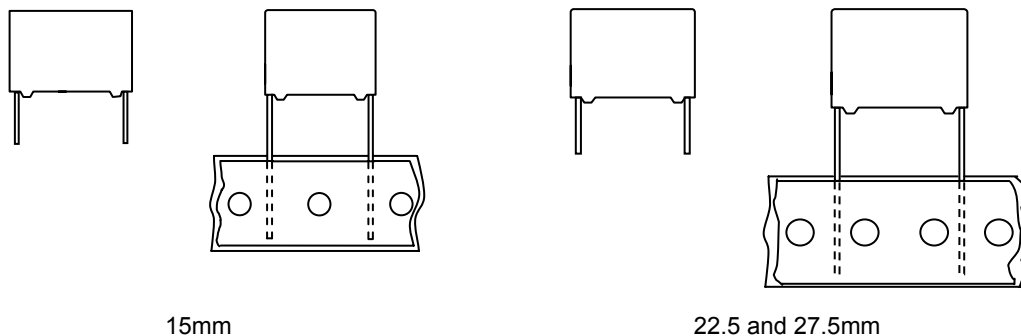


**MKP RADIAL POTTED CAPACITORS**

Pitch 15.0/22.5/27.5mm



**QUICK REFERENCE DATA**

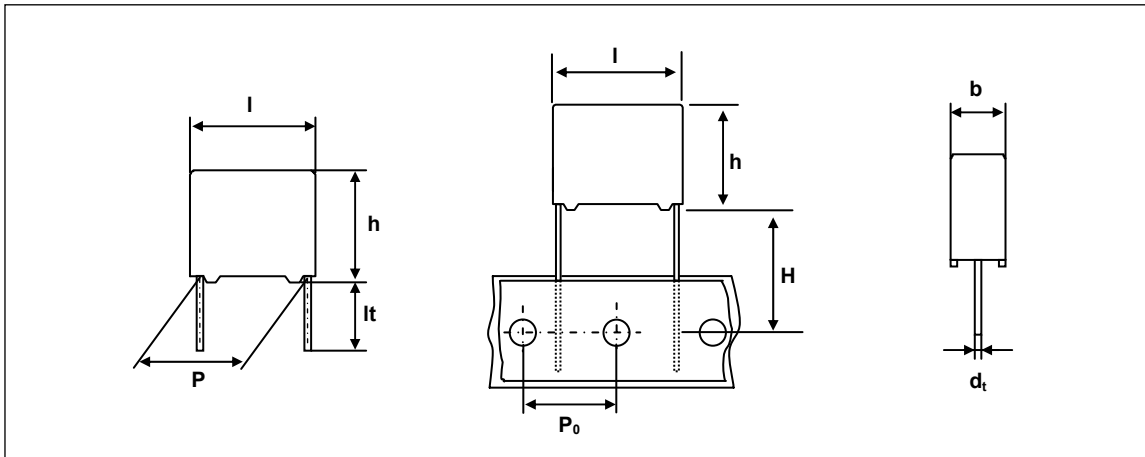
Capacitance range (E6 series) *	0.01 $\mu$ F to 1.0 $\mu$ F
Capacitance tolerance	$\pm$ 10 %, $\pm$ 20 %
Rated (AC) voltage 50 to 60 Hz	440 V $\sim$
Climatic category	55/105/21
Temperature range	-55 $^{\circ}$ C ~ +105 $^{\circ}$ C
Reference IEC specification	IEC 60384-14(3rd edition) and EN 60384-14
Safety approvals	UL60384-14 & CSA E60384-14:09(cUL) ENEC (SEMKO)
Potting & Encapsulation material	Qualified in accordance with UL 94V-0
Safety class	X1

\* Intermediate values of the E12 series are available to special order

<b>FEATURES</b>	<b>APPLICATIONS</b>
<ul style="list-style-type: none"> <li>. 15 to 27.5 mm lead pitch</li> <li>. Supplied loose in box and taped on reel</li> <li>. Consist of a low-inductive wound cell of Metallized Polypropylene film, potted in a flame retardant case</li> </ul>	<ul style="list-style-type: none"> <li>. For X1-electromagnetic interference suppression</li> <li>. Specially designed to meet the <b>NEW REQUIREMENTS</b> in new IEC 60384-14 specification(3rd edition)/EN 60384-14/UL60384-14 requiring for X1 a 4kV peak pulse voltage test</li> <li>. Not for use in series with the mains</li> </ul>

• Please refer to caution and warning at <http://www.pilkor.co.kr/download/Introductions.pdf> before using these products.

**Ordering Information**



**PCX1 331 X X X X X**

Type series

Capacitance

Code	Voltage
4	440Vac

Code	Original pitch
F	15.0mm
J	22.5mm
L	27.5mm

Available versions					Product (I <sub>max</sub> )			
code	Packing method	C – tol.	Lead length & Height	Hole to hole ( P <sub>0</sub> )	12.5	18.0	26.0	31.0
					Pitch (P)			
0	Loose in box	±20%	lt = 5.0 ± 1.0mm	-	10.0	15.0	22.5	27.5
1	Loose in box	±10%	lt = 5.0 ± 1.0mm	-	10.0	15.0	22.5	27.5
4	Loose in box	±20%	lt = 25.0 ± 2.0mm	-	10.0	15.0	22.5	27.5
5	Loose in box	±10%	lt = 25.0 ± 2.0mm	-	10.0	15.0	22.5	27.5
6	Ammopack	±20%	H = 18.5mm	12.7mm	10.0	15.0	22.5	27.5
7	Ammopack	±10%	H = 18.5mm	12.7mm	10.0	15.0	22.5	27.5

\*\* Some values is not following the coding rule.

**EMI Suppression  
film capacitors****PCX1 331****SAFETY APPROVALS**

<b>SAFETY APPROVALS</b>	<b>Voltage</b>	<b>Value</b>	<b>File Number</b>
UL 60384-14 & CSA E60384-14:09(cUL)	440V(AC)	10nF to 1uF	E165646
ENEC(SEMKO)*	440V(AC)	10nF to 1uF	SE/02566

\* The ENEC-approval together with the CB-Certificate replace all national approval marks of the following countries(they have already signed the ENEC-Agreement): Austria; Belgium; Czech Republic; Denmark; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Norway; Portugal; Slovenian; Spain; Sweden; Switzerland and United Kingdom

**Packaging Information**

<b>SMALLEST PACKING QUANTITIES (SPQ)</b>	<b>LOOSE IN BOX</b>	
<b>DIMENSIONS</b>	<b>It = 5.0 ± 1.0 mm</b>	<b>It = 25 ± 2.0 mm</b>
5.0 x 11.0 x 18.0	1000	1000
6.0 x 12.0 x 18.0	1000	1000
7.0 x 13.5 x 18.0	1000	1000
8.5 x 15.0 x 18.0	1000	1000
10.0 x 16.5 x 18.0	1000	1000
6.0 x 15.5 x 26.0	1000	1000
7.0 x 16.5 x 26.0	1000	1000
8.5 x 18.0 x 26.0	500	500
10.0 x 19.5 x 26.0	500	500
12.0 x 22.0 x 26.0	500	500
11.0 x 21.0 x 31.0	500	250
13.0 x 23.0 x 31.0	250	250
15.0 x 25.0 x 31.0	250	250
18.0 x 28.0 x 31.0	200	200
21.0 x 31.0 x 31.0	150	150

# EMI Suppression film capacitors

PCX1 331

## SPECIFIC REFERENCE DATA FOR 275 V<sub>AC</sub>

Tangent of loss angle	at 1 kHz	at 10 kHz	at 100kHz
C ≤ 470 nF	≤ 10 x 10 <sup>-4</sup>	≤ 20 x 10 <sup>-4</sup>	≤ 100 x 10 <sup>-4</sup>
C > 470 nF	≤ 20 x 10 <sup>-4</sup>	≤ 70 x 10 <sup>-4</sup>	-
Rated voltage pulse slope (dV/dt) <sub>R</sub> P = 15.0 mm P = 22.5 mm P = 27.5 mm	250 V/us 150 V/us 100 V/us		
R between leads, for C ≤ 0.33 μF at 100V 1min	> 15 000 MΩ		
RC between leads, for C > 0.33 μF at 100V 1min	> 5000 s		
R between leads and case ; 100V 1min	> 30 000 MΩ		
Withstanding(DC) Voltage (cut-off current 10mA)	3400 V ; 1 min		
Withstanding(AC) Voltage between leads and case	2400 V ; 1 min		

V<sub>Rac</sub> = 440V~ X1

Cap. (μF)	b x h x l (mm)	MASS (g)	CATALOGUE NUMBER				
			PCX1 331 .....				
			loose in box				
			lt = 5.0 ± 1.0 mm		lt = 25.0 ± 2.0 mm		
C - tol ± 20 %		C - tol ± 10 %		C - tol ± 20 %		C - tol ± 10 %	
Pitch = 15.0 ± 0.4 mm			d <sub>t</sub> = 0.8+0.08/-0.05 mm				
0.01	5.0 x 11.0 x 18.0	1.2	F40103	F41103	F44103	F45103	
0.015			F40153	F41153	F44153	F45153	
0.022			F40223	F41223	F44223	F45223	
0.033	6.0 x 12.0 x 18.0	1.4	F40333	F41333	F44333	F45333	
0.047	7.0 x 13.5 x 18.0	1.9	F40473	F41473	F44473	F45473	
0.068	8.5 x 15.0 x 18.0	2.6	F40683	F41683	F44683	F45683	
0.1	10.0 x 16.5 x 18.0	3.1	F40104	F41104	F44104	F45104	
Pitch = 22.5 ± 0.4 mm			d <sub>t</sub> = 0.8+0.08/-0.05 mm				
0.068	6.0 x 15.5 x 26.0	2.6	J40683	J41683	J44683	J45683	
0.1	7.0 x 16.5 x 26.0	3.1	J40104	J41104	J44104	J45104	
0.15	8.5 x 18.0 x 26.0	4.4	J40154	J41154	J44154	J45154	
0.22	10.0 x 19.5 x 26.0	5.5	J40224	J41224	J44224	J45224	
0.33	12.0 x 22.0 x 26.0	6.7	J40334	J41334	J44334	J45334	
Pitch = 27.5 ± 0.4 mm			d <sub>t</sub> = 0.8+0.08/-0.05 mm				
0.22	11.0 x 21.0 x 31.0	7.8	L40224	L41224	L44224	L45224	
0.33	13.0 x 23.0 x 31.0	10.4	L40334	L41334	L44334	L45334	
0.47	15.0 x 25.0 x 31.0	12.8	L40474	L41474	L44474	L45474	
0.68	18.0 x 28.0 x 31.0	17.2	L40684	L41684	L44684	L45684	
1.0	21.0 x 31.0 x 31.0	20.4	L40105	L41105	L44105	L45105	
Original pitch	New Code	Old Code	Example				
15.0mm	PCX1 331F4xxxx	PCX1 331 4xxxx	PCX1 331 45104 => PCX1 331F45104				
22.5mm	PCX1 331J4xxxx	PCX1 331 5xxxx					
27.5mm	PCX1 331L4xxxx	PCX1 331 6xxxx					

## MOUNTING

### NORMAL USE

The capacitors are designed for mounting on printed-circuit boards.

The capacitors packed in bandoliers are designed for mounting on printed-circuit boards by means of automatic insertion machines.

For detailed specifications refer to chapter "PACKAGING".

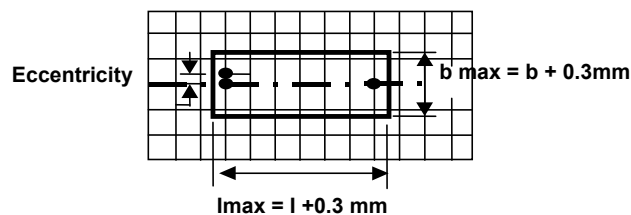
### SPECIFIC METHOD OF MOUNTING TO WITHSTAND VIBRATION AND SHOCK

In order to withstand vibration and shock tests, it must be ensured that the stand-off pins are in good contact with the printed-circuit board.

- For pitches of 15mm the capacitors shall be mechanically fixed by leads.
- For larger pitches the capacitors shall be mounted in the same way and the body clamped.

## SPACE REQUIREMENTS ON PRINTED-CIRCUIT BOARD

The maximum length and width of film capacitors are shown in the following drawing ;

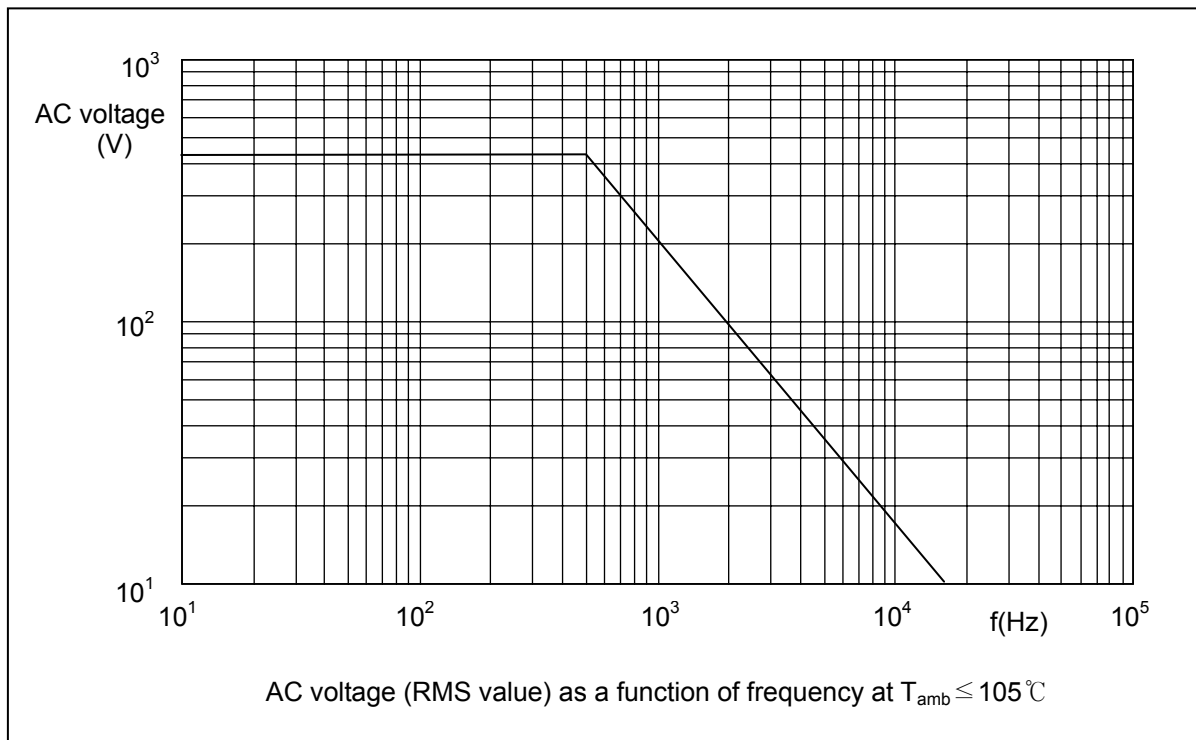


- Eccentricity as in drawing.  
The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned.
- Product height with seating plane as given by IEC 60717 as reference :  $h_{max} \leq h + 0.3 \text{ mm}$

**RATINGS AND CHARACTERISTICS**

Unless otherwise specified all electrical values apply to an ambient temperature of  $23 \pm 1^\circ\text{C}$ , an atmospheric pressure of 86 to 106kPa and a relative humidity  $50 \pm 2\%$ .

For reference testing, a conditioning period shall be applied of  $96 \pm 4$  hours by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20%.

**Maximum RMS Voltage as a function of frequency**

**PRODUCT MARKING**

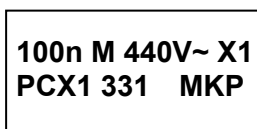
Capacitors are marked with the following information;

- 1.Manufacturer (PILKOR) for capacitors
- 2.Manufacturer's type designation (PCX1 331)
- 3.Rated capacitance in code according to IEC 60062
- 4.Rated (AC) voltage (440V~)
- 5.Sub class (X1)
- 6.Tolerance on rated capacitance M = ± 20 % K = ± 10 %
- 7.Climatic category (55/105/21)
- 8.Code for dielectric material (MKP) for capacitors with original pitch
- 9.Year and week of manufacturing (1401)
- 10.Safety approvals

**Example of marking**

Pitch P = 15mm or 22.5mm or 27.5mm

Head face



Side face



Pitch P = 22.5mm or 27.5mm

Head face



Pitch P = 27.5mm

Head face

