

# DATA SHEET

MMKP 383  
**AC and pulse double  
metallized polypropylene film  
capacitors**

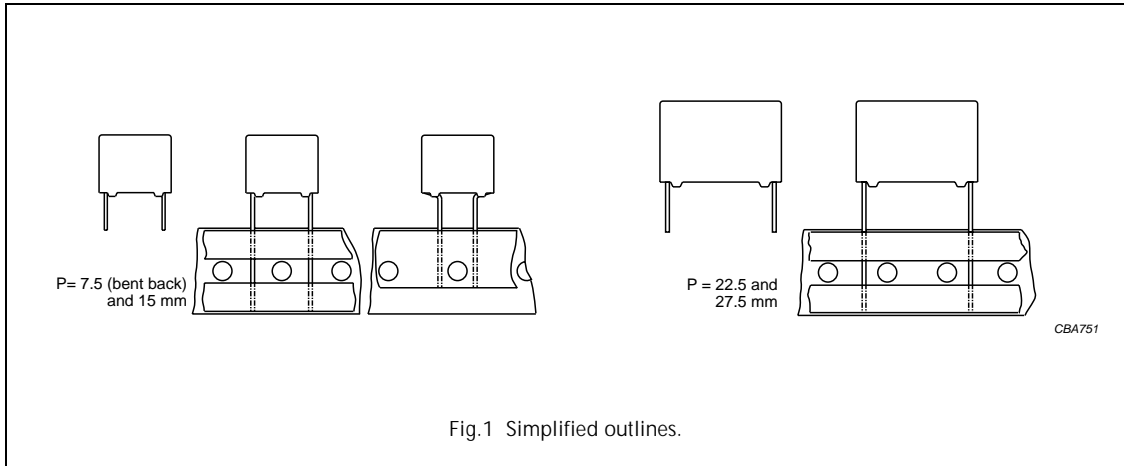
Product specification  
Supersedes data of 2000-08-29  
File under BCcomponents, BC05

2001 Jun 22

# AC and pulse double metallized polypropylene film capacitors

MMKP 383

MMKP RADIAL POTTED TYPE

 PITCH 15/22.5/27.5 mm  
 PITCH 7.5 mm (bent back leads)


## FEATURES

- 7.5 mm bent back pitch
- 15 to 27.5 mm lead pitch
- Low contact resistance
- Low loss dielectric
- Small dimensions for high density packaging
- Supplied loose in box and taped on reel.

## APPLICATIONS

- Electronic lighting e.g. Ballast
- Motor control circuits
- S - correction
- Where steep pulses occur e.g. SMPS (switch mode power supplies)
- For flyback applications please use 1400 V series
- For hot asphalt encapsulation process.

## DETAIL SPECIFICATION

For more detailed data and test requirements see "Type detail specification HQN-384-17/106".

## QUICK REFERENCE DATA

DESCRIPTION	VALUE
Capacitance range (E24 series)	0.001 to 2.7 $\mu$ F
Capacitance tolerance	$\pm$ 5%
Rated (DC) voltage	250 V; 400 V; 630 V; 1000 V; 1400 V; 1600 V; 2000 V; 2500 V
Rated (AC) voltage	125 V; 200 V; 220 V; 350 V; 500 V; 550 V; 700 V; 900 V
Rated peak-to-peak voltage	350 V; 560 V; 630 V; 1000 V; 1400 V; 1600 V; 2000 V; 2500 V
Climatic category	55/105/56
Rated temperature (DC)	85 °C
Rated temperature (AC)	105 °C
Maximum application temperature	105 °C
Reference specification	IEC 60384-17
Performance grade	grade 1 (long life)
Stability grade	grade 2
Materials	qualified in accordance with UL94 V-0

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### COMPOSITION OF CATALOGUE NUMBER

TYPE AND PITCHES	
383	15.0/7.5 mm
	15.0 mm
	22.5 mm
	27.5 mm

MULTIPLIER (nF)	
0.1	2
1	3
10	4
100	5

CAPACITANCE (numerically)

Example:  
104 = 10 x 10 = 100 nF

2222 383 XX XX X

TYPE	PACKAGING	LEAD CONFIGURATION	PREFERRED TYPES				
			C-TOL	250 V	400 V	630 V	1000 V
383	loose in box	lead length 3.5 mm	±5%	00	10	20	30
	taped on reel	bent back leads reel diameter 500 mm	±5%	03	13	23	33
			ON REQUEST				
383	loose in box	lead length 5.0 mm	±5%	01	11	21	31
		lead length 25.0 mm	±5%	04	14	24	34
	taped on reel		±5%	02	12	22	32
	taped on reel	bent back leads reel diameter 356 mm for hot asphalt encapsulation	±5%	-	-	-	-

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

TYPE AND PITCHES	
383	15.0/7.5 mm
	15.0 mm
	22.5 mm
	27.5 mm

MULTIPLIER (nF)	
0.1	2
1	3
10	4
100	5

**CAPACITANCE**  
(numerically)

Example:  
104 = 10 x 10 = 100 nF

2222 383 XX XX X

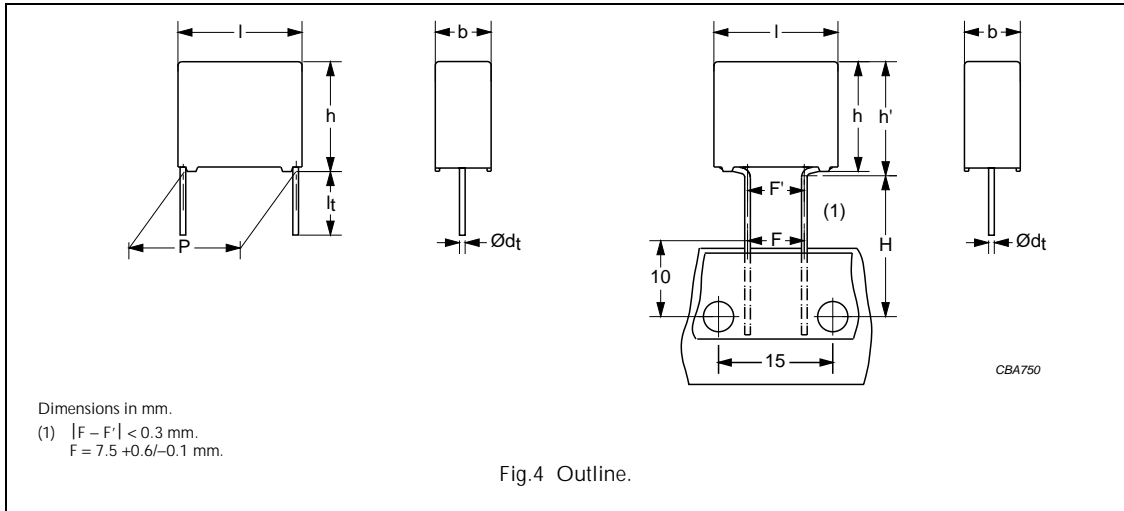
TYPE	PACKAGING	LEAD CONFIGURATION	PREFERRED TYPES				
			C-TOL	1400 V	1600 V	2000 V	2500 V
383	loose in box	lead length 3.5 mm	±5%	40	50	60	70
	taped on reel	bent back leads reel diameter 500 mm	±5%	43	53	63	–
			ON REQUEST				
383	loose in box	lead length 5.0 mm	±5%	41	51	61	71
		lead length 25.0 mm	±5%	44	54	64	74
	taped on reel		±5%	42	52	62	72
	taped on reel	bent back leads reel diameter 356 mm for hot asphalt encapsulation	±5%	46	56	66	–

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



### Specific reference data for the 250 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.15 \mu\text{F}$ $0.15 \mu\text{F} < C \leq 0.39 \mu\text{F}$	$\leq 5 \times 10^{-4}$ $\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$ $\leq 25 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 250 V (DC): $C \leq 0.15 \mu\text{F}$ $0.15 \mu\text{F} < C \leq 0.39 \mu\text{F}$	450 V/ $\mu\text{s}$ 900 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 100 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 100 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$>220 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	400 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 250 V DC versions

PACKAGING	DIMENSIONS	C-toI	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 00...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 01...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 04...	on request
Taped on reel	$H = 18.5 \text{ mm}$ ; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 02...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}$ ; $P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 03...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 250 \text{ V}; U_{Rac} = 125 \text{ V}; U_{p-p} = 350 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol $\pm 5\%$	C-tol $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.082	5.0 × 11.0 (13.0) × 17.5	1.2	2222 383 00823	.. 03823
0.091			2222 383 00913	.. 03913
0.1			2222 383 00104	.. 03104
0.11	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 00114	.. 03114
0.12			2222 383 00124	.. 03124
0.13			2222 383 00134	.. 03134
0.15			2222 383 00154	.. 03154
0.16	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 00164	.. 03164
0.18			2222 383 00184	.. 03184
0.2			2222 383 00204	.. 03204
0.22	8.5 × 15.0 (17.0) × 17.5	2.7	2222 383 00224	.. 03224
0.24			2222 383 00244	.. 03244
0.27			2222 383 00274	.. 03274
0.3			2222 383 00304	.. 03304
0.33	10.0 × 16.5 (18.5) × 17.5	3.3	2222 383 00334	.. 03334
0.36			2222 383 00364	.. 03364
0.39			2222 383 00394	.. 03394

### Note

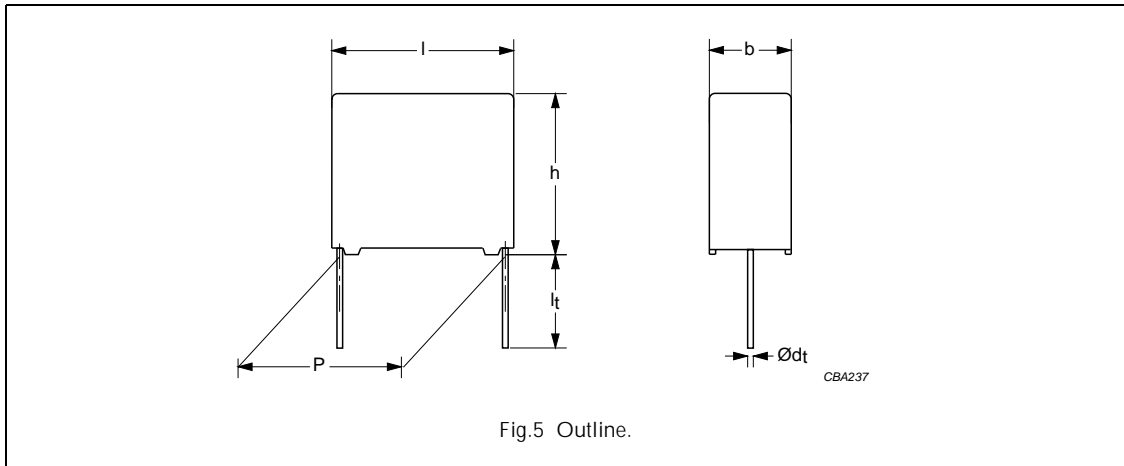
1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm



### Specific reference data for the 250 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.39 $\mu\text{F} < C \leq 0.56 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 $\mu\text{F} < C \leq 0.82 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.82 $\mu\text{F} < C \leq 1.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
1.2 $\mu\text{F} < C \leq 1.8 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 75 \times 10^{-4}$
1.8 $\mu\text{F} < C \leq 2.2 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 85 \times 10^{-4}$
2.2 $\mu\text{F} < C \leq 2.7 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 95 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 250 V (DC):		
P = 22.5 mm		290 V/ $\mu\text{s}$
P = 27.5 mm, for 0.82 $\mu\text{F} < C \leq 2 \mu\text{F}$		190 V/ $\mu\text{s}$
P = 27.5 mm, for 2 $\mu\text{F} < C \leq 2.7 \mu\text{F}$		130 V/ $\mu\text{s}$
R between leads, for $C \leq 1 \mu\text{F}$ at 100 V; 1 minute		$> 100000 \text{ M}\Omega$
RC between leads, for $C > 1 \mu\text{F}$ at 100 V; 1 minute		$> 100000 \text{ s}$
R between leads and case; 100 V; 1 minute		$> 30000 \text{ M}\Omega$
Ionization (AC) voltage (typical value) at 50 pC peak discharge		$> 220 \text{ V}$
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s		400 V; 1 minute
Withstanding (DC) voltage between leads and case		2840 V; 1 minute

### Available 250 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 00...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 01...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 04...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 02...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 250 \text{ V}$ ;  $U_{Rac} = 125 \text{ V}$ ;  $U_{p-p} = 350 \text{ V}$

C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.43	$7.0 \times 16.5 \times 26.0$	3.5	2222 383 00434
0.47	$8.5 \times 18.0 \times 26.0$	4.8	2222 383 00474
0.51			2222 383 00514
0.56			2222 383 00564
0.62			2222 383 00624
0.68	$10.0 \times 19.5 \times 26.0$	6.0	2222 383 00684
0.75			2222 383 00754
0.82			2222 383 00824
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.91	$11.0 \times 21.0 \times 31.0$	8.4	2222 383 00914
1.0			2222 383 00105
1.1			2222 383 00115
1.2			2222 383 00125
1.3	$13.0 \times 23.0 \times 31.0$	11.0	2222 383 00135
1.5			2222 383 00155
1.6			2222 383 00165
1.8	$15.0 \times 25.0 \times 31.0$	13.6	2222 383 00185
2.0			2222 383 00205
2.2	$18.0 \times 28.0 \times 31.0$	18.5	2222 383 00225
2.4			2222 383 00245
2.7			2222 383 00275

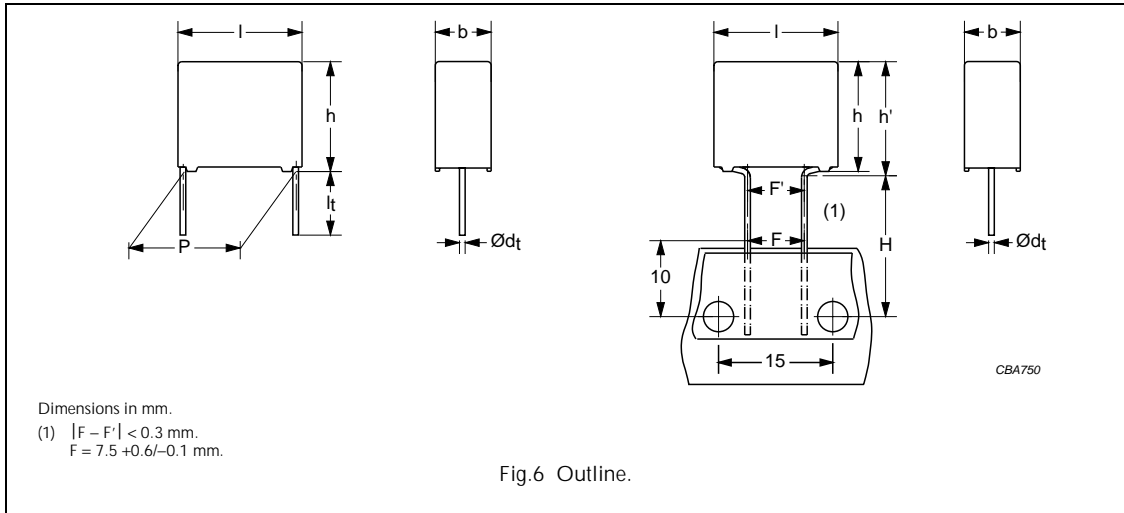


# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



Specific reference data for the 400 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.22 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 400 V (DC): $C \leq 0.082 \mu\text{F}$ $0.082 \mu\text{F} < C \leq 0.22 \mu\text{F}$	600 V/ $\mu\text{s}$ 1200 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 100 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 100 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$>220 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	640 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 400 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 10...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 11...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 14...	on request
Taped on reel	$H = 18.5 \text{ mm}$ ; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 12...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}$ ; $P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 13...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 400 \text{ V}; U_{Rac} = 200 \text{ V}; U_{p-p} = 560 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.047	5.0 × 11.0 (13.0) × 17.5	1.2	2222 383 10473	.. 13473
0.051			2222 383 10513	.. 13513
0.056			2222 383 10563	.. 13563
0.062	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 10623	.. 13623
0.068			2222 383 10683	.. 13683
0.075			2222 383 10753	.. 13753
0.082			2222 383 10823	.. 13823
0.091	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 10913	.. 13913
0.1			2222 383 10104	.. 13104
0.11			2222 383 10114	.. 13114
0.12	8.5 × 15.0 (17.0) × 17.5	2.7	2222 383 10124	.. 13124
0.13			2222 383 10134	.. 13134
0.15			2222 383 10154	.. 13154
0.16			2222 383 10164	.. 13164
0.18	10.0 × 16.5 (18.5) × 17.5	3.3	2222 383 10184	.. 13184
0.2			2222 383 10204	.. 13204
0.22			2222 383 10224	.. 13224

### Note

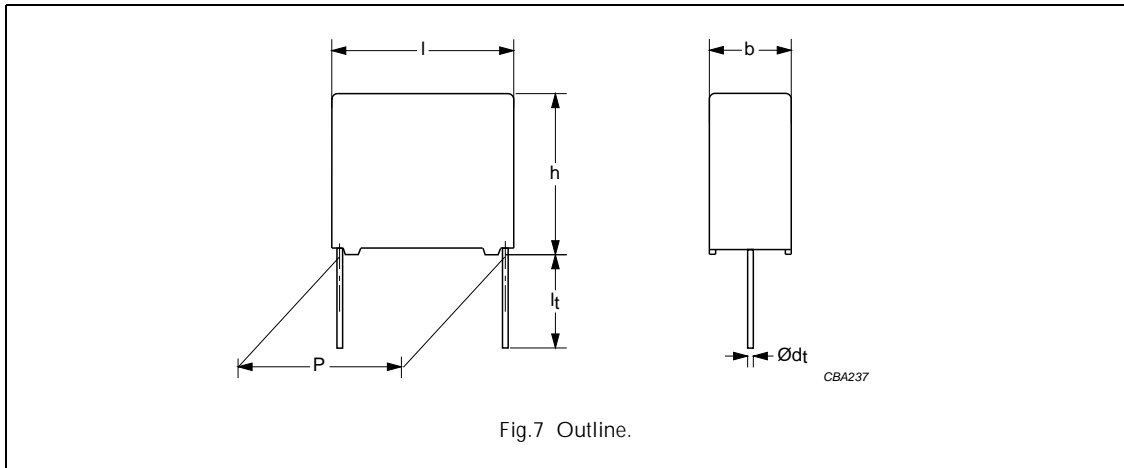
1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm



### Specific reference data for the 400 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.22 $\mu\text{F} < C \leq 0.33 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.33 $\mu\text{F} < C \leq 0.43 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.43 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.68 $\mu\text{F} < C \leq 0.82 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
0.82 $\mu\text{F} < C \leq 1.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
1.2 $\mu\text{F} < C \leq 1.5 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 400 V (DC):		
P = 22.5 mm	410 V/ $\mu\text{s}$	
P = 27.5 mm; for 0.43 $\mu\text{F} < C \leq 1.1 \mu\text{F}$	260 V/ $\mu\text{s}$	
P = 27.5 mm; for 1.1 $\mu\text{F} < C \leq 1.5 \mu\text{F}$	180 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 100 V; 1 minute	$> 100000 \text{ M}\Omega$	
RC between leads, for $C > 1 \mu\text{F}$ at 100 V; 1 minute	$> 100000 \text{ s}$	
R between leads and case; 100 V; 1 minute	$> 30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$> 220 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	640 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 400 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 10...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 11...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 14...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 12...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 400 \text{ V}$ ;  $U_{Rac} = 200 \text{ V}$ ;  $U_{p-p} = 560 \text{ V}$

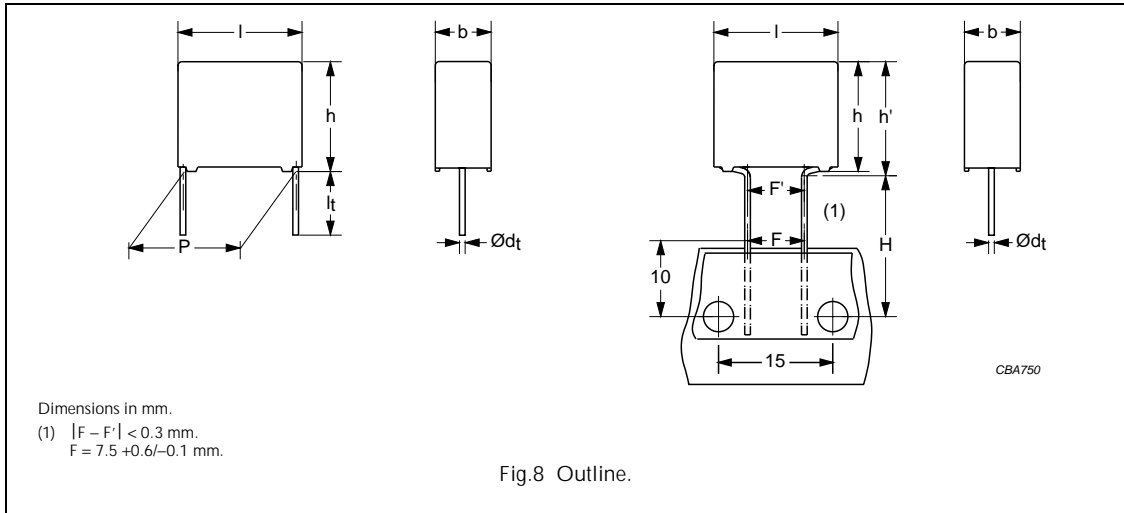
C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.24	$7.0 \times 16.5 \times 26.0$	3.5	2222 383 10244
0.27	$8.5 \times 18.0 \times 26.0$	4.8	2222 383 10274
0.3			2222 383 10304
0.33			2222 383 10334
0.36	$10.0 \times 19.5 \times 26.0$	6.0	2222 383 10364
0.39			2222 383 10394
0.43			2222 383 10434
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.47	$11.0 \times 21.0 \times 31.0$	8.4	2222 383 10474
0.51			2222 383 10514
0.56			2222 383 10564
0.62			2222 383 10624
0.68	$13.0 \times 23.0 \times 31.0$	11.0	2222 383 10684
0.75			2222 383 10754
0.82			2222 383 10824
0.91	$15.0 \times 25.0 \times 31.0$	13.6	2222 383 10914
1			2222 383 10105
1.1			2222 383 10115
1.2	$18.0 \times 28.0 \times 31.0$	18.5	2222 383 10125
1.3			2222 383 10135
1.5			2222 383 10155

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



Specific reference data for the 630 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.15 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 630 V (DC): $C \leq 0.056 \mu\text{F}$ $0.056 \mu\text{F} < C \leq 0.15 \mu\text{F}$	700 V/ $\mu\text{s}$ 1400 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$> 100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$> 30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$> 250 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	1000 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 630 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 20...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 21...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 24...	on request
Taped on reel	$H = 18.5 \text{ mm}$ ; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 22...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}$ ; $P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 23...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 630 \text{ V}; U_{Rac} = 220 \text{ V}; U_{p-p} = 630 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.03	5.0 × 11.0 (13.0) × 17.5	1.2	2222 383 20303	.. 23303
0.033			2222 383 20333	.. 23333
0.036			2222 383 20363	.. 23363
0.039	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 20393	.. 23393
0.043			2222 383 20433	.. 23433
0.047			2222 383 20473	.. 23473
0.051			2222 383 20513	.. 23513
0.056			2222 383 20563	.. 23563
0.062	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 20623	.. 23623
0.068			2222 383 20683	.. 23683
0.075			2222 383 20753	.. 23753
0.082	8.5 × 15.0 (17.0) × 17.5	2.7	2222 383 20823	.. 23823
0.091			2222 383 20913	.. 23913
0.1			2222 383 20104	.. 23104
0.11			2222 383 20114	.. 23114
0.12	10.0 × 16.5 (18.5) × 17.5	3.3	2222 383 20124	.. 23124
0.13			2222 383 20134	.. 23134
0.15			2222 383 20154	.. 23154

### Note

- Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm

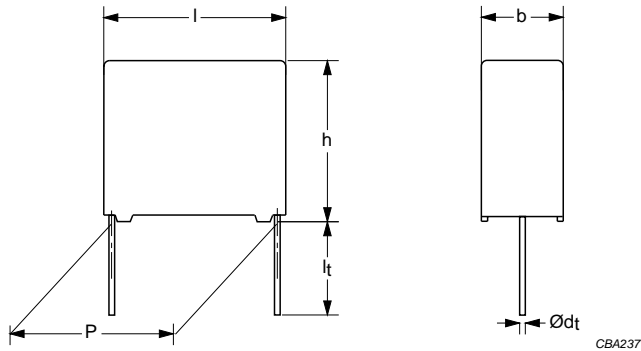


Fig.9 Outline.

### Specific reference data for the 630 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.15 $\mu\text{F} < C \leq 0.22 \mu\text{F}$	$\leq 8 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.22 $\mu\text{F} < C \leq 0.3 \mu\text{F}$	$\leq 8 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.3 $\mu\text{F} < C \leq 0.47 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.47 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.68 $\mu\text{F} < C \leq 1.0 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 630 V (DC):		
P = 22.5 mm	470 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.3 $\mu\text{F} < C \leq 0.75 \mu\text{F}$	300 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.75 $\mu\text{F} < C \leq 1 \mu\text{F}$	210 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$> 100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$> 30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$> 250 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	1000 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 630 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 20...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 21...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 24...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 22...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 630 \text{ V}; U_{Rac} = 220 \text{ V}; U_{p-p} = 630 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.16	8.5 × 18.0 × 26.0	4.8	2222 383 20164
0.18			2222 383 20184
0.2			2222 383 20204
0.22			2222 383 20224
0.24	10.0 × 19.5 × 26.0	6.0	2222 383 20244
0.27			2222 383 20274
0.3			2222 383 20304
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.33	11.0 × 21.0 × 31.0	8.4	2222 383 20334
0.36			2222 383 20364
0.39			2222 383 20394
0.43			2222 383 20434
0.47	13.0 × 23.0 × 31.0	11.0	2222 383 20474
0.51			2222 383 20514
0.56			2222 383 20564
0.62	15.0 × 25.0 × 31.0	13.6	2222 383 20624
0.68			2222 383 20684
0.75			2222 383 20754
0.82	18.0 × 28.0 × 31.0	18.5	2222 383 20824
0.91			2222 383 20914
1			2222 383 20105

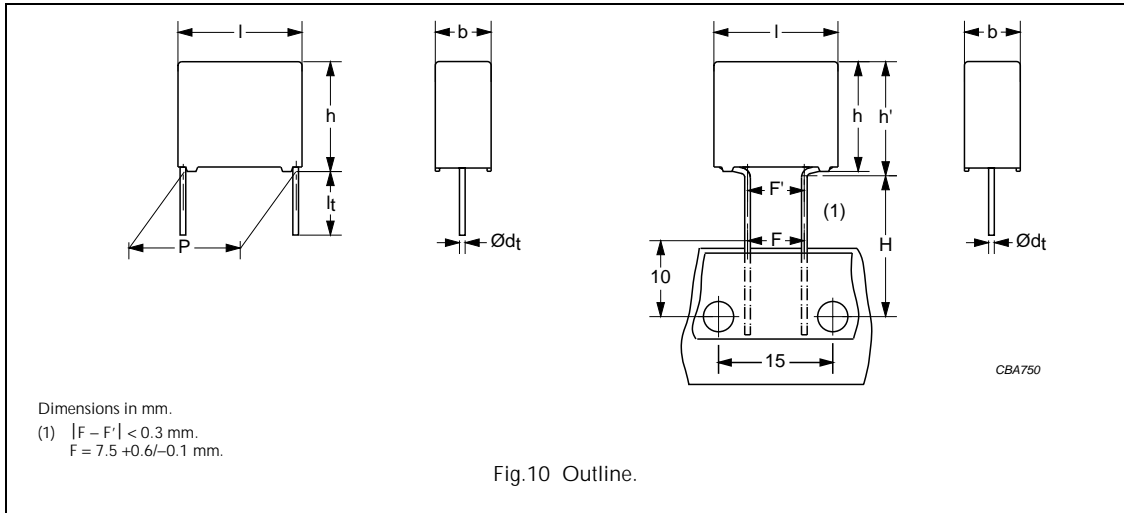


# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



Specific reference data for the 1000 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.062 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1000 V (DC): $C \leq 0.024 \mu\text{F}$ $0.024 \mu\text{F} < C \leq 0.062 \mu\text{F}$	1700 V/ $\mu\text{s}$ 3300 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	$>440 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	1600 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 1000 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 30...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 31...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 34...	on request
Taped on reel	$H = 18.5 \text{ mm}$ ; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 32...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}$ ; $P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 33...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 1000 \text{ V}; U_{Rac} = 350 \text{ V}; U_{p-p} = 1000 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.0043	$5.0 \times 11.0 (13.0) \times 17.5$	1.2	2222 383 30432	.. 33432
0.0047			2222 383 30472	.. 33472
0.0051			2222 383 30512	.. 33512
0.0056			2222 383 30562	.. 33562
0.0062			2222 383 30622	.. 33622
0.0068			2222 383 30682	.. 33682
0.0075			2222 383 30752	.. 33752
0.0082			2222 383 30822	.. 33822
0.0091			2222 383 30912	.. 33912
0.010			2222 383 30103	.. 33103
0.011			2222 383 30113	.. 33113
0.012			2222 383 30123	.. 33123
0.013			2222 383 30133	.. 33133
0.015			2222 383 30153	.. 33153
0.016	2222 383 30163	.. 33163		
0.018	$6.0 \times 12.0 (14.0) \times 17.5$	1.5	2222 383 30183	.. 33183
0.02			2222 383 30203	.. 33203
0.022			2222 383 30223	.. 33223
0.024			2222 383 30243	.. 33243
0.027	$7.0 \times 13.5 (15.5) \times 17.5$	2.0	2222 383 30273	.. 33273
0.03			2222 383 30303	.. 33303
0.033			2222 383 30333	.. 33333
0.036	$8.5 \times 15.0 (17.0) \times 17.5$	2.7	2222 383 30363	.. 33363
0.039			2222 383 30393	.. 33393
0.043			2222 383 30433	.. 33433
0.047			2222 383 30473	.. 33473
0.051	$10.0 \times 16.5 (18.5) \times 17.5$	3.3	2222 383 30513	.. 33513
0.056			2222 383 30563	.. 33563
0.062			2222 383 30623	.. 33623

### Note

1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm

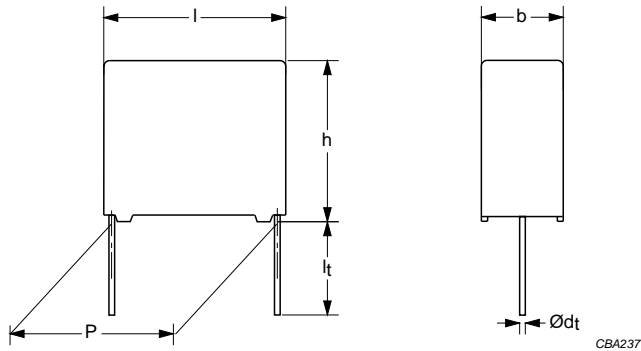


Fig.11 Outline.

### Specific reference data for the 1000 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.062 $\mu\text{F}$ < C $\leq$ 0.13 $\mu\text{F}$	$\leq 6 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.13 $\mu\text{F}$ < C $\leq$ 0.22 $\mu\text{F}$	$\leq 8 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.22 $\mu\text{F}$ < C $\leq$ 0.33 $\mu\text{F}$	$\leq 8 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.33 $\mu\text{F}$ < C $\leq$ 0.47 $\mu\text{F}$	$\leq 8 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) <sub>R</sub> at 1000 V (DC):		
P = 22.5 mm	1200 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.13 $\mu\text{F}$ < C $\leq$ 0.33 $\mu\text{F}$	700 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.33 $\mu\text{F}$ < C $\leq$ 0.47 $\mu\text{F}$	470 V/ $\mu\text{s}$	
R between leads, for C $\leq$ 1 $\mu\text{F}$ at 500 V; 1 minute	>100000 M $\Omega$	
R between leads and case; 500 V; 1 minute	>30000 M $\Omega$	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	>440 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	1600 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 1000 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3$ mm	$\pm 5\%$	2222 383 30...	preferred
	$l_t = 5.0 \pm 1.0$ mm	$\pm 5\%$	2222 383 31...	on request
	$l_t = 25.0 \pm 2.0$ mm	$\pm 5\%$	2222 383 34...	on request
Taped on reel	H = 18.5 mm; P <sub>0</sub> = 12.7 mm	$\pm 5\%$	2222 383 32...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 1000 \text{ V}$ ;  $U_{Rac} = 350 \text{ V}$ ;  $U_{p-p} = 1000 \text{ V}$

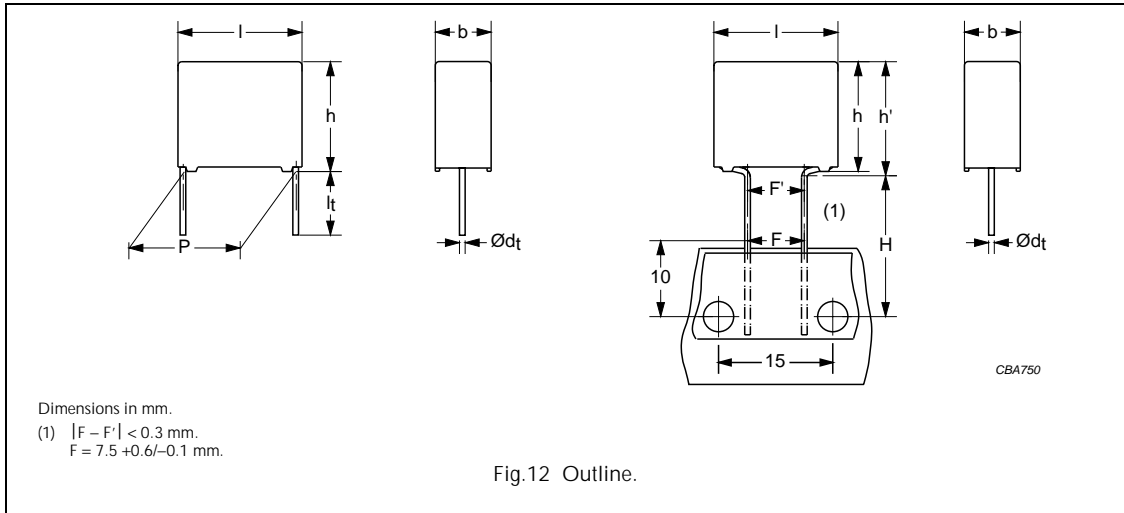
C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.068	$7.0 \times 16.5 \times 26.0$	3.5	2222 383 30683
0.075	$8.5 \times 18.0 \times 26.0$	4.8	2222 383 30753
0.082			2222 383 30823
0.091			2222 383 30913
0.1	$10.0 \times 19.5 \times 26.0$	6.0	2222 383 30104
0.11			2222 383 30114
0.12			2222 383 30124
0.13			2222 383 30134
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.15	$11.0 \times 21.0 \times 31.0$	8.4	2222 383 30154
0.16			2222 383 30164
0.18			2222 383 30184
0.2	$13.0 \times 23.0 \times 31.0$	11.0	2222 383 30204
0.22			2222 383 30224
0.24			2222 383 30244
0.27	$15.0 \times 25.0 \times 31.0$	13.6	2222 383 30274
0.3			2222 383 30304
0.33			2222 383 30334
0.36	$18.0 \times 28.0 \times 31.0$	18.5	2222 383 30364
0.39			2222 383 30394
0.43			2222 383 30434
0.47			2222 383 30474

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



### Specific reference data for the 1400 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.016 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 10 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1400 V (DC): $C \leq 0.0056 \mu\text{F}$ $0.0056 \mu\text{F} < C \leq 0.016 \mu\text{F}$	8000 V/ $\mu\text{s}$ 15000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>500 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2250 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 1400 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 40...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 41...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 44...	on request
Taped on reel	$H = 18.5 \text{ mm}$ ; for $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 42...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}$ ; for $P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 43...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 1400 \text{ V}; U_{Rac} = 500 \text{ V}; U_{p-p} = 1400 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.0022	5.0 × 11.0 (13.0) × 17.5	1.2	2222 383 40222	.. 43222
0.0024			2222 383 40242	.. 43242
0.0027			2222 383 40272	.. 43272
0.003			2222 383 40302	.. 43302
0.0033			2222 383 40332	.. 43332
0.0036			2222 383 40362	.. 43362
0.0039			2222 383 40392	.. 43392
0.0043	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 40432	.. 43432
0.0047			2222 383 40472	.. 43472
0.0051			2222 383 40512	.. 43512
0.0056			2222 383 40562	.. 43562
0.0062	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 40622	.. 43622
0.0068			2222 383 40682	.. 43682
0.0075			2222 383 40752	.. 43752
0.0082			2222 383 40822	.. 43822
0.0091	8.5 × 15.0 (17.0) × 17.5	2.7	2222 383 40912	.. 43912
0.01			2222 383 40103	.. 43103
0.011			2222 383 40113	.. 43113
0.012			2222 383 40123	.. 43123
0.013	10.0 × 16.5 (18.5) × 17.5	3.3	2222 383 40133	.. 43133
0.015			2222 383 40153	.. 43153
0.016			2222 383 40163	.. 43163

### Note

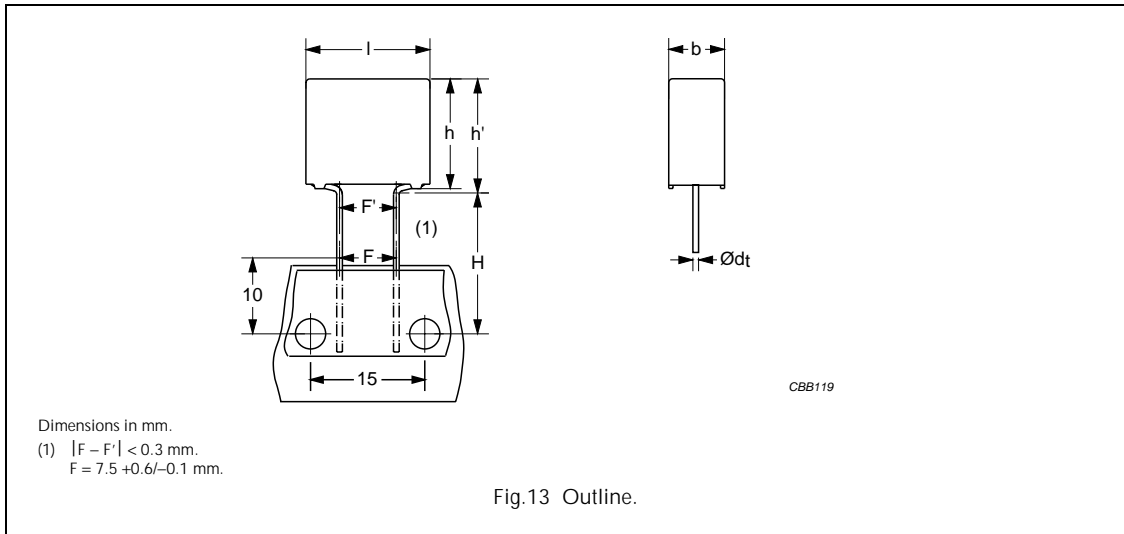
1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 7.5 mm (bent back leads)



Specific reference data for the 1400 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.016 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 10 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1400 V (DC): $C \leq 0.0056 \mu\text{F}$ $0.0056 \mu\text{F} < C \leq 0.0082 \mu\text{F}$	8000 V/ $\mu\text{s}$ 15000 V/ $\mu\text{s}$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>500 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2250 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 1400 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Taped on reel (bent back)	$H = 16.0 \text{ mm; for } P_0 = 15.0 \text{ mm;}$ reel diameter = 356 mm for hot asphalt encapsulation	$\pm 5\%$	2222 383 46...	on request

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 1400 \text{ V}$ ;  $U_{Rac} = 500 \text{ V}$ ;  $U_{p-p} = 1400 \text{ V}$  (for hot asphalt encapsulation)

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> b × h (h') × l (mm)	MASS (g)	CATALOGUE NUMBER
			REEL DIAMETER = 356 mm
			H = 16.0 mm; P <sub>0</sub> = 15.0 mm
			C-tol = ±5%
Pitch = 15.0 ±0.4 mm; d <sub>t</sub> = 0.80 ±0.08 mm		pitch = 7.5 mm (bent back)	
0.0022	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 46222
0.0024			2222 383 46242
0.0027			2222 383 46272
0.003			2222 383 46302
0.0033			2222 383 46332
0.0036			2222 383 46362
0.0039			2222 383 46392
0.0043	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 46432
0.0047			2222 383 46472
0.0051			2222 383 46512
0.0056			2222 383 46562
0.0062			2222 383 46622
0.0068			2222 383 46682
0.0075			2222 383 46752
0.0082			2222 383 46822

### Note

- Dimensions in brackets for bent back leads.



# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm

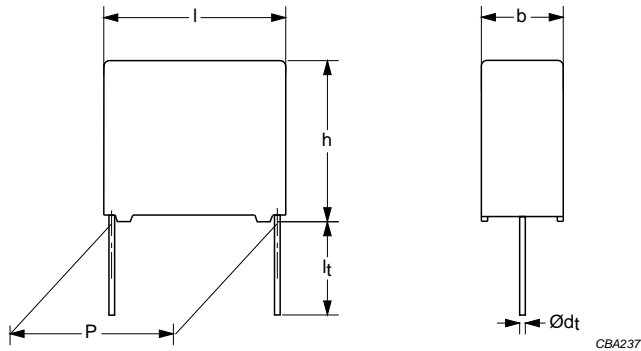


Fig.14 Outline.

### Specific reference data for the 1400 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.016 $\mu\text{F}$ < C $\leq$ 0.039 $\mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
0.039 $\mu\text{F}$ < C $\leq$ 0.13 $\mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) <sub>R</sub> at 1400 V (DC):		
P = 22.5 mm	4000 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.039 $\mu\text{F}$ < C $\leq$ 0.1 $\mu\text{F}$	2100 V/ $\mu\text{s}$	
P = 27.5 mm, for 0.1 $\mu\text{F}$ < C $\leq$ 0.13 $\mu\text{F}$	1500 V/ $\mu\text{s}$	
R between leads, for C $\leq$ 1 $\mu\text{F}$ at 500 V; 1 minute	>100000 M $\Omega$	
R between leads and case; 500 V; 1 minute	>30000 M $\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	>500 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2250 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 1400 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_1 = 3.5 \pm 0.3$ mm	$\pm 5\%$	2222 383 40...	preferred
	$l_1 = 5.0 \pm 1.0$ mm	$\pm 5\%$	2222 383 41...	on request
	$l_1 = 25.0 \pm 2.0$ mm	$\pm 5\%$	2222 383 44...	on request
Taped on reel	H = 18.5 mm; P <sub>0</sub> = 12.7 mm	$\pm 5\%$	2222 383 42...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 1400 \text{ V}$ ;  $U_{Rac} = 500 \text{ V}$ ;  $U_{p-p} = 1400 \text{ V}$

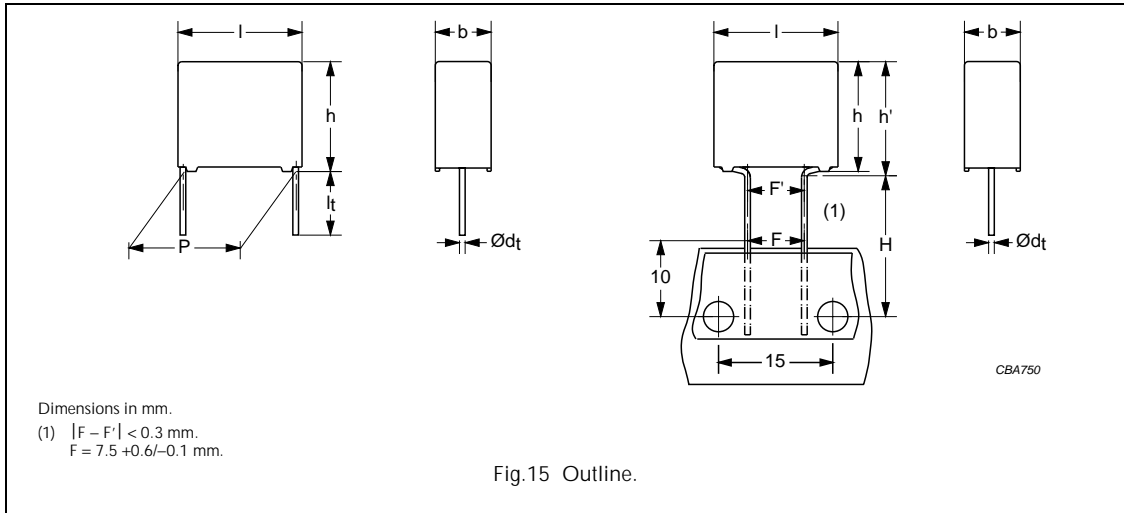
C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.018	7.0 × 16.5 × 26.0	3.5	2222 383 40183
0.02			2222 383 40203
0.022	8.5 × 18.0 × 26.0	4.8	2222 383 40223
0.024			2222 383 40243
0.027			2222 383 40273
0.03	10.0 × 19.5 × 26.0	6.0	2222 383 40303
0.033			2222 383 40333
0.036			2222 383 40363
0.039			2222 383 40393
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.043	11.0 × 21.0 × 31.0	8.4	2222 383 40433
0.047			2222 383 40473
0.051			2222 383 40513
0.056			2222 383 40563
0.062	13.0 × 23.0 × 31.0	11.0	2222 383 40623
0.068			2222 383 40683
0.075			2222 383 40753
0.082	15.0 × 25.0 × 31.0	13.6	2222 383 40823
0.091			2222 383 40913
0.1			2222 383 40104
0.11	18.0 × 28.0 × 31.0	11.0	2222 383 40114
0.12			2222 383 40124
0.13			2222 383 40134

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

**MMKP 383 GENERAL DATA**

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



**Specific reference data for the 1600 V DC capacitors**

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.015 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1600 V (DC): $C \leq 0.0056 \mu\text{F}$ $0.0056 \mu\text{F} < C \leq 0.015 \mu\text{F}$	8000 V/ $\mu\text{s}$ 15000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$> 100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$> 30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$> 660 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2560 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

**Available 1600 V DC versions**

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 50...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 51...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 54...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 52...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 53...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 1600 \text{ V}; U_{Rac} = 550 \text{ V}; U_{p-p} = 1600 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.0027	5.0 × 11.0 (13.0) × 17.5	1.2	2222 383 50272	.. 53272
0.003			2222 383 50302	.. 53302
0.0033			2222 383 50332	.. 53332
0.0036			2222 383 50362	.. 53362
0.0039			2222 383 50392	.. 53392
0.0043	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 50432	.. 53432
0.0047			2222 383 50472	.. 53472
0.0051			2222 383 50512	.. 53512
0.0056			2222 383 50562	.. 53562
0.0062	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 50622	.. 53622
0.0068			2222 383 50682	.. 53682
0.0075			2222 383 50752	.. 53752
0.0082	8.5 × 15.0 (17.0) × 17.5	2.7	2222 383 50822	.. 53822
0.0091			2222 383 50912	.. 53912
0.01			2222 383 50103	.. 53103
0.011			2222 383 50113	.. 53113
0.012	10.0 × 16.5 (18.5) × 17.5	3.3	2222 383 50123	.. 53123
0.013			2222 383 50133	.. 53133
0.015			2222 383 50153	.. 53153

### Note

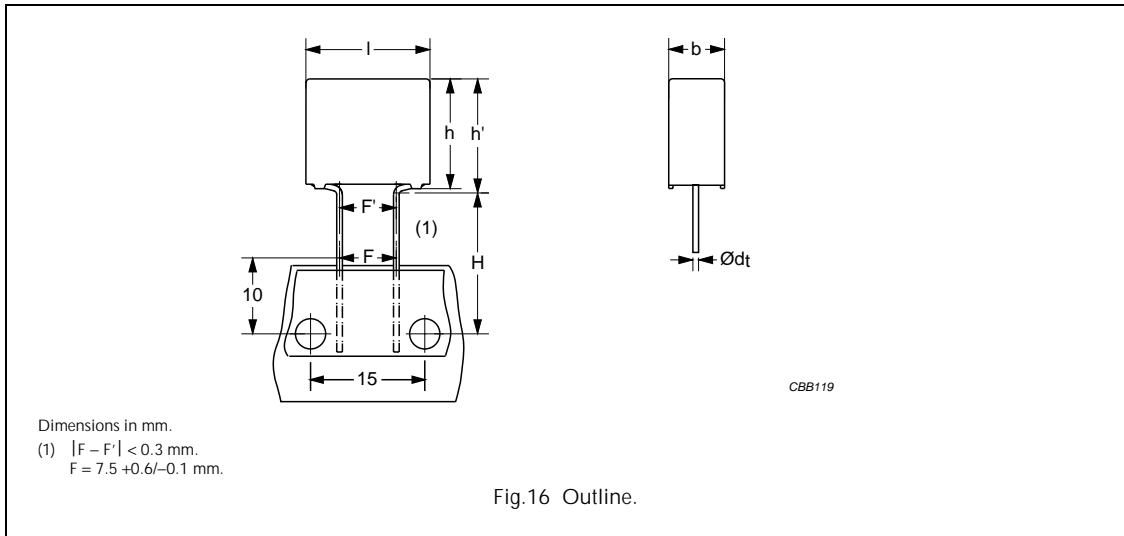
- Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

**MMKP 383 GENERAL DATA**

PITCH 7.5 mm (bent back leads)



**Specific reference data for the 1600 V DC capacitors (for hot asphalt encapsulation)**

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.015 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1600 V (DC): $C \leq 0.0056 \mu\text{F}$ $0.0056 \mu\text{F} < C \leq 0.0075 \mu\text{F}$	8000 V/ $\mu\text{s}$ 15000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>660 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2560 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

**Available 1600 V DC versions**

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Taped on reel (bent back)	H = 16.0 mm; $P_0 = 15.0 \text{ mm}$ ; reel diameter = 356 mm for hot asphalt encapsulation	$\pm 5\%$	2222 383 56...	on request

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 1600 \text{ V}$ ;  $U_{Rac} = 550 \text{ V}$ ;  $U_{p-p} = 1600 \text{ V}$  (for hot asphalt encapsulation)

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			REEL DIAMETER = 356 mm
			H = 16.0 mm; P <sub>o</sub> = 15.0 mm
			C-tol = $\pm 5\%$
Pitch = 15.0 $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 $\pm$ 0.08 mm		pitch = 7.5 mm (bent back)	
0.0027	6.0 $\times$ 12.0 (14.0) $\times$ 17.5	1.5	2222 383 56272
0.003			2222 383 56302
0.0033			2222 383 56332
0.0036			2222 383 56362
0.0039			2222 383 56392
0.0043	7.0 $\times$ 13.5 (15.5) $\times$ 17.5	2.0	2222 383 56432
0.0047			2222 383 56472
0.0051			2222 383 56512
0.0056			2222 383 56562
0.0062			2222 383 56622
0.0068			2222 383 56682
0.0075			2222 383 56752

### Note

- Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm

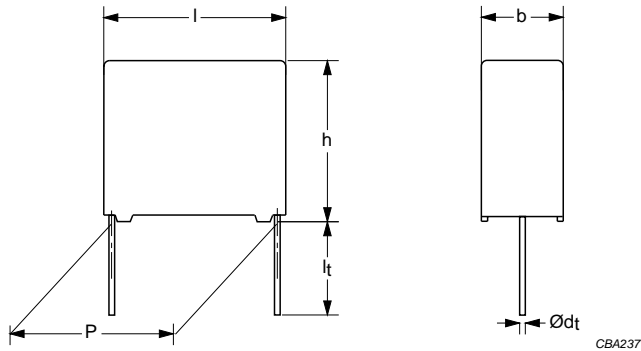


Fig.17 Outline.

### Specific reference data for the 1600 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $0.015 \mu\text{F} < C \leq 0.15 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 1600 V (DC): P = 22.5 mm P = 27.5 mm, for $0.039 \mu\text{F} < C \leq 0.1 \mu\text{F}$ P = 27.5 mm; for $0.1 \mu\text{F} < C \leq 0.15 \mu\text{F}$	3100 V/ $\mu\text{s}$ 1800 V/ $\mu\text{s}$ 1200 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	>100000 M $\Omega$	
R between leads and case; 500 V; 1 minute	>30000 M $\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	>660 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	2560 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 1600 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 50...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 51...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 54...	on request
Taped on reel	H = 18.5 mm; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 52...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 1600 \text{ V}$ ;  $U_{Rac} = 550 \text{ V}$ ;  $U_{p-p} = 1600 \text{ V}$

C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	
			$l_t = 3.5 \pm 0.3 \text{ mm}$	
			C-tol = $\pm 5\%$	
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>				
0.016	7.0 × 16.5 × 26.0	3.5	2222 383 50163	
0.018			2222 383 50183	
0.02			2222 383 50203	
0.022	8.5 × 18.0 × 26.0	4.8	2222 383 50223	
0.024			2222 383 50243	
0.027			2222 383 50273	
0.03			2222 383 50303	
0.033	10.0 × 19.5 × 26.0	6.0	2222 383 50333	
0.036			2222 383 50363	
0.039			2222 383 50393	
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>				
0.043	11.0 × 21.0 × 31.0	8.4	2222 383 50433	
0.047			2222 383 50473	
0.051			2222 383 50513	
0.056			2222 383 50563	
0.062	13.0 × 23.0 × 31.0	11.0	2222 383 50623	
0.068			2222 383 50683	
0.075			2222 383 50753	
0.082	15.0 × 25.0 × 31.0	13.6	2222 383 50823	
0.091			2222 383 50913	
0.1			2222 383 50104	
0.11	18.0 × 28.0 × 31.0	18.5	2222 383 50114	
0.12			2222 383 50124	
0.13			2222 383 50134	
0.15			2222 383 50154	

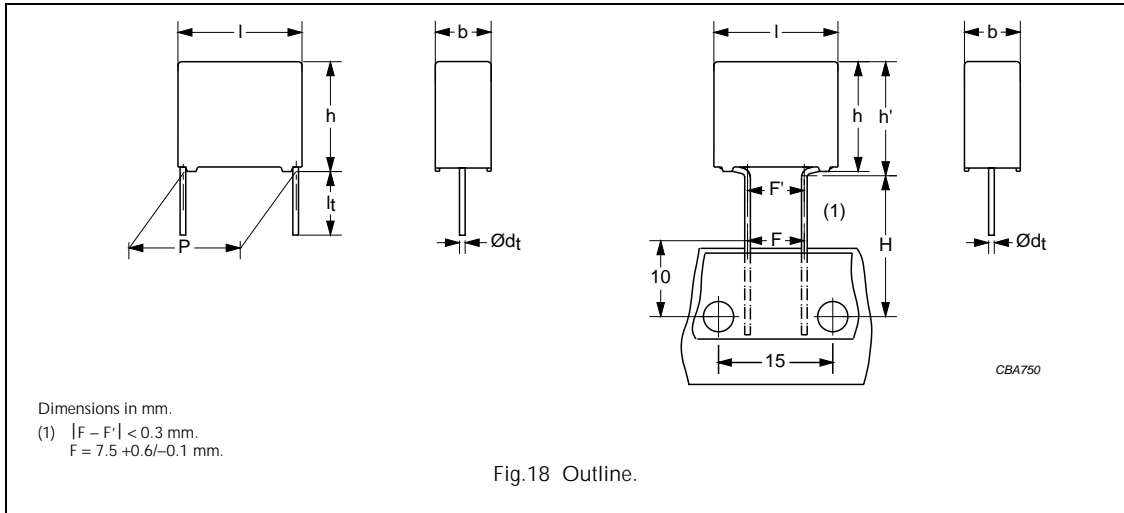


# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 15 mm  
PITCH 7.5 mm (bent back leads)



Specific reference data for the 2000 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.01 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 2000 V (DC): $C \leq 0.0036 \mu\text{F}$ $0.0036 \mu\text{F} < C \leq 0.01 \mu\text{F}$	11000 V/ $\mu\text{s}$ 20000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>750 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	3200 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 2000 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 60...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 61...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 64...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 62...	on request
Taped on reel (bent back)	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$	$\pm 5\%$	2222 383 63...	preferred

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 2000 \text{ V}; U_{Rac} = 700 \text{ V}; U_{p-p} = 2000 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER	
			LOOSE IN BOX	REEL DIAMETER = 500 mm
			$l_t = 3.5 \pm 0.3 \text{ mm}$	$H = 16.0 \text{ mm}; P_0 = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$	C-tol = $\pm 5\%$
			catalogue number	last 5 digits
Pitch = $15.0 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			pitch = 7.5 mm (bent back)	
0.001	$5.0 \times 11.0 (13.0) \times 17.5$	1.2	2222 383 60102	.. 63102
0.0011			2222 383 60112	.. 63112
0.0012			2222 383 60122	.. 63122
0.0013			2222 383 60132	.. 63132
0.0015			2222 383 60152	.. 63152
0.0016			2222 383 60162	.. 63162
0.0018			2222 383 60182	.. 63182
0.002			2222 383 60202	.. 63202
0.0022			2222 383 60222	.. 63222
0.0024			2222 383 60242	.. 63242
0.0027	$6.0 \times 12.0 (14.0) \times 17.5$	1.5	2222 383 60272	.. 63272
0.003			2222 383 60302	.. 63302
0.0033			2222 383 60332	.. 63332
0.0036			2222 383 60362	.. 63362
0.0039	$7.0 \times 13.5 (15.5) \times 17.5$	2.0	2222 383 60392	.. 63392
0.0043			2222 383 60432	.. 63432
0.0047			2222 383 60472	.. 63472
0.0051	$8.5 \times 15.0 (17.0) \times 17.5$	2.7	2222 383 60512	.. 63512
0.0056			2222 383 60562	.. 63562
0.0062			2222 383 60622	.. 63622
0.0068			2222 383 60682	.. 63682
0.0075	$10.0 \times 16.5 (18.5) \times 17.5$	3.3	2222 383 60752	.. 63752
0.0082			2222 383 60822	.. 63822
0.0091			2222 383 60912	.. 63912
0.01			2222 383 60103	.. 63103

### Note

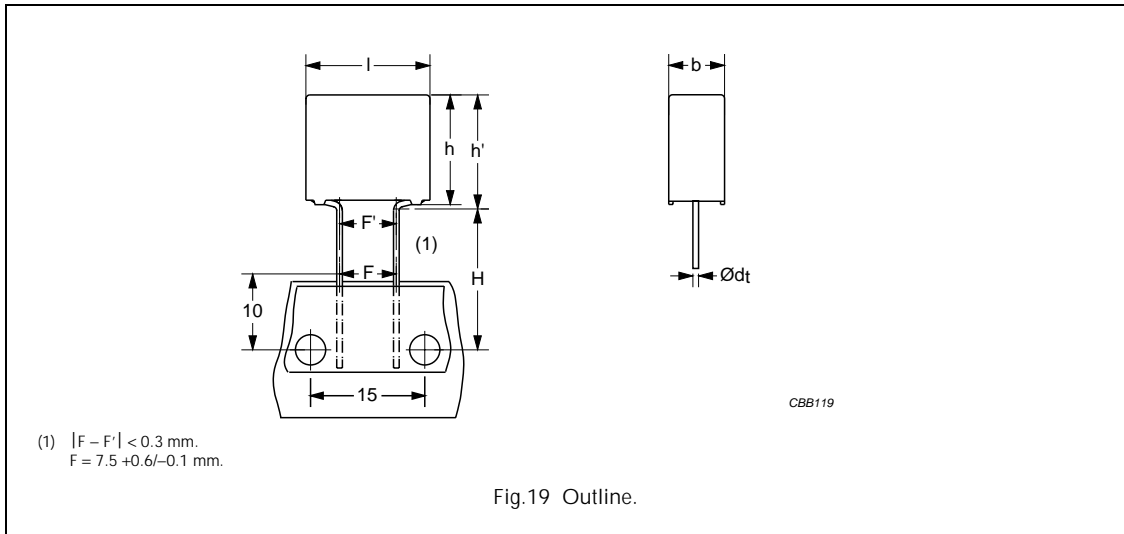
1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 7.5 mm (bent back leads)



Specific reference data for the 2000 V DC capacitors (for hot asphalt encapsulation)

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.01 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 2000 V (DC): $C \leq 0.0036 \mu\text{F}$ $0.0036 \mu\text{F} < C \leq 0.0047 \mu\text{F}$	11000 V/ $\mu\text{s}$ 20000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>750 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	3200 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

Available 2000 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Taped on reel (bent back)	H = 16.0 mm; $P_0 = 15.0 \text{ mm}$ ; reel diameter = 356 mm for hot asphalt encapsulation	$\pm 5\%$	2222 383 66...	on request

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 2000 \text{ V}$ ;  $U_{Rac} = 700 \text{ V}$ ;  $U_{p-p} = 2000 \text{ V}$  (for hot asphalt encapsulation)

C ( $\mu\text{F}$ )	DIMENSIONS <sup>(1)</sup> $b \times h (h') \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			REEL DIAMETER = 356 mm; H = 16.0 mm; $P_o = 15.0 \text{ mm}$
			C-tol = $\pm 5\%$
Pitch = $15.0 \pm 0.4 \text{ mm}$ ; $d_t = 0.80 \pm 0.08 \text{ mm}$		pitch = 7.5 mm (bent back)	
0.001	6.0 × 12.0 (14.0) × 17.5	1.5	2222 383 66102
0.0011			2222 383 66112
0.0012			2222 383 66122
0.0013			2222 383 66132
0.0015			2222 383 66152
0.0016			2222 383 66162
0.0018			2222 383 66182
0.002			2222 383 66202
0.0022			2222 383 66222
0.0024			2222 383 66242
0.0027	7.0 × 13.5 (15.5) × 17.5	2.0	2222 383 66272
0.003			2222 383 66302
0.0033			2222 383 66332
0.0036			2222 383 66362
0.0039			2222 383 66392
0.0043			2222 383 66432
0.0047	2222 383 66472		

### Note

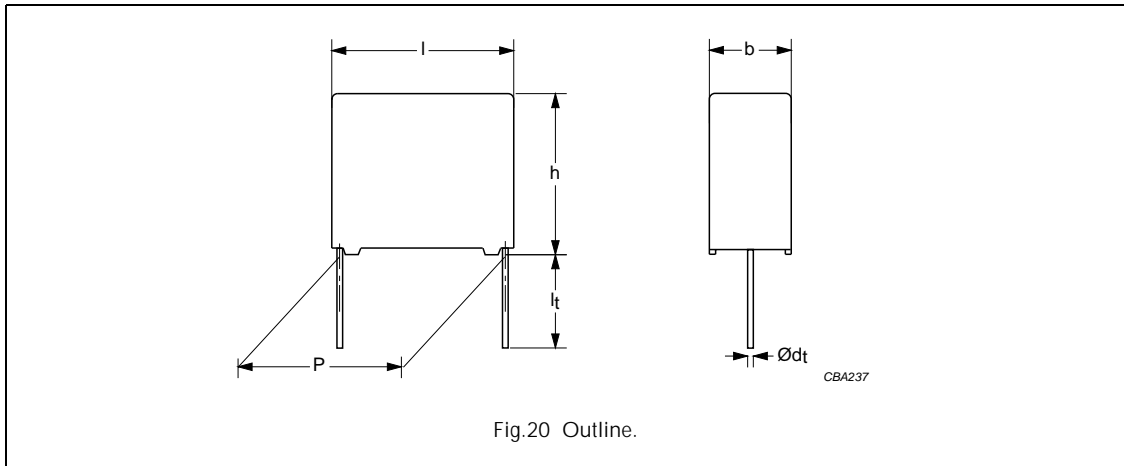
1. Dimensions in brackets for bent back leads.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5/27.5 mm



### Specific reference data for the 2000 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $0.01 \mu\text{F} < C \leq 0.1 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 18 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 2000 V (DC): P = 22.5 mm P = 27.5 mm, for $0.024 \mu\text{F} < C \leq 0.068 \mu\text{F}$ P = 27.5 mm, for $0.068 \mu\text{F} < C \leq 0.1 \mu\text{F}$	4400 V/ $\mu\text{s}$ 2500 V/ $\mu\text{s}$ 1800 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	>100000 M $\Omega$	
R between leads and case; 500 V; 1 minute	>30000 M $\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	>750 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	3200 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 2000 V DC versions

PACKAGING <sup>(1)</sup>	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 60...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 61...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 64...	on request
Taped on reel	H = 18.5 mm; $P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 62...	on request

### Note

1. Taped on reel pitch = 27.5 mm is not available.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 2000 \text{ V}$ ;  $U_{Rac} = 700 \text{ V}$ ;  $U_{p-p} = 2000 \text{ V}$

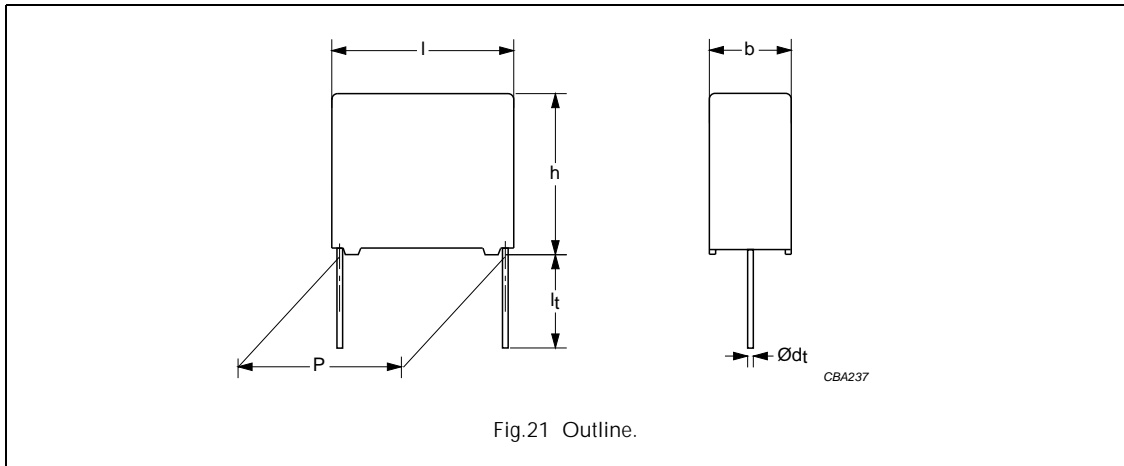
C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
<b>Pitch = <math>22.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.011	7.0 × 16.5 × 26.0	3.5	2222 383 60113
0.012			2222 383 60123
0.013			2222 383 60133
0.015	8.5 × 18.0 × 26.0	4.8	2222 383 60153
0.016			2222 383 60163
0.018			2222 383 60183
0.02	10.0 × 19.5 × 26.0	6.0	2222 383 60203
0.022			2222 383 60223
0.024			2222 383 60243
<b>Pitch = <math>27.5 \pm 0.4 \text{ mm}</math>; <math>d_t = 0.80 \pm 0.08 \text{ mm}</math></b>			
0.027	11.0 × 21.0 × 31.0	8.4	2222 383 60273
0.03			2222 383 60303
0.033			2222 383 60333
0.036			2222 383 60363
0.039			2222 383 60393
0.043	13.0 × 23.0 × 31.0	11.0	2222 383 60433
0.047			2222 383 60473
0.051			2222 383 60513
0.056	15.0 × 25.0 × 31.0	13.6	2222 383 60563
0.062			2222 383 60623
0.068			2222 383 60683
0.075	18.0 × 28.0 × 31.0	18.5	2222 383 60753
0.082			2222 383 60823
0.091			2222 383 60913
0.1			2222 383 60104

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 22.5 mm



### Specific reference data for the 2500 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.015 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 10 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 2500 V (DC)	13000 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	$>100000 \text{ M}\Omega$	
R between leads and case; 500 V; 1 minute	$>30000 \text{ M}\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	$>1000 \text{ V}$	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	3500 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 2500 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 70...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 71...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 74...	on request
Taped on reel	$H = 18.5 \text{ mm}; P_0 = 12.7 \text{ mm}$	$\pm 5\%$	2222 383 72...	on request

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

 $U_{Rdc} = 2500 \text{ V}; U_{Rac} = 900 \text{ V}; U_{p-p} = 2500 \text{ V}$ 

C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
Pitch = $22.5 \pm 0.4 \text{ mm}; d_t = 0.80 \pm 0.08 \text{ mm}$			
0.001	$6.0 \times 15.5 \times 26.0$	3.0	2222 383 70102
0.0011			2222 383 70112
0.0012			2222 383 70122
0.0013			2222 383 70132
0.0015			2222 383 70152
0.0016			2222 383 70162
0.0018			2222 383 70182
0.002			2222 383 70202
0.0022			2222 383 70222
0.0024			2222 383 70242
0.0027			2222 383 70272
0.003			2222 383 70302
0.0033			2222 383 70332
0.0036			2222 383 70362
0.0039			2222 383 70392
0.0043			2222 383 70432
0.0047	2222 383 70472		
0.0051	2222 383 70512		
0.0056	2222 383 70562		
0.0062	$7.0 \times 16.5 \times 26.0$	3.5	2222 383 70622
0.0068			2222 383 70682
0.0075			2222 383 70752
0.0082	$8.5 \times 18.0 \times 26.0$	4.8	2222 383 70822
0.0091			2222 383 70912
0.01			2222 383 70103
0.011			2222 383 70113
0.012	$10.0 \times 19.5 \times 26.0$	6.0	2222 383 70123
0.013			2222 383 70133
0.015			2222 383 70153

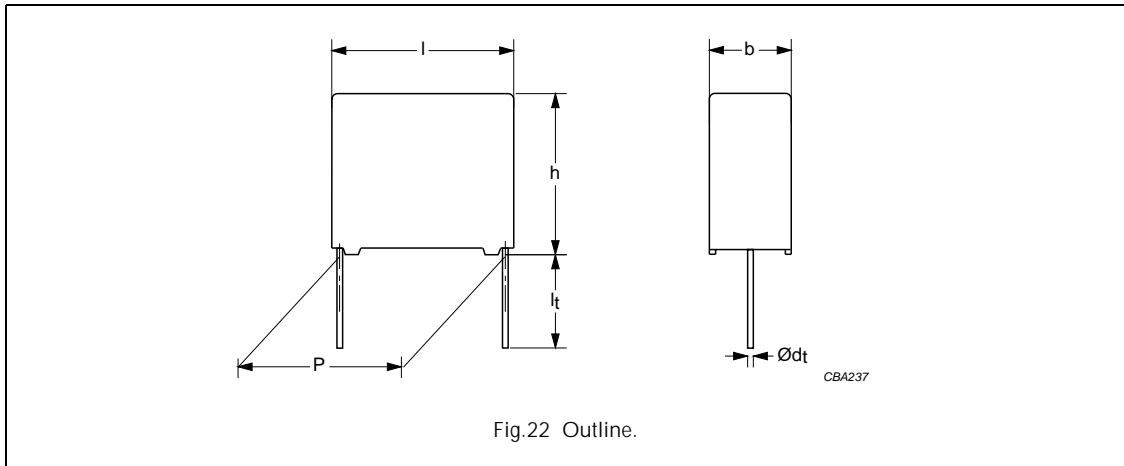


# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

MMKP 383 GENERAL DATA

PITCH 27.5 mm



### Specific reference data for the 2500 V DC capacitors

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle: $0.015 \mu\text{F} < C \leq 0.056 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at 2500 V (DC): P = 27.5 mm, for $0.015 \mu\text{F} < C \leq 0.043 \mu\text{F}$ P = 27.5 mm, for $0.043 \mu\text{F} < C \leq 0.056 \mu\text{F}$	6000 V/ $\mu\text{s}$ 4200 V/ $\mu\text{s}$	
R between leads, for $C \leq 1 \mu\text{F}$ at 500 V; 1 minute	>100000 M $\Omega$	
R between leads and case; 500 V; 1 minute	>30000 M $\Omega$	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	>1000 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	3500 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

### Available 2500 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Loose in box	$l_t = 3.5 \pm 0.3 \text{ mm}$	$\pm 5\%$	2222 383 70...	preferred
	$l_t = 5.0 \pm 1.0 \text{ mm}$	$\pm 5\%$	2222 383 71...	on request
	$l_t = 25.0 \pm 2.0 \text{ mm}$	$\pm 5\%$	2222 383 74...	on request

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

$U_{Rdc} = 2500 \text{ V}$ ;  $U_{Rac} = 900 \text{ V}$ ;  $U_{p-p} = 2500 \text{ V}$

C ( $\mu\text{F}$ )	DIMENSIONS $b \times h \times l$ (mm)	MASS (g)	CATALOGUE NUMBER
			LOOSE IN BOX
			$l_t = 3.5 \pm 0.3 \text{ mm}$
			C-tol = $\pm 5\%$
Pitch = $27.5 \pm 0.4 \text{ mm}$ ; $d_t = 0.80 \pm 0.08 \text{ mm}$			
0.016	$9.0 \times 19.0 \times 31.0$	6.0	2222 383 70163
0.018	$11.0 \times 21.0 \times 31.0$	8.4	2222 383 70183
0.02			2222 383 70203
0.022			2222 383 70223
0.024			2222 383 70243
0.027	$13.0 \times 23.0 \times 31.0$	11.0	2222 383 70273
0.03			2222 383 70303
0.033			2222 383 70333
0.036	$15.0 \times 25.0 \times 31.0$	13.6	2222 383 70363
0.039			2222 383 70393
0.043			2222 383 70433
0.047	$18.0 \times 28.0 \times 31.0$	18.5	2222 383 70473
0.051			2222 383 70513
0.056			2222 383 70563

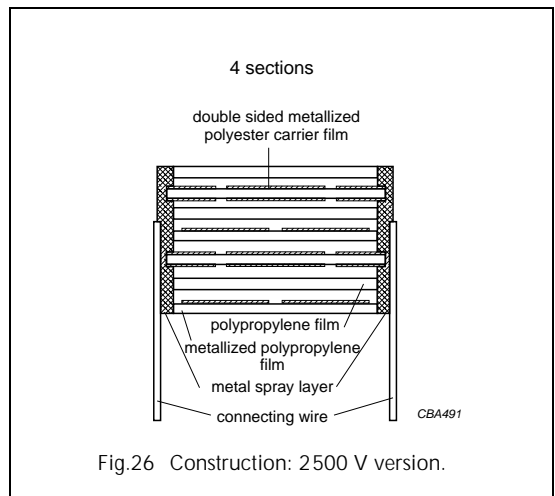
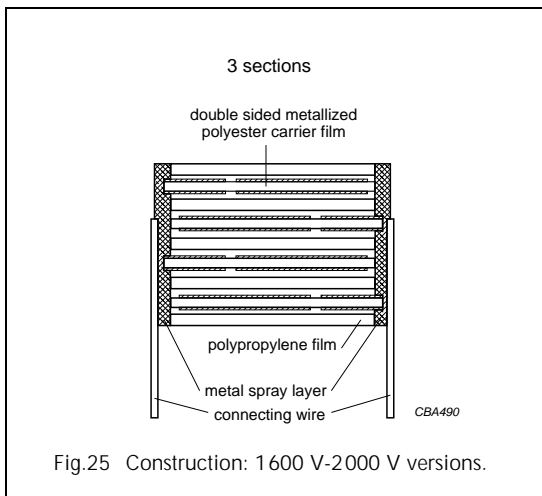
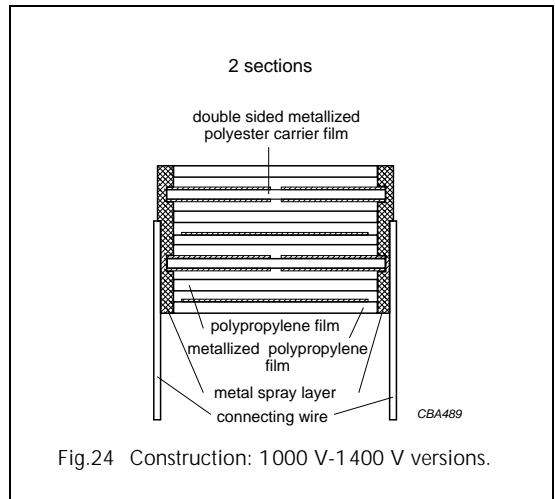
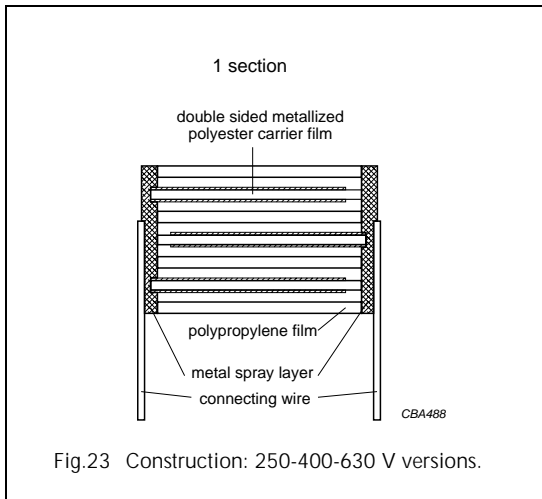
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### CONSTRUCTION

#### Description

- Low-inductive wound cell of double sided metallized polyester carrier film and polypropylene (PP) film, potted with epoxy resin in a flame-retardant polypropylene case
- Radial leads, solder-coated
- Small stand-off pips allow removal of solder flux etc. during cleaning of the printed-circuit board.



# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### 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 tape specifications refer to this handbook, chapter "*Packaging information*".

#### 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 original pitch = 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 is shown in Fig.27:

- Eccentricity as in Fig.27. 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:  $h_{\max} \leq h + 0.3 \text{ mm}$ .

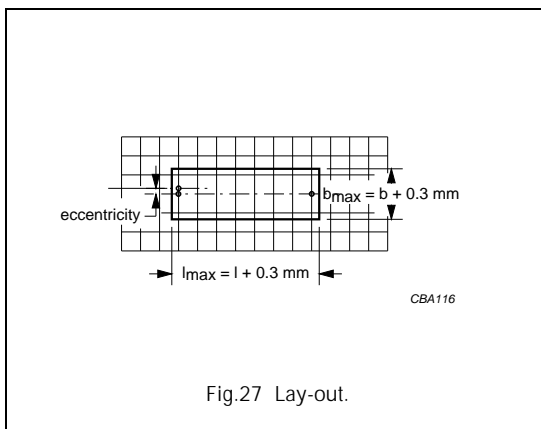
### Storage temperature

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

### RATINGS AND CHARACTERISTICS REFERENCE CONDITIONS

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

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



# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### CHARACTERISTICS

#### Capacitance

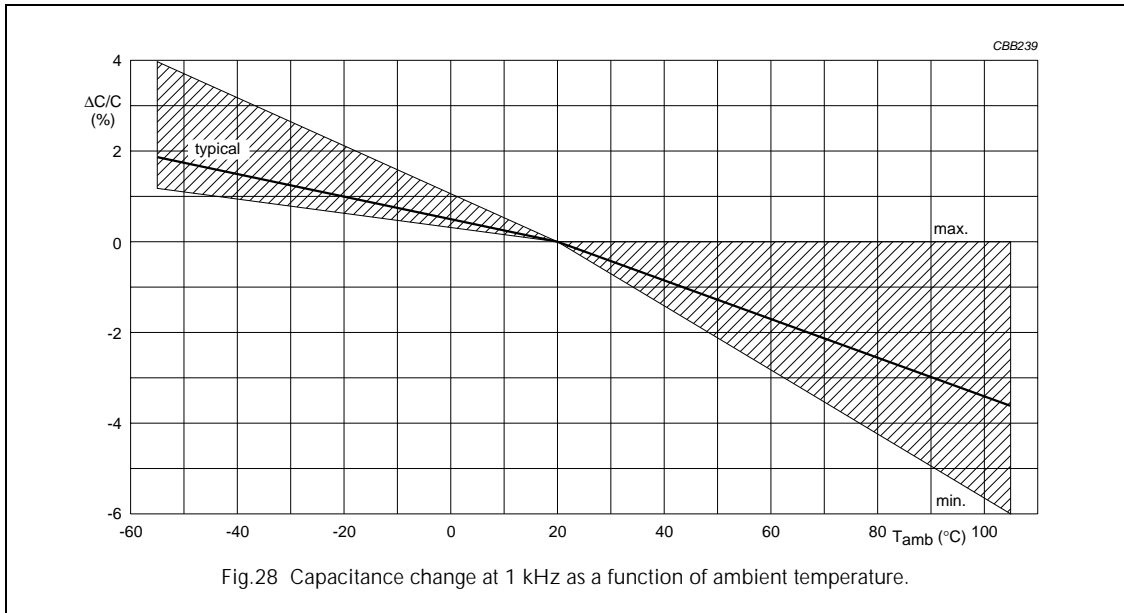


Fig.28 Capacitance change at 1 kHz as a function of ambient temperature.

#### Impedance

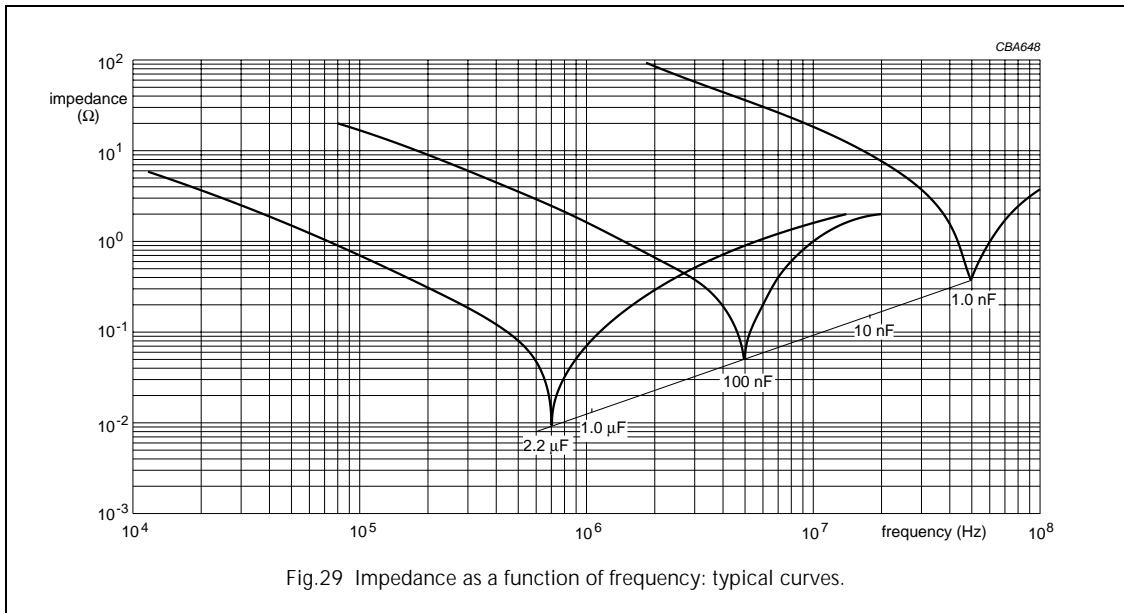


Fig.29 Impedance as a function of frequency: typical curves.

# AC and pulse double metallized polypropylene film capacitors

**MMKP 383**

Maximum DC voltage as a function of temperature

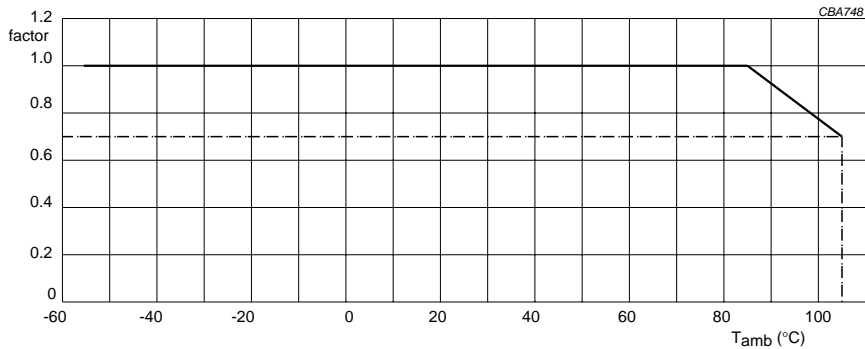
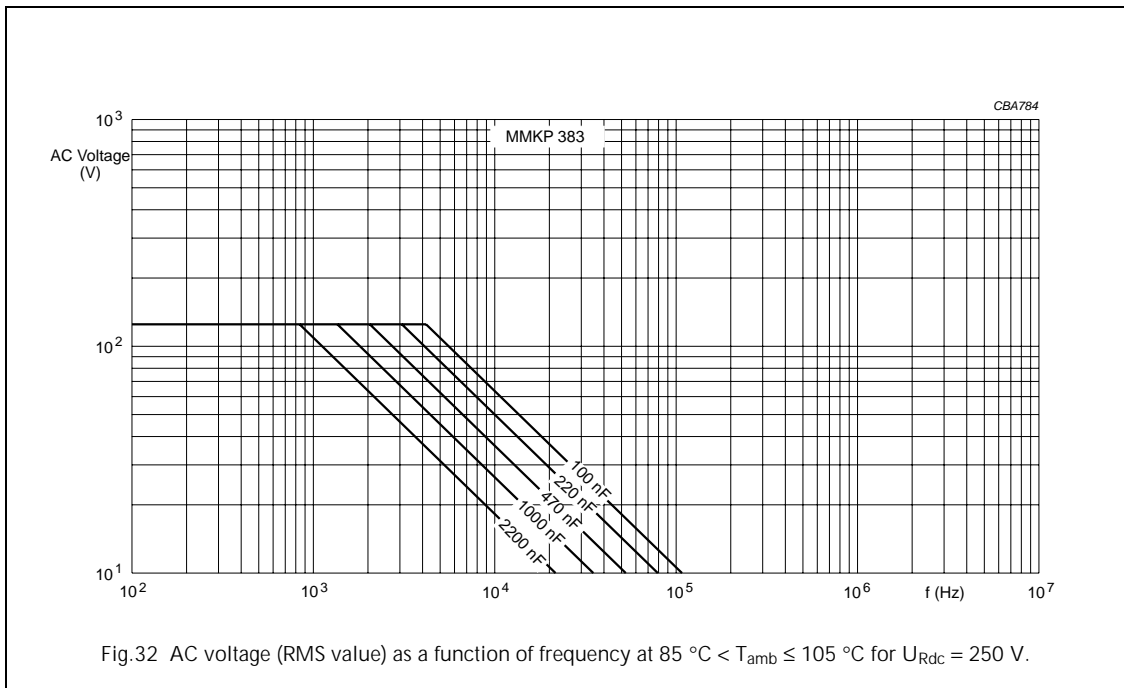
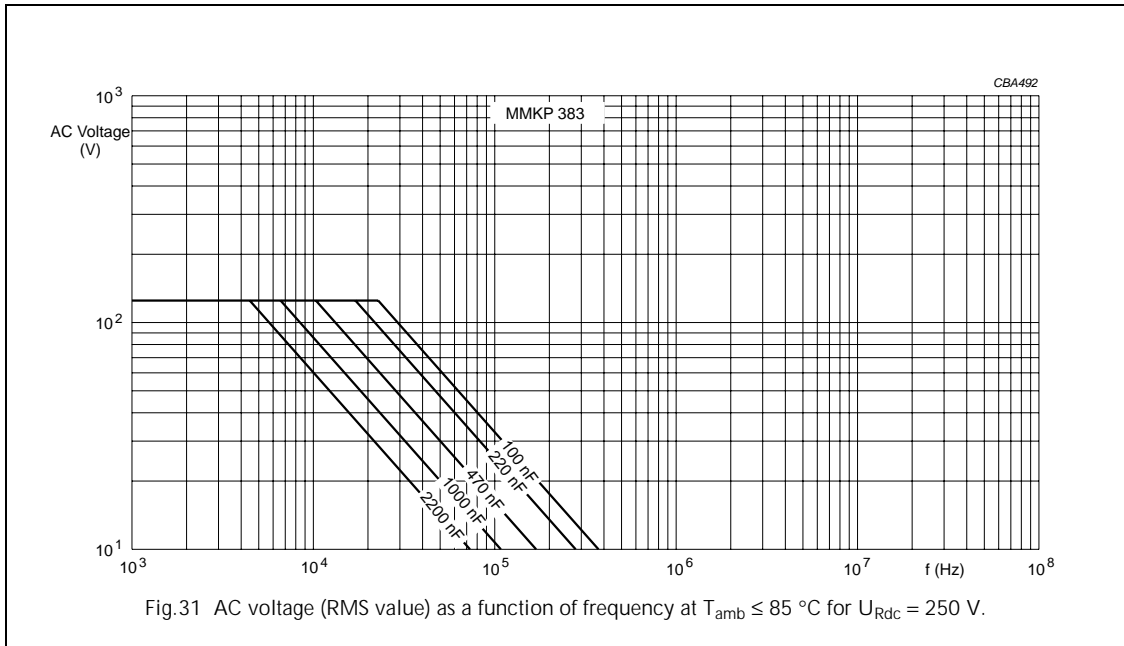


Fig.30 Multiplying factor as a function of temperature.

# AC and pulse double metallized polypropylene film capacitors

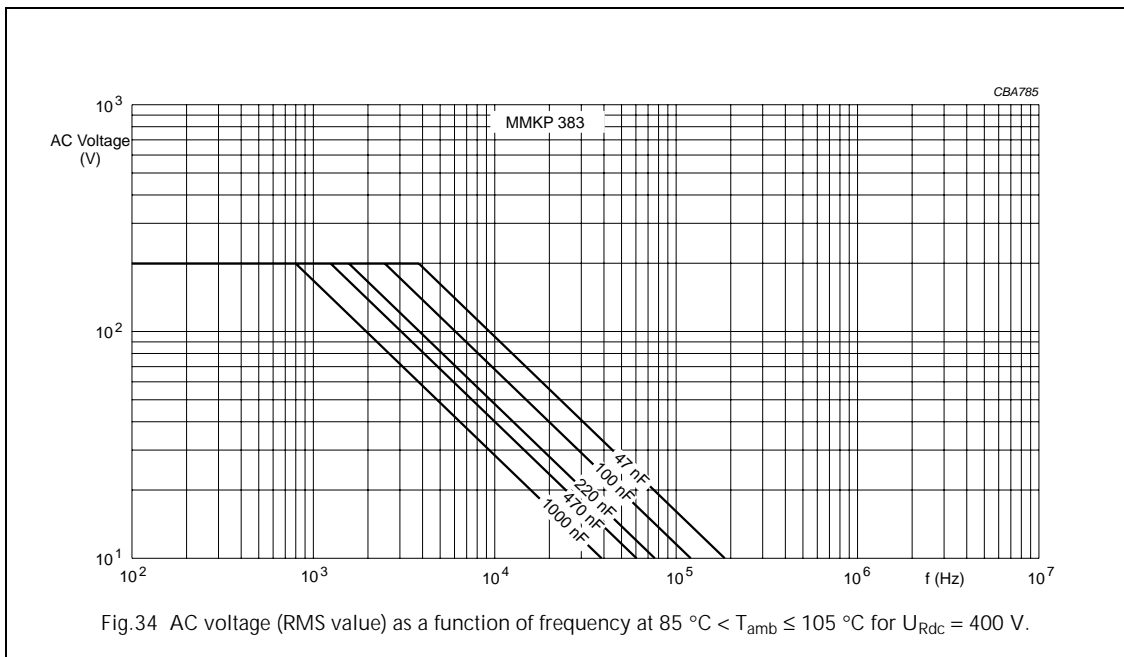
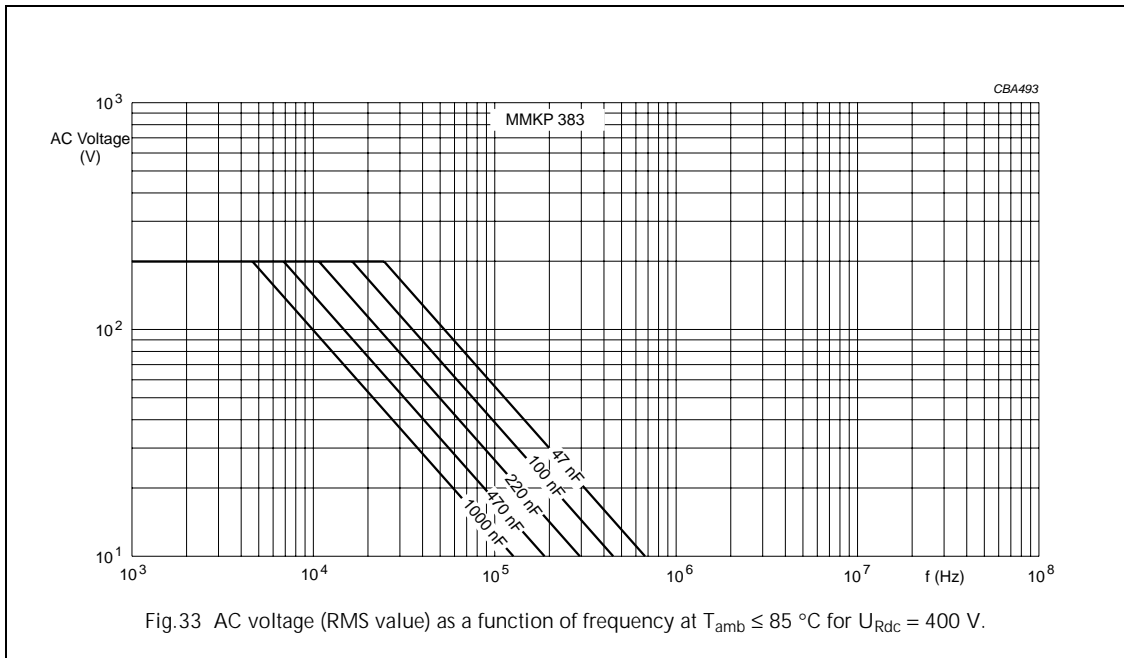
## MMKP 383

Maximum RMS voltage (sinewave) as a function of frequency



# AC and pulse double metallized polypropylene film capacitors

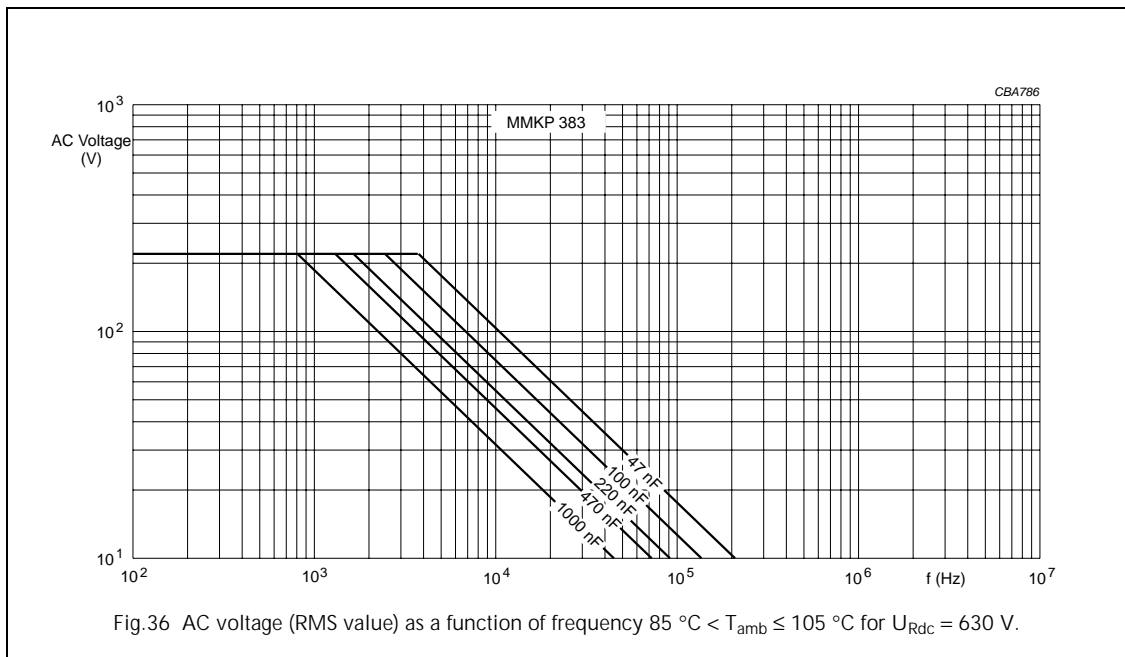
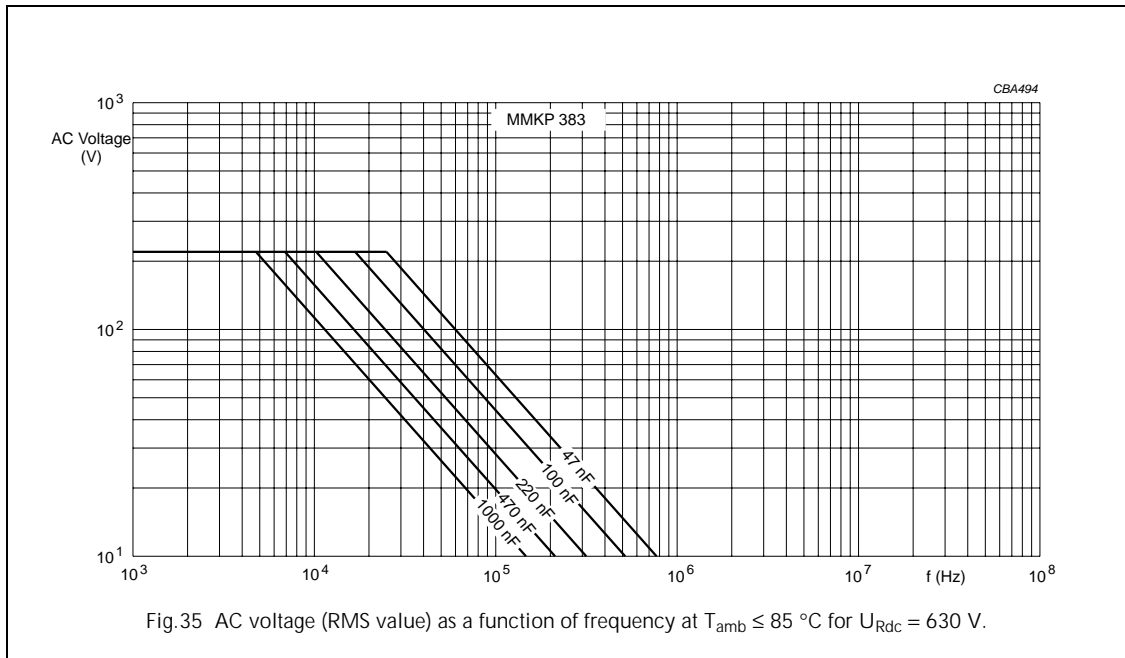
## MMKP 383





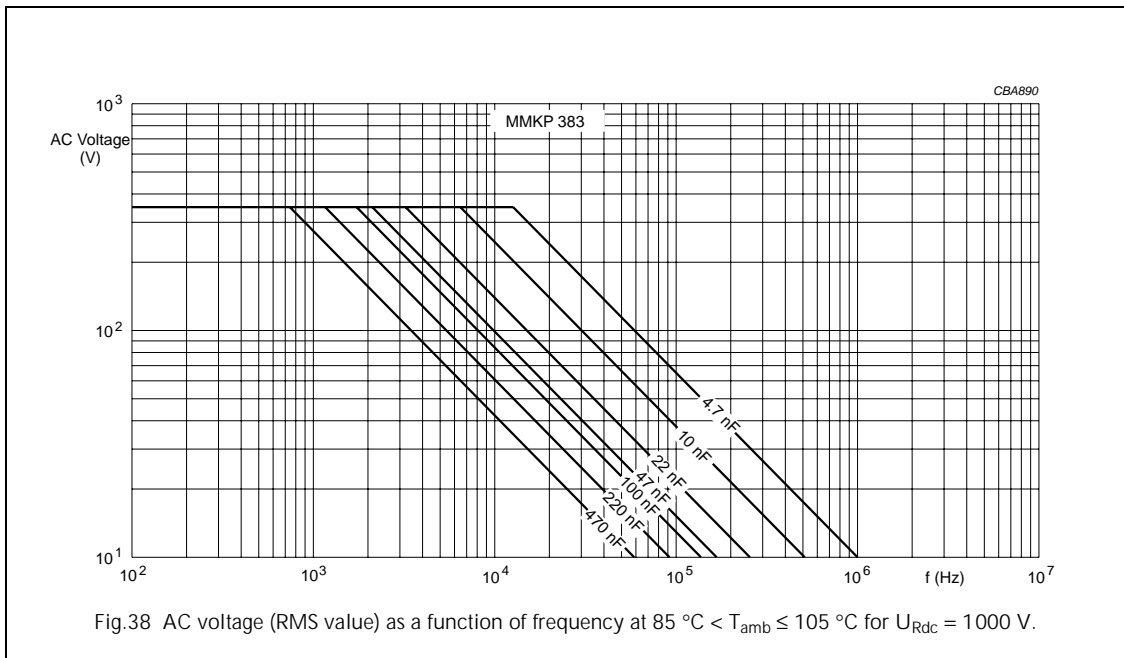
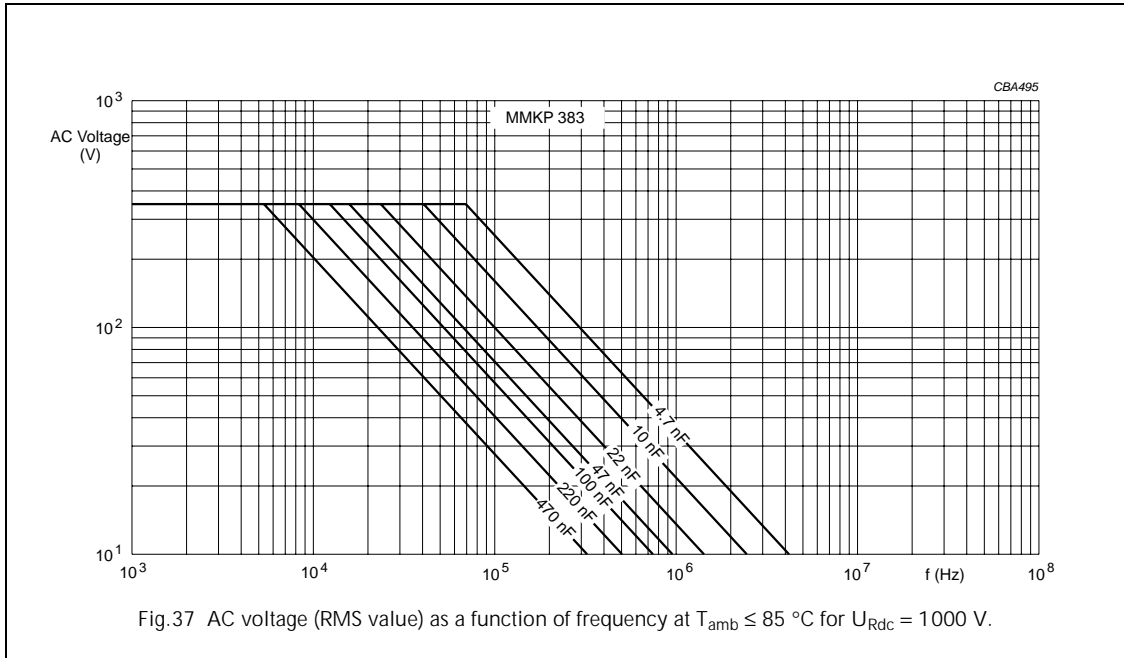
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



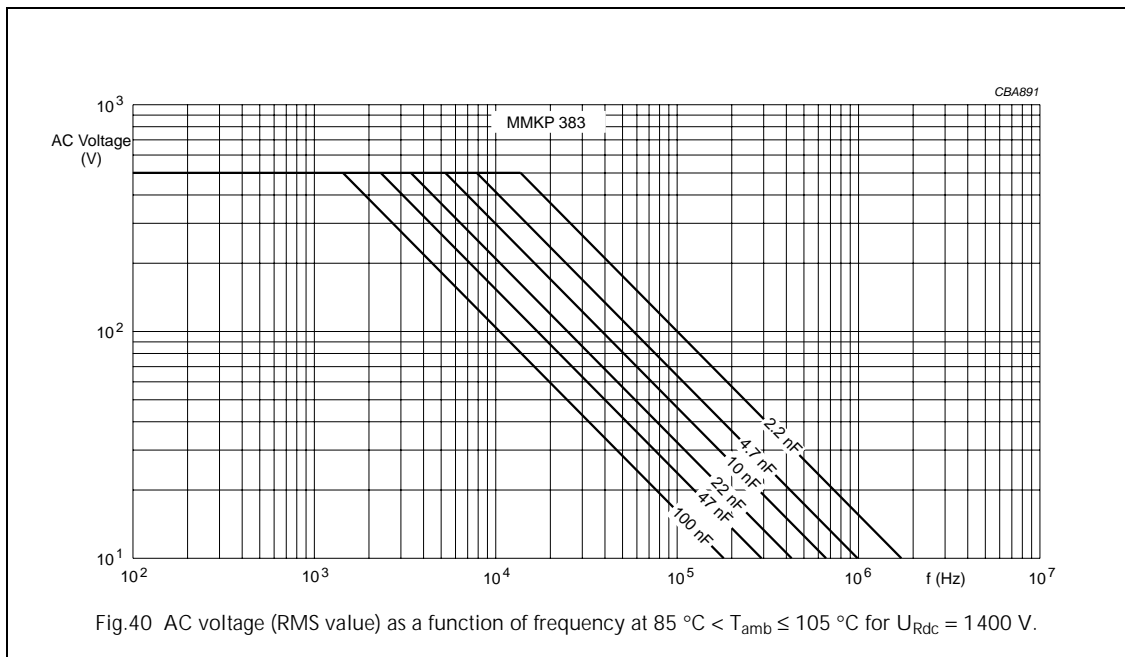
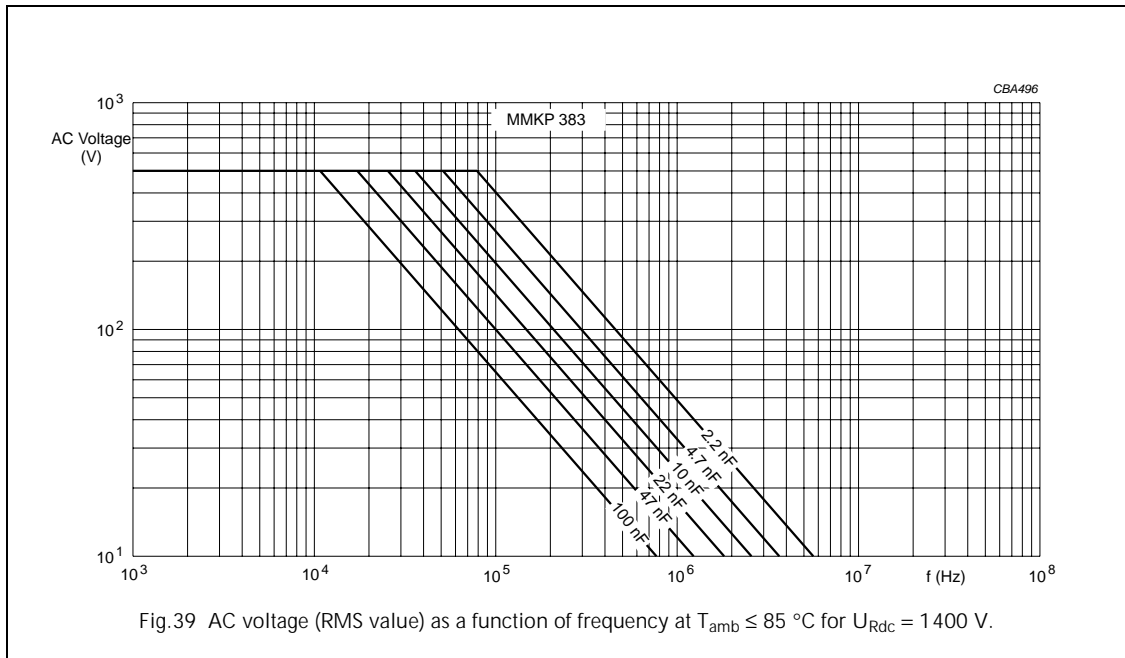
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



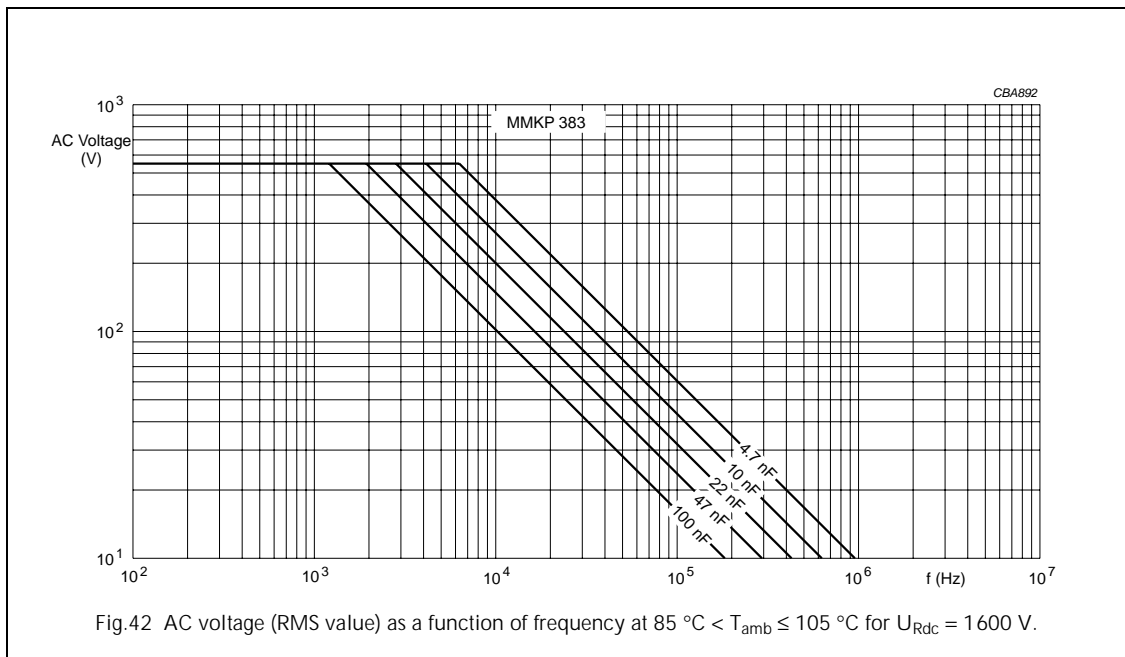
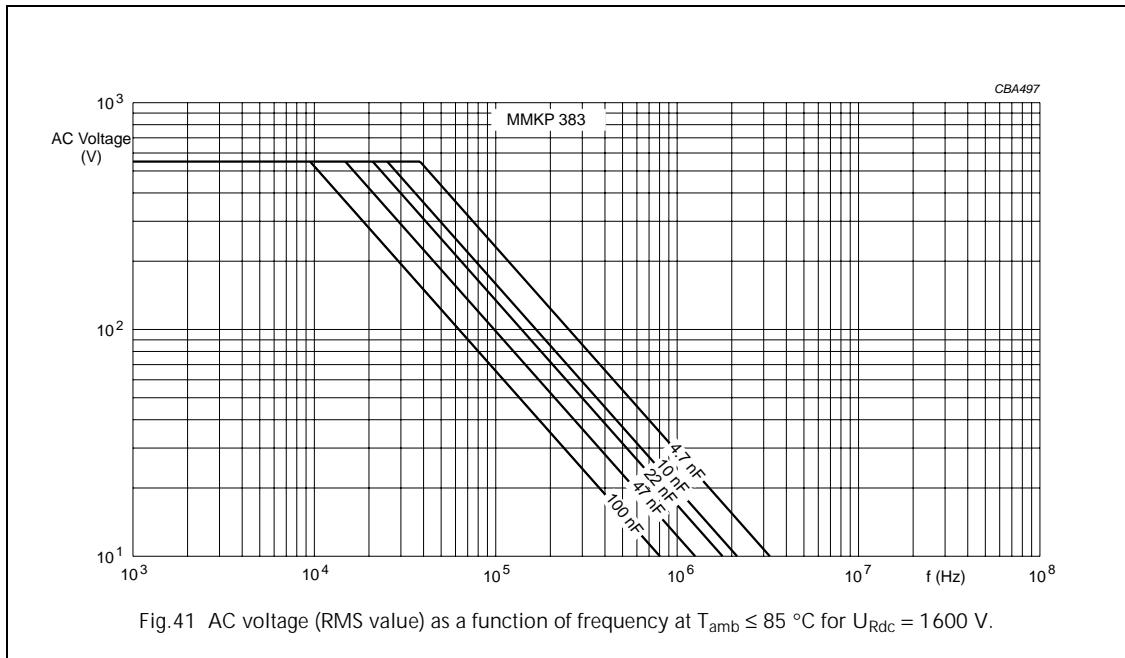
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



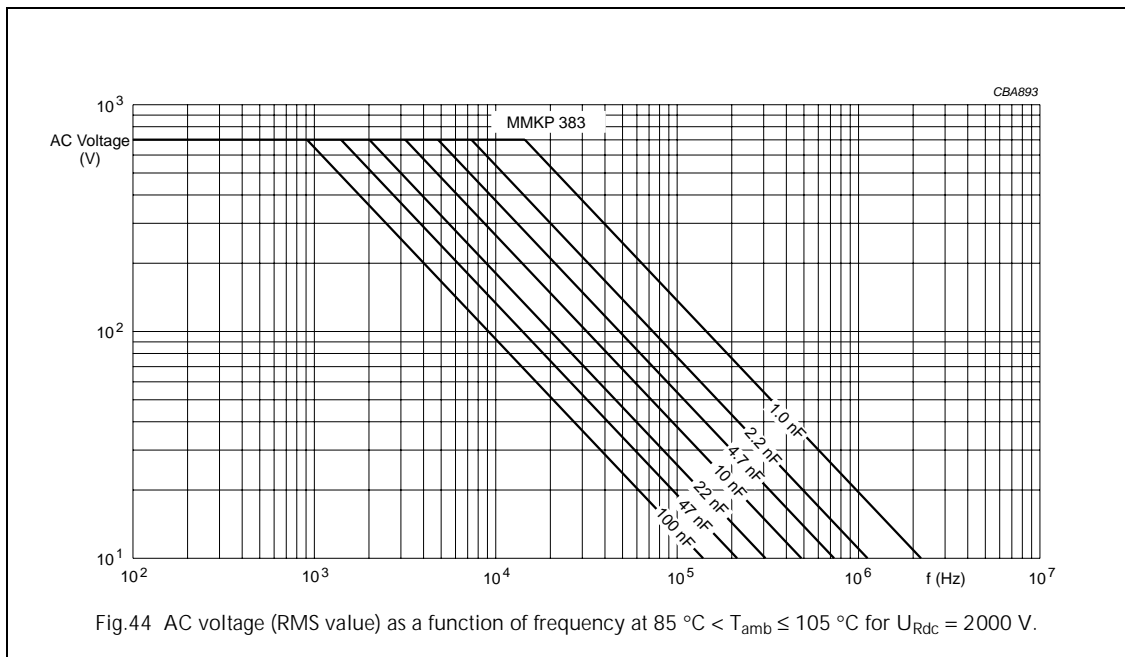
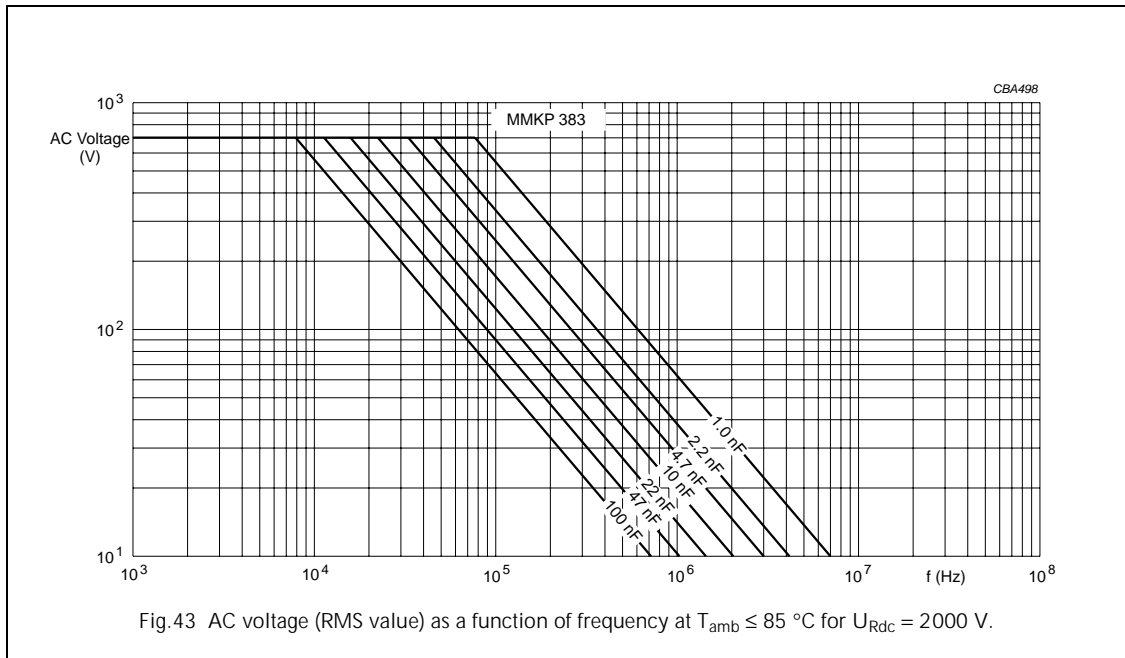
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



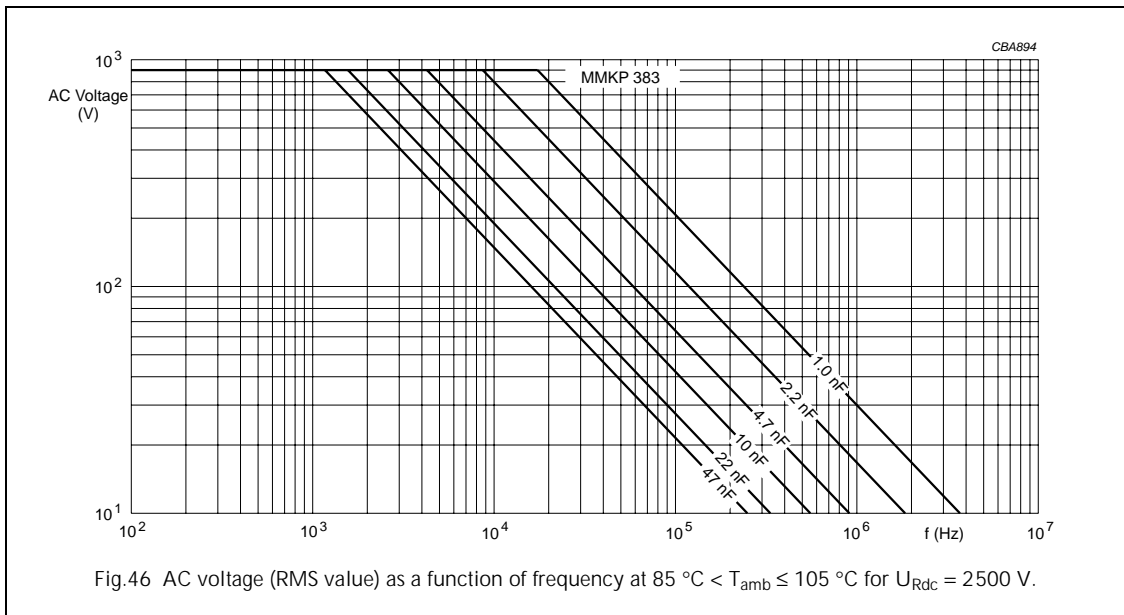
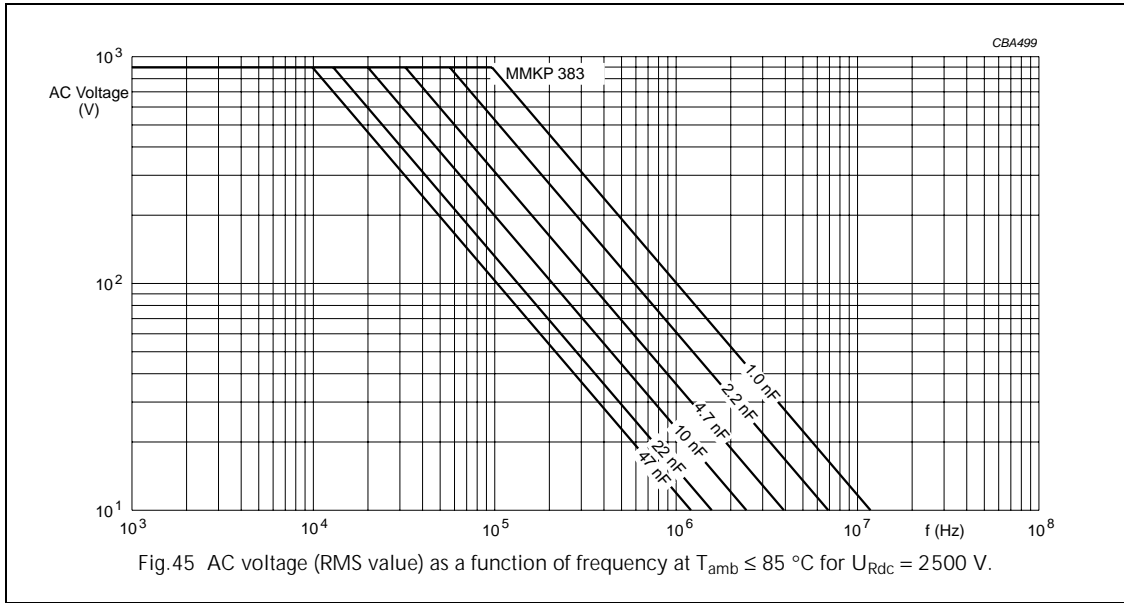
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



# AC and pulse double metallized polypropylene film capacitors

## MMKP 383



### Maximum RMS current (sinewave) as a function of frequency

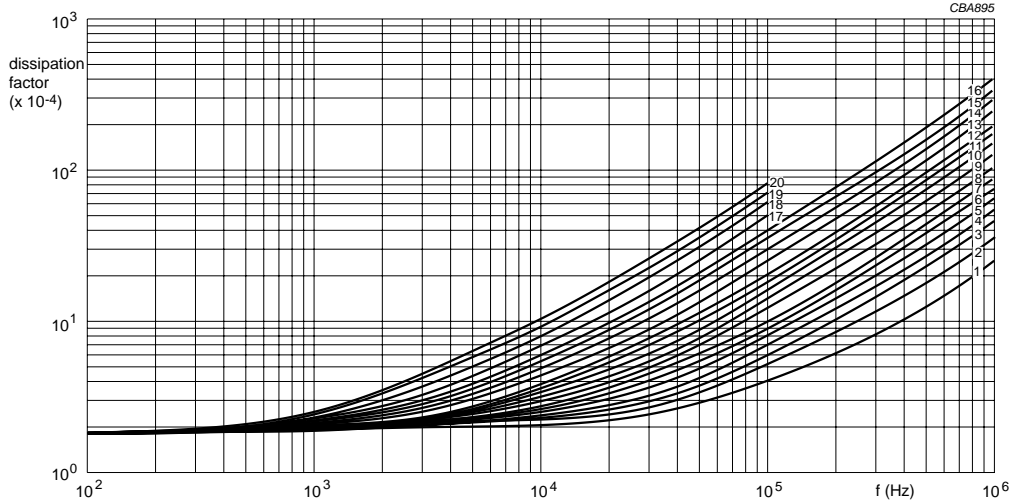
The maximum RMS current is defined by  $I_{ac} = \omega \times C \times U_{ac}$ .

$U_{ac}$  is the maximum AC voltage depending on the ambient temperature in Figs 31 to 46.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### Tangent of loss angle



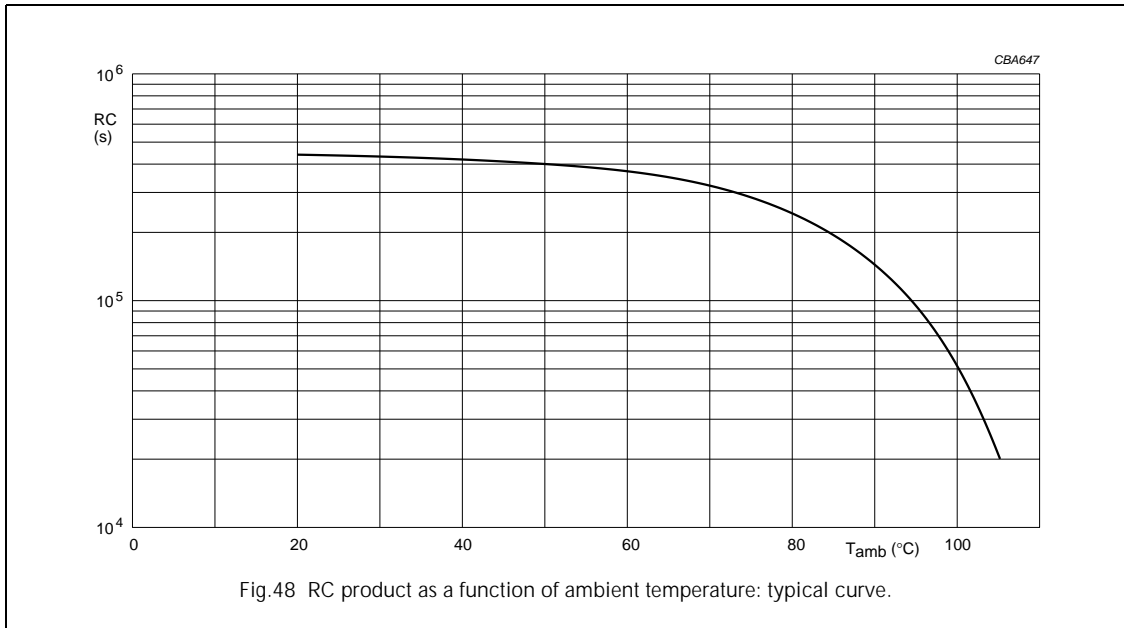
<p>250 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.091 μF, curve 8.</li> <li>C ≤ 0.15 μF, curve 9.</li> <li>C ≤ 0.22 μF, curve 10.</li> <li>C ≤ 0.27 μF, curve 11.</li> <li>C ≤ 0.33 μF, curve 12.</li> <li>C ≤ 0.56 μF, curve 15.</li> <li>C ≤ 0.82 μF, curve 16.</li> <li>C ≤ 1.2 μF, curve 18.</li> <li>C ≤ 1.6 μF, curve 19.</li> <li>C ≤ 2.2 μF, curve 20.</li> </ul>	<p>400 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.047 μF, curve 5.</li> <li>C ≤ 0.068 μF, curve 6.</li> <li>C ≤ 0.1 μF, curve 7.</li> <li>C ≤ 0.2 μF, curve 8.</li> <li>C ≤ 0.24 μF, curve 12.</li> <li>C ≤ 0.36 μF, curve 13.</li> <li>C ≤ 0.43 μF, curve 14.</li> <li>C ≤ 0.56 μF, curve 16.</li> <li>C ≤ 1.1 μF, curve 17.</li> </ul>	<p>630 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.033 μF, curve 4.</li> <li>C ≤ 0.068 μF, curve 5.</li> <li>C ≤ 0.1 μF, curve 6.</li> <li>C ≤ 0.15 μF, curve 7.</li> <li>C ≤ 0.22 μF, curve 11.</li> <li>C ≤ 0.27 μF, curve 12.</li> <li>C ≤ 0.47 μF, curve 15.</li> <li>C ≤ 0.68 μF, curve 16.</li> </ul>	<p>1000 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.01 μF, curve 2.</li> <li>C ≤ 0.027 μF, curve 3.</li> <li>C ≤ 0.047 μF, curve 4.</li> <li>C ≤ 0.062 μF, curve 5.</li> <li>C ≤ 0.075 μF, curve 6.</li> <li>C ≤ 0.1 μF, curve 7.</li> <li>C ≤ 0.15 μF, curve 8.</li> <li>C ≤ 0.22 μF, curve 9.</li> <li>C ≤ 0.3 μF, curve 10.</li> <li>C ≤ 0.39 μF, curve 11.</li> <li>C ≤ 0.47 μF, curve 12.</li> </ul>
<p>1400 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.0047 μF, curve 1.</li> <li>C ≤ 0.016 μF, curve 2.</li> <li>C ≤ 0.033 μF, curve 3.</li> <li>C ≤ 0.051 μF, curve 4.</li> <li>C ≤ 0.068 μF, curve 5.</li> <li>C ≤ 0.082 μF, curve 6.</li> <li>C ≤ 0.1 μF, curve 7.</li> </ul>	<p>1600 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.0047 μF, curve 3.</li> <li>C ≤ 0.0091 μF, curve 4.</li> <li>C ≤ 0.068 μF, curve 5.</li> <li>C ≤ 0.01 μF, curve 6.</li> <li>C ≤ 0.15 μF, curve 7.</li> </ul>	<p>2000 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.0047 μF, curve 2.</li> <li>C ≤ 0.033 μF, curve 3.</li> <li>C ≤ 0.1 μF, curve 4.</li> </ul>	<p>2500 V:</p> <ul style="list-style-type: none"> <li>C ≤ 0.0047 μF, curve 1.</li> <li>C ≤ 0.015 μF, curve 2.</li> <li>C ≤ 0.056 μF, curve 3.</li> </ul>

Fig.47 Tangent of loss angle as a function of frequency; typical curves.

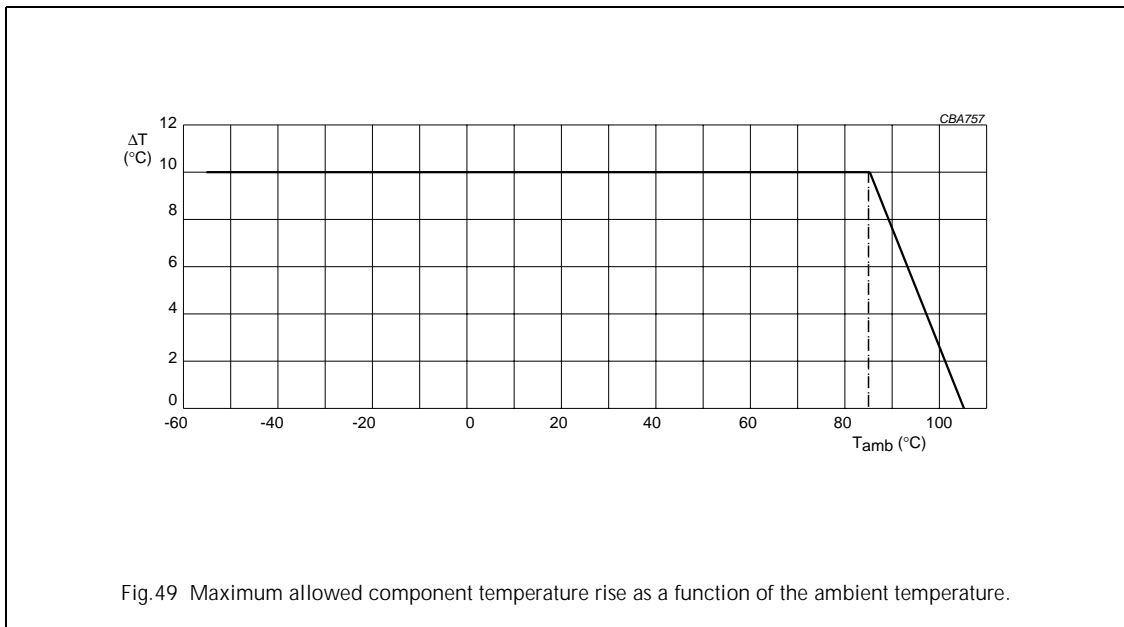
# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### Insulation resistance



### Maximum allowed component temperature rise (DT) as a function of the ambient temperature (T<sub>amb</sub>)





# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

Heat conductivity (G) as a function of pitch and capacitor body thickness in mW/°C

**Table 1** Heat conductivity

b <sub>max</sub> (mm)	ORIGINAL PITCH (mm)		
	15	22.5	27.5
4.0	–	–	–
5.0	10	–	–
6.0	11	19	–
7.0	12	21	–
8.5	16	25	–
10.0	18	28	–
11.0	–	–	36
13.0	–	–	42
15.0	–	–	48
18.0	–	–	57

### Power dissipation and maximum component temperature rise

The power dissipation must be limited in order not to exceed the maximum allowed component temperature rise as a function of the free air ambient temperature.

The power dissipation can be calculated according Type detail specification "HQN-384-01/001", with the typical  $\tan \delta$  of the curves in Fig.47.

The component temperature rise ( $\Delta T$ ) can be measured (see section "Measuring the component temperature" for more details) or calculated by  $\Delta T = P/G$

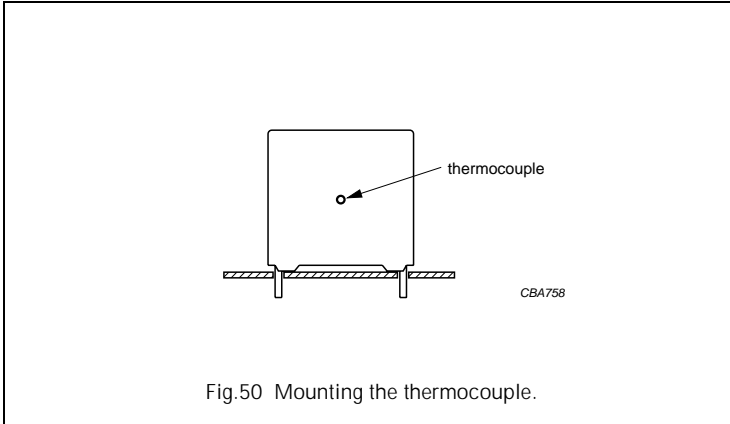
- $\Delta T$  = component temperature rise (°C).
- P = power dissipation of the component (mW).
- G = heat conductivity of the component (mW/°C).

# AC and pulse double metallized polypropylene film capacitors

**MMKP 383**

## Measuring the component temperature

A thermocouple must be attached to the capacitor body; see Fig.50.



The temperature is measured in unloaded ( $T_{amb}$ ) and maximum loaded condition ( $T_c$ ).

The temperature rise is given by  $\Delta T = T_c - T_{amb}$ .

To avoid radiation or convection, the capacitor should be tested in a wind-free box.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### Application note and limiting conditions

These capacitors are not suitable for mains applications as across-the-line capacitors without additional protection, as described hereunder. These mains applications are strictly regulated in safety standards and therefore electromagnetic interference suppression capacitors conforming the standards must be used.

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

1. The peak voltage ( $U_p$ ) shall not be greater than the rated DC voltage ( $U_{Rdc}$ ).
2. The peak-to-peak voltage ( $U_{p-p}$ ) shall not be greater than the maximum  $U_{p-p}$  to avoid the ionisation inception level.
3. The voltage pulse slope ( $dU/dt$ ) 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  $U_{Rdc}$  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 in Fig.49.
5. Since in circuits used at voltages over 280 V peak-to-peak the risk for an intrinsically active flammability after a capacitor breakdown (short circuit) increases, it is recommended that the power to the component is limited to 100 times the values mentioned in Table 1 "Heat conductivity".
6. When using these capacitors as across-the-line capacitor in the input filter for mains applications or as series connected with an impedance to the mains the applicant must guarantee that following conditions are fulfilled in any case (spikes and surge voltages from the mains included).

#### VOLTAGE CONDITIONS FOR 6 ABOVE

ALLOWED VOLTAGES	$T_{amb} \leq 85 \text{ }^\circ\text{C}$	$85 \text{ }^\circ\text{C} < T_{amb} \leq 105 \text{ }^\circ\text{C}$
Maximum continuous RMS voltage	$U_{Rac}$	$U_{Rac}$
Maximum temporary RMS -overvoltage (<24 hours)	$1.25 \times U_{Rac}$	$1.25 \times U_{Rac}$
Maximum peak voltage ( $V_{o-p}$ ) (<2 s)	$1.6 \times U_{Rdc}$	$1.1 \times U_{Rdc}$

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### Example

$C = 4 \text{ nF} - 1600 \text{ V}$  used for the voltage signal shown in Fig.51.

$$U_{p-p} = 1000 \text{ V}; U_p = 900 \text{ V}; T_1 = 12 \text{ } \mu\text{s}; T_2 = 64 \text{ } \mu\text{s}; T_3 = 4 \text{ } \mu\text{s}$$

The ambient temperature is 80 °C. In case of failure, the oscillation is blocked.

Checking the conditions:

1. The peak voltage  $U_p = 900 \text{ V}$  is lower than 1600 V (DC).
2. The peak-to-peak voltage 1000 V is lower than  $2 \times \sqrt{2} \times 550 \text{ V(AC)} = 1600 U_{p-p}$ .
3. The voltage pulse slope  $dU/dt = 1000 \text{ V}/4 \text{ } \mu\text{s} = 250 \text{ V}/\mu\text{s}$ .  
This is lower than 8000 V/ $\mu\text{s}$  (see specific reference data for each version).
4. The dissipated power is 35 mW as calculated with Fourier terms and typical tangent of loss angle.

$$\text{The temperature rise for } b_{\text{max}} = 6.0 \text{ and pitch} = 15 \text{ mm will be } \frac{35 \text{ mW}}{11 \text{ mW}/^\circ\text{C}} = 3.2 \text{ } ^\circ\text{C}.$$

This is lower than 10 °C temperature rise at 80 °C; see Fig.49.

5. Oscillation is blocked.
6. Not applicable.

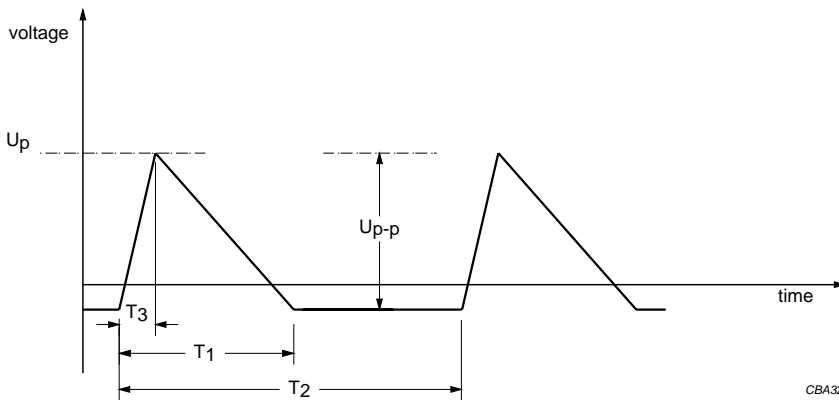


Fig.51 Voltage signal.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### MARKING

#### Product marking

The capacitors are marked on the top for original pitch  $\geq 22.5$  mm (see Fig.53) or on the top and one side for original pitch = 15 mm (see Fig.52), with the following information:

1. Rated capacitance code in accordance with "IEC 60062"
2. Tolerance on rated capacitance: J =  $\pm 5\%$
3. Rated (DC) voltage (e.g. 1 000 V)
4. Code for dielectric material (MMKP)
5. Code for factory of origin (HQ)
6. Manufacturer's type designation (383)
7. Manufacturer
8. Year and week of manufacture (e.g. 0001).

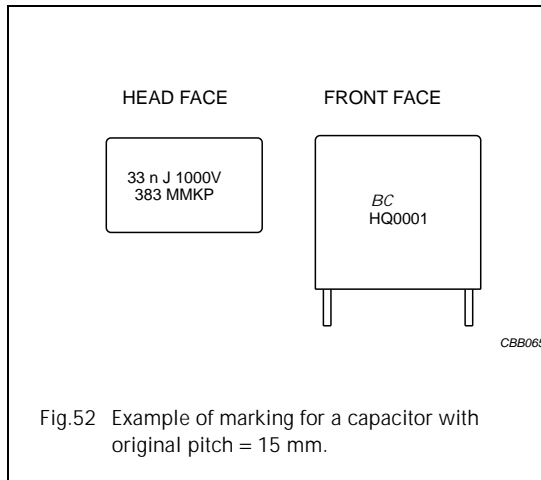


Fig.52 Example of marking for a capacitor with original pitch = 15 mm.

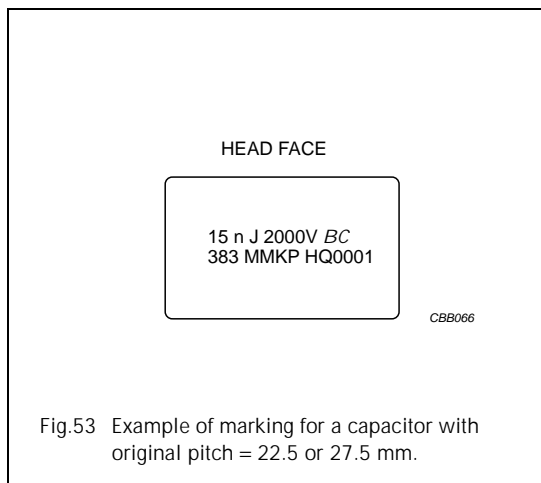


Fig.53 Example of marking for a capacitor with original pitch = 22.5 or 27.5 mm.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### Package marking

The package containing the capacitors is marked as shown in Fig.54.

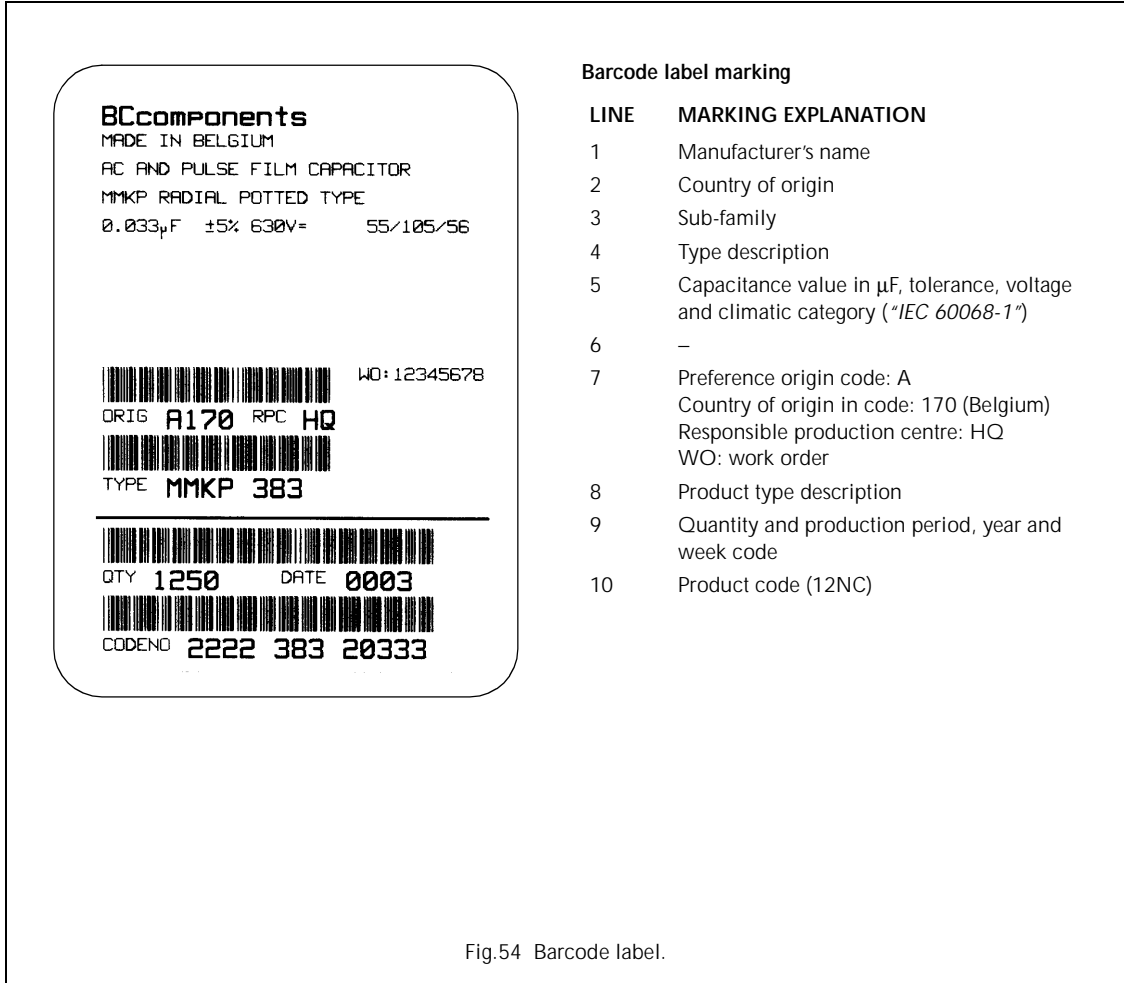


Fig.54 Barcode label.

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

### QUICK REFERENCE TEST REQUIREMENTS

TEST	PROCEDURE (quick reference)	REQUIREMENTS
<b>Robustness of leads</b>		
Tensile strength: <i>"IEC 60068-2-21"</i>	load 10 N; 10 s	no visible damage
Bending: <i>"IEC 60068-2-21"</i>	load 5 N; 4 × 90 °	legible marking
Resistance to soldering heat: <i>"IEC 60068-2-20"</i>	solder bath: 260 °C; 10 s	$ \Delta C/C  \leq 1\%$
Component solvent resistance	isopropyl alcohol; 23 °C; 5 minutes	$\Delta \tan \delta \leq 5 \times 10^{-4}$ (C ≤ 100 nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ (100 nF < C ≤ 470 nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ (C > 470 nF)
<b>Robustness of component</b>		
Vibration: <i>"IEC 60068-2-6"</i>	10 Hz to 55 Hz; amplitude 0.75 mm or acceleration 98 m/s <sup>2</sup> ; 6 hours	$ \Delta C/C  \leq 1\%$ $\Delta \tan \delta \leq 5 \times 10^{-4}$ (C ≤ 100 nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ (100 nF < C ≤ 470 nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ (C > 470 nF)
Shock: <i>"IEC 60068-2-27"</i>	half sinewave; 490 m/s <sup>2</sup> ; 11 ms	
<b>Climatic sequence</b>		
Dry heat: <i>"IEC 60068-2-2"</i>	16 hours; +105 °C	$ \Delta C/C  \leq 2\%$ (original pitch = 22.5 or 27.5 mm) $ \Delta C/C  \leq 3\%$ (original pitch = 15 mm) $\Delta \tan \delta \leq 5 \times 10^{-4}$ (C ≤ 100 nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ (100 nF < C ≤ 470 nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ (C > 470 nF) $R_{ins} \geq 50\%$ of specified value
Damp heat, cyclic, test Db, first cycle: <i>"IEC 60068-2-30"</i>		
Cold: <i>"IEC 60068-2-1"</i>	2 hours; -55 °C	
Damp heat, cyclic, test Db, remaining cycles: <i>"IEC 60068-2-30"</i>		
<b>Other applicable tests</b>		
Damp heat, steady state: <i>"IEC 60068-2-3"</i>	56 days; 40 °C; 90 to 95% RH	$ \Delta C/C  \leq 1\%$ $\Delta \tan \delta \leq 5 \times 10^{-4}$ (C ≤ 100 nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ (100 nF < C ≤ 470 nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ (C > 470 nF) $R_{ins} \geq 50\%$ of specified value
Endurance (AC): <i>"IEC 60384-17"</i>	2000 hours; 1.25 × U <sub>Rac</sub> (RMS); 50 Hz; 105 °C	$ \Delta C/C  \leq 5\%$ $\Delta \tan \delta \leq 5 \times 10^{-4}$ (C ≤ 100 nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ (100 nF < C ≤ 470 nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ (C > 470 nF) $R_{ins} \geq 50\%$ of specified value

# AC and pulse double metallized polypropylene film capacitors

## MMKP 383

TEST	PROCEDURE (quick reference)	REQUIREMENTS
Heat storage: "IEC 60384-17"	2000 hours; 105 °C	$ \Delta C/C  \leq 1\%$ (original pitch = 22.5 or 27.5 mm) $ \Delta C/C  \leq 2\%$ (original pitch = 15 mm) $\Delta \tan \delta \leq 5 \times 10^{-4}$ ( $C \leq 100$ nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ ( $100$ nF < $C \leq 470$ nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ ( $C > 470$ nF)
Resistance to soldering heat with preheating: "IEC 60384-17"	body temperature: 105 °C; bath temperature: 260 °C; dwell time: 10 s	$ \Delta C/C  \leq 1\%$ (original pitch = 22.5 or 27.5 mm) $ \Delta C/C  \leq 2\%$ (original pitch = 15 mm) $\Delta \tan \delta \leq 5 \times 10^{-4}$ ( $C \leq 100$ nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ ( $100$ nF < $C \leq 470$ nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ ( $C > 470$ nF)
Passive flammability: "IEC 60384-1"	class B	no burning
Endurance (DC): "IEC 60384-17"	2000 hours; $1.25 \times U_{Rdc}$ ; 85 °C $0.875 \times U_{Rdc}$ ; 105 °C	$ \Delta C/C  \leq 3\%$ for 250 V $ \Delta C/C  \leq 2\%$ for 400 to 2500 V $\Delta \tan \delta \leq 5 \times 10^{-4}$ ( $C \leq 100$ nF) $\Delta \tan \delta \leq 10 \times 10^{-4}$ ( $100$ nF < $C \leq 470$ nF) $\Delta \tan \delta \leq 15 \times 10^{-4}$ ( $C > 470$ nF) $R_{ins} \geq 50\%$ of specified value
Wax potting for: 2222 383 46...; 2222 383 56... and 2222 383 66... only	60 ±5 seconds at 165 ±3 °C	$ \Delta C/C  \leq 2\%$ $\Delta \tan \delta \leq 5 \times 10^{-4}$ ( $C \leq 100$ nF) $R_{ins} \geq 50\%$ of specified value