AC Line Rated Ceramic Disc Capacitors
Class X1, 760 V_{AC}, Class Y1, 500 V_{AC}

FEATURES
- Complying with IEC 60384-14 4th edition
- High reliability
- Wide range of different leadstyles
- Small dimensions
- Singlelayer AC disc safety capacitors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS
- X1, Y1 according to IEC 60384-14.4
- Across-the-line
- Line-by-pass
- Antenna coupling

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 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
470 pF to 4.7 nF

TOLERANCE ON CAPACITANCE
± 10 %, ± 20 %

RATED VOLTAGE
- X1: 760 V_{AC}, 50 Hz (IEC 60384-14.4)
  760 V_{AC}, 50 Hz / 60 Hz (US/UL/CSA 60384-14)
- Y1: 500 V_{AC}, 50 Hz (IEC 60384-14.4)
  500 V_{AC}, 50 Hz / 60 Hz (US/UL/CSA 60384-14)

TEST VOLTAGE
- 4000 V_{AC}, 50 Hz, 2 s Component test (100 %)
- 4000 V_{AC}, 50 Hz, 60 s Random sampling test (destructive)
- 4000 V_{AC}, 50 Hz, 60 s Voltage proof of coating (destructive)

INSULATION RESISTANCE AT 500 V_{DC}
≥ 10 000 MΩ (60 s)

DISSIPATION FACTOR
Class 2: max. 2.5 % (1 kHz)

MARKING
Marking indicates series, AC rating, capacitance, tolerance code, and approvals.

OPERATING TEMPERATURE RANGE
-40 °C to +125 °C

TEMPERATURE CHARACTERISTICS
Class 2 Y5U

SECTIONAL SPECIFICATIONS
Climatic category (according to EN 60058-1)
Class 2 40/125/21

APPROVALS
IEC 60384-14.4
UL 60384-14.1
CSA E60384-1:03 2nd edition, CSA E60384-14:09 2nd edition

QUICK REFERENCE DATA

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>VALUE</th>
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<tr>
<td>Ceramic Class</td>
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<tr>
<td>Ceramic Dielectric</td>
<td>Y5U</td>
</tr>
<tr>
<td>Voltage (V_{AC})</td>
<td>760 500</td>
</tr>
<tr>
<td>Min. Capacitance (pF)</td>
<td>470</td>
</tr>
<tr>
<td>Max. Capacitance (pF)</td>
<td>4700</td>
</tr>
<tr>
<td>Mounting</td>
<td>Radial</td>
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</table>

3D Models

Quick Reference Data

Quick Reference Data

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### TECHNICAL DATA

<table>
<thead>
<tr>
<th>CAPACITANCE (C) (pF)</th>
<th>CAPACITANCE TOLERANCE (%)</th>
<th>BODY DIAMETER (D_{\text{MAX}}) (mm)</th>
<th>BODY THICKNESS (S_{\text{MAX}}) (mm)</th>
<th>LEAD SPACING (F) (mm) ± 1 mm</th>
<th>LEAD DIAMETER (d) (mm) ± 0.05 mm</th>
<th>WIDTH (V) (mm) ± 0.5 mm</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y5U (2E3)</td>
<td></td>
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<tr>
<td>470</td>
<td>± 10, ± 20</td>
<td>8.0</td>
<td>5.0</td>
<td>12.5</td>
<td>0.6</td>
<td>2.1</td>
<td>VKP471#CQ###KR</td>
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<tr>
<td>680</td>
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<td>1500</td>
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<td>VKP472#CQ###KR</td>
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**Notes**

1. Standard lead configuration, other lead spacing and diameter available on request
2. When capacitance values less than 470 pF are required, the usage of WKP series is recommended

### ORDERING CODE

<table>
<thead>
<tr>
<th>#</th>
<th>7th digit</th>
<th>Capacitance tolerance</th>
<th>± 10 % = K, ± 20 % = M</th>
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<tbody>
<tr>
<td>###</td>
<td>10th to 12th digit</td>
<td>Lead configuration</td>
<td>see “General Information”</td>
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</tbody>
</table>

**Example**

- **Series**: VKP
- **Capacitance value**: 470 pF to 1.5 nF
- **Tolerance code**: ± 10, ± 20
- **Voltage code**: 2.2 nF to 4.7 nF
- **Lead configuration**: 2n2 M
- **Internal code**: RoHS compliant

**MARKING**

- **Capacitance value**: 470 pF to 1.5 nF
- **Voltage code**: 2.2 nF to 4.7 nF
**APPROVALS**

IEC 60384-14.4 - Safety tests
This approval together with CB test certificate substitutes all national approvals.

**CB Test Certificate**

<table>
<thead>
<tr>
<th>Component</th>
<th>Certificate</th>
<th>Capacitance</th>
<th>Voltage</th>
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</thead>
<tbody>
<tr>
<td>Y1 Capacitor</td>
<td>US-26551-UL</td>
<td>470 pF to 4.7 nF</td>
<td>500 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
<tr>
<td>X1 Capacitor</td>
<td>US-26551-UL</td>
<td>470 pF to 4.7 nF</td>
<td>760 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Minimum thickness of insulation: 0.4 mm

**VDE**

<table>
<thead>
<tr>
<th>Component</th>
<th>Approval</th>
<th>Capacitance</th>
<th>Voltage</th>
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</thead>
<tbody>
<tr>
<td>Y1 Capacitor</td>
<td>136494</td>
<td>470 pF to 4.7 nF</td>
<td>500 V&lt;sub&gt;AC&lt;/sub&gt;</td>
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<tr>
<td>X1 Capacitor</td>
<td>136494</td>
<td>470 pF to 4.7 nF</td>
<td>760 V&lt;sub&gt;AC&lt;/sub&gt;</td>
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</table>

DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests
Minimum thickness of insulation: 0.4 mm

**Underwriters Laboratories Inc. / Canadian Standards Association**

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<tr>
<th>Component</th>
<th>Certificate</th>
<th>Capacitance</th>
<th>Voltage</th>
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<tbody>
<tr>
<td>Y1 Capacitor</td>
<td>E183844</td>
<td>470 pF to 4.7 nF</td>
<td>500 V&lt;sub&gt;AC&lt;/sub&gt;</td>
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<tr>
<td>X1 Capacitor</td>
<td>E183844</td>
<td>470 pF to 4.7 nF</td>
<td>760 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Across-the-line, antenna-coupling and line-by-pass component
Minimum thickness of insulation: 0.4 mm

**LEAKAGE CURRENT VS. VOLTAGE** (typical)

![Leakage Current vs. Voltage Graph]

**IMPEDEANCE VS. FREQUENCY** (typical)

![Impedance vs. Frequency Graph]

**RELATED DOCUMENTS**

<table>
<thead>
<tr>
<th>Document Type</th>
<th>URL</th>
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</thead>
<tbody>
<tr>
<td>General Information</td>
<td><a href="http://www.vishay.com/doc?22001">www.vishay.com/doc?22001</a></td>
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<tr>
<td>CB-Test Certificate</td>
<td><a href="http://www.vishay.com/doc?22211">www.vishay.com/doc?22211</a></td>
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<td>VDE Marks Approval</td>
<td><a href="http://www.vishay.com/doc?22212">www.vishay.com/doc?22212</a></td>
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<td>UL-Test Certificate</td>
<td><a href="http://www.vishay.com/doc?22213">www.vishay.com/doc?22213</a></td>
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