MULTILAYER POLYMER CAPACITORS

- Ultra Low ESR
- High Frequency
- High Ripple Current
- Long Life

MLP Capacitor Advantages over Ceramics

Multilayer Polymer Film (MLP)
✔ Stable under voltage
✔ Stable under AC voltage
✔ Chip is plastic with good TCE
✔ Stable over temperature
✔ No aging mechanism
✔ Resilient under thermal shock
✔ Self-clearing thin electrodes
✔ Stable under mechanical stress
✔ Ultra Low ESR
✔ Dissipation Factor ≤ 1%

X7R Ceramic (MLC)
Cap drops 40% at 100 volts bias
DF increases with AC voltage
Body is ceramic which cracks
DF increases at low temperature
Cap drops per decade hour
Ceramic body cracks easily
Thick film electrodes fail short
Piezoelectric voltage sensitive
Low ESR
Dissipation Factor ≤ 2.5%

TYPICAL CHARACTERISTICS

The following graphs contrast important characteristics of MLP Capsticks to MLC ceramic units in typical, dynamic converter conditions. The electrical stability of the MLP capacitor is clear.

![Graphs showing ESR vs. Frequency, 120 Hz ESR vs. Temperature, Dissipation Factor vs Vrms, and Capacitance vs DC Bias]
# Premier Line of Film Capacitors

## Metallized PET-SMD (Low Shrinkage Polyester) dielectric — MLP Capacitor Styles

<table>
<thead>
<tr>
<th>Category</th>
<th>Series</th>
<th>Case Style</th>
<th>Lead Style</th>
<th>Voltages (V)</th>
<th>Capacitance (µF)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angstor</td>
<td>RA</td>
<td>Taped</td>
<td>Radial</td>
<td>100 - 500</td>
<td>0.1 - 0.10</td>
<td>4</td>
</tr>
<tr>
<td>Capstick</td>
<td>CS</td>
<td>Epoxy coated</td>
<td>Lead frame</td>
<td>50 - 500</td>
<td>0.33 - 0.20</td>
<td>10</td>
</tr>
<tr>
<td>Capstick</td>
<td>CB</td>
<td>Shell</td>
<td>Lead frame</td>
<td>100</td>
<td>2.0 - 0.0</td>
<td>12</td>
</tr>
<tr>
<td>Capstick</td>
<td>CB-FS</td>
<td>Shell</td>
<td>Lead frame</td>
<td>100 - 500</td>
<td>0.47 - 0.10</td>
<td>13</td>
</tr>
<tr>
<td>Surfilm</td>
<td>ST</td>
<td>Chip</td>
<td>Surface mount</td>
<td>100</td>
<td>1.0 - 2.2</td>
<td>16</td>
</tr>
</tbody>
</table>

## Metallized PET (Polyester) dielectric with series resistor (snubber network)

<table>
<thead>
<tr>
<th>Category</th>
<th>Series</th>
<th>Case Style</th>
<th>Lead Style</th>
<th>Voltages (V)</th>
<th>Capacitance (µF)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quencharc</td>
<td>Q/QRL</td>
<td>Epoxy coated</td>
<td>Radial</td>
<td>200 - 1600</td>
<td>0.1 - 1.0</td>
<td>18</td>
</tr>
</tbody>
</table>

## Ordering/Part Number Information

**Example:**

405 K 100 CS4 G

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**Suffix:** A two-letter suffix may be added by the factory to denote special construction and/or RoHS (Pb-Free) status.

**Lead Style or Packaging:** G = Gull-wing lead, C = Tape/Reel

**Product Type:** Identifies the basic capacitor design and lead spacing. Includes resistor value for Type Q/QRL.

**DC Voltage Rating:** Expressed in hundreds of volts, except for Type Q/QRL, which is expressed in two digit voltage code.

**Capacitance Tolerance:** J = ±5%, K = ±10%, M = ±20%

**Capacitance:** Expressed in picofarad code. The first two digits are the significant figures, the third digit is the number of zeros following. (i.e. 405 = 4000000 pF = 4.0 µF)

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