

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



### FEATURES

- Worldwide safety agency recognition  
Underwriters Laboratories UL 1283  
Canadian Standards Association - CSA 22.2  
European EN132400 to IEC 60384-14 second edition
- Complete range of capacitance values
- Radial leads
- Compliant to RoHS Directive 2002/95/EC


**RoHS**  
COMPLIANT

### 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 0.025" (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."

| QUICK REFERENCE DATA       |              |          |
|----------------------------|--------------|----------|
| DESCRIPTION                | VALUE        |          |
| Ceramic Class              | 2            |          |
| Ceramic Dielectric         | Y5V          | Z5U      |
| Voltage (V <sub>AC</sub> ) | 250, 400     | 250, 400 |
| Min. Capacitance (pF)      | 9000         | 10 000   |
| Max. Capacitance (pF)      | 100 000      | 10 000   |
| 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, Z5U (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

### CAPACITANCE RANGE

9 nF to 0.1  $\mu$ F

### RATED VOLTAGE

IEC 60384-14.12: (X2): 400 V<sub>AC</sub>, 50 Hz

UL 1238: 250 V<sub>AC</sub>, 60 Hz

CSA 22.2 No.8: 250 V<sub>AC</sub>, 60 Hz

### DIELECTRIC STRENGTH BETWEEN LEADS

Component test:

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

As repeated test admissible only once with:

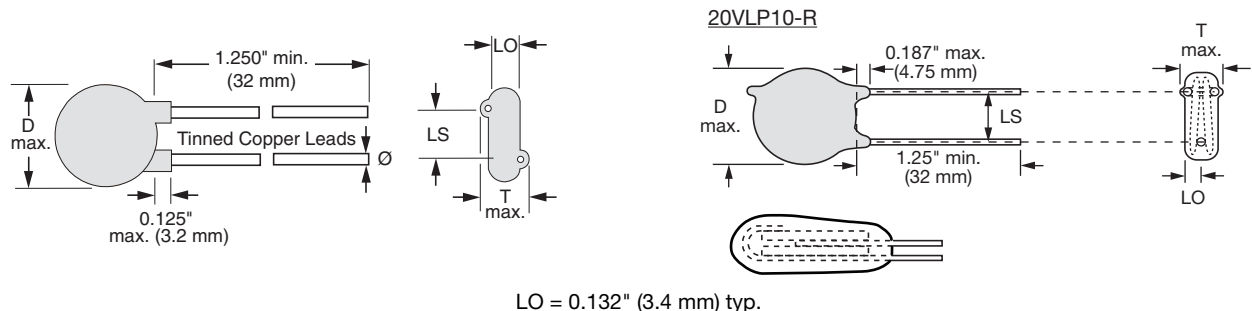
1080 V<sub>AC</sub>, 50 Hz, 2 s

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<br>( $\mu$ F) | TOL.<br>(%) | D<br>DIAMETER<br>INCH (mm) | T<br>THICKNESS<br>INCH (mm) | WIRE SIZE |              | LS<br>LEAD SPACE<br>INCH (mm) | ORDERING<br>CODE         |
|-----------------|-------------|----------------------------|-----------------------------|-----------|--------------|-------------------------------|--------------------------|
| Y5V             |             |                            |                             |           |              |                               |                          |
| 0.009           | $\pm 20$    | 0.530 (13.5)               | 0.150 (3.8)                 | 22        | 0.025 (0.64) | 0.375 (9.5)                   | 20VLD90-R                |
| 0.010           | $\pm 20$    | 0.620 (15.7)               | 0.150 (3.8)                 |           |              |                               | 20VLS10-R                |
| 0.020           | $\pm 20$    | 0.720 (18.3)               | 0.150 (3.8)                 |           |              |                               | 20VLS20-R                |
| 0.100           | $\pm 20$    | 0.940 (23.9)               | 0.240 (6.1)                 |           |              |                               | 20VLP10-R <sup>(1)</sup> |
| Z5U             |             |                            |                             |           |              |                               |                          |
| 0.010           | $\pm 20$    | 0.530 (13.5)               | 0.160 (4.1)                 | 22        | 0.025 (0.64) | 0.250 (6.4)                   | 20VLSS10-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)
- (1) 20VLP10-R not available with CSA 22.2 no. 8 recognition

**TAPE AND REEL OPTIONS**

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

**APPROVALS**

IEC 60384 - 14/2nd 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   |                |

X2 Capacitor: CB-Test Certificate:

DE 1-19450

9000 pF to 0.1  $\mu$ F

400 V<sub>AC</sub>

**UNDERWRITERS LABORATORIES INC.**
**UL 1238**

EMI filters  
Agency File/  
License

E128046 V1S1

9000 pF to 0.1  $\mu$ F

250 V<sub>AC</sub>

**CANADIAN STANDARDS ASSOCIATION**
**CSA C22.8**

EMI filters  
Agency File/  
License

LR 62016-3

9000 pF to 0.020  $\mu$ F

250 V<sub>AC</sub>

**Note**

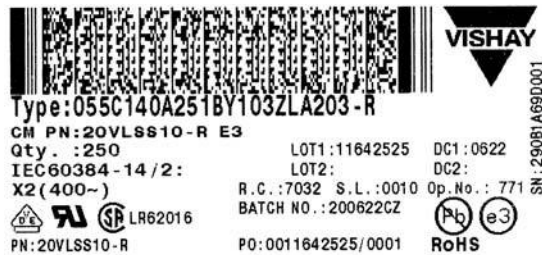
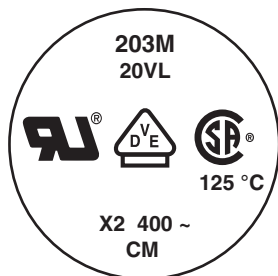
IEC 60384-14 subclass X capacitors:

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



MARKING

Sample





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