

## Ceramic Singlelayer DC Disc Capacitors, 4 kV<sub>DC</sub> General Purpose



### FEATURES

- High capacitance in small sizes
- Low losses
- Wide range of different lead styles
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

- Lighting ballasts
- SMPS

### DESIGN

The capacitors consist of a ceramic disc which is silver plated on both sides. Connection leads are made of tinned copper having diameters of 0.6 mm or 0.8 mm.

The capacitors may be supplied with straight or kinked leads having a lead spacing of 10.0 mm or 12.5 mm.

Coating is made of blue colored flame retardant epoxy resin in accordance with UL 94 V-0.

### CAPACITANCE RANGE

10 pF to 4.7 nF

### RATED VOLTAGE

4 kV<sub>DC</sub>

### DIELECTRIC STRENGTH

6000 V<sub>DC</sub>, 2 s    Component test

### INSULATION RESISTANCE AT 500 V<sub>DC</sub>

≥ 10 000 MΩ (60 s)

### TOLERANCE ON CAPACITANCE

± 10 %, ± 20 %

### DISSIPATION FACTOR

Class 1:

$C < 30 \text{ pF: } \left( \frac{100 \text{ pF}}{C} + 0.7 \right) \times 10^{-4} \text{ max. (1 MHz)}$

$C \geq 30 \text{ pF: max. 0.1 \% (1 MHz)}$

Class 2:    max. 2.5 % (1 kHz)

### QUICK REFERENCE DATA

| DESCRIPTION                | VALUE     |      |
|----------------------------|-----------|------|
| Ceramic Class              | 1         | 2    |
| Ceramic Dielectric         | N750, Y5U |      |
| Voltage (V <sub>DC</sub> ) | 4000      |      |
| Min. Capacitance (pF)      | 10        | 33   |
| Max. Capacitance (pF)      | 470       | 4700 |
| Mounting                   | Radial    |      |

### MARKING

Marking indicates, capacitance, tolerance code, and rated voltage.

### OPERATING TEMPERATURE RANGE

-40 °C to +85 °C

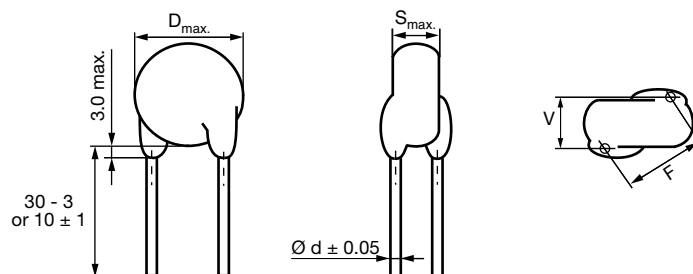
### TEMPERATURE CHARACTERISTICS

Class 1    N750 (U2J)

Class 2    Y5U

### SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60068-1):  
40/085/21

**DIMENSIONS** in millimeters**ORDERING INFORMATION**

| CAPACITANCE<br>(pF) | TOLERANCE<br>(%)    | BODY<br>DIAMETER<br>D <sub>max.</sub> (mm) | BODY<br>THICKNESS<br>S <sub>max.</sub> (mm) | LEAD<br>SPACING <sup>(1)</sup><br>F (mm)<br>± 1 mm | LEAD<br>DIAMETER <sup>(1)</sup><br>d (mm)<br>± 0.05 mm | WIDTH <sup>(1)</sup><br>V (mm)<br>± 0.5 mm | ORDERING CODE                                |
|---------------------|---------------------|--------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------|--------------------------------------------|----------------------------------------------|
|                     |                     |                                            |                                             |                                                    |                                                        |                                            | MISSING DIGITS<br>SEE ORDERING<br>CODE BELOW |
| N750 (U2J)          |                     |                                            |                                             |                                                    |                                                        |                                            |                                              |
| 10                  | ± 10                | 7.0                                        | 4.3                                         | 10.0                                               | 0.6                                                    | 1.7                                        | HDU100KBD####KR                              |
| 15                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDU150KBD####KR                              |
| 22                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDU220KBD####KR                              |
| 33                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDU330KBD####KR                              |
| 47                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDU470KBD####KR                              |
| 68                  |                     | 9.5                                        | 4.7                                         |                                                    | 0.8                                                    | 1.9                                        | HDU680KBD####KR                              |
| 82                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDU820KBD####KR                              |
| 100                 |                     | HDU101KBD####KR                            |                                             |                                                    |                                                        |                                            |                                              |
| 150                 |                     | HDU151KBD####KR                            |                                             |                                                    |                                                        |                                            |                                              |
| 220                 |                     | HDU221KBD####KR                            |                                             |                                                    |                                                        |                                            |                                              |
| 330                 |                     | HDU331KBD####KR                            |                                             |                                                    |                                                        |                                            |                                              |
| 470                 |                     | HDU471KBD####KR                            |                                             |                                                    |                                                        |                                            |                                              |
| Y5U (2E3)           |                     |                                            |                                             |                                                    |                                                        |                                            |                                              |
| 33                  | ± 20 <sup>(2)</sup> | 8.0                                        | 4.5                                         | 12.5                                               | 0.6                                                    | 1.9                                        | HDE330#BD####KR                              |
| 47                  |                     |                                            | 5.0                                         |                                                    |                                                        | 2.3                                        | HDE470#BD####KR                              |
| 68                  |                     |                                            |                                             |                                                    |                                                        |                                            | HDE680#BD####KR                              |
| 100                 |                     |                                            |                                             |                                                    |                                                        |                                            | HDE101#BD####KR                              |
| 150                 |                     |                                            |                                             |                                                    |                                                        |                                            | HDE151#BD####KR                              |
| 220                 |                     |                                            |                                             |                                                    |                                                        |                                            | HDE221#BD####KR                              |
| 330                 |                     |                                            |                                             |                                                    |                                                        |                                            | 2.5                                          |
| 470                 |                     |                                            | HDE471#BD####KR                             |                                                    |                                                        |                                            |                                              |
| 680                 |                     |                                            | HDE681#BD####KR                             |                                                    |                                                        |                                            |                                              |
| 1000                |                     |                                            | 9.0                                         |                                                    |                                                        | 0.8                                        | 2.7                                          |
| 1500                |                     | 10.0                                       | HDE152#BD####KR                             |                                                    |                                                        |                                            |                                              |
| 2200                |                     | 12.0                                       | HDE222#BD####KR                             |                                                    |                                                        |                                            |                                              |
| 3300                |                     | 13.0                                       | HDE332#BD####KR                             |                                                    |                                                        |                                            |                                              |
| 4700                |                     | 15.0                                       | HDE472#BD####KR                             |                                                    |                                                        |                                            |                                              |
|                     |                     | 18.0                                       |                                             |                                                    |                                                        |                                            |                                              |

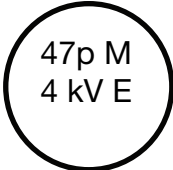
**Notes**<sup>(1)</sup> Standard lead configuration, other lead spacing and diameter available on request<sup>(2)</sup> ± 10 % available on request



## ORDERING CODE

|         |                                            |                                 |                              |                           |                                  |                           |                            |
|---------|--------------------------------------------|---------------------------------|------------------------------|---------------------------|----------------------------------|---------------------------|----------------------------|
| #       | 7 <sup>th</sup> digit                      | Capacitance tolerance           | $\pm 10\% = K, \pm 20\% = M$ |                           |                                  |                           |                            |
| ###     | 10 <sup>th</sup> to 12 <sup>th</sup> digit | Lead configuration              | see "General Information"    |                           |                                  |                           |                            |
| Example | <b>HDE</b><br>Series                       | <b>100</b><br>Capacitance value | <b>M</b><br>Tolerance code   | <b>BD</b><br>Voltage code | <b>EF0</b><br>Lead configuration | <b>K</b><br>Internal code | <b>R</b><br>RoHS compliant |

## MARKING

|                                                                                   |                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |
| HDU 10 pF to 100 pF<br>HDE 33 pF to 1.5 nF                                        | HDU 150 pF to 470 pF<br>HDE 2.2 nF to 4.7 nF                                       |

## RELATED DOCUMENTS

|                     |                                                                        |
|---------------------|------------------------------------------------------------------------|
| General Information | <a href="http://www.vishay.com/doc?22001">www.vishay.com/doc?22001</a> |
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