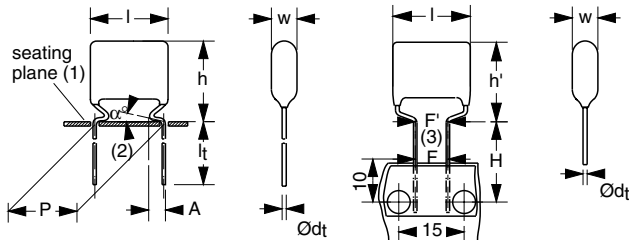
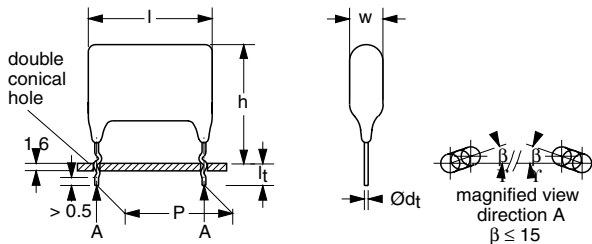


AC and Pulse Polypropylene Film Capacitors MKP Radial Epoxy Lacquered Type



Dimensions in mm

- (1) Hole $\varnothing$ 1.0 for $d_t = 0.6$ mm
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 (pitch = 10.0 mm)
 $A = 2.5 + 1.4/-0.5$ mm (pitch = 15.0 mm; 22.5 mm and 27.5 mm)



Dimensions in mm

APPLICATIONS

Low losses due to low contact resistance and low loss dielectric result in applications where high currents at high frequency occur or high stability is preferred. Typical for S-correction in TV-sets and monitor. Their small dimensions make them suitable for circuits with high packaging density.

MARKING

Manufacturer's emblem; C-value; tolerance; rated voltage; manufacturer's type designation; code for dielectric material; code for monitor type

DIELECTRIC

Polypropylene film

ELECTRODES

Vacuum deposited aluminum

COATING

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

LEADS

Tinned wire

FEATURES

7.5 mm bent back pitch. 10 to 27.5 mm lead pitch. 10 to 27.5 mm lead pitch. Low contact resistance. Low loss dielectric. Supplied loose in box (including lock lead versions) and taped on reel

Lead (Pb)-free product

RoHS-compliant product



RoHS
COMPLIANT

CONSTRUCTION

Wound mono construction

CAPACITANCE RANGE (E24 SERIES)

0.01 to 3.9 μ F

CAPACITANCE TOLERANCE

$\pm 5 \%$

RATED (DC) VOLTAGE

160 V; 250 V; 400 V; 630 V

RATED (AC) VOLTAGE

100 V; 160 V; 200 V; 200 V

RATED PEAK-TO-PEAK VOLTAGE

280 V; 450 V; 560 V; 560 V

CLIMATIC CATEGORY

55/105/56

RATED TEMPERATURE

85 °C

MAXIMUM APPLICATION TEMPERATURE

105 °C

REFERENCE SPECIFICATIONS

IEC 60384-17

PERFORMANCE GRADE

Grade 1 (long life)

STABILITY GRADE

Grade 2

DETAIL SPECIFICATION

For more detailed data and test requirements contact:
filmcaps.roeselare@vishay.com

AC and Pulse Polypropylene
Film Capacitors MKP Radial Epoxy
Lacquered Type

Vishay BCcomponents

COMPOSITION OF CATALOG NUMBER

TYPE AND PITCHES							MULTIPLIER (nF)	
479	15.0/7.5 mm						0.1	2
	10.0 mm						1	3
	15.0 mm						10	4
	22.5 mm						100	5
	27.5 mm							
		CAPACITANCE (numerically; but not for lock lead)						
		Example: 104 = 10 x 10 = 100 nF						
		2222	479	XX	XX	X		
		BFC2*	479	XX	XX	X		

SPECIFIC REFERENCE DATA (160 VDC)

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
C = 0.075 μ F	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.075 μ F < C $\leq$ 0.11 μ F	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.11 μ F < C $\leq$ 0.18 μ F	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.18 μ F < C $\leq$ 0.3 μ F	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.3 μ F < C $\leq$ 0.39 μ F	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.39 μ F < C $\leq$ 0.56 μ F	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 μ F < C $\leq$ 0.68 μ F	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.68 μ F < C $\leq$ 0.75 μ F	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
C = 0.82 μ F	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
0.82 μ F < C $\leq$ 0.91 μ F	$\leq 10 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
0.91 μ F < C $\leq$ 1.0 μ F	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
1.0 μ F < C $\leq$ 1.2 μ F	$\leq 10 \times 10^{-4}$	$\leq 70 \times 10^{-4}$
1.2 μ F < C $\leq$ 1.3 μ F	$\leq 10 \times 10^{-4}$	$\leq 75 \times 10^{-4}$
1.3 μ F < C $\leq$ 1.5 μ F	$\leq 10 \times 10^{-4}$	$\leq 80 \times 10^{-4}$
1.5 μ F < C $\leq$ 1.6 μ F	$\leq 10 \times 10^{-4}$	$\leq 85 \times 10^{-4}$
1.6 μ F < C $\leq$ 1.8 μ F	$\leq 10 \times 10^{-4}$	$\leq 90 \times 10^{-4}$
1.8 μ F < C $\leq$ 2.0 μ F	$\leq 10 \times 10^{-4}$	$\leq 95 \times 10^{-4}$
2.0 μ F < C $\leq$ 2.2 μ F	$\leq 10 \times 10^{-4}$	$\leq 100 \times 10^{-4}$
2.2 μ F < C $\leq$ 2.4 μ F	$\leq 15 \times 10^{-4}$	$\leq 105 \times 10^{-4}$
2.4 μ F < C $\leq$ 2.7 μ F	$\leq 15 \times 10^{-4}$	$\leq 110 \times 10^{-4}$
2.7 μ F < C $\leq$ 3.0 μ F	$\leq 15 \times 10^{-4}$	$\leq 115 \times 10^{-4}$
3.0 μ F < C $\leq$ 3.3 μ F	$\leq 15 \times 10^{-4}$	$\leq 125 \times 10^{-4}$
3.3 μ F < C $\leq$ 3.6 μ F	$\leq 15 \times 10^{-4}$	$\leq 130 \times 10^{-4}$
3.6 μ F < C $\leq$ 3.9 μ F	$\leq 15 \times 10^{-4}$	$\leq 135 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R at 160 V (DC):		
P = 10 mm	60 V/ μ s	
P = 15 mm	50 V/ μ s	
P = 22.5 mm	25 V/ μ s	
P = 27.5 mm	15 V/ μ s	
R between leads, for C $\leq$ 1.0 μ F at 100 V; 1 minute	> 100000 M Ω	
RC between leads, for C > 1 μ F at 100 V; 1 minute	> 100000 s	
R between leads and case; 100 V; 1 minute	> 100000 M Ω	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 220 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	256 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

U_{Rdc} = 160 V; U_{Rac} = 100 V; U_{p-p} = 280 V (standard)

C (μF)	DIMENSIONS wmax × h (h')max × lma x (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			lt = 5.0 ±1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
Pitch = 10.0 ± 0.4 mm; d _t = 0.60 ± 0.06 mm			pitch = 7.5 mm (bent back)		pitch = 10.0 mm		
0.075	6.0 × 15.0 × 12.5	0.9	32753	1000		1000	
0.082			32823				
0.091			32913				
0.1			32104				
0.11			32114				
0.12			32124				
0.13			32134				



AC and Pulse Polypropylene
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C (μ F)	DIMENSIONS w _{max} × h (h') _{max} × l _{ma} x (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			lt = 5.0 ± 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
0.15 0.16	6.5 × 15.5 × 12.5	1.0	32154 32164	1000			900
Pitch = 15.0 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 15.0 mm
0.18	6.0 × 15.0 (16.5) × 18.5	1.2	32184	2000	36184	800	1000
0.20 0.22	6.5 × 15.5 (17.0) × 18.5	1.3	32204 32224	1500	36204 36224	750	900
0.24 0.27 0.30 0.33 0.36 0.39	7.0 × 16.0 (17.5) × 18.5	1.4	32244 32274 32304 32334 32364 32394	1250	36244 36274 36304 36334 36364 36394	700	800
0.43 0.47	7.5 × 16.5 (18.0) × 18.5	1.5	32434 32474	1250	36434 36474	650	800
0.51 0.56	8.0 × 17.0 (18.5) × 18.5	1.6	32514 32564	1250	36514 36564	600	700
0.62	8.5 × 17.5 (19.0) × 18.5	1.7	32624	1000	36624	550	700
0.68	9.0 × 18.0 (19.5) × 18.5	1.8	32684	1000	36684	550	600
0.75	9.5 × 18.5 (20.0) × 18.5	1.9	32754	900	36754	500	600
Pitch = 22.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 22.5 mm
0.82	7.0 × 20.0 × 26.0	1.8	32824	650			550
0.91 1	7.5 × 20.5 × 26.0	1.9	32914 32105	600			500
1.1	8.0 × 21.0 × 26.0	2.0	32115	550			500
1.2 1.3	8.5 × 21.5 × 26.0	2.1	32125 32135	500			450
1.5 1.6	9.5 × 22.5 × 26.0	2.4	32155 32165	450			400
1.8	10.0 × 23.0 × 26.0	2.5	32185	400			400
Pitch = 27.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 27.5 mm
2	10.0 × 23.0 × 30.0	5.0	32205	450			
2.2	10.5 × 23.5 × 30.0	5.0	32225	450			
2.4	11.0 × 24.0 × 30.0	5.5	32245	400			
2.7	11.5 × 24.5 × 30.0	5.5	32275	400			
3	12.0 × 25.0 × 30.0	6.0	32305	350			
3.3	13.0 × 26.0 × 30.0	6.5	32335	300			
3.6	13.5 × 26.5 × 30.0	7.0	32365	300			
3.9	14.0 × 27.0 × 30.0	7.0	32395	300			

$U_{Rdc} = 160 \text{ V}$; $U_{Rac} = 100 \text{ V}$; $U_{p-p} = 280 \text{ V}$ (lock lead)

C (μF)	DIMENSIONS w _{max} × h _{max} × l _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			It = 4.0 + 1.0/– 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 10.0 ± 1.0 mm; d _t = 0.60 ± 0.06 mm				
0.075 0.082 0.091 0.1 0.11 0.12 0.13	6.0 × 18.0 × 12.5	0.9	90089 90091 90092 90093 90094 90095 90096	1400
0.15 0.16	6.5 × 18.5 × 12.5	1.0	90097 90098	1250
Pitch = 15.0 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.18	6.0 × 18.0 × 18.5	1.2	90099	1500
0.20 0.22	6.5 × 18.5 × 18.5	1.3	90101 90102	1250
0.24 0.27 0.30 0.33 0.36 0.39	7.0 × 19.0 × 18.5	1.4	90103 90104 90105 90106 90107 90108	1250
0.43 0.47	7.5 × 19.5 × 18.5	1.5	90109 90111	1000
0.51 0.56	8.0 × 20.0 × 18.5	1.6	90112 90113	1000
0.62	8.5 × 20.5 × 18.5	1.7	90114	900
0.68	9.0 × 21.0 × 18.5	1.8	90115	800
0.75	9.5 × 21.5 × 18.5	1.9	90116	800
Pitch = 22.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.82	7.0 × 23.0 × 26.0	1.8	90117	850
0.91 1	7.5 × 23.5 × 26.0	1.9	90118 90119	750
1.1	8.0 × 24.0 × 26.0	2.0	90121	700
1.2 1.3	8.5 × 24.5 × 26.0	2.1	90122 90036	650
1.5 1.6	9.5 × 25.5 × 26.0	2.4	90037 90038	550
1.8	10.0 × 26.0 × 26.0	2.5	90039	500
Pitch = 27.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
2	10.0 × 26.0 × 30.0	5.0	90041	400
2.2	10.5 × 26.5 × 30.0	5.0	90042	400
2.4	11.0 × 27.0 × 30.0	5.5	90123	350
2.7	11.5 × 27.5 × 30.0	5.5	90124	350
3	12.0 × 28.0 × 30.0	6.0	90125	350
3.3	13.0 × 29.0 × 30.0	6.5	90126	300
3.6	13.5 × 29.5 × 30.0	7.0	90127	250
3.9	14.0 × 30.0 × 30.0	7.0	90128	250



AC and Pulse Polypropylene
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SPECIFIC REFERENCE DATA (250 VDC)

DESCRIPTION	VALUE	
	at 10 kHz	at 100 kHz
Tangent of loss angle:		
0.047 $\mu\text{F} < C \leq 0.075 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.075 $\mu\text{F} < C \leq 0.11 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.11 $\mu\text{F} < C \leq 0.18 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.18 $\mu\text{F} < C \leq 0.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.3 $\mu\text{F} < C \leq 0.39 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.39 $\mu\text{F} < C \leq 0.47 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.51 $\mu\text{F} < C \leq 0.56 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.68 $\mu\text{F} < C \leq 0.82 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
0.82 $\mu\text{F} < C \leq 0.91 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
0.91 $\mu\text{F} < C \leq 1.0 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
1.0 $\mu\text{F} < C \leq 1.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 70 \times 10^{-4}$
1.2 $\mu\text{F} < C \leq 1.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 75 \times 10^{-4}$
1.3 $\mu\text{F} < C \leq 1.5 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 80 \times 10^{-4}$
1.5 $\mu\text{F} < C \leq 1.6 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 85 \times 10^{-4}$
1.6 $\mu\text{F} < C \leq 1.8 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 90 \times 10^{-4}$
1.8 $\mu\text{F} < C \leq 2.0 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 95 \times 10^{-4}$
2.0 $\mu\text{F} < C \leq 2.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 100 \times 10^{-4}$
2.2 $\mu\text{F} < C \leq 2.4 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 105 \times 10^{-4}$
2.4 $\mu\text{F} < C \leq 2.7 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 110 \times 10^{-4}$
2.7 $\mu\text{F} < C \leq 3 \mu\text{F}$	$\leq 15 \times 10^{-4}$	$\leq 115 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R :		
P = 10.0 mm	70 V/ μs	
P = 15.0 mm	60 V/ μs	
P = 22.5 mm	30 V/ μs	
P = 27.5 mm	20 V/ μs	
R between leads, for $C \leq 1.0 \mu\text{F}$ at 100 V; 1 minute	> 100000 M Ω	
RC between leads, for $C > 1 \mu\text{F}$ at 100 V; 1 minute	> 100000 s	
R between leads and case; 100 V; 1 minute	> 100000 M Ω	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 220 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	

$U_{Rdc} = 250 \text{ V}$; $U_{Rac} = 160 \text{ V}$; $U_{p-p} = 450 \text{ V}$ (standard)

C (μF)	DIMENSIONS $w_{\text{max}} \times h'(\text{h})_{\text{max}} \times l_{\text{max}}$ (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING			
			LOOSE IN BOX		REEL	
			$l_t = 5.0 \pm 1.0 \text{ mm}$	all leads	pitch 7.5 mm (bent back)	original pitch
			C-tol = $\pm 5 \%$		C-tol = $\pm 5 \%$	
			last 5 digits of catalog number	SPQ	last 5 digits of catalog number	SPQ
Pitch = $10.0 \pm 0.4 \text{ mm}$; $d_t = 0.60 \pm 0.06 \text{ mm}$					pitch = 7.5 mm (bent back)	pitch = 10.0 mm
0.047	6.0 $\times$ 15.0 $\times$ 12.5	0.9	42473	1000		1000
0.051			42513			
0.056			42563			
0.062			42623			
0.068			42683			
0.075			42753			
0.082			42823			
0.091			42913			
0.1	6.5 $\times$ 15.5 $\times$ 12.5	1.0	42104	1000		900

C (μF)	DIMENSIONS wmax × h (h')max × lmax ax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING									
			LOOSE IN BOX		REEL							
			lt = 5.0 ± 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch					
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ					
			last 5 digits of catalog number		last 5 digits of catalog number							
Pitch = 15.0 ± 0.4 mm; dt = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 15.0 mm					
0.11 0.12 0.13 0.15 0.16 0.18 0.20 0.22	6.5 × 15.5 (17.0) × 18.5	1.3	42114 42124 42134 42154 42164 42184 42204 42224	1500	46114 46124 46134 46154 46164 46184 46204 46224	750	900					
0.24			7.0 × 16.0 (17.5) × 18.5		1.4			42244	1250	46244	700	800
0.27 0.30			7.5 × 16.5 (18.0) × 18.5		1.5			42274 42304	1250	46274 46304	650	800
0.33			8.0 × 17.0 (18.5) × 18.5		1.6			42334	150	46334	600	700
0.36 0.39			8.5 × 17.5 (19.0) × 18.5		1.7			42364 42394	1000	46364 46394	550	700
0.43			9.0 × 18.0 (19.5) × 18.5		1.8			42434	1000	46434	550	600
0.47			9.5 × 18.5 (20.0) × 18.5		1.9			42474	900	46474	500	600
Pitch = 22.5 ± 0.4 mm; dt = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)			pitch = 22.5 mm				
0.51 0.56	7.0 × 20.0 × 26.0	1.8	42514 42564	650			550					
0.62 0.68	7.5 × 20.5 × 26.0	1.9	42624 42684	600			500					
0.75	8.0 × 21.0 × 26.0	2.0	42754	550			500					
0.82	8.5 × 21.5 × 26.0	2.1	42824	500			450					
0.91	9.0 × 22.0 × 26.0	2.4	42914	450			450					
1.0	9.5 × 22.5 × 26.0	2.5	42105	450			400					
1.1	10.0 × 23.0 × 26.0	2.6	42115	400			400					
1.2	10.5 × 23.5 × 26.0	2.7	42125	350			350					
Pitch = 27.5 ± 0.4 mm; dt = 0.80 ± 0.08 mm							pitch = 7.5 mm (bent back)		pitch = 27.5 mm			
1.3 1.5 1.6 1.8 2.0 2.2 2.4 2.7 3.0	10.0 × 23.0 × 30.0 10.5 × 23.5 × 30.0 11.0 × 24.0 × 30.0 11.5 × 24.5 × 30.0 12.5 × 25.5 × 30.0 13.0 × 26.0 × 30.0 13.5 × 26.5 × 30.0 14.0 × 27.0 × 30.0 15.0 × 28.0 × 30.0	5.0 5.0 5.5 5.5 6.5 6.5 7.0 7.0 7.5	42135 42155 42165 42185 42205 42225 42245 42275 42305	450 450 400 400 350 300 300 300 250								



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$U_{Rdc} = 250 \text{ V}$; $U_{Rac} = 160 \text{ V}$; $U_{p-p} = 450 \text{ V}$ (lock lead)

C (μF)	DIMENSIONS w _{max} × H _{max} × l _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			It = 4.0 + 1.0/– 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 10.0 ± 1.0 mm; d _t = 0.60 ± 0.06 mm				
0.047 0.051 0.056 0.062 0.068 0.075 0.082 0.091	6.0 × 18.0 × 12.5	0.9	90052	1400
90129				
90131				
90132				
90133				
90134				
90135				
90136				
0.1	6.5 × 18.5 × 12.5	1.0	90137	1250
Pitch = 15.0 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.11 0.12 0.13 0.15 0.16 0.18 0.20 0.22	6.5 × 18.5 × 18.5	1.3	90138	1250
90051				
90139				
90141				
90142				
90012				
90013				
90014				
0.24	7.0 × 19.0 × 18.5	1.4	90015	1250
0.27 0.30	7.5 × 19.5 × 18.5	1.5	90016	1000
90017				
0.33	8.0 × 20.0 × 18.5	1.6	90018	1000
0.36 0.39	8.5 × 20.5 × 18.5	1.7	90019	900
90021				
0.43	9.0 × 21.0 × 18.5	1.8	90022	800
0.47	9.5 × 21.5 × 18.5	1.9	90023	800
Pitch = 22.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.51 0.56	7.0 × 23.0 × 26.0	1.8	90024	850
90025				
0.62 0.68	7.5 × 23.5 × 26.0	1.9	90026	750
90027				
0.75	8.0 × 24.0 × 26.0	2.0	90028	700
0.82	8.5 × 24.5 × 26.0	2.1	90029	650
0.91	9.0 × 25.0 × 26.0	2.4	90031	600
1.0	9.5 × 25.5 × 26.0	2.5	90032	550
1.1	10.0 × 26.0 × 26.0	2.6	90033	500
1.2	10.5 × 26.5 × 26.0	2.7	90034	500
Pitch = 27.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
1.3	10.0 × 26.0 × 30.0	5.0	90143	400
1.5	10.5 × 26.5 × 30.0	5.0	90144	400
1.6	11.0 × 27.0 × 30.0	5.5	90145	350
1.8	11.5 × 27.5 × 30.0	5.5	90146	350
2.0	12.5 × 28.5 × 30.0	6.5	90147	300
2.2	13.0 × 29.0 × 30.0	6.5	90148	300
2.4	13.5 × 29.5 × 30.0	7.0	90149	250
2.7	14.0 × 30.0 × 30.0	7.0	90151	250
3.0	15.0 × 31.0 × 30.0	7.5	90152	200

SPECIFIC REFERENCE DATA (400 VDC)

DESCRIPTION	VALUE	
Tangent of loss angle:	at 10 kHz	at 100 kHz
0.022 $\mu\text{F} < C \leq 0.027 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
0.027 $\mu\text{F} < C \leq 0.075 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.075 $\mu\text{F} < C \leq 0.11 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.11 $\mu\text{F} < C \leq 0.18 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.18 $\mu\text{F} < C \leq 0.22 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.24 $\mu\text{F} < C \leq 0.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.3 $\mu\text{F} < C \leq 0.39 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.39 $\mu\text{F} < C \leq 0.56 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.68 $\mu\text{F} < C \leq 0.82 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
0.82 $\mu\text{F} < C \leq 0.91 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
0.91 $\mu\text{F} < C \leq 1.0 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
1.0 $\mu\text{F} < C \leq 1.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 70 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R at 400 V (DC):		
P = 10.0 mm	80 V/ μs	
P = 15.0 mm	70 V/ μs	
P = 22.5 mm	35 V/ μs	
P = 27.5 mm	25 V/ μs	
R between leads, for $C \leq 1.0 \mu\text{F}$ at 100 V; 1 minute	> 100000 M Ω	
RC between leads, for $C > 1.0 \mu\text{F}$ at 100 V; 1 minute	> 100000 s	
R between leads and case; 100 V; 1 minute	> 100000 M Ω	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 220 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	

U_{Rdc} = 400 V; U_{Rac} = 200 V; U_{p-p} = 560 V (standard)

C (μF)	DIMENSIONS $w_{\text{max}} \times h \text{ (h') }_{\text{max}} \times l_{\text{ma}}$ x (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			$l_t = 5.0 \pm 1.0 \text{ mm}$	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = $\pm 5 \%$	SPQ	C-tol = $\pm 5 \%$	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
Pitch = $10.0 \pm 0.4 \text{ mm}$; $d_t = 0.60 \pm 0.06 \text{ mm}$					pitch = 7.5 mm (bent back)		pitch = 10.0 mm
0.022	$6.0 \times 15.0 \times 12.5$	0.9	52223	1000			1000
0.024			52243				
0.027			52273				
0.03			52303				
0.033			52333				
0.036			52363				
0.039			52393				
0.043			52433				
0.047			52473				
Pitch = $15.0 \pm 0.4 \text{ mm}$; $d_t = 0.80 \pm 0.08 \text{ mm}$					pitch = 7.5 mm (bent back)		pitch = 15.0 mm
0.051	$6.5 \times 15.5 \text{ (17.0)} \times 18.5$	1.3	52513	1500	56513	750	900
0.056			52563		56563		
0.062			52623		56623		
0.068			52683		56683		
0.075			52753		56753		
0.082			52823		56823		



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C (μ F)	DIMENSIONS $w_{max} \times h (h')_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			$l_t = 5.0 \pm 1.0$ mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
0.091 0.1 0.11 0.12	7.0 $\times$ 16.0 (17.5) $\times$ 18.5	1.4	52913 52104 52114 52124	1250	56913 56104 56114 56124	700	800
0.13 0.15	7.5 $\times$ 16.5 (18.0) $\times$ 18.5	1.5	52134 52154	1250	56134 56154	650	800
0.16	8.0 $\times$ 17.0 (18.5) $\times$ 18.5	1.6	52164	1250	56164	600	700
0.18 0.2	8.5 $\times$ 17.5 (19.0) $\times$ 18.5	1.7	52184 52204	1000	56184 56204	550	700
0.22	9.0 $\times$ 18.0 (19.5) $\times$ 18.5	1.8	52224	1000	56224	550	600
Pitch = 22.5 $\pm$ 0.4 mm; $d_t = 0.80 \pm 0.08$ mm					pitch = 7.5 mm (bent back)		pitch = 22.5 mm
0.24	6.5 $\times$ 19.5 $\times$ 26.0	1.7	52244	750			600
0.27	7.0 $\times$ 20.0 $\times$ 26.0	1.8	52274	650			550
0.3 0.33	7.5 $\times$ 20.5 $\times$ 26.0	1.9	52304 52334	600			500
0.36	8.0 $\times$ 21.0 $\times$ 26.0	2.0	52364	550			500
0.39 0.43	8.5 $\times$ 21.5 $\times$ 26.0	2.1	52394 52434	500			450
0.47	9.0 $\times$ 22.0 $\times$ 26.0	2.4	52474	450			450
0.51	9.5 $\times$ 22.5 $\times$ 26.0	2.5	52514	450			400
0.56	10.0 $\times$ 23.0 $\times$ 26.0	2.6	52564	400			400
0.62	10.5 $\times$ 23.5 $\times$ 26.0	2.7	52624	350			350
Pitch = 27.5 $\pm$ 0.4 mm; $d_t = 0.80 \pm 0.08$ mm					pitch = 7.5 mm (bent back)		pitch = 27.5 mm
0.68	10.0 $\times$ 23.0 $\times$ 30.0	5.0	52684	450			
0.75	10.5 $\times$ 23.5 $\times$ 30.0	5.0	52754	450			
0.82	11.0 $\times$ 24.0 $\times$ 30.0	5.5	52824	400			
0.91	11.5 $\times$ 24.5 $\times$ 30.0	5.5	52914	400			
1.0	12.0 $\times$ 25.0 $\times$ 30.0	6.0	52105	350			
1.1	12.5 $\times$ 25.5 $\times$ 30.0	6.5	52115	350			
1.2	13.0 $\times$ 26.0 $\times$ 30.0	6.5	52125	300			

$U_{Rdc} = 400$ V; $U_{Rac} = 200$ V; $U_{p-p} = 560$ V (lock lead)

C (μ F)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			$l_t = 4.0 + 1.0/-0.5$ mm	
			C-tol = ± 5 %	
			last 5 digits of catalog number	SPQ
Pitch = 10.0 $\pm$ 1.0 mm; $d_t = 0.60 \pm 0.06$ mm				
0.022 0.024 0.027 0.03 0.033	6.0 $\times$ 18.0 $\times$ 12.5	0.9	90153 90154 90155 90156 90157	1400

C (μ F)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			$l_t = 4.0 + 1.0/-0.5$ mm	
			C-tol = ± 5 %	
			last 5 digits of catalog number	SPQ
0.036 0.039 0.043 0.047	6.0 $\times$ 18.0 $\times$ 12.5	0.9	90158 90159 90161 90162	1400
Pitch = 15.0 $\pm$ 1.0 mm; $d_t = 0.80 \pm 0.08$ mm				
0.051 0.056 0.062 0.068 0.075 0.082	6.5 $\times$ 18.5 $\times$ 18.5	1.3	90163 90164 90165 90166 90167 90168	1250
0.091 0.1 0.11 0.12	7.0 $\times$ 19.0 $\times$ 18.5	1.4	90169 90171 90172 90173	1250
0.13 0.15	7.5 $\times$ 19.5 $\times$ 18.5	1.5	90174 90175	1000
0.16	8.0 $\times$ 20.0 $\times$ 18.5	1.6	90176	1000
0.18 0.2	8.5 $\times$ 20.5 $\times$ 18.5	1.7	90177 90178	900
0.22	9.0 $\times$ 21.0 $\times$ 18.5	1.8	90179	800
Pitch = 22.5 $\pm$ 1.0 mm; $d_t = 0.80 \pm 0.08$ mm				
0.24	6.5 $\times$ 22.5 $\times$ 26.0	1.7	90181	900
0.27	7.0 $\times$ 23.0 $\times$ 26.0	1.8	90182	850
0.3 0.33	7.5 $\times$ 23.5 $\times$ 26.0	1.9	90183 90184	750
0.36	8.0 $\times$ 24.0 $\times$ 26.0	2.0	90185	700
0.39 0.43	8.5 $\times$ 24.5 $\times$ 26.0	2.1	90186 90187	650
0.47	9.0 $\times$ 25.0 $\times$ 26.0	2.4	90188	600
0.51	9.5 $\times$ 25.5 $\times$ 26.0	2.5	90189	550
0.56	10.0 $\times$ 26.0 $\times$ 26.0	2.6	90191	500
0.62	10.5 $\times$ 26.5 $\times$ 26.0	2.7	90192	500
Pitch = 27.5 $\pm$ 1.0 mm; $d_t = 0.80 \pm 0.08$ mm				
0.68	10.0 $\times$ 26.0 $\times$ 30.0	5.0	90193	400
0.75	10.5 $\times$ 26.5 $\times$ 30.0	5.0	90194	400
0.82	11.0 $\times$ 27.0 $\times$ 30.0	5.5	90195	350
0.91	11.5 $\times$ 27.5 $\times$ 30.0	5.5	90196	350
1.0	12.0 $\times$ 28.0 $\times$ 30.0	6.0	90086	350
1.1	12.5 $\times$ 28.5 $\times$ 30.0	6.5	90197	300
1.2	13.0 $\times$ 29.0 $\times$ 30.0	6.5	90198	300



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SPECIFIC REFERENCE DATA (630 VDC)

DESCRIPTION	VALUE	
Tangent of loss angle:	at 10 kHz	at 100 kHz
0.01 $\mu\text{F} < C \leq 0.027 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
0.027 $\mu\text{F} < C \leq 0.075 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.075 $\mu\text{F} < C \leq 0.11 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.12 $\mu\text{F} < C \leq 0.18 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.18 $\mu\text{F} < C \leq 0.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.3 $\mu\text{F} < C \leq 0.39 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.39 $\mu\text{F} < C \leq 0.56 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R at 630 V (DC):		
P = 10.0 mm	100 V/ μs	
P = 15.0 mm	90 V/ μs	
P = 22.5 mm	45 V/ μs	
P = 27.5 mm	30 V/ μs	
R between leads, for $C \leq 1.0 \mu\text{F}$ at 500 V; 1 minute	> 100000 M Ω	
R between leads and case; 500 V; 1 minute	> 100000 M Ω	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 220 V	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	1008 V; 1 minute	
Withstanding (DC) voltage between leads and case	2840 V; 1 minute	

U_{Rdc} = 630 V; U_{Rac} = 200 V; U_{p-p} = 560 V (standard)

C (μF)	DIMENSIONS $W_{\max} \times H (H')_{\max} \times L_{\max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			$l_t = 5.0 \pm 1.0$ mm	ALL LEADS	PITCH 7.5 mm (BENT BACK)		ORIGINAL PITCH
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			LAST 5 DIGITS OF CATALOG NUMBER		LAST 5 DIGITS OF CATALOG NUMBER		
Pitch = 10.0 ± 0.4 mm; $d_t = 0.60 \pm 0.06$ mm				pitch = 7.5 mm (bent back)		pitch = 10.0 mm	
0.01	6.0 x 15.0 x 12.5	0.9	62103	1000			1000
0.011			62113				
0.012			62123				
0.013			62133				
0.015			62153				
0.016			62163				
0.018			62183				
0.02			62203				
0.022			62223				
0.024			62243				
0.027	6.5 x 15.5 x 12.5	1.0	62273	1000			900
Pitch = 15.0 ± 0.4 mm; $d_t = 0.80 \pm 0.08$ mm				pitch = 7.5 mm (bent back)		pitch = 15.0 mm	
0.03	6.5 x 15.5 (17.0) x 18.5	1.3	62303	1500	66303	750	900
0.033			62333		66333		
0.036			62363		66363		
0.039			62393		66393		
0.043			62433		66433		
0.047			62473		66473		
0.051			62513		66513		
0.056			62563		66563		
0.062			7.0 x 16.0 (17.5) x 18.5		1.4		
0.068	7.5 x 16.5 (18.0) x 18.5	1.5	62683	1250	66683	650	800
0.075	8.0 x 17.0 (18.5) x 18.5	1.6	62753	1250	66753	600	700
0.082			62823		66823		

C (μF)	DIMENSIONS W _{max} × H (H') _{max} × L _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			It = 5.0 ± 1.0 mm	ALL LEADS	PITCH 7.5 mm (BENT BACK)		ORIGINAL PITCH
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			LAST 5 DIGITS OF CATALOG NUMBER		LAST 5 DIGITS OF CATALOG NUMBER		
0.091	8.5 x 17.5 (19.0) x 18.5	1.7	62913	1000	66913	550	700
0.1	9.0 x 18.0 (19.5) x 18.5	1.8	62104	1000	66104	550	600
0.11	9.5 x 18.5 (20.0) x 18.5	1.9	62114	900	66114	500	600
Pitch = 22.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 22.5 mm
0.12	6.5 x 19.5 x 26.0	1.7	62124	750			600
0.13	7.0 x 20.0 x 26.0	1.8	62134	650			550
0.15	7.5 x 20.5 x 26.0	1.9	62154	600			500
0.16			62164				
0.18	8.0 x 21.0 x 26.0	2.0	62184	550			500
0.20	8.5 x 21.5 x 26.0	2.1	62204	500			450
0.22	9.0 x 22.0 x 26.0	2.4	62224	450			450
0.24			62244				
0.27	9.5 x 22.5 x 26.0	2.5	62274	450			400
0.30	10.0 x 23.0 x 26.0	2.7	62304	400	400		
Pitch = 27.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 27.5 mm
0.33	9.5 x 22.5 x 30.0	5.0	62334	550			
0.36	10.0 x 22.5 x 30.0	5.0	62364	500			
0.39	10.5 x 23.0 x 30.0	5.0	62394	450			
0.43	11.0 x 23.0 x 30.0	5.5	62434	450			
0.47	11.5 x 24.5 x 30.0	5.5	62474	400			
0.51	12.0 x 25.0 x 30.0	6.0	62514	350			
0.56	13.0 x 26.0 x 30.0	6.5	62564	300			
0.62	13.5 x 26.5 x 30.0	6.5	62624	300			
0.68	14.0 x 27.0 x 30.0	7.0	62684	300			

$U_{Rdc} = 630$ V; $U_{Rac} = 200$ V; $U_{p-p} = 560$ V (lock lead)

C (μF)	DIMENSIONS w _{max} × h _{max} × l _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			lt = 4.0 + 1.0/- 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 10.0 ± 1.0 mm; d _t = 0.60 ± 0.06 mm				
0.01	6.0 x 18.0 x 12.5	0.9	90199	1400
0.011			90201	
0.012			90202	
0.013			90203	
0.015			90204	
0.016			90205	
0.018			90206	
0.02			90207	
0.022			90208	
0.024			90209	
0.027	6.5 x 18.5 x 12.5	1.0	90211	1250



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C (μF)	DIMENSIONS w _{max} x h _{max} x l _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			lt = 4.0 + 1.0/- 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 15.0 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.03	6.5 x 18.5 x 18.5	1.3	90212	1250
0.033			90213	
0.036			90214	
0.039			90215	
0.043			90216	
0.047			90217	
0.051			90218	
0.056			90219	
0.062	7.0 x 19.0 x 18.5	1.4	90221	1250
0.068	7.5 x 19.5 x 18.5	1.5	90222	1000
0.075	8.0 x 20.0 x 18.5	1.6	90223	1000
0.082			90224	
0.091	8.5 x 20.5 x 18.5	1.7	90225	900
0.1	9.0 x 21.0 x 18.5	1.8	90226	800
0.11	9.5 x 21.5 x 18.5	1.9	90227	800
Pitch = 22.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.12	6.5 x 22.5 x 26.0	1.7	90228	900
0.13	7.0 x 23.0 x 26.0	1.8	90229	850
0.15	7.5 x 23.5 x 26.0	1.9	90231	750
0.16			90232	
0.18	8.0 x 24.0 x 26.0	2.0	90233	700
0.20	8.5 x 24.5 x 26.0	2.1	90234	650
0.22	9.0 x 25.0 x 26.0	2.4	90235	600
0.24			90236	
0.27	9.5 x 25.5 x 26.0	2.5	90237	550
0.30	10.0 x 26.0 x 26.0	2.7	90238	500
Pitch = 27.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.33	9.5 x 25.5 x 30.0	5.0	90239	450
0.36	10.0 x 25.5 x 30.0	5.0	90241	450
0.39	10.5 x 26.0 x 30.0	5.0	90242	400
0.43	11.0 x 26.0 x 30.0	5.5	90243	400
0.47	11.5 x 27.5 x 30.0	5.5	90244	350
0.51	12.0 x 28.0 x 30.0	6.0	90245	350
0.56	13.0 x 29.0 x 30.0	6.5	90246	300
0.62	13.5 x 29.5 x 30.0	6.5	90247	250
0.68	14.0 x 30.0 x 30.0	7.0	90248	250

SPECIFIC REFERENCE DATA (250 VDC MONITOR)

DESCRIPTION	VALUE	
Tangent of loss angle:	at 10 kHz	at 100 kHz
0.022 $\mu\text{F} < C \leq 0.027 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
0.027 $\mu\text{F} < C \leq 0.075 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
0.075 $\mu\text{F} < C \leq 0.11 \mu\text{F}$	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
0.11 $\mu\text{F} < C \leq 0.18 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
0.18 $\mu\text{F} < C \leq 0.22 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.24 $\mu\text{F} < C \leq 0.3 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
0.3 $\mu\text{F} < C \leq 0.39 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
0.39 $\mu\text{F} < C \leq 0.56 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
0.56 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 50 \times 10^{-4}$
0.68 $\mu\text{F} < C \leq 0.82 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 55 \times 10^{-4}$
0.82 $\mu\text{F} < C \leq 0.91 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 60 \times 10^{-4}$
0.91 $\mu\text{F} < C \leq 1.0 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 65 \times 10^{-4}$
1.0 $\mu\text{F} < C \leq 1.2 \mu\text{F}$	$\leq 10 \times 10^{-4}$	$\leq 70 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R :		
P = 10.0 mm	160 V/ μs	
P = 15.0 mm	140 V/ μs	
P = 22.5 mm	70 V/ μs	
P = 27.5 mm	50 V/ μs	
R between leads, for $C \leq 1.0 \mu\text{F}$ 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	$> 100000 \text{ M}\Omega$	
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	

U_{Rdc} = 250 V; U_{Rac} = 160 V; U_{p-p} = 450 V (monitor standard)

C (μF)	DIMENSIONS wmax × h (h')max × lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			lt = 5.0 ± 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
last 5 digits of catalog number	last 5 digits of catalog number						
Pitch = 10.0 ± 0.4 mm; dt = 0.60 ± 0.06 mm			pitch = 7.5 mm (bent back)			pitch = 10.0 mm	
0.022	6.0 x 15.0 x 12.5	0.9	41223	1000			1000
0.024			41243				
0.027			41273				
0.03			41303				
0.033			41333				
0.036			41363				
0.039			41393				
0.043			41433				
0.047	41473						
Pitch = 15.0 ± 0.4 mm; dt = 0.80 ± 0.08 mm			pitch = 7.5 mm (bent back)			pitch = 15.0 mm	
0.051	6.5 x 15.5 (17.0) x 18.5	1.3	41513	1500	49513	750	900
0.056			41563		49563		
0.062			41623		49623		
0.068			41683		49683		
0.075			41753		49753		
0.082			41823		49823		



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C (μ F)	DIMENSIONS wmax x h (h')max x lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			It = 5.0 $\pm$ 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = $\pm$ 5 %	SPQ	C-tol = $\pm$ 5 %	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
0.091 0.1 0.11 0.12	7.0 x 16.0 (17.5) x 18.5	1.4	41913 41104 41114 41124	1250	49913 49104 49114 49124	700	800
0.13 0.15	7.5 x 16.5 (18.0) x 18.5	1.5	41134 41154	1250	49134 49154	650	800
0.16	8.0 x 17.0 (18.5) x 18.5	1.6	41164	1250	49164	600	700
0.18 0.2	8.5 x 17.5 (19.0) x 18.5	1.7	41184 41204	1000	49184 49204	550	700
0.22	9.0 x 18.0 (19.5) x 18.5	1.8	41224	1000	49224	550	600
Pitch = 22.5 $\pm$ 0.4 mm; d _t = 0.80 $\pm$ 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 22.5 mm
0.24	6.5 x 19.5 x 26.0	1.7	41244	750			600
0.27	7.0 x 20.0 x 26.0	1.8	41274	650			550
0.3 0.33	7.5 x 20.5 x 26.0	1.9	41304 41334	600			500
0.36	8.0 x 21.0 x 26.0	2.0	41364	550			500
0.39 0.43	8.5 x 21.5 x 26.0	2.1	41394 41434	500			450
0.47	9.0 x 22.0 x 26.0	2.4	41474	450			450
0.51	9.5 x 22.5 x 26.0	2.5	41514	450			400
0.56	10.0 x 23.0 x 26.0	2.6	41564	400			400
0.62	10.5 x 23.5 x 26.0	2.7	41624	350			350
Pitch = 27.5 $\pm$ 0.4 mm; d _t = 0.80 $\pm$ 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 27.5 mm
0.68	10.0 x 23.0 x 30.0	5.0	41684	450			
0.75	10.5 x 23.5 x 30.0	5.0	41754	450			
0.82	11.0 x 24.0 x 30.0	5.5	41824	400			
0.91	11.5 x 24.5 x 30.0	5.5	41914	400			
1.0	12.0 x 25.0 x 30.0	6.0	41105	350			
1.1	12.5 x 25.5 x 30.0	6.5	41115	350			
1.2	13.0 x 26.0 x 30.0	6.5	41125	300			

U_{Rdc} = 250 V; U_{Rac} = 160 V; U_{p-p} = 450 V (monitor lock lead)

C (μF)	DIMENSIONS wmax x hmax x lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			lt = 4.0 + 1.0/- 0.5 mm	
			C-tol = ± 5 %	SPQ
last 5 digits of catalog number				
Pitch = 10.0 ± 1.0 mm; d _t = 0.60 ± 0.06 mm				
0.022	6.0 x 18.0 x 12.5	0.9	90379	1400
0.024			90381	
0.027			90382	
0.03			90383	
0.033			90384	
0.036			90385	
0.039			90386	
0.043			90387	
0.047			90388	

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C (μF)	DIMENSIONS wmax x hmax x lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			It = 4.0 + 1.0/- 0.5 mm	
			C-tol = ± 5 %	SPQ
last 5 digits of catalog number				
Pitch = 15.0 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.051 0.056 0.062 0.068 0.075 0.082	6.5 x 18.5 x 18.5	1.3	90389	1250
			90391	
			90392	
			90393	
			90394	
			90395	
0.091 0.1 0.11 0.12	7.0 x 19.0 x 18.5	1.4	90396	1250
			90397	
			90398	
			90399	
0.13 0.15	7.5 x 19.5 x 18.5	1.5	90401	1000
			90402	
0.16	8.0 x 20.0 x 18.5	1.6	90403	1000
0.18 0.2	8.5 x 20.5 x 18.5	1.7	90404	900
			90405	
0.22	9.0 x 21.0 x 18.5	1.8	90406	800
Pitch = 22.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.24	6.5 x 22.5 x 26.0	1.7	90407	900
0.27	7.0 x 23.0 x 26.0	1.8	90408	850
0.3 0.33	7.5 x 23.5 x 26.0	1.9	90409	750
			90411	
0.36	8.0 x 24.0 x 26.0	2.0	90412	700
0.39 0.43	8.5 x 24.5 x 26.0	2.1	90413	650
			90414	
0.47	9.0 x 25.0 x 26.0	2.4	90415	600
0.51	9.5 x 25.5 x 26.0	2.5	90416	550
0.56	10.0 x 26.0 x 26.0	2.6	90417	500
0.62	10.5 x 26.5 x 26.0	2.7	90418	500
Pitch = 27.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.68	10.0 x 26.0 x 30.0	5.0	90419	400
0.75	10.5 x 26.5 x 30.0	5.0	90421	400
0.82	11.0 x 27.0 x 30.0	5.5	90422	350
0.91	11.5 x 27.5 x 30.0	5.5	90423	350
1.0	12.0 x 28.0 x 30.0	6.0	90424	350
1.1	12.5 x 28.5 x 30.0	6.5	90425	300
1.2	13.0 x 29.0 x 30.0	6.5	90426	300



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SPECIFIC REFERENCE DATA (400 VDC MONITOR)

DESCRIPTION	VALUE	
Tangent of loss angle: 0.01 $\mu\text{F} < C \leq 0.027 \mu\text{F}$ 0.027 $\mu\text{F} < C \leq 0.075 \mu\text{F}$ 0.075 $\mu\text{F} < C \leq 0.11 \mu\text{F}$ 0.12 $\mu\text{F} < C \leq 0.18 \mu\text{F}$ 0.18 $\mu\text{F} < C \leq 0.3 \mu\text{F}$ 0.3 $\mu\text{F} < C \leq 0.39 \mu\text{F}$ 0.39 $\mu\text{F} < C \leq 0.56 \mu\text{F}$ 0.56 $\mu\text{F} < C \leq 0.68 \mu\text{F}$	at 10 kHz	at 100 kHz
	$\leq 5 \times 10^{-4}$	$\leq 15 \times 10^{-4}$
	$\leq 5 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
	$\leq 5 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
	$\leq 10 \times 10^{-4}$	$\leq 30 \times 10^{-4}$
	$\leq 10 \times 10^{-4}$	$\leq 35 \times 10^{-4}$
	$\leq 10 \times 10^{-4}$	$\leq 40 \times 10^{-4}$
	$\leq 10 \times 10^{-4}$	$\leq 45 \times 10^{-4}$
Rated voltage pulse slope (dU/dt) _R : P = 10.0 mm P = 15.0 mm P = 22.5 mm P = 27.5 mm	200 V/ μs	
	180 V/ μs	
	90 V/ μs	
	60 V/ μs	
R between leads, for $C \leq 1.0 \mu\text{F}$ at 100 V; 1 minute	> 100000 M Ω	
R between leads and case; 100 V; 1 minute	> 100000 M Ω	
Ionization (AC) voltage (typical value) at 50 pC peak discharge	> 220 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	

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

C (μF)	DIMENSIONS wmax x h (h')max x lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			It = 5.0 ± 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
			last 5 digits of catalog number		last 5 digits of catalog number		
Pitch = 10.0 ± 0.4 mm; d _t = 0.60 ± 0.06 mm				pitch = 7.5 mm (bent back)		pitch = 10.0 mm	
0.01 0.011 0.012 0.013 0.015 0.016 0.018 0.02	6.0 x 15.0 x 12.5	0.9	51103 51113 51123 51133 51153 51163 51183 51203	1000			1000
0.022 0.024	6.0 x 15.0 x 12.5	0.9	51223 51243	1000			1000
0.027	6.5 x 15.5 x 12.5	1.0	51273	1000			900
Pitch = 15.0 ± 0.4 mm; d _t = 0.80 ± 0.08 mm				pitch = 7.5 mm (bent back)		pitch = 15.0 mm	
0.03 0.033 0.036 0.039 0.043 0.047 0.051 0.056	6.5 x 15.5 (17.0) x 18.5	1.3	51303 51333 51363 51393 51433 51473 51513 51563	1500	59303 59333 59363 59393 59433 59473 59513 59563	750	900
0.062	7.0 x 16.0 (17.5) x 18.5	1.4	51623	1250	59623	700	800
0.068	7.5 x 16.5 (18.0) x 18.5	1.5	51683	1250	59683	650	800

C (μF)	DIMENSIONS wmax x h (h')max x lmax (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING				
			LOOSE IN BOX		REEL		
			lt = 5.0 ± 1.0 mm	all leads	pitch 7.5 mm (bent back)		original pitch
			C-tol = ± 5 %	SPQ	C-tol = ± 5 %	SPQ	SPQ
last 5 digits of catalog number	last 5 digits of catalog number						
0.075	8.0 x 17.0 (18.5) x 18.5	1.6	51753	1250	59753	600	700
0.082			51823		59823		
0.091	8.5 x 17.5 (19.0) x 18.5	1.7	51913	1000	59913	550	700
0.1	9.0 x 18.0 (19.5) x 18.5	1.8	51104	1000	59104	550	600
0.11	9.5 x 18.5 (20.0) x 18.5	1.9	51114	900	59114	500	600
Pitch = 22.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 22.5 mm
0.12	6.5 x 19.5 x 26.0	1.7	51124	750			600
0.13	7.0 x 20.0 x 26.0	1.8	51134	650			550
0.15	7.5 x 20.5 x 26.0	1.9	51154	600			500
0.16			51164				
0.18	8.0 x 21.0 x 26.0	2.0	51184	550			500
0.20	8.5 x 21.5 x 26.0	2.1	51204	500			450
0.22	9.0 x 22.0 x 26.0	2.4	51224	450			450
0.24			51244				
0.27	9.5 x 22.5 x 26.0	2.5	51274	450			400
0.30	10.0 x 23.0 x 26.0	2.7	51304	400	400		
Pitch = 27.5 ± 0.4 mm; d _t = 0.80 ± 0.08 mm					pitch = 7.5 mm (bent back)		pitch = 27.5 mm
0.33	9.5 x 22.5 x 30.0	5.0	51334	550			
0.36	10.0 x 22.5 x 30.0	5.0	51364	500			
0.39	10.5 x 23.0 x 30.0	5.0	51394	450			
0.43	11.0 x 23.0 x 30.0	5.5	51434	450			
0.47	11.5 x 24.5 x 30.0	5.5	51474	400			
0.51	12.0 x 25.0 x 30.0	6.0	51514	350			
0.56	13.0 x 26.0 x 30.0	6.5	51564	300			
0.62	13.5 x 26.5 x 30.0	6.5	51624	300			
0.68	14.0 x 27.0 x 30.0	7.0	51684	300			

$U_{Rdc} = 400$ V; $U_{Rac} = 200$ V; $U_{p-p} = 560$ V (monitor lock lead)

C (μF)	DIMENSIONS W _{max} × H _{max} × L _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			It = 4.0 + 1.0/– 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 10.0 ± 1.0 mm; d _t = 0.60 ± 0.06 mm				
0.01	6.0 x 18.0 x 12.5	0.9	90427	1400
0.011			90428	
0.012			90429	
0.013			90431	
0.015			90432	
0.016			90433	
0.018			90434	
0.02			90435	
0.022			90436	
0.024			90437	
0.027	6.5 x 18.5 x 12.5	1.0	90438	1250



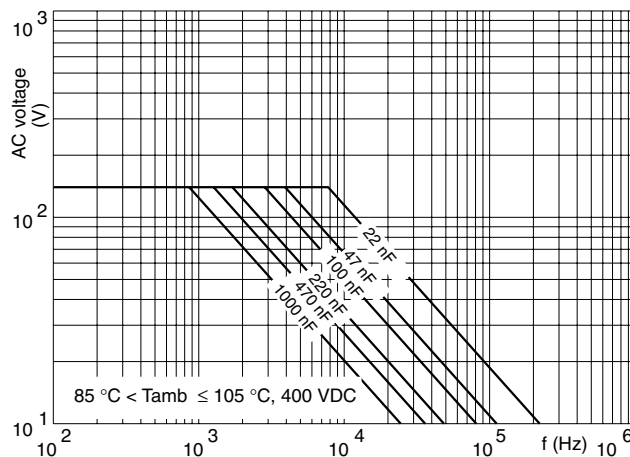
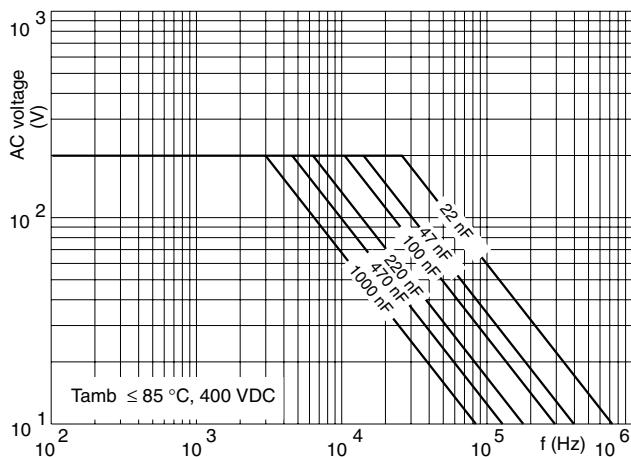
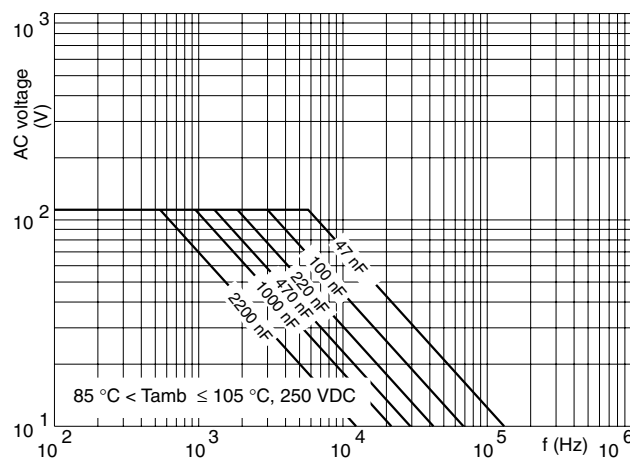
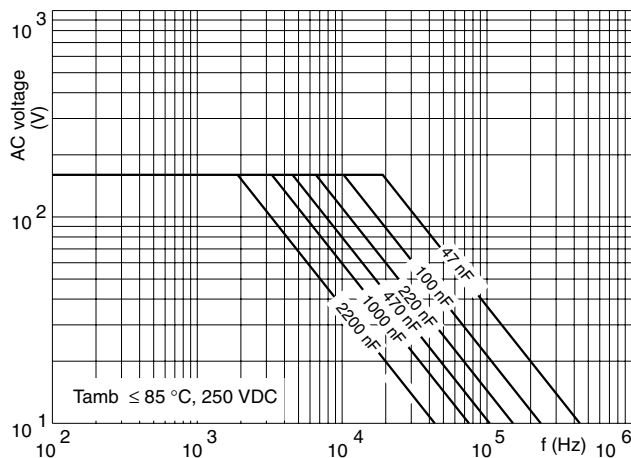
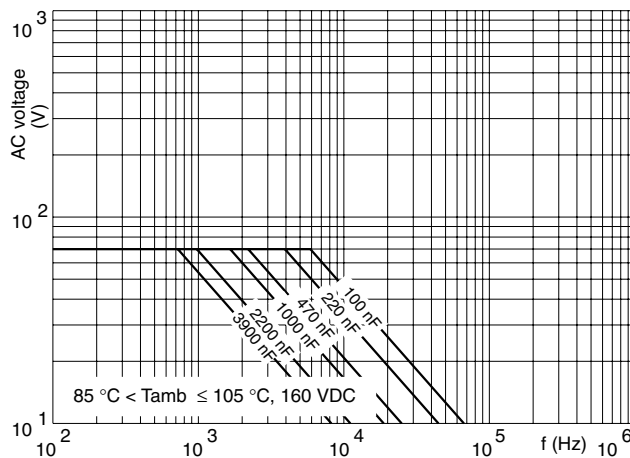
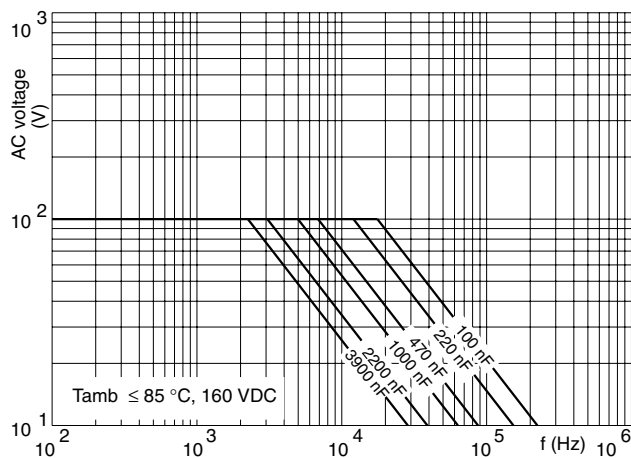
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C (μF)	DIMENSIONS W _{max} × H _{max} × L _{max} (mm)	MASS (g)	CATALOG NUMBER 2222 479 AND PACKAGING	
			LOOSE IN BOX	
			It = 4.0 + 1.0/– 0.5 mm	
			C-tol = ± 5 %	SPQ
			last 5 digits of catalog number	
Pitch = 15.0 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.03	6.5 x 18.5 x 18.5	1.3	90439	1250
0.033			90441	
0.036			90442	
0.039			90443	
0.043			90444	
0.047			90445	
0.051			90446	
0.056			90447	
0.062	7.0 x 19.0 x 18.5	1.4	90448	1250
0.068	7.5 x 19.5 x 18.5	1.5	90449	1000
0.075	8.0 x 20.0 x 18.5	1.6	90451	1000
0.082			90452	
0.091	8.5 x 20.5 x 18.5	1.7	90453	900
0.1	9.0 x 21.0 x 18.5	1.8	90454	800
0.11	9.5 x 21.5 x 18.5	1.9	90455	800
Pitch = 22.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.12	6.5 x 22.5 x 26.0	1.7	90456	800
0.13	7.0 x 23.0 x 26.0	1.8	90457	800
0.15	7.5 x 23.5 x 26.0	1.9	90458	800
0.16			90459	
0.18	8.0 x 24.0 x 26.0	2.0	90461	800
0.20	8.5 x 24.5 x 26.0	2.1	90462	800
0.22	9.0 x 25.0 x 26.0	2.4	90463	800
0.24			90464	
0.27	9.5 x 25.5 x 26.0	2.5	90465	800
0.30	10.0 x 26.0 x 26.0	2.7	90466	800
Pitch = 27.5 ± 1.0 mm; d _t = 0.80 ± 0.08 mm				
0.33	9.5 x 25.5 x 30.0	5.0	90467	800
0.36	10.0 x 25.5 x 30.0	5.0	90468	800
0.39	10.5 x 26.0 x 30.0	5.0	90469	800
0.43	11.0 x 26.0 x 30.0	5.5	90471	800
0.47	11.5 x 27.5 x 30.0	5.5	90472	800
0.51	12.0 x 28.0 x 30.0	6.0	90473	800
0.56	13.0 x 29.0 x 30.0	6.5	90474	800
0.62	13.5 x 29.5 x 30.0	6.5	90475	800
0.68	14.0 x 30.0 x 30.0	7.0	90476	800

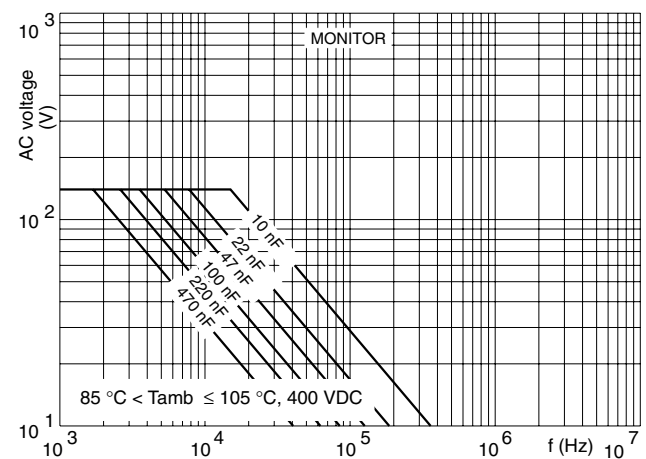
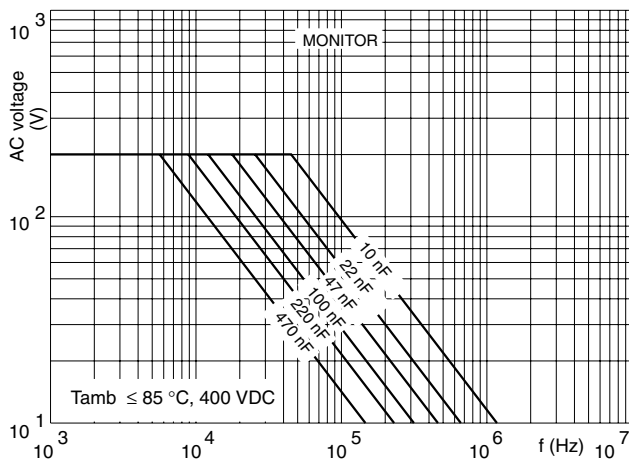
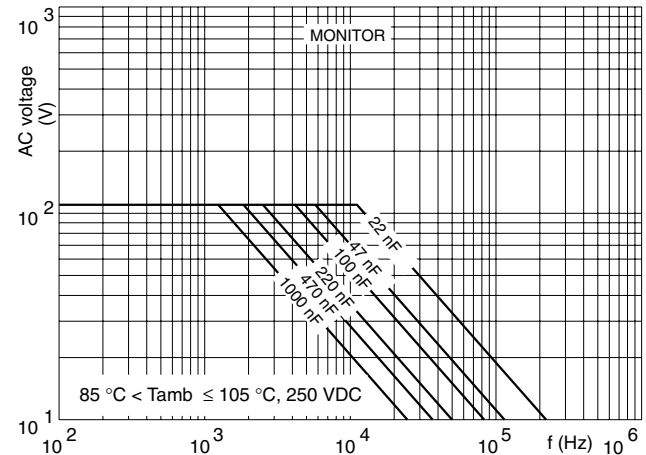
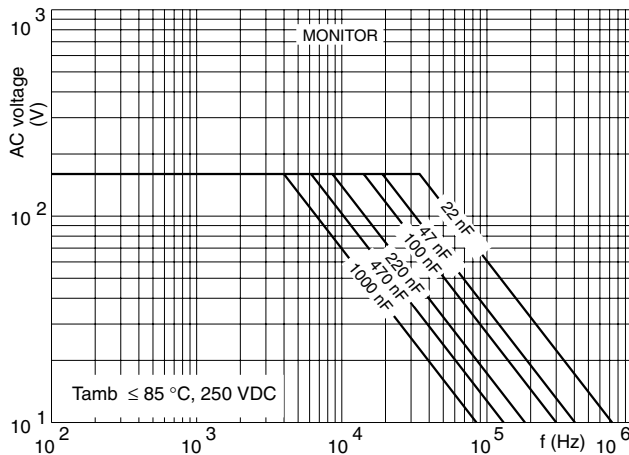
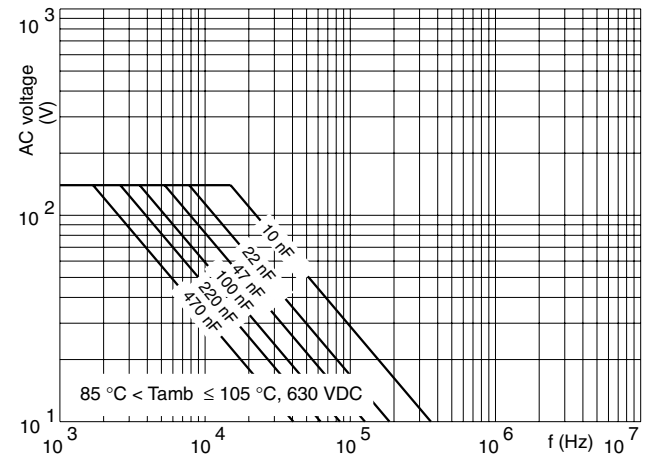
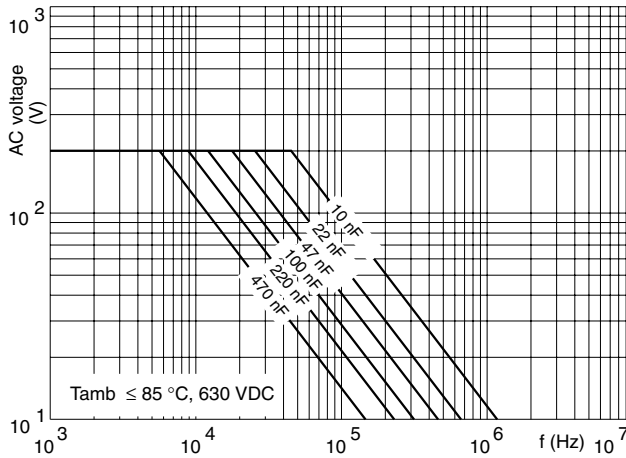
MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY



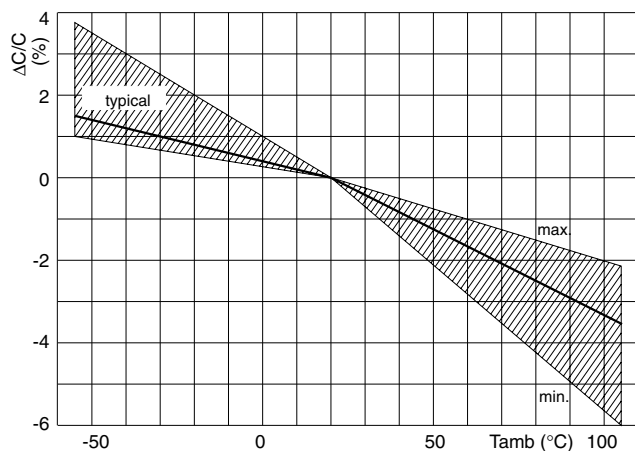


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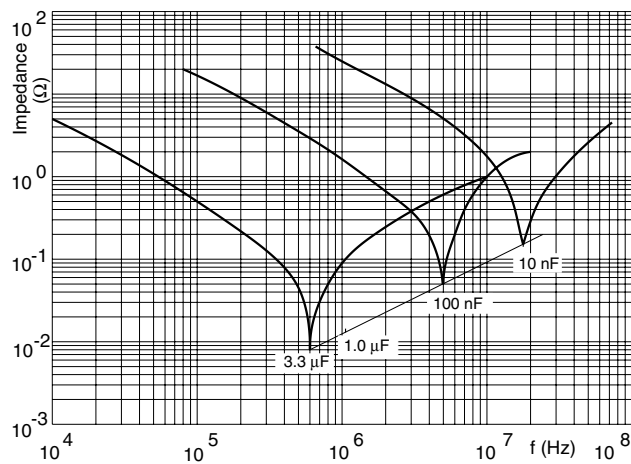
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CAPACITANCE



IMPEDANCE





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Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

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