Type CS (Capstick®) Metallized Polymer Network

Radial Multi-pin Metallized Polymer Network for DC to DC Converters

The Type CS multi-pin metallized polymer network is ideal for the low ESR/ESL requirements in DC to DC converters and switching power supply applications. This unique, robust, capacitor design offers high ripple current capability and high capacitance in a small package. It is available with straight pins on 0.10” centers for through-hole mounting or with gull wing leads for surface mount assembly. Type CS (Capstick®) is encapsulated in a rugged conformal coating and is packaged in anti-static tubes for easy handling.

Highlights
- Rugged conformal coated case meets UL94V-0
- Low ESR/ESL
- High ripple current
- High capacitance in a small package
- Non-inductive design
- Non-polar
- Surface mount or through hole assembly
- Multi-pin leads on 0.10” centers

Specifications

- Capacitance Range: 0.33 µF to 20.0 µF
- Voltage Range: 50 Vdc, 100 Vdc, 250 Vdc, 400 Vdc, 500 Vdc
- Capacitance Tolerance: ±10%
- Operating Temperature Range for 50, 100 and 250 Vdc: –55 ºC to +125 ºC (with 50% Vdc derating >85 ºC)
- Operating Temperature Range for 400 and 500 Vdc: –55 ºC to +125 ºC with no derating
- Construction: Multilayer metallized polymer dielectric
- Temperature Coefficient: +6% from –55 ºC to +85 ºC
- Dielectric Withstand Voltage: 1.3 x rated voltage: 50/100/250/500 Vdc
- 1.6 x rated voltage: 400 Vdc
- Dissipation Factor (DF): ≤1.0% @ 1 kHz
- Total Self Inductance (L): <6 nH typical (CS6)
- Lead Material: Tinned copper alloy frame
- Insulation Resistance: ≥1000 MΩ • µF - need not exceed 1000 MΩ
- Part Numbering System

<table>
<thead>
<tr>
<th>Cap</th>
<th>K</th>
<th>Vol</th>
<th>CS</th>
<th>Pin</th>
<th>&quot;Optional&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>334 = 0.33 µF</td>
<td>K = ±10%</td>
<td>050 = 50 Vdc</td>
<td>CS</td>
<td>Blank = Straight Pins</td>
<td>Blank = 9/10 RoHS</td>
</tr>
<tr>
<td>405 = 4.0 µF</td>
<td>100 = 100 Vdc</td>
<td>4</td>
<td>Blank = Gull Wing</td>
<td>FA = 10/10 RoHS</td>
<td></td>
</tr>
<tr>
<td>206 = 20.0 µF</td>
<td>400 = 400 Vdc</td>
<td>6 = 0.6&quot; (15.0 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Type CS (Capstick®) Metallized Polymer Network

Capacitor Outline Drawing

Test Method and Performance

### Accelerated Dry Life

**Test Conditions**
- Temperature: +85 ºC ±5 ºC
- Applied Voltage: 1.25 x rated voltage
- Test Duration: 1000 hours performance

**Requirements**
- Capacitance: Change of ≤5.0%
- Dissipation Factor: ≤1.0% @ 1 kHz
- Insulation Resistance: ≥1K MΩ + μF, need not exceed 1 K MΩ

### Humidity

**Test Conditions**
- Temperature: +85 ºC ±2.0 ºC
- Applied Voltage: Zero voltage
- Humidity: 85% ±2% RH
- Test Duration: 21 days

**Performance Requirements**
- Capacitance: Change of ≤7.0%
- Dissipation Factor: ≤1.0% @ 1 kHz
- Insulation Resistance: ≥30% of limit value

### Soldering

**Thru Hole Soldering Temperature:** 260 ºC, 5 sec.
**SMD Reflow Soldering Temperature:** 220 ºC, 30 sec.

**Performance Requirements**
- Capacitance: Change of ≤2%
- Capacitance Drift: ≤2.0% over 2 years between 0 ºC and 35 ºC and a RH of between 35% and 65%

### Vibration

Conforms to MIL-STD-202 Method 204D

Note: The 400 Vdc rating can handle a 450 Vdc surge and is built to a 640 Vdc high potential.

## Ratings

<table>
<thead>
<tr>
<th>Catalog Part Number</th>
<th>Cap Voltage @ 500 kHz</th>
<th>DC RMS Current @ 500 kHz</th>
<th>W Max.</th>
<th>T Max.</th>
<th>L Max.</th>
<th>Nom. L.S.</th>
<th>Leads</th>
<th>Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(µF)</td>
<td>@ 500 kHz</td>
<td>(inches)</td>
<td>(inches)</td>
<td>(inches)</td>
<td>Per Side</td>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>50 Vdc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>106K050CS4*</td>
<td>10.00</td>
<td>50</td>
<td>0.0030</td>
<td>15.3</td>
<td>0.5</td>
<td>(12.7)</td>
<td>0.32</td>
<td>(8.1)</td>
</tr>
<tr>
<td>206K050CS4*</td>
<td>20.00</td>
<td>50</td>
<td>0.0025</td>
<td>17.8</td>
<td>0.5</td>
<td>(12.7)</td>
<td>0.32</td>
<td>(8.1)</td>
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<tr>
<td>200 Vdc</td>
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<td></td>
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<td></td>
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<tr>
<td>205K100CS4*</td>
<td>2.00</td>
<td>100</td>
<td>0.009</td>
<td>8.3</td>
<td>0.5</td>
<td>(12.7)</td>
<td>0.25</td>
<td>(6.4)</td>
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<td>405K100CS4*</td>
<td>4.00</td>
<td>100</td>
<td>0.007</td>
<td>11.5</td>
<td>0.5</td>
<td>(12.7)</td>
<td>0.25</td>
<td>(6.4)</td>
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<td>475K100CS4*</td>
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<td>100</td>
<td>0.006</td>
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<td>(12.7)</td>
<td>0.25</td>
<td>(6.4)</td>
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<td>100</td>
<td>0.005</td>
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<td>0.25</td>
<td>(6.4)</td>
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<td>0.003</td>
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<td>(6.4)</td>
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<td>250</td>
<td>0.012</td>
<td>5.2</td>
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<td>(17.8)</td>
<td>0.30</td>
<td>(7.6)</td>
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<td>400 Vdc</td>
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<td></td>
<td></td>
<td></td>
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<td>334K400CS6*</td>
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<td>400</td>
<td>0.012</td>
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<td>0.7</td>
<td>(17.8)</td>
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<td>(8.1)</td>
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<td>400</td>
<td>0.011</td>
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<td>0.7</td>
<td>(17.8)</td>
<td>0.32</td>
<td>(8.1)</td>
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<tr>
<td>105K400CS6*</td>
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<td>400</td>
<td>0.008</td>
<td>9.5</td>
<td>0.7</td>
<td>(17.8)</td>
<td>0.32</td>
<td>(8.1)</td>
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<tr>
<td>500 Vdc</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>474K500CS6*</td>
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<td>500</td>
<td>0.011</td>
<td>6.2</td>
<td>0.7</td>
<td>(17.8)</td>
<td>0.32</td>
<td>(8.1)</td>
</tr>
<tr>
<td>105K500CS6*</td>
<td>1.00</td>
<td>500</td>
<td>0.008</td>
<td>9.5</td>
<td>0.7</td>
<td>(17.8)</td>
<td>0.32</td>
<td>(8.1)</td>
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### RoHS Compliant
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