

## Ceramic Singlelayer DC Disc Capacitors, 2 kV<sub>DC</sub> General Purpose


**RoHS**  
COMPLIANT

### 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)

### 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 7.5 mm.

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

### CAPACITANCE RANGE

10 pF to 22 nF

### RATED VOLTAGE

2 kV<sub>DC</sub>

### DIELECTRIC STRENGTH

3000 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 %, - 20 % / + 50 %

### 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, Y5T, Y5U, Y5V |        |
| Voltage (V <sub>DC</sub> ) | 2000                |        |
| Min. Capacitance (pF)      | 10                  | 56     |
| Max. Capacitance (pF)      | 470                 | 22 000 |
| Mounting                   | Radial              |        |

### MARKING

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

### OPERATING TEMPERATURE RANGE

-40 °C to +85 °C

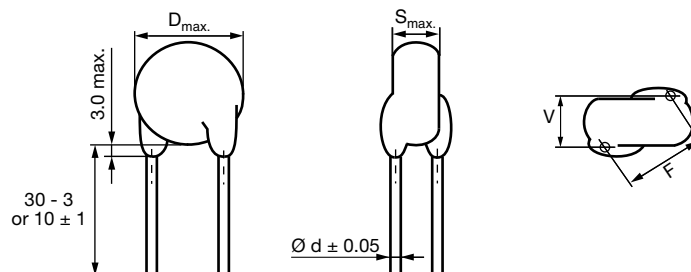
### TEMPERATURE CHARACTERISTICS

Class 1 N750 (U2J)

Class 2 Y5T, Y5U, Y5V

### 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                                        | 4.0                                         | 7.5                                                | 0.6                                                    | 1.2                                        | HBU100KBB####KR                              |
| 15                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBU150KBB####KR                              |
| 22                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBU220KBB####KR                              |
| 33                  |                  |                                            |                                             |                                                    |                                                        | 1.3                                        | HBU330KBB####KR                              |
| 47                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBU470KBB####KR                              |
| 68                  |                  | 8.0                                        | 4.2                                         |                                                    |                                                        | 1.4                                        | HBU680KBB####KR                              |
| 82                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBU820KBB####KR                              |
| 100                 |                  | 10.0                                       |                                             |                                                    |                                                        |                                            | HBU101KBB####KR                              |
| 150                 |                  | 12.0                                       |                                             |                                                    |                                                        |                                            | HBU151KBB####KR                              |
| 220                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBU221KBB####KR                              |
| 330                 |                  | 15.0                                       |                                             |                                                    |                                                        |                                            | HBU331KBB####KR                              |
| 470                 |                  | 17.0                                       |                                             |                                                    |                                                        |                                            | HBU471KBB####KR                              |
| Y5T (2D3)           |                  |                                            |                                             |                                                    |                                                        |                                            |                                              |
| 56                  | ± 10, ± 20       | 7.0                                        | 3.0                                         | 7.5                                                | 0.6                                                    | 1.4                                        | HBZ560#BB####KR                              |
| 68                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ680#BB####KR                              |
| 82                  |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ820#BB####KR                              |
| 100                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ101#BB####KR                              |
| 150                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ151#BB####KR                              |
| 220                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ221#BB####KR                              |
| 330                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ331#BB####KR                              |
| 470                 |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ471#BB####KR                              |
| 680                 |                  | 9.0                                        |                                             |                                                    |                                                        |                                            | HBZ681#BB####KR                              |
| 1000                |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ102#BB####KR                              |
| 1500                |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ152#BB####KR                              |
| 2200                |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ222#BB####KR                              |
| 3300                |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ332#BB####KR                              |
| 4700                |                  |                                            |                                             |                                                    |                                                        |                                            | HBZ472#BB####KR                              |



## ORDERING INFORMATION

| ORDERING INFORMATION |                            |                                            |                                             |                                                    |                                                        |                                            | ORDERING CODE                                |
|----------------------|----------------------------|--------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------------------|--------------------------------------------|----------------------------------------------|
| 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 | MISSING DIGITS<br>SEE ORDERING<br>CODE BELOW |
| Y5U (2E3)            |                            |                                            |                                             |                                                    |                                                        |                                            |                                              |
| 680                  | ± 20                       | 7.0                                        | 3.0                                         | 7.5                                                | 0.6                                                    | 1.4                                        | HBE681MBB####KR                              |
| 1000                 |                            |                                            |                                             |                                                    |                                                        |                                            | HBE102MBB####KR                              |
| 1500                 |                            |                                            |                                             |                                                    |                                                        |                                            | HBE152MBB####KR                              |
| 2200                 |                            | 9.0                                        |                                             |                                                    |                                                        |                                            | HBE222MBB####KR                              |
| 3300                 |                            | 11.0                                       |                                             |                                                    |                                                        |                                            | HBE332MBB####KR                              |
| 4700                 |                            | 13.0                                       |                                             |                                                    |                                                        |                                            | HBE472MBB####KR                              |
| 6800                 |                            | 15.0                                       |                                             |                                                    |                                                        |                                            | HBE682MBB####KR                              |
| 10 000               |                            | 17.0                                       |                                             |                                                    |                                                        |                                            | HBE103MBB####KR                              |
| Y5V (2F3)            |                            |                                            |                                             |                                                    |                                                        |                                            |                                              |
| 1500                 | - 20 / + 50 <sup>(2)</sup> | 7.0                                        | 3.0                                         | 7.5                                                | 0.6                                                    | 1.2                                        | HBX152#BB####KR                              |
| 2200                 |                            | 9.0                                        |                                             |                                                    |                                                        |                                            | HBX222#BB####KR                              |
| 3300                 |                            |                                            |                                             |                                                    |                                                        |                                            | HBX332#BB####KR                              |
| 4700                 |                            | 11.0                                       |                                             |                                                    |                                                        |                                            | HBX472#BB####KR                              |
| 6800                 |                            |                                            |                                             |                                                    |                                                        |                                            | HBX682#BB####KR                              |
| 10 000               |                            | 15.0                                       |                                             |                                                    |                                                        |                                            | HBX103#BB####KR                              |
| 15 000               |                            | 17.0                                       |                                             |                                                    |                                                        |                                            | HBX153#BB####KR                              |
| 22 000               |                            | 20.0                                       |                                             |                                                    |                                                        |                                            | HBX223#BB####KR                              |

## Notes

<sup>(1)</sup> Standard lead configuration, other lead spacing and diameter available on request<sup>(2)</sup> ± 20 % available on request

## ORDERING CODE

|                |                                            |                       |                                             |              |                    |               |                |
|----------------|--------------------------------------------|-----------------------|---------------------------------------------|--------------|--------------------|---------------|----------------|
| #              | 7 <sup>th</sup> digit                      | Capacitance tolerance | ± 10 % = K, ± 20 % = M, - 20 % / + 50 % = S |              |                    |               |                |
| ###            | 10 <sup>th</sup> to 12 <sup>th</sup> digit | Lead configuration    | see "General Information"                   |              |                    |               |                |
| <b>Example</b> | <b>HBX</b>                                 | <b>223</b>            | <b>S</b>                                    | <b>BB</b>    | <b>CRU</b>         | <b>K</b>      | <b>R</b>       |
|                | Series                                     | Capacitance value     | Tolerance code                              | Voltage code | Lead configuration | Internal code | RoHS compliant |

## MARKING

|                                                                        |                                                                         |                          |                         |
|------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------|-------------------------|
| <br>HBU 10 pF to 220 pF<br>HBZ 56 pF to 2.2 nF<br>HBE 680 pF to 4.7 nF | <br>HBU 330 pF to 470 pF<br>HBZ 3.3 nF to 4.7 nF<br>HBE 6.8 nF to 10 nF | <br>HBX 1.5 nF to 4.7 nF | <br>HBX 6.8 nF to 22 nF |
|------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------|-------------------------|

## RELATED DOCUMENTS

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



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