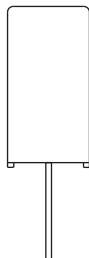
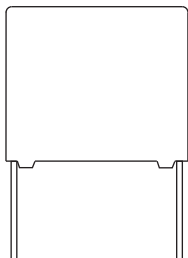




AC and Pulse Metallized Polypropylene Film Capacitors MKP/MKP Radial Potted Type



FEATURES

- 15 mm to 27.5 mm pitch
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912

APPLICATIONS

- Where steep pulses occur e.g. SMPS (switch mode power supplies)
- Motor control circuits



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

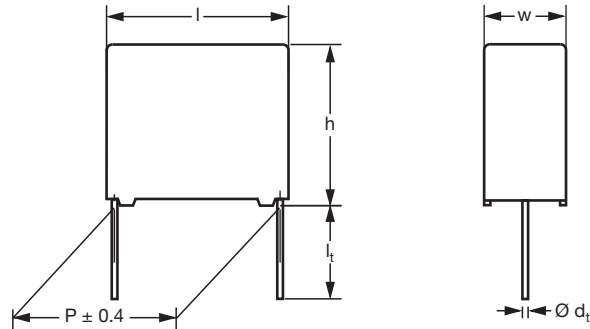
QUICK REFERENCE DATA	
Capacitance range (E24 series)	0.002 μ F to 0.68 μ F
Capacitance tolerance	$\pm 5\%$
Climatic testing class according to IEC 60068-1	55/085/56
Rated DC temperature	85 °C
Rated AC temperature	70 °C
Maximum application temperature	85 °C
Reference specifications	IEC 60384-17
Dielectric	Polypropylene film
Electrodes	Metallized film
Construction	Internal serial construction
Encapsulation	Flame retardant plastic case and epoxy resin (UL-class 94 V-0)
Leads	Tinned wire
Marking	C-value; tolerance; rated voltage; manufacturer's type designation; code for dielectric material; manufacturer's emblem; code for factory of origin; year and week of manufacture
Rated DC voltage	630 V _{DC} ; 1000 V _{DC} ; 1600 V _{DC} ; 2000 V _{DC}
Rated AC voltage	300 V _{AC} ; 400 V _{AC} ; 500 V _{AC} ; 600 V _{AC}
Rated peak-to-peak voltage	850 V; 1130 V; 1400 V; 1700 V
Performance grade	Grade 1 (long life)
Stability grade	Pitch 15 mm: grade 2 Pitch 22.5 mm and 27.5 mm: grade 1

Note

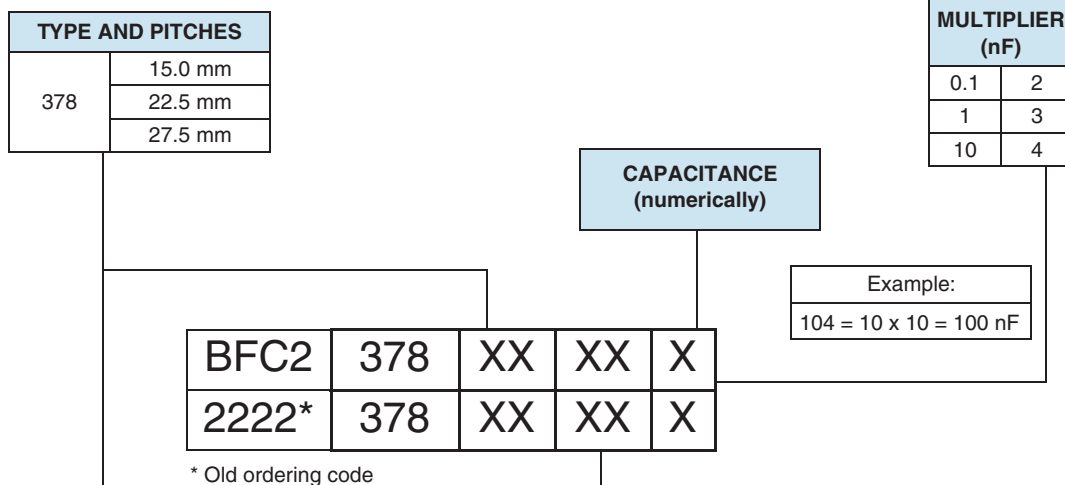
- For more detailed data and test requirements contact: dc-film@vishay.com



DIMENSIONS in millimeters



COMPOSITION OF CATALOG NUMBER



TYPE	PACKAGING	LEAD CONFIGURATION	PREFERRED TYPES				
			C-TOL.	630 V	1000 V	1600 V	2000 V
380	Loose in box	Lead length 3.5 mm ± 0.3 mm	± 5 %	64	74	84	94
TYPE	PACKAGING	LEAD CONFIGURATION	ON REQUEST				
378	Loose in box	Lead length 5.0 mm ± 1.0 mm	± 5 %	62	72	82	92
	Taped on reel	H = 18.5 mm; P ₀ = 12.7 mm		65	75	85	95

DESCRIPTION	VALUE	
Tangent of loss angle:	at 10 kHz	at 100 kHz
$C \leq 0.18 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
$0.2 \mu\text{F} \leq C \leq 0.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
$0.33 \mu\text{F} \leq C \leq 0.39 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
$0.43 \mu\text{F} \leq C \leq 0.51 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
$C > 0.51 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 75 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R :		
P = 15 mm	500 V/μs	
P = 22.5 mm	370 V/μs	
P = 27.5 mm	230 V/μs (b < 15 mm)	
P = 27.5 mm	120 V/μs (b ≥ 15 mm)	
R between leads, for $C \leq 1 \mu\text{F}$; 500 V; 1 min	> 100 000 MΩ	
R between leads and case; 500 V; 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 400 V	
Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s	1008 V; 1 min	
Withstanding (DC) voltage between leads and case	2840 V; 1 min	

(1) See “Voltage Proof Test for Metalized Film Capacitors” www.yishay.com/doc?28169

U _{RDC} (V)	CAP. (μF)	DIMENSIONS w x h x l (mm)	MASS ⁽²⁾ (g)	CATALOG NUMBER BFC2 378 AND PACKAGING								
				LOOSE IN BOX		REEL ⁽¹⁾						
				I _t = 3.5 mm ± 0.3 mm	ALL LEADS	H = 18.5 mm; P ₀ = 12.7 mm						
				C-TOL. = ± 5 %								
				LAST 5 DIGITS OF CATALOG NUMBER	SPQ	SPQ						
630	PITCH = 15.0 mm ± 0.4 mm; d _t = 0.60 ± 0.06 mm; U _{RAC} = 300 V; U _{p-p} = 850 V											
	0.015 0.016 0.018 0.020 0.022	5.0 x 11.0 x 17.5	1.0	64153 64163 64183 64203 64223	1000	1100						
	0.024 0.027 0.030 0.033			64243 64273 64303 64333								
	PITCH = 15.0 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 850 V											
	0.036 0.039 0.043			6.0 x 12.0 x 17.5			1.8	64363 64393 64433	1000	800		
	0.047							64473				
	0.051	7.0 x 13.0 x 17.5	2.4	64513	1000	650						
	PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 850 V											
	0.056 0.062	6.0 x 15.5 x 26.0	2.4	64563 64623	300	600						
	0.068 0.075 0.082 0.091			2.9			64683 64753 64823 64913	200	550			
	0.10						3.8			64104	200	450
	0.11 0.12 0.13						7.0 x 16.5 x 26.0			3.8	64114 64124 64134	200
	0.15 0.16 0.18			64154 64164 64184				200	350			



ELECTRICAL DATA AND ORDERING CODE						
U _{RDC} (V)	CAP. (μF)	DIMENSIONS w x h x l (mm)	MASS ⁽²⁾ (g)	CATALOG NUMBER BFC2 378 AND PACKAGING		
				LOOSE IN BOX		REEL ⁽¹⁾
				I _t = 3.5 mm ± 0.3 mm	ALL LEADS	H = 18.5 mm; P ₀ = 12.7 mm
				C-TOL. = ± 5 %		
				LAST 5 DIGITS OF CATALOG NUMBER	SPQ	SPQ
630	PITCH = 27.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 850 V					
	0.20	9.0 x 19.0 x 31.5	7.4	64204	100	
	0.22			64224		
	0.24			64244		
	0.27			64274		
	0.30	11.0 x 21.0 x 31.0	9.2	64304	100	
	0.33			64334		
	0.36			64364		
	0.39			64394		
	0.43	13.0 x 23.0 x 31.0	12.3	64434	100	
	0.47			64474		
	0.51			64514		
	0.56	15.0 x 25.0 x 31.5	16.1	64564	100	
	0.62			64624		
	0.68			64684		

Notes

- (1) H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
- (2) Weight for short lead product only
- SPQ = Standard Packing Quantity

SPECIFIC REFERENCE DATA - 1000 V _{DC}		
DESCRIPTION	VALUE	
Tangent of loss angle:	at 10 kHz	at 100 kHz
C ≤ 0.051 μF	≤ 10 x 10 ⁻⁴	≤ 20 x 10 ⁻⁴
0.056 μF ≤ C ≤ 0.22 μF	≤ 10 x 10 ⁻⁴	≤ 25 x 10 ⁻⁴
Rated voltage pulse slope (dU/dt) _R :		
P = 15 mm	1300 V/μs	
P = 22.5 mm	1200 V/μs	
P = 27.5 mm	600 V/μs (b < 15 mm)	
P = 27.5 mm	300 V/μs (b ≥ 15 mm)	
R between leads, for C ≤ 1 μF; 500 V; 1 min	> 100 000 MΩ	
R between leads and case; 500 V; 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 500 V	
Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s	1600 V; 1 min	
Withstanding (DC) voltage between leads and case	2840 V; 1 min	

Note

- (1) See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169



ELECTRICAL DATA AND ORDERING CODE

U _{RDC} (V)	CAP. (μF)	DIMENSIONS w x h x l (mm)	MASS ⁽²⁾ (g)	CATALOG NUMBER BFC2 378 AND PACKAGING							
				LOOSE IN BOX		REEL ⁽¹⁾					
				I _t = 3.5 mm ± 0.3 mm	ALL LEADS	H = 18.5 mm; P ₀ = 12.7 mm					
				C-TOL. = ± 5 %							
				LAST 5 DIGITS OF CATALOG NUMBER	SPQ	SPQ					
1000	PITCH = 15.0 mm ± 0.4 mm; d _t = 0.60 ± 0.06 mm; U _{RAC} = 300 V; U _{p-p} = 1130 V										
	0.0030 0.0033 0.0036 0.0039 0.0043 0.0047 0.0051 0.0056 0.0062 0.0068 0.0075	5.0 x 11.0 x 17.5	1.0	74302 74332 74362 74392 74432 74472 74512 74562 74622 74682 74752	1000	1100					
	0.0082 0.0091			74822 74912			1000	900			
	0.010 0.011								74103 74113		
	PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 1130 V										
	0.012 0.013 0.015 0.016 0.018			6.0 x 15.5 x 26.0			2.4	74123 74133 74153 74163 74183	300	600	
	0.020 0.022 0.024							74203 74223 74243			200
	0.027 0.030						3.8		74273 74303	200	
	0.033 0.036							7.0 x 16.5 x 26.0	74333 74363		
	0.039 0.043								74393 74433		200
	0.047 0.051			74473 74513							
	PITCH = 27.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 1130 V										
	0.056 0.062 0.068 0.075	9.0 x 19.0 x 31.5	7.4	74563 74623 74683 74753	100						
	0.082			74823							
	0.091 0.10 0.11	11.0 x 21.0 x 31.5	9.2	74913 74104 74114	100						
	0.12			74124							
	0.13 0.15 0.16	13.0 x 23.0 x 31.0	12.3	74134 74154	100						
	0.18 0.20			15.0 x 25.0 x 31.5			16.1	74164 74184 74204	100		
	0.22	18.0 x 28.0 x 31.5	74224								

Notes

(1) H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information

(2) Weight for short lead product only

- SPQ = Standard Packing Quantity

SPECIFIC REFERENCE DATA - 1600 V_{DC}

DESCRIPTION	VALUE	
Tangent of loss angle: C ≤ 0.022 μF 0.024 μF ≤ C ≤ 0.1 μF	at 10 kHz ≤ 10 × 10 ⁻⁴ ≤ 10 × 10 ⁻⁴	at 100 kHz ≤ 15 × 10 ⁻⁴ ≤ 20 × 10 ⁻⁴
Rated voltage pulse slope (dU/dt) _R : P = 22.5 mm P = 27.5 mm P = 27.5 mm	1600 V/μs 900 V/μs (b < 15 mm) 450 V/μs (b ≥ 15 mm)	
R between leads, for C ≤ 1 μF; 500 V; 1 min	> 100 000 MΩ	
R between leads and case; 500 V; 1 min	> 100 000 MΩ	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	> 600 V	
Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s	2560 V; 1 min	
Withstanding (DC) voltage between leads and case	2840 V; 1 min	

Note

⁽¹⁾ See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169

ELECTRICAL DATA AND ORDERING CODE

U _{RDC} (V)	CAP. (μF)	DIMENSIONS w x h x l (mm)	MASS ⁽²⁾ (g)	CATALOG NUMBER BFC2 378 AND PACKAGING		
				LOOSE IN BOX		REEL ⁽¹⁾
				I _t = 3.5 mm ± 0.3 mm	ALL LEADS	H = 18.5 mm; P ₀ = 12.7 mm
				C-TOL. = ± 5 %		
				LAST 5 DIGITS OF CATALOG NUMBER	SPQ	SPQ
1600	PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 500 V; U _{p-p} = 1400 V					
	0.0056 0.0062 0.0068	6.0 x 15.5 x 26.0	2.4	84562 84622 84682	300	600
	0.0075 0.0082 0.0091 0.010		2.9	84752 84822 84912 84103	200	550
	0.011 0.012 0.013 0.015 0.016		3.8	84113 84123 84133 84153 84163	200	450
	0.018 0.020 0.022		6.8	84183 84203 84223	200	350
	PITCH = 27.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 500 V; U _{p-p} = 1400 V					
	0.024 0.027 0.030 0.033 0.036	9.0 x 19.0 x 31.5	7.4	84243 84273 84303 84333 84363	100	
	0.039 0.043		9.2	84393 84433 84473 84513	100	
	0.047 0.051	11.0 x 21.0 x 31.0		12.3	84563 84623 84683	
	0.056 0.062 0.068		13.0 x 23.0 x 31.0		16.1	
	0.075 0.082 0.091	84104				
	0.10	15.0 x 25.0 x 31.5				

Notes

⁽¹⁾ H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information

⁽²⁾ Weight for short lead product only

- SPQ = Standard Packing Quantity

SPECIFIC REFERENCE DATA - 2000 V_{DC}

DESCRIPTION	VALUE	
Tangent of loss angle: $C \leq 0.051 \mu\text{F}$	at 10 kHz $\leq 10 \times 10^{-4}$	at 100 kHz $\leq 15 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R : P = 22.5 mm P = 27.5 mm P = 27.5 mm	2000 V/ μs 1200 V/ μs (b < 15 mm) 600 V/ μs (b $\geq$ 15 mm)	
R between leads, for $C \leq 1 \mu\text{F}$; 500 V; 1 min	> 100 000 M Ω	
R between leads and case; 500 V; 1 min	> 100 000 M Ω	
Ionization (AC) voltage (typical value) at 20 pC peak discharge	> 600 V	
Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time $\leq$ 1000 V/s	3200 V; 1 min	
Withstanding (DC) voltage between leads and case	2840 V; 1 min	

Note

⁽¹⁾ See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169

ELECTRICAL DATA AND ORDERING CODE

U _{RDC} (V)	CAP. (μF)	DIMENSIONS w x h x l (mm)	MASS ⁽²⁾ (g)	CATALOG NUMBER BFC2 378 AND PACKAGING		
				LOOSE IN BOX		REEL ⁽¹⁾
				I _t = 3.5 mm ± 0.3 mm	ALL LEADS	H = 18.5 mm; P ₀ = 12.7 mm
				C-TOL. = ± 5 %		
				LAST 5 DIGITS OF CATALOG NUMBER	SPQ	SPQ
2000	PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 600 V; U _{p-p} = 1700 V					
	0.0033 0.0036	6.0 x 12.0 x 26.0	2.4	94332 94362	300	600
	0.0039 0.0043 0.0047 0.0051		2.9	94392 94432 94472 94512	200	550
	0.0056		3.8	94562	200	450
	0.0062 0.0068 0.0075			94622 94682 94752		
	0.0082			94822		
	0.0091 0.010 0.011	94912 94103 94113		200		
	0.012	10.0 x 19.5 x 26.0		94123		
	PITCH = 27.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 600 V; U _{p-p} = 1700 V					
	0.013 0.015 0.016	9.0 x 19.0 x 31.5	7.4	94133 94153 94163	100	
	0.018 0.020	11.0 x 21.0 x 31.0	9.2	94183 94203	100	
	0.022 0.024			94223 94243		
	0.027			94273		
	0.030 0.033 0.036	13.0 x 23.0 x 31.0	12.3	94303 94333 94363	100	
	0.039 0.043 0.047	15.0 x 25.0 x 31.5	16.1	94393 94433 94473	100	
	0.051	18.0 x 28.0 x 31.5		94513		

Notes

- ⁽¹⁾ H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
⁽²⁾ Weight for short lead product only
• SPQ = Standard Packing Quantity

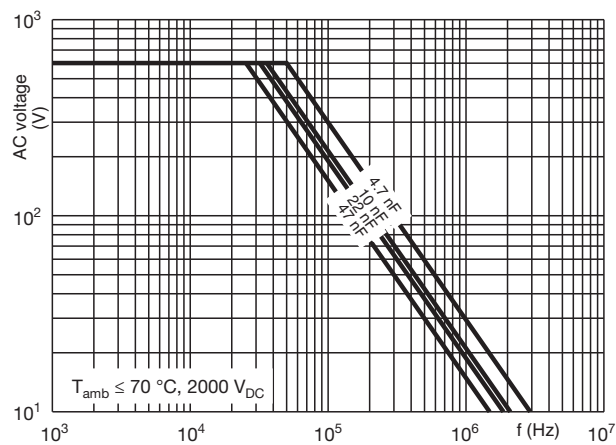
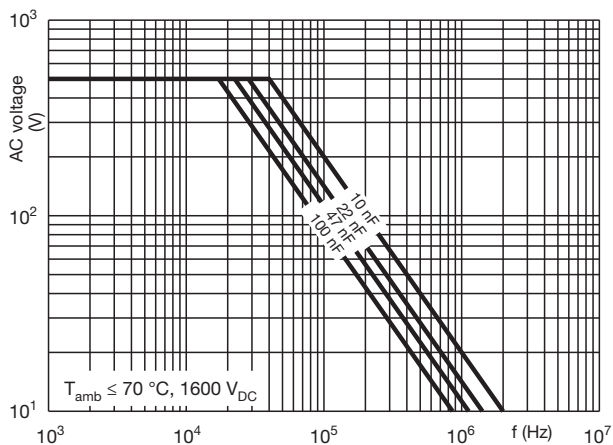
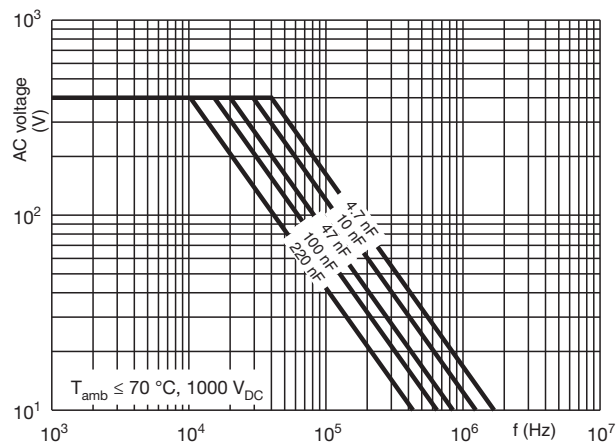


Figure 1 is a graph showing the temperature dependence of the relative change in capacitance C/C_0 (%) versus ambient temperature T_{amb} (°C) for a 1 kHz signal. The graph includes a typical curve and a shaded region representing the maximum and minimum values.

T_{amb} (°C)	Typical C/C_0 (%)	Max C/C_0 (%)	Min C/C_0 (%)
-40	1.5	2.0	0.5
0	0.5	1.0	-0.5
40	-0.5	0.0	-1.5
80	-2.0	-1.0	-3.0



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