

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

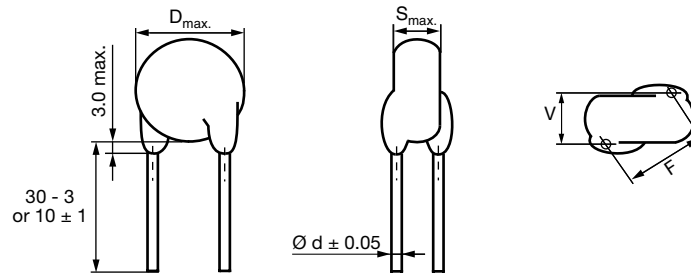
- 4000 V_{AC}, 50 Hz, 2 s Component test (100 %)
- 4000 V_{AC}, 50 Hz, 60 s Random sampling test (destructive)
- 4000 V_{AC}, 50 Hz, 60 s Voltage proof of coating (destructive)

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

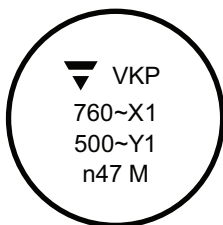
CAPACITANCE ⁽²⁾ C (pF)	CAPACITANCE TOLERANCE (%)	BODY DIAMETER D _{MAX.} (mm)	BODY THICKNESS S _{MAX.} (mm)	LEAD SPACING ⁽¹⁾ F (mm) ± 1 mm	LEAD DIAMETER ⁽¹⁾ d (mm) ± 0.05 mm	WIDTH ⁽¹⁾ V (mm) ± 0.5 mm	PART NUMBER
							MISSING DIGITS SEE ORDERING CODE BELOW
Y5U (2E3)							
470	± 10, ± 20	8.0	5.0	12.5	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

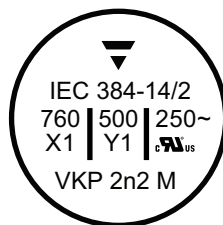
- (1) Standard lead configuration, other lead spacing and diameter available on request
 (2) When capacitance values less than 470 pF are required, the usage of WKP series is recommended

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	CQ	ED0	K	R
	Series	Capacitance value	Tolerance code	Voltage code	Lead configuration	Internal code	RoHS compliant

MARKING


VKP 470 pF to 1.5 nF



VKP 2.2 nF to 4.7 nF

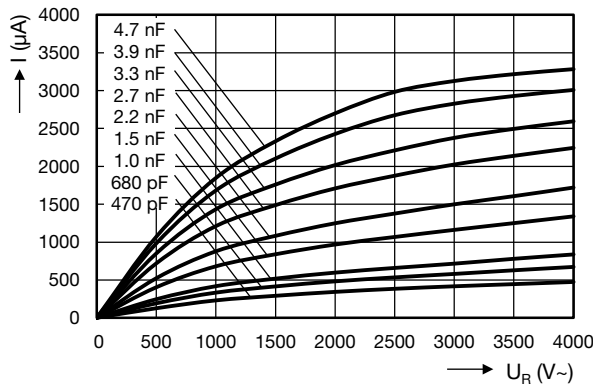


PN: VKP222MCQEDOKR PO: 0031254565/0001 SN: 28032873B012

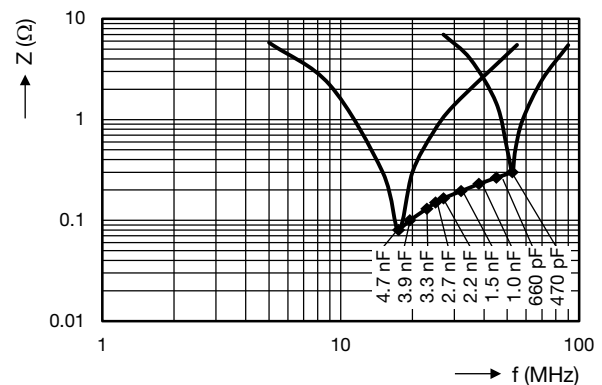


APPROVALS				
IEC 60384-14.4 - Safety tests This approval together with CB test certificate substitutes all national approvals.				
CB Test Certificate				
Y1 Capacitor: CB-test certificate:	US-26551-UL	470 pF to 4.7 nF	500 V _{AC}	
X1 Capacitor: CB-test certificate:	US-26551-UL	470 pF to 4.7 nF	760 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 2 nd edition, CSA E60384-14:09 2 nd 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



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.