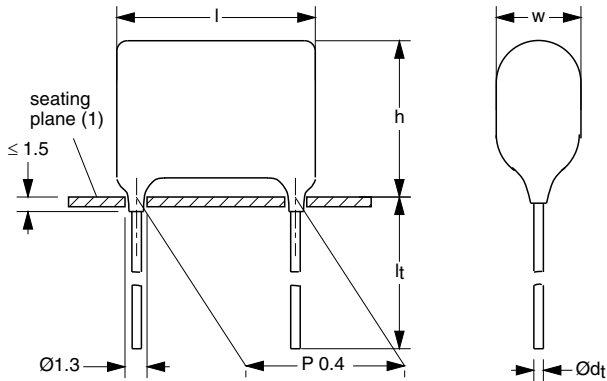


Metallized Polyester Film Capacitors MKT Radial Potted Type



Dimensions in mm
(1) Hole \varnothing 1.0 for $d_t = 0.6$ mm

APPLICATIONS

Blocking and coupling. Bypass and energy reservoir

MARKING

C-value; tolerance; rated voltage

DIELECTRIC

Polyester film

ELECTRODES

Vacuum deposited aluminium

COATING

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

CONSTRUCTION

Wound mono construction

LEADS

Tinned wire

CAPACITANCE RANGE (E12 SERIES)

0.001 to 1.0 μ F

FEATURES

Available taped on reel and loose in box

- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912

CAPACITANCE TOLERANCE

$\pm 10\%$; $\pm 5\%$

RATED (DC) VOLTAGE

63 V; 100 V; 250 V; 400 V; 630 V

RATED (AC) VOLTAGE

40 V; 63 V; 160 V; 220 V; 250 V

CLIMATIC CATEGORY

55/105/56

RATED TEMPERATURE

85 °C

MAXIMUM APPLICATION TEMPERATURE

105 °C

REFERENCE SPECIFICATIONS

IEC 60384-2

PERFORMANCE GRADE

Grade 1 (long life)

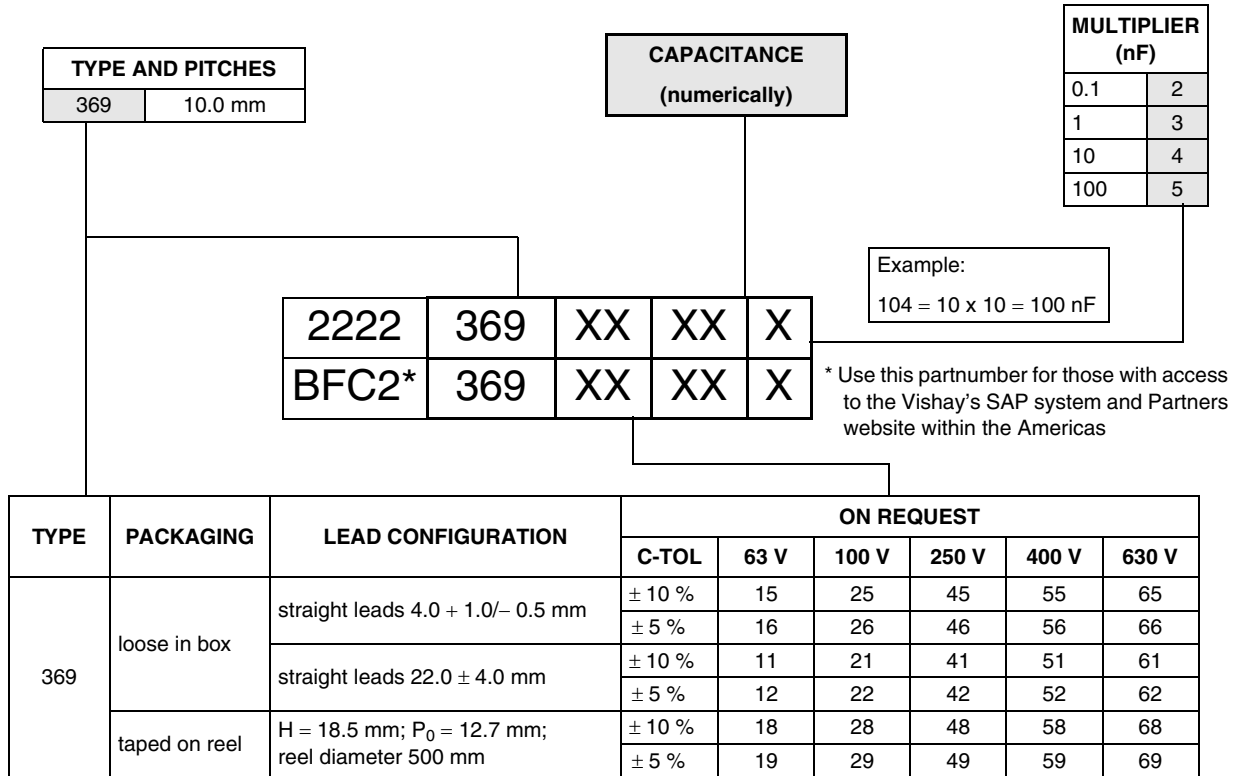
DETAIL SPECIFICATION

For more detailed data and test requirements see "Type detail specification HQN-384-02/101"



RoHS
COMPLIANT

COMPOSITION OF CATALOG NUMBER



SPECIFIC REFERENCE DATA

DESCRIPTION	VALUE				
	at 1 kHz	at 10 kHz	at 100 kHz		
Tangent of loss angle:					
C ≤ 0.47 μF	≤ 75 × 10 ⁻⁴	≤ 130 × 10 ⁻⁴	≤ 300 × 10 ⁻⁴		
0.47 μF < C ≤ 1.0 μF	≤ 75 × 10 ⁻⁴	≤ 130 × 10 ⁻⁴	≤ 225 × 10 ⁻⁴		
C ≥ 0.1 μF	≤ 75 × 10 ⁻⁴	≤ 130 × 10 ⁻⁴	≤ 300 × 10 ⁻⁴		
Rated voltage pulse slope (dU/dt) _R	at 63 V (DC)	at 100 V (DC)	at 250 V (DC)	at 400 V (DC)	at 630 V (DC)
	30 V/μs	28 V/μs	70 V/μs	110 V/μs	70 V/μs
R between leads, for C ≤ 0.33 μF:					
at 10 V; 1 minute	> 15000 MΩ				
at 100 V; 1 minute		> 15000 MΩ	> 30000 MΩ	> 30000 MΩ	
at 500 V; 1 minute					> 30000 MΩ
RC between leads, for C > 0.33 μF:					
at 10 V; 1 minute	> 5000 s				
at 500 V; 1 minute					> 10000 s
R between interconnecting leads and casing;					
at 10 V; 1 minute	> 30000 MΩ				
at 100 V; 1 minute		> 30000 MΩ	> 30000 MΩ	> 30000 MΩ	
at 500 V; 1 minute					> 30000 MΩ
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s	100 V; 1 minute	160 V; 1 minute	400 V; 1 minute	640 V; 1 minute	1008 V; 1 minute
Withstanding (DC) voltage between leads and case	200 V; 1 minute	200 V; 1 minute	500 V; 1 minute	800 V; 1 minute	1260 V; 1 minute



Metallized Polyester Film Capacitors Vishay BCcomponents
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$U_{Rdc} = 63\text{ V}; U_{Rac} = 40\text{ V}$

C (μF)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 369 AND PACKAGING			
			LOOSE IN BOX			REEL
			$l_t = 4.0 + 1.0/- 0.5\text{ mm}$		$l_t = 22.0 \pm 4.0\text{ mm}$	
			C-tol = $\pm 10\%$	SPQ	SPQ	SPQ
last 5 digits of catalog number						
Pitch = $10.0 \pm 0.4\text{ mm}; d_t = 0.60 \pm 0.06\text{ mm}$						
0.22	4.2 × 9.3 × 12.5	0.4	15224	2000	1000	1300
0.27	3.8 × 9.0 × 12.5	0.4	15274	2000	1000	1300
0.33	4.1 × 9.3 × 12.5	0.4	15334	2000	1000	1300
0.39	4.0 × 9.2 × 12.5	0.4	15394	2000	1000	1300
0.47	4.3 × 9.5 × 12.5	0.5	15474	2000	1000	1200
0.56	4.7 × 9.8 × 12.5	0.5	15564	2000	1000	1200
0.68	5.1 × 10.2 × 12.5	0.5	15684	2000	1000	1100
0.82	5.5 × 10.7 × 12.5	0.6	15824	2000	1000	1000
1	6.0 × 11.1 × 12.5	0.7	15105	2000	1000	900

$U_{Rdc} = 100\text{ V}; U_{Rac} = 63\text{ V}$

C (μF)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 369 AND PACKAGING			
			LOOSE IN BOX			REEL
			$l_t = 4.0 + 1.0/- 0.5\text{ mm}$		$l_t = 22.0 \pm 4.0\text{ mm}$	
			C-tol = $\pm 10\%$	SPQ	SPQ	SPQ
last 5 digits of catalog number						
Pitch = $10.0 \pm 0.4\text{ mm}; d_t = 0.60 \pm 0.06\text{ mm}$						
0.056	4.0 × 9.1 × 12.5	0.4	25563	2000	1000	1500
0.068			25683			
0.082	3.7 × 8.8 × 12.5	0.4	25823	2000	1000	1500
0.1	4.0 × 9.0 × 12.5	0.4	25104	2000	1000	1500
0.12	4.3 × 9.3 × 12.5	0.4	25124	2000	1000	1500
0.15	3.9 × 8.9 × 12.5	0.4	25154	2000	1000	1500
0.18	4.2 × 9.2 × 12.5	0.5	25184	2000	1000	1300
0.22	4.5 × 9.4 × 12.5	0.5	25224	2000	1000	1200

$U_{Rdc} = 250\text{ V}; U_{Rac} = 160\text{ V}$

C (μF)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 369 AND PACKAGING			
			LOOSE IN BOX			REEL
			$l_t = 4.0 + 1.0/- 0.5\text{ mm}$		$l_t = 22.0 \pm 4.0\text{ mm}$	
			C-tol = $\pm 10\%$	SPQ	SPQ	SPQ
last 5 digits of catalog number						
Pitch = $10.0 \pm 0.4\text{ mm}; d_t = 0.60 \pm 0.06\text{ mm}$						
0.027	4.2 × 8.7 × 12.5	0.4	45273	2000	1000	1500
0.033	4.6 × 8.8 × 12.5	0.5	45333	2000	1000	1300
0.039	4.0 × 8.8 × 12.5	0.4	45393	2000	1000	1500
0.047	4.5 × 9.0 × 12.5	0.5	45473	2000	1000	1500
0.056	4.6 × 8.8 × 12.5	0.5	45563	2000	1000	1300
0.068	4.6 × 9.2 × 12.5	0.5	45683	2000	1000	1300
0.082	4.4 × 9.4 × 12.5	0.5	45823	2000	1000	1200
0.1	4.7 × 9.7 × 12.5	0.5	45104	2000	1000	1200

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$U_{Rdc} = 400\text{ V}$; $U_{Rac} = 220\text{ V}$

C (μF)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 369 AND PACKAGING				
			LOOSE IN BOX			REEL	
			$l_t = 4.0 + 1.0/- 0.5\text{ mm}$		$l_t = 22.0 \pm 4.0\text{ mm}$		SPQ
			C-tol = $\pm 10\%$	last 5 digits of catalog number	SPQ	SPQ	
Pitch = $10.0 \pm 0.4\text{ mm}$; $d_t = 0.60 \pm 0.06\text{ mm}$							
0.001	4.5 × 8.7 × 12.5	0.5	55102	2000	1000	1500	
0.0012	4.5 × 9.0 × 12.5	0.5	55122	2000	1000	1500	
0.0015	4.5 × 8.8 × 12.5	0.5	55152	2000	1000	1500	
0.0018	4.5 × 8.7 × 12.5	0.5	55182	2000	1000	1500	
0.0022	4.0 × 8.6 × 12.5	0.5	55222	2000	1000	1500	
0.0027	4.3 × 8.9 × 12.5	0.5	55272	2000	1000	1500	
0.0033	4.6 × 9.1 × 12.5	0.5	55332	2000	1000	1500	
0.0039	4.0 × 8.7 × 12.5	0.5	55392	2000	1000	1500	
0.0047	4.1 × 8.8 × 12.5	0.5	55472	2000	1000	1500	
0.0056	4.6 × 9.1 × 12.5	0.5	55562	2000	1000	1500	
0.0068			55682				
0.0082			55822				
0.01			55103				
0.012	4.0 × 8.7 × 12.5	0.5	55123	2000	1000	1500	
0.015	4.1 × 8.8 × 12.5	0.5	55153	2000	1000	1500	
0.018	4.4 × 8.8 × 12.5	0.5	55183	2000	1000	1300	
0.022	4.2 × 8.8 × 12.5	0.5	55223	2000	1000	1500	
0.027	4.2 × 9.1 × 12.5	0.5	55273	2000	1000	1300	
0.033	4.6 × 9.4 × 12.5	0.5	55333	2000	1000	1300	

$U_{Rdc} = 630\text{ V}$; $U_{Rac} = 250\text{ V}$

C (μF)	DIMENSIONS $w_{max} \times h_{max} \times l_{max}$ (mm)	MASS (g)	CATALOG NUMBER 2222 369 AND PACKAGING				
			LOOSE IN BOX			REEL	
			$l_t = 4.0 + 1.0/- 0.5\text{ mm}$		$l_t = 22.0 \pm 4.0\text{ mm}$		SPQ
			C-tol = $\pm 10\%$	last 5 digits of catalog number	SPQ	SPQ	
Pitch = $10.0 \pm 0.4\text{ mm}$; $d_t = 0.60 \pm 0.06\text{ mm}$							
0.01	4.1 × 8.7 × 12.5	0.4	65103	2000	1000	1300	
0.012	4.4 × 8.9 × 12.5	0.5	65123	2000	1000	1200	
0.015	4.9 × 9.2 × 12.5	0.5	65153	2000	1000	1100	
0.018	5.3 × 9.5 × 12.5	0.6	65183	2000	1000	1000	
0.022	5.9 × 9.9 × 12.5	0.7	65223	2000	1000	900	

APPLICATION NOTE AND LIMITING CONDITIONS

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

For capacitors connected in parallel, normally the proof voltage and possibly the rated voltage must be reduced. For information depending of the capacitance value and the number of parallel connections contact: dc-film@vishay.com

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

1. The peak voltage (U_P) shall not be greater than the rated DC voltage (U_{RDC}).
2. The peak-to-peak voltage (U_{P-P}) shall not be greater than $2\sqrt{2} \times U_{RAC}$ 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.

The rated voltage pulse slope is valid for ambient temperatures up to 85 °C. For higher temperatures a derating factor of 3 % per K shall be applied.

4. The maximum component surface temperature rise must be lower than the limits (see graph “Max. allowed component temperature rise”).
5. Since in circuits used at voltages over 280 V peak-to-peak the risk for an intrinsically active flammability after a capacitor breakdown (short circuit) increases, it is recommended that the power to the component is limited to 100 times the values mentioned in the table: “Heat Conductivity”
6. When using these capacitors as across-the-line capacitor in the input filter for mains applications the applicant must guarantee that the following conditions are fulfilled in any case (spikes and surge voltages from the mains included).
7. For continuous use as series connection with an impedance to the mains, please refer to application note www.vishay.com/doc?28153.

Voltage Conditions for 6 Above

ALLOWED VOLTAGES	$T_{amb} \leq 85 \text{ °C}$	$85 \text{ °C} < T_{amb} \leq 105 \text{ °C}$
Maximum continuous RMS voltage	U_{RAC}	$0.8 \times U_{RAC}$
Maximum temperature RMS-overvoltage (< 24 h)	$1.25 \times U_{RAC}$	U_{RAC}
Maximum peak voltage (V_{O-P}) (< 2 s)	$1.6 \times U_{RDC}$	$1.3 \times U_{RDC}$

Example

C = 3300 nF - 100 V used for the voltage signal shown in next figure.

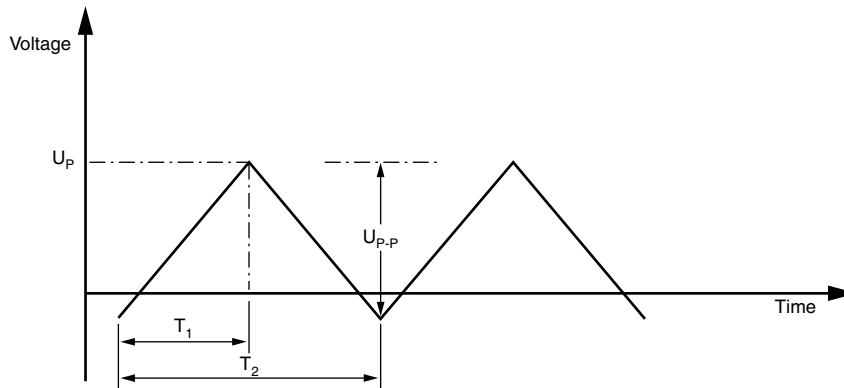
$U_{P-P} = 80 \text{ V}$; $U_P = 70 \text{ V}$; $T_1 = 0.5 \text{ ms}$; $T_2 = 1 \text{ ms}$

The ambient temperature is 35 °C.

Checking conditions:

1. The peak voltage $U_P = 70 \text{ V}$ is lower than $100 V_{DC}$.
2. The peak-to-peak voltage 80 V is lower than $2\sqrt{2} \times 63 V_{AC} = 178 U_{P-P}$.
3. The voltage pulse slope (dU/dt) = $80 \text{ V}/500 \mu\text{s} = 0.16 \text{ V}/\mu\text{s}$
This is lower than $8 \text{ V}/\mu\text{s}$ (see “Specific Reference Data” for each version).
4. The dissipated power is 60 mW as calculated with fourier terms
The temperature rise for $w_{max.} = 8.5 \text{ mm}$ and pitch = 22.5 mm will be $60 \text{ mW}/18 \text{ mW}/\text{°C} = 3.3 \text{ °C}$
This is lower than 15 °C temperature rise at 35 °C, according figure “Maximum allowed component temperature rise”
5. Not applicable
6. Not applicable
7. Not applicable

Voltage Signal





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