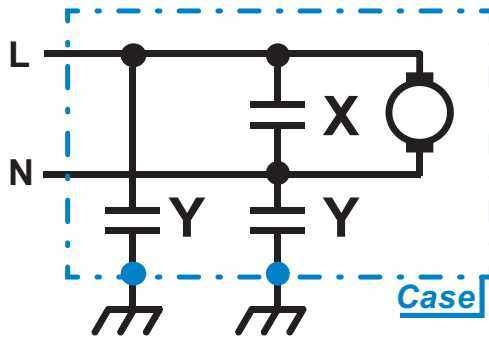


### Safety-Rated RFI Capacitors From Vishay

#### Typical Circuit

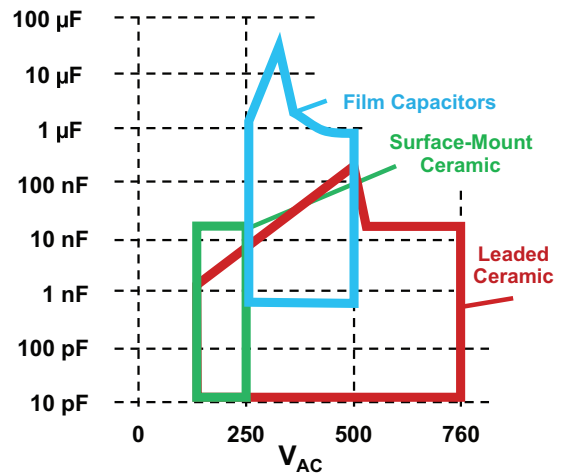


#### CLASS X

Differential Mode Filtering  
Across the Line

| Sub Class | Peak Impulse Voltage | Typical Application |
|-----------|----------------------|---------------------|
| X1        | 4.0 kV               | High Pulse          |
| X2        | 2.5 kV               | General Purpose     |
| X3        | 1.2 kV               | General Purpose     |

#### Safety Capacitor Environment



#### CLASS Y

Common Mode Filtering  
Line to Ground

| Sub Class | Peak Impulse Voltage | Typical Application |
|-----------|----------------------|---------------------|
| Y1        | 8.0 kV               | High Pulse          |
| Y2        | 5.0 kV               | General Purpose     |
| Y3        | Not pulse rated      | General Purpose     |
| Y4        | 2.5 kV               | General Purpose     |

### BENEFITS FROM VISHAY









- All three capacitor technologies available from one source
- Wide product range
  - X2 from 10 pF up to 40 μF
- C0G (NP0) material available up to 1 nF nominal capacitance value in surface-mount capacitor
- Surface-mount product meets IEC 60384-14 min. 4 mm creepage at 1 nF in X1 / Y2 with COG (NP0)
- Y1 leaded ceramic up to 10 kV pulse strength guaranteed
- AEC-Q200 qualification available for film and leaded ceramic
  - AY2 leaded ceramic 3000 temp cycles from -55 °C to +125 °C
- F1772S withstands THB testing: 85 °C / 85 % RH / 240 V<sub>AC</sub> / 1000 h
- VY1+C withstands THB testing: 85 °C / 85 % RH / 500 V<sub>AC</sub> / 1000 h









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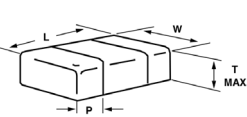
## RFI CAPACITORS FROM VISHAY

## Safety Capacitors

| RFI X and Y Film Capacitors  |                      |                       |                       |                        |              |                           |                    |  |
|--|----------------------|-----------------------|-----------------------|------------------------|--------------|---------------------------|--------------------|--|
| Series   | Rated AC Voltage (V) | Capacitance Min. (µF) | Capacitance Max. (µF) | Rated Temperature (°C) | Construction | Agency Approvals          | Pitch              |  |
|  <b>F1772SX2</b>                  | 310                  | 0.01                  | 2.2                   | 110                    | Series       | IEC / EN / UL / CSA       | 15 mm to 27.5 mm   |  |
| X2 and series impedance applications; 85 °C / 85 % RH, 240 V <sub>AC</sub> for 1000 h                              |                      |                       |                       |                        |              |                           |                    |  |
|  <b>MKP339X2</b>                  | 310                  | 0.001                 | 4.7                   | 110                    | Mono         | IEC / EN / UL / CSA / CQC | 7.5 mm to 27.5 mm  |  |
| AEC-Q200 Automotive Grade X2 class capacitor   |                      |                       |                       |                        |              |                           |                    |  |
|  <b>F340X2</b>                    | 305                  | 1                     | 20                    | 105                    | Mono         | IEC / EN / UL / CSA       | 27.5 mm to 52.5 mm |  |
| X2 class capacitor for high robustness under high humidity. THB grade III B-SOP Q3 2017                            |                      |                       |                       |                        |              |                           |                    |  |
|  <b>F340Y2</b>                    | 305                  | 0.001                 | 1                     | 105                    | Mono         | IEC / EN / UL / CSA / CQC | 10 mm to 37.5 mm   |  |
| Y2 class capacitor for high robustness under high humidity. THB grade III B-SOP, Q3 2017                           |                      |                       |                       |                        |              |                           |                    |  |
|  <b>F340X1</b>                    | 480                  | 0.22                  | 8.2                   | 105                    | Mono         | IEC / EN / UL / CSA / CQC | 22.5 mm to 52.5 mm |  |
| X1 class capacitor for high robustness under high humidity. THB grade III B-SOP, Q3 2017                           |                      |                       |                       |                        |              |                           |                    |  |
|  <b>F339X1 480 V<sub>AC</sub></b> | 480                  | 0.001                 | 1                     | 110                    | Series       | IEC / EN / UL / CSA / CQC | 10 mm to 27.5 mm   |  |
| X1 capacitor for high capacitance stability; 85 °C / 85 % RH, 400 V <sub>AC</sub> for 500 h                        |                      |                       |                       |                        |              |                           |                    |  |
|  <b>MKP3386Y2</b>                 | 300                  | 0.001                 | 0.47                  | 105                    | Series       | IEC / EN / UL / CSA       | 7.5 mm to 27.5 mm  |  |
| AEC-Q200 Automotive Grade Y2 class capacitor   |                      |                       |                       |                        |              |                           |                    |  |
|  <b>F1773X2</b>                   | 253                  | 0.01                  | 2.2                   | 100                    | Series       | IEC / EN / UL / CSA       | -                  |  |
| Axial X2 capacitor for low building height applications  |                      |                       |                       |                        |              |                           |                    |  |

| Leaded Ceramic Safety Capacitors  |                     |                     |                  |                 |                             |  |
|---|---------------------|---------------------|------------------|-----------------|-----------------------------|--|
| Series  | Voltage             |                     | Capacitance      | Tolerance       | Temperature Characteristics |  |
|   | Y Rating            | X Rating            |                  |                 |                             |  |
|  <b>YY1 Series</b>   | 500 V <sub>AC</sub> | 760 V <sub>AC</sub> | 10 pF to 4.7 nF  | ± 10 % / ± 20 % | U2J / Y5S / Y5U / Y5V       |  |
| AC-line rated ceramic disc capacitors; class X1: 760 V <sub>AC</sub> ; class Y1: 500 V <sub>AC</sub> ; this series includes <b>mini sized YY1...Y5V</b> |                     |                     |                  |                 |                             |  |
|  <b>YY1 Compact Series</b>   | 500 V <sub>AC</sub> | 760 V <sub>AC</sub> | 470 pF to 4.7 nF | ± 20 %          | Y5U                         |  |
| Compact size and high pulse strength; AC-line rated ceramic disc capacitors; class X1: 760 V <sub>AC</sub> ; class Y1: 500 V <sub>AC</sub>              |                     |                     |                  |                 |                             |  |
|  <b>YY2 Series</b>   | 300 V <sub>AC</sub> | 440 V <sub>AC</sub> | 10 pF to 10 nF   | ± 10 % / ± 20 % | U2J / Y5S / Y5U / Y5V       |  |
| AC-line rated ceramic disc capacitors; class X1: 440 V <sub>AC</sub> ; class Y2: 300 V <sub>AC</sub> ; this series includes <b>mini sized YY2...Y5V</b> |                     |                     |                  |                 |                             |  |
|  <b>AY1 Series</b>   | 500 V <sub>AC</sub> | 760 V <sub>AC</sub> | 470 pF to 4.7 nF | ± 20 %          | Y5U                         |  |
| AC-line rated ceramic disc capacitors for automotive applications; class X1: 760 V <sub>AC</sub> ; class Y1: 500 V <sub>AC</sub>                        |                     |                     |                  |                 |                             |  |
|  <b>AY2 Series</b>   | 300 V <sub>AC</sub> | 440 V <sub>AC</sub> | 10 pF to 10 nF   | ± 10 % / ± 20 % | U2J / Y5S / Y5U             |  |
| AC-line rated ceramic disc capacitors for automotive applications; class X1: 440 V <sub>AC</sub> ; class Y2: 300 V <sub>AC</sub>                        |                     |                     |                  |                 |                             |  |
|  <b>WKP Series</b>   | 500 V <sub>AC</sub> | 760 V <sub>AC</sub> | 33 pF to 4.7 nF  | ± 10 % / ± 20 % | U2J / Y5S / Y5T / Y5U       |  |
| AC-line rated ceramic disc capacitors; class X1: 760 V <sub>AC</sub> ; class Y1: 500 V <sub>AC</sub>  |                     |                     |                  |                 |                             |  |
|  <b>WYO Series</b>   | 250 V <sub>AC</sub> | 440 V <sub>AC</sub> | 1.0 nF to 12 nF  | ± 20 %          | Y5U                         |  |
| AC-line rated ceramic disc capacitors; class X1: 440 V <sub>AC</sub> ; class Y2: 300 V <sub>AC</sub>  |                     |                     |                  |                 |                             |  |
|  <b>440L Series</b>  | 500 V <sub>AC</sub> | 760 V <sub>AC</sub> | 10 pF to 20 nF   | ± 10 % / ± 20 % | C0G / U2J / P3K / R3L       |  |
| AC-line rated ceramic disc capacitors; class X1: 760 V <sub>AC</sub> ; class Y1: 500 V <sub>AC</sub>  |                     |                     |                  |                 |                             |  |

| Surface-Mount Ceramic Capacitors |         |                  |           |                  |        |                   |   |
|----------------------------------|---------|------------------|-----------|------------------|--------|-------------------|---|
| TCC                              | Rating  | Rated AC Voltage | Body Size | Capacitance (pF) |        | Rated Temperature | Agency Approvals                          |
|                                  |         |                  |           | Min.             | Max.   |                   |   |
| C0G(NP0)                         | X1 / Y2 | 250              | 2008      | 10               | 220    | -55 °C to +125 °C | IEC<br>EN<br>CAN/CSA<br>cCSAus<br>ANSI/UL |
|                                  |         |                  | 2012      | 18               | 470    |                   |   |
|                                  | 2220    |                  | 47        | 1000             |        |                   |   |
|                                  | 2008    |                  | 10        | 390              |        |                   |   |
| X7R                              | X1 / Y2 | 250              | 2012      | 18               | 470    |                   |   |
|                                  |         |                  | 2008      | 100              | 1000   |                   |   |
|                                  | 2012    |                  | 150       | 1200             |        |                   |   |
|                                  | 2220    |                  | 270       | 4700             |        |                   |   |
|                                  | X2      |                  | 2008      | 100              | 2700   |                   |   |
|                                  |         |                  | 2012      | 150              | 5600   |                   |   |
|                                  |         |                  | 2220      | 270              | 12,000 |                   |   |

| DIMENSIONS in inches (millimeters)   |           |                             |                             |                   |              |              |  |
|--|-----------|-----------------------------|-----------------------------|-------------------|--------------|--------------|--|
|  | Body size | Length (L)                  | Width (W)                   | Maximum Thickness | Term. (P)    |              |  |
|  |           |                             |                             |                   | Min.         | Max.         |  |
|  | 2008      | 0.200 ± 0.010 (5.08 ± 0.25) | 0.080 ± 0.010 (2.03 ± 0.25) | 0.086 (2.18)      | 0.010 (0.25) | 0.030 (0.76) |  |
|  | 2012      | 0.200 ± 0.010 (5.08 ± 0.25) | 0.126 ± 0.008 (3.20 ± 0.20) | 0.086 (2.18)      | 0.010 (0.25) | 0.030 (0.76) |  |
|  | 2220      | 0.220 ± 0.008 (5.59 ± 0.20) | 0.200 ± 0.010 (5.08 ± 0.25) | 0.086 (2.18)      | 0.010 (0.25) | 0.030 (0.76) |  |

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