

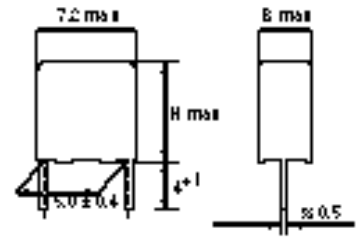
# PFR

## Typical applications

High speed applications requiring low losses at high frequencies and high dU/dt. Typical applications: electrical ballasts, TV/video, telecommunications.

## Construction

Capacitor with polypropylene film and metal foil electrodes. Radial leads of tinned wire are electrically welded to the winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



## General data

### Technical data in accordance with

IEC 384-13

### Capacitance and rated voltage

Capacitance measured at  $f=1\text{kHz}$ ,  $T=20^\circ\text{C}$ .  
 For  $C = 1000\text{ pF}$ ,  $f = 100\text{ kHz}$ .  
 DC test voltage =  $2 \times U_R$  for 2s.

100 ... 22 000 pF	63VDC/40VAC
100 ... 10 000 pF	100VDC/63VAC
100 ... 1 000 pF	250VDC/160VAC
100 ... 1 500 pF	400VDC/220VAC
100 ... 4 700 pF	630VDC/250VAC
100 ... 680 pF	1000VDC/250VAC

### Capacitance tolerance

$\pm 10\%$ ,  $\pm 5\%$ ,  $\pm 2.5\%$ ,  $\pm 2\%$ ,  $\pm 1\%$ .

### Temperature range

$-55 \dots +100^\circ\text{C}$   
 An operating temperature up to  $+105^\circ\text{C}$  is allowed under certain conditions. For details consult the manufacturer.

### Climatic category

IEC 68-1, 55/100/56  
 DIN 40040, FMD

### Capacitance drift

Max. 0.3% after a 2 year storage period at a temperature of  $+10^\circ \dots +40^\circ\text{C}$  and a relative humidity of 40 ... 60%.

## Environmental test data

<b>Damp heat test</b>	Test conditions:	$T = +40^\circ\text{C}$ , $\text{RH} = 93\%$ , $t = 56$ days.
	Test criteria:	$C/C \pm 1\%$ , $\tan \delta 1.4 \times$ value before test, (1kHz and 100 kHz) $\text{IR after test } 250\,000\text{ M}\Omega$
<b>Endurance test</b>	Test conditions:	$T = +85^\circ\text{C}$ , $U = 1.5 \times U_R$ , $t = 1000$ h and $T = +100^\circ\text{C}$ , $U = 1.25 \times U_C$ , $t = 1000$ h.
	Test criteria:	$C/C \pm 1\%$ , $\tan \delta 1.4 \times$ value before test, (1kHz and 100 kHz) $\text{IR after test } 250\,000\text{ M}\Omega$

## Marking

Capacitance, tolerance, rated voltage, and the code PFR5 are marked on the capacitors.

## Electrical characteristics

**Temperature coefficient** -200 (+50, -100) ppm/°C (at 1 kHz)

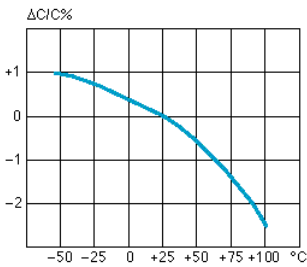
**Self inductance** Approximately 6 nH/cm for the total length of capacitor winding and leads.

**Dissipation factor tan** Maximum values at +23°C

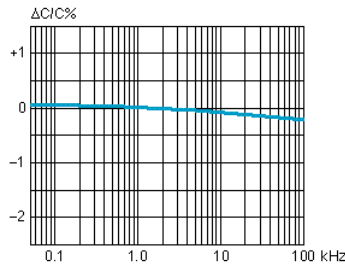
	C < 1000 pF	1000 pF < C < 4700 pF	C > 4700 pF
1 kHz	0.04%	0.04%	0.04%
10 kHz	0.04%	0.05%	0.07%
100 kHz	0.05%	0.07%	

**Insulation resistance** Measured at +20°C, according to IEC 384-13.  
Minimum value between terminals: 500 000 M

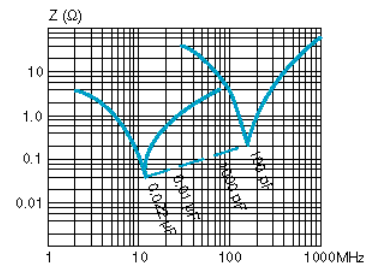
## Typical values of important parameters



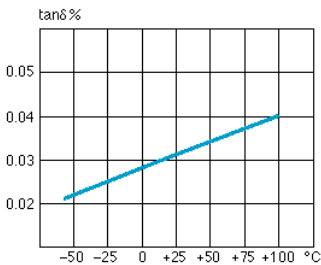
Capacitance vs. temperature (at 1 kHz)



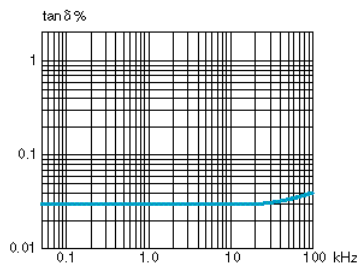
Capacitance vs. frequency (at +23°C)



Resonance frequencies



Dissipation factor vs. temperature (at 1 kHz)



Dissipation factor vs. frequency (at +23°C)

Article table PFR

C <sub>R</sub> μF	Max dimensions in mm				Quantity per package				Max dU/dt V/μs	Article code
	B	H	L	p	Bulk	Tray	Reel	Ammo		
<b>63 VDC / 40 VAC</b>										
0.00010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J63L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J63L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J63L4 BULK
0.00033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 331J63L4 BULK
0.00047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 471J63L4 BULK
0.00068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 681J63L4 BULK
0.0010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 102J63L4 BULK
0.0015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 152J63L4 BULK
0.0022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 222J63L4 BULK
0.0033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 332J63L4 BULK
0.0047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 472J63L4 BULK
0.0068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 682J63L4 BULK
0.010	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 103J63L4 BULK
0.015	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 153J63L4 BULK
0.020	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 203J63L4 BULK
0.022	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 223J63L4 BULK
<b>100 VDC/ 63 VAC</b>										
0.00010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J100L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J100L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J100L4 BULK
0.00033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 331J100L4 BULK
0.00047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 471J100L4 BULK
0.00068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 681J100L4 BULK
0.001	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 102J100L4 BULK
0.0015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 152J100L4 BULK
0.0022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 222J100L4 BULK
0.0033	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 332J100L4 BULK
0.0047	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 472J100L4 BULK
0.0068	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 682J100L4 BULK
0.010	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 103J100L4 BULK
<b>250 VDC/ 160 VAC</b>										
0.00010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J250L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J250L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J250L4 BULK
0.00033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 331J250L4 BULK
0.00047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 471J250L4 BULK
0.00068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 681J250L4 BULK
0.0010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 102J250L4 BULK
<b>400 VDC/ 220 VAC</b>										
0.00010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J400L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J400L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J400L4 BULK
0.00033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 331J400L4 BULK
0.00047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 471J400L4 BULK
0.00068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 681J400L4 BULK
0.0010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 102J400L4 BULK
0.0015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 152J400L4 BULK

## Article table PFR

C <sub>R</sub> μF	Max dimensions in mm				Quantity per package				Max dU/dt V/μs	Article code
	B	H	L	p	Bulk	Tray	Reel	Ammo		
<b>630 VDC/ 250 VAC</b>										
0.0001	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J630L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J630L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J630L4 BULK
0.00033	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 331J630L4 BULK
0.00047	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 471J630L4 BULK
0.00068	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 681J630L4 BULK
0.0010	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 102J630L4 BULK
0.0015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 152J630L4 BULK
0.0022	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 222J630L4 BULK
0.0033	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 332J630L4 BULK
0.0047	6.5	8.0	7.2	5.0	1000		900	1100	1000	PFR5 472J630L4 BULK
<b>1000 VDC/ 250 VAC</b>										
0.0001	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 101J1000L4 BULK
0.00015	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 151J1000L4 BULK
0.00022	4.5	6.0	7.2	5.0	1000		1500	1700	1000	PFR5 221J1000L4 BULK
0.00033	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 331J1000L4 BULK
0.00047	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 471J1000L4 BULK
0.00068	5.5	7.0	7.2	5.0	1000		1200	1300	1000	PFR5 681J1000L4 BULK