

## AC Line Rated Ceramic Disc Capacitors Class X1, 400 V<sub>AC</sub>/Class Y4, 125 V<sub>AC</sub>


**RoHS  
COMPLIANT**
**FEATURES**

- Worldwide safety agency recognition  
Underwriters laboratories - UL 1414  
Canadian standards association - CSA 22.2  
European EN132400 to IEC 60384-14 2<sup>nd</sup> edition
- Complete range of capacitance values
- Radial leads
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**APPLICATIONS**

- Required in AC power supply and filter applications
- Specific industry requirements

**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) or 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  $\pm 20\%$ . Coating is made of flame retardant epoxy resin in accordance with "UL 94 V-0".

**CAPACITANCE RANGE**

 1.0 nF to 0.050  $\mu$ F

**RATED VOLTAGE**

IEC 60384-14.2: (Y4): 125 V<sub>AC</sub>, 50 Hz  
 IEC 60384-14.2: (X1): 400 V<sub>AC</sub>, 50 Hz  
 UL 1414: 250 V<sub>AC</sub>, 60 Hz  
 CSA 22.2 No.1: 125 V<sub>AC</sub>/250 V<sub>AC</sub>, 60 Hz

**DIELECTRIC STRENGTH BETWEEN LEADS**

Component test:  
 2000 V<sub>AC</sub>, 50 Hz, 2 s  
 As repeated test admissible only once with:  
 1800 V<sub>AC</sub>, 50 Hz, 2 s  
 Random sampling test (destructive test):  
 2000 V<sub>AC</sub>, 50 Hz, 60 s

**DIELECTRIC STRENGTH OF BODY INSULATION**

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

QUICK REFERENCE DATA			
DESCRIPTION	VALUE		
Ceramic Class	2		
Ceramic Dielectric	Y5V		
Voltage (V <sub>AC</sub> )	125	250	400
Min. Capacitance (pF)	1000		
Max. Capacitance (pF)	50 000		
Mounting	Through hole		

**INSULATION RESISTANCE**

 Min. 1000  $\Omega$ F

**TOLERANCE ON CAPACITANCE**
 $\pm 20\%$ 
**DISSIPATION FACTOR**

2.0 % max. at 1 kHz; 1 V

**CERAMIC DIELECTRIC**

Y5V (Class 2)

**CATEGORY TEMPERATURE RANGE**

- 25 °C to + 125 °C

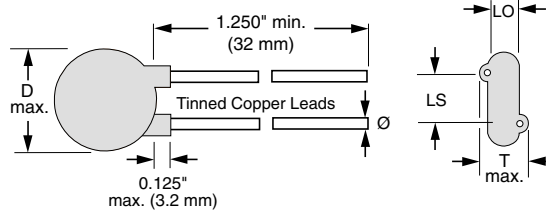
**CLIMATIC CATEGORY ACC. TO EN60068-1**

25/125/21

**OPERATING TEMPERATURE RANGE**

- 30 °C to + 125 °C

### DIMENSIONS in inches (millimeters)



LO' = 0.132" (3.4 mm) typ.

### ORDERING INFORMATION, CERAMIC X1/Y4 CAPACITORS 125L

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>Y5V</b>								
1000	± 20 %	0.330 (8.4)	0.195 (5.0)	20	0.032 (0.81)	0.250 (6.4)	125LD10-R	
1500		0.330 (8.4)	0.195 (5.0)				125LD15-R	
2000		0.330 (8.4)	0.188 (4.8)				125LD20-R	
2200		0.330 (8.4)	0.182 (4.7)				125LD22-R	
3300		0.365 (9.3)	0.195 (5.0)				125LD33-R	
4700		0.400 (10.2)	0.185 (4.7)				125LD47-R	
5000		0.430 (11.0)	0.195 (5.0)			125LD50-R		
6800		0.490 (12.5)	0.198 (5.1)			125LD68-R		
8200		0.530 (13.5)	0.193 (5.0)			125LD82-R		
0.010 μF		0.560 (14.3)	0.195 (5.0)			125LS10-R		
0.015 μF		0.720 (18.3)	0.205 (5.3)			125LS15-R		
0.018 μF		0.790 (20.1)	0.205 (5.3)			125LS18-R		
0.020 μF		0.720 (18.3)	0.250 (6.4)			22	0.025 (0.64)	125LS20-R
0.022 μF		0.790 (20.1)	0.192 (4.9)			20	0.032 (0.81)	125LS22-R
0.030 μF		0.720 (18.3)	0.240 (6.1)			22	0.025 (0.64)	125LS30-R
0.050 μF		0.925 (23.5)	0.275 (7.0)			22	0.025 (0.64)	125LS50-R

#### Notes

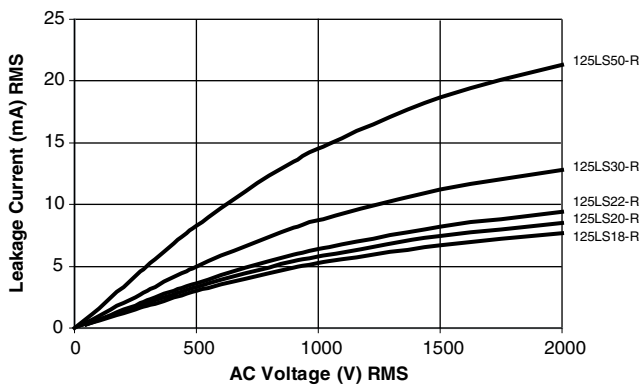
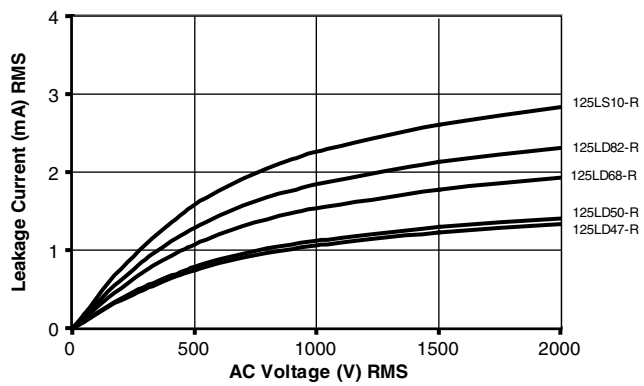
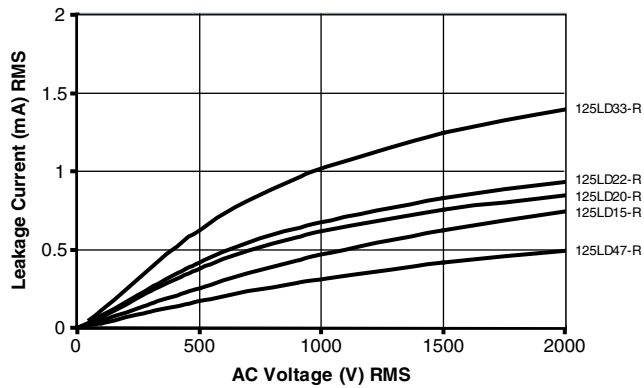
- Alternate lead spacings of 7.5 mm and 10 mm are available bulk or tape and reel on request.
- European required minimum lead clearance (prevents use of inside crimp) 0.118" (3 mm)

#### TAPE AND REEL OPTIONS

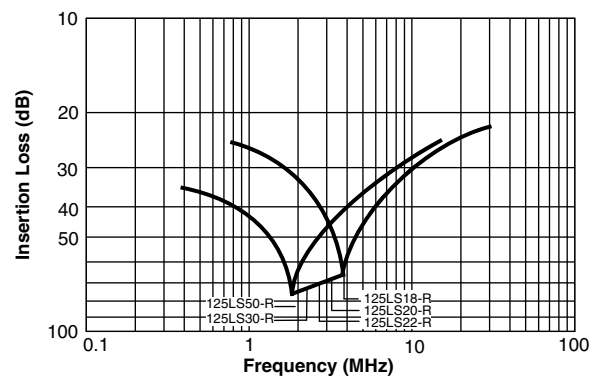
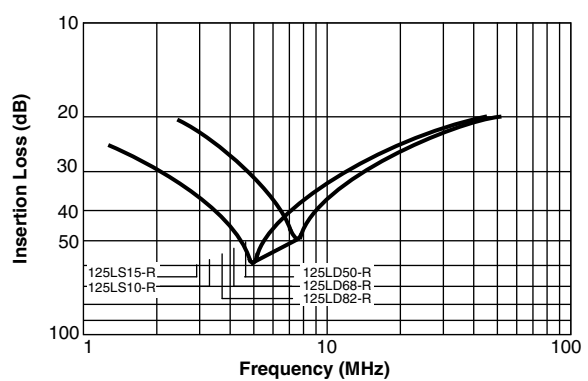
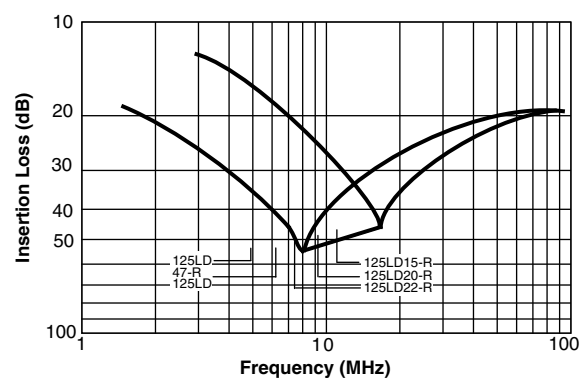
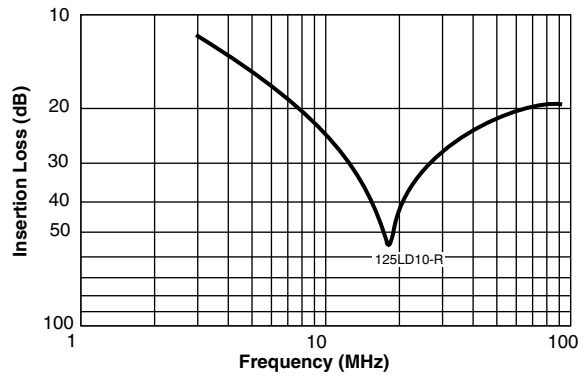
To specify tape and reel, add two letter suffix to the ordering code (for details of the packaging code see general section of the catalog)



### LEAKAGE CURRENT VS. VOLTAGE (TYPICAL)



### INSERTION LOSS VS. FREQUENCY (TYPICAL)



<b>APPROVALS</b>						
IEC 60384 - 14/2 <sup>nd</sup> Issue (1993) incl. Am.1 (1995) - Safety Tests EN132400 (1994) - Safety Tests						
That approval together with CB Test Certificate substitutes the national approval of the following nations:						
Belgium	France	Italy	Austria	China	Japan	Spain
Denmark	Greece	Luxembourg	Portugal	Singapore	Poland	United Kingdom
Germany	Ireland	Netherlands	Sweden	Slovenia	Hungaria	Czech Republic
Finland	Iceland	Norway	Switzerland	Korea	Israel	
X1 Capacitor: CB-Test Certificate:		DE 1-19447	1000 pF to 0.05 µF	400 V <sub>AC</sub>		
Y4 Capacitor: CB-Test Certificate:		DE 1-19447	1000 pF to 0.05 µF	125 V <sub>AC</sub>		
<b>UNDERWRITERS LABORATORIES INC.</b>						
<b>UL 1414</b>	Line-by-pass component Agency File/License	E99264	1000 pF to 0.05 µF	250 V <sub>AC</sub>		
<b>CANADIAN STANDARDS ASSOCIATION</b>						
<b>CSA C22.2 No. 1</b>	Isolation component Agency File/License	LR 62016	1000 pF to 0.05 µF	250 V <sub>AC</sub>		

**Notes**

UL1414 Across-The-Line, Antenna Coupling, and Line-By-Pass Capacitors:

- Across-The-Line - a capacitor connected either across a supply circuit or between one side of a supply circuit and a conductive part that may be connected to earth ground.
- Antenna-Coupling - a capacitor connected from an antenna terminal to circuits within an appliance.
- Line-By-Pass - a capacitor connected between one side of a supply circuit and an accessible conductive part.

IEC 60384-14 Subclass Y Capacitors:

- A capacitor of a type suitable for use in situations where failure of the capacitor could lead to danger of electric shock.
- Class Y capacitors are divided into subclasses based on type of insulation bridged and voltage ranges.
- For definitions of basic, supplementary, double and reinforced insulation, see IEC publication 536.
- Subclass Y capacitors may be used in applications which require a subclass X rating.

IEC 60384-14 Subclass X Capacitors:

- A capacitor of a type suitable for use in situations where failure of the capacitor in situations where failure of the capacitor would not lead to danger of electric shock.
- Class X capacitors are divided into subclasses according to the peak impulse test voltage superimposed on the main voltage.

<b>MARKING</b>	
<p>Sample</p>	<p><b>VISHAY</b></p> <p>Type: 040C085B251AY202MLA010 - R</p> <p>CM PN: 125LD20 - R E3      LOT1: 11642584      DC1: 0622</p> <p>Qty. : 250      IEC60384 - 14 / 2:      LOT2:      DC2:      S.N.: 290R1A6D8012</p> <p>Y4 ( 125~ ), X1 ( 400~ )      R.C. : 7032      S.L. : 0010      Op.No. : 771</p> <p>   LR62016      BATCH NO. : 200622CZ       </p> <p>PN: 125LD20 - R      PO: 0011642584 / 0001      <b>RoHS</b></p>



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