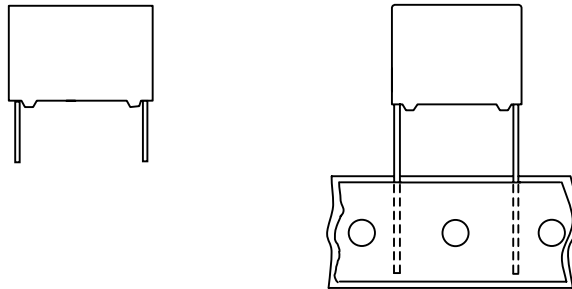


Metallized Polypropylene film capacitors

PCMP 389

MKP RADIAL POTTED CAPACITORS

Pitch 10.0/15.0/22.5/27.5mm
(reduced pitch 7.5mm)

QUICK REFERENCE DATA

Capacitance range (E24 series)	0.01 to 3.9 μ F
Capacitance tolerance	\pm 5%
Rated voltage (DC)	250 V, 400 V, 630 V
Climatic category	55/105/56
Temperature range	-55 $^{\circ}$ C ~ +105 $^{\circ}$ C
Reference specification	IEC 60384-17/16
Potting & Encapsulation material	Qualified in accordance with UL94V-0

FEATURES	APPLICATIONS
<ul style="list-style-type: none"> . 15mm to 27.5mm lead pitch . Low contact resistance . Low loss dielectric . Small dimensions for high density packaging . Supplied loose in box and taped on reel 	<ul style="list-style-type: none"> . Where steep pulses occur e.g. SMPS (switch mode power supplies) . S - correction . Motor control circuits

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

Packing Information

SMALLEST PACKING QUANTITIES (SPQ)	Loose in box	Ammo packing
	It = 5.0 ± 1.0mm	H=18.5mm
DIMENSIONS	SPQ	SPQ
4.0 x 10.0 x 12.5	2000	800
5.0 x 11.0 x 12.5	1500	700
6.0 x 12.0 x 12.5	1000	600
5.0 x 11.0 x 18.0	1000	700
6.0 x 12.0 x 18.0	1000	600
7.0 x 13.5 x 18.0	1000	500
8.5 x 15.0 x 18.0	1000	400
10.0 x 16.5 x 18.0	1000	370
6.0 x 15.5 x 26.0	1000	600
7.0 x 16.5 x 26.0	1000	500
8.5 x 18.0 x 26.0	500	400
10.0 x 19.5 x 26.0	500	370
11.0 x 21.0 x 31.0	500	300
13.0 x 23.0 x 31.0	250	250
15.0 x 25.0 x 31.0	250	220
18.0 x 28.0 x 31.0	200	200

Metallized Polypropylene film capacitors

PCMP 389

$V_{Rdc} = 250 V$		$V_{Rac} = 160 V$		$V_{p-p} = 450 V$	
Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER		
			PCMP 389		
			loose in box	ammo packing	
			lt = 5.0 \pm 1.0 mm	H = 18.5 mm	
		C - tol. \pm 5%		C - tol. \pm 5%	
Pitch = 10.0 \pm 0.4 mm		dt = 0.6 mm (+ 0.06 / - 0.05)			
0.047 0.051 0.056 0.062 0.068	4.0 x 10.0 x 12.5	0.8	PCMP 389 42473 PCMP 389 42513 PCMP 389 42563 PCMP 389 42623 PCMP 389 42683	PCMP 389 45473 PCMP 389 45513 PCMP 389 45563 PCMP 389 45623 PCMP 389 45683	
0.075 0.082 0.091	5.0 x 11.0 x 12.5	0.9	PCMP 389 42753 PCMP 389 42823 PCMP 389 42913	PCMP 389 45753 PCMP 389 45823 PCMP 389 45913	
0.10 0.11 0.12	6.0 x 12.0 x 12.5	1.0	PCMP 389 42104 PCMP 389 42114 PCMP 389 42124	PCMP 389 45104 PCMP 389 45114 PCMP 389 45124	
Pitch = 15.0 \pm 0.4 mm		dt = 0.8 mm (+ 0.08 / - 0.05)			
0.10 0.11 0.12 0.13 0.15 0.16	5.0 x 11.0 x 18.0	1.2	PCMP 389F42104 PCMP 389F42114 PCMP 389F42124 PCMP 389 42134 PCMP 389 42154 PCMP 389 42164	PCMP 389F45104 PCMP 389F45114 PCMP 389F45124 PCMP 389 45134 PCMP 389 45154 PCMP 389 45164	
0.18 0.20 0.22 0.24	6.0 x 12.0 x 18.0	1.4	PCMP 389 42184 PCMP 389 42204 PCMP 389 42224 PCMP 389 42244	PCMP 389 45184 PCMP 389 45204 PCMP 389 45224 PCMP 389 45244	
0.27 0.30 0.33	7.0 x 13.5 x 18.0	1.9	PCMP 389 42274 PCMP 389 42304 PCMP 389 42334	PCMP 389 45274 PCMP 389 45304 PCMP 389 45334	
0.36 0.39 0.43 0.47	8.5 x 15.0 x 18.0	2.6	PCMP 389 42364 PCMP 389 42394 PCMP 389 42434 PCMP 389 42474	PCMP 389 45364 PCMP 389 45394 PCMP 389 45434 PCMP 389 45474	
Pitch = 22.5 \pm 0.4 mm		dt = 0.8 mm (+ 0.08 / - 0.05)			
0.33 0.36 0.39 0.43 0.47 0.51 0.56 0.62	7.0 X 16.5 X 26.0	3.1	PCMP 389J42334 PCMP 389J42364 PCMP 389J42394 PCMP 389J42434 PCMP 389J42474 PCMP 389 42514 PCMP 389 42564 PCMP 389 42624	PCMP 389J45334 PCMP 389J45364 PCMP 389J45394 PCMP 389J45434 PCMP 389J45474 PCMP 389 45514 PCMP 389 45564 PCMP 389 45624	
0.68 0.75 0.82 0.91	8.5 X 18.0 X 26.0	4.4	PCMP 389 42684 PCMP 389 42754 PCMP 389 42824 PCMP 389 42914	PCMP 389 45684 PCMP 389 45754 PCMP 389 45824 PCMP 389 45914	
1.0 1.1 1.2	10.0 X 19.5 X 26.0	5.5	PCMP 389 42105 PCMP 389 42115 PCMP 389 42125	PCMP 389 45105 PCMP 389 45115 PCMP 389 45125	

**Metallized Polypropylene
film capacitors**
PCMP 389

$V_{Rdc} = 250 V$		$V_{Rac} = 160 V$		$V_{p-p} = 450 V$	
Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER		
			PCMP 389		
			loose in box		ammo packing
			lt = 5.0 \pm 1.0 mm		H = 18.5 mm
		C - tol. \pm 5%		C - tol. \pm 5%	
Pitch = 27.5 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)		
0.91	11.0 X 21.0 X 31.0	8.2	PCMP 389L42914		-
1.0			PCMP 389L42105		-
1.1			PCMP 389L42115		-
1.2			PCMP 389L42125		-
1.3			PCMP 389 42135		-
1.5			PCMP 389 42155		-
1.6			PCMP 389 42165		-
1.8	13.0 X 23.0 X 31.0	10.4	PCMP 389 42185		-
2.0			PCMP 389 42205		-
2.2			PCMP 389 42225		-
2.4	15.0 X 25.0 X 31.0	12.8	PCMP 389 42245		-
2.7			PCMP 389 42275		-
3.0	18.0 X 28.0 X 31.0	17.2	PCMP 389 42305		-
3.3			PCMP 389 42335		-
3.6			PCMP 389 42365		-
3.9			PCMP 389 42395		-

Metallized Polypropylene film capacitors

PCMP 389

$V_{Rdc} = 400 V$		$V_{Rac} = 200 V$		$V_{p-p} = 560 V$	
Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER		
			PCMP 389		
			loose in box		ammo packing
			It = 5.0 \pm 1.0 mm		H = 18.5 mm
			C - tol. \pm 5%		C - tol. \pm 5%
Pitch = 10.0 \pm 0.4 mm			dt = 0.6 mm (+ 0.06 / - 0.05)		
0.022 0.024 0.027 0.030 0.033	4.0 x 10.0 x 12.5	0.8	PCMP 389 52223 PCMP 389 52243 PCMP 389 52273 PCMP 389 52303 PCMP 389 52333	PCMP 389 55223 PCMP 389 55243 PCMP 389 55273 PCMP 389 55303 PCMP 389 55333	
0.036 0.039 0.043 0.047	5.0 x 11.0 x 12.5	0.9	PCMP 389 52363 PCMP 389 52393 PCMP 389 52433 PCMP 389 52473	PCMP 389 55363 PCMP 389 55393 PCMP 389 55433 PCMP 389 55473	
0.051 0.056	6.0 x 12.0 x 12.5	1.0	PCMP 389 52513 PCMP 389 52563	PCMP 389 55513 PCMP 389 55563	
Pitch = 15.0 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)		
0.047 0.051 0.056 0.062 0.068 0.075 0.082	5.0 x 11.0 x 18.0	1.2	PCMP 389F52473 PCMP 389F52513 PCMP 389F52563 PCMP 389 52623 PCMP 389 52683 PCMP 389 52753 PCMP 389 52823	PCMP 389F55473 PCMP 389F55513 PCMP 389F55563 PCMP 389 55623 PCMP 389 55683 PCMP 389 55753 PCMP 389 55823	
0.091 0.10 0.11 0.12	6.0 x 12.0 x 18.0	1.4	PCMP 389 52913 PCMP 389 52104 PCMP 389 52114 PCMP 389 52124	PCMP 389 55913 PCMP 389 55104 PCMP 389 55114 PCMP 389 55124	
0.13 0.15 0.16	7.0 x 13.5 x 18.0	1.9	PCMP 389 52134 PCMP 389 52154 PCMP 389 52164	PCMP 389 55134 PCMP 389 55154 PCMP 389 55164	
0.18 0.20 0.22	8.5 x 15.0 x 18.0	2.6	PCMP 389 52184 PCMP 389 52204 PCMP 389 52224	PCMP 389 55184 PCMP 389 55204 PCMP 389 55224	
Pitch = 22.5 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)		
0.18 0.20 0.22 0.24 0.27 0.30	7.0 X 16.5 X 26.0	3.1	PCMP 389J52184 PCMP 389J52204 PCMP 389J52224 PCMP 389 52244 PCMP 389 52274 PCMP 389 52304	PCMP 389J55184 PCMP 389J55204 PCMP 389J55224 PCMP 389 55244 PCMP 389 55274 PCMP 389 55304	
0.33 0.36 0.39 0.43 0.47	8.5 X 18.0 X 26.0	4.4	PCMP 389 52334 PCMP 389 52364 PCMP 389 52394 PCMP 389 52434 PCMP 389 52474	PCMP 389 55334 PCMP 389 55364 PCMP 389 55394 PCMP 389 55434 PCMP 389 55474	
0.51 0.56 0.62	10.0 X 19.5 X 26.0	5.5	PCMP 389 52514 PCMP 389 52564 PCMP 389 52624	PCMP 389 55514 PCMP 389 55564 PCMP 389 55624	

Metallized Polypropylene film capacitors

PCMP 389

Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER	
			PCMP 389	
			loose in box	ammo packing
			It = 5.0 \pm 1.0 mm	H = 18.5 mm
			C - tol. \pm 5%	C - tol. \pm 5%
Pitch = 27.5 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)	
0.51	11.0 X 21.0 X 31.0	8.2	PCMP 389L52514	-
0.56			PCMP 389L52564	-
0.62			PCMP 389L52624	-
0.68			PCMP 389 52684	-
0.75			PCMP 389 52754	-
0.82			PCMP 389 52824	-
0.91	13.0 X 23.0 X 31.0	10.4	PCMP 389 52914	-
1.0			PCMP 389 52105	-
1.1			PCMP 389 52115	-
1.2	15.0 X 25.0 X 31.0	12.8	PCMP 389 52125	-
1.3			PCMP 389 52135	-
1.5			PCMP 389 52155	-
1.6	18.0 X 28.0 X 31.0	17.2	PCMP 389 52165	-
1.8			PCMP 389 52185	-
2.0			PCMP 389 52205	-

Metallized Polypropylene film capacitors

PCMP 389

 $V_{Rdc} = 630 V$ $V_{Rac} = 250 V$ $V_{p-p} = 700 V$

Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER	
			PCMP 389	
			loose in box	ammo packing
			lt = 5.0 \pm 1.0 mm	H = 18.5 mm
			C - tol. \pm 5%	C - tol. \pm 5%
Pitch = 10.0 \pm 0.4 mm			dt = 0.6 mm (+ 0.06 / - 0.05)	
0.010 0.011 0.012 0.013 0.015 0.016	4.0 x 10.0 x 12.5	0.8	PCMP 389 62103 PCMP 389 62113 PCMP 389 62123 PCMP 389 62133 PCMP 389 62153 PCMP 389 62163	PCMP 389 65103 PCMP 389 65113 PCMP 389 65123 PCMP 389 65133 PCMP 389 65153 PCMP 389 65163
0.018 0.020 0.022 0.024	5.0 x 11.0 x 12.5	0.9	PCMP 389 62183 PCMP 389 62203 PCMP 389 62223 PCMP 389 62243	PCMP 389 65183 PCMP 389 65203 PCMP 389 65223 PCMP 389 65243
0.027 0.030 0.033	6.0 x 12.0 x 12.5	1.0	PCMP 389 62273 PCMP 389 62303 PCMP 389 62333	PCMP 389 65273 PCMP 389 65303 PCMP 389 65333
Pitch = 15.0 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)	
0.027 0.030 0.033 0.036 0.039	5.0 X 11.0 X 18.0	1.2	PCMP 389F62273 PCMP 389F62303 PCMP 389F62333 PCMP 389 62363 PCMP 389 62393	PCMP 389F65273 PCMP 389F65303 PCMP 389F65333 PCMP 389 65363 PCMP 389 65393
0.043 0.047 0.051 0.056 0.062	6.0 X 12.0 X 18.0	1.4	PCMP 389 62433 PCMP 389 62473 PCMP 389 62513 PCMP 389 62563 PCMP 389 62623	PCMP 389 65433 PCMP 389 65473 PCMP 389 65513 PCMP 389 65563 PCMP 389 65623
0.068 0.075 0.082	7.0 X 13.5 X 18.0	1.9	PCMP 389 62683 PCMP 389 62753 PCMP 389 62823	PCMP 389 65683 PCMP 389 65753 PCMP 389 65823
0.091 0.10 0.11	8.5 X 15.0 X 18.0	2.6	PCMP 389 62913 PCMP 389 62104 PCMP 389 62114	PCMP 389 65913 PCMP 389 65104 PCMP 389 65114
Pitch = 22.5 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)	
0.10 0.11 0.12 0.13 0.15 0.16	7.0 X 16.5 X 26.0	3.1	PCMP 389J62104 PCMP 389J62114 PCMP 389 62124 PCMP 389 62134 PCMP 389 62154 PCMP 389 62164	PCMP 389J65104 PCMP 389J65114 PCMP 389 65124 PCMP 389 65134 PCMP 389 65154 PCMP 389 65164
0.18 0.20 0.22	8.5 X 18.0 X 26.0	4.4	PCMP 389 62184 PCMP 389 62204 PCMP 389 62224	PCMP 389 65184 PCMP 389 65204 PCMP 389 65224
0.24 0.27 0.30	10.0 X 19.5 X 26.0	5.5	PCMP 389 62244 PCMP 389 62274 PCMP 389 62304	PCMP 389 65244 PCMP 389 65274 PCMP 389 65304

Metallized Polypropylene film capacitors

PCMP 389

$V_{Rdc} = 630 V$	$V_{Rac} = 250 V$		$V_{p-p} = 700 V$	
Cap (μF)	b x h x l (mm)	Mass (g)	CATALOGUE NUMBER	
			PCMP 389	
			loose in box	ammo packing
			lt = 5.0 \pm 1.0 mm	H = 18.5 mm
			C - tol. \pm 5%	C - tol. \pm 5%
Pitch = 27.5 \pm 0.4 mm			dt = 0.8 mm (+ 0.08 / - 0.05)	
0.22	11.0 X 21.0 X 31.0	8.2	PCMP 389L62224	-
0.24			PCMP 389L62244	-
0.27			PCMP 389L62274	-
0.30			PCMP 389L62304	-
0.33			PCMP 389 62334	-
0.36			PCMP 389 62364	-
0.39			PCMP 389 62394	-
0.43	PCMP 389 62434	-		
0.47	13.0 X 23.0 X 31.0	10.4	PCMP 389 62474	-
0.51			PCMP 389 62514	-
0.56			PCMP 389 62564	-
0.62	15.0 X 25.0 X 31.0	12.8	PCMP 389 62624	-
0.68			PCMP 389 62684	-
0.75			PCMP 389 62754	-
0.82			PCMP 389 62824	-
0.91	18.0 X 28.0 X 31.0	17.2	PCMP 389 62914	-
1.0			PCMP 389 62105	-

MOUNTING

NORMAL USE

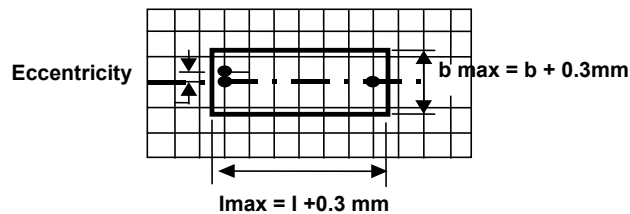
The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoilers are designed for mounting on printed-circuit boards by means of automatic insertion machines.

SPECIFIC METHOD OF MOUNTING TO WITHSTAND VIBRATION AND SHOCK

- . For pitches of 15 mm the capacitors shall be mechanically fixed by the 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 : $T_{stg} = -25$ to $+40$ °C with RH maximum 80% without condensation.

RATINGS AND CHARACTERISTICS

Unless otherwise specified all electrical values apply at an ambient temperature of 23 ± 1 °C, an atmospheric pressure of 86 to 106 kPa and a relative humidity of 50 ± 2 %.

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

CHARACTERISTICS

● Test Voltage

. Test Voltage (between terminations) : $1.6 \times V_{Rdc}$, 1min (cut-off current 10mA)

. Test Voltage (between leads and case) : $2840 V_{dc}$, 1min

● Dissipation Factor

Rated voltage	Capacitance	Tangent of loss angle ($\times 10^{-4}$)		
		1 kHz	10 kHz	100 kHz
250 V	$0.047 \mu F \leq C \leq 0.12 \mu F$	≤ 5	≤ 5	≤ 30
	$0.12 \mu F < C \leq 0.33 \mu F$	≤ 5	≤ 8	≤ 40
	$0.33 \mu F < C \leq 0.56 \mu F$	≤ 5	≤ 10	≤ 50
	$0.56 \mu F < C \leq 0.91 \mu F$	≤ 5	≤ 10	≤ 60
	$0.91 \mu F < C \leq 1.5 \mu F$	≤ 6	≤ 10	≤ 80
	$1.5 \mu F < C \leq 2.2 \mu F$	≤ 6	≤ 10	≤ 100
	$2.2 \mu F < C \leq 3.9 \mu F$	≤ 6	≤ 15	≤ 135
400 V	$0.022 \mu F \leq C \leq 0.075 \mu F$	≤ 5	≤ 5	≤ 20
	$0.075 \mu F < C \leq 0.39 \mu F$	≤ 5	≤ 8	≤ 40
	$0.39 \mu F < C \leq 0.91 \mu F$	≤ 5	≤ 10	≤ 60
	$0.91 \mu F < C \leq 1.5 \mu F$	≤ 6	≤ 10	≤ 80
	$1.5 \mu F < C \leq 2.0 \mu F$	≤ 6	≤ 10	≤ 95
630 V	$0.010 \mu F \leq C \leq 0.068 \mu F$	≤ 5	≤ 5	≤ 15
	$0.068 \mu F < C \leq 0.39 \mu F$	≤ 5	≤ 8	≤ 40
	$0.39 \mu F < C \leq 1.0 \mu F$	≤ 5	≤ 10	≤ 60

● Insulation Resistance

The insulation resistance is measured for 1min \pm 5s, at 100V for $V_{Rdc} < 630V$, at 500V for $V_{Rdc} \geq 630V$

$$R_{ins} > 100,000M\Omega \quad \text{when} \quad C \leq 0.33\mu F$$

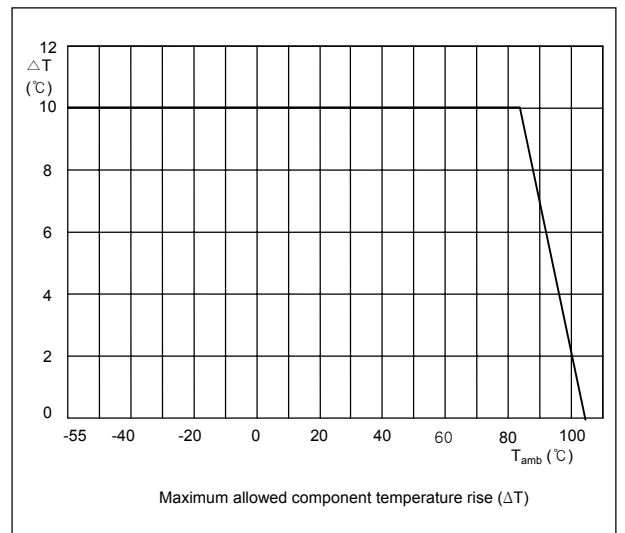
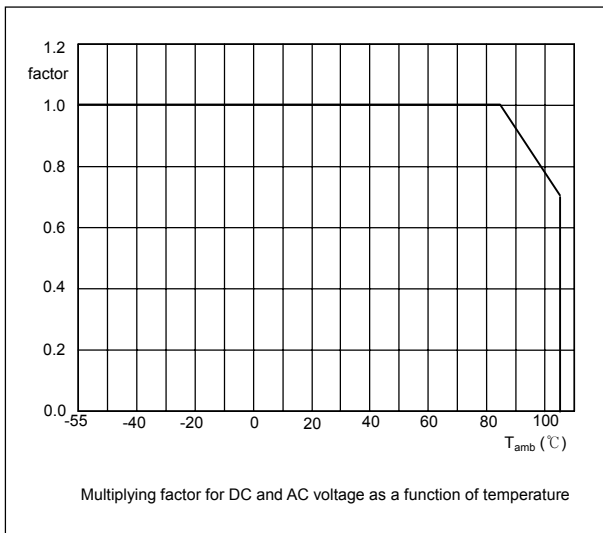
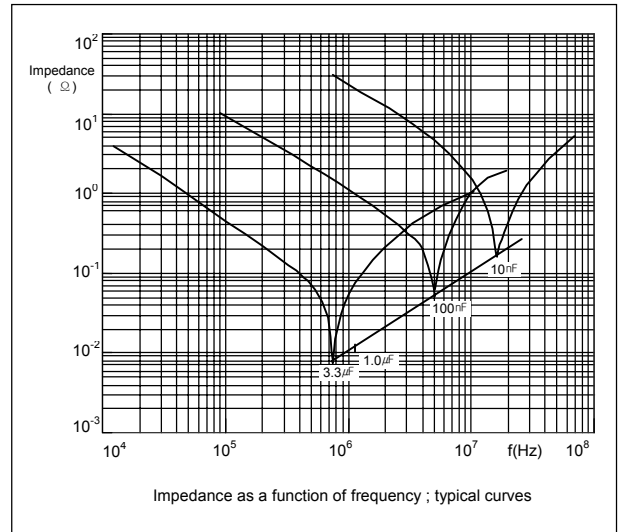
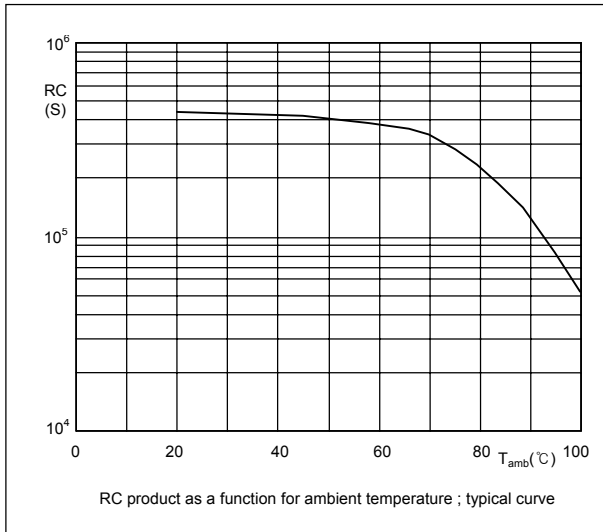
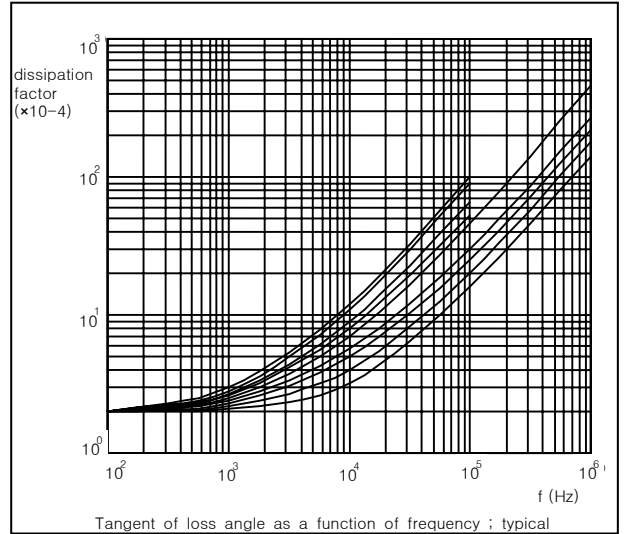
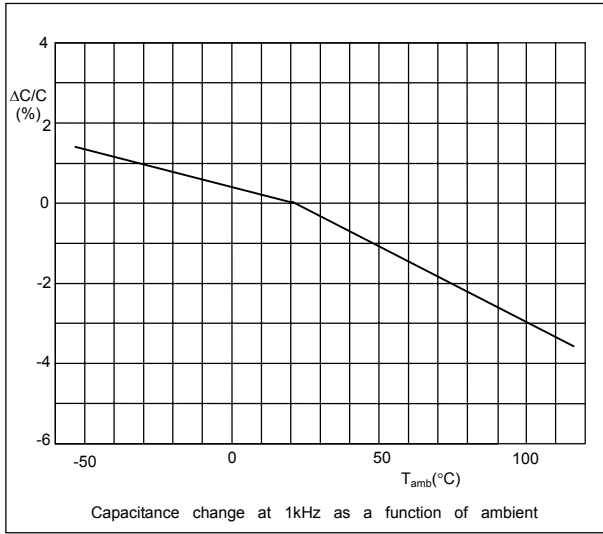
$$R_{ins} > 30,000\Omega F \quad \text{when} \quad C > 0.33\mu F$$

● Rated Voltage Pulse Lode Slope (dV/dt)_R

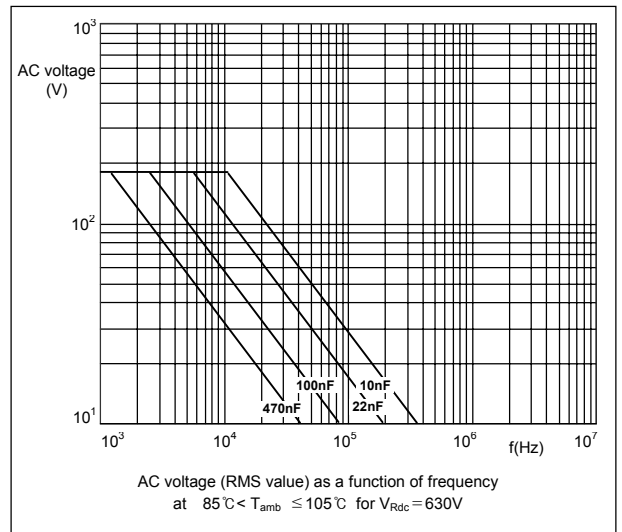
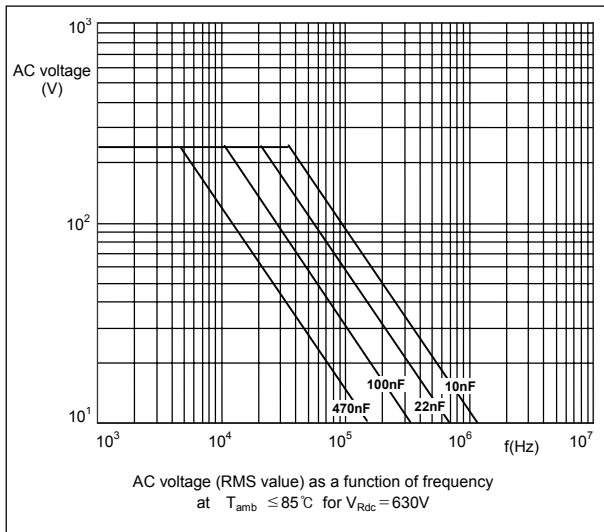
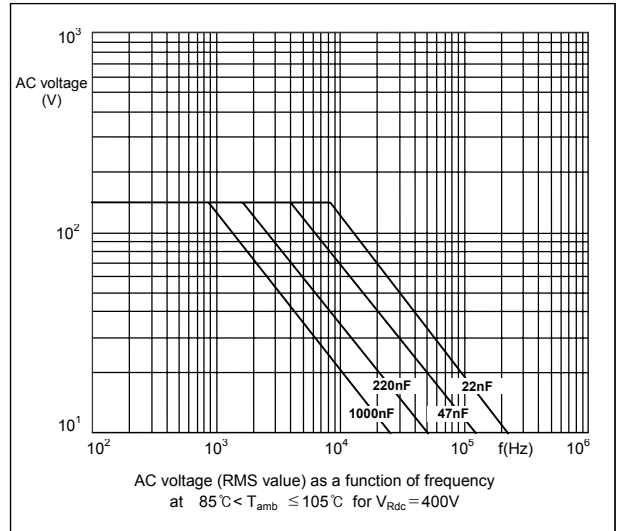
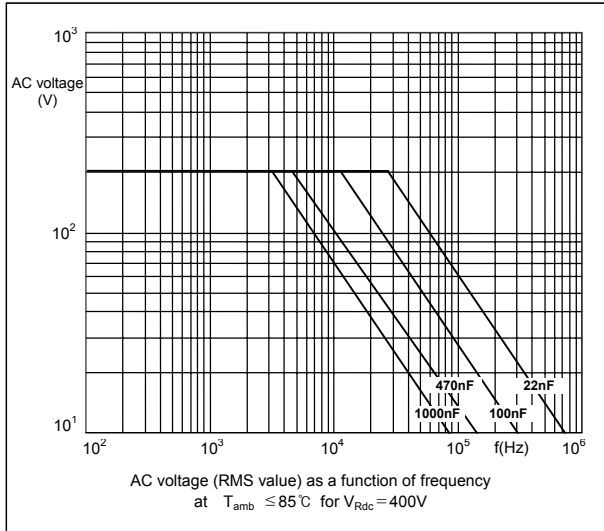
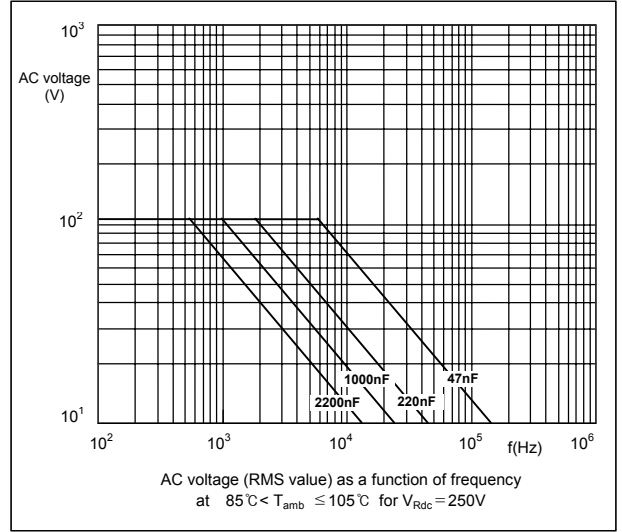
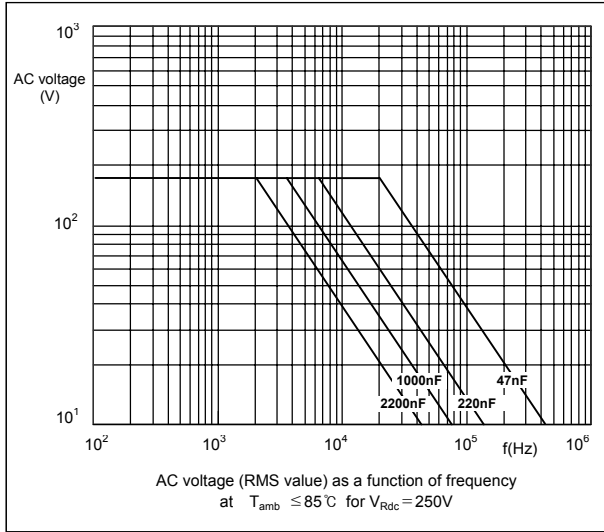
For values see specific reference data. If the pulse voltage is lower than the rated voltage, the values of the specific reference data must be multiplied by V_{Rdc} and divided by the applied voltage

Rated voltage	MAXIMUM RATED VOLTAGE PULSE SLOPE (V/ μ S)			
	P = 10.0 mm	P = 15.0 mm	P = 22.5 mm	P = 27.5 mm
250 V	280	200	125	50
400 V	420	300	180	70
630 V	550	400	250	100

THE GRAPHS OF CHARACTERISTICS



MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY



APPLICATION NOTE AND LIMITING CONDITIONS

These capacitors are not suitable for mains application as across-the-line capacitors without additional protection.

To select the capacitor for a certain application, the following conditions must be checked :

1. The peak voltage (V_p) shall not be greater than the rated DC voltage (V_{Rdc}).
2. The peak-to-peak voltage (V_{p-p}) shall not be greater than the maximum V_{p-p} to avoid the ionisation inception level.
3. The voltage pulse slope (dV/dt) shall not exceed the rated voltage pulse slope in an RC-circuit at rated voltage and without ringing. If the pulse voltage is lower than the rated DC voltage, the rated voltage pulse slope may be multiplied by V_{Rdc} and divided by the applied voltage.

For all other pulses following equation must be fulfilled :

$$2 \times \int_0^T \left(\frac{dU}{dt} \right)^2 \times dt < U_{Rdc} \times \left(\frac{dU}{dt} \right)_{rated}$$

T is the pulse duration.

4. The maximum component surface temperature rise must be lower than the limits.

PRODUCT MARKING

Capacitors are marked with the following information :

- . Rated capacitance code in accordance with IEC 60062
- . Tolerance on rated capacitance : J = $\pm 5\%$
- . Rated (DC) Voltage (e.g. 630 V)
- . Code for dielectric material (MKP)
- . Manufacturer's type designation (389)
- . Manufacturer's name (PILKOR)
- . Year and week of manufacture (e.g. 1101)

Example of marking

Pitch = 10mm

10n J 630V 389 MKP 0401 PILKOR

Marking on the side

Pitch = 15.0 mm

36n J 630V 389 MKP

Marking on the top

PILKOR WK....

Marking on the side

Pitch = 22.5 mm or 27.5mm

120n J 630V 389 MKP

Marking on the top

PILKOR WK....

Marking on the side

or

120n J 630V 389 MKP	PILKOR WK....
------------------------	------------------

Marking on the top

Pitch = 27.5 mm

470n J 630V 389 MKP 0401 PILKOR

Marking on the top