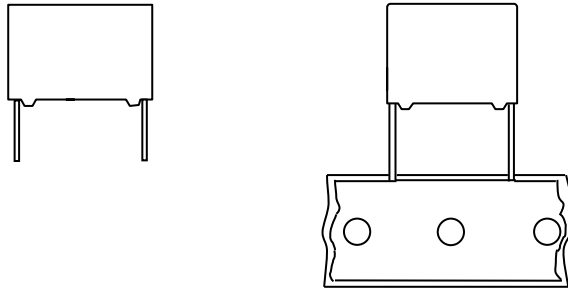


MKP RADIAL POTTED CAPACITORS

Pitch 10.0/15.0/22.5/27.5 mm



**QUICK REFERENCE DATA**

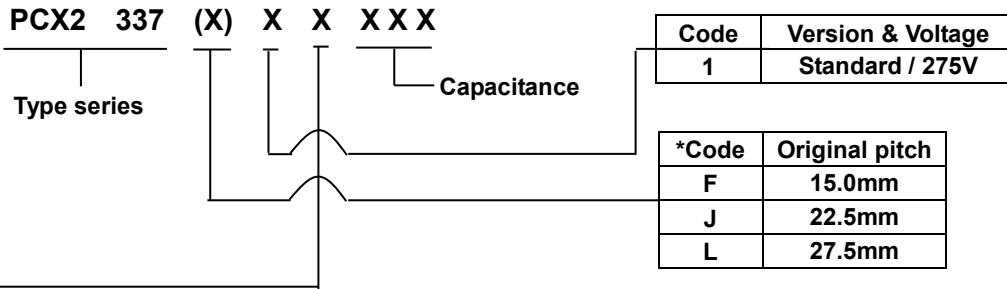
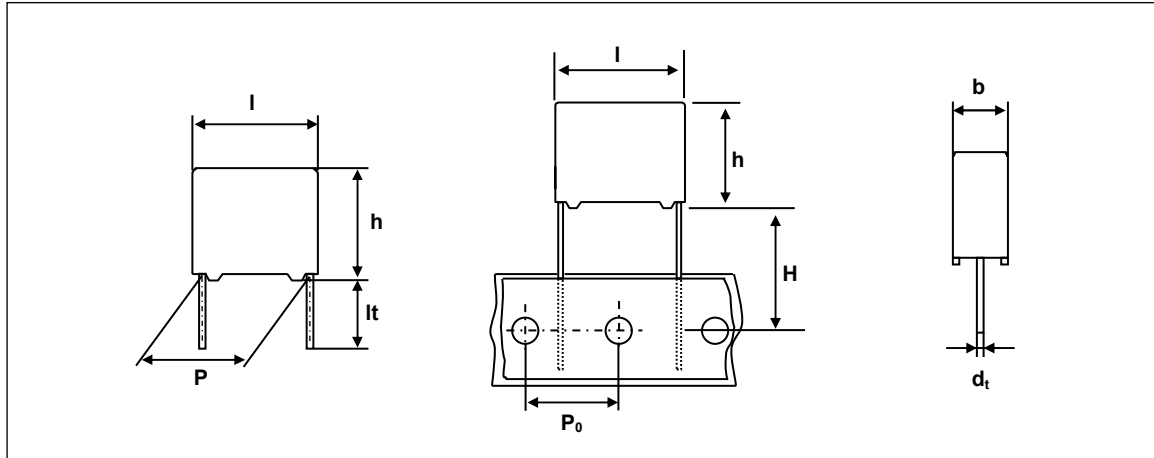
Capacitance range (E6 series) *	0.01 $\mu$ F to 3.3 $\mu$ F
Capacitance tolerance	$\pm 10 \%$ , $\pm 20 \%$
Rated (AC) voltage 50 to 60 Hz	275 V $\sim$
Climatic category	40/100/21
Temperature range	-40 $^{\circ}$ C ~ +100 $^{\circ}$ C
Reference IEC specification	IEC 60384-14(3rd edition) and EN 60384-14
Safety approvals	UL60384-14 & CSA E60384-14:09(cUL), ENEC, EK, CQC
Potting & Encapsulation material	Qualified in accordance with UL 94V-0
Safety class	X2

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

<p><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>. 10 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 (PP) film</li> <li>. potted in a flame retardant case</li> </ul>	<p><b>APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>. For X2-electromagnetic interference suppression</li> <li>. Specially designed to meet the NEW REQUIREMENTS of new IEC 60384-14 Specification(3rd edition)/ EN 60384-14/UL60384-14 requiring a 2.5kV peak pulse voltage test</li> <li>. Not for use in series with the mains</li> </ul>
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• Design and specifications are subjected to change without notice. Please refer to caution and warning at <http://www.pilkor.co.kr/sub/download/Introductions.pdf> before using these products.

Ordering Information



\* In case of overlapping the value, use the 13NC with pitch information.

Available versions					Product ( $l_{max}$ )			
Code	Packing method	C - tol.	Lead length & Height	Hole to hole ( $P_0$ )	12.5	18.0	26.0	31.0
					Pitch (P)			
0	Loose in box	$\pm 20\%$	$l_t = 5.0 \pm 1.0\text{mm}$	-	10.0	15.0	22.5	27.5
1	Loose in box	$\pm 10\%$	$l_t = 5.0 \pm 1.0\text{mm}$	-	10.0	15.0	22.5	27.5
4	Loose in box	$\pm 20\%$	$l_t = 25.0 \pm 2.0\text{mm}$	-	10.0	15.0	22.5	27.5
5	Loose in box	$\pm 10\%$	$l_t = 25.0 \pm 2.0\text{mm}$	-	10.0	15.0	22.5	27.5
6	Ammopack	$\pm 20\%$	$H = 18.5\text{mm}^*$	12.7mm	10.0	15.0	22.5	27.5
7	Ammopack	$\pm 10\%$	$H = 18.5\text{mm}^*$	12.7mm	10.0	15.0	22.5	27.5

\* H ; intape height ; for detailed specifications refer to chapter PACKAGING

\*\* Some values do not follow coding rule.

## SAFETY APPROVALS

SAFETY APPROVALS	Voltage	Value	File Number
UL 60384-14 & CSA E60384-14:09(cUL)	305V(AC)	10nF to 3.3 $\mu$ F	E165646
ENEC(SEMKO) *	275V(AC)	10nF to 3.3 $\mu$ F	SE/0256-1
EK	275V(AC)	10nF to 3.3 $\mu$ F	SH03001-2003
CQC	275V(AC)	10nF to 3.3 $\mu$ F	CQC04001009332

\* 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

SMALLEST PACKING QUANTITIES (SPQ)	LOOSE IN BOX	
	It = 5.0 $\pm$ 1.0 mm	It = 25 $\pm$ 2.0 mm
<b>DIMENSIONS</b>		
4.0 x 10.0 x 12.5	2000	1200
5.0 x 11.0 x 12.5	1500	1000
6.0 x 12.0 x 12.5	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
11.0 x 18.5 x 18.0	1000	1000
12.0 x 20.0 x 18.0	1000	1000
6.0 x 15.5 x 26.5	1000	1000
7.0 x 16.5 x 26.5	1000	1000
8.5 x 18.0 x 26.5	500	500
10.0 x 19.5 x 26.0	500	500
13.0 x 23.0 x 26.0	500	500
11.0 x 21.0 x 31.5	500	250
13.0 x 23.0 x 31.5	250	250
15.0 x 25.0 x 31.5	250	250
18.0 x 28.0 x 31.5	200	200
21.0 x 31.0 x 31.5	150	150

**EMI Suppression  
film capacitors**

**PCX2 337x1  
(Standard)**

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

Tangent of loss angle	at 1 khz	at 10 khz
$C \leq 470 \text{ nF}$ $470 \text{ nF} < C \leq 1 \text{ } \mu\text{F}$ $C > 1 \text{ } \mu\text{F}$	$\leq 10 \times 10^{-4}$ $\leq 20 \times 10^{-4}$ $\leq 30 \times 10^{-4}$	$\leq 20 \times 10^{-4}$ $\leq 70 \times 10^{-4}$ -
Rated voltage pulse slope (dV/dt) <sub>R</sub> P = 10.0mm P = 15.0mm P = 22.5mm P = 27.5mm	550 V/ $\mu\text{s}$ 400 V/ $\mu\text{s}$ 200 V/ $\mu\text{s}$ 150 V/ $\mu\text{s}$	
R between leads, for $C \leq 0.33 \text{ } \mu\text{F}$	$> 15\,000 \text{ M}\Omega$	
RC between leads, for $C > 0.33 \text{ } \mu\text{F}$	$> 5\,000 \text{ s}$	
Withstanding(DC) Voltage (cut-off current 10mA) $C \leq 1 \text{ } \mu\text{F}$ $1 \text{ } \mu\text{F} < C \leq 3.3 \text{ } \mu\text{F}$	2250 V, 1 min 1850 V, 1 min	
Withstanding(AC) Voltage between leads and case	2400 V ; 1 min	

**V<sub>Rac</sub> = 275 V~ X2**

**loose and taped**

Cap. ( $\mu\text{F}$ )	b x h x l (mm)	MASS (g)	CATALOGUE NUMBER			
			PCX2 337 .....			
			loose in box			
			lt = 5 $\pm$ 1.0 mm		lt = 25 $\pm$ 2.0 mm	
			C - tol. $\pm 20 \%$	C - tol. $\pm 10 \%$	C - tol. $\pm 20 \%$	C - tol. $\pm 10 \%$
Pitch = 10.0 $\pm$ 0.4 mm			dt = 0.6 +0.06/-0.05 mm			
0.01	4.0 x 10.0 x 12.5	0.8	10103	11103	14103	15103
0.015	4.0 x 10.0 x 12.5	0.8	10153	11153	14153	15153
0.022	4.0 x 10.0 x 12.5	0.8	10223	11223	14223	15223
0.033	5.0 x 11.0 x 12.5	0.9	10333	11333	14333	15333
0.047	5.0 x 11.0 x 12.5	0.9	10473	11473	14473	15473
0.068	6.0 x 12.0 x 12.5	1.0	10683	11683	14683	15683
0.1	6.0 x 12.0 x 12.5	1.0	10104	11104	14104	15104
Pitch = 15.0 $\pm$ 0.4 mm			dt = 0.8 +0.08/-0.05 mm			
0.01	5.0 x 11.0 x 18.0	1.6	F10103	F11103	F14103	F15103
0.015	5.0 x 11.0 x 18.0	1.6	F10153	F11153	F14153	F15153
0.022	5.0 x 11.0 x 18.0	1.6	F10223	F11223	F14223	F15223
0.033	5.0 x 11.0 x 18.0	1.6	F10333	F11333	F14333	F15333
0.047	5.0 x 11.0 x 18.0	1.6	F10473	F11473	F14473	F15473
0.068	5.0 x 11.0 x 18.0	1.6	F10683	F11683	F14683	F15683
0.1	5.0 x 11.0 x 18.0	1.6	FJ0104	FJ1104	FJ4104	FJ5104
0.1	6.0 x 12.0 x 18.0	1.8	F10104	F11104	F14104	F15104
0.15	7.0 x 13.5 x 18.0	1.9	10154	11154	14154	15154
0.22	8.5 x 15.0 x 18.0	2.6	10224	11224	14224	15224
0.33	10.0 x 16.5 x 18.0	3.1	10334	11334	14334	15334
0.47	11.0 x 18.5 x 18.0	4.1	99001	99002	99003	99004

**; Mini Type ( xJxxxx )**

**EMI Suppression  
film capacitors**

**PCX2 337x1  
(Standard)**

$V_{Rac} = 275 V \sim X2$

loose and taped

Cap. ( $\mu F$ )	b x h x l (mm)	MASS (g)	CATALOGUE NUMBER			
			PCX2 337 .....			
			loose in box			
			lt = 5 $\pm$ 1.0 mm		lt = 25 $\pm$ 2.0 mm	
		C - tol. $\pm 20 \%$	C - tol. $\pm 10 \%$	C - tol. $\pm 20 \%$	C - tol. $\pm 10 \%$	
Pitch = 22.5 $\pm$ 0.4 mm			dt = 0.8 +0.08/-0.05 mm			
0.22	6.0 x 15.5 x 26.0	4.4	J10224	J11224	J14224	J15224
0.33	7.0 x 16.5 x 26.0	4.4	J10334	J11334	J14334	J15334
0.47	8.5 x 18.0 x 26.0	4.4	10474	11474	14474	15474
0.68	10.0 x 19.5 x 26.0	5.5	10684	11684	14684	15684
1.0	13.0 x 23.0 x 26.0	8.0	10105	11105	14105	15105
Pitch = 27.5 $\pm$ 0.4 mm			dt = 0.8 +0.08/-0.05 mm			
0.68	11.0 x 21.0 x 31.0	7.8	L10684	L11684	L14684	L15684
1.0	13.0 x 23.0 x 31.0	10.4	L10105	L11105	L14105	L15105
1.5	15.0 x 25.0 x 31.0	12.8	10155	11155	14155	15155
2.2	18.0 x 28.0 x 31.0	17.2	10225	11225	14225	15225
3.3	21.0 x 31.0 x 31.0	20.4	10335	11335	14335	15335

## 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 pips are in good contact with the printed-circuit board.

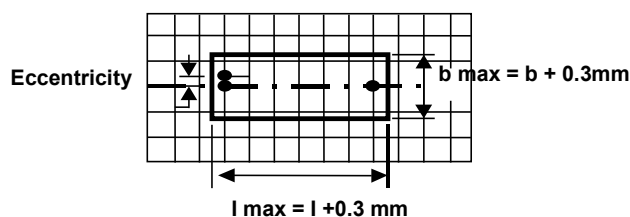
. For pitches of 15mm the capacitors shall be mechanically fixed by leads.

. 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 :  $h_{max.} \leq h + 0.3 \text{ mm}$

## STORAGE TEMPERATURE

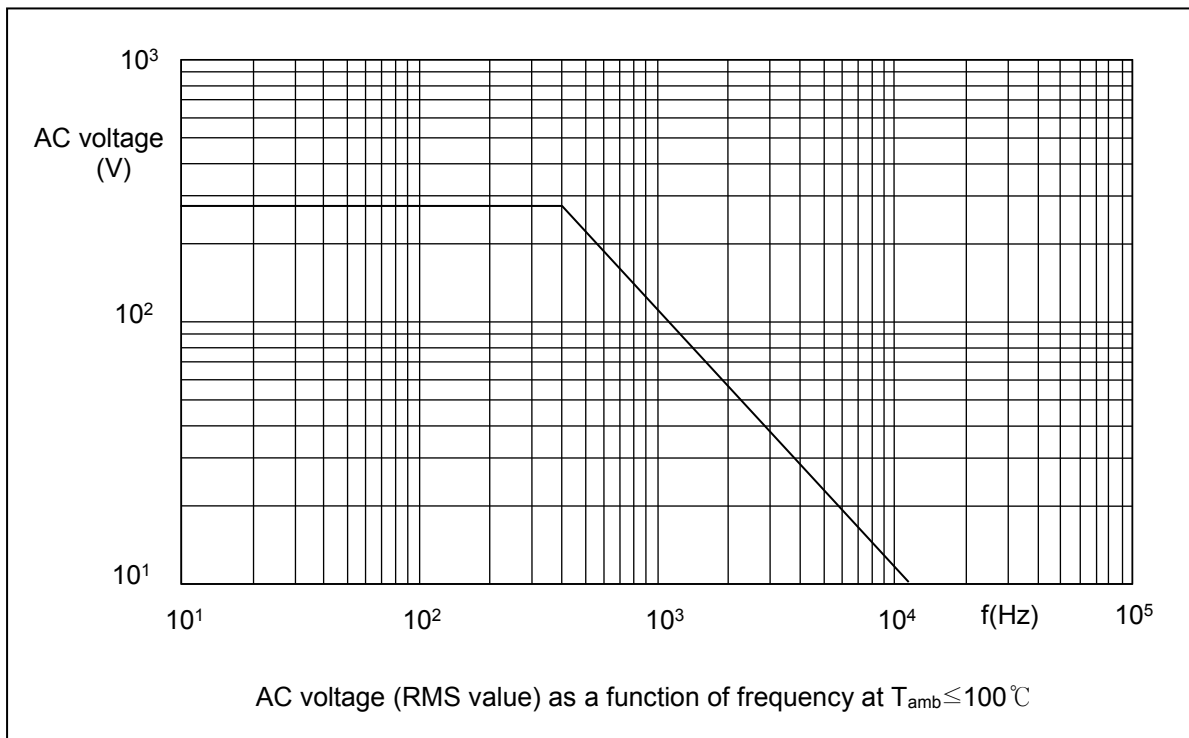
. Storage temperature :  $T_{stg} = -25 \text{ to } +40 \text{ } ^\circ\text{C}$  with RH maximum 80% without condensation.

**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 ;

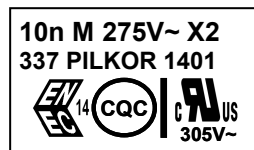
- 1.Manufacturer (PILKOR) for capacitors with original pitch  $\geq 15\text{mm}$ ,  
PILKOR trade mark for pitch=10mm
  - 2.Manufacturer's type designation (PCX2 337)
  - 3.Rated capacitance in code according to IEC 60062
  - 4.Rated (AC) voltage (275V~)
  - 5.Sub class (X2)
  - 6.Tolerance on rated capacitance M  $=\pm 20\%$  K  $=\pm 10\%$
  - 7.Climatic category (40/100/21)
  - 8.Code for dielectric material (MKP) for capacitors with original pitch  $\geq 15\text{mm}$
  - 9.Year and week of manufacturing (1401)
  - 10.Safety approvals
- \* white or black color

**Example of marking**

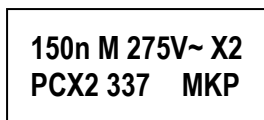


Marking on the side

or



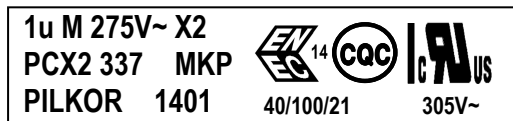
Marking on the side



Marking on the top



Marking on the side



Marking on headface



Marking on the top