

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


**FEATURES**

- Complying with IEC 60384-14 3<sup>rd</sup> edition
- High reliability
- Radial leads
- 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 a ceramic disc of which both sides are silver-plated. Connection leads are made of tinned copper having a diameter of 0.032" (0.81 mm). The capacitors may be supplied with radial kinked or straight leads having a lead spacing of 0.375" (9.5 mm). The standard tolerances are ± 10 % or ± 20 %. Coating is made of flame retardant epoxy resin in accordance with "UL 94 V-0".

QUICK REFERENCE DATA				
DESCRIPTION	VALUE			
Ceramic Class	1		2	
Ceramic Dielectric	C0G, U2J, P3K, R3L	C0G, U2J, P3K, R3L	X7R, Y5U	X7R, Y5U
Voltage (V <sub>AC</sub> )	500	760	500	760
Min. Capacitance (pF)	10		68	
Max. Capacitance (pF)	47		10 000	
Mounting	Radial			

**INSULATION RESISTANCE**

Min. 1000 ΩF

**TOLERANCE ON CAPACITANCE**

± 10 %; ± 20 %

**DISSIPATION FACTOR**

2.0 % max. at 1 kHz; 1 V

**CERAMIC DIELECTRIC**

 C0G, U2J, P3K, R3L (class 1)  
 X7R, Y5U (class 2)

**OPERATING TEMPERATURE RANGE**

- 30 °C to + 125 °C

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

25/125/21

**CAPACITANCE RANGE**

10 pF to 0.01 μF

**RATED VOLTAGE**

IEC 60384-14.3:

- X1: 760 V<sub>AC</sub>, 50 Hz
- Y1: 500 V<sub>AC</sub>, 50 Hz

**DIELECTRIC STRENGTH BETWEEN LEADS**

Component test:

 4000 V<sub>AC</sub>, 50 Hz, 2 s

As repeated test admissible only once with:

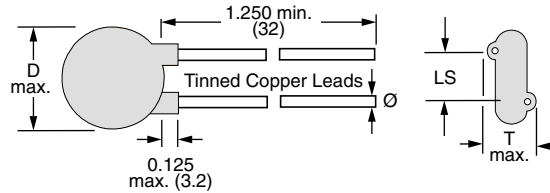
 3600 V<sub>AC</sub>, 50 Hz, 2 s

Random sampling test (destructive test):

 4000 V<sub>AC</sub>, 50 Hz, 60 s

**DIELECTRIC STRENGTH OF BODY INSULATION**

 4000 V<sub>AC</sub>, 50 Hz, 60 s (destructive test)

**DIMENSIONS** in inches (millimeters)

**ORDERING INFORMATION, CERAMIC X1/Y1 CAPACITORS 440L**

C (pF)	TOL. (%)	D <sub>max.</sub> DIAMETER INCH (mm)	T <sub>max.</sub> THICKNESS INCH (mm)	WIRE SIZE		LS LEAD SPACE INCH (mm)	ORDERING CODE
				AWG	INCH (mm)		
<b>C0G</b>							
10	± 10	0.330 (8.4)	0.195 (5.0)	20	0.032 (0.81)	0.375 (9.5)	440LQ10-R
<b>U2J</b>							
15	± 10	0.330 (8.4)	0.210 (5.3)	20	0.032 (0.81)	0.375 (9.5)	440LQ15-R
<b>P3K</b>							
22	± 10	0.330 (8.4)	0.190 (4.8)	20	0.032 (0.81)	0.375 (9.5)	440LQ22-R
<b>R3L</b>							
33	± 10	0.330 (8.4)	0.200 (5.1)	20	0.032 (0.81)	0.375 (9.5)	440LQ33-R
47	± 10	0.330 (8.4)	0.180 (4.6)	20	0.032 (0.81)	0.375 (9.5)	440LQ47-R
<b>X7R</b>							
68	± 10	0.330 (8.4)	0.220 (5.6)	20	0.032 (0.81)	0.375 (9.5)	440LQ68-R
100			0.220 (5.6)				440LT10-R
150			0.235 (6.0)				440LT15-R
220			0.235 (6.0)				440LT22-R
330			0.225 (5.7)				440LT33-R
<b>Y5U</b>							
470	± 20	0.330 (8.4)	0.230 (5.8)	20	0.032 (0.81)	0.375 (9.5)	440LT47-R
560		0.330 (8.4)	0.230 (5.8)				440LT56-R
680		0.330 (8.4)	0.235 (6.0)				440LT68-R
1000		0.365 (9.3)	0.220 (5.6)				440LD10-R
1500		0.365 (9.3)	0.220 (5.6)				440LD15-R
2000		0.400 (10.2)	0.220 (5.6)				440LD20-R
2200		0.430 (10.9)	0.225 (5.7)				440LD22-R
2700		0.460 (11.7)	0.225 (5.7)				440LD27-R
2800		0.460 (11.7)	0.220 (5.6)				440LD28-R
3000		0.490 (12.4)	0.225 (5.7)				440LD30-R
3200		0.490 (12.4)	0.220 (5.6)				440LD32-R
3300		0.490 (10.9)	0.215 (5.5)				440LD33-R
3900		0.530 (13.5)	0.220 (5.6)				440LD39-R
4000		0.530 (13.5)	0.220 (5.6)				440LD40-R
4700		0.620 (15.7)	0.230 (5.8)				440LD47-R
5000		0.620 (15.7)	0.225 (5.7)				440LD50-R
5500		0.680 (17.3)	0.230 (5.8)				440LD55-R
5600		0.680 (17.3)	0.230 (5.8)				440LD56-R
6800		0.720 (18.3)	0.235 (6.0)				440LD68-R
8000		0.720 (18.3)	0.220 (5.6)				440LD80-R
9000	0.790 (20.1)	0.225 (5.7)	440LD90-R				
0.01 μF		0.850 (21.6)	0.230 (5.8)				440LS10-R

**Notes**

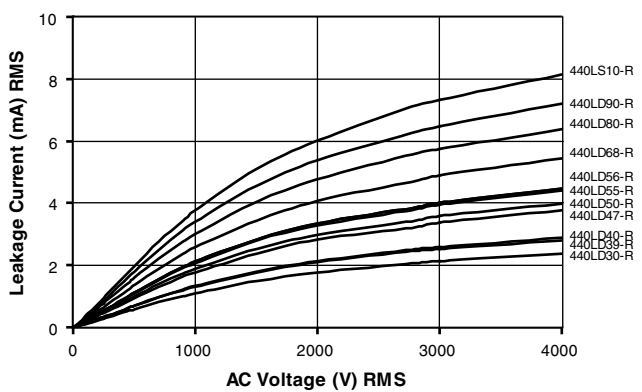
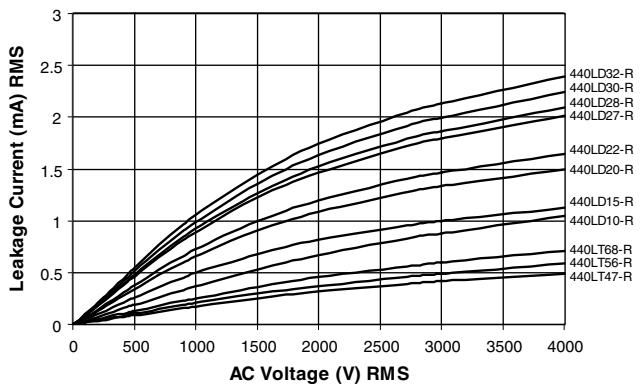
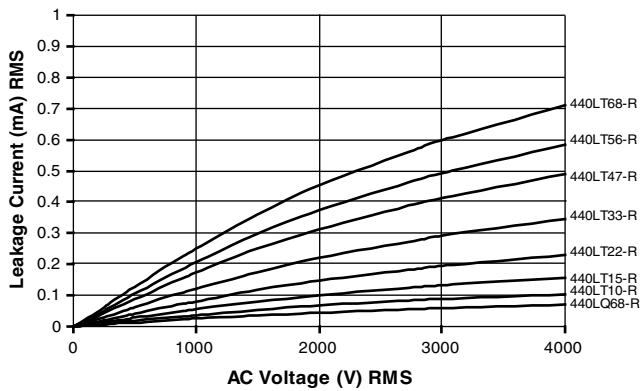
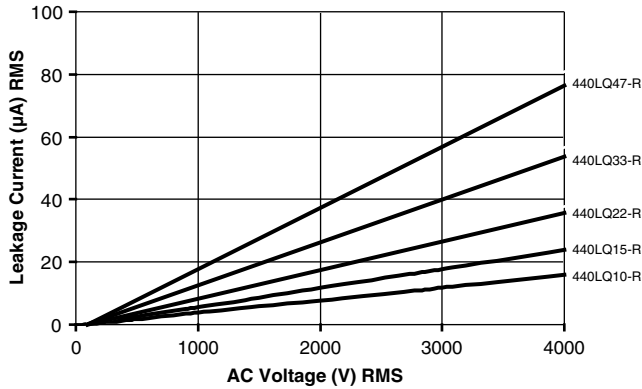
- Alternate lead spacings are available bulk or tape and reel on request.
- Minimum lead clearance according to IEC 60384-14: 0.315" (8 mm)

**TAPE AND REEL OPTIONS**

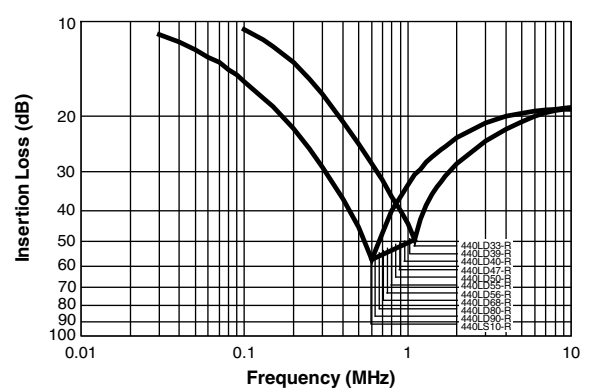
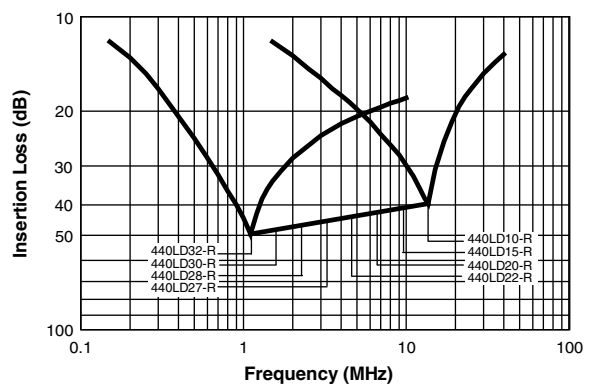
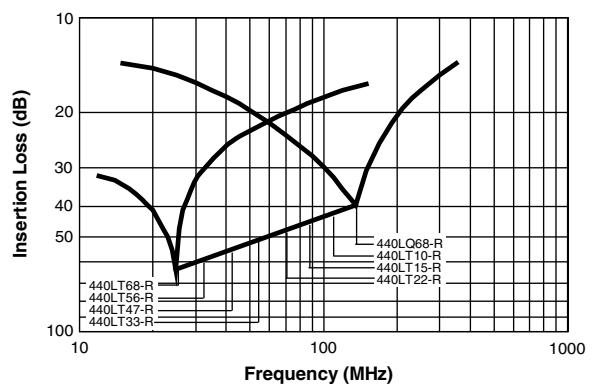
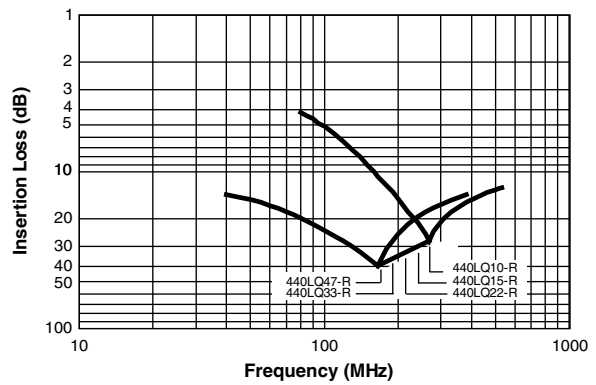
Part number codes and specifications for tape and reel packaging are found in the general information document - find web-link below.



### LEAKAGE CURRENT VS. VOLTAGE (Typical)



### INSERTION LOSS VS. FREQUENCY (Typical)





APPROVALS				
IEC 60384-14.3 - Safety tests This approval together with CB test certificate substitutes all national approvals.				
<b>CB Certificate</b>				
Y1-capacitor: CB test certificate:	CA/14105/CSA	10 pF to 10 nF	500 V <sub>AC</sub>	
X1-capacitor: CB test certificate:	CA/14105/CSA	10 pF to 10 nF	760 V <sub>AC</sub>	
<b>VDE</b>				
Y1-capacitor: VDE marks approval:	40003985	10 pF to 10 nF	500 V <sub>AC</sub>	
X1-capacitor: VDE marks approval:	40003985	10 pF to 10 nF	400 V <sub>AC</sub>	
DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests				
<b>Underwriters Laboratories Inc.</b>				
Y1-capacitor: UL test certificate:	E99264	10 pF to 10 nF	500 V <sub>AC</sub>	
X1-capacitor: UL test certificate:	E99264	10 pF to 10 nF	760 V <sub>AC</sub>	
UL 60384-14, CSA E60384-1:03, CSA E60384-14:09				
Fixed capacitors for electromagnetic interference suppression and connection to the supply mains.				

MARKING	
<p>Sample</p>	<p>Type: 571C085B251AY103MLA612-R</p> <p>CM PN: 440LS10-R E3      LOT1: 11647764      DC1: 0622</p> <p>Qty.: 100      LOT2:      DC2:</p> <p>IEC60384-14/2:      R.C.: 7032 S.L.: 0010      Op.No.: 771      SN: 29001BB14024</p> <p>Y1 (500~), X1 (400~)      BATCH NO.: 200622GZ            RoHS</p> <p>   LR62016      PN: 440LS10-R      PO: 0011647764/0001</p>

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?22237">www.vishay.com/doc?22237</a>
VDE Marks Approval	<a href="http://www.vishay.com/doc?22238">www.vishay.com/doc?22238</a>
UL Test Certificate	<a href="http://www.vishay.com/doc?22239">www.vishay.com/doc?22239</a>



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