

## AC Line Rated Ceramic Disc Capacitors Class X2, 400 V<sub>AC</sub>



QUICK REFERENCE DATA		
DESCRIPTION	VALUE	
Ceramic Class	2	
Ceramic Dielectric	Y5V	Z5U
Voltage (V <sub>AC</sub> )	400	400
Min. Capacitance (pF)	9000	10 000
Max. Capacitance (pF)	100 000	10 000
Mounting	Radial	

### INSULATION RESISTANCE

Min. 1000 ΩF

### TOLERANCE ON CAPACITANCE

± 20 %

### DISSIPATION FACTOR

2.0 % max. at 1 kHz; 1 V

### CERAMIC DIELECTRIC

Y5V

### CATEGORY TEMPERATURE RANGE

-25 °C to +125 °C

### CLIMATIC CATEGORY ACC. TO EN 60068-1

25 / 125 / 21

### OPERATING TEMPERATURE RANGE

-30 °C to +125 °C

### FEATURES

- Complying with IEC 60384-14
- High reliability
- Radial leads
- 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

- X2 according to IEC 60384-14
- Across-the-line
- RFI filtering
- EMI / RFI suppression

### DESIGN

The capacitors consist of a ceramic disc of which both sides are silver-plated. Connection leads are made of tinned copper having a diameter of 0.025" (0.64 mm). The capacitors may be supplied with radial kinked or straight leads having a lead spacing of 0.375" (9.5 mm) or 0.250" (6.4 mm). The standard tolerance is ± 20 %. Coating is made of flame retardant epoxy resin in accordance with "UL 94 V-0."

### CAPACITANCE RANGE

9 nF to 0.1 μF

### RATED VOLTAGE

IEC 60384-14:

X2: 400 V<sub>AC</sub>, 50 Hz

### DIELECTRIC STRENGTH BETWEEN LEADS

Component test:

1250 V<sub>AC</sub>, 50 Hz, 2 s

As repeated test admissible only once with:

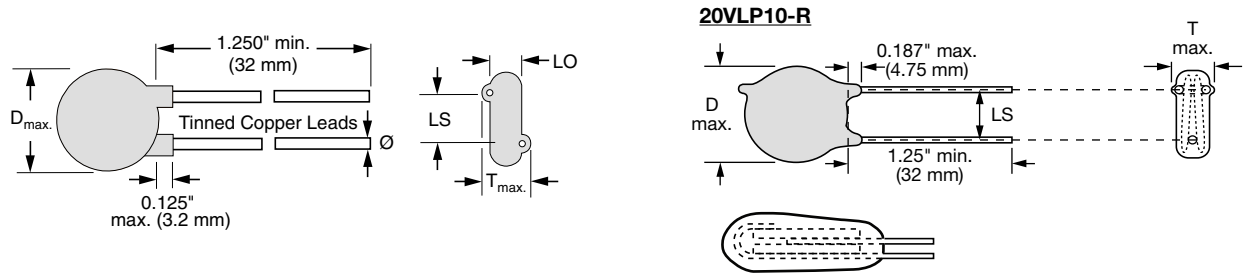
1080 V<sub>AC</sub>, 50 Hz, 2 s

Random sampling test (destructive test):

1250 V<sub>AC</sub>, 50 Hz, 60 s

### DIELECTRIC STRENGTH OF BODY INSULATION

2300 V<sub>AC</sub>, 50 Hz, 60 s (destructive test)

**DIMENSIONS** in inches (millimeters)

**ORDERING INFORMATION, CERAMIC X2 CAPACITORS 20VL**

C ( $\mu$ F)	TOL. (%)	D <sub>max.</sub> DIAMETER INCH (mm)	T <sub>max.</sub> THICKNESS INCH (mm)	WIRE SIZE		LS LEAD SPACE INCH (mm) $\pm 1$ mm	LO LEAD OFFSET INCH (mm) $\pm 0.5$ mm	ORDERING CODE
				AWG	INCH (mm)			
<b>Y5V</b>								
0.009	$\pm 20$	0.530 (13.5)	0.150 (3.8)	22	0.025 (0.64)	0.375 (9.5)	0.055 (1.4)	20VLD90-R
0.010	$\pm 20$	0.620 (15.7)	0.150 (3.8)				0.063 (1.6)	20VLS10-R
0.020	$\pm 20$	0.720 (18.3)	0.150 (3.8)				0.055 (1.4)	20VLS20-R
0.100	$\pm 20$	0.950 (24.1)	0.230 (5.8)				0.067 (1.7)	20VLP10-R
<b>Z5U</b>								
0.010	$\pm 20$	0.530 (13.5)	0.160 (4.1)	22	0.025 (0.64)	0.250 (6.4)	0.067 (1.7)	20VLS10-R

**Notes**

- Alternate lead spacings of 7.5 mm and 10 mm are available bulk or tape and reel on request
- Minimum lead clearance according to IEC 60384-14: 0.118" (3 mm)

**TAPE AND REEL OPTIONS**

Part number codes and specifications for tape and reel packaging are found in the general information document - find web-link below.

**APPROVALS**

IEC 60384-14 - Safety tests

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

**CB Certificate**

 X2-capacitor: CB test certificate: DE1-63496 9 nF to 0.1  $\mu$ F 400 V<sub>AC</sub>

**VDE**

X2-capacitor: VDE marks approval:

 40003982 9 nF to 0.1  $\mu$ F 400 V<sub>AC</sub>

DIN EN 60384-14 VDE 0565-1-1 - Safety tests


**Underwriters Laboratories Inc.**

X2-capacitor: UL test certificate:

 E99264 9 nF to 0.1  $\mu$ F 400 V<sub>AC</sub>

UL 60384-14, CSA E60384-1, CSA E60384-14





MARKING	
<p>Sample</p> <div style="border: 1px solid black; border-radius: 50%; width: 150px; height: 150px; margin: 20px auto; text-align: center;"> <p>CM</p> <p>20VL                      203M</p> <p>IEC 60384-14</p> <p> X2 400V~</p> <p>XX - XXX</p> </div>	<div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>PN:20VLP10-R Cap.:100NF ±20% Ur.:X2(400~) Qty.:125 IEC 60384-14:2013:  PO:0034761587/0001</p> </div> <div style="width: 45%;"> <p>LOT1:34761587 DC1:1949 LOT2: DC2: BATCH NO.:201949CZ R.C.:7032 S.L.:0010</p> <p>SN:292126873015</p> </div> </div> <div style="text-align: right; margin-top: 10px;">   </div>

**Notes**

- Marking IEC 60384-14 does not apply for  $\varnothing \leq 9$  mm
- Coding is as follows: 1<sup>st</sup> figure indicates the year and 2<sup>nd</sup> figure indicates the month according to IEC 60062. The 3<sup>rd</sup> to 5<sup>th</sup> figure indicate the last three digits of the lot number

RELATED DOCUMENTS	
General Information	<a href="http://www.vishay.com/doc?23140">www.vishay.com/doc?23140</a>
CB Test Certificate	<a href="http://www.vishay.com/doc?22247">www.vishay.com/doc?22247</a>
VDE Marks Approval	<a href="http://www.vishay.com/doc?22246">www.vishay.com/doc?22246</a>
UL Test Certificate	<a href="http://www.vishay.com/doc?22245">www.vishay.com/doc?22245</a>



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