

## AC Line Rated Ceramic Disc Capacitors

### Class X1, 760 V<sub>AC</sub>, Class Y1, 500 V<sub>AC</sub>



QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Ceramic Class	2
Ceramic Dielectric	Y5U
Voltage (V <sub>AC</sub> )	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      40/125/21B

#### APPROVALS

IEC 60384-14.3

UL 60384-14.1

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

#### FEATURES

- Complying with IEC 60384-14 3<sup>rd</sup> edition
- High reliability
- Wide range of different leadstyles
- Small dimensions
- Singlelayer AC Disc capacitors
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

#### APPLICATIONS

- X1, Y1 according to IEC 60384-14.3
- 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<sub>AC</sub>, 50 Hz (IEC 60384-14.3)  
                  760 V<sub>AC</sub>, 50 Hz/60 Hz (US/UL/CSA 60384-14)
- Y1:            500 V<sub>AC</sub>, 50 Hz (IEC 60384-14.3)  
                  500 V<sub>AC</sub>, 50 Hz/60 Hz (US/UL/CSA 60384-14)

#### TEST VOLTAGE

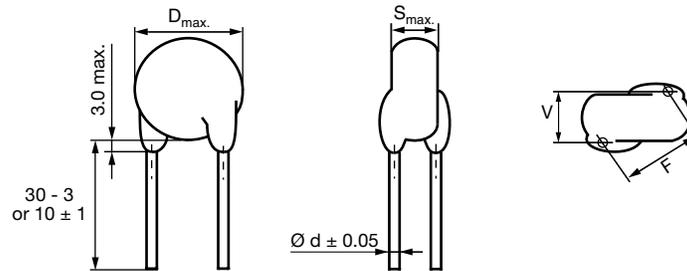
- 4000 V<sub>AC</sub>, 50 Hz, 2 s      Component test (100 %)
- 4000 V<sub>AC</sub>, 50 Hz, 60 s      Random sampling test (destructive)
- 4000 V<sub>AC</sub>, 50 Hz, 60 s      Voltage proof of coating (destructive)

#### INSULATION RESISTANCE AT 500 V<sub>DC</sub>

≥ 10 000 MΩ (60 s)

#### DISSIPATION FACTOR

Class 2:            Max. 2.5 % (1 kHz)

**DIMENSIONS** in millimeters

**TECHNICAL DATA**

CAPACITANCE <sup>(2)</sup> C (pF)	CAPACITANCE TOLERANCE (%)	BODY DIAMETER D <sub>MAX.</sub> (mm)	BODY THICKNESS S <sub>MAX.</sub> (mm)	LEAD SPACING <sup>(1)</sup> F (mm) ± 1 mm	LEAD DIAMETER <sup>(1)</sup> d (mm) ± 0.05 mm	WIDTH <sup>(1)</sup> V (mm) ± 0.5 mm	PART NUMBER
							MISSING DIGITS SEE ORDERING CODE BELOW
<b>Y5U (2E3)</b>							
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 <sup>th</sup> digit	Capacitance tolerance	± 10 % = K, ± 20 % = M				
###	10 <sup>th</sup> to 12 <sup>th</sup> digit	Lead configuration	see "General Information"				
<b>Example</b>	<b>VKP</b>	<b>222</b>	<b>M</b>	<b>CQ</b>	<b>ED0</b>	<b>K</b>	<b>R</b>
	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

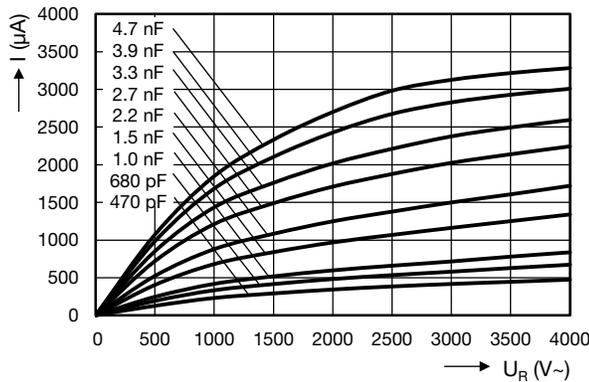
Type: VKP222MCQEDOKR    LOT1: 032673    DC1: 1134  
 Cap.: 2200pF ±20%    LOT2:    DC2:  
 Ur.: 500/760VAC    BATCH NO.: 201134CZ  
 Qty.: 1000    REGION: 7032    S.L.: 0010  
 IEC 60 384-14/2: Y1(500~), X1(760~)  
 EN132400: 125°C c9AUS

PN: VKP222MCQEDOKR    PO: 0031254565/0001    SN: 28032673B012

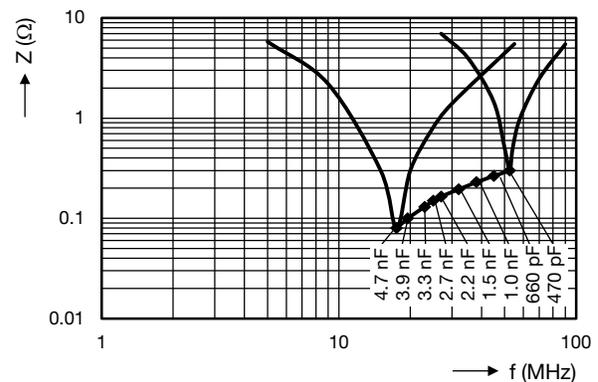
RoHS

APPROVALS				
IEC 60384-14.3 - Safety tests This approval together with CB test certificate substitutes all national approvals.				
<b>CB Test Certificate</b>				
Y1 Capacitor: CB-test certificate:	US-19596-UL	470 pF to 4.7 nF	500 V <sub>AC</sub>	
X1 Capacitor: CB-test certificate:	US-19596-UL	470 pF to 4.7 nF	760 V <sub>AC</sub>	
Minimum thickness of insulation: 0.4 mm				
<b>VDE</b>				
Y1 Capacitor: VDE marks approval:	136494	470 pF to 4.7 nF	500 V <sub>AC</sub>	
X1 Capacitor: VDE marks approval:	136494	470 pF to 4.7 nF	760 V <sub>AC</sub>	
DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests Minimum thickness of insulation: 0.4 mm				
<b>Underwriters Laboratories Inc./Canadian Standards Association</b>				
Y1 Capacitor: UL-test certificate:	E183844	470 pF to 4.7 nF	500 V <sub>AC</sub>	
X1 Capacitor: UL-test certificate:	E183844	470 pF to 4.7 nF	760 V <sub>AC</sub>	
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)



### IMPEDANCE VS. FREQUENCY (typical)



RELATED DOCUMENTS	
General Information	<a href="http://www.vishay.com/doc?22001">www.vishay.com/doc?22001</a>
CB-Test Certificate	<a href="http://www.vishay.com/doc?22211">www.vishay.com/doc?22211</a>
VDE Marks Approval	<a href="http://www.vishay.com/doc?22212">www.vishay.com/doc?22212</a>
UL-Test Certificate	<a href="http://www.vishay.com/doc?22213">www.vishay.com/doc?22213</a>



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