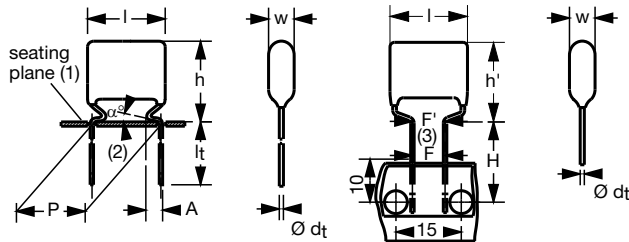


AC and Pulse Metallized Polypropylene Film Capacitors KP/MKP Radial Lacquered Type



Dimensions in mm

(1) Hole \varnothing 1.3 for $d_t = 0.8$ mm

(2) $0 \leq \alpha < 50^\circ$

(3) $|F - F'| < 0.3$ mm

$F = 7.5 + 0.6 / - 0.1$ mm

(4) $A = 2.0 + 1.0 / - 0.5$ mm for 10 mm pitch

$A = 2.5 + 1.5 / - 0.5$ mm for 15 mm pitch

$A = 2.5 + 1.4 / - 0.5$ mm for pitch > 22.5 mm



Dimensions in mm

APPLICATIONS

Where high currents and steep pulses occur. For deflection circuits in television sets.

REFERENCE SPECIFICATIONS

IEC 60384-17

MARKING

C-value; tolerance; rated voltage; manufacturer's type; manufacturer's location

DIELECTRIC

Polypropylene film

ELECTRODES

Metallized and aluminum

CONSTRUCTION

Internal serial construction

RATED (DC) VOLTAGE

630 V, 1000 V, 1600 V, 2000 V

RATED (AC) VOLTAGE

300 V, 400 V, 500 V, 600 V

RATED PEAK-TO-PEAK VOLTAGE

850 V, 1100 V, 1400 V, 1700 V

FEATURES

- 10 mm to 27.5 mm pitch
- Supplied loose in box (including lock lead versions) and taped
- Bent back version for automatic insertion available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

ENCAPSULATION

Flame retardant epoxy material
(Class UL 94 V-0)

CLIMATIC TESTING CLASS ACCORDING TO IEC 60068-1

55/105/56

CAPACITANCE RANGE (E24 SERIES)

0.1 nF to 270 nF

CAPACITANCE TOLERANCE

$\pm 5\%$; $\pm 3.5\%$

LEADS

Tinned wire

RATED TEMPERATURE

85 °C

MAXIMUM APPLICATION TEMPERATURE

105 °C

PERFORMANCE GRADE

for $C > 5.6$ nF: grade 1 (long life)

for $C \leq 5.6$ nF: grade 2

STABILITY GRADE

Grade 2

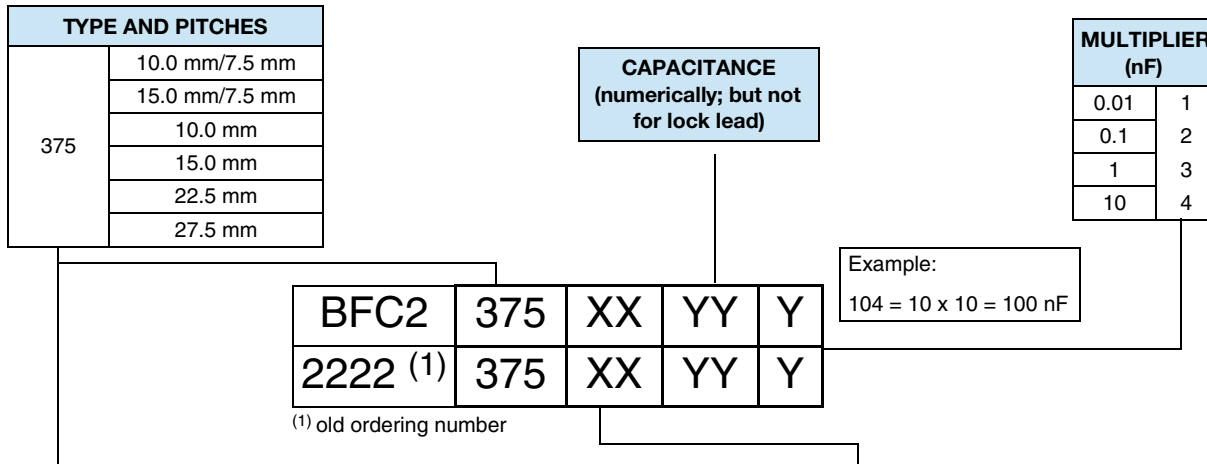
DETAIL SPECIFICATION

For more detailed data and test requirements contact:

dc-film@vishay.com



COMPOSITION OF CATALOG NUMBER



TYPE	PACKAGING	LEAD CONFIGURATION	PREFERRED TYPES				
			C-TOL.	630 V	1000 V	1600 V	2000 V
375	Loose in box	Lead length 5.0 mm ± 1.0 mm	± 5 %	14	24	34	44
		Lock lead 4.0 mm + 1.0/- 0.5 mm	± 5 %	90	90	90	90
	Taped on reel ⁽²⁾ (bent back)	H = 16.0 mm; P ₀ = 15.0 mm; Reel diameter 500 mm	± 5 %	16	26	36	46
Dimensions of this code numbers stays between brackets							
ON REQUEST							
375	Loose in box	Lead length 5.0 ± 1.0 mm	± 3.5 %	15	25	35	45
		Lead length 3.5 ± 0.5 mm	± 5 %	10	20	30	40
			± 3.5 %	11	21	31	41
	Taped on reel ⁽²⁾	H = 16.0 mm; P ₀ = 12.7 mm; Reel diameter = 500 mm	± 5 %	12	22	32	42
			± 3.5 %	13	23	33	43
	Taped on reel ⁽²⁾ (bent back)	H = 16.0 mm; P ₀ = 15.0 mm; Reel diameter = 500 mm	± 3.5 %	17	27	37	47
Dimensions of this code numbers stays between brackets							
		H = 16.0 mm; P ₀ = 15.0 mm; Reel diameter = 356 mm	± 5 %	18	28	38	48

Note

⁽²⁾ For detailed tape specifications refer to “Packaging Information” www.vishay.com/doc?28139 or end of catalog

SPECIFIC REFERENCE DATA (630 V_{DC})

DESCRIPTION	VALUE	
	10 kHz	100 kHz
Tangent of loss angle at (x 10 ⁻⁴)		
Pitch = 10 mm, 15 mm, and 7.5 mm (bent back)	≤ 6	≤ 10
Pitch = 22.5 mm	≤ 8	≤ 15
Pitch = 27.5 mm	≤ 8	≤ 20
Rated voltage pulse slope (dU/dt) _R :		
Pitch = 10 mm	15 000 V/μs	
Pitch = 15 mm and 7.5 mm (bent back)	8000 V/μs	
Pitch = 22.5 mm	2800 V/μs	
Pitch = 27.5 mm	1900 V/μs	
R between leads at 500 V, 1 min	> 100 000 MΩ	
R between interconnected leads and case, 500 V, 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge at 50 pC peak discharge at 20 pC peak discharge	> 400 V	
Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s for C ≤ 47 nF for C > 47 nF	1008 V, 1 min	
Withstanding (DC) voltage between leads and case	2840 V, 1 min	
Maximum application temperature	105 °C	



U_{RDC} = 630 V; U_{RAC} = 300 V; U_{PP} = 850 V (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)				
C (pF)	PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm		PITCH = 10.0 mm	PITCH = 7.5 mm (BENT BACK)			
680 750	5.0 x 13.0 x 14.5	0.65	14... (2000)	12... (1200)		681 751	
820 910 1000	5.5 x 13.5 x 14.5	0.70	14... (2000)	12... (1100)		821 911 102	
1100 1200 1300		0.75				112 122 132	
1500 1600		0.80 0.85				152 162	
1800 2000 2200 2400		0.80 0.85 0.90 1.0				182 202 222 242	
2700	6.5 x 14.5 x 14.5	1.1	14... (1500)	12... (900)		272	

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only



U_{RDC} = 630 V; U_{RAC} = 300 V; U_{PP} = 850 (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH Ø 500 mm	PITCH = 7.5 mm (BENT BACK)		
			XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)	
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm			PITCH = 7.5 mm (BENT BACK)			
3000 3300	5.0 x 14.0 (16.0) x 18.5	1.0	14... (2000)	12... (1200)	16... (1000)	18... (550)	302 332
3600 3900 4300 4700 5100 5600	5.5 x 14.5 (16.0) x 18.5	1.1	14... (2000)	12... (1100)	16... (900)	18... (500)	362 392 432 472 512 562
6200 6800 7500 8200 9100 10 000 11 000 12 000 13 000 15 000 16 000	6.0 x 15.0 (16.0) x 18.5	1.2	14... (2000)	12... (1000)	16... (800)	18... (450)	622 682 752 822 912 103 113 123 133 153 163
18 000 20 000	6.5 x 15.5 (17.0) x 18.5	1.3	14... (1500)	12... (900)	16... (750)	18... (400)	183 203
22 000	7.0 x 16.0 (17.5) x 18.5	1.5	14... (1500)	12... (800)	16... (700)	18... (400)	223
24 000	7.5 x 16.5 (18.0) x 18.5	1.6	14... (1250)	12... (800)	16... (650)	18... (350)	243
27 000 30 000	8.0 x 17.0 (18.5) x 18.5	1.9	14... (1250)	12... (750)	16... (600)	18... (350)	273 303
33 000	8.5 x 17.5 (19.0) x 18.5	2	14... (1000)	12... (700)	16... (550)	18... (300)	333
36 000 39 000	9.0 x 18.5 (20.0) x 18.5	2.3	14... (900)	12... (600)	16... (500)	18... (300)	On request
C (µF)	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 22.5 mm		PITCH = 7.5 mm (BENT BACK)		
0.036 0.039 0.043 0.047 0.051 0.056 0.062	7.0 x 20.0 x 26.0	2.7	14... (650)	-	-	-	363 393 433 473 513 563 623
0.068	7.5 x 20.5 x 26.0	3	14... (600)	-	-	-	683
0.075 0.082	8.0 x 21.0 x 26.0	3.3	14... (550)	-	-	-	753 823
0.091	8.5 x 21.5 x 26.0	3.8	14... (500)	-	-	-	913
0.1	9.0 x 22.0 x 26.0	4	14... (450)	-	-	-	104

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only



U_{RDC} = 630 V; U_{RAC} = 300 V; U_{PP} = 850 (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				
			LOOSE IN BOX	REEL			C VALUE
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		..YYY
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)				
C (µF)	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 22.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.11	9.5 x 22.5 x 26.0	4.3	14... (400)	-	-	114	
0.12	10.0 x 23.0 x 26.0	4.7	14... (400)	-	-	124	
C (µF)	PITCH = 27.5 mm ± 0.5 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 27.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.13	9.5 x 22.5 x 30.0	4.7	14... (500)	-	-	134	
0.15	10.0 x 23.0 x 30.0	5.2	14... (500)	-	-	154	
0.16	10.5 x 23.5 x 30.0	5.5	14... (450)	-	-	164	
0.18	11.0 x 24.0 x 30.0	6	14... (400)	-	-	184	
0.2	11.5 x 24.5 x 30.0	6.6	14... (400)	-	-	204	
0.22	12.5 x 25.5 x 30.0	7.1	14... (350)	-	-	224	
0.24	13.0 x 26.0 x 30.0	7.7	14... (300)	-	-	244	
0.27	13.5 x 26.5 x 30.0	8.5	14... (300)	-	-	274	

Notes

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only

U_{RDC} = 630 V; U_{RAC} = 300 V; U_{PP} = 850 V (LOCK LEAD); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
				(SPQ)
C (pF)			PITCH = 10.0 mm ± 1.0 mm; d_t = 0.60 mm ± 0.06 mm	
680	5.0 x 16.0 x 14.5	0.65	90308	(2000)
750			90309	
820	5.5 x 16.5 x 14.5	0.7	90311	(2000)
910		0.7	90312	
1000		0.7	90313	
1100		0.75	90314	
1300		0.75	90316	
1500		0.80	90317	
1600		0.85	90318	
1800		6.0 x 17.0 x 14.5	0.80	
2000	0.85		90321	
2200	0.90		90322	
2400	1.0		90323	
2700	1.1		90324	(1500)

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only



U_{RDC} = 630 V; U_{RAC} = 300 V; U_{PP} = 850 V (LOCK LEAD); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)	PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
3000 3300	5.0 x 17.0 x 18.5	1	90325 90326	(2000)
3600 3900 4300 4700 5100 5600	5.5 x 17.5 x 18.5	1.1	90327 90328 90329 90331 90332 90333	(2000)
6200 6800 7500 8200 9100 10 000 11 000 12 000 13 000 15 000 16 000	6.0 x 18.0 x 18.5	1.3	90334 90335 90336 90337 90338 90339 90236 90341 90342 90343 90344	(2000)
18 000 20 000	6.5 x 18.5 x 18.5	1.4	90218 90345	(1750)
22 000	7.0 x 19.0 x 18.5	1.5	90219	(1500)
24 000	7.5 x 19.5 x 18.5	1.6	90221	(1400)
27 000 30 000	8.0 x 20.0 x 18.5	1.9	90223 90346	(1250)
33 000	8.5 x 20.5 x 18.5	2	90347	(1200)
36 000 39 000	9.0 x 21.5 x 18.5	2.3	On request	(1000)
C (µF)	PITCH = 22.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
0.036 0.039 0.043 0.047 0.051 0.056 0.062	7.0 x 23.0 x 26.0	2.7	90348 90349 90351 90352 90353 90354 90355	(600)
0.068	7.5 x 23.5 x 26.0	3	90356	(550)
0.075 0.082	8.0 x 24.0 x 26.0	3.3	90357 90358	(500)
0.091	8.5 x 24.5 x 26.0	3.8	90359	(450)



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (μF)	PITCH = 22.5 mm ± 1.0 mm; d _t = 0.80 mm ± 0.08 mm			
0.1	9.0 x 25.0 x 26.0	4.0	90361	(450)
0.11	9.5 x 25.5 x 26.0	4.3	90362	(400)
0.12	10.0 x 26.0 x 26.0	4.7	90363	(350)
C (μF)	PITCH = 27.5 mm ± 1.0 mm; d _t = 0.80 mm ± 0.08 mm			
0.13	9.5 x 25.5 x 30.0	4.7	90364	(450)
0.15	10.0 x 26.0 x 30.0	5.2	90365	(400)
0.16	10.5 x 26.5 x 30.0	5.5	90366	(350)
0.18	11.0 x 27.0 x 30.0	6.0	90367	(350)
0.2	11.5 x 27.5 x 30.0	6.6	90368	(350)
0.22	12.5 x 28.5 x 30.0	7.1	90369	(300)
0.24	13.0 x 29.0 x 30.0	7.7	90371	(250)
0.27	13.5 x 29.5 x 30.0	8.5	90372	(250)

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only

SPECIFIC REFERENCE DATA (1000 V_{DC})

DESCRIPTION	VALUE	
	10 kHz	100 kHz
Tangent of loss angle at (x 10 ⁻⁴) Pitch = 10 mm, 15 mm, and 7.5 mm (bent back)	≤ 6	≤ 10
Pitch = 22.5 mm	≤ 8	≤ 15
Pitch = 27.5 mm	≤ 8	≤ 20
Rated voltage pulse slope (dU/d _t): Pitch = 10 mm	27 000 V/μs	
Pitch = 15 mm and 7.5 mm (bent back)	15 000 V/μs	
Pitch = 22.5 mm	5000 V/μs	
Pitch = 27.5 mm	3300 V/μs	
R between leads at 500 V, 1 min	> 100 000 MΩ	
R between interconnected leads and case, 500 V, 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge at 20 pC peak discharge	> 500 V	
Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s for C ≤ 47 nF for C > 47 nF	1600 V, 1 min [1.6 - (0.0364 x (C - 47))] x 1000 V, 1 min	
Withstanding (DC) voltage between leads and case	2840 V, 1 min	
Maximum application temperature	105 °C	



U_{RDC} = 1000 V; U_{RAC} = 400 V; U_{PP} = 1100 V (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)	..YYY			
C (pF)	PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm		PITCH = 10.0 mm	PITCH = 7.5 mm (BENT BACK)			
100	5.0 x 13.0 x 14.5	0.5	24... (2000)	22... (1200)	-	-	101
110							111
120							121
130							131
150							151
160	5.5 x 13.5 x 14.5	0.55	24... (2000)	22... (1100)	-	-	161
180		181					
200		201					
220		221					
240		241					
270		271					
300		301					
330		331					
360		361					
390		391					
430		431					
470		471					
510		511					
560		561					
620		621					
680	681						
750	751						
820	821						
910	911						
1000	6.0 x 14.0 x 14.5	0.75	24... (1750)	22... (1000)	-	-	102
1100		112					
1200		122					
1300		132					
1500		152					
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 15.0 mm	PITCH = 7.5 mm (BENT BACK)			
1600	5.5 x 14.5 (16.0) x 18.5	1.1	24... (2000)	22... (1100)	26... (900)	28... (500)	162
1800							182
2000							202
2200							222
2400							242
2700	6.0 x 15.0 (16.5) x 18.5	1.2	24... (2000)	22... (1000)	26... (800)	28... (450)	272
3000							302
3300							332
3600							362
3900							392
4300							432
4700							472
5100							512
5600							562

Notes

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only



U_{RDC} = 1000 V; U_{RAC} = 400 V; U_{pp} = 1100 V (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH Ø 500 mm	PITCH = 7.5 mm (BENT BACK) Ø 500 mm Ø 356 mm		
			XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)	
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 15.0 mm	PITCH = 7.5 mm (BENT BACK)			
6200 6800	6.0 x 15.0 (16.5) x 18.5	1.2	24... (2000)	22... (1000)	26... (800)	28... (450)	622 682
7500 8200 9100	7.0 x 16.0 (17.5) x 18.5	1.4	24... (1500)	22... (800)	26... (700)	28... (400)	752 822 912
10 000	7.5 x 16.5 (18.0) x 18.5	1.6	24... (1250)	22... (800)	26... (650)	28... (350)	103
11 000 12 000	8.0 x 17.0 (18.5) x 18.5	1.8	24... (1250)	22... (750)	26... (600)	28... (350)	113 123
13 000	8.5 x 17.5 (19.0) x 18.5	1.9	24... (1000)	22... (700)	26... (550)	28... (300)	133
15 000	9.0 x 18.5 (19.5) x 18.5	2.1	24... (1000)	22... (650)	26... (550)	28... (300)	153
C (µF)	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 22.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.016 0.018	6.0 x 19.0 x 26.0	2.2	24... (800)				163 183
0.02 0.022	6.5 x 19.5 x 26.0	2.5	24... (750)				203 223
0.024	7.0 x 20.0 x 26.0	2.7	24... (650)				243
0.027 0.03	7.5 x 20.5 x 26.0	3.1	24... (600)	-	-	-	273 303
0.033	8.0 x 21.0 x 26.0	3.4	24... (550)				333
0.036 0.039	8.5 x 21.5 x 26.0	3.7	24... (500)				363 393
0.043	9.0 x 22.0 x 26.0	4.1	24... (450)				433
C (µF)	PITCH = 27.5 mm ± 0.5 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 27.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.047	7.0 x 20.0 x 30.0	3.1	24... (1000)				473
0.051 0.056	7.5 x 20.5 x 30.0	3.4	24... (750)				513 563
0.062	8.0 x 21.0 x 30.0	3.8	24... (650)				623
0.068	8.5 x 21.5 x 30.0	4.0	24... (550)				683
0.075	9.0 x 22.0 x 30.0	4.4	24... (550)				753
0.082	9.5 x 22.5 x 30.0	4.7	24... (500)				823
0.091	10.0 x 23.0 x 30.0	5.1	24... (500)	-	-	-	913
0.10	10.5 x 23.5 x 30.0	5.5	24... (450)				104
0.11	11.0 x 24.0 x 30.0	5.9	24... (400)				114
0.12	11.5 x 24.5 x 30.0	6.3	24... (400)				124
0.13	12.0 x 25.0 x 30.0	6.8	24... (350)				134
0.15	12.5 x 25.5 x 30.0	7.6	24... (350)				154

Notes

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity
- (1) Net weight for short lead product only



U_{RDC} = 1000 V; U_{RAC} = 400 V; U_{PP} = 1100 V (LOCK LEAD); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)	PITCH = 10.0 mm ± 1.0 mm; d_t = 0.60 mm ± 0.06 mm			
100	5.0 x 16.0 x 14.5	0.5	90373	(2000)
110			90374	
120			90375	
130			90376	
150	5.5 x 16.5 x 14.5	0.55	90377	(2000)
160		0.55	90378	
180		0.55	90379	
200		0.55	90281	
220		0.60	90382	
240		0.60	90383	
270		0.60	90384	
300		0.60	90385	
330		0.60	90386	
360		0.60	90387	
390		0.65	90388	
430		0.70	90389	
470		0.75	90391	
510		0.75	90392	
560		0.80	90393	
620		0.80	90394	
680	0.80	90395		
750	0.70	90396		
820	0.70	90397		
910	0.70	90398		
1000	6.0 x 17.0 x 14.5	0.75	90399	(1750)
1100		0.85	90401	
1200		0.90	90402	
1300		0.85	90403	
1500		0.90	90404	
C (pF)	PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
1600	5.5 x 17.5 x 18.5	1.1	90405	(2000)
1800			90406	
2000			90407	
2200			90408	
2400			90409	
2700	6.0 x 18.0 x 18.5	1.2	90411	(2000)
3000			90412	
3300			90413	
3600			90414	
3900			90415	
4300			90416	
4700			90417	
5100			90418	
5600			90419	
6200			90421	
6800	90422			



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)	PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
7500	7.0 x 19.0 x 18.5	1.5	90232	(1500)
8200			90423	
9100			90424	
10 000	7.5 x 19.5 x 18.5	1.6	90425	(1400)
11 000	8.0 x 20.0 x 18.5	1.8	90426	(1250)
12 000			90427	
13 000	8.5 x 20.5 x 18.5	1.9	90428	(1200)
15 000	9.0 x 21.0 x 18.5	2.1	90429	(1100)
C (μF)	PITCH = 22.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
0.016	6.0 x 22.0 x 26.0	2.2	90431	(750)
0.018			90432	
0.02	6.5 x 22.5 x 26.0	2.5	90433	(700)
0.022			90434	
0.024	7.0 x 23.0 x 26.0	2.7	90435	(600)
0.027	7.5 x 23.5 x 26.0	3.1	90436	(550)
0.03			90437	
0.033	8.0 x 24.0 x 26.0	3.4	90438	(500)
0.036	8.5 x 24.5 x 26.0	3.8	90439	(450)
0.039			90224	
0.043	9.0 x 25.0 x 26.0	4.1	90441	(450)
C (μF)	PITCH = 27.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
0.047	7.0 x 23.0 x 30.0	3.1	90442	(800)
0.051	7.5 x 23.5 x 30.0	3.4	90443	(600)
0.056			90444	
0.062	8.0 x 24.0 x 30.0	3.8	90445	(550)
0.068	8.5 x 24.5 x 30.0	4.0	90446	(550)
0.075	9.0 x 25.0 x 30.0	4.4	90447	(450)
0.082	9.5 x 25.5 x 30.0	4.7	90448	(450)
0.091	10.0 x 26.0 x 30.0	5.1	90449	(400)
0.1	10.5 x 26.5 x 30.0	5.5	90451	(350)
0.11	11.0 x 27.0 x 30.0	5.9	90452	(350)
0.12	11.5 x 27.5 x 30.0	6.3	90453	(350)
0.13	12.0 x 28.0 x 30.0	6.8	90454	(350)
0.15	12.0 x 28.5 x 30.0	7.6	90455	(300)

Notes

- SPQ = Standard Packing Quantity
- (1) Net weight for short lead product only



SPECIFIC REFERENCE DATA (1600 V_{DC})

DESCRIPTION	VALUE	
	10 kHz	100 kHz
Tangent of loss angle at (x 10 ⁻⁴): Pitch = 10 mm, 15 mm and 7.5 mm (bent back)	≤ 6	≤ 10
Pitch = 22.5 mm	≤ 6	≤ 15
Pitch = 27.5 mm	≤ 6	≤ 20
Rated voltage pulse slope (dU/dt): Pitch = 10 mm Pitch = 15 mm and 7.5 mm (bent back) Pitch = 22.5 mm Pitch = 27.5 mm	21 000 V/μs 7000 V/μs 4700 V/μs	
R between leads at 500 V, 1 min	> 100 000 MΩ	
R between interconnected leads and case, 500 V, 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge at 10 pC peak discharge	> 550 V	
Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s for C ≤ 47 nF for C > 47 nF	2560 V, 1 min	
Withstanding (DC) voltage between leads and case	2840 V, 1 min	
Maximum application temperature	105 °C	

U_{RDC} = 1600 V; U_{RAC} = 500 V; U_{PP} = 1400 V (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
			XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)	
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 15.0 mm	PITCH = 7.5 mm (BENT BACK)			
680	5.5 x 14.5 (15.0) x 18.5	0.75	34... (2000)	32... (1100)	36... (900)	38... (500)	681
750							751
820							821
910	6.0 x 15.0 (15.5) x 18.5	0.8	34... (2000)	32... (1000)	36... (800)	38... (450)	911
1000							102
1100							112
1200							122
1300							132
1500	5.5 x 14.5 (16.0) x 18.5	1.1	34... (2000)	32... (1100)	36... (900)	38... (500)	152
1600							162
1800	6.0 x 15.0 (16.5) x 18.5	1.2	34... (2000)	32... (1000)	36... (800)	38... (450)	182
2000	6.5 x 15.5 (17.0) x 18.5	1.3	34... (1500)	32... (900)	36... (750)	38... (400)	202
2200							222
2400	7.0 x 16.0 (17.5) x 18.5	1.4	34... (1500)	32... (800)	36... (700)	38... (400)	242
2700	7.5 x 16.5 (18.0) x 18.5	1.6	34... (1250)	32... (800)	36... (650)	38... (350)	272
3000							302
3300	8.0 x 17.0 (18.5) x 18.5	1.7	34... (1250)	32... (750)	36... (600)	38... (350)	332
3600	8.5 x 17.5 (19.0) x 18.5	1.8	34... (1000)	32... (700)	36... (550)	38... (300)	362
3900	9.0 x 18.5 (19.5) x 18.5	2.0	34... (1000)	32... (650)	36... (550)	38... (300)	392
4300							432



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)				
C (µF)	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 22.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.0047 0.0051 0.0056	6.0 x 19.0 x 26.0	2.0	34... (800)			472 512 562	
0.0062 0.0068	6.5 x 19.5 x 26.0	2.1	34... (750)			622 682	
0.0075 0.0082	7.0 x 20.0 x 26.0	2.3	34... (650)			752 822	
0.0091	7.5 x 20.5 x 26.0	2.5	34... (600)			912	
0.01	8.0 x 21.0 x 26.0	2.6	34... (550)	-	-	103	
0.011 0.012	8.5 x 21.5 x 26.0	2.9	34... (500)			113 123	
0.013	9.0 x 22.0 x 26.0	3.1	34... (450)			133	
0.015	9.5 x 22.5 x 26.0	3.5	34... (400)			153	
0.016	10.0 x 23.0 x 26.0	3.6	34... (400)			163	
0.018	10.5 x 23.5 x 26.0	4.0	34... (350)			183	
C (µF)	PITCH = 27.5 mm ± 0.5 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 27.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.02	9.0 x 22.0 x 30.0	4.2	34... (550)			203	
0.022	9.5 x 22.5 x 30.0	4.4	34... (500)			223	
0.024	10.0 x 23.0 x 30.0	4.7	34... (500)			243	
0.027	10.5 x 23.5 x 30.0	5.2	34... (450)			273	
0.03	11.0 x 24.0 x 30.0	5.6	34... (400)			303	
0.033	11.5 x 24.5 x 30.0	6.0	34... (400)			333	
0.036	12.0 x 25.0 x 30.0	6.5	34... (350)			363	
0.039	12.5 x 25.5 x 30.0	6.9	34... (350)			393	

Notes

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity
- (1) Net weight for short lead product only



U_{RDC} = 1600 V; U_{RAC} = 500 V; U_{PP} = 1400 V (LOCK LEAD); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)			PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm	
680	5.5 x 17.5 x 18.5	0.75	90456	(2000)
750			90457	
820			90458	
910	6.0 x 18.0 x 18.5	0.80	90459	(2000)
1000		0.85	90461	
1100		0.85	90462	
1200		0.90	90463	
1300		0.95	90464	
1500	5.5 x 17.5 x 18.5	1.1	90465	(2000)
1600			90466	
1800	6.0 x 18.0 x 18.5	1.2	90467	(2000)
2000	6.5 x 18.5 x 18.5	1.3	90468	(1750)
2200			90469	
2400	7.0 x 19.0 x 18.5	1.4	90471	(1500)
2700	7.5 x 19.5 x 18.5	1.6	90472	(1400)
3000			90473	
3300	8.0 x 20.0 x 18.5	1.9	90141	(1250)
3600	8.5 x 20.5 x 18.5	2.3	90142	(1200)
3900	9.0 x 21.5 x 18.5	2.5	90143	(1100)
4300			90144	
C (µF)			PITCH = 22.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm	
0.0047	6.0 x 22.0 x 26.0	2.4	90145	(750)
0.0051			90146	
0.0056			90147	
0.0062	6.5 x 22.5 x 26.0	2.6	90148	(700)
0.0068			90149	
0.0075	7.0 x 23.0 x 26.0	2.8	90151	(600)
0.0082			90152	
0.0083			90202	
0.0091	7.5 x 23.5 x 26.0	2.9	90153	(550)
0.01	8.0 x 24.0 x 26.0	3.2	90154	(500)
0.011	8.5 x 24.5 x 26.0	3.4	90155	(450)
0.012			90156	
0.013	9.0 x 25.0 x 26.0	3.6	90157	(450)
0.015	9.5 x 25.5 x 26.0	4.0	90158	(400)
0.016	10.0 x 26.0 x 26.0	4.3	90159	(350)
0.018	10.5 x 26.5 x 26.0	4.7	90161	(350)
C (µF)			PITCH = 27.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm	
0.02	9.0 x 25.0 x 30.0	4.2	90474	(450)
0.022	9.5 x 25.5 x 30.0	4.4	90475	(450)
0.024	10.0 x 26.0 x 30.0	4.7	90476	(400)
0.027	10.5 x 26.5 x 30.0	5.2	90477	(350)
0.03	11.0 x 27.0 x 30.0	5.6	90478	(350)
0.033	11.5 x 27.5 x 30.0	6.0	90479	(350)
0.036	12.0 x 28.0 x 30.0	6.5	90481	(300)
0.039	12.5 x 28.5 x 30.0	6.9	90482	(300)

Notes

- SPQ = Standard Packing Quantity
- (1) Net weight for short lead product only



SPECIFIC REFERENCE DATA (2000 V_{DC})

DESCRIPTION	VALUE	
	10 kHz	100 kHz
Tangent of loss angle at (x 10 ⁻⁴): Pitch = 10 mm, 15 mm, and 7.5 mm (bent back)	≤ 6	≤ 10
Pitch = 22.5 mm	≤ 6	≤ 10
Pitch = 27.5 mm	≤ 6	≤ 15
Rated voltage pulse slope (dU/dt): Pitch = 10 mm	30 000 V/μs	
Pitch = 15 mm and 7.5 mm (bent back)	10 000 V/μs	
Pitch = 22.5 mm	6700 V/μs	
Pitch = 27.5 mm		
R between leads at 500 V, 1 min	> 100 000 MΩ	
R between interconnected leads and case, 500 V, 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge at 20 pC peak discharge	> 600 V	
Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s for C ≤ 47 nF for C > 47 nF	3200 V, 1 min	
Withstanding (DC) voltage between leads and case	2840 V, 1 min	
Maximum application temperature	105 °C	

U_{RDC} = 2000 V; U_{RAC} = 600 V; U_{PP} = 1700 (KINKED); C-TOL. = ± 5 %

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
			XX (SPQ)	Ø 500 mm	Ø 500 mm	Ø 356 mm	
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d _t = 0.80 mm ± 0.08 mm	PITCH = 15.0 mm	PITCH = 7.5 mm (BENT BACK)				
100		0.75				101	
110		0.75				111	
120		0.75				121	
130		0.75				131	
150		0.75				151	
160		0.75				161	
180		0.75				181	
200		0.75				201	
220		0.75				221	
240	5.5 x 14.5 (15.0) x 18.5	0.75	44... (2000)	42... (1100)	46... (900)	48... (500)	241
270		0.75					271
300		0.75					301
330		0.75					331
360		0.75					361
390		0.75					391
430		0.75					431
470		0.80					471
510		0.80					511
560		0.80					561



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				C VALUE ..YYY
			LOOSE IN BOX	REEL			
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)				
C (pF)	PITCH = 15.0 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 15.0 mm	PITCH = 7.5 mm (BENT BACK)			
620	6.0 x 15.0 (15.5) x 18.5	0.85	44... (2000)	42... (1000)	46... (800)	48... (450)	621
680		0.85					681
750		0.90					751
820	6.5 x 15.5 (16.0) x 18.5	0.95	44... (1500)	42... (900)	46... (750)	48... (400)	821
910	5.5 x 14.5 (16.0) x 18.5	1.1	44... (2000)	42... (420)	46... (900)	48... (500)	911
1000	6.0 x 15.0 (16.5) x 18.5	1.2	44... (2000)	42... (1000)	46... (800)	48... (450)	102
1100							112
1200							122
1300	6.5 x 15.5 (17.0) x 18.5	1.3	44... (1500)	42... (900)	46... (750)	48... (400)	132
1500	7.0 x 16.0 (17.5) x 18.5	1.4	44... (1500)	42... (800)	46... (700)	48... (400)	152
1600	7.5 x 16.5 (18.0) x 18.5	1.5	44... (1250)	42... (800)	46... (650)	48... (350)	162
1800							182
2000	8.0 x 17.0 (18.5) x 18.5	1.6	44... (1250)	42... (750)	46... (600)	48... (350)	202
2200	8.5 x 17.5 (19.0) x 18.5	1.7	44... (1000)	42... (700)	46... (550)	48... (300)	222
2400	9.0 x 18.0 (19.5) x 18.5	1.8	44... (1000)	42... (650)	46... (550)	48... (300)	242
2700	9.5 x 18.5 (20.0) x 18.5	2.0	44... (900)	42... (600)	46... (500)	48... (300)	272
C (µF)	PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 22.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.003	6.0 x 19.0 x 26.0	2.1	44... (800)				302
0.0033							332
0.0036							362
0.0039	6.5 x 19.5 x 26.0	2.3	44... (750)				392
0.0043							432
0.0047	7.0 x 20.0 x 26.0	2.6	44... (650)				472
0.0051							512
0.0056	7.5 x 20.5 x 26.0	2.8	44... (600)				562
0.0062							622
0.0068	8.0 x 21.0 x 26.0	3.0	44... (550)				682
0.0075							752
0.0082	8.5 x 21.5 x 26.0	3.3	44... (500)				822
0.0091	9.0 x 22.0 x 26.0	3.6	44... (450)				912
0.01	9.5 x 22.5 x 26.0	3.8	44... (400)				103



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING				
			LOOSE IN BOX	REEL			C VALUE
			LEADS 5 mm ± 1.0 mm	ORIGINAL PITCH	PITCH = 7.5 mm (BENT BACK)		..YYY
				Ø 500 mm	Ø 500 mm	Ø 356 mm	
XX (SPQ)	XX (SPQ)	XX (SPQ)	XX (SPQ)				
C (µF)	PITCH = 27.5 mm ± 0.5 mm; d_t = 0.80 mm ± 0.08 mm		PITCH = 27.5 mm	PITCH = 7.5 mm (BENT BACK)			
0.011	9.0 x 22.0 x 30.0	3.8	44... (550)			113	
0.012	9.5 x 22.5 x 30.0	4.1	44... (500)			123	
0.013	10.0 x 23.0 x 30.0	4.4	44... (500)			133	
0.015	10.5 x 23.5 x 30.0	4.9	44... (450)			153	
0.016	11.0 x 24.0 x 30.0	5.1	44... (400)			163	
0.018	11.5 x 24.5 x 30.0	5.6	44... (400)			183	
0.02	12.5 x 25.5 x 30.0	6.1	44... (350)			203	
0.022	13.0 x 26.0 x 30.0	6.5	44... (300)			223	

Notes

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only

U_{RDC} = 2000 V; U_{RAC} = 600 V; U_{PP} = 1700 V (LOCK LEAD)

C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)			PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm	
100	5.5 x 17.5 x 18.5	0.75	90483	
110		0.75	90484	
120		0.75	90485	
130		0.75	90486	
150		0.75	90487	
160		0.75	90488	
180		0.75	90489	
200		0.75	90491	
220		0.75	90276	
240		0.75	90492	
270		0.75	90493	
300		0.75	90494	
330		0.75	90495	
360		0.75	90496	
390		0.75	90188	
430		0.75	90497	
470		0.80	90498	
510	0.80	90499		
560	0.80	90501		



C	DIMENSIONS w x h (h') x l (mm)	MASS (g) ⁽¹⁾	CATALOG NUMBER BFC2 375 XYYYY AND PACKAGING	
			LOOSE IN BOX	
			l _t = 4.0 mm + 1.0 mm/- 0.5 mm	
			(SPQ)	
C (pF)	PITCH = 15.0 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
620	6.0 x 18.0 x 18.5	0.85	90502	(2000)
680		0.85	90229	
750		0.90	90503	
820	6.5 x 18.5 x 18.5	0.95	90504	(1750)
910	5.5 x 17.5 x 18.5	1.1	90505	(2000)
1000	6.0 x 18.0 x 18.5	1.3	90225	(2000)
1100			90506	
1200			90226	
1300	6.5 x 18.5 x 18.5	1.3	90507	(1750)
1500	7.0 x 19.0 x 18.5	1.5	90266	(1500)
1600	7.5 x 19.5 x 18.5	1.7	90508	(1400)
1800			90237	
2000	8.0 x 20.0 x 18.5	1.7	90509	(1250)
2200	8.5 x 20.5 x 18.5	2.3	90227	(1200)
2400	9.0 x 21.0 x 18.5	1.8	90511	(1100)
2700	9.5 x 21.5 x 18.5	2.7	90228	(1000)
C (µF)	PITCH = 22.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
0.003	6.0 x 22.0 x 26.0	2.2	90512	(750)
0.0033			90162	
0.0036			90163	
0.0039			90164	
0.0043	6.5 x 22.5 x 26.0	2.4	90165	(700)
0.0047			90166	
0.0051	7.0 x 23.0 x 26.0	2.6	90167	(600)
0.0056			90168	
0.0062	7.5 x 23.5 x 26.0	2.8	90169	(550)
0.0068	8.0 x 24.0 x 26.0	3.0	90171	(500)
0.0075			90172	
0.0082	8.5 x 24.5 x 26.0	3.2	90173	(450)
0.0091	9.0 x 25.0 x 26.0	3.5	90174	(450)
0.01	9.5 x 25.5 x 26.0	3.8	90175	(400)
C (µF)	PITCH = 27.5 mm ± 1.0 mm; d_t = 0.80 mm ± 0.08 mm			
0.011	9.0 x 25.0 x 30.0	4.4	90176	(450)
0.012	9.5 x 25.5 x 30.0	4.6	90177	(450)
0.013	10.0 x 26.0 x 30.0	5.0	90178	(400)
0.015	10.5 x 26.5 x 30.0	5.4	90179	(350)
0.016	11.0 x 27.0 x 30.0	5.8	90181	(350)
0.018	11.5 x 27.5 x 30.0	6.2	90182	(350)
0.02	12.5 x 28.5 x 30.0	6.1	90513	(300)
0.022	13.0 x 29.0 x 30.0	6.5	90514	(250)

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Net weight for short lead product only



MOUNTING

Normal Use

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

For detailed tape specifications refer to “Packaging information” www.vishay.com/doc?28139 or end of catalog.

Specific Method of Mounting to Withstand Vibration and Shock

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

Storage Temperature

$T_{stg} = -25\text{ °C to }+35\text{ °C}$ with RH maximum 75 % without condensation

Ratings and Characteristics Reference Conditions

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

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



CHARACTERISTICS



Capacitance as a function of ambient temperature (typical curve)



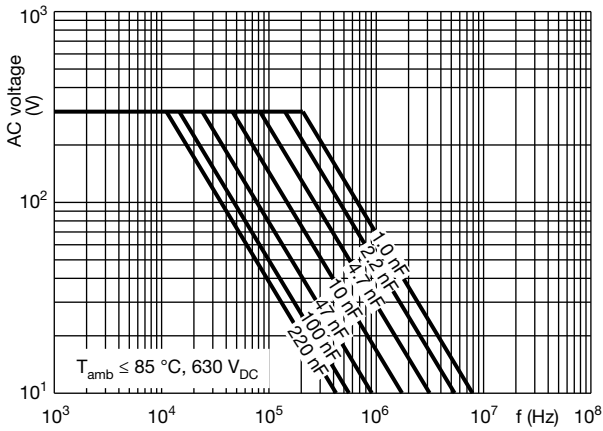
Impedance as a function of frequency (typical curve)



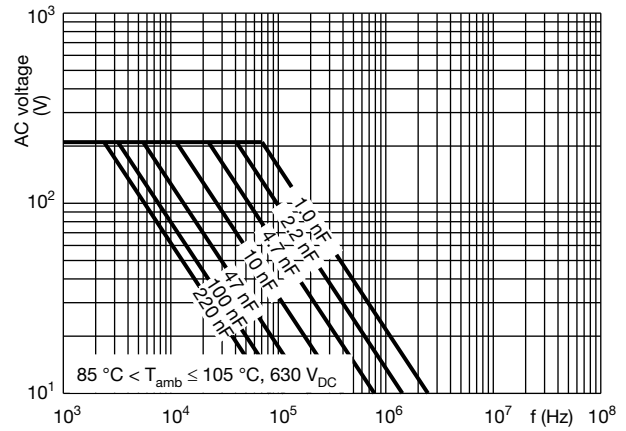
Maximum DC voltage as a function of temperature



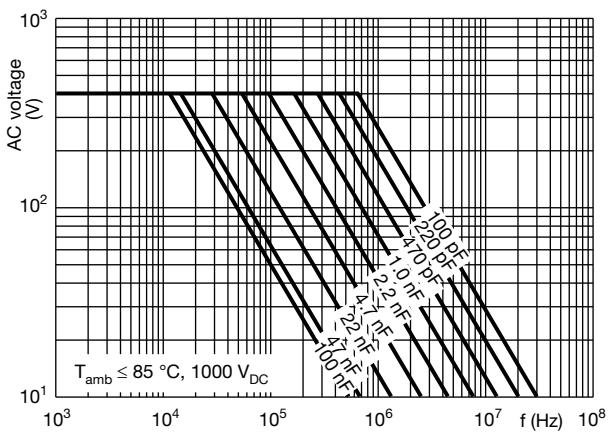
Maximum allowed component temperature rise as a function of ambient temperature



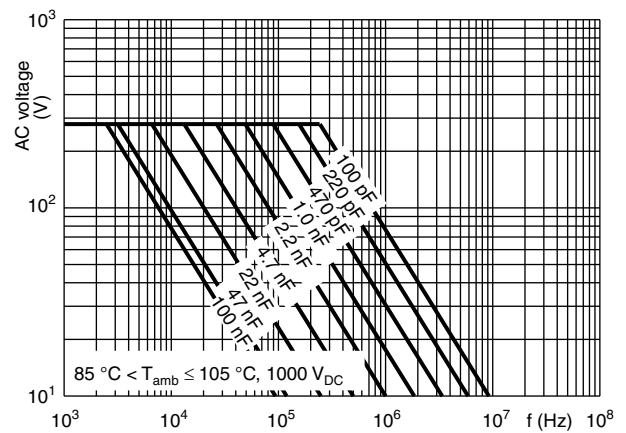
Max. RMS voltage (sinewave) as a function of frequency



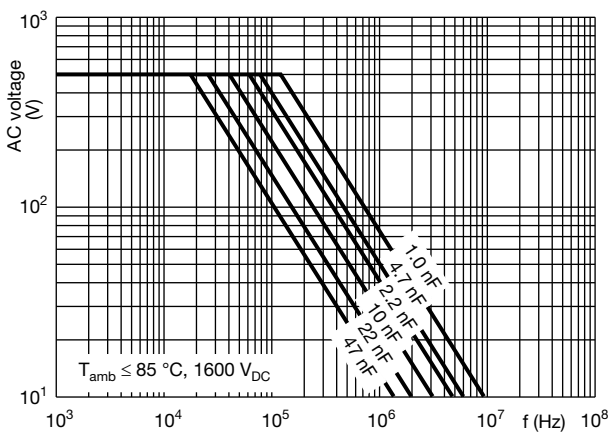
Max. RMS voltage (sinewave) as a function of frequency



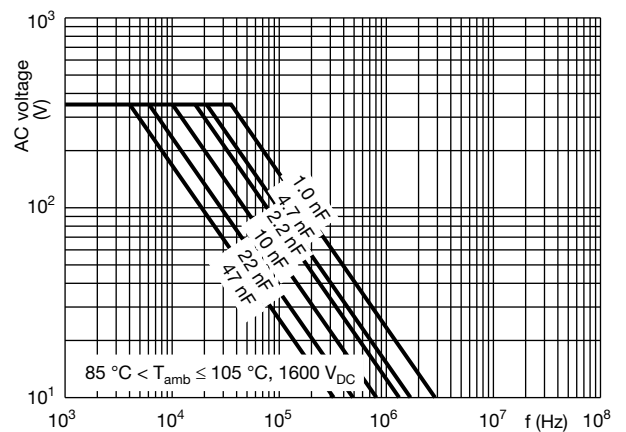
Max. RMS voltage (sinewave) as a function of frequency



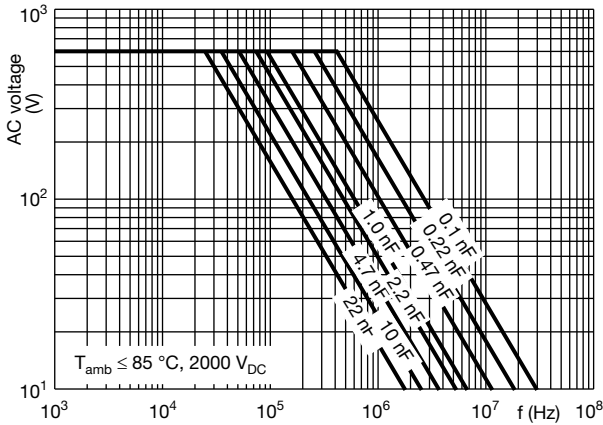
Max. RMS voltage (sinewave) as a function of frequency



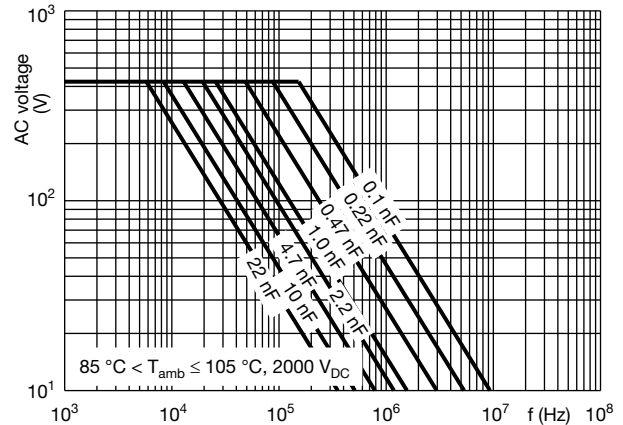
Max. RMS voltage (sinewave) as a function of frequency



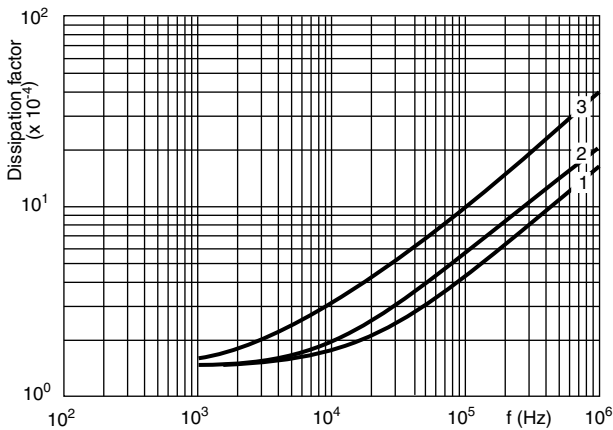
Max. RMS voltage (sinewave) as a function of frequency



Max. RMS voltage (sinewave) as a function of frequency



Max. RMS voltage (sinewave) as a function of frequency



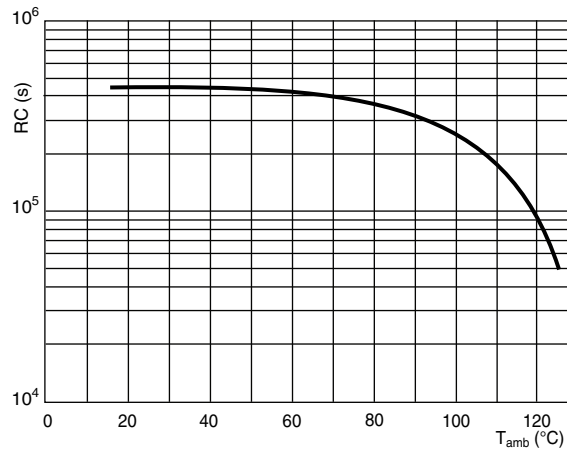
1. KP/MPK 10.0 mm and 15 mm pitch all versions
22.5 mm pitch, 1000 V, 1600 V, 2000 V and 2500 V versions
2. KP/MPK 22.5 mm pitch, 630 V versions
27.5 mm pitch, 1000 V, 1600 V and 2000 V versions
3. KP/MPK 27.5 mm pitch, 630 V versions

Tangent of loss angle
(typical curve)



1. KP/MPK 10.0 mm and 15 mm pitch all versions
22.5 mm pitch, 1000 V, 1600 V, 2000 V and 2500 V versions
2. KP/MPK 22.5 mm pitch, 630 V versions
27.5 mm pitch, 1000 V, 1600 V and 2000 V versions
3. KP/MPK 27.5 mm pitch, 630 V versions

Maximum curves



Insulation resistance as a function of ambient temperature



HEAT CONDUCTIVITY (G) AS A FUNCTION OF (ORIGINAL) PITCH AND CAPACITOR BODY THICKNESS IN mW/°C

W _{max.} (mm)	HEAT CONDUCTIVITY (mW/°C)			
	PITCH 10 mm	PITCH 15 mm	PITCH 22.5 mm	PITCH 27.5 mm
4.0	4.0	5.0	-	-
4.5	4.5	6.0	-	-
5.0	5.0	6.0	12.0	13.0
5.5	6.0	6.5	13.0	15.0
6.0	6.0	6.5	13.0	15.0
6.5	6.5	8.0	15.0	17.0
7.0	-	8.0	15.0	17.0
7.5	-	9.0	17.0	18.0
8.0	-	9.0	17.0	20.0
8.5	-	11.0	18.0	20.0
9.0	-	11.0	18.0	22.0
9.5	-	12.0	20.0	22.0
10.0	-	12.0	20.0	23.0
10.5	-	-	22.0	25.0
11.0	-	-	22.0	25.0
11.5	-	-	23.0	27.0
12.0	-	-	-	27.0
12.5	-	-	-	30.0
13.0	-	-	-	30.0
13.5	-	-	-	30.0
14.0	-	-	-	30.0
14.5	-	-	-	33.0
15.0	-	-	-	33.0
15.5	-	-	-	37.0
16.0	-	-	-	37.0

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 ambient temperature.

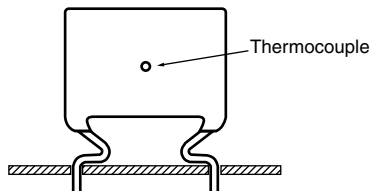
The power dissipation can be calculated according type detail specification “HQN-384-01/101: Technical Information Film Capacitors”

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

- ΔT = component temperature rise (°C)
- P = power dissipation of the component (mW)
- G = heat conductivity of the component (mW/°C)

MEASURING THE COMPONENT TEMPERATURE

A thermocouple must be attached to the capacitor body as in:



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.

APPLICATION NOTE AND LIMITING CONDITIONS

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_{PP}) shall not be greater than the maximum (U_{p-p}) to avoid the ionization 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.

Example

$C = 10 \text{ nF}$ 1600 V, KP/MPK

This is a signal as in the drawing below

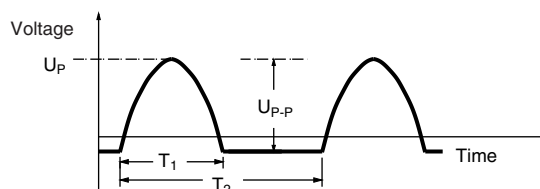
$U_{P-P} = 1200 \text{ V}$; $U_P = 1100 \text{ V}$; $T_1 = 12 \text{ } \mu\text{s}$; $T_2 = 64 \text{ } \mu\text{s}$

The ambient temperature is $50 \text{ }^\circ\text{C}$

Checking conditions:

1. The peak voltage $U_P = 1100 \text{ V}$ is lower than 1600 V_{DC}
2. The peak-to-peak voltage 1200 V is lower than $2\sqrt{02} \times 550 \text{ V}_{AC} = 1414 \text{ } U_{P-P}$
3. The voltage pulse slope (dU/dt) = 320 V is much lower than $7000 \text{ V}/\mu\text{s}$
4. The dissipated power is 170 mW as calculated with fourier terms

This gives a temperature rise of $170 \text{ mW}/(17 \text{ mW}/^\circ\text{C}) = 10 \text{ }^\circ\text{C}$ which is allowed according Fig. "Max. allowed temperature rise as a function of ambient temperature" for an ambient temperature of $50 \text{ }^\circ\text{C}$





INSPECTION REQUIREMENTS

General Notes

Sub-clause numbers of tests and performance requirements refer to the "Sectional Specification, Publication IEC 60384-17 and Specific Reference Data".

Group C Inspection Requirements

SUB-CLAUSE NUMBER AND TEST	CONDITIONS	PERFORMANCE REQUIREMENTS
SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1		
4.1 Dimensions (detail)		As specified in chapters "General Data" of this specification
4.3.1 Initial measurements	Capacitance Tangent of loss angle at 100 kHz	
4.3 Robustness of terminations	Tensile: load 10 N; 10 s Bending: load 5 N; 4 x 90°	No visible damage
4.4 Resistance to soldering heat	Method: 1A Solder bath: 280 °C ± 5 °C Duration: 10 s	
4.14 Component solvent resistance	Isopropylalcohol at room temperature Method: 2 Immersion time: 5 min ± 0.5 min Recovery time: min. 1 h, max. 2 h	
4.4.2 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$ \Delta C/C \leq 1\% + 5 \text{ pF}$ of the value measured initially
	Tangent of loss angle	Increase of $\tan \delta: \leq 0.0005$ Compared to values measured in 4.3.1
SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1		
4.6.1 Initial measurements	Capacitance Tangent of loss angle at 100 kHz	
4.15 Solvent resistance of the marking	Isopropylalcohol at room temperature Method: 1 Rubbing material: cotton wool Immersion time: 5 min ± 0.5 min	No visible damage Legible marking
4.6 Rapid change of temperature	$\theta A = -55 \text{ °C}$ $\theta B = +105 \text{ °C}$ 5 cycles Duration t = 30 min	
4.7 Vibration	Visual examination Mounting: See section "Mounting" of this specification Procedure B4 Frequency range: 10 Hz to 55 Hz Amplitude: 0.75 mm or Acceleration 98 m/s ² (whichever is less severe) Total duration 6 h	No visible damage



SUB-CLAUSE NUMBER AND TEST	CONDITIONS	PERFORMANCE REQUIREMENTS
4.7.2 Final inspection	Visual examination	No visible damage
4.9 Shock	Mounting: see section "Mounting" of this specification Pulse shape: half sine Acceleration: 490 m/s ² Duration of pulse: 11 ms	
4.9.3 Final measurements	Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage For C > 0.027µF: $ \Delta C/C \leq 2\%$ or for C ≤ 0.027µF: $ \Delta C/C \leq 3\% + 5\text{ pF}$ of the value measured in 4.6.1. Increase of tan δ: ≤ 0.0005 Compared to values measured in 4.6.1 As specified in chapter "General data" of this specification
SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B		
4.10 Climatic sequence		
4.10.2 Dry heat	Temperature: +105 °C Duration: 16 h	
4.10.3 Damp heat cyclic Test Db, first cycle		
4.10.4 Cold	Temperature: -55 °C Duration: 2 h	
4.10.6 Damp heat cyclic Test Db, remaining cycles		
4.10.6.2 Final measurements	Voltage proof = U _{RDC} for 1 min within 15 min after removal from testchamber Visual examination Capacitance Tangent of loss angle Insulation resistance	No breakdown of flash-over No visible damage Legible marking $ \Delta C/C \leq 3\%$ of the value measured in 4.4.2 or 4.9.3 Increase of tan δ: ≤ 0.001 Compared to values measured in 4.3.1 or 4.6.1 ≥ 50 % of values specified in chapters "General data" of this specification



SUB-CLAUSE NUMBER AND TEST	CONDITIONS	PERFORMANCE REQUIREMENTS
SUB-GROUP C2		
4.11 Damp heat steady state	56 days, 40 °C, 90 % to 95 % RH	
4.11.1 Initial measurements	Capacitance Tangent of loss angle at 1 kHz	
4.11.3 Final measurements	Voltage proof = U_{RDC} for 1 min within 15 min after removal from testchamber Visual examination Capacitance Tangent of loss angle Insulation resistance	No breakdown of flash-over No visible damage Legible marking $ \Delta C/C \leq 1\% + 5\text{ pF}$ of the value measured in 4.11.1. Increase of $\tan \delta \leq 0.0005$ Compared to values measured in 4.11.1 $\geq 50\%$ of values specified in section "Insulation Resistance" of this specification
SUB GROUP C3		
4.12.1 Endurance	Duration: 2000 h Temperature: 85 °C Voltage: 1.25 x max. $U_{RDC} V_{RMS}$, 50 Hz Duration: 2000 h Temperature: 105 °C	
4.12.1.1 Initial measurements	Voltage: 0.875 x max. $U_{RDC} V_{RMS}$, 50 Hz Capacitance Tangent of loss angle at 100 kHz	
4.12.1.3 Final measurements	Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage Legible marking Temperature: 85 °C For $C > 0.056\ \mu\text{F}$: $ \Delta C/C \leq 2\% + 5\text{ pF}$ or for $C > 0.056\ \mu\text{F}$: $ \Delta C/C \leq 3\% + 5\text{ pF}$ of the value measured in 4.12.1.1 Temperature: 105 °C $ \Delta C/C \leq 5\% + 5\text{ pF}$ Increase of $\tan \delta: \leq 0.001$ Compared to values measured in 4.12.1 $\geq 50\%$ of values specified in chapters "General data" of this specification
SUB-GROUP C4		
4.2.6 Temperature characteristics	Capacitance Insulation resistance	As specified in section "Capacitance" of this specification As specified in chapters "General data" of this specification



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