

Ceramic Disc Capacitors Class 1 and 2, 1 kV_{DC}, 2 kV_{DC}, 3 kV_{DC} and 6 kV_{DC}, General Purpose



Capacitors with 5 mm (0.20\"), 7.5 mm (0.30\") and
10 mm (0.40\") lead spacing

QUICK REFERENCE DATA

DESCRIPTION	CLASS 1 (SL0, S3N)	CLASS 2 (Y5P, X7R, Z5U, Y5V, X5F)
Voltage (V _{DC})	1000, 2000, 3000, 6000	
Min. Capacitance (pF)	10	100
Max. Capacitance (pF)	220	33 000
Mounting	Through hole	

MARKING

Straight and kinked leaded versions are gold coloured
Marking indicates capacitance value and tolerance in
accordance with “EIA 198” and voltage:

OPERATING TEMPERATURE RANGE

Class 1 SL0, S3N, - 55 °C to + 125 °C

Class 2, X7R - 55 °C to + 125 °C

Class 2, Y5P, Z5U, Y5V, - 30 °C to + 85 °C

Class 2, X5F - 55 °C to + 85 °C

TEMPERATURE COEFFICIENTS

Class 1 SL0, S3N

Class 2 X7R, Y5P, Z5U, Y5V, X5F

SECTIONAL SPECIFICATIONS

Class 1, IEC 60 384-8,

Class 2, IEC 60 384-9,

EIA 198

CLIMATIC CATEGORY

Class 1, SL0, 55/125/21

Class 2, X7R, 55/125/21

Class 2, Y5P, Z5U, Y5V, 30/85/21

Class 2, X5F, 55/85/21

FEATURES

- Low losses
- High stability
- High capacitance in small size
- Kinked (preferred) or straight leads
- Compliant to RoHS directive 2002/95/EC

APPLICATIONS

- DC high voltage
- Pulse high voltage
- SMPS
- HV power supply
- HF ballast

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 up to 3 kV and 0.8 mm for 6 kV.

The capacitors may be supplied with kinked or straight leads with a lead spacing of 5 mm (0.20\"), 7.5 mm (0.30\") or 10 mm (0.40\") and a lead length from 4 mm to 30 mm. The standard tolerance on capacitance is 5 % or 10 % for class 1 capacitors and ± 10 % or ± 20 % for class 2 capacitors. Encapsulation is made of gold-colored epoxy-resin, flammable resistant in accordance with “UL 94 V-0”

CAPACITANCE RANGE

Class 1, at 1 MHz, 1.2 V_{RMS} ; 10 pF to 220 pF

1 kHz, 1 V_{RMS} ± 0.2 V_{RMS} for capacitance values higher than 1000 pF

Class 2, at 1 kHz, 1 V_{RMS} ± 0.2 V_{RMS} ; 100 pF to 33 000 pF

RATED DC VOLTAGE

1 kV; 2 kV; 3 kV; 6 kV

DIELECTRIC STRENGTH

200 % of rated voltage

INSULATION RESISTANCE AT 500 V_{DC}

≥ 10 000 MΩ

TOLERANCE ON CAPACITANCE

± 5 %; ± 10 %; ± 20 %; + 80/- 20 %

Other tolerances available on request

DISSIPATION FACTOR

Class 1, C ≤ 30 pF; ≤ 20 x (10/C + 0.7) x 10⁻⁴ max.

Class 1, C > 30 pF; ≤ 0.2 %

Class 2, ≤ 3.0 %



RoHS
COMPLIANT

ORDERING INFORMATION 1 kV _{DC} , STRAIGHT								
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			
CLASS 1 SLO								
10	± 5	6.5	5.0	4.0	S100J25SL0N6.J5.			
	± 10				S100K25SL0N6.J5.			
12	± 5				S120J25SL0N6.J5.			
	± 10				S120K25SL0N6.J5.			
15	± 5				S150J25SL0N6.J5.			
	± 10				S150K25SL0N6.J5.			
18	± 5				S180J25SL0N6.J5.			
	± 10				S180K25SL0N6.J5.			
22	± 5				S220J25SL0N6.J5.			
	± 10				S220K25SL0N6.J5.			
27	± 5				S270J25SL0N6.J5.			
	± 10				S270K25SL0N6.J5.			
33	± 5				S330J25SL0N6.J5.			
	± 10				S330K25SL0N6.J5.			
39	± 5				S390J25SL0N6.J5.			
	± 10				S390K25SL0N6.J5.			
47	± 5	S470J25SL0N6.J5.						
	± 10	S470K25SL0N6.J5.						
56	± 5	7.5			S560J29SL0N6.J5.			
	± 10				S560K29SL0N6.J5.			
68	± 5				S680J29SL0N6.J5.			
	± 10				S680K29SL0N6.J5.			
82	± 5				S820J29SL0N6.J5.			
	± 10				S820K29SL0N6.J5.			
100	± 5				S101J29SL0N6.J5.			
	± 10				S101K29SL0N6.J5.			
120	± 5				8.5	S121J33SL0N6.J5.		
150	± 10				10	S121K33SL0N6.J5.		
220						S151K33SL0N6.J5.		
CLASS 2 X7R								
100	± 10				6.5	5.0	4.0	S101K25X7RN6.J5.
150								S151K25X7RN6.J5.
220			S221K25X7RN6.J5.					
330			S331K25X7RN6.J5.					
470		S471K29X7RN6.J5.						
680		S681K29X7RN6.J5.						
1000		8.5	S102K33X7RN6.J5.					
1500		10	S152K39X7RN6.J5.					
2200		11	S222K43X7RN6.J5.					
3 300		12	7.5	S332K47X7RN6.J7.				
4 700		15	4.8	S472K59X7RN6.J7.				
CLASS 2 Y5P								
100	± 10	6.5	5.0	4.0	S101K25Y5PN6.J5.			
150					S151K25Y5PN6.J5.			
220					S221K25Y5PN6.J5.			
330					S331K25Y5PN6.J5.			
470					S471K25Y5PN6.J5.			
680					S681K29Y5PN6.J5.			
1000		7.5			S102K29Y5PN6.J5.			
1500		8.5			S152K33Y5PN6.J5.			



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ORDERING INFORMATION 1 kV _{DC} , STRAIGHT						
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	
CLASS 2 Y5P						
2200	± 10	10	5.0	4.0	S222K39Y5PN6.J5.	
3300		11			S332K43Y5PN6.J5.	
4700		13.5	7.5	4.8	S472K53Y5PN63J7.	
6800		15			S682K59Y5PN63J7.	
10 000		19	10		S103K75Y5PN83J0.	
CLASS 2 Z5U						
1000	± 20	6.5	5.0	4.0	S102M25Z5UN6.J5.	
1500					S152M29Z5UN6.J5.	
2200					S222M29Z5UN6.J5.	
3300					S332M33Z5UN6.J5.	
4700		8.5	7.5	4.8	S472M39Z5UN6.J5.	
6800		10			S682M43Z5UN6.J5.	
10 000		11			S103M47Z5UN63J7.	
15 000		12			S153M59Z5UN63J7.	
22 000		15	10		S223M75Z5UN83J0.	
		19				
CLASS 2 Y5V						
1000	+ 80/- 20	6.5	5.0	4.0	S102Z25Y5VN6.J5.	
1500					S152Z25Y5VN6.J5.	
2200					S222Z29Y5VN6.J5.	
3300					S332Z29Y5VN6.J5.	
4700		7.5	7.5	4.8	S472Z33Y5VN6.J5.	
6800		8.5			S682Z39Y5VN6.J5.	
10 000		10			S103Z43Y5VN6.J5.	
15 000		11			S153Z53Y5VN6.J7.	
22 000		13.5	10		S223Z59Y5VN6.J7.	
33 000		15			S333Z75Y5VN8.J0.	

ORDERING INFORMATION 1 kV _{DC} , KINKED					
C (pF)	TOL. (%)	D _{MAX.} (mm)	LEAD SPACING (mm)	SH ⁽²⁾ (mm)	CLEAR TEXT CODE
					13 TH DIGIT: T = REEL; U = AMMO; 3 = BULK 16 TH DIGIT: R = RoHS COMPLIANT
CLASS 2 X5F					
100	± 10	6.5	5.0	4.0	S101K25X5FN6.J5R
220					S221K25X5FN6.J5R
270					S271K25X5FN6.J5R
330					S331K25X5FN6.J5R
390					S391K25X5FN6.J5R
470					S471K25X5FN6.J5R
680					S681K29X5FN6.J5R
820		7.5	7.5	4.8	S821K29X5FN6.J5R
1000					S102K29X5FN6.J5R
2200					S222K43X5FN6.J5R
3300		11	7.5	4.8	S332K53X5FN6.J7R
4700		13.5			S472K63X5FN63J7R
		16			

Notes

⁽¹⁾ SH = seated height

- Maximum thickness 4.0 mm
- Lead style codes refer to inward kinked leads. Other styles available on request

ORDERING INFORMATION 2 kV _{DC} , KINKED							
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		
CLASS 1 SL0							
10	± 5	6.5	5.0	4.0	S100J25SL0P6.K5.		
	± 10				S100K25SL0P6.K5.		
12	± 5				S120J25SL0P6.K5.		
	± 10				S120K25SL0P6.K5.		
15	± 5				S150J25SL0P6.K5.		
	± 10				S150K25SL0P6.K5.		
18	± 5				S180J25SL0P6.K5.		
	± 10				S180K25SL0P6.K5.		
22	± 5				S220J25SL0P6.K5.		
	± 10				S220K25SL0P6.K5.		
27	± 5				S270J25SL0P6.K5.		
	± 10				S270K25SL0P6.K5.		
33	± 5	7.5			S330J29SL0P6.K5.		
	± 10				S330K29SL0P6.K5.		
39	± 5				S390J29SL0P6.K5.		
	± 10				S390K29SL0P6.K5.		
47	± 5				S470J29SL0P6.K5.		
	± 10				S470K29SL0P6.K5.		
56	± 5				S560J29SL0P6.K5.		
	± 10				S560K29SL0P6.K5.		
68	± 5				8.5	S680J33SL0P6.K5.	
	± 10					S680K33SL0P6.K5.	
82	± 5					S820J33SL0P6.K5.	
	± 10					S820K33SL0P6.K5.	
100	± 5	10			S101J39SL0P6.K5.		
	± 10				S101K39SL0P6.K5.		
120	± 5				S121J39SL0P6.K5.		
	± 10				S121K39SL0P6.K5.		
150	± 10	11			S151K43SL0P6.K5.		
CLASS 2 X7R							
100	± 10	6.5	5.0	4.0	S101K25X7RP6.K5.		
150					S151K25X7RP6.K5.		
220					S221K25X7RP6.K5.		
330					S331K25X7RP6.K5.		
470					7.5	S471K29X7RP6.K5.	
680					8.5	S681K33X7RP6.K5.	
1000					10	S102K39X7RP6.K5.	
1500		11			S152K43X7RP6.K5.		
2200		13.5			7.5	4.8	S222K53X7RP6.K7.
3300		15					S332K59X7RP6.K7.
CLASS 2 Y5P							
100	± 10	6.5	5.0	4.0	S101K25Y5PP6.K5.		
150					S151K25Y5PP6.K5.		
220					S221K25Y5PP6.K5.		
330					S331K25Y5PP6.K5.		
470					7.5	S471K29Y5PP6.K5.	
680					8.5	S681K29Y5PP6.K5.	
1000					10	S102K33Y5PP6.K5.	
1500		10			S152K39Y5PP6.K5.		
2200		11			S222K43Y5PP6.K5.		
3300		13.5			7.5	4.8	S332K53Y5PP6K7.
4700		17.5					S472K69Y5PP6K7.



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ORDERING INFORMATION 2 kV _{DC} , KINKED					
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
CLASS 2 Z5U					
1000	± 20	7.5	5.0	4.0	S102M29Z5UP6.K5.
1500					S152M29Z5UP6.K5.
2200					S222M33Z5UP6.K5.
3300		11	7.5	4.8	S332M43Z5UP6.K5.
4700		12			S472M47Z5UP63K7.
6800		13.5			S682M53Z5UP63K7.
10 000		17.5			S103M69Z5UP63K7.
CLASS 2 Y5V					
1000	+ 80/- 20	7.5	5.0	4.0	S102Z29Y5VP6.K5.
1500					S152Z29Y5VP6.K5.
2200					S222Z33Y5VP6.K5.
3300		10.5	7.5	4.8	S322Z39Y5VP6.K5.
4700		11			S472Z43Y5VP6.K5.
6800		12			S682Z47Y5VP6.K7.
10 000		15			S103Z59Y5VP6.K7.
CLASS 2 X5F					
1 00	± 10	6.5	5.0	4.0	S101K25X5FP6.K5R
220					S221K25X5FP6.K5R
330					S331K29X5FP6.K5R
470		8	7.5	4.8	S471K31X5FP6.K5R
680		10			S681K39X5FP6.K5R
1000		11			S102K43X5FP6.K5R
2200		15			S222K59X5FP6.K7R
3300	16.5		S332K65X5FP63K7R		

Notes

⁽¹⁾ SH = seated height

- Maximum thickness 4.0 mm
- Lead style codes refer to inward kinked leads. Other styles available on request

ORDERING INFORMATION CLASS 3 kV _{DC} , KINKED					
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
CLASS 1 SL					
10	± 10	8.5	7.5	4.0	S100K33SL0R63K7.
15					S150K33SL0R63K7.
22					S220K33SL0R63K7.
33					S330K33SL0R63K7.
47					S470K33SL0R63K7.
68		10			S680K39SL0R63K7.
CLASS 2 X7R					
100	± 10	8.5	7.5	4.0	S101K33X7RR63K7.
150					S151K33X7RR63K7.
220					S221K33X7RR63K7.
330					S331K33X7RR63K7.
470					S471K33X7RR63K7.
680					S681K39X7RR63K7.
1000		10	4.8	S102K43X7RR63K7.	
1500		11		S152K53X7RR63K7.	
		13.5		S222K59X7RR83K7.	
2200		17.5			

ORDERING INFORMATION CLASS 3 kV _{DC} , KINKED					
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
CLASS 2 Y5P					
100	± 10	8.5	7.5	4.0	S101K33Y5PR63K7.
150					S151K33Y5PR63K7.
220					S221K33Y5PR63K7.
330					S331K33Y5PR63K7.
470					S471K33Y5PR63K7.
680		10	4.8	S681K39Y5PR63K7.	
1000		11		S102K43Y5PR63K7.	
1500		12		S152K47Y5PR63K7.	
2200		15		S222K59Y5PR63K7.	
3 300		19		S332K75Y5PR83K0.	
CLASS 2 Z5U					
470	± 20	8.5	7.5	4.0	S471M33Z5UR63K7.
680					S681M33Z5UR63K7.
1000					S102M33Z5UR63K7.
1500		10	4.8	S152M39Z5UR63K7.	
2200		11		S222M43Z5UR63K7.	
3300		13.5		S332M53Z5UR63K7.	
4700		17.5		S472M69Z5UR83K7.	
CLASS 2 Y5V					
1000	+ 80/- 20	8.5	7.5	4.0	S102Z33Y5VR63K7.
1500					S152Z33Y5VR63K7.
2200		10		4.8	S222Z39Y5VR63K7.
3300		11			S322Z43Y5VR63K7.
4700		12			S472Z47Y5VR63K7.
6800		15			S682Z59Y5VR63K7.

Notes

- ⁽¹⁾ SH = seated height
- Maximum thickness 4.0 mm
 - Lead style codes refer to inward kinked leads. Other styles available on request

ORDERING INFORMATION CLASS 6 kV _{DC} , KINKED					
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
CLASS 1 SL					
10	± 20	10	10	3.0	S100M39SL0U83L0.
15					S150M43SL0U83L0.
22					S220M43SL0U83L0.
33		13.5			S330M53SL0U83L0.
CLASS 1 S3N					
47	± 20	11	10	3.0	S470M43S3NU83L0.
68		13.5			S680M53S3NU83L0.
100		15			S101M59S3NU83L0.
150		15			S151M59S3NU83L0.
CLASS 2 Z5U					
220	± 20	10	10	3.0	S221M39Z5UU83L0.
330		11			S331M43Z5UU83L0.
470		12			S471M47Z5UU83L0.

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ORDERING INFORMATION CLASS 6 kV_{DC}, KINKED

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
CLASS 2 Z5U					
680	± 20	13.5	10	3.0	S681M53Z5UU83L0.
1000		15			S102M59Z5UU83L0.
1500		17.5			S152M69Z5UU83L0.
2200		19			S222M75Z5UU83L0.

Notes

⁽¹⁾ SH = seated height

- Maximum thickness 4.0 mm
- Lead style codes refer to inward kinked leads. Other styles available on request

PACKAGING

PACKAGING TYPE	SIZE CODE	LEAD SPACE (mm)	VOLTAGE (V _{DC})	SPQ	BOX DIMENSIONS L x W x H (mm)
Bulk (long lead L ≥ 25.4 mm)	20 to 47	all	all	1000	245 x 120 x 65
				1000	
	53 to 75			1000	
	84 to 96			500	
Tape and reel	≤ 47	≤ 6.40	< 500	2500	370 x 370 x 60
			500 ≤ WV ≤ 2000	2000	
		≥ 7.5	3000	1000	
			all	1000	
Ammopack	≤ 47	≤ 6.40	< 500	2000	335 x 240 x 50
			500 ≤ WV < 2000	1500	335 x 290 x 50
		≥ 7.5	2000 and 3000	1500	360 x 330 x 55
			all	1500	

Note

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



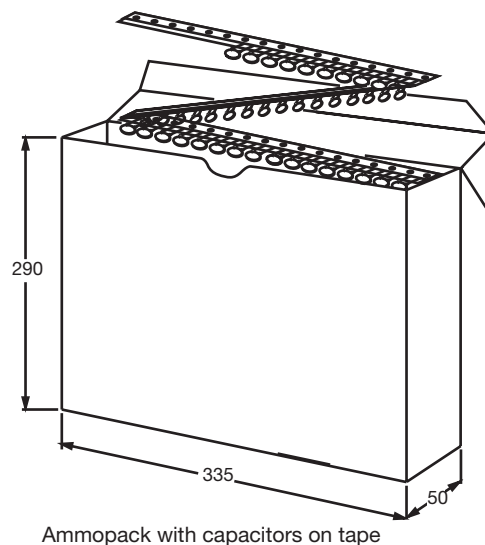
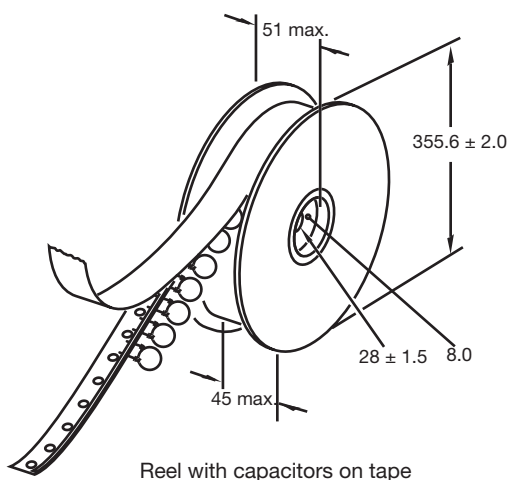
DIMENSIONS OF TAPE			
SYMBOL	PARAMETER	DIMENSIONS (mm)	
		NOMINAL	TOLERANCE
D	Body diameter	11.0 maximum	-
d	Lead diameter	0.6	± 0.05
P	Pitch between capacitors	12.7	± 1.0
P ₀ ⁽¹⁾	Feed-hole pitch	12.7	± 0.3
ΔP	Plane deviation	1.0 maximum	-
P ₁ ⁽²⁾	Feed-hole center to lead center	3.85	± 0.7
P ₂ ⁽²⁾	Feed-hole center to component center	6.35	± 1.3
F	Lead spacing	5.0	0.6 - 0.4
Δh	Component alignment	0	± 1.0
W	Tape width	18.0	1.0 - 0.5
W ₀	Hold-down tape width	5.0 minimum	-
W ₁	Hole position	9.0	0.75 - 0.5
W ₂	Hold-down tape margin	3.0 maximum	-
H ₀	Height to seating plane	16.0	± 0.5
H ₁	Maximum component height	32.0	-
e	Lead end protrusion	1.0 maximum	-
L	Maximum length of snapped lead	11.0	-
D ₀	Feed-hole diameter	4.0	± 0.2
t	Total tape thickness	0.9 maximum	-
t ₁	Maximum thickness of tape and wires	1.5 maximum	-

Notes

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

(2) Obliquity maximum 3°

REEL AND TAPE DATA in millimeters





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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