

## Ceramic Disc Capacitors

### Safety, Class X1/Y2 440/250V (AC) Series DS

**FEATURES**

- Complying with “EN 132 400” and “IEC 60384-14, 2nd edition, including amendment 1.1995”
- High reliability
- Kinked (preferred) or straight leads.
- Lead (Pb)-free available.


**APPLICATIONS**

- Across-the-line
- Line by-pass
- Antenna coupling.

**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 may be supplied with kinked or straight leads having a lead spacing of 5.0 mm (0.200") or 7.5 mm (0.300") and a lead length from 4 to 30 mm. The standard tolerance on capacitance is  $\pm 10\%$  for U2M and Y5P material,  $\pm 20\%$  for Y5U and  $-20/+80\%$  for Y5V material. Encapsulation is made of flammable resistant epoxy resin in accordance with “UL94V-0”.

**CAPACITANCE RANGE:**

at 1kHz, 1V (RMS); 10 to 10000pF

**RATED VOLTAGE  $U_R$ :**

(X1): 440V (AC), 50Hz (IEC 60384-14.2)

(Y2): 250V (AC), 50Hz (IEC 60384-14.2)

**DIELECTRIC STRENGTH BETWEEN LEADS:**

Component test:

1900V (AC), 50Hz, 2 seconds

As repeated test admissible only once with:

1700V (AC), 50Hz, 2 seconds

Random sampling test (destructive test):

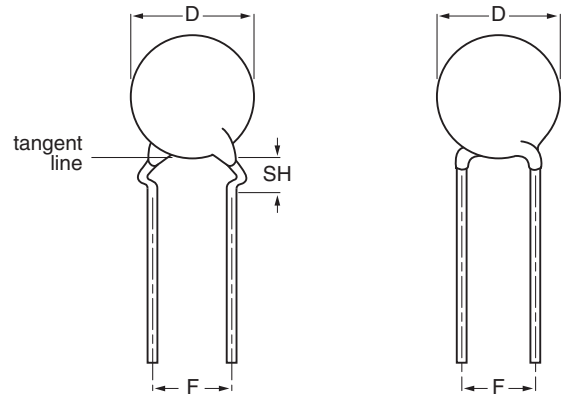
1500V (AC), 50Hz, 60 seconds

**DIELECTRIC STRENGTH OF BODY INSULATION:**

1500V (AC), 50Hz, 60 seconds (destructive test)

**INSULATION RESISTANCE AT 500V (DC):**

$\geq 10000 \text{ M}\Omega$



Capacitors with 5.0 mm (0.20") 7.5 mm (0.30") lead spacing.

**TOLERANCE ON CAPACITANCE:**

$\pm 10\%$ ;  $\pm 20\%$ ;  $-20/+80\%$

**DISSIPATION FACTOR:**

at 1kHz; 1V (RMS); 2.5% max

**TEMPERATURE COEFFICIENTS:**

U2M; Y5P; Y5U; Y5V

**APPROVALS:**

ENEC, UL file E95439 and CSA

**CLIMATIC CATEGORY:**

25/125/56 or 25/85/21

**OPERATING TEMPERATURE RANGE:**

-30 to +125°C

**MARKING**

Marking indicates capacitance value and tolerance in accordance with “EIA 198”, voltage and approval marks.

The capacitors meet the essential requirements of “EIA 198”. Unless stated otherwise all electrical values apply at an ambient temperature of  $25 \pm 3^\circ\text{C}$ , at normal atmospheric conditions



<b>ORDERING INFORMATION, X1 440V (AC); Y1 250V (AC)</b>										
C (pF)	TOL. (%)	D <sub>max</sub> (mm)	LEAD SPACING F (mm)	SH <sup>(2)</sup> (mm)	CLEAR TEXT CODE	PACKAGING CODE 8 <sup>th</sup> AND 9 <sup>th</sup> DIGIT			CATALOG NUMBER <sup>(4)</sup> 3 <sup>rd</sup> DIGIT: 5 = STANDARD, 8 = RoHS COMPLIANT	
					13 <sup>th</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK <sup>(3)</sup> 16 <sup>th</sup> DIGIT: R = RoHS COMPLIANT	REEL	AMMO	BULK		
<b>U2M</b>										
10	±10	6.5	5.0	4.0	S100K25U2MY6.K5.	13	14	15	22.2 815 ..006	
15					S150K25U2MY6.K5.				22.2 815 ..106	
22					S220K25U2MY6.K5.				22.2 815 ..206	
33					S330K25U2MY6.K5.				22.2 815 ..306	
47					S470K29U2MY6.K5.				22.2 815 ..406	
68					S680K33U2MY6.K5.				22.2 815 ..606	
<b>Y5P</b>										
100	±10	6.5	5.0	4.0	S101K25Y5PY6.K5.	13	14	15	22.2 815 ..016	
150					S151K25Y5PY6.K5.				22.2 815 ..116	
220					S221K29Y5PY6.K5.				22.2 815 ..216	
330					S331K29Y5PY6.K5.				22.2 815 ..316	
470					S471K29Y5PY6.K5.				22.2 815 ..416	
680					S681K29Y5PY6.K5.				22.2 815 ..616	
<b>Y5U</b>										
1000	±20	7.5	5.0	4.0	S102M29Y5UY6.K5.	13	14	15	22.2 815 ..027	
1500					S152M29Y5UY6.K5.				22.2 815 ..127	
2200					8.5				S222M33Y5UY6.K5.	22.2 815 ..227
3300		10.0							S332M39Y5UY6.K5.	22.2 815 ..327
4700		12.0							S472M47Y5UY6.K5.	22.2 815 ..427
<b>Y5V</b>										
2200	-20/+80%	8.5	5.0	4.0	S222Z33Y5VY6.K5.	13	14	15	22.2 815 ..228	
3300		10.0			S332Z39Y5VY6.K5.				22.2 815 ..328	
4700		11.0			S472Z43Y5VY6.K5.				22.2 815 ..428	
10000		15.0	7.5	4.8	S103Z59Y5VY6.K7.	35	36	37	22.2 815 ..038	

**Notes**

1. Maximum thickness 4.5 mm.
2. SH = seated height.
3. Straight leads are available on request.
4. 3<sup>rd</sup> digit to complete RoHS catalog number. 8<sup>th</sup> and 9<sup>th</sup> digit of the catalog number to be completed with the packaging code.

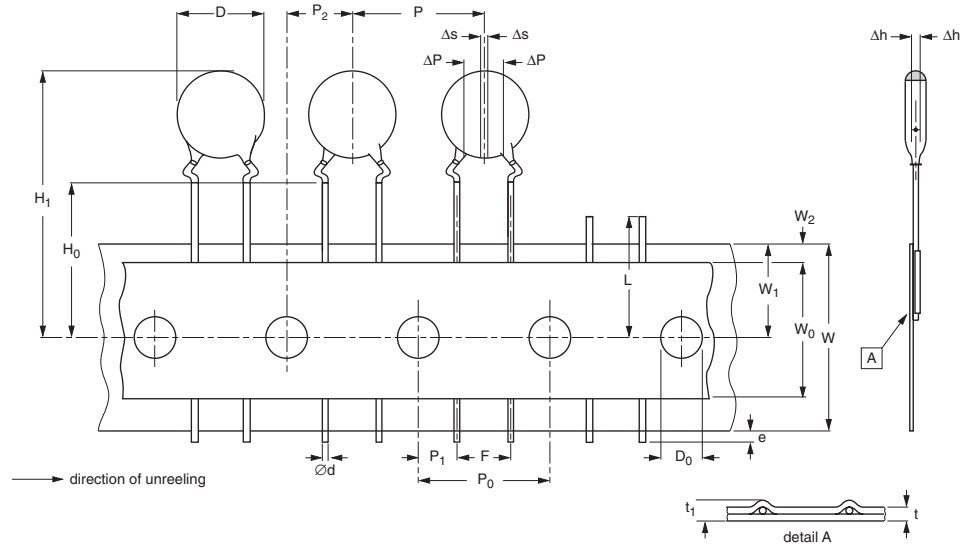
<b>PACKAGING</b>				
D <sub>max</sub> (mm)	SIZE CODE	PACKAGING QUANTITIES		
		BULK	REEL	AMMO
8.5 (0.33")	33	1000	1000	1500
10.0 (0.39")	39			
11.0 (0.43")	43			
12.0 (0.47")	47			
13.5 (0.53")	53	500	-	-
15.0 (0.59")	59			

**Note**

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

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**Safety, Class X1/Y2 440/250V (AC)**  
**Series DS**

Vishay BCcomponents



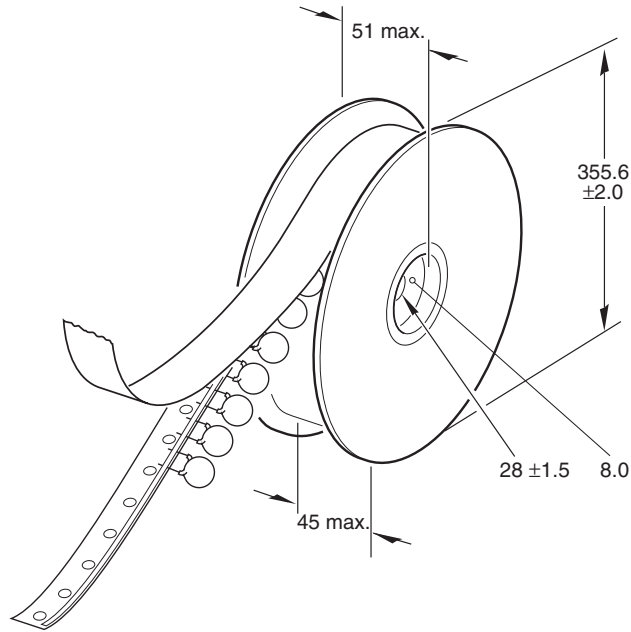
Kinked capacitors on tape, lead spacing 5 mm (0.20") or 7.5 mm (0.30").

<b>DIMENSIONS OF TAPE</b>		<b>DIMENSIONS (mm)</b>	
<b>SYMBOL</b>	<b>PARAMETER</b>	<b>FEED-HOLE PITCH <math>P_0 = 12.7</math></b>	<b>FEED-HOLE PITCH <math>P_0 = 15.0</math></b>
		D	body diameter
d	lead diameter	0.6 ±0.05	0.6 ±0.05
P	pitch between capacitors	12.7 ±1.0	15.0 ±1.0
$P_0$	feed-hole pitch	12.7 ±0.3; note 1	15.0 ±0.3; note 1
$\Delta P$	plane deviation	1.0 max.	1.0 max.
$P_1$	feed-hole centre to lead centre	3.85 ±0.7; note 2	3.75 ±1.0; note 2
$P_2$	feed-hole centre to component centre	6.35 ±1.3; note 2	7.5 ±1.5; note 2
F	lead spacing	5.0 +0.6/-0.4	7.5 ±1.0
$\Delta h$	component alignment	0 ±1.0	0 ±1.0
$\Delta s$	deviation along tape, left or right	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.

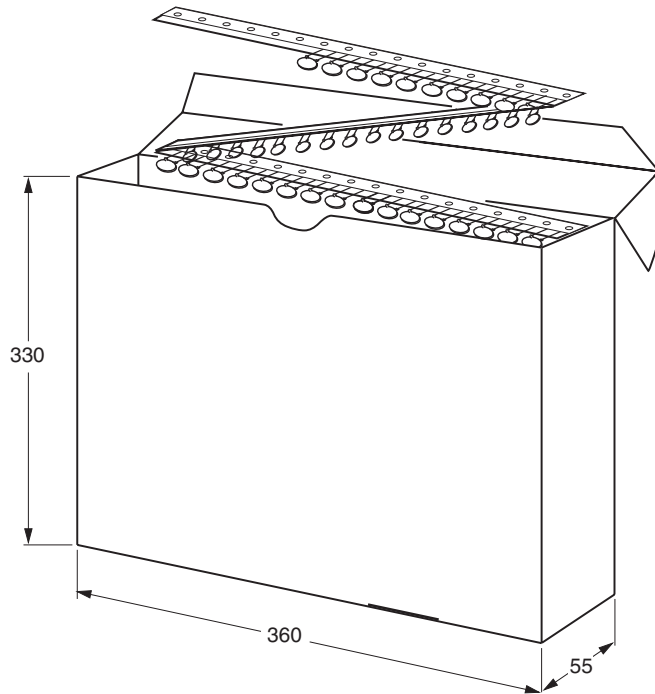
**Notes**

- Cumulative pitch error:  $\pm 1$  mm/20 pitches.
- Obliquity maximum 3°.

## REEL AND TAPE DATA in millimeters



Reel with capacitors on tape.



Ampopack with capacitors on tape.



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