Ceramic Capacitors

**VY1, VY1 Compact, and VY2**
- VY1, VY1 Compact*: X1/Y1 Class, 10 pF (470 pF)* to 4.7 nF

**High-Voltage SMD Capacitors**
- Up to 5 kV

**SMD Safety Certified Capacitors**
- COG (NPO) and X7R Dielectrics

**715C**
- High Voltage Up to 50 kV<sub>DC</sub>

**HIFREQ and Quad HIFREQ**
- Up to 7.2 kV

**A...R, K...R, and K...H**
- Rated Voltage of 50 V, 100 V, and 200 V, AEC-Q200-Qualified, 160 °C / 175 °C

**GA...31G, GA...34G, VJ...31X, VJ...31, VJ...34**
- AEC-Q200-Qualified

**AY2**
- X1/Y2 Class AEC-Q200-Qualified
### Leaded Ceramic Safety Capacitors

<table>
<thead>
<tr>
<th>Series</th>
<th>Voltage</th>
<th>Capacitance</th>
<th>Tolerance</th>
<th>Temperature Characteristics</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VY1 Series</strong></td>
<td>500 V AC</td>
<td>760 V AC</td>
<td>10 pF to 4.7 nF</td>
<td>± 10 % / ± 20 % U2J / Y5S / Y5U / Y5V</td>
<td></td>
</tr>
<tr>
<td><strong>VY1 Compact Series</strong></td>
<td>500 V AC</td>
<td>760 V AC</td>
<td>470 pF to 4.7 nF</td>
<td>± 20 % Y5U</td>
<td></td>
</tr>
<tr>
<td><strong>VY2 Series</strong></td>
<td>300 V AC</td>
<td>440 V AC</td>
<td>10 pF to 10 nF</td>
<td>± 10 % / ± 20 % U2J / Y5S / Y5U / Y5V</td>
<td></td>
</tr>
<tr>
<td><strong>AY2 Series</strong></td>
<td>300 V AC</td>
<td>440 V AC</td>
<td>10 pF to 4.7 nF</td>
<td>± 10 % / ± 20 % U2J / Y5S / Y5U / Y5V</td>
<td></td>
</tr>
<tr>
<td><strong>WKP Series</strong></td>
<td>500 V AC</td>
<td>760 V AC</td>
<td>33 pF to 4.7 nF</td>
<td>± 10 % / ± 20 % U2J / Y5S / Y5U / Y5V</td>
<td></td>
</tr>
<tr>
<td><strong>WYO Series</strong></td>
<td>250 V AC</td>
<td>440 V AC</td>
<td>1.0 nF to 12 nF</td>
<td>± 20 % Y5U</td>
<td></td>
</tr>
<tr>
<td><strong>440L Series</strong></td>
<td>500 V AC</td>
<td>760 V AC</td>
<td>10 pF to 20 nF</td>
<td>± 10 % / ± 20 % C0G / U2J / P3K / R3L</td>
<td></td>
</tr>
</tbody>
</table>

### High-Voltage Ceramic Capacitors

<table>
<thead>
<tr>
<th>Series</th>
<th>Voltage</th>
<th>Capacitance</th>
<th>Tolerance</th>
<th>Temperature Characteristics</th>
<th>Dissipation Factor</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>715 Series</strong></td>
<td>10 kVDC to 50 kVDC</td>
<td>100 pF to 10 nF</td>
<td>± 20 % / +80 %, -20 %</td>
<td>T3M / S3N / Y5U</td>
<td>0.2 % (Class 1) / 2.0 % (Class 2)</td>
<td>Screw</td>
</tr>
<tr>
<td><strong>HPD Series</strong></td>
<td>20 kVDC</td>
<td>350 pF to 5.0 nF</td>
<td>± 20 %</td>
<td>Z5U</td>
<td>0.5 %</td>
<td>Screw</td>
</tr>
<tr>
<td><strong>660 Series</strong></td>
<td>10 kVDC to 30 kVDC</td>
<td>180 pF to 10 nF</td>
<td>± 20 % / +80 %, -20 %</td>
<td>T3M / X7R / Y5U / Z5U</td>
<td>0.2 % (Class 1) / 2.0 % (Class 2)</td>
<td>Axial leded</td>
</tr>
<tr>
<td><strong>615 Series</strong></td>
<td>10 kVDC to 20 kVDC</td>
<td>100 pF to 3.3 nF</td>
<td>± 20 % / +80 %, -20 %</td>
<td>T3M / X5R / Y5S / Y5U / Z5U</td>
<td>0.2 % (Class 1) / 2.0 % (Class 2)</td>
<td>Radial leded</td>
</tr>
<tr>
<td><strong>HIK Series</strong></td>
<td>15 kVDC</td>
<td>100 pF to 1.5 nF</td>
<td>± 20 %</td>
<td>Y5T</td>
<td>0.5 %</td>
<td>Radial leded</td>
</tr>
</tbody>
</table>

### Leaded MLCCs For Automotive Applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Voltage</th>
<th>Capacitance</th>
<th>Tolerance</th>
<th>Temperature Characteristics</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A…R Series</strong></td>
<td>50 VDC to 200 VDC</td>
<td>100 pF to 1.0 µF</td>
<td>± 5 % / ± 10 % / ± 20 %</td>
<td>C0G / X7R</td>
<td>Axial leded</td>
</tr>
<tr>
<td><strong>K…R Series</strong></td>
<td>50 VDC to 200 VDC</td>
<td>100 pF to 1.0 µF</td>
<td>± 5 % / ± 10 % / ± 20 %</td>
<td>C0G / X7R</td>
<td>Radial leded</td>
</tr>
<tr>
<td><strong>K…H Series</strong></td>
<td>50 VDC to 200 VDC</td>
<td>100 pF to 1.0 µF</td>
<td>± 5 % / ± 10 % / ± 20 %</td>
<td>C0G / X0U</td>
<td>Radial leded</td>
</tr>
</tbody>
</table>

### Ceramic SMD Capacitors for General Applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Sizes</th>
<th>Dielectric</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VJ Commercial Series</strong></td>
<td>1 pF to 6.8 µF</td>
<td>16 V to 1000 V</td>
<td>0402, 0603, 0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225, 3640</td>
<td>C0G (NP0), X7R</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td><strong>VJ….W1BC Basic Commodity</strong></td>
<td>0.5 pF to 100 µF</td>
<td>10 V to 100 V</td>
<td>0201, 0402, 0603, 0805, 1206, 1210</td>
<td>C0G (NP0), X5R, X7R, Y5V</td>
<td>Dry sheet, base metal electrode</td>
</tr>
<tr>
<td><strong>VJ06C4….W1BC Chip Array</strong></td>
<td>10 pF to 100 nF</td>
<td>16 V and 50 V</td>
<td>0612 (4 x 0603 capacitors inside)</td>
<td>C0G (NP0), X7R, Y5V</td>
<td>Dry sheet, base metal electrode</td>
</tr>
</tbody>
</table>
CERAMIC CAPACITORS

**Focus Products**

### Ceramic SMD Capacitors for Special Applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Sizes</th>
<th>Dielectric</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJ, 31/VJ, 34, VJ, 31X, GA...31G Automotive Series</td>
<td>1 pF to 1 µF</td>
<td>16 V to 3000 V</td>
<td>0402, 0603, 0805, 1206, 1210, 1812</td>
<td>C0G (NP0), X7R, X8R</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>AgPd termination for epoxy bonding; polymer (flexible) termination available; excellent ESD performance; robust design due to wet build process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VJ X8R</td>
<td>330 pF to 220 nF</td>
<td>25 V to 100 V</td>
<td>0402, 0603, 0805, 1206, 1210</td>
<td>X8R</td>
<td></td>
</tr>
<tr>
<td>High-temperature dielectric with TCC ±15 % up to +150 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Magnetic Series</td>
<td>1 pF to 6.8 µF</td>
<td>6.3 V to 3000 V</td>
<td>0402, 0603, 0805, 1206, 1210, 1805, 3640, 0505, 1111, 2525, 3838</td>
<td>C0G (NP0), X5R, X7R</td>
<td></td>
</tr>
<tr>
<td>Non-magnetic safety screened; copper termination; also see HIFREQ and QUAD HIFREQ series</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Ceramic SMD Capacitors for MIL and Hi-Reliability Applications

<table>
<thead>
<tr>
<th>Series</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Sizes</th>
<th>Dielectric</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Rel Series</td>
<td>1 pF to 1.5 µF</td>
<td>6.3 V to 600 V</td>
<td>0402, 0603, 0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225, 3640</td>
<td>C0G (NP0), X5R, X7R</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>MIL-PRF-55681 group testing (A only, full A and C); several life test and voltage conditioning options; customer-specific requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDR</td>
<td>10 pF to 470 nF</td>
<td>50 V to 100 V</td>
<td>0402, 0603, 0805,1206</td>
<td>BP, BX</td>
<td></td>
</tr>
<tr>
<td>Several failure rate options; high reliability tested per MIL-PRF-55681; CAGE CODE 2770A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full group “C”; several life test and voltage conditioning options; CAGE CODE 2770A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full group “C”; several life test and voltage conditioning options; CAGE CODE 2770A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIL-PRF-123</td>
<td>1 pF to 470 nF</td>
<td>50 V to 250 V</td>
<td>0402, 0603, 0805</td>
<td>High Q</td>
<td></td>
</tr>
<tr>
<td>Space-level reliability tested per MIL-PRF-123; tin / lead and guarded terminations, CAGE CODE 2770A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RF - High-Frequency SMD Capacitors

<table>
<thead>
<tr>
<th>Series</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Sizes</th>
<th>Dielectric / DF</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIFREQ Series</td>
<td>0.1 pF to 1.5 nF</td>
<td>25 V to 250 V</td>
<td>0402, 0603, 0805</td>
<td>Q: &gt; 2000 (at 1 MHz)</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>Highest Q factor; &quot;GREEN&quot; available, in addition to tin / lead and copper terminations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUAD HIFREQ Series</td>
<td>0.1 pF to 5.1 nF</td>
<td>200 V to 7200 V</td>
<td>0505, 1111, 2525, 3838</td>
<td>Q: &gt; 2000 (at 1 MHz)</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>Highest Q factor; &quot;GREEN&quot; available, in addition to tin / lead and copper terminations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaded QUAD HIFREQ Series</td>
<td>1 pF to 5100 pF</td>
<td>300 V to 7200 V</td>
<td>1111, 2525, 3838</td>
<td>Q: &gt; 2000 (at 1 MHz)</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>Ultra stable; high Q dielectric material; high frequency and high power</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VJ High Q Series</td>
<td>1 pF to 220 pF</td>
<td>50 V to 200 V</td>
<td>0603, 0805</td>
<td>Q: &gt; 1400</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>High Q; stable dielectric; NME electrode system; AgPd termination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VJ,...W1BC High Q</td>
<td>0.5 pF to 3.3 nF</td>
<td>16 V to 100 V</td>
<td>0402, 0603</td>
<td>Q: &gt; 1000</td>
<td>Dry sheet</td>
</tr>
<tr>
<td>High Q; stable dielectric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VJ,...W1BC Ultra High Q/Low ESR</td>
<td>0.1 pF to 100 pF</td>
<td>10 V to 250 V</td>
<td>0201, 0402, 0603, 0805</td>
<td>Q: &gt; 1400</td>
<td>Dry sheet</td>
</tr>
<tr>
<td>High Q; low ESR; stable dielectric; ultra-small 0201 size; BME electrode system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### High-Voltage and Safety-Certified Ceramic SMD Capacitors

<table>
<thead>
<tr>
<th>Series</th>
<th>Capacitance</th>
<th>Voltage</th>
<th>Sizes</th>
<th>Dielectric</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV ArcGuard Series</td>
<td>10 pF to 270 nF</td>
<td>250 V to 2500 V</td>
<td>0805, 1206, 1210, 1808, 1812, 2220, 2225</td>
<td>C0G (NP0), X7R</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>Prevents arcing over; polymer (flexible) termination available for X7R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Mode Design Series</td>
<td>10 pF to 1.8 µF</td>
<td>16 V to 3000 V</td>
<td>0805, 1206, 1210, 1808, 1812, 1825, 2220, 2225</td>
<td>C0G (NP0), X7R</td>
<td>Wet sheet, noble metal electrode</td>
</tr>
<tr>
<td>Reduces risk of short circuit due to bending crack; polymer (flexible) termination available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety-Certified Capacitors</td>
<td>10 pF to 12 nF</td>
<td>250 Vc</td>
<td>2008, 2012, 2220</td>
<td>C0G (NP0), X7R</td>
<td></td>
</tr>
<tr>
<td>VDE, CSA, cCSAus, X1/Y2 and X2 class; IEC 60384-14; CAN/CSA - E60384-14-09, ANSM/UL 60384-14-2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source Energy Capacitor</td>
<td>4.7 nF to 560 nF</td>
<td>1000 V, 1500 V</td>
<td>1812, 1825, 2220, 3040, 3640, 4044</td>
<td>X7R (Y5P)</td>
<td></td>
</tr>
<tr>
<td>Low electrostrictive ceramic for charge and discharge cycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HV High-Voltage Series</td>
<td>180 pF to 15 nF</td>
<td>3000 V, 4000 V, 5000 V</td>
<td>1812, 1825, 2220, 2225</td>
<td>X7R</td>
<td></td>
</tr>
<tr>
<td>High-reliability serial design, low electrostrictive ceramic for charge and discharge cycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled Discharge Capacitor</td>
<td>33 nF to 560 nF</td>
<td>1000 V, 1500 V</td>
<td>3040, 3640, 4044</td>
<td>X7R (Y5P)</td>
<td></td>
</tr>
<tr>
<td>500 MΩ integrated resistor; low electrostrictive ceramic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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VISHAY INTERTECHNOLOGY, INC.
Advantages of Vishay Ceramic Capacitors

- Wide range of sizes and voltages
- Several termination options
- Robust and reliable design with high stability
- Customized options available

For the Following Applications

- High voltage generation, and AC mains filtering
- High frequency and high voltage / power
- High-reliability, medical, military, and space
- Automotive

Go “GREEN” with our halogen-free, AEC-Q200-approved AY2 safety capacitors for AC line filtering in onboard chargers

Useful Links

- Ceramic multilayer SMD capacitors overview [www.vishay.com/capacitors/ceramic/ceramic-multilayer-smd/](http://www.vishay.com/capacitors/ceramic/ceramic-multilayer-smd/)
- Ceramic single-layer capacitors overview [www.vishay.com/capacitors/ceramic/ceramic-singlelayer/](http://www.vishay.com/capacitors/ceramic/ceramic-singlelayer/)
- Ceramic multilayer leaded capacitors overview [www.vishay.com/capacitors/ceramic/ceramic-multilayer-leaded/](http://www.vishay.com/capacitors/ceramic/ceramic-multilayer-leaded/)

HALOGEN FREE

ISO 9001 / ISO/TS 16949 / OHSAS 18001 / ISO 14001
ISO 13485:2003
IEC 60384-14, CAN/CSA-ES0384-14:09, ANSI/UL 60384-14-2009
AEC-Q200 Qualified and MIL-PRF-55681 (CAGE CODE SHV71)
See specific datasheets if applicable

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