Type FCA Acrylic Surface Mount Film Capacitors

Acrylic Stacked Metallized Film Capacitors for Filtering and Noise Attenuation

Type FCA acrylic film chips are non-inductive stacked metallized film capacitors which feature large capacitance values in standard surface mount case sizes.

**Highlights**
- Smallest film chips
- No piezoelectric effect
- Non-polarized, non-magnetic
- Low ESR
- 1.0 µF/10V in 1206 case

**Filtering • Decoupling • Noise Attenuation • Distortion Free Audio**

Type FCA acrylic film capacitors offer high capacitance values in standard surface mount case sizes. They excel in attenuating DC power bus noise, and as ripple filters in dc to dc power conversion circuits. As coupling capacitors in audio circuits, they yield distortion free sound and better high frequency filtering. The 1.0 µF 10 Vdc rating offers a film capacitor that is a direct replacement for tantalum “A” case capacitors. The nonpolar FCA capacitor has lower ESR and lower DCL than an equivalent tantalum capacitor, and in high frequency applications it takes a tantalum capacitor with ten times the capacitance to perform as well as the FCA capacitor.

The capacitor is constructed of noninductive stacked layers of metallized acrylic resin film with lead free solder (Sn/Ag/Cu) plated copper alloy terminals.

**Specifications**

- **Capacitance Range:** 0.10 µF to 1.0 µF
- **Capacitance Tolerance:** ±20% @ 1 kHz and +20 ºC
- **Rated Voltage:** 16 Vdc [1.0 µF in 1206 case, 10 Vdc]
- **AC Voltage Rating:** 12 Vrms
- **Operating Temperature Range:** –40 ºC to +85 ºC
- **Dissipation Factor:** 0.015 @ 1 kHz and +20 ºC
- **Dielectric Strength:** 175% of rated voltage for 5 seconds
- **Insulation Resistance (IR):**
  - After 1 minute @10 Vdc; +20 ºC
  - IR > 1000 MΩ (C ≤0.33 µF)
  - IR > 300 MΩ•µF (C >0.33 µF)
- **Resistance to Soldering:** The capacitor can withstand being heated in an oven at 235 ºC for 200 seconds

**RoHS Compliant**

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Specifications

Moisture Resistance:
After 500 hours with rated voltage applied at +40 °C and 90 to 95% RH, the capacitor will meet the following limits:

\[ \Delta C = +20/-3\% \text{ of the initial measured value} \]
\[ DF \leq 2.25\% \text{ (at 1 kHz)} \]
\[ IR > 100M\Omega (C \leq 0.33 \mu F) \]
\[ IR > 30M\Omega \mu F (C > 0.33 \mu F) \]

Dielectric Strength: Capacitor will withstand 130% of the rated voltage for 1 minute.

Life Test:
Apply 125% of the rated DC working voltage at 85 °C for 1000 hours, and then stabilize them to +20 °C.
Capacitors will meet the following limits:

\[ C = +7%/-20\% \text{ of the initial measured value} \]
\[ DF \leq 1.65\% \text{ (at 1 kHz)} \]
\[ IR > 300M\Omega (C \leq 0.33 \mu F) \]
\[ IR > 100M\Omega \mu F (C > 0.33 \mu F) \]

Ratings

<table>
<thead>
<tr>
<th>Capacitance (µF)</th>
<th>Catalog Part Number</th>
<th>dv/dt (V/µs)</th>
<th>Maximum Current</th>
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<tbody>
<tr>
<td></td>
<td>dv/dt (V/µs)</td>
<td>10kHz (Arms)</td>
<td>20kHz (Arms)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50kHz (Arms)</td>
<td>100kHz (Arms)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200kHz (Arms)</td>
<td>500kHz (Arms)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1MHz (Arms)</td>
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</tr>
<tr>
<td>1.00</td>
<td>FCA1206A105M-H3</td>
<td>3</td>
<td>0.60</td>
</tr>
<tr>
<td>1.00</td>
<td>FCA1210C105M-G2</td>
<td>3</td>
<td>0.60</td>
</tr>
<tr>
<td>.10</td>
<td>FCA0805C104M-J2</td>
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Outline Drawing

Outline Dimensions

<table>
<thead>
<tr>
<th>Part Number Suffix</th>
<th>Case Code</th>
<th>Inches</th>
<th>Millimeters</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±.008in.)</td>
<td>(±.008in.)</td>
</tr>
<tr>
<td>J2</td>
<td>0805</td>
<td>0.079</td>
<td>0.049</td>
</tr>
<tr>
<td>H1</td>
<td>1206</td>
<td>0.126</td>
<td>0.063</td>
</tr>
<tr>
<td>H2</td>
<td>1206</td>
<td>0.126</td>
<td>0.063</td>
</tr>
<tr>
<td>H3</td>
<td>1206</td>
<td>0.126</td>
<td>0.063</td>
</tr>
<tr>
<td>G2</td>
<td>1210</td>
<td>0.126</td>
<td>0.098</td>
</tr>
</tbody>
</table>
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Temperature Characteristics

Frequency Characteristics
Typical Applications

Coupling Capacitor for Audio:

Using FCA capacitors in audio circuits can result in lower sound distortion. The low ESR, the absence of piezoelectric effects, and the non-polar nature of the capacitor will eliminate sources of distortion in your audio circuits.

PLL Circuit: Cellular phone, Blue Tooth, Data Communication Card

FCA surface mount film capacitors have advantages over tantalum and ceramic capacitors in PLL circuits. There are no piezoelectric effects to create noise, they are not polarized, and they result in faster signal lock-up time.
Typical Applications

Filtering Performance:

In the above circuit, one 1 µF FCA capacitor results in the same ripple reduction performance as a 10 µF tantalum capacitor at 200 kHz. With a 1 µF tantalum capacitor in the circuit the measured ripple voltage was 70 mVpp, and with a 10 µF tantalum or a 1 µF FCA capacitor the ripple voltage was 8 mVpp.

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