

Ceramic Disc Capacitors Class 2, Low Loss (0.2 %), 500 V_{DC}, 1 kV_{DC}, 2 kV_{DC} and 3 kV_{DC}



Capacitors with outside and inside kink lead spacing

RoHS
COMPLIANT

FEATURES

- High reliability
- Low losses
- High capacitance in small size
- Kinked leads
- Compliant to RoHS directive 2002/95/EC

APPLICATIONS

In electronic circuits where low losses and high capacitance per volume are essential, for example:

- SMPS
- HF ballast
- Snubber and high voltage circuits

DESIGN

The capacitors consist of a ceramic disc both sides of which are silver-plated. Connection leads are made of tinned copper having a diameter of 0.6 mm or 0.8 mm.

The capacitors are supplied with kinked leads and lead spacings of 5 mm or 7.5 mm and 10 mm. Encapsulation is made of epoxy-resin, flammable resistant in accordance with "UL 94 V-0"

QUICK REFERENCE DATA

DESCRIPTION	CLASS 2 (Y5R)
Voltage (V _{DC})	500, 1000, 2000, 3000
Min. Capacitance (pF)	100
Max. Capacitance (pF)	4700
Mounting	Through hole

MARKING

Marking indicates capacitance value and tolerance in accordance with "EIA 198" and voltage marks.

OPERATING TEMPERATURE RANGE

- 30 °C to + 125 °C

TEMPERATURE COEFFICIENT Y5R (2C4)

- 30 °C TO + 85 °C

± 15 %

SECTIONAL SPECIFICATIONS

IEC 60384-9, EIA 198

EXAMPLES OF MARKING CODE

Disc size (D _{max.}) ≤ 6.5 mm:	Disc size (D _{max.}) ≥ 7.5 mm:
	BC
RP = low loss with T.C. Y5P	RP
101K	102K
2 kV	3 kV

CAPACITANCE RANGE

100 pF to 4700 pF

RATED DC VOLTAGE

500 V; 1 kV; 2 kV; 3 kV

DIELECTRIC STRENGTH

200 % of rated voltage

INSULATION RESISTANCE AT 500 V_{DC}

≥ 10 000 MΩ min.

TOLERANCE ON CAPACITANCE

± 10 %; ± 20 %

DISSIPATION FACTOR

0.2 % max.

AGING

typical 0.5 % per time decade

Note

The capacitors meet the essential requirements of "IEC 60384-9 and EIA 198". Unless stated otherwise all electrical values apply at an ambient temperature of 25 °C ± 3 °C, at normal atmospheric conditions



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ORDERING INFORMATION					
C (pF)	TOL. (%)	D _{MAX.} (mm)	LEAD SPACING (mm)	SH ⁽¹⁾ (mm)	CLEAR TEXT CODE
					13 TH DIGIT: T = REEL; U = AMMO; 3 = BULK
					16 TH DIGIT: R = RoHS COMPLIANT
500 V					
100	± 10	5.0	5.0	4.0	F101K20Y5RL6.J5.
120					F121K20Y5RL6.J5.
150					F151K20Y5RL6.J5.
180					F181K20Y5RL6.J5.
220					F221K20Y5RL6.J5.
270					F271K20Y5RL6.J5.
330		6.5	5.0		F331K20Y5RL6.J5.
390					F391K25Y5RL6.J5.
470					F471K25Y5RL6.J5.
560					F561K25Y5RL6.J5.
680					F681K25Y5RL6.J5.
820					F821K29Y5RL6.J5.
1000		7.5	F102K29Y5RL6.J5.		
500 V					
1200	± 10	8.5	5.0	4.0	F122K33Y5RL6.J5.
1500		10.0			F152K33Y5RL6.J5.
1800			F182K39Y5RL6.J5.		
2200			F222K39Y5RL6.J5.		
2700		12.0	7.5		F272K47Y5RL6J7.
1 kV					
100	± 10	6.5	5.0	4.0	F101K25Y5RN6.J5.
120					F121K25Y5RN6.J5.
150					F151K25Y5RN6.J5.
180					F181K25Y5RN6.J5.
220					F221K25Y5RN6.J5.
270		7.5			F271K29Y5RN6.J5.
330					F331K29Y5RN6.J5.
390					F391K29Y5RN6.J5.
470					F471K29Y5RN6.J5.
560					8.5
680		F681K33Y5RN6.J5.			
820		F821K39Y5RN6.J5.			
1000		F102K39Y5RN6.J5.			
1200		11.0			
1500					F152K43Y5RN6.J5.
1800			12.5		F182K47Y5RN6J7.
2200					F222K53Y5RN6J7.
2700					F272K53Y5RN6J7.
3300		17.5			F332K69Y5RN6J7.
3900					F392K69Y5RN6J7.
4700			19.0		10.0
2 kV					
100	± 10	6.5	5.0	4.0	F101K25Y5RP6.K5.
120					F121K25Y5RP6.K5.
150					F151K25Y5RP6.K5.
180		7.5			F181K29Y5RP6.K5.
220					F221K29Y5RP6.K5.
270					F271K29Y5RP6.K5.
330					F331K29Y5RP6.K5.
390					8.5
470		F471K33Y5RP6.K5.			
560		10.0			

F Series

Vishay BCcomponents

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					13 TH DIGIT: T = REEL; U = AMMO; 3 = BULK	
					16 TH DIGIT: R = RoHS COMPLIANT	
2 kV						
680	± 10	10.0	5.0	4.0	F681K39Y5RP6.K5.	
820		11.0			F821K43Y5RP6.K5.	
1000		12.0			F102K43Y5RP6.K5.	
1200		13.5	7.5	4.8	F122K47Y5RP63K7.	
1500					F152K53Y5RP63K7.	
1800					F182K53Y5RP63K7.	
2200					17.5	F222K69Y5RP63K7.
2700					19.0	F272K75Y5RP83K0.
3300			10.0		F332K75Y5RP83K0.	
3900		F392K75Y5RP83K0.				
4700		F472K96Y5RP83K0.				
3 kV						
100	± 10	8.5	7.5	4.0	F101K33Y5RR6.K7.	
120					F121K33Y5RR6.K7.	
150					F151K33Y5RR6.K7.	
180					F181K33Y5RR6.K7.	
220					F221K33Y5RR6.K7.	
270					F271K33Y5RR6.K7.	
330					F331K33Y5RR6.K7.	
390					10	F391K39Y5RR6.K7.
470					11	F471K39Y5RR6.K7.
560		13.5			F561K43Y5RR6.K7.	
680					F681K43Y5RR6.K7.	
820					F821K53Y5RR63K7.	
1000		15		4.8	F102K53Y5RR63K7.	
1200					F122K59Y5RR63K7.	
1500					F152K59Y5RR63K7.	
1800		19			F182K75Y5RR83K0.	
2200		10.0	F222K75Y5RR83K0.			
2700			F272K84Y5RR83K0.			
			21			

Notes

⁽¹⁾ SH = seated height

- Maximum thickness: 500 V = 3.5 mm; 1 kV = 4.5 mm; 2 kV = 5.0 mm; 3 kV = 6.0 mm

PACKAGING					
PACKAGING TYPE	SIZE CODE	LEAD SPACE (mm)	VOLTAGE (V _{DC})	SPQ	BOX DIMENSIONS L x W x H
Bulk (long lead L ≥ 25.4 mm)	20 to 25	all	all	1000	245 x 120 x 65
	29 to 39			1000	
	43 to 47			1000	
	53 to 75			500	
	84 to 96			250	
Tape and reel	≤ 47	≤ 6.4	< 500	2500	370 x 370 x 60
			500 ≤ WV ≤ 2000	2000	
			3000	1000	
	≥ 53	≥ 7.5	all	1000	
		all	all	1000	
Ammopack	≤ 47	≤ 6.4	< 500	2000	335 x 240 x 50
			500 ≤ WV < 2000	2000	335 x 290 x 50
			2000 and 3000	1500	360 x 330 x 55
	≥ 53	all	all	1500	335 x 290 x 50
			all	1500	335 x 290 x 50

Note

- The capacitors are supplied in bulk packaging (cardboard boxes), in tape on reel or in ammpack

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Kinked capacitors on tape, lead spacing 5.0 mm (0.2") or 7.5 mm (0.3")

DIMENSIONS OF TAPE

SYMBOL	PARAMETER	DIMENSIONS (mm)	
		FEED-HOLE PITCH $P_0 = 12.7$	FEED-HOLE PITCH $P_0 = 15.0$
D	Body diameter	11.0 max.	14.0 max.
d	Lead diameter	0.6 ± 0.05	0.6 ± 0.05
P ⁽¹⁾	Pitch between capacitors	12.7 ± 1.0	15.0 ± 1.0
P ₀	Feed-hole pitch	12.7 ± 0.3	15.0 ± 0.3
ΔP	Plane deviation	1.0 max.	1.0 max.
P ₁ ⁽²⁾	Feed-hole center to lead center	3.85 ± 0.7	3.75 ± 0.7
P ₂ ⁽²⁾	Feed-hole center to component center	6.35 ± 1.3	7.5 ± 1.5
F	Lead spacing	$5.0 + 0.6/- 0.4$	$7.5 + 0.6/- 0.4$
Δh	Component alignment	0 ± 1.0	0 ± 1.0
W	Tape width	$18.0 + 1.0/- 0.5$	$18.0 + 1.0/- 0.5$
W ₀	Hold-down tape width	5.0 min.	5.0 min.
W ₁	Hole position	$9.0 + 0.75/- 0.5$	$9.0 + 0.75/- 0.5$
W ₂	Hold-down tape margin	3.0 max.	3.0 max.
H ₀	Height to seating plane	16.0 ± 0.5	16.0 ± 0.5
H ₁	Maximum component height	32.0	40.0
e	Lead end protrusion	1.0 max.	1.0 max.
L	Maximum length of snapped lead	11.0	11.0
D ₀	Feed-hole diameter	4.0 ± 0.2	4.0 ± 0.2
t	Total tape thickness	0.9 max.	0.9 max.
t ₁	Maximum thickness of tape and wires	1.5 max.	1.5 max.

Notes

(1) Cumulative pitch error: $\pm \leq 1 \text{ mm}/20 \text{ pitches}$

(2) Obliquity maximum 3°

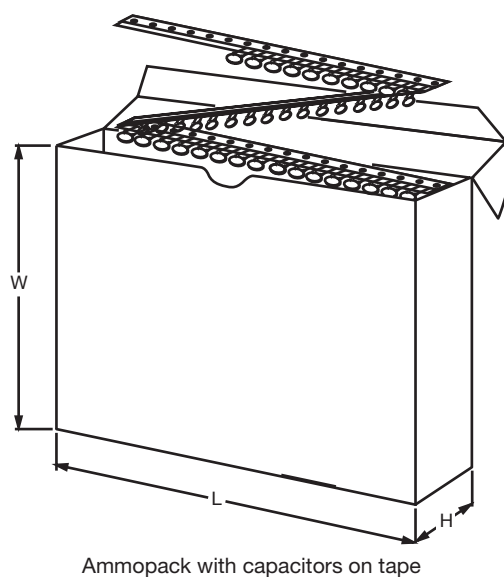
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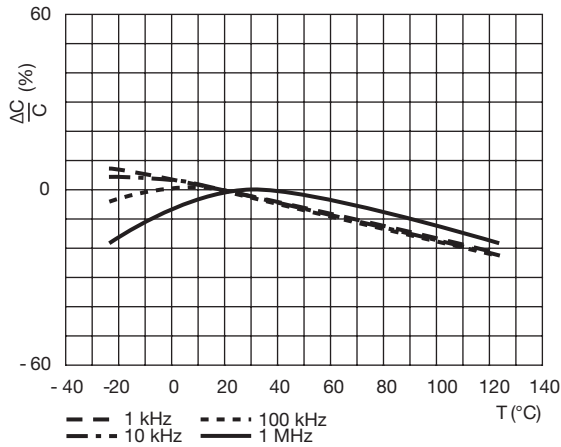
REEL AND TAPE DATA in millimeters



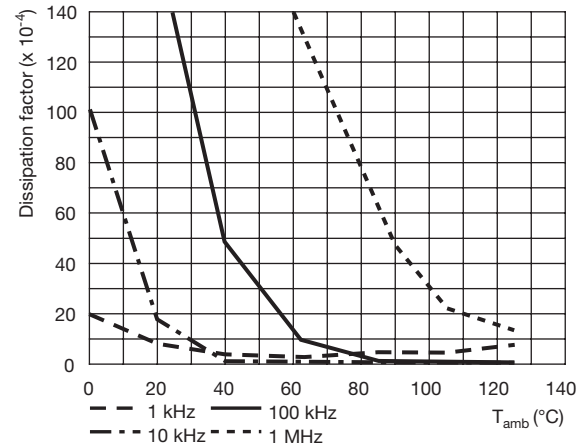
DIMENSIONS OF AMMOPACK			
PARAMETER	DISC SIZE (D _{MAX.})		UNIT
	6.5 mm to 11.0 mm	12.0 mm to 13.5 mm	
Taping pitch	12.7	15.0	mm
L	335	360	mm
W	290	330	mm
H	50	55	mm



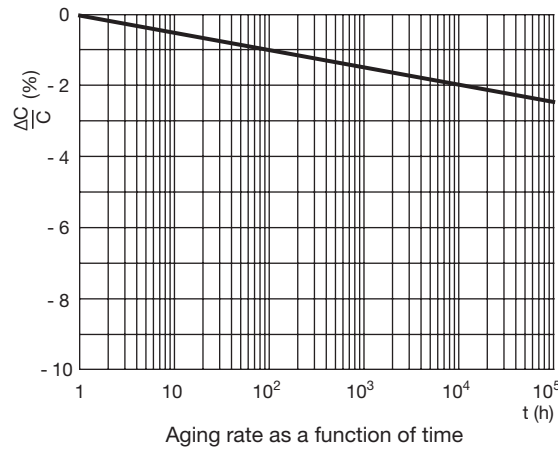
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Typical capacitance change as a function of temperature and frequency



Typical dissipation factor as a function of temperature and frequency



Aging rate as a function of time



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