

## AC Line Rated Disc Capacitors

### Class X1, 400 V<sub>AC</sub> / Class Y2, 300 V<sub>AC</sub> / 250 V<sub>AC</sub>


**RoHS**  
COMPLIANT

#### FEATURES

- Complying with IEC 60384-14 3<sup>rd</sup> edition
- High reliability
- Complete range of capacitance values
- 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)

#### APPLICATIONS

- X1 / Y2 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) 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 0.01  $\mu$ F

#### RATED VOLTAGE

IEC 60384-14.3:

- X1: 400 V<sub>AC</sub>, 50 Hz
- Y2: 300 V<sub>AC</sub>, 50 Hz (LS  $\geq 5.5$  mm)
- Y2: 250 V<sub>AC</sub>, 50 Hz (LS < 5.5 mm)

#### DIELECTRIC STRENGTH BETWEEN LEADS

Component test:

2500 V<sub>AC</sub>, 50 Hz, 2 s

As repeated test admissible only once with:

2250 V<sub>AC</sub>, 50 Hz, 2 s

Random sampling test (destructive test):

2500 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         | Y5U    | Y5U | Y5U | Y5V    | Y5V | Y5V |
| Voltage (V <sub>AC</sub> ) | 250    | 300 | 400 | 250    | 300 | 400 |
| Min. Capacitance (pF)      | 1000   |     |     | 4700   |     |     |
| Max. Capacitance (pF)      | 10 000 |     |     | 10 000 |     |     |
| Mounting                   | Radial |     |     |        |     |     |

#### INSULATION RESISTANCE

Min. 1000  $\Omega$ F

#### TOLERANCE ON CAPACITANCE

 $\pm 20\%$ 

#### DISSIPATION FACTOR

2.0 % max. at 1 kHz; 1 V

#### CERAMIC DIELECTRIC

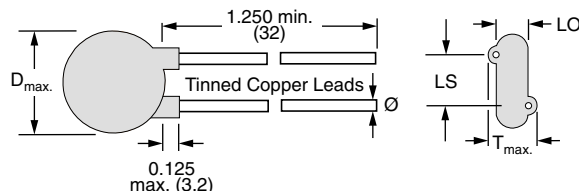
Y5U, Y5V (Class 2)

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

25/125/21

#### OPERATING TEMPERATURE RANGE

-30 °C to +125 °C

**DIMENSIONS** in inches (millimeters)

**ORDERING INFORMATION, CERAMIC X1 / Y2 CAPACITORS 30LVS**

| C<br>(pF) | TOL.<br>(%) | D <sub>max.</sub><br>DIAMETER<br>INCH (mm) | T <sub>max.</sub><br>THICKNESS<br>INCH (mm) | WIRE SIZE   |              | LS<br>LEAD SPACE<br>INCH (mm)<br>± 1 mm | LO<br>LEAD OFFSET<br>INCH (mm)<br>± 0.5 mm | ORDERING<br>CODE |
|-----------|-------------|--------------------------------------------|---------------------------------------------|-------------|--------------|-----------------------------------------|--------------------------------------------|------------------|
|           |             |                                            |                                             | AWG         | INCH (mm)    |                                         |                                            |                  |
| Y5U       |             |                                            |                                             |             |              |                                         |                                            |                  |
| 1000      | ± 20        | 0.330 (8.4)                                | 0.195 (5.0)                                 | 22          | 0.025 (0.64) | 0.250 (6.4)                             | 0.098 (2.5)                                | 30LVSD10-R       |
| 1500      |             | 0.330 (8.4)                                | 0.185 (4.7)                                 |             |              |                                         | 0.091 (2.3)                                | 30LVSD15-R       |
| 2000      |             | 0.330 (8.4)                                | 0.180 (4.6)                                 |             |              |                                         | 0.083 (2.1)                                | 30LVSD20-R       |
| 2200      |             | 0.330 (8.4)                                | 0.170 (4.3)                                 |             |              |                                         | 0.079 (2.0)                                | 30LVSD22-R       |
| 2700      |             | 0.365 (9.3)                                | 0.180 (4.6)                                 |             |              |                                         | 0.083 (2.1)                                | 30LVSD27-R       |
| 2800      |             | 0.365 (9.3)                                | 0.175 (4.4)                                 |             |              |                                         | 0.079 (2.0)                                | 30LVSD28-R       |
| 3000      |             | 0.400 (10.2)                               | 0.180 (4.6)                                 |             |              |                                         | 0.083 (2.1)                                | 30LVSD30-R       |
| 3200      |             | 0.400 (10.2)                               | 0.180 (4.6)                                 |             |              |                                         | 0.091 (2.3)                                | 30LVSD32-R       |
| 3300      |             | 0.400 (10.2)                               | 0.175 (4.4)                                 |             |              |                                         | 0.083 (2.1)                                | 30LVSD33-R       |
| 3900      |             | 0.460 (11.7)                               | 0.185 (4.7)                                 |             |              |                                         | 0.098 (2.5)                                | 30LVSD39-R       |
| 4000      |             | 0.490 (12.4)                               | 0.190 (4.8)                                 |             |              |                                         | 0.102 (2.6)                                | 30LVSD40-R       |
| 4700      |             | 0.490 (12.4)                               | 0.185 (4.7)                                 |             |              |                                         | 0.094 (2.4)                                | 30LVSD47-R       |
| 5000      |             | 0.530 (13.5)                               | 0.190 (4.8)                                 |             |              |                                         | 0.098 (2.5)                                | 30LVSD50-R       |
| 5500      |             | 0.530 (13.5)                               | 0.180 (4.6)                                 |             |              |                                         | 0.091 (2.3)                                | 30LVSD55-R       |
| 6800      |             | 0.620 (15.7)                               | 0.200 (5.1)                                 |             |              |                                         | 20                                         | 0.032 (0.81)     |
| 0.010 μF  |             | 0.720 (18.3)                               | 0.200 (5.1)                                 | 0.102 (2.6) | 30LVSS10-R   |                                         |                                            |                  |
| Y5V       |             |                                            |                                             |             |              |                                         |                                            |                  |
| 4700      | ± 20        | 0.430 (10.9)                               | 0.185 (4.7)                                 | 22          | 0.025 (0.64) | 0.250 (6.4)                             | 0.091 (2.3)                                | 30LVSD47-R       |
| 0.010 μF  | ± 20        | 0.620 (15.7)                               | 0.200 (5.1)                                 | 20          | 0.032 (0.81) | 0.375 (9.5)                             | 0.098 (2.5)                                | 30LVSVS10-R      |

**Notes**

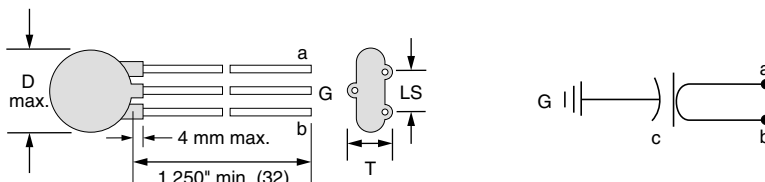
- Alternate lead spacings of 7.5 mm and 10 mm are available bulk or tape and reel on request.
- Minimum lead clearance according to IEC 60384-14: 0.118" (3 mm)

**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.

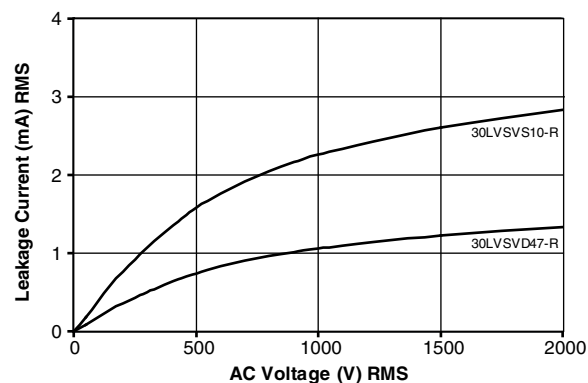
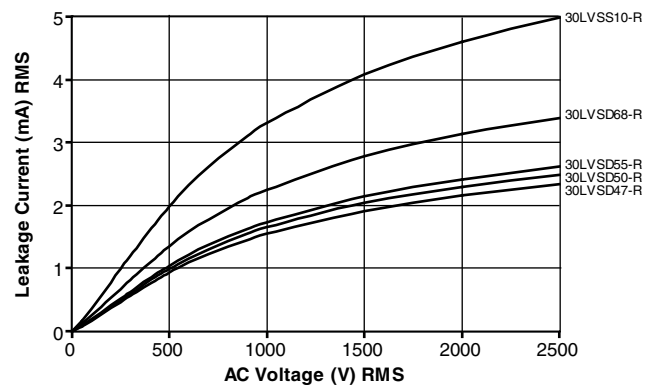
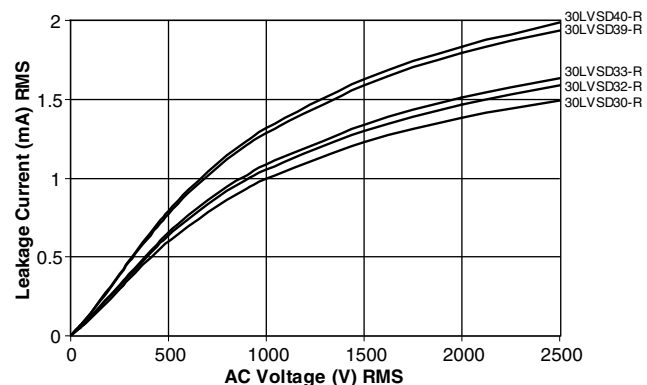
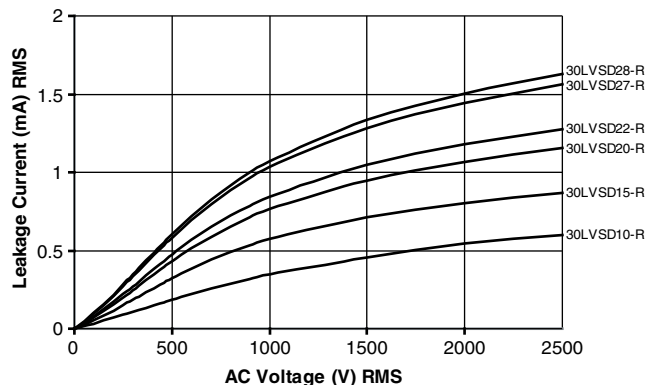
**OPTIONAL 3-LEADED STYLE**

An optional 3-leaded construction is available. It consists of a single capacitor with the two outside leads attached to one electrode, and the center lead attached to the electrode. Used in feed-thru or line-to-ground applications, it allows a short ground lead for enhanced high frequency performance.

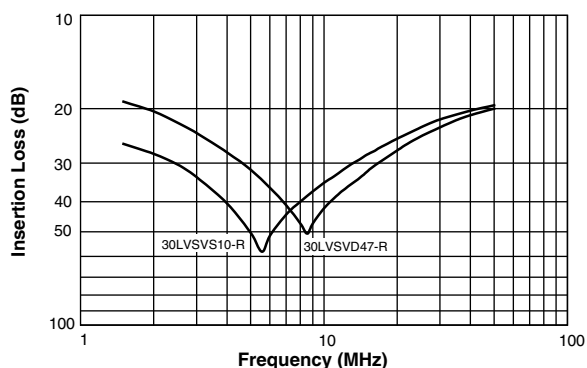
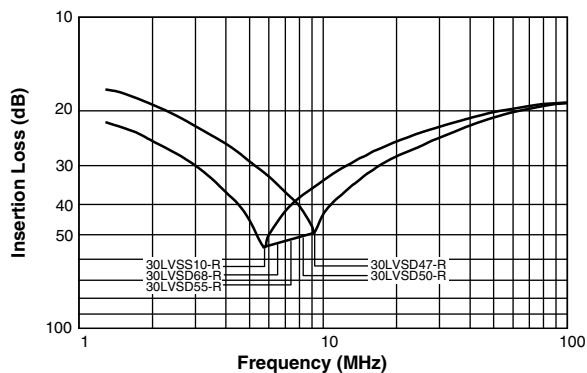
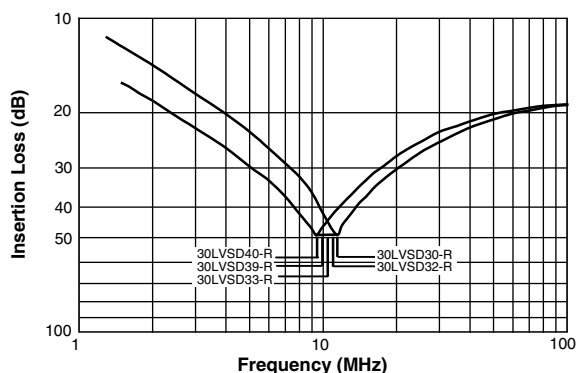
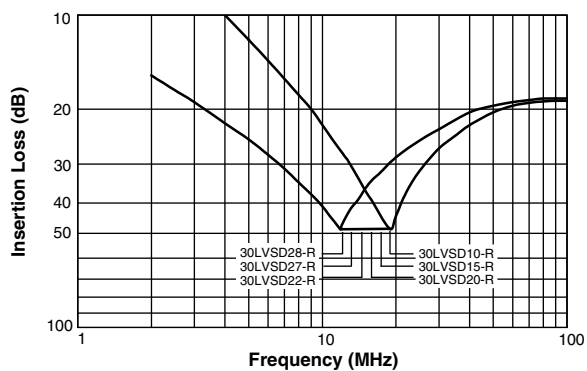




**LEAKAGE CURRENT VS. VOLTAGE (Typical)**



**INSERTION LOSS VS. FREQUENCY (Typical)**



**APPROVALS**

IEC 60384-14.3 - Safety tests

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

**CB Certificate**

|                                    |              |               |                                    |
|------------------------------------|--------------|---------------|------------------------------------|
| Y2-capacitor: CB test certificate: | CA/14038/CSA | 1 nF to 10 nF | 300 V <sub>AC</sub> <sup>(1)</sup> |
| Y2-capacitor: CB test certificate: | CA/14038/CSA | 1 nF to 10 nF | 250 V <sub>AC</sub> <sup>(1)</sup> |
| X1-capacitor: CB test certificate: | CA/14038/CSA | 1 nF to 10 nF | 400 V <sub>AC</sub>                |

**VDE**

|                                   |          |               |                     |
|-----------------------------------|----------|---------------|---------------------|
| Y2-capacitor: VDE marks approval: | 40003969 | 1 nF to 10 nF | 250 V <sub>AC</sub> |
| X1-capacitor: VDE marks approval: | 40003969 | 1 nF to 10 nF | 400 V <sub>AC</sub> |



DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safety tests

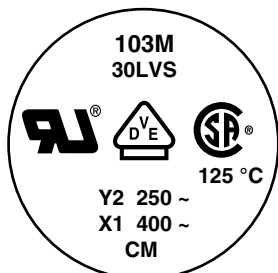
**Underwriters Laboratories Inc.**

|                                    |        |               |                                    |
|------------------------------------|--------|---------------|------------------------------------|
| Y2-capacitor: UL test certificate: | E99264 | 1 nF to 10 nF | 300 V <sub>AC</sub> <sup>(1)</sup> |
| Y2-capacitor: UL test certificate: | E99264 | 1 nF to 10 nF | 250 V <sub>AC</sub> <sup>(1)</sup> |
| X1-capacitor: UL test certificate: | E99264 | 1 nF to 10 nF | 400 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.

**Note**<sup>(1)</sup> LS ≥ 5.5 mm: 300 V<sub>AC</sub>; LS < 5.5 mm: 250 V<sub>AC</sub>**MARKING****Sample****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?22231">www.vishay.com/doc?22231</a> |
| VDE Marks Approval  | <a href="http://www.vishay.com/doc?22232">www.vishay.com/doc?22232</a> |
| UL Test Certificate | <a href="http://www.vishay.com/doc?22233">www.vishay.com/doc?22233</a> |



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