FE52N6P0156*B	N	57.5 (2.264)	45.0 (1.772)	30.0 (1.181)	52.5 (2.067)	20.3 (0.799)	1.20 (0.047)	35.0	525.0	11.0	10.5	35.0	11.8	25
20	1200	FE52P6P0206*B	P	57.5 (2.264)	50.0 (1.969)	35.0 (1.378)	52.5 (2.067)	20.3 (0.799)	1.20 (0.047)	35.0	700.0	14.0	8.0	35.0	9.6	20

Dimensions in millimeters (inches)
 * 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.

TYPICAL LIFETIME* CHARACTERISTICS



*Lifetime is the number of operating hours required for the capacitor to lose 3% of its initial value.

