

AC Line Rated Ceramic Disc Capacitors

Class X1, 760 V_{AC}, Class Y1, 500 V_{AC}



DESIGN SUPPORT TOOLS

[click logo to get started](#)


QUICK REFERENCE DATA

| DESCRIPTION | VALUE | |
|----------------------------|--------|-----|
| Ceramic Class | 2 | |
| Ceramic Dielectric | Y5U | |
| Voltage (V _{AC}) | 760 | 500 |
| Min. Capacitance (pF) | 470 | |
| Max. Capacitance (pF) | 4700 | |
| Mounting | Radial | |

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

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



RoHS
COMPLIANT

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

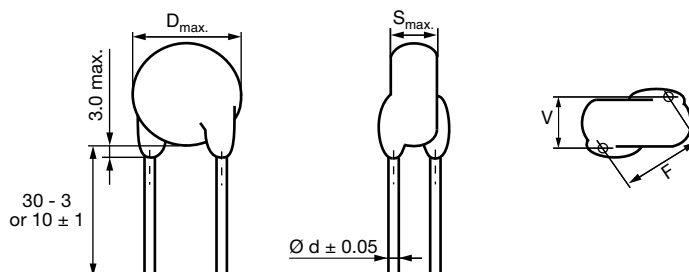
- 4000 V_{AC}, 50 Hz, 2 s Component test (100 %)
- 4000 V_{AC}, 50 Hz, 60 s Random sampling test (destructive)
- 4000 V_{AC}, 50 Hz, 60 s Voltage proof of coating (destructive)

INSULATION RESISTANCE AT 500 V_{DC}

≥ 10 000 MΩ (60 s)

DISSIPATION FACTOR

Class 2: max. 2.5 % (1 kHz)

DIMENSIONS in millimeters

TECHNICAL DATA

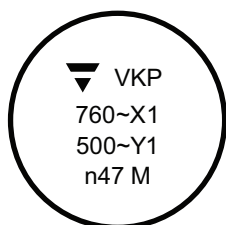
| CAPACITANCE ⁽²⁾ C (pF) | CAPACITANCE TOLERANCE (%) | BODY DIAMETER D _{MAX.} (mm) | BODY THICKNESS S _{MAX.} (mm) | LEAD SPACING ⁽¹⁾ F (mm) ± 1 mm | LEAD DIAMETER ⁽¹⁾ d (mm) ± 0.05 mm | WIDTH ⁽¹⁾ V (mm) ± 0.5 mm | PART NUMBER |
|--------------------------------------|---------------------------------|--|---|--|--|--|--|
| | | | | | | | MISSING DIGITS SEE ORDERING CODE BELOW |
| Y5U (2E3) | | | | | | | |
| 470 | ± 10, ± 20 | 8.0 | 5.0 | 12.5 | 0.6 | 2.1 | VKP471#CQ###KR |
| 680 | | 8.0 | | | VKP681#CQ###KR | | |
| 1000 | | 9.0 | | | VKP102#CQ###KR | | |
| 1500 | | 10.0 | | | VKP152#CQ###KR | | |
| 2200 | | 12.0 | | | VKP222#CQ###KR | | |
| 2700 | | 13.0 | | | VKP272#CQ###KR | | |
| 3300 | | 15.0 | | | VKP332#CQ###KR | | |
| 3900 | | 15.0 | | | VKP392#CQ###KR | | |
| 4700 | | 17.0 | | | VKP472#CQ###KR | | |

Notes

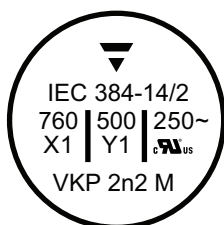
- (1) Standard lead configuration, other lead spacing and diameter available on request
(2) When capacitance values less than 470 pF are required, the usage of WKP series is recommended

ORDERING CODE

| # | 7 th digit | Capacitance tolerance | ± 10 % = K, ± 20 % = M |
|----------------|--|-----------------------|---------------------------|
| ### | 10 th to 12 th digit | Lead configuration | see "General Information" |
| Example | VKP | 222 | M |
| | Series | Capacitance value | Tolerance code |
| | | | CQ |
| | | | Voltage code |
| | | | ED0 |
| | | | Lead configuration |
| | | | K |
| | | | Internal code |
| | | | R |
| | | | RoHS compliant |

MARKING


VKP 470 pF to 1.5 nF



VKP 2.2 nF to 4.7 nF



PN: VKP222MCQEDOKR

PO: 0031254565 / 0001 SN: 28032673B012

**APPROVALS**

IEC 60384-14.4 - Safety tests

This approval together with CB test certificate substitutes all national approvals.

CB Test Certificate

Y1 Capacitor: CB-test certificate:

US-26551-UL

470 pF to 4.7 nF

500 V_{AC}

X1 Capacitor: CB-test certificate:

US-26551-UL

470 pF to 4.7 nF

760 V_{AC}

Minimum thickness of insulation: 0.4 mm

**VDE**

Y1 Capacitor: VDE marks approval:

136494

470 pF to 4.7 nF

500 V_{AC}

X1 Capacitor: VDE marks approval:

136494

470 pF to 4.7 nF

760 V_{AC}

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**

Y1 Capacitor: UL-test certificate:

E183844

470 pF to 4.7 nF

500 V_{AC}

X1 Capacitor: UL-test certificate:

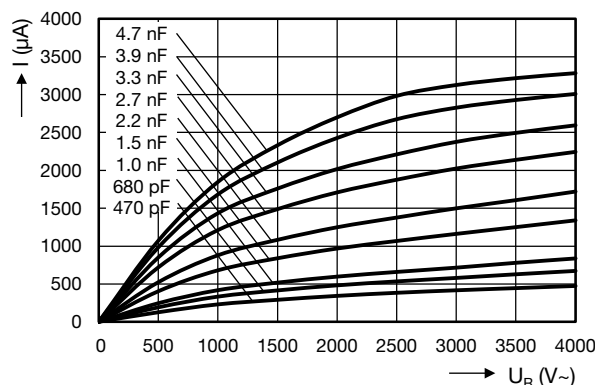
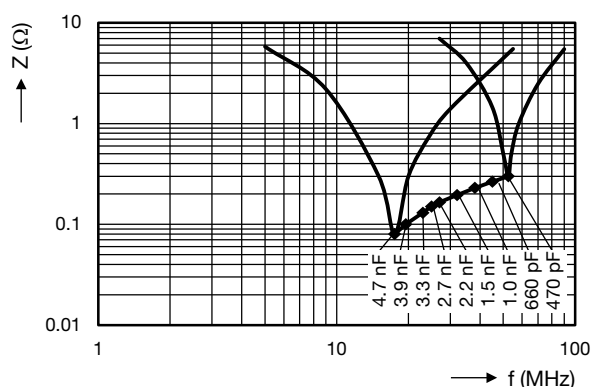
E183844

470 pF to 4.7 nF

760 V_{AC}UL 60384-14.1, CSA E60384-1:03 2nd edition, CSA E60384-14:09 2nd edition

Across-the-line, antenna-coupling and line-by-pass component

Minimum thickness of insulation: 0.4 mm

**LEAKAGE CURRENT VS. VOLTAGE (typical)****IMPEDANCE VS. FREQUENCY (typical)****RELATED DOCUMENTS**

| | |
|---------------------|--|
| General Information | www.vishay.com/doc?22001 |
| CB-Test Certificate | www.vishay.com/doc?22211 |
| VDE Marks Approval | www.vishay.com/doc?22212 |
| UL-Test Certificate | www.vishay.com/doc?22213 |



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