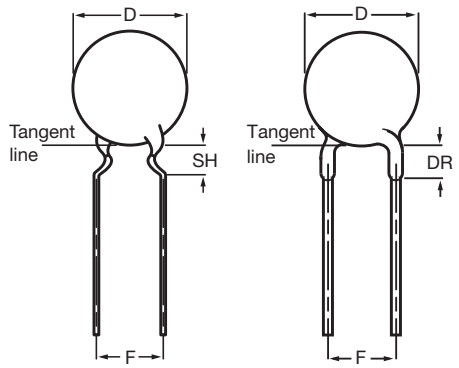
# Ceramic Disc Capacitors
# Class 1 and 2, 100 $V_{DC}$, General Purpose




Capacitors with 5 mm (0.20") and 2.5 mm (0.10") lead spacing

| QUICK REFERENCE DATA | | |
|---|---|---|
| DESCRIPTION | CLASS 1 (NP0, SL0) | CLASS 2 (YP5, Z50, Y5V, Z5V) |
| Voltage ($V_{DC}$) | 100 | |
| Min. Capacitance (pF) | 1.0 | 150 |
| Max. Capacitance (pF) | 100 | 47 000 |
| Mounting | Through hole | |

## MARKING
Marking indicates capacitance value and tolerance in accordance with “EIA 198”.

## OPERATING TEMPERATURE RANGE
Class 1, - 55 °C to + 125 °C
Class 2, - 30 °C to + 85 °C

## TEMPERATURE COEFFICIENTS
Class 1, NP0; SL0
Class 2, Y5P; Z5U; Y5V; Z5V

## SECTIONAL SPECIFICATIONS
Class 1, IEC 60 384-8,
Class 2, IEC 60 384-9,
EIA 198

## CLIMATIC CATEGORY
Class 1, 55/125/21
Class 2, 10/85/21 and 30/85/21

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

RoHS COMPLIANT

## APPLICATIONS
- Bypassing
- Coupling
- Resonant circuit

## 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.
The capacitors have inward kinked leads with a spacing of 5 mm (0.200") and straight leads with 2.5 mm (0.100"), lead length from 4 mm to 30 mm.

## CAPACITANCE RANGE
1.0 pF to 100 pF; Class 1, at 1 MHz, 1.2 $V_{RMS}$
150 pF to 47 000 pF; Class 2, at 1 kHz, 1 $V_{RMS}$ ± 0.2 $V_{RMS}$
1 kHz, 1 $V_{RMS}$ ± 0.2 $V_{RMS}$ for capacitance values higher than 1000 pF

## RATED DC VOLTAGE
100 V

## DIELECTRIC STRENGTH
250 % of rated voltage

## INSULATION RESISTANCE AT 100 $V_{DC}$
≥ 10 000 MΩ

## TOLERANCE ON CAPACITANCE
± 0.25 pF; ± 0.5 pF; ± 5 % ; ± 10 %; ± 20 %; + 80/- 20 %

## DISSIPATION FACTOR
Class 1, C ≤ 30 pF; ≤ 2 x (10/C + 0.7) x $10^{-4}$ maximum
Class 1, C > 30 pF; ≤ 0.2 %
Class 2, ≤ 3.0 %

**Note**
The capacitors meet the essential requirements of “EIA 198”. Unless stated otherwise all electrical values apply at an ambient temperature of 25 °C ± 3 °C, at normal atmospheric conditions.

| ORDERING INFORMATION, CLASS 1, 100 $V_{DC}$, KINKED AND STRAIGHT | | | | | |
|---|---|---|---|---|---|
| C (pF) | TOL. (%) | $D_{MAX.}$ (mm) | LEAD SPACING F (mm) | $SH/DR_{MAX.}$ (1) (mm) | CLEAR TEXT CODE 13TH DIGIT: T = REEL; U = AMMO; 3 = BULK |
| **CLASS 1 NP0** | | | | | |
| 1.0 | ± 0.25 pF | 5.0 | 5.0 | 4.0 | D109C20C0KH6.J5R |
| | | | 2.5 | 1.5 | D109C20C0KH6.L2R |
| 1.5 | | | 5.0 | 4.0 | D159C20C0KH6.J5R |
| | | | 2.5 | 1.5 | D159C20C0KH6.L2R |
| 2.2 | | | 5.0 | 4.0 | D229C20C0JH6.J5R |
| | | | 2.5 | 1.5 | D229C20C0JH6.L2R |
| 3.3 | | | 5.0 | 4.0 | D339C20C0JH6.J5R |
| | | | 2.5 | 1.5 | D339C20C0JH6.L2R |
| 4.7 | | | 5.0 | 4.0 | D479C20C0HH6.J5R |
| | | | 2.5 | 1.5 | D479C20C0HH6.L2R |
| 6.8 | ± 0.5 pF | | 5.0 | 4.0 | D689D20C0HH6.J5R |
| | | | 2.5 | 1.5 | D689D20C0HH6.L2R |
| 10 | ± 5 | | 5.0 | 4.0 | D100J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D100J20C0GH6.L2R |
| 12 | | | 5.0 | 4.0 | D120J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D120J20C0GH6.L2R |
| 15 | | | 5.0 | 4.0 | D150J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D150J20C0GH6.L2R |
| 18 | | | 5.0 | 4.0 | D180J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D180J20C0GH6.L2R |
| 22 | | | 5.0 | 4.0 | D220J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D220J20C0GH6.L2R |
| 27 | | | 5.0 | 4.0 | D270J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D270J20C0GH6.L2R |
| 33 | | | 5.0 | 4.0 | D330J20C0GH6.J5R |
| | | | 2.5 | 1.5 | D330J20C0GH6.L2R |
| 39 | | 6.5 | 5.0 | 4.0 | D390J25C0GH6.J5R |
| | | | 2.5 | 1.5 | D390J25C0GH6.L2R |
| 47 | | | 5.0 | 4.0 | D470J25C0GH6.J5R |
| | | | 2.5 | 1.5 | D470J25C0GH6.L2R |
| **CLASS 1 SL0** | | | | | |
| 56 | ± 5 | 5.0 | 5.0 | 4.0 | D560J20SL0H6.J5R |
| | | | 2.5 | 1.5 | D560J20SL0H6.L2R |
| 68 | | | 5.0 | 4.0 | D680J20SL0H6.J5R |
| | | | 2.5 | 1.5 | D680J20SL0H6.L2R |
| 82 | | | 5.0 | 4.0 | D820J20SL0H6.J5R |
| | | | 2.5 | 1.5 | D820J20SL0H6.L2R |
| 100 | | | 5.0 | 4.0 | D101J20SL0H6.J5R |
| | | | 2.5 | 1.5 | D101J20SL0H6.L2R |

**Notes**

(1) SH = seated height; DR = run down

- Maximum thickness 4.0 mm
- Lead style codes refer to lead cofigurations

| ORDERING INFORMATION, CLASS 2, 100 $V_{DC}$, KINKED AND STRAIGHT | | | | | |
|---|---|---|---|---|---|
| C (pF) | TOL. (%) | $D_{MAX.}$ (mm) | LEAD SPACING F (mm) | $SH/DR_{MAX.}$ [1] (mm) | CLEAR TEXT CODE 13TH DIGIT: T = REEL; U = AMMO; 3 = BULK |
| **CLASS 2 Y5P** | | | | | |
| 150 | ±10 | 5.0 | 5.0 | 4.0 | D151K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D151K20Y5PH6.L2R |
| 180 | | | 5.0 | 4.0 | D181K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D181K20Y5PH6.L2R |
| 220 | | | 5.0 | 4.0 | D221K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D221K20Y5PH6.L2R |
| 330 | | | 5.0 | 4.0 | D331K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D331K20Y5PH6.L2R |
| 470 | | | 5.0 | 4.0 | D471K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D471K20Y5PH6.L2R |
| 680 | | | 5.0 | 4.0 | D681K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D681K20Y5PH6.L2R |
| 1000 | | | 5.0 | 4.0 | D102K20Y5PH6.J5R |
| | | | 2.5 | 1.5 | D102K20Y5PH6.L2R |
| 1500 | | 6.5 | 5.0 | 4.0 | D152K25Y5PH6.J5R |
| | | | 2.5 | 1.5 | D152K25Y5PH6.L2R |
| 1800 | | | 5.0 | 4.0 | D182K25Y5PH6.J5R |
| | | | 2.5 | 1.5 | D182K25Y5PH6.L2R |
| 2200 | | | 5.0 | 4.0 | D222K25Y5PH6.J5R |
| | | | 2.5 | 1.5 | D222K25Y5PH6.L2R |
| 3300 | | 7.5 | 5.0 | 4.0 | D332K29Y5PH6.J5R |
| | | | 2.5 | 1.5 | D332K29Y5PH6.L2R |
| 4700 | | 8.5 | 5.0 | 4.0 | D472K33Y5PH6.J5R |
| | | | 2.5 | 1.5 | D472K33Y5PH6.L2R |
| 6800 | | 10.0 | 5.0 | 4.0 | D682K39Y5PH6.J5R |
| | | | 2.5 | 1.5 | D682K39Y5PH6.L2R |
| 10000 | | 11.0 | 5.0 | 4.0 | D103K43Y5PH6.J5R |
| | | | 2.5 | 1.5 | D103K43Y5PH6.L2R |
| **CLASS 2 Z5U** | | | | | |
| 1000 | ± 20 | 5.0 | 5.0 | 4.0 | D102M20Z5UH6.J5R |
| | | | 2.5 | 1.5 | D102M20Z5UH6.L2R |
| 1500 | | | 5.0 | 4.0 | D152M20Z5UH6.J5R |
| | | | 2.5 | 1.5 | D152M20Z5UH6.L2R |
| 2200 | | | 5.0 | 4.0 | D222M20Z5UH6.J5R |
| | | | 2.5 | 1.5 | D222M20Z5UH6.L2R |
| 3300 | | | 5.0 | 4.0 | D332M20Z5UH6.J5R |
| | | | 2.5 | 1.5 | D332M20Z5UH6.L2R |
| 4700 | | 6.5 | 5.0 | 4.0 | D472M25Z5UH6.J5R |
| | | | 2.5 | 1.5 | D472M25Z5UH6.L2R |
| 6800 | | | 5.0 | 4.0 | D682M25Z5UH6.J5R |
| | | | 2.5 | 1.5 | D682M25Z5UH6.L2R |
| 10 000 | | 7.5 | 5.0 | 4.0 | D103M29Z5UH6.J5R |
| | | | 2.5 | 1.5 | D103M29Z5UH6.L2R |
| 15 000 | | 8.5 | 5.0 | 4.0 | D153M33Z5UH6.J5R |
| | | | 2.5 | 1.5 | D153M33Z5UH6.L2R |
| 22 000 | | 10.0 | 5.0 | 4.0 | D223M39Z5UH6.J5R |
| | | | 2.5 | 1.5 | D223M39Z5UH6.L2R |

**Note**

[1] SH = seated height; DR = run down

- Maximum thickness 4.0 mm
- Lead style codes refer to lead cofiguration

| ORDERING INFORMATION, CLASS 2, 100 $V_{DC}$, KINKED AND STRAIGHT | | | | | |
|---|---|---|---|---|---|
| C (pF) | TOL. (%) | $D_{MAX.}$ (mm) | LEAD SPACING F (mm) | $SH/DR_{MAX.}$ (1) (mm) | CLEAR TEXT CODE 13TH DIGIT: T = REEL; U = AMMO; 3 = BULK |
| **CLASS 2 Y5V** | | | | | |
| 1000 | + 80/- 20 | 5.0 | 5.0 | 4.0 | D102Z20Y5VH6.J5R |
| | | | 2.5 | 1.5 | D102Z20Y5VH6.L2R |
| 1500 | | | 5.0 | 4.0 | D152Z20Y5VH6.J5R |
| | | | 2.5 | 1.5 | D152Z20Y5VH6.L2R |
| 2200 | | | 5.0 | 4.0 | D222Z20Y5VH6.J5R |
| | | | 2.5 | 1.5 | D222Z20Y5VH6.L2R |
| 3300 | | | 5.0 | 4.0 | D332Z20Y5VH6.J5R |
| | | | 2.5 | 1.5 | D332Z20Y5VH6.L2R |
| 4700 | | 6.5 | 5.0 | 4.0 | D472Z25Y5VH6.J5R |
| | | | 2.5 | 1.5 | D472Z25Y5VH6.L2R |
| 6800 | | | 5.0 | 4.0 | D682Z25Y5VH6.J5R |
| | | | 2.5 | 1.5 | D682Z25Y5VH6.L2R |
| 10 000 | | 7.5 | 5.0 | 4.0 | D103Z29Y5VH6.J5R |
| | | | 2.5 | 1.5 | D103Z29Y5VH6.L2R |
| 15 000 | | 8.5 | 5.0 | 4.0 | D153Z33Y5VH6.J5R |
| | | | 2.5 | 1.5 | D153Z33Y5VH6.L2R |
| 22 000 | | 10.0 | 5.0 | 4.0 | D223Z39Y5VH6.J5R |
| | | | 2.5 | 1.5 | D223Z39Y5VH6.L2R |
| **CLASS 2 Z5V** | | | | | |
| 4700 | + 80/- 20 | 5.0 | 5.0 | 4.0 | D472Z20Z5VH6.J5R |
| | | | 2.5 | 1.5 | D472Z20Z5VH6.L2R |
| 10 000 | | 6.5 | 5.0 | 4.0 | D103Z25Z5VH6.J5R |
| | | | 2.5 | 1.5 | D103Z25Z5VH6.L2R |
| 22 000 | | 8.5 | 5.0 | 4.0 | D223Z33Z5VH6.J5R |
| | | | 2.5 | 1.5 | D223Z33Z5VH6.L2R |
| 47 000 | | 11.0 | 5.0 | 4.0 | D473Z43Z5VH6.J5R |
| | | | 2.5 | 1.5 | D473Z43Z5VH6.L2R |

**Note**

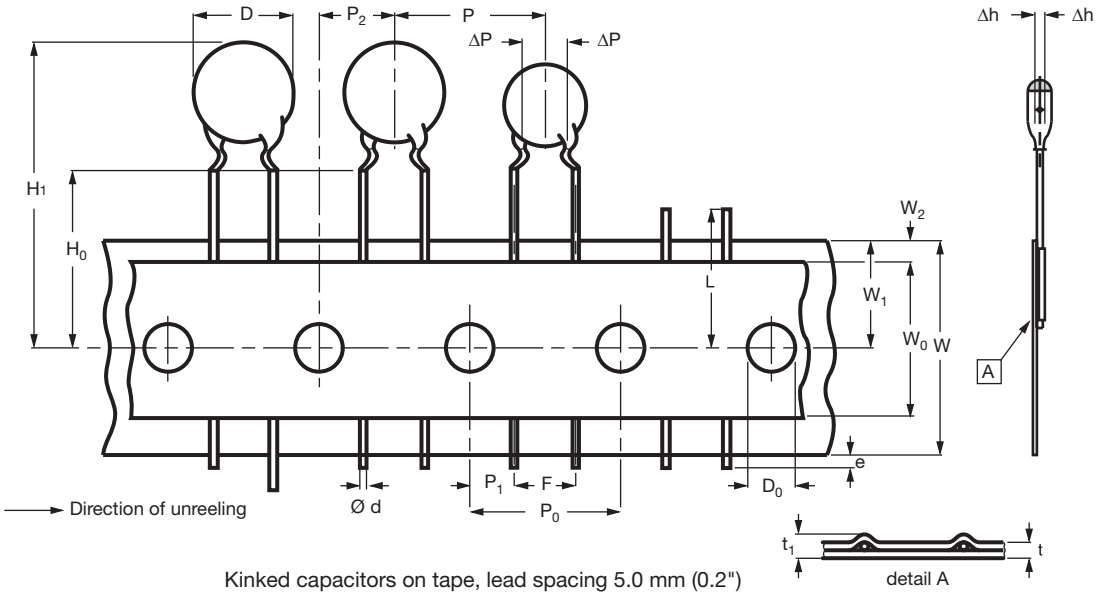
(1) SH = seated height; DR = run down

- Maximum thickness 4.0 mm
- Lead style codes refer to lead cofiguration

| PACKAGING | | | | |
|---|---|---|---|---|
| $D_{MAX.}$ (mm) | SIZE CODE | PACKAGING QUANTITIES | | |
| | | BULK | REEL | AMMO |
| 5.0 (0.20") | 20 | 1000 | 2500 | 2000 |
| 6.5 (0.25") | 25 | | | |
| 7.5 (0.29") | 29 | | | |
| 8.5 (0.33") | 33 | | | |
| 10.0 (0.39") | 39 | | | |
| 11.0 (0.43") | 43 | | | |

**Note**

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




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

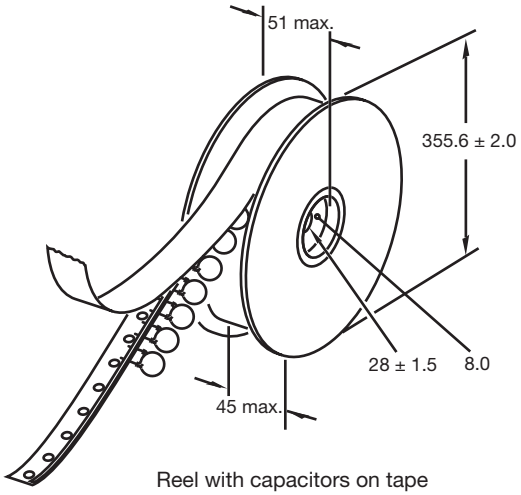
| DIMENSION OF TAPE | | | |
|---|---|---|---|
| SYMBOL | PARAMETER | DIMENSIONS (mm) | |
| | | NOMINAL | TOLERANCE |
| D | Body diameter | 11.0 maximum | - |
| d | Lead diameter | 0.6 | ± 0.05 |
| P | Pitch between capacitors | 12.7 | ± 1.0 |
| $P_0$ (1) | Feed-hole pitch | 12.7 | ± 0.3 (1) |
| ΔP | Plane deviation | 1.0 maximum | - |
| $P_1$ (2) | Feed-hole center to lead center | 3.85 | ± 0.7; (2) |
| $P_2$ (2) | Feed-hole center to component center | 6.35 | ± 1.3; (2) |
| F | Lead spacing | 5.0 | 0.6<br>- 0.4 |
| Δh | Component alignment | 0 | ± 1.0 |
| W | Tape width | 18.0 | 1.0<br>- 0.5 |
| $W_0$ | Hold-down tape width | 5.0 minimum | - |
| $W_1$ | Hole position | 9.0 | 0.75<br>- 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 snipped 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**

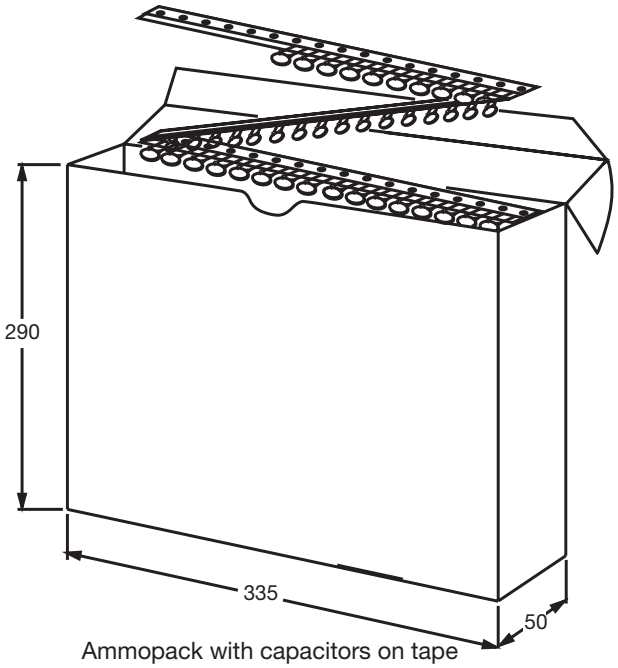
(1) Cumulative pitch error: ± ≤ 1 mm/20 pitches

(2) Obliquity maximum 3°

**REEL AND TAPE DATA** in millimeters




Reel with capacitors on tape




Ammopack with capacitors on tape

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