

## AC Line Rated Ceramic Disc Capacitors Class X1, 760 V<sub>AC</sub>, Class Y1, 500 V<sub>AC</sub>


**DESIGN SUPPORT TOOLS**
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QUICK REFERENCE DATA				
DESCRIPTION	VALUE			
Ceramic Class	1		2	
Ceramic Dielectric	N750	N750	Y5S, Y5T, Y5U	Y5S, Y5T, Y5U
Voltage (V <sub>AC</sub> )	500	760	500	760
Min. Capacitance (pF)	33		47	
Max. Capacitance (pF)	33		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 1 N750 (U2J)

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 60384-14.4

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 4<sup>th</sup> edition
- 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](http://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**

33 pF to 4.7 nF

**TOLERANCE ON CAPACITANCE**

± 10 %, ± 20 %

**RATED VOLTAGE**

- X1: 760 V<sub>AC</sub>, 50 Hz (IEC 60384-14.4)  
760 V<sub>AC</sub>, 50 Hz / 60 Hz (US/UL/CSA 60384-14)
- Y1: 500 V<sub>AC</sub>, 50 Hz (IEC 60384-14.4)  
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)

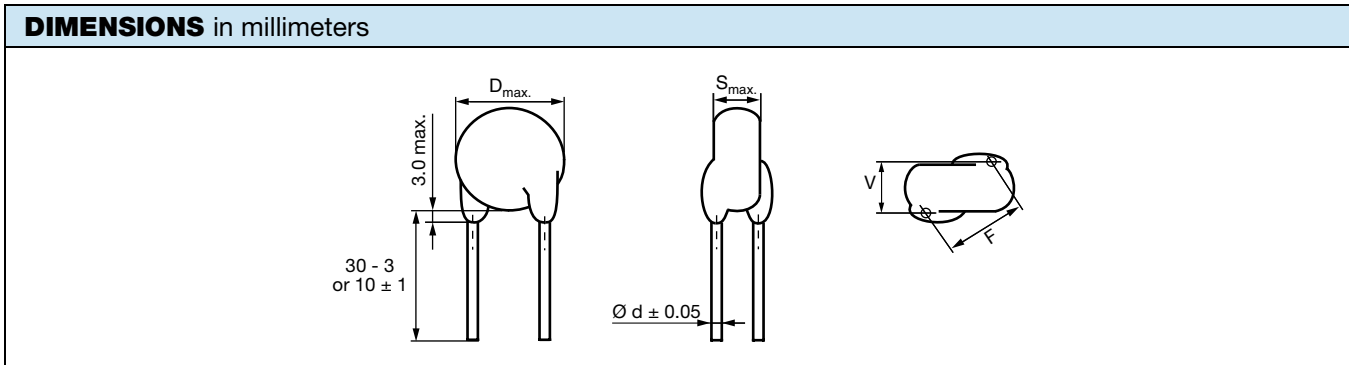
**INSULATION RESISTANCE AT 500 V<sub>DC</sub>**

≥ 10 000 MΩ (60 s)

**DISSIPATION FACTOR**

Class 1: max. 0.5 % (1 kHz)

Class 2: max. 2.5 % (1 kHz)



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>N750 (U2J)</b>								
33	± 10 %, ± 20 %	8.0	6.0	12.5	0.6	1.9	WKP330#CP###KR	
<b>Y5S (2C3)</b>								
47	± 10 %, ± 20 %	8.0	6.0	12.5	0.6	2.3	WKP470#CP###KR	
68							WKP680#CP###KR	
100							WKP101#CP###KR	
<b>Y5T (2D3)</b>								
150	± 10 %, ± 20 %	8.0	6.0	12.5	0.6	2.3	WKP151#CP###KR	
220							WKP221#CP###KR	
<b>Y5U (2E3)</b>								
330	± 10 %, ± 20 %	8.0	6.0	12.5	0.6	2.5	WKP331#CP###KR	
470		9.0					WKP471#CP###KR	
680		10.0					WKP681#CP###KR	
1000		12.0					WKP102#CP###KR	
1500		13.0					WKP152#CP###KR	
2200		15.0			WKP222#CP###KR			
3300		16.0			WKP332#CP###KR			
3900		18.0			WKP392#CP###KR			
4700						0.8	2.7	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							
#	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>WKP</b>	<b>222</b>	<b>M</b>	<b>CP</b>	<b>ED0</b>	<b>K</b>	<b>R</b>
	Series	Capacitance value	Tolerance code	Voltage code	Lead configuration	Internal code	RoHS compliant

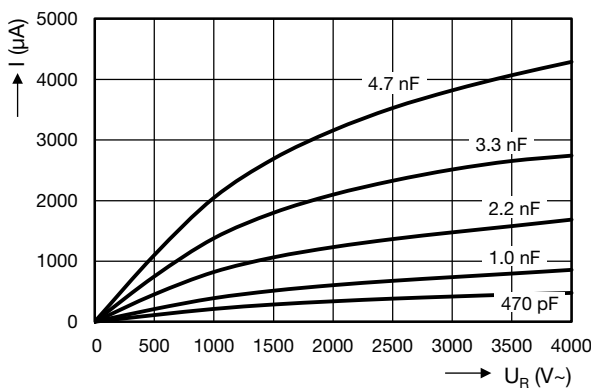
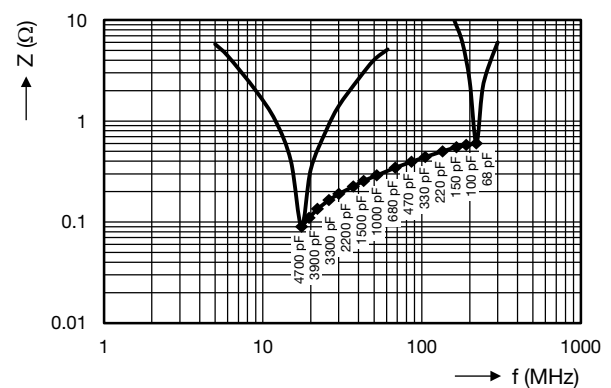
**MARKING**

WKP 33 pF to 1.5 nF

WKP 2.2 nF to 4.7 nF

Type: WKP222MCPRECKR LOT1: 032691 DC1: 1134  
 Cap.: 2200pF ±20% LOT2: DC2:  
 Ur.: 500/760VAC BATCH NO.: 201134CZ  
 Qty.: 600 REGION: 7032 S.L.: 0010  
 IEC 60 384-14/2: Y1 (500~), X1 (760~)  
 EN132400: 125°C cAuS  
 H=18+2, F=12.5  
 PN: WKP222MCPRECKR PO: 0031254565/0001 SN: 28032691B005

APPROVALS				
IEC 60384-14.4 - Safety tests This approval together with CB test certificate substitutes all national approvals.				
<b>CB Certificate</b>				
Y1-capacitor: CB test certificate:	US-26549-UL	33 pF to 4.7 nF	500 V <sub>AC</sub>	
X1-capacitor: CB test certificate:	US-26549-UL	33 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:	136493	33 pF to 4.7 nF	500 V <sub>AC</sub>	
X1-capacitor: VDE marks approval:	136493	33 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	33 pF to 4.7 nF	500 V <sub>AC</sub>	
X1-capacitor: UL-test certificate:	E183844	33 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?22214">www.vishay.com/doc?22214</a>
VDE Marks Approval	<a href="http://www.vishay.com/doc?22216">www.vishay.com/doc?22216</a>
UL Test Certificate	<a href="http://www.vishay.com/doc?22215">www.vishay.com/doc?22215</a>



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