

# WIMA FKP 1

High-reliability capacitors

## Polypropylene capacitors for pulse applications with metal foil electrodes, internally series-connected for very high current ratings

- For extremely high pulse ratings because of metal foil electrodes and metal sprayed end-surface contacts.
- Self-healing – internal structure see illustration page 55.
- Extremely low dissipation factor ( $\tan \delta$ ) and ESR.
- High insulation resistance.
- Low dielectric absorption.
- Preferred applications: Damping and commutation capacitors in switch mode power supplies, static frequency changes in drive and power electronics, deflection systems in monitors and TV-sets.
- Close tolerances.
- Available taped and reeled up to and including case size 15 x 26 x 31.5/PCM 27.5.

### Technical Data

**Dielectric:** Polypropylene film.

**Capacitor electrodes:** Aluminium foil and double-sided metallized plastic film.

**Encapsulation:** Flame-retardent plastic case, UL 94 V-O, with epoxy resin seal. Colour: Blue. Marking: Black.

**Temperature range:** -55° C to +100° C.

**Test category:** 55/100/56 in accordance with IEC.

**Insulation resistance at +20° C:**

$C \leq 0.1 \mu\text{F}$ :  $\geq 1 \times 10^5$  megohms

(mean value:  $5 \times 10^5$  megohms)

$C > 0.1 \mu\text{F}$ :  $\geq 10\,000$  sec (megohms  $\times \mu\text{F}$ )

(mean value: 100 000 sec)

Measuring voltage: 100 V/1 min.

**Dissipation factors at +20° C:**  $\tan \delta$

$\alpha f$	$C \leq 0.1 \mu\text{F}$	$0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$
1 kHz	$\leq 3 \times 10^{-4}$	$\leq 3 \times 10^{-4}$
10 kHz	$\leq 4 \times 10^{-4}$	$\leq 6 \times 10^{-4}$
100 kHz	$\leq 10 \times 10^{-4}$	-

**Capacitance tolerances:**  $\pm 20\%$ ,  $\pm 10\%$ ,  $\pm 5\%$

(closer tolerances are available subject to special enquiry).

**Temperature characteristics:** See graph page 8.

### Maximum pulse rise time:

Capacitance $\mu\text{F}/\mu\text{F}$	Pulse rise time $V/\mu\text{sec}$ max. operation					
	400 VDC	630 VDC	1000 VDC	1250 VDC	1600 VDC	2000 VDC
100 ... 220	-	-	-	-	18000	18000
330 ... 680	-	-	-	-	15000	16000
1000 ... 2200	-	-	-	13200	11000	15000
3300 ... 6800	-	5500	10000	11200	9000	13000
0.01 ... 0.022	2700	3300	5500	7700	6000	8500
0.033 ... 0.068	1900	2200	4200	4900	3900	5000
0.1 ... 0.22	1200	1500	2200	3100	3500	-

**Test voltage:**  $2 V_r$ , 2 sec.

**Vibration:** 6 hours at 10 ... 2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 68-2-6.

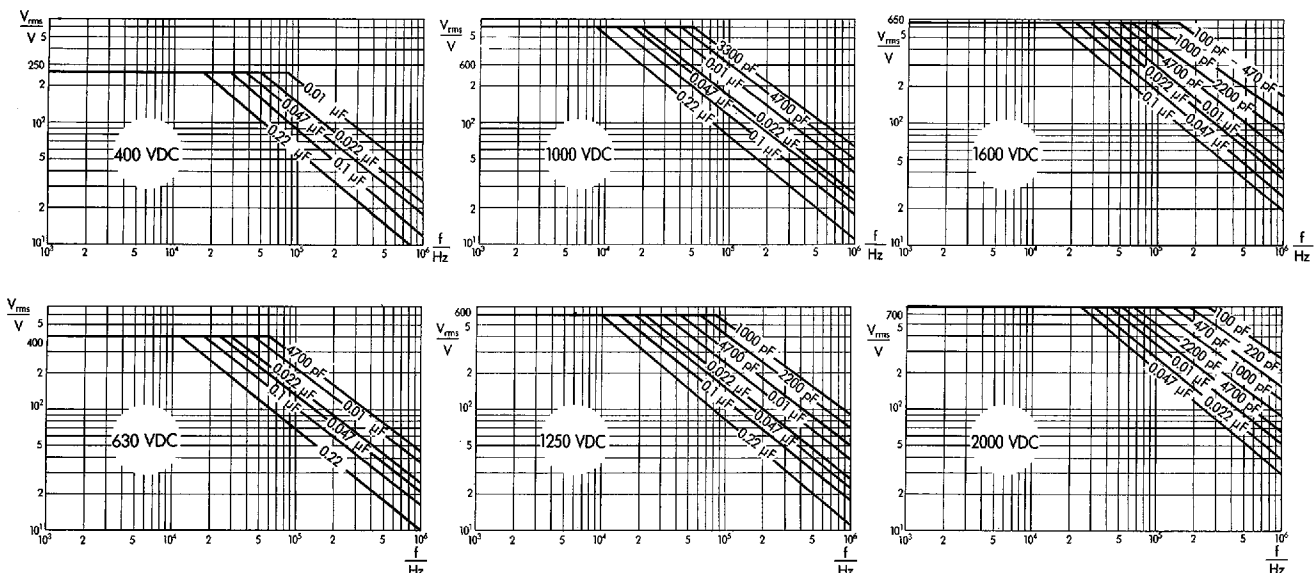
**Low air density:** 1 kPa = 10 mbar in accordance with IEC 68-2-13.

**Bump test:** 4000 bumps at 390 m/sec<sup>2</sup> in accordance with IEC 68-2-29.

**Voltage derating:** A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.

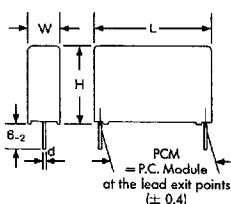
Graphs see page 8.

Permissible AC voltages in relation to frequency at 10° C internal temperature rise (general guide):



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## General Data

Capacitance	400 VDC / 250 VAC*				630 VDC / 400 VAC*				1000 VDC / 600 VAC*				* AC voltage: $f \leq 1000 \text{ Hz}$ ; $1.4 \times V_{\text{rms}} + \text{VDC}$ $\leq \text{VDC (rated)}$ ** PCM = Printed circuit module = lead spacing
	W	H	L	PCM**	W	H	L	PCM**	W	H	L	PCM**	
3300 pF									5	11	18	15	Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.  Other values available subject to special enquiry.  * On ordering please state the required PCM (lead spacing).  If not specified, smaller PCM will be booked.
4700 "					5	11	18	15	6	12.5	18	15	
6800 "					6	12.5	18	15	7	14	18	15	
0.01 $\mu\text{F}$	5	11	18	15	7	14	18	15*	8	15	18	15*	Taped version see page 71.  Rights reserved to amend design data without prior notification.
0.015 "	6	12.5	18	15	5	14	26.5	22.5*	6	15	26.5	22.5*	
0.022 "	7	14	18	15*	6	15	26.5	22.5*	6	15	26.5	22.5	
0.033 "	5	14	26.5	22.5*	7	16.5	26.5	22.5	8.5	18.5	26.5	22.5	
	8	15	18	15*	8.5	18.5	26.5	22.5	10.5	20.5	26.5	22.5*	
0.047 "	6	15	26.5	22.5*	9	19	31.5	27.5*	9	19	31.5	27.5*	
	7	16.5	26.5	22.5	10.5	20.5	26.5	22.5*	11	21	31.5	27.5	
0.068 "	8.5	18.5	26.5	22.5	9	19	31.5	27.5*	11	21	31.5	27.5	
					11	21	31.5	27.5*	13	24	31.5	27.5*	
0.1 $\mu\text{F}$	10.5	20.5	26.5	22.5*	9	19	41.5	37.5*	11	22	41.5	37.5*	
	9	19	31.5	27.5*	13	24	31.5	27.5*	13	24	41.5	37.5	
0.15 "	11	21	31.5	27.5	11	22	41.5	37.5*	15	26	41.5	37.5	
0.22 "	13	24	31.5	27.5	13	24	41.5	37.5	15	26	41.5	37.5	
					15	26	41.5	37.5	19	32	41.5	37.5	
Capacitance	1250 VDC / 600 VAC*				1600 VDC / 650 VAC*				2000 VDC / 700 VAC*				
	W	H	L	PCM**	W	H	L	PCM**	W	H	L	PCM**	
100 pF					5	11	18	15	5	11	18	15	 <p><math>d = 0.8 \varnothing</math> if PCM 15 ... 27.5 <math>d = 1.0 \varnothing</math> if PCM 37.5</p>
150 "					5	11	18	15	5	11	18	15	
220 "					5	11	18	15	5	11	18	15	
330 "					5	11	18	15	6	12.5	18	15	
470 "					5	11	18	15	6	12.5	18	15	
680 "					5	11	18	15	6	12.5	18	15	
1000 pF	5	11	18	15	6	12.5	18	15*	7	14	18	15*	
1500 "	5	11	18	15	5	14	26.5	22.5*	5	14	26.5	22.5*	
2200 "	5	11	18	15	7	14	18	15*	6	15	26.5	22.5	
3300 "	5	11	18	15	5	14	26.5	22.5*	7	16.5	26.5	22.5	
	6	12.5	18	15	6	15	26.5	22.5	7	16.5	26.5	22.5	
4700 "	7	14	18	15	7	16.5	26.5	22.5	8.5	18.5	26.5	22.5	
6800 "	8	15	18	15*	8.5	18.5	26.5	22.5	10.5	20.5	26.5	22.5	
	5	14	26.5	22.5*									
0.01 $\mu\text{F}$	7	16.5	26.5	22.5	10.5	20.5	26.5	22.5	11	21	31.5	27.5	
0.015 "	8.5	18.5	26.5	22.5	11	21	31.5	27.5	13	24	31.5	27.5	
0.022 "	10.5	20.5	26.5	22.5	11	21	31.5	27.5	15	26	31.5	27.5*	
0.033 "					13	24	31.5	27.5*	13	24	41.5	37.5*	
	11	21	31.5	27.5*	13	24	31.5	27.5*	13	24	41.5	37.5	
0.047 "	9	19	41.5	37.5*	13	24	41.5	37.5*	13	24	41.5	37.5	
	13	24	31.5	27.5	13	24	41.5	37.5	17	29	41.5	37.5	
0.068 "	11	22	41.5	37.5	15	26	41.5	37.5					
0.1 $\mu\text{F}$	15	26	41.5	37.5	17	29	41.5	37.5					
0.15 "	17	29	41.5	37.5									
0.22 "	19	32	41.5	37.5									