# 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 ±10% for U2M and Y5P material, ±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):

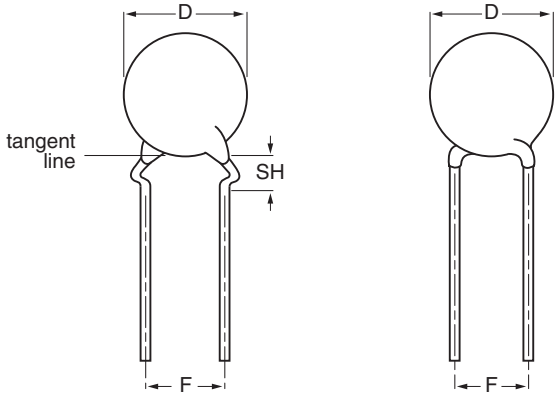
1500V (AC), 50Hz, 60 seconds

## DIELECTRIC STRENGTH OF BODY INSULATION:

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

## INSULATION RESISTANCE AT 500V (DC):

≥10000 MΩ




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

## TOLERANCE ON CAPACITANCE:

±10%; ±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 ± 3°C, at normal atmospheric conditions

## ORDERING INFORMATION, X1 440V (AC); Y1 250V (AC)

| C (pF) | TOL. (%) | $D_{max}$ (mm) | LEAD SPACING F (mm) | SH[2] (mm) | CLEAR TEXT CODE: 13th DIGIT: T = REEL; U = AMMO; 3 = BULK[3] 16th DIGIT: R = RoHS COMPLIANT | PACKAGING CODE 8th AND 9th DIGIT: REEL | AMMO | BULK | CATALOG NUMBER[4] 3rd DIGIT: 5 = STANDARD, 8 = RoHS COMPLIANT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | KINKED | | | |
| **U2M** | | | | | | | | | |
| 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 | | 7.5 | | | S470K29U2MY6.K5. | | | | 22.2 815 ..406 |
| 68 | | 8.5 | | | S680K33U2MY6.K5. | | | | 22.2 815 ..606 |
| **Y5P** | | | | | | | | | |
| 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 | | 7.5 | | | 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 |
| **Y5U** | | | | | | | | | |
| 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 |
| **Y5V** | | | | | | | | | |
| 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. 3rd digit to complete RoHS catalog number. 8th and 9th digit of the catalog number to be completed with the packaging code.

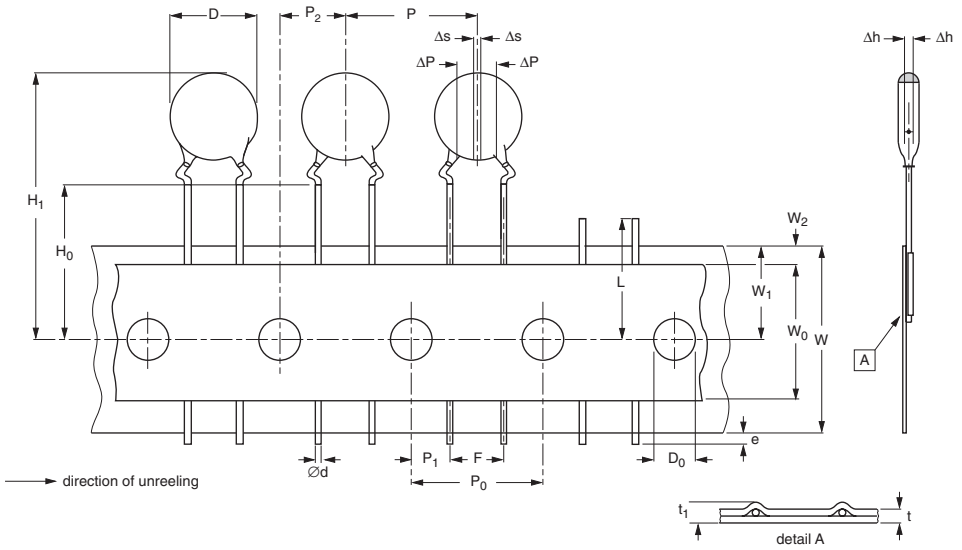
## PACKAGING

| $D_{max}$ (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 ammopack.

Ceramic Disc Capacitors
Sarfety, Class X1/Y2 440/250V (AC)
Series DS



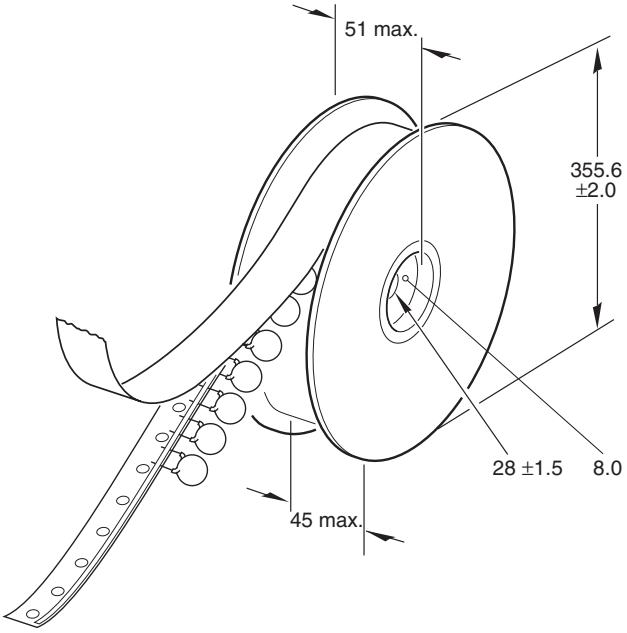

Kinked capacitors on tape, lead spacing 5 mm (0.20”) or 7.5 mm (0.30”).

| 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 | 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 |
| ΔP | 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 |
| Δh | component alignment | 0 ±1.0 | 0 ±1.0 |
| Δs | 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 snipped 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. |

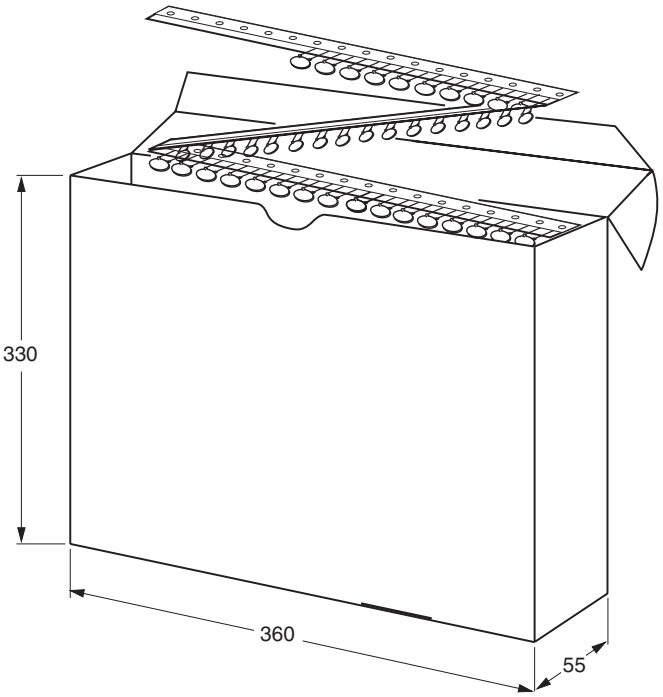
**Notes**

1. Cumulative pitch error: ±≤1 mm/20 pitches.
2. Obliquity maximum 3°.

**REEL AND TAPE DATA** in millimeters




Reel with capacitors on tape.




Ammopack with capacitors on tape.

# Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.