

# Ceramic Singlelayer DC Disc Capacitors for General Purpose Class 1, Class 2 and Class 3, 50 V<sub>DC</sub>, 100 V<sub>DC</sub>, 500 V<sub>DC</sub>



## FEATURES

- High capacitance with small size
- High reliability
- Crimp and straight lead styles
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## APPLICATIONS

- Temperature compensation
- Coupling and decoupling
- Bypassing

## QUICK REFERENCE DATA

| DESCRIPTION                | VALUE        |          |              |        |      |      |              |         |
|----------------------------|--------------|----------|--------------|--------|------|------|--------------|---------|
| Ceramic class              | 1            |          | 2            |        |      |      | 3            |         |
| Ceramic dielectric         | SL0          | N750     | Y5P          | Z5U    | X7R  | X5F  | Y5V          | Z5V     |
| Voltage (V <sub>DC</sub> ) | 50, 100, 500 | 100, 500 | 50, 100, 500 |        | 500  |      | 50, 100, 500 | 50, 100 |
| Min. capacitance (pF)      | 56           | 6.8      | 100          | 1000   | 100  | 100  | 1000         | 4700    |
| Max. capacitance (pF)      | 100          | 330      | 10 000       | 22 000 | 4700 | 4700 | 22 000       | 47 000  |
| Mounting                   | Radial       |          |              |        |      |      |              |         |

## MARKING

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

## OPERATING TEMPERATURE RANGE

SL0, N750, X7R, X5F: -55 °C to +125 °C

Y5P, Z5U, Z5V, Y5V: -30 °C to +125 °C

## TEMPERATURE CHARACTERISTICS

Class 1: SL0, N750

Class 2: Y5P, Z5U, X7R, X5F

Class 3: Y5V, Z5V

## SECTIONAL SPECIFICATIONS

Climatic category (acc. to EN 60058-1)

Class 1 and 2: 55/125/21

Class 3: 30/85/21

## APPROVALS

EIA 198

IEC 60384-8

IEC 60384-9

## CAPACITANCE RANGE

6.8 pF to 47 nF

## TOLERANCE ON CAPACITANCE

± 0.25 pF, ± 2 %, ± 5 %, ± 10 %, ± 20 %, + 80 % / - 20 %

## RATED VOLTAGE

50 V<sub>DC</sub>, 100 V<sub>DC</sub>, 500 V<sub>DC</sub>

## TEST VOLTAGE

250 % of rated voltage

## INSULATION RESISTANCE AT RATED VOLTAGE

10 GΩ min.

## DISSIPATION FACTOR

Class 1 0.1 % max. when C ≥ 30 pF  
(at 1 MHz; 1 V where C ≤ 1000 pF, and at  
1 kHz; 1 V where C > 1000 pF)

For C < 30 pF: DF = 100/(400 + 20 x C)  
DF = dissipation factor in %;  
C = capacitance value in pF

Class 2 2.5 % max. (at 1 kHz; 1 V)

Class 3 5 % max. (at 1 kHz; 1 V)

**LEAD CONFIGURATION** (in millimeters)

**Note**

- Lead-spacing 2.5 mm is available for L lead configuration only.

**MARKING**

Size 20



Size 25



Size 29 and above


**Note**

- Refer to specified part for detail marking.

**ORDERING CODE INFORMATION**

| D            | 102                                                                                                                                                              | K                                                                                                                | 25                                 | Y5P                                | L                                                                            | 6                            | 3                                         | J                                  | 5                                                    | R              |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|------------------------------------------------------------------------------|------------------------------|-------------------------------------------|------------------------------------|------------------------------------------------------|----------------|
| 1            | 2 3 4                                                                                                                                                            | 5                                                                                                                | 6 7                                | 8 9 10                             | 11                                                                           | 12                           | 13                                        | 14                                 | 15                                                   | 16             |
| Product Type | Capacitance (pF)                                                                                                                                                 | Capacitance Tolerance                                                                                            | Size Code                          | T.C. Code                          | Rated Voltage                                                                | Lead Diameter                | Packaging / Lead Length                   | Lead Style                         | Lead Spacing                                         | RoHS Compliant |
| D series     | The first two digits are the significant figures of capacitance and the last digit is a multiplier as follows:<br>0 = * 1<br>1 = * 10<br>2 = * 100<br>3 = * 1000 | C = $\pm 0.25$ pF<br>G = $\pm 2$ %<br>J = $\pm 5$ %<br>K = $\pm 10$ %<br>M = $\pm 20$ %<br>Z = $+80$ % / $-20$ % | Please refer to relevant datasheet | Please refer to relevant datasheet | F = 50 V <sub>DC</sub><br>H = 100 V <sub>DC</sub><br>L = 500 V <sub>DC</sub> | 6 = 0.60 mm<br>$\pm 0.05$ mm | 3 = bulk<br>T = tape and reel<br>U = ammo | Please refer to relevant datasheet | 2 = 2.5 mm<br>5 = 5.0 mm<br>6 = 6.4 mm<br>7 = 7.5 mm |                |



## ORDERING CODES

| DIELECTRIC SLO (50 V <sub>DC</sub> / 100 V <sub>DC</sub> ) |                    |                       |                        |                     |                       |                        |
|------------------------------------------------------------|--------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                                               | 50 V <sub>DC</sub> |                       |                        | 100 V <sub>DC</sub> |                       |                        |
|                                                            | ORDERING CODE      | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 56                                                         | D560#20SLOF6###R   | 5                     | 3.5                    | D560#20SLOH6###R    | 5                     | 3.5                    |
| 68                                                         | D680#20SLOF6###R   | 5                     | 3.5                    | D680#20SLOH6###R    | 5                     | 3.5                    |
| 82                                                         | D820#20SLOF6###R   | 5                     | 3.5                    | D820#20SLOH6###R    | 5                     | 3.5                    |
| 100                                                        | D101#20SLOF6###R   | 5                     | 3.5                    | D101#20SLOH6###R    | 5                     | 3.5                    |

| DIELECTRIC SLO (500 V <sub>DC</sub> ) |                     |                       |                        |
|---------------------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                          | 500 V <sub>DC</sub> |                       |                        |
|                                       | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 33                                    | D330#20SLOL6###R    | 5                     | 3.5                    |
| 39                                    | D390#20SLOL6###R    | 5                     | 3.5                    |
| 47                                    | D470#20SLOL6###R    | 5                     | 3.5                    |
| 56                                    | D560#20SLOL6###R    | 5                     | 3.5                    |
| 68                                    | D680#20SLOL6###R    | 6.5                   | 3.5                    |
| 82                                    | D820#20SLOL6###R    | 6.5                   | 3.5                    |

## Notes

- Lead diameter is 0.6 mm
- # 5th digit is capacitance tolerance code:  $\pm 5\%$  = J;  $\pm 10\%$  = K
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6 (rated voltage 500 V is not available on 2.5 mm lead-spacing)

| DIELECTRIC N750 |                     |                       |                        |                     |                       |                        |
|-----------------|---------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)    | 100 V <sub>DC</sub> |                       |                        | 500 V <sub>DC</sub> |                       |                        |
|                 | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 6.8             | D689C20U2JH6###R    | 5                     | 3.5                    | D689C20U2JL6###R    | 5                     | 3.5                    |
| 8.2             | D829C20U2JH6###R    | 5                     | 3.5                    | D829C20U2JL6###R    | 5                     | 3.5                    |
| 10              | D100#20U2JH6###R    | 5                     | 3.5                    | D100#20U2JL6###R    | 5                     | 3.5                    |
| 12              | D120#20U2JH6###R    | 5                     | 3.5                    | D120#20U2JL6###R    | 5                     | 3.5                    |
| 15              | D150#20U2JH6###R    | 5                     | 3.5                    | D150#20U2JL6###R    | 5                     | 3.5                    |
| 18              | D180#20U2JH6###R    | 5                     | 3.5                    | D180#20U2JL6###R    | 5                     | 3.5                    |
| 22              | D220#20U2JH6###R    | 5                     | 3.5                    | D220#20U2JL6###R    | 5                     | 3.5                    |
| 27              | D270#20U2JH6###R    | 5                     | 3.5                    | D270#25U2JL6###R    | 6.5                   | 3.5                    |
| 33              | D330#20U2JH6###R    | 5                     | 3.5                    | D330#25U2JL6###R    | 6.5                   | 3.5                    |
| 39              | D390#20U2JH6###R    | 5                     | 3.5                    | D390#29U2JL6###R    | 7.5                   | 3.5                    |
| 47              | D470#20U2JH6###R    | 5                     | 3.5                    | D470#29U2JL6###R    | 7.5                   | 3.5                    |
| 56              | D560#25U2JH6###R    | 6.5                   | 3.5                    | D560#33U2JL6###R    | 8.5                   | 3.5                    |
| 68              | D680#25U2JH6###R    | 6.5                   | 3.5                    | D680#33U2JL6###R    | 8.5                   | 3.5                    |
| 82              | D820#25U2JH6###R    | 6.5                   | 3.5                    | D820#39U2JL6###R    | 10                    | 3.5                    |
| 100             | D101#29U2JH6###R    | 7.5                   | 3.5                    | D101#39U2JL6###R    | 10                    | 3.5                    |
| 120             | D121#33U2JH6###R    | 8.5                   | 3.5                    | D121#47U2JL6###R    | 12                    | 3.5                    |
| 150             | D151#33U2JH6###R    | 8.5                   | 3.5                    | D151#47U2JL6###R    | 12                    | 3.5                    |
| 180             | D181#39U2JH6###R    | 10                    | 3.5                    | /                   | /                     | /                      |
| 220             | D221#39U2JH6###R    | 10                    | 3.5                    | /                   | /                     | /                      |
| 270             | D271#39U2JH6###R    | 10                    | 3.5                    | /                   | /                     | /                      |
| 330             | D331#47U2JH6###R    | 12                    | 3.5                    | /                   | /                     | /                      |

## Notes

- Lead diameter is 0.5 mm
- # 5th digit is capacitance tolerance code:  $\pm 2\%$  = G;  $\pm 5\%$  = J (which C < 10 pF, the tolerance code is C =  $\pm 0.25$  pF)
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6 (rated voltage 500 V is not available on 2.5 mm lead-spacing)



| DIELECTRIC Y5P (50 V <sub>DC</sub> / 100 V <sub>DC</sub> ) |                    |                       |                        |                     |                       |                        |
|------------------------------------------------------------|--------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                                               | 50 V <sub>DC</sub> |                       |                        | 100 V <sub>DC</sub> |                       |                        |
|                                                            | ORDERING CODE      | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 100                                                        | D101#20Y5PF6###R   | 5.0                   | 3.5                    | D101#20Y5PH6###R    | 5.0                   | 3.5                    |
| 150                                                        | D151#20Y5PF6###R   | 5.0                   | 3.5                    | D151#20Y5PH6###R    | 5.0                   | 3.5                    |
| 180                                                        | D181#20Y5PF6###R   | 5.0                   | 3.5                    | D181#20Y5PH6###R    | 5.0                   | 3.5                    |
| 220                                                        | D221#20Y5PF6###R   | 5.0                   | 3.5                    | D221#20Y5PH6###R    | 5.0                   | 3.5                    |
| 330                                                        | D331#20Y5PF6###R   | 5.0                   | 3.5                    | D331#20Y5PH6###R    | 5.0                   | 3.5                    |
| 470                                                        | D471#20Y5PF6###R   | 5.0                   | 3.5                    | D471#20Y5PH6###R    | 5.0                   | 3.5                    |
| 680                                                        | D681#20Y5PF6###R   | 5.0                   | 3.5                    | D681#20Y5PH6###R    | 5.0                   | 3.5                    |
| 1000                                                       | D102#20Y5PF6###R   | 5.0                   | 3.5                    | D102#20Y5PH6###R    | 5.0                   | 3.5                    |
| 1500                                                       | D152#20Y5PF6###R   | 5.0                   | 3.5                    | D152#25Y5PH6###R    | 6.5                   | 3.5                    |
| 1800                                                       | D182#25Y5PF6###R   | 6.5                   | 3.5                    | D182#25Y5PH6###R    | 6.5                   | 3.5                    |
| 2200                                                       | D222#25Y5PF6###R   | 6.5                   | 3.5                    | D222#25Y5PH6###R    | 6.5                   | 3.5                    |
| 3300                                                       | D332#25Y5PF6###R   | 6.5                   | 3.5                    | D332#29Y5PH6###R    | 7.5                   | 3.5                    |
| 4700                                                       | D472#29Y5PF6###R   | 7.5                   | 3.5                    | D472#33Y5PH6###R    | 8.5                   | 3.5                    |
| 6800                                                       | D682#33Y5PF6###R   | 8.5                   | 3.5                    | D682#39Y5PH6###R    | 10.0                  | 3.5                    |
| 10 000                                                     | D103#39Y5PF6###R   | 10.0                  | 3.5                    | D103#43Y5PH6###R    | 11.0                  | 3.5                    |

| DIELECTRIC Y5P (500 V <sub>DC</sub> ) |                     |                       |                        |
|---------------------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                          | 500 V <sub>DC</sub> |                       |                        |
|                                       | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 100                                   | D101#20Y5PL6###R    | 5.0                   | 3.5                    |
| 150                                   | D151#20Y5PL6###R    | 5.0                   | 3.5                    |
| 180                                   | D181#20Y5PL6###R    | 5.0                   | 3.5                    |
| 220                                   | D221#20Y5PL6###R    | 5.0                   | 3.5                    |
| 330                                   | D331#20Y5PL6###R    | 5.0                   | 3.5                    |
| 470                                   | D471#20Y5PL6###R    | 5.0                   | 3.5                    |
| 680                                   | D681#25Y5PL6###R    | 6.5                   | 3.5                    |
| 1000                                  | D102#25Y5PL6###R    | 6.5                   | 3.5                    |
| 1500                                  | D152#29Y5PL6###R    | 7.5                   | 3.5                    |
| 1800                                  | D182#29Y5PL6###R    | 7.5                   | 3.5                    |
| 2200                                  | D222#33Y5PL6###R    | 8.5                   | 3.5                    |
| 3300                                  | D332#39Y5PL6###R    | 10.0                  | 3.5                    |
| 4700                                  | D472#43Y5PL6###R    | 11.0                  | 3.5                    |
| 6800                                  | D682#53Y5PL6###R    | 13.5                  | 3.5                    |
| 10 000                                | D103#69Y5PL6###R    | 17.5                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 5th digit is capacitance tolerance code:  $\pm 10\%$  = K;  $\pm 20\%$  = M
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)



| DIELECTRIC Z5U (50 V <sub>DC</sub> / 100 V <sub>DC</sub> ) |                    |                       |                        |                     |                       |                        |
|------------------------------------------------------------|--------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                                               | 50 V <sub>DC</sub> |                       |                        | 100 V <sub>DC</sub> |                       |                        |
|                                                            | ORDERING CODE      | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 1000                                                       | D102M20Z5UF6###R   | 5.0                   | 3.5                    | D102M20Z5UH6###R    | 5.0                   | 3.5                    |
| 1500                                                       | D152M20Z5UF6###R   | 5.0                   | 3.5                    | D152M20Z5UH6###R    | 5.0                   | 3.5                    |
| 2200                                                       | D222M20Z5UF6###R   | 5.0                   | 3.5                    | D222M20Z5UH6###R    | 5.0                   | 3.5                    |
| 3300                                                       | D332M20Z5UF6###R   | 5.0                   | 3.5                    | D332M20Z5UH6###R    | 5.0                   | 3.5                    |
| 4700                                                       | D472M20Z5UF6###R   | 5.0                   | 3.5                    | D472M25Z5UH6###R    | 6.5                   | 3.5                    |
| 6800                                                       | D682M25Z5UF6###R   | 8.5                   | 3.5                    | D682M25Z5UH6###R    | 6.5                   | 3.5                    |
| 10 000                                                     | D103M29Z5UF6###R   | 10.0                  | 3.5                    | D103M29Z5UH6###R    | 7.5                   | 3.5                    |

| DIELECTRIC Z5U (500 V <sub>DC</sub> ) |                     |                       |                        |
|---------------------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                          | 500 V <sub>DC</sub> |                       |                        |
|                                       | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 1000                                  | D102M20Z5UL6###R    | 5.0                   | 3.5                    |
| 1500                                  | D152M25Z5UL6###R    | 6.5                   | 3.5                    |
| 2200                                  | D222M25Z5UL6###R    | 6.5                   | 3.5                    |
| 3300                                  | D332M29Z5UL6###R    | 7.5                   | 3.5                    |
| 4700                                  | D472M33Z5UL6###R    | 8.5                   | 3.5                    |
| 6800                                  | D682M39Z5UL6###R    | 10.0                  | 3.5                    |
| 10 000                                | D103M43Z5UL6###R    | 11.0                  | 3.5                    |
| 15 000                                | D153M53Z5UL6###R    | 13.5                  | 3.5                    |
| 22 000                                | D223M59Z5UL6###R    | 15.0                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)



| DIELECTRIC Y5V (50 V <sub>DC</sub> / 100 V <sub>DC</sub> ) |                    |                       |                        |                     |                       |                        |
|------------------------------------------------------------|--------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                                               | 50 V <sub>DC</sub> |                       |                        | 100 V <sub>DC</sub> |                       |                        |
|                                                            | ORDERING CODE      | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 1000                                                       | D102Z20Y5VF6###R   | 5.0                   | 3.5                    | D102Z20Y5VH6###R    | 5.0                   | 3.5                    |
| 1500                                                       | D152Z20Y5VF6###R   | 5.0                   | 3.5                    | D152Z20Y5VH6###R    | 5.0                   | 3.5                    |
| 2200                                                       | D222Z20Y5VF6###R   | 5.0                   | 3.5                    | D222Z20Y5VH6###R    | 5.0                   | 3.5                    |
| 3300                                                       | D332Z20Y5VF6###R   | 5.0                   | 3.5                    | D332Z20Y5VH6###R    | 5.0                   | 3.5                    |
| 4700                                                       | D472Z20Y5VF6###R   | 5.0                   | 3.5                    | D472Z25Y5VH6###R    | 6.5                   | 3.5                    |
| 6800                                                       | D682Z25Y5VF6###R   | 6.5                   | 3.5                    | D682Z25Y5VH6###R    | 6.5                   | 3.5                    |
| 10 000                                                     | D103Z29Y5VF6###R   | 7.5                   | 3.5                    | D103Z29Y5VH6###R    | 7.5                   | 3.5                    |
| 15 000                                                     | D153Z33Y5VF6###R   | 8.5                   | 3.5                    | D153Z33Y5VH6###R    | 8.5                   | 3.5                    |
| 22 000                                                     | D223Z39Y5VF6###R   | 10.0                  | 3.5                    | D223Z39Y5VH6###R    | 10.0                  | 3.5                    |

| DIELECTRIC Y5V (500 V <sub>DC</sub> ) |                     |                       |                        |
|---------------------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)                          | 500 V <sub>DC</sub> |                       |                        |
|                                       | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 1000                                  | D102Z20Y5VL6###R    | 5.0                   | 3.5                    |
| 1500                                  | D152Z20Y5VL6###R    | 5.0                   | 3.5                    |
| 2200                                  | D222Z25Y5VL6###R    | 6.5                   | 3.5                    |
| 3300                                  | D332Z25Y5VL6###R    | 6.5                   | 3.5                    |
| 4700                                  | D472Z29Y5VL6###R    | 7.5                   | 3.5                    |
| 6800                                  | D682Z33Y5VL6###R    | 8.5                   | 3.5                    |
| 10 000                                | D103Z39Y5VL6###R    | 10.0                  | 3.5                    |
| 15 000                                | D153Z43Y5VL6###R    | 11.0                  | 3.5                    |
| 22 000                                | D223Z53Y5VL6###R    | 13.5                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)

| DIELECTRIC Z5V |                    |                       |                        |                     |                       |                        |
|----------------|--------------------|-----------------------|------------------------|---------------------|-----------------------|------------------------|
| CAP.<br>(pF)   | 50 V <sub>DC</sub> |                       |                        | 100 V <sub>DC</sub> |                       |                        |
|                | ORDERING CODE      | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 4700           | D472Z20Z5VF6###R   | 5.0                   | 3.5                    | D472Z20Z5VH6###R    | 6.5                   | 3.5                    |
| 10 000         | D103Z25Z5VF6###R   | 6.5                   | 3.5                    | D103Z25Z5VH6###R    | 7.5                   | 3.5                    |
| 22 000         | D223Z29Z5VF6###R   | 7.5                   | 3.5                    | D223Z33Z5VH6###R    | 8.5                   | 3.5                    |
| 33 000         | D333Z39Z5VF6###R   | 10.0                  | 3.5                    | D333Z39Z5VH6###R    | 10.0                  | 3.5                    |
| 47 000         | D473Z39Z5VF6###R   | 10.0                  | 3.5                    | D473Z43Z5VH6###R    | 11.0                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)

**DIELECTRIC X5F**

| CAP.<br>(pF) | 500 V <sub>DC</sub> |                       |                        |
|--------------|---------------------|-----------------------|------------------------|
|              | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 100          | D101#20X5FL6###R    | 5.0                   | 3.5                    |
| 150          | D151#20X5FL6###R    | 5.0                   | 3.5                    |
| 220          | D221#20X5FL6###R    | 5.0                   | 3.5                    |
| 330          | D331#20X5FL6###R    | 5.0                   | 3.5                    |
| 470          | D471#25X5FL6###R    | 6.5                   | 3.5                    |
| 680          | D681#25X5FL6###R    | 6.5                   | 3.5                    |
| 1,000        | D102#29X5FL6###R    | 7.5                   | 3.5                    |
| 1,500        | D152#33X5FL6###R    | 8.5                   | 3.5                    |
| 2,200        | D222#39X5FL6###R    | 10.0                  | 3.5                    |
| 3,300        | D332#47X5FL6###R    | 12.0                  | 3.5                    |
| 4,700        | D472#53X5FL6###R    | 13.5                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 5th digit is capacitance tolerance code:  $\pm 10\%$  = K;  $\pm 20\%$  = M
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)

**DIELECTRIC X7R**

| CAP.<br>(pF) | 500 V <sub>DC</sub> |                       |                        |
|--------------|---------------------|-----------------------|------------------------|
|              | ORDERING CODE       | DIAMETER<br>(mm max.) | THICKNESS<br>(mm max.) |
| 100          | D101#20X7RL6###R    | 5.0                   | 3.5                    |
| 150          | D151#20X7RL6###R    | 5.0                   | 3.5                    |
| 220          | D221#20X7RL6###R    | 5.0                   | 3.5                    |
| 330          | D331#20X7RL6###R    | 5.0                   | 3.5                    |
| 470          | D471#20X7RL6###R    | 5.0                   | 3.5                    |
| 560          | D561#25X7RL6###R    | 6.5                   | 3.5                    |
| 680          | D681#25X7RL6###R    | 6.5                   | 3.5                    |
| 1,000        | D102#29X7RL6###R    | 7.5                   | 3.5                    |
| 1,500        | D152#29X7RL6###R    | 8.5                   | 3.5                    |
| 2,200        | D222#39X7RL6###R    | 10.0                  | 3.5                    |
| 3,300        | D332#43X7RL6###R    | 12.0                  | 3.5                    |
| 4,700        | D472#53X7RL6###R    | 13.5                  | 3.5                    |

**Notes**

- Lead diameter is 0.6 mm
- # 5th digit is capacitance tolerance code:  $\pm 10\%$  = K;  $\pm 20\%$  = M
- # 13th digit is packaging code: bulk = 3; reel = T; ammo = U
- # 14th digit is lead style code: L; J; K (L and J are preferred lead configuration)
- # 15th digit is lead spacing code: 2.5 mm = 2; 5.0 mm = 5; 6.4 mm = 6; 7.5 mm = 7 (rated voltage 500 V is not available on 2.5 mm lead-spacing)

**TAPING AND PACKAGING****LABELLING**

Each reel is provided with a label showing the following details:

manufacturer, D style, capacitance, tolerance, batch number, quantity of components, rated voltage, dielectric.

On special request other designations can be shown.

For example:



**PACKAGING QUANTITIES AND BOX DIMENSIONS**

| PACKAGING           | SIZE CODE | LEAD SPACING (mm) | RATED VOLTAGE | SMALLEST PACKAGING QUANTITY (SPQ) | BOX DIMENSIONS L x W x H (mm) |
|---------------------|-----------|-------------------|---------------|-----------------------------------|-------------------------------|
| Tape on reel        | $\leq 47$ | $\leq 6.4$        | $< 500$       | 2500                              | 370 x 370 x 60                |
|                     |           | $> 6.4$           | 500           | 2000                              |                               |
|                     | $> 47$    | All               | All           | 1000                              |                               |
| Ammopack            | $\leq 47$ | $\leq 6.4$        | $\leq 500$    | 2000                              | 335 x 240 x 50                |
|                     |           | $> 6.4$           |               | 1500                              | 335 x 290 x 50                |
|                     | $> 47$    | $> 6.4$           |               | 1000                              |                               |
| Bulk <sup>(1)</sup> | $< 49$    | All               | All           | 1000                              | 245 x 120 x 65                |
|                     | $\geq 49$ | All               | All           | 500                               |                               |

**Note**

(1) SPQ contains one or a multiple of poly-bags, 1000 units per bag.

**CAPACITORS ON TAPE**


| PARAMETER                                    | SYMBOL         | DIMENSIONS (mm)     |                     |                    |
|----------------------------------------------|----------------|---------------------|---------------------|--------------------|
| Body diameter                                | D              | 11.0 Max.           | 11.0 Max.           | 14.0 Max.          |
| Lead diameter                                | d              | 0.6 ± 0.05          | 0.6 ± 0.05          | 0.6 ± 0.05         |
| Pitch of component                           | p              | 12.7 ± 1.0          | 12.7 ± 1.0          | 15.0 ± 1.0         |
| Pitch of sprocket hole                       | P <sub>0</sub> | 12.7 ± 0.3          | 12.7 ± 0.3          | 15.0 ± 0.3         |
| Distance, hole center to lead                | P <sub>1</sub> | 5.1 ± 0.7           | 3.85 ± 0.7          | 3.75 ± 0.7         |
| Distance, hole to center of component        | P <sub>2</sub> | 6.35 ± 1.3          | 6.35 ± 1.3          | 7.5 ± 1.5          |
| Lead spacing                                 | F              | 2.5 + 0.60 / - 0.40 | 5.0 + 0.60 / - 0.40 | 7.5 + 0.6 / - 0.4  |
| Average deviation across tape                | Δh             | ± 1.0 max.          | ± 1.0 max.          | ± 1.0 max.         |
| Average deviation in direction of reeling    | ΔP             | ± 1.0 max.          | ± 1.0 max.          | ± 1.0 max.         |
| Carrier tape width                           | W              | 18.0 + 1.0 / - 0.5  | 18.0 + 1.0 / - 0.5  | 18.0 + 1.0 / - 0.5 |
| Hold-down tape width                         | W <sub>0</sub> | 5.0 min.            | 5.0 min.            | 5.0 min.           |
| Position of sprocket hole                    | W <sub>1</sub> | 9.0 + 0.75 / - 0.5  | 9.0 + 0.75 / - 0.5  | 9.0 + 0.75 / - 0.5 |
| Distance of hold-down tape                   | W <sub>2</sub> | 3.0 max.            | 3.0 max.            | 3.0 max.           |
| Maximum component height                     | H <sub>1</sub> | 32 max.             | 32 max.             | 40 max.            |
| Height to seating plane (for kinked leads)   | H <sub>0</sub> | 16.0 ± 0.5          | 16.0 ± 0.5          | 16.0 ± 0.5         |
| Height to seating plane (for straight leads) | H <sub>0</sub> | 20.0 ± 0.5          | 20.0 ± 0.5          | 20.0 ± 0.5         |
| Length of cut leads                          | L              | 11.0 max.           | 11.0 max.           | 11.0 max.          |
| Length of lead protrusion                    | e              | 1.0 max.            | 1.0 max.            | 1.0 max.           |
| Diameter of sprocket hole                    | D <sub>0</sub> | 4.0 ± 0.2           | 4.0 ± 0.2           | 4.0 ± 0.2          |
| Total tape thickness                         | t              | 0.9 max.            | 0.9 max.            | 0.9 max.           |
| Maximum thickness of taping and wires        | t <sub>1</sub> | 1.5 max.            | 1.5 max.            | 1.5 max.           |

**RELATED DOCUMENTS**

|                     |                                                                        |
|---------------------|------------------------------------------------------------------------|
| General Information | <a href="http://www.vishay.com/doc?28536">www.vishay.com/doc?28536</a> |
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