

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



| QUICK REFERENCE DATA       |                                 |
|----------------------------|---------------------------------|
| DESCRIPTION                | VALUE                           |
| Ceramic Class              | 1                      2        |
| Ceramic Dielectric         | N750, Y5T, Y5U, Y5V             |
| Voltage (V <sub>AC</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

### FEATURES

- High capacitance in small sizes
- Low losses
- Wide range of different leadstyles
- 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 ceramic disc both sides of which are silver plated. 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 %

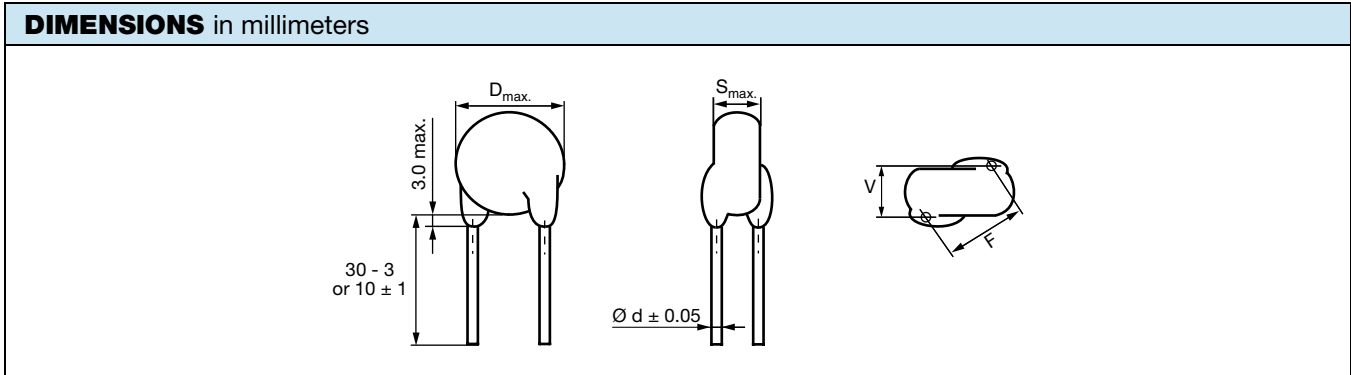
### DISSIPATION FACTOR

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)



| ORDERING INFORMATION |                |                              |                               |   |   |  |   |                |            |     |     |                |
|----------------------|----------------|------------------------------|-------------------------------|---|---|--|---|----------------|------------|-----|-----|----------------|
| CAPACITANCE (pF)     | TOLERANCE (%)  | BODY DIAMETER $D_{max}$ (mm) | BODY THICKNESS $S_{max}$ (mm) | LEAD SPACING <sup>(1)</sup> F (mm) $\pm 1$ mm | LEAD DIAMETER <sup>(1)</sup> d (mm) $\pm 0.05$ mm | WIDTH <sup>(1)</sup> V (mm) $\pm 0.5$ mm | ORDERING CODE<br>MISSING DIGITS<br>SEE ORDERING<br>CODE BELOW |                |            |     |     |                |
| <b>N750 (U2J)</b>    |                |                              |                               |   |   |  |   |                |            |     |     |                |
| 10                   | $\pm 10$       | 7.0                          | 4.0                           | $\pm 1$ mm                                    | 0.6   | 1.2                                      | HBU100KBB...KR  |                |            |     |     |                |
| 15                   |                |                              |                               |   |   |  | HBU150KBB...KR  |                |            |     |     |                |
| 22                   |                |                              |                               |   |   |  | HBU220KBB...KR  |                |            |     |     |                |
| 33                   |                |                              |                               |   |   | 1.3                                      | HBU330KBB...KR  |                |            |     |     |                |
| 47                   |                |                              |                               |   |   |  | 1.4   | HBU470KBB...KR |            |     |     |                |
| 68                   |                |                              |                               |   |   |  |   | HBU680KBB...KR |            |     |     |                |
| 82                   |                | HBU820KBB...KR               |                               |   |   |  |   |                |            |     |     |                |
| 100                  |                | HBU101KBB...KR               |                               |   |   |  |   |                |            |     |     |                |
| 150                  |                | HBU151KBB...KR               |                               |   |   |  |   |                |            |     |     |                |
| 220                  |                | 4.2                          | 4.2                           |   |   | HBU221KBB...KR                           |   |                |            |     |     |                |
| 330                  |                |                              |                               |   |   | HBU331KBB...KR                           |   |                |            |     |     |                |
| 470                  |                |                              |                               |   |   | HBU471KBB...KR                           |   |                |            |     |     |                |
| <b>Y5T (2D3)</b>     |                |                              |                               |   |   |  |   |                |            |     |     |                |
| 56                   |                |                              |                               |   |   | $\pm 10, \pm 20$                         | 7.0   | 3.0            | $\pm 1$ mm | 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            | 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 |                        |                                      |                                       |   |   |                                      |   |
|----------------------|------------------------|--------------------------------------|---------------------------------------|---|---|--------------------------------------|---|
| CAPACITANCE (pF)     | TOLERANCE (%)          | BODY DIAMETER D <sub>max.</sub> (mm) | BODY THICKNESS S <sub>max.</sub> (mm) | LEAD SPACING <sup>(1)</sup> F (mm) ± 1 mm | LEAD DIAMETER <sup>(1)</sup> d (mm) ± 0.05 mm | WIDTH <sup>(1)</sup> V (mm) ± 0.5 mm | ORDERING CODE<br>MISSING DIGITS SEE ORDERING CODE BELOW |
| <b>Y5U (2E3)</b>     |                        |                                      |                                       |   |   |                                      |   |
| 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  |
| <b>Y5V (2F3)</b>     |                        |                                      |                                       |   |   |                                      |   |
| 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                 |                        | 11.0                                 |                                       |   |   |                                      | HBX332.BB...KR  |
| 4700                 |                        |                                      |                                       |   |   |                                      | 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>56p K<br>2 kV U  | <br>3n3 K   | <br>3n3 M<br>2 kV    | <br>HBX<br>10n S    |
| HBU 10 pF to 220 pF<br>HBZ 56 pF to 2.2 nF<br>HBE 680 pF to 4.7 nF | HBU 330 pF to 470 pF<br>HBZ 3.3 nF to 4.7 nF<br>HBE 6.8 nF to 10 nF | HBX 1.5 nF to 4.7 nF | 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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