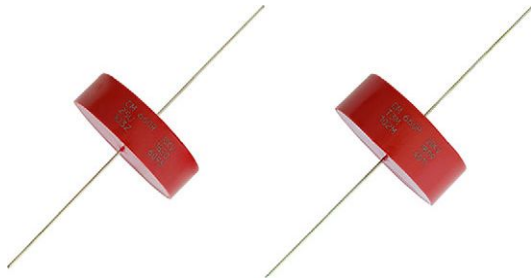


# High Voltage Ceramic DC Disc Capacitors With Axial Leads, 10 kV<sub>DC</sub> to 30 kV<sub>DC</sub>



## FEATURES

- Class 1 and class 2 ceramic
- High insulation resistance
- Epoxy encapsulated
- Wide capacitance range
- Ceramic singlelayer capacitor
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**RoHS**  
COMPLIANT

## LINKS TO ADDITIONAL RESOURCES



| QUICK REFERENCE DATA       |             |        |        |        |        |        |        |        |        |        |        |        |
|----------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| DESCRIPTION                | VALUE       |        |        |        |        |        |        |        |        |        |        |        |
| Ceramic class              | 1           |        |        |        | 2      |        |        |        | 2      |        |        |        |
| Ceramic dielectric         | N4700 (T3M) |        |        |        | X7R    |        |        |        | Z5U    |        |        |        |
| Voltage (V <sub>DC</sub> ) | 10 000      | 15 000 | 20 000 | 30 000 | 10 000 | 15 000 | 20 000 | 30 000 | 10 000 | 15 000 | 20 000 | 30 000 |
| Min. capacitance (pF)      | 470         | 390    | 220    | 180    | 180    | 100    | 100    | 100    | 1500   | 1000   | 680    | 470    |
| Max. capacitance (pF)      | 2000        | 1500   | 1000   | 680    | 4700   | 3900   | 2700   | 2000   | 10 000 | 6800   | 5000   | 3300   |
| Mounting                   | Axial       |        |        |        |        |        |        |        |        |        |        |        |

## MARKING

Capacitance value and tolerance, rated DC voltage, T/C code, production date code, CM mark.

## MATERIAL

Capacitor elements made from class 1 or class 2 ceramic in a molded case, high temperature epoxy construction.  
Leads: tinned copper clad steel.

## DIELECTRIC STRENGTH

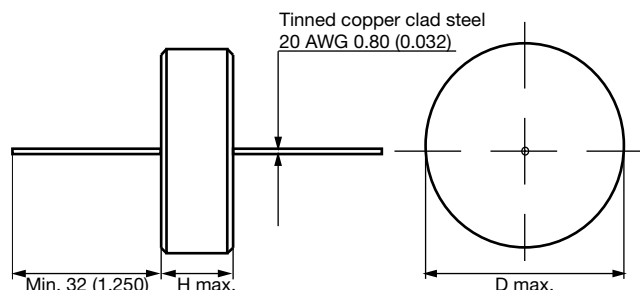
150 % of rated voltage (in dielectric fluid), charging current limited to 50 mA.

## DISSIPATION FACTOR $\tan \delta$

N4700 (T3M):  $\leq 2 \times 10^{-3}$  (1 kHz)

X7R, Z5U:  $\leq 20 \times 10^{-3}$  (1 kHz)

## DIMENSIONS in millimeters (inches)



## INSULATION RESISTANCE

Min. 200 000 M $\Omega$ , at 180 V<sub>DC</sub> or 1000  $\Omega$ F

## OPERATING TEMPERATURE RANGE

-30 °C to +85 °C

## RATED VOLTAGE <sup>(1)</sup>

- 660R10A### 10 kV<sub>DC</sub> (3.5 kV<sub>RMS</sub>)
- 660R15A### 15 kV<sub>DC</sub> (5.6 kV<sub>RMS</sub>)
- 660R20A### 20 kV<sub>DC</sub> (7.0 kV<sub>RMS</sub>)
- 660R30A### 30 kV<sub>DC</sub> (10.6 kV<sub>RMS</sub>)

### Note

<sup>(1)</sup> All kV<sub>RMS</sub> values up to 60 Hz



| ORDERING INFORMATION |                     |                   |           |         |
|----------------------|---------------------|-------------------|-----------|---------|
| 660R30ACT47          | 30 kV <sub>DC</sub> | 470 pF            | ± 20 %    | X7R     |
| MODEL                | RATED VOLTAGE       | CAPACITANCE VALUE | TOLERANCE | CERAMIC |

| SAP NUMBER AND ELECTRICAL DATA |             |                 |               |                                   |                                    |             |                 |             |                 |
|--------------------------------|-------------|-----------------|---------------|-----------------------------------|------------------------------------|-------------|-----------------|-------------|-----------------|
| MODEL NUMBER                   | CERAMIC     | CAP. VALUE (pF) | TOLERANCE (%) | RATED VOLTAGE (kV <sub>DC</sub> ) | RATED VOLTAGE (kV <sub>RMS</sub> ) | D MAX. (mm) | D MAX. (INCHES) | H MAX. (mm) | H MAX. (INCHES) |
| <b>660R10AZ###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R10AZT47                    | N4700 (T3M) | 470             | ± 20          | 10                                | 3.5                                | 21          | 0.83            | 13          | 0.50            |
| 660R10AZD10                    |             | 1000            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R10AZD20                    |             | 2000            |               |                                   |                                    | 37          | 1.45            |             |                 |
| <b>660R10AC###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R10ACT18                    | X7R         | 180             | ± 20          | 10                                | 3.5                                | 21          | 0.83            | 13          | 0.50            |
| 660R10ACT22                    |             | 220             |               |                                   |                                    |             |                 |             |                 |
| 660R10ACT33                    |             | 330             |               |                                   |                                    |             |                 |             |                 |
| 660R10ACT47                    |             | 470             |               |                                   |                                    |             |                 |             |                 |
| 660R10ACT68                    |             | 680             |               |                                   |                                    |             |                 |             |                 |
| 660R10ACD10                    |             | 1000            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R10ACD15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R10ACD22                    |             | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R10ACD33                    |             | 3300            |               |                                   |                                    | 37          | 1.45            |             |                 |
| 660R10ACD47                    |             | 4700            |               |                                   |                                    |             |                 |             |                 |
| <b>660R10AE###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R10AED15                    | Z5U         | 1500            | + 80 / - 20   | 10                                | 3.5                                | 21          | 0.83            | 13          | 0.50            |
| 660R10AED22                    |             | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R10AED33                    |             | 3300            |               |                                   |                                    |             |                 |             |                 |
| 660R10AED47                    |             | 4700            |               |                                   |                                    |             |                 |             |                 |
| 660R10AED68                    |             | 6800            |               |                                   |                                    |             |                 |             |                 |
| 660R10AES10                    |             | 10 000          |               |                                   |                                    |             |                 |             |                 |
| <b>660R15AZ###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R15AZT39                    | N4700 (T3M) | 390             | ± 20          | 15                                | 5.3                                | 21          | 0.83            | 15          | 0.59            |
| 660R15AZT82                    |             | 820             |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R15AZD15                    |             | 1500            |               |                                   |                                    | 37          | 1.45            |             |                 |
| <b>660R15AC###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R15ACT10                    | X7R         | 100             | ± 20          | 15                                | 5.3                                | 21          | 0.83            | 15          | 0.59            |
| 660R15ACT22                    |             | 220             |               |                                   |                                    |             |                 |             |                 |
| 660R15ACT33                    |             | 330             |               |                                   |                                    |             |                 |             |                 |
| 660R15ACT47                    |             | 470             |               |                                   |                                    |             |                 |             |                 |
| 660R15ACT68                    |             | 680             |               |                                   |                                    |             |                 |             |                 |
| 660R15ACD10                    |             | 1000            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R15ACD15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R15ACD22                    |             | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R15ACD33                    |             | 3300            |               |                                   |                                    | 37          | 1.45            |             |                 |
| 660R15ACD39                    |             | 3900            |               |                                   |                                    |             |                 |             |                 |

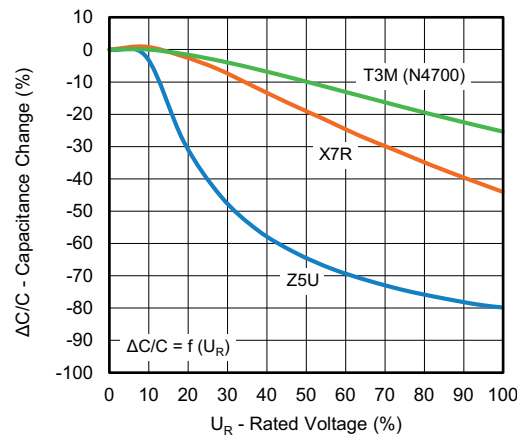


| SAP NUMBER AND ELECTRICAL DATA |             |                 |               |                                   |                                    |             |                 |             |                 |
|--------------------------------|-------------|-----------------|---------------|-----------------------------------|------------------------------------|-------------|-----------------|-------------|-----------------|
| MODEL NUMBER                   | CERAMIC     | CAP. VALUE (pF) | TOLERANCE (%) | RATED VOLTAGE (kV <sub>DC</sub> ) | RATED VOLTAGE (kV <sub>RMS</sub> ) | D MAX. (mm) | D MAX. (INCHES) | H MAX. (mm) | H MAX. (INCHES) |
| <b>660R15AE###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R15AED10                    | Z5U         | 1000            | + 80 / - 20   | 15                                | 5.3                                | 21          | 0.83            | 15          | 0.59            |
| 660R15AED15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R15AED22                    |             | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R15AED33                    |             | 3300            |               |                                   |                                    |             |                 |             |                 |
| 660R15AED47                    |             | 4700            |               |                                   |                                    |             |                 |             |                 |
| 660R15AED68                    |             | 6800            |               |                                   |                                    |             |                 |             |                 |
| <b>660R20AZ###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R20AZT22                    | N4700 (T3M) | 220             | ± 20          | 20                                | 7                                  | 21          | 0.83            | 17          | 0.67            |
| 660R20AZT68                    |             | 680             |               |                                   |                                    |             |                 |             |                 |
| 660R20AZD10                    |             | 1000            |               |                                   |                                    |             |                 |             |                 |
| <b>660R20AC###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R20ACT10                    | X7R         | 100             | ± 20          | 20                                | 7                                  | 21          | 0.83            | 17          | 0.67            |
| 660R20ACT22                    |             | 220             |               |                                   |                                    |             |                 |             |                 |
| 660R20ACT33                    |             | 330             |               |                                   |                                    |             |                 |             |                 |
| 660R20ACT47                    |             | 470             |               |                                   |                                    |             |                 |             |                 |
| 660R20ACT68                    |             | 680             |               |                                   |                                    |             |                 |             |                 |
| 660R20ACD10                    |             | 1000            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R20ACD15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R20ACD22                    |             | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R20ACD25                    |             | 2500            |               |                                   |                                    | 37          | 1.45            |             |                 |
| 660R20ACD27                    |             | 2700            |               |                                   |                                    |             |                 |             |                 |
| <b>660R20AE###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R20AET68                    | Z5U         | 680             | + 80 / - 20   | 20                                | 7                                  | 21          | 0.83            | 17          | 0.67            |
| 660R20AED10                    |             | 1000            |               |                                   |                                    |             |                 |             |                 |
| 660R20AED15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R20AED22                    |             | 2200            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R20AED33                    |             | 3300            |               |                                   |                                    |             |                 |             |                 |
| 660R20AED47                    |             | 4700            |               |                                   |                                    |             |                 |             |                 |
| 660R20AED50                    |             | 5000            |               |                                   |                                    | 37          | 1.45            |             |                 |
|                                |             |                 |               |                                   |                                    |             |                 |             |                 |
| <b>660R30AZ###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R30AZT18                    | N4700 (T3M) | 180             | ± 20          | 30                                | 10.6                               | 21          | 0.83            | 20          | 0.79            |
| 660R30AZT47                    |             | 470             |               |                                   |                                    |             |                 |             |                 |
| 660R30AZT68                    |             | 680             |               |                                   |                                    |             |                 |             |                 |
| <b>660R30AC###</b>             |             |                 |               |                                   |                                    |             |                 |             |                 |
| 660R30ACT10                    | X7R         | 100             | ± 20          | 30                                | 10.6                               | 21          | 0.83            | 20          | 0.79            |
| 660R30ACT22                    |             | 220             |               |                                   |                                    |             |                 |             |                 |
| 660R30ACT33                    |             | 330             |               |                                   |                                    |             |                 |             |                 |
| 660R30ACT47                    |             | 470             |               |                                   |                                    |             |                 |             |                 |
| 660R30ACT68                    |             | 680             |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R30ACD10                    |             | 1000            |               |                                   |                                    |             |                 |             |                 |
| 660R30ACD15                    |             | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R30ACD20                    |             | 2000            |               |                                   |                                    | 37          | 1.45            |             |                 |
|                                |             |                 |               |                                   |                                    |             |                 |             |                 |



| SAP NUMBER AND ELECTRICAL DATA |         |                 |               |                                   |                                    |             |                 |             |                 |
|--------------------------------|---------|-----------------|---------------|-----------------------------------|------------------------------------|-------------|-----------------|-------------|-----------------|
| MODEL NUMBER                   | CERAMIC | CAP. VALUE (pF) | TOLERANCE (%) | RATED VOLTAGE (kV <sub>DC</sub> ) | RATED VOLTAGE (kV <sub>RMS</sub> ) | D MAX. (mm) | D MAX. (INCHES) | H MAX. (mm) | H MAX. (INCHES) |
| <b>660R30AE###</b>             |         |                 |               |                                   |                                    |             |                 |             |                 |
| 660R30AET47                    | Z5U     | 470             | + 80 / - 20   | 30                                | 10.6                               | 21          | 0.83            | 20          | 0.79            |
| 660R30AET68                    |         | 680             |               |                                   |                                    |             |                 |             |                 |
| 660R30AET82                    |         | 820             |               |                                   |                                    |             |                 |             |                 |
| 660R30AED10                    |         | 1000            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED12                    |         | 1200            |               |                                   |                                    | 30          | 1.18            |             |                 |
| 660R30AED15                    |         | 1500            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED18                    |         | 1800            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED20                    |         | 2000            |               |                                   |                                    | 37          | 1.45            |             |                 |
| 660R30AED22                    |         | 2200            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED25                    |         | 2500            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED30                    |         | 3000            |               |                                   |                                    |             |                 |             |                 |
| 660R30AED33                    |         | 3300            |               |                                   |                                    |             |                 |             |                 |

**CAPACITANCE CHANGE VS. VOLTAGE** (typical)



| RELATED DOCUMENTS   |  |
|---------------------|--|
| General Information | <a href="http://www.vishay.com/doc?23140">www.vishay.com/doc?23140</a> |



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