# EMI Suppression Capacitor, Ceramic Disc, Class X1, 760 $V_{AC}$, Class Y1, 500 $V_{AC}$



## FEATURES

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

Pb e3 RoHS COMPLIANT

## APPLICATIONS

- X1, Y1 according to IEC 60384-14
- Line-to-line filtering (Class X)
- Line-to-ground filtering (Class Y)
- EMI / RFI suppression and filtering
- Primary and secondary coupling (SMPS)

## LINKS TO ADDITIONAL RESOURCES

3D Models

| QUICK REFERENCE DATA | | | | |
|---|---|---|---|---|
| DESCRIPTION | VALUE | | | |
| Ceramic Class | 1 | | 2 | |
| Ceramic Dielectric | N750 | N750 | Y5S, Y5T, Y5U | Y5S, Y5T, Y5U |
| Voltage ($V_{AC}$) | 500 | 760 | 500 | 760 |
| Min. Capacitance (pF) | 33 | | 47 | |
| Max. Capacitance (pF) | 33 | | 4700 | |
| Mounting | Radial | | | |

## OPERATING TEMPERATURE RANGE

-40 °C to +125 °C (1)

**Note**

(1) For explanation about the difference of operating temperature range and temperature characteristic of capacitance please see www.vishay.com/doc?48299

## TEMPERATURE CHARACTERISTICS

Class 1: N750

Class 2: Y5S, Y5T, Y5U

## SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60068-1)

Class 1: 40 / 125 / 21

Class 2: 40 / 125 / 21

## APPROVALS

IEC 60384-14

UL 60384-14

CSA E60384-14

## 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

33 pF to 4.7 nF

## TOLERANCE ON CAPACITANCE

± 10 %, ± 20 %

## RATED VOLTAGE

- X1: 760 $V_{AC}$, 50 Hz (IEC 60384-14)
  760 $V_{AC}$, 50 Hz / 60 Hz (US/UL/CSA 60384-14)
- Y1: 500 $V_{AC}$, 50 Hz (IEC 60384-14)
  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 1: max. 0.5 % (1 kHz)

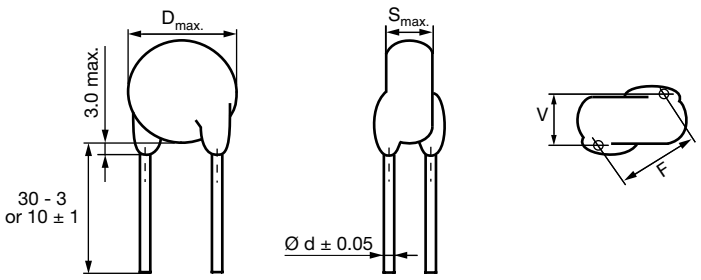
Class 2: max. 2.5 % (1 kHz)



For technical questions, contact: slcap@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

## 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 |
|---|---|---|---|---|---|---|---|
| **N750** | | | | | | | |
| 33 | ± 10 %, ± 20 % | 8.0 | 6.0 | 12.5 | 0.6 | 1.9 | WKP330#CP###KR |
| **Y5S** | | | | | | | |
| 47 | ± 10 %, ± 20 % | 8.0 | 6.0 | 12.5 | 0.6 | 2.3 | WKP470#CP###KR |
| 68 | | | | | | | WKP680#CP###KR |
| 100 | | | | | | | WKP101#CP###KR |
| **Y5T** | | | | | | | |
| 150 | ± 10 %, ± 20 % | 8.0 | 6.0 | 12.5 | 0.6 | 2.3 | WKP151#CP###KR |
| 220 | | | | | | | WKP221#CP###KR |
| **Y5U** | | | | | | | |
| 330 | ± 10 %, ± 20 % | 8.0 | 6.0 | 12.5 | 0.6 | 2.5 | WKP331#CP###KR |
| 470 | | | | | | | WKP471#CP###KR |
| 680 | | 9.0 | | | | | WKP681#CP###KR |
| 1000 | | 10.0 | | | 0.8 | 2.7 | WKP102#CP###KR |
| 1500 | | 12.0 | | | | | WKP152#CP###KR |
| 2200 | | 13.0 | | | | | WKP222#CP###KR |
| 3300 | | 15.0 | | | | | WKP332#CP###KR |
| 3900 | | 16.0 | | | | | WKP392#CP###KR |
| 4700 | | 18.0 | | | | | WKP472#CP###KR |

**Notes**

(1) Standard lead configuration, other lead spacing and diameter available on request

(2) Capacitance values from 1 nF to 4.7 nF: the alternative usage of smaller VKP series is recommended for new application.

## ORDERING CODE

| | | | |
|---|---|---|---|
| # | 7th digit | Capacitance tolerance | ± 10 % = K, ± 20 % = M |
| ### | 10th to 12th digit | Lead configuration | See “General Information” www.vishay.com/doc?22001 |

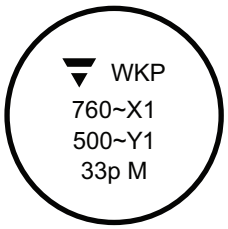
| Example | WKP | 222 | M | CP | ED0 | K | R |
|---|---|---|---|---|---|---|---|
| | Series | Capacitance value | Tolerance code | Voltage code | Lead configuration | Internal code | RoHS compliant |



For technical questions, contact: slcap@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

## MARKING




WKP 33 pF to 1.5 nF




WKP 2.2 nF to 4.7 nF

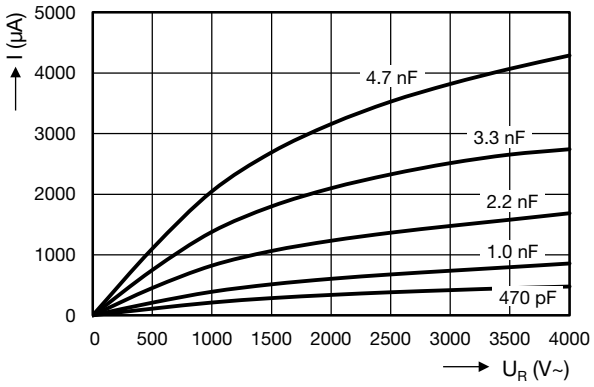



## APPROVALS

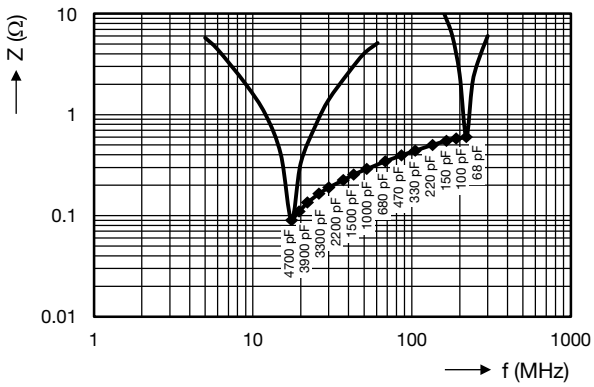
IEC 60384-14 - Safety tests
This approval together with CB test certificate substitutes all national approvals.

| | | | | |
|---|---|---|---|---|
| **CB Certificate (www.vishay.com/doc?22214)** | | | | |
| Y1-capacitor: CB test certificate: | US-45516-UL | 33 pF to 4.7 nF | 500 $V_{AC}$ | |
| X1-capacitor: CB test certificate: | US-45516-UL | 33 pF to 4.7 nF | 760 $V_{AC}$ | |
| Minimum thickness of insulation: 0.4 mm | | | | |
| **VDE (www.vishay.com/doc?22216)** | | | | |
| Y1-capacitor: VDE marks approval: | 136493 | 33 pF to 4.7 nF | 500 $V_{AC}$ | |
| X1-capacitor: VDE marks approval: | 136493 | 33 pF to 4.7 nF | 760 $V_{AC}$ | |
| DIN EN 60384-14 (VDE 0565-1-1) | | | | |
| Minimum thickness of insulation: 0.4 mm | | | | |
| **Underwriters Laboratories Inc. / Canadian Standards Association (www.vishay.com/doc?22215)** | | | | |
| Y1-capacitor: UL-test certificate: | E183844 | 33 pF to 4.7 nF | 500 $V_{AC}$ | |
| X1-capacitor: UL-test certificate: | E183844 | 33 pF to 4.7 nF | 760 $V_{AC}$ | |
| UL 60384-14, CSA E60384-14 | | | | |
| Minimum thickness of insulation: 0.4 mm | | | | |

## AC CURRENT VS. VOLTAGE (typical)




## IMPEDANCE VS. FREQUENCY (typical)






For technical questions, contact: slcap@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

## STORAGE

The capacitors must not be stored in a corrosive atmosphere, where sulphide or chloride gas, acid, alkali or salt are present. Exposure of the components to moisture, should be avoided. The solderability of the leads is not affected by storage of up to 24 months (temperature +10 °C to +35 °C, relative humidity up to 60 %). Class 2 ceramic dielectric capacitors are also subject to aging, see www.vishay.com/doc?22001.

## SOLDERING

| SOLDERING SPECIFICATIONS | | |
|---|---|---|
| Soldering test for capacitors with wire leads: (according to IEC 60068-2-20, solder bath method) | | |
| | SOLDERABILITY | RESISTANCE TO SOLDERING HEAT |
| Soldering temperature | 235 °C ± 5 °C | 260 °C ± 5 °C |
| Soldering duration | 2 s ± 0.5 s | 10 s ± 1 s |
| Distance from component body | ≥ 2 mm | ≥ 5 mm |

## SOLDERING RECOMMENDATIONS

Soldering of the component should be achieved using a Sn60/40 type or a silver-bearing Sn62/36/2Ag type solder. Ceramic capacitors are very sensitive to rapid changes in temperature (thermal shock) therefore the solder heat resistance specification (see Soldering Specifications table) should not be exceeded. Subjecting the capacitor to excessive heating may result in thermal shocks that can crack the ceramic body. Similarly, excessive heating can cause the internal solder junction to melt.

## CLEANING

The components should be cleaned immediately following the soldering operation with vapor degreasers.

## SOLVENT RESISTANCE

The coating and marking of the capacitors are resistant to the following test method: IEC 60068-2-45 (method XA).

## MOUNTING

If a defined product stop is required for mounting on a PCB, a mechanically formed product stop (kinked or inline wire) or a mounting tool should be used.

We do not recommend modifying the lead terminals, e.g. bending or cropping. This action could break the coating or crack the ceramic insert. If however, the lead must be modified in any way, we recommend support of the lead with a clamping fixture next to the coating.

## OPERATING VOLTAGE

In case the voltage is applied to the circuit, starting as well as stopping, may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

## OPERATING TEMPERATURE AND SELF-GENERATED HEAT

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency, pulse, or similar application, it may have self-generated heat due to dielectric dissipation.

Temperature increase due to self-generated heating should not exceed 20 °C while operating at an atmosphere temperature of 25 °C.

When measuring, the surface temperature, make sure that the capacitor is not affected by radiant, conductive and convective heat by its surroundings. Excessive heat may lead to thermo-mechanical deterioration of the capacitor's characteristics and reliability.

| RELATED DOCUMENTS | |
|---|---|
| General Information | www.vishay.com/doc?22001 |
| CB Test Certificate | www.vishay.com/doc?22214 |
| VDE Marks Approval | www.vishay.com/doc?22216 |
| UL Test Certificate | www.vishay.com/doc?22215 |


For technical questions, contact: slcap@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

# 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.

*© 2026 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED*



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