AC Line Rated Ceramic Disc Capacitors
Class X1, 760 V AC / Class Y1, 500 V AC

FEATURES
- Complies with IEC 60384-14
- High reliability
- Radial leads
- High capacitance up to 20 nF
- 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
- Across-the-line
- Line by-pass
- Antenna coupling

DESIGN
The capacitors consist of a ceramic disc of which both sides are silver-plated. Connection leads are made of tinned copper having a diameter of 0.032” (0.81 mm). The capacitors may be supplied with radial kinked or straight leads having a lead spacing of 0.375” (9.5 mm). The standard tolerances are ± 10 % or ± 20 %. Coating is made of flame-retardant epoxy resin in accordance with "UL 94 V-0."

CAPACITANCE RANGE
10 pF to 20 nF

RATED VOLTAGE
IEC 60384-14:
- X1: 760 V AC, 50 Hz
- Y1: 500 V AC, 50 Hz

DIELECTRIC STRENGTH BETWEEN LEADS
Component test:
4000 V AC, 50 Hz, 2 s
As repeated test admissible only once with:
3600 V AC, 50 Hz, 2 s
Random sampling test (destructive test):
4000 V AC, 50 Hz, 60 s

DIELECTRIC STRENGTH OF BODY INSULATION
4000 V AC, 50 Hz, 60 s (destructive test)
### 440L Series

**Vishay Cera-Mite**

**www.vishay.com**

**Revision:** 17-Feb-2020

**Document Number:** 23102

For technical questions, contact: ceramitesupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT [www.vishay.com/doc?91000](http://www.vishay.com/doc?91000)

---

**Notes**

- Alternate lead spacings are available bulk or tape and reel on request
- Minimum lead clearance according to IEC 60384-14: 0.315" (8 mm)

---

**TAPE AND REEL OPTIONS**

Part number codes and specifications for tape and reel packaging are found in the general information document - find web-link below.

---

**DIMENSIONS** in inches (millimeters)

<table>
<thead>
<tr>
<th>Part</th>
<th>Diameter</th>
<th>Thickness</th>
<th>Wire Size</th>
<th>Lead Space</th>
<th>Lead Offset</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>440LS20-R</td>
<td>0.125 max. (3.2)</td>
<td>0.375 (9.5) ± 0.315 (8)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.083 (2.1)</td>
<td>440LS20-R</td>
</tr>
</tbody>
</table>

---

**ORDERING INFORMATION, CERAMIC X1 / Y1 CAPACITORS 440L**

<table>
<thead>
<tr>
<th>C (pF)</th>
<th>TOL. (%)</th>
<th>Dmax. DIAMETER (inch)</th>
<th>Tmax. THICKNESS (inch)</th>
<th>Wire Size</th>
<th>Lead Space</th>
<th>Lead Offset</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0G</td>
<td>± 10</td>
<td>0.330 (8.4)</td>
<td>0.195 (5.0)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.098 (2.5)</td>
<td>440LQ10-R</td>
</tr>
<tr>
<td>U2J</td>
<td>± 10</td>
<td>0.330 (8.4)</td>
<td>0.210 (5.3)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.110 (2.8)</td>
<td>440LQ15-R</td>
</tr>
<tr>
<td>P3K</td>
<td>± 10</td>
<td>0.330 (8.4)</td>
<td>0.190 (4.8)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.094 (2.4)</td>
<td>440LQ22-R</td>
</tr>
<tr>
<td>R3L</td>
<td>± 10</td>
<td>0.330 (8.4)</td>
<td>0.200 (5.1)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.102 (2.6)</td>
<td>440LQ33-R</td>
</tr>
<tr>
<td>X7R</td>
<td>± 10</td>
<td>0.330 (8.4)</td>
<td>0.180 (4.6)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.083 (2.1)</td>
<td>440LQ47-R</td>
</tr>
<tr>
<td>Y5U</td>
<td>± 20</td>
<td>0.330 (8.4)</td>
<td>0.230 (5.8)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.130 (3.3)</td>
<td>440LQ68-R</td>
</tr>
<tr>
<td>470</td>
<td>± 20</td>
<td>0.330 (8.4)</td>
<td>0.230 (5.8)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.130 (3.3)</td>
<td>440LT47-R</td>
</tr>
<tr>
<td>680</td>
<td>± 20</td>
<td>0.330 (8.4)</td>
<td>0.235 (6.0)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.130 (3.3)</td>
<td>440LT56-R</td>
</tr>
<tr>
<td>800</td>
<td>± 20</td>
<td>0.330 (8.4)</td>
<td>0.235 (6.0)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.130 (3.3)</td>
<td>440LT68-R</td>
</tr>
<tr>
<td>1000</td>
<td>± 20</td>
<td>0.330 (8.4)</td>
<td>0.225 (5.7)</td>
<td>20</td>
<td>0.032 (0.81)</td>
<td>0.130 (3.3)</td>
<td>440LD10-R</td>
</tr>
</tbody>
</table>

---

**Notes**

- Alternate lead spacings are available bulk or tape and reel on request
- Minimum lead clearance according to IEC 60384-14: 0.315" (8 mm)
AC CURRENT VS. VOLTAGE (Leakage Current)

Impedance VS. Frequency (Wire Length 10 mm)
**APPROVALS**

IEC 60384-14 - Safety tests
This approval together with CB test certificate substitutes all national approvals.

**CB Certificate**
- Y1-capacitor: CB test certificate: DE1-56450/A1 10 pF to 20 nF 500 VAC
- X1-capacitor: CB test certificate: DE1-56450/A1 10 pF to 20 nF 760 VAC

**VDE**
- Y1-capacitor: VDE marks approval: 40003985 10 pF to 20 nF 500 VAC
- X1-capacitor: VDE marks approval: 40003985 10 pF to 20 nF 400 VAC

**Underwriters Laboratories Inc.**
- Y1-capacitor: UL test certificate: E99264 10 pF to 20 nF 500 VAC
- X1-capacitor: UL test certificate: E99264 10 pF to 20 nF 760 VAC

Fixed capacitors for electromagnetic interference suppression and connection to the supply mains.

**MARKING**

Sample

Notes
- Marking IEC 60384-14 does not apply for Ø ≤ 9 mm
- Coding is as follows: 1st figure indicates the year and 2nd figure indicates the month according to IEC 60062. The 3rd to 5th figure indicate the last three digits of the lot number

**RELATED DOCUMENTS**

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Document URL</th>
</tr>
</thead>
</table>
Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.