AC Line Rated Ceramic Disc Capacitors
Class X1, 440 V<sub>AC</sub>, Class Y2, 300 V<sub>AC</sub>

FEATURES
- Complying with IEC 60384-14 4<sup>th</sup> 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, Y2 according to IEC 60384-14.4
- Line-by-pass

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.

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
1.0 nF to 4.7 nF

TOLERANCE ON CAPACITANCE
± 10 %, ± 20 %

RATED VOLTAGE
- X1: 440 V<sub>AC</sub>, 50 Hz (IEC 60384-14.4)
  440 V<sub>AC</sub>, 50 Hz / 60 Hz (US/UL/CSA 60384-14)
- Y2: 300 V<sub>AC</sub>, 50 Hz (IEC 60384-14.4)
  300 V<sub>AC</sub>, 50 Hz / 60 Hz (US/UL/CSA 60384-14)

TEST VOLTAGE
- 2600 V<sub>AC</sub>, 50 Hz, 2 s Component test (100 %)
- 2600 V<sub>AC</sub>, 50 Hz, 60 s Random sampling test (destructive)
- 2600 V<sub>AC</sub>, 50 Hz, 60 s Voltage proof of coating (destructive)

INSULATION RESISTANCE AT 500 V<sub>DC</sub>
≥ 6000 MΩ (60 s)

DISSIPATION FACTOR
Class 2: max. 2.5 % (1 kHz)
### DIMENSIONS in millimeters

![DIMENSIONS Diagram](image)

### TECHNICAL DATA

<table>
<thead>
<tr>
<th>CAPACITANCE VALUE (2) C (pF)</th>
<th>CAPACITANCE TOLERANCE</th>
<th>BODY DIAMETER DMAX (mm)</th>
<th>BODY THICKNESS SMAX (mm)</th>
<th>LEAD SPACING (1) F (mm) ± 1 mm</th>
<th>LEAD DIAMETER D (mm) ± 0.05 mm</th>
<th>WIDTH (1) V (mm) ± 0.5 mm</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y5U (2E3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1000</td>
<td>± 10 %, ± 20 %</td>
<td>7.0</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td>VKO102#CQ###KR</td>
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<tr>
<td>1500</td>
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<td>8.0</td>
<td>6.0</td>
<td>7.5</td>
<td>0.6</td>
<td>1.6</td>
<td>VKO152#CQ###KR</td>
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<td>2200</td>
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<td>10.0</td>
<td>6.0</td>
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<td></td>
<td></td>
<td>VKO222#CQ###KR</td>
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<td>3300</td>
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<td>12.0</td>
<td>6.0</td>
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<td>VKO332#CQ###KR</td>
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<tr>
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<td>6.0</td>
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<td>VKO392#CQ###KR</td>
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<tr>
<td>4700</td>
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<td>13.5</td>
<td>4.5</td>
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</tbody>
</table>

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

### ORDERING CODE

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

Example: VKO 102 K CQ TC0 K R

- Series
- Capacitance value
- Tolerance code
- Voltage code
- Lead configuration
- Internal code
- RoHS compliant

### MARKING

- VKO 1.0 nF to 1.5 nF
- VKO 2.2 nF to 4.7 nF

For technical questions, contact: slcap@vishay.com

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**APPROVALS**

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

<table>
<thead>
<tr>
<th>CB Certificate</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Y2-capacitor: CB test certificate:</td>
<td>US-26162-UL</td>
<td>1 nF to 4.7 nF</td>
<td>300 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
<tr>
<td>X1-capacitor: CB test certificate:</td>
<td>US-26162-UL</td>
<td>1 nF to 4.7 nF</td>
<td>440 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
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Minimum thickness of insulation: 0.4 mm

<table>
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<tr>
<th>VDE</th>
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</thead>
<tbody>
<tr>
<td>Y2-capacitor: VDE marks approval:</td>
<td>137866</td>
<td>1 nF to 4.7 nF</td>
<td>300 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
<tr>
<td>X1-capacitor: VDE marks approval:</td>
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<td>1 nF to 4.7 nF</td>
<td>440 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
</tbody>
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DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests  
Minimum thickness of insulation: 0.4 mm

<table>
<thead>
<tr>
<th>Underwriters Laboratories Inc. / Canadian Standards Association</th>
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</thead>
<tbody>
<tr>
<td>Y2-capacitor: UL-test certificate:</td>
<td>E183844</td>
<td>1 nF to 4.7 nF</td>
<td>300 V&lt;sub&gt;AC&lt;/sub&gt;</td>
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<tr>
<td>X1-capacitor: UL-test certificate:</td>
<td>E183844</td>
<td>1 nF to 4.7 nF</td>
<td>440 V&lt;sub&gt;AC&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

UL 60384-14, 1, CSA E60384-1:03 2<sup>nd</sup> edition, CSA E60384-14:09 2<sup>nd</sup> edition  
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]

**IMPEDANCE VS. FREQUENCY** (typical)

![Impedance vs. Frequency Graph]

**RELATED DOCUMENTS**

| General Information | [www.vishay.com/doc?22001] |
| CB Test Certificate  | [www.vishay.com/doc?22220] |
| VDE Marks Approval   | [www.vishay.com/doc?22222] |
| UL Test Certificate   | [www.vishay.com/doc?22221] |
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