Types MCM and MIN SMT Clad RF Capacitors

Multilayer High Power, High Temperature Mica and PTFE Capacitors

Types MCM and MIN SMT clad PTFE and mica capacitors are top performers for high power applications requiring low inductance at high frequencies and can operate at temperatures up to 200 °C and voltages to 1000 Vdc. Choosing from 16 different configurations offers easy mounting with options for surface mount as well as through-hole and mechanical assembly. To assure high current capability in the smallest capacitors, low-capacitance ratings use polytetrafluoroethylene (PTFE) that has ultra-low dielectric absorption - better than polypropylene, polystyrene and NPO ceramic.

**Highlights**

- 200 °C rated with no voltage derating
- Wave solderable
- No cracking or delaminating
- CTE ≈ 18 ppm/°C compatible with FR4 PCBs
- Highly thermal conductive package
- Gull-wing terminal minimizes stress
- Typical 100 pF ESR, <11 mΩ @ 100 MHz
- Nonmagnetic for minimal RF loss
- Very low ESL for excellent by-pass action
- Ultra stable: no change with (t), (V) and (f)
- Exact capacitance with tolerances from ±0.25 pF

**RoHS Compliant**

<table>
<thead>
<tr>
<th>Capacitance Range:</th>
<th>Voltage Ratings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM</td>
<td>MIN</td>
</tr>
<tr>
<td>1 to 1500 pF</td>
<td>1 to 350 pF</td>
</tr>
<tr>
<td>300 to 1000 Vdc</td>
<td>300 Vdc</td>
</tr>
</tbody>
</table>

- -55 °C to +200 °C with no voltage derating
- ±0.25pF, ±0.5 pF, ±1 pF, ±0.5%, ±1%, ±2%, ±5%
- 200% of rated voltage for 5 seconds
- 1000 MΩ µF Need not exceed 100,000 MΩ at 25 °C

None

**Applications**

- RF Power Amplifiers
- Lasers
- Mobile Radio
- Plasma generators
- MRI Coils
- RF Medical Equipment
- Land Mobile antennas 27 to 900 MHZ

**Design Kits for Engineers**

- **MIN300VKIT1** 300 Vdc
  - 5 pieces each
  - 13 ratings 3.3 – 150 pF
- **MCM500VKIT2** Nonmagnetic to 500 Vdc
  - 5 pieces each
  - 10 ratings 10 – 1000 pF
- **MCM1000VKIT3** 1 kVdc
  - 5 pieces each
  - 7 ratings 100 – 750 pF

**Marking:**

- MIN - Capacitance in pF and ID letters CD
- MCM - Capacitance, ID letters CD and voltage if other than 500 when space permits

RoHS Compliant - marked in green ink
### Types MCM and MIN  SMT Clad RF Capacitors

#### Ratings Available

<table>
<thead>
<tr>
<th>Capacitance (pF)</th>
<th>Voltage Ratings (Vdc)</th>
<th>Dielectric</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300</td>
<td>500</td>
</tr>
</tbody>
</table>

**MIN02**

- 1 - 2.9 X PTFE
- 3 - 9.9 X PTFE or Mica
- 10 - 60 X PTFE or Mica
- 61 - 120 X Mica
- 121 - 180 X Mica
- 181 - 240 X Mica
- 241 - 300 X Mica
- 301 - 350 X Mica

**MCM01**

- 1 - 7 X X X PTFE
- 8 - 32 X X PTFE or Mica
- 33 - 250 X X Mica
- 251 - 500 X X Mica
- 501 - 750 X X Mica
- 751 - 1000 X X Mica
- 1001 - 1280 X Mica
- 1281 - 1500 X Mica

*1000 V available in MCM01-001 and -009 style

#### Part Numbering System

<table>
<thead>
<tr>
<th>Type</th>
<th>&quot;dash&quot;</th>
<th>Terminal Configuration</th>
<th>Temperature Coefficient *</th>
<th>Rated Voltages (Vdc)</th>
<th>Capacitance (pF)</th>
<th>Tolerance* (pF or %)</th>
<th>Packaging</th>
<th>RoHS Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM01</td>
<td>001</td>
<td>C</td>
<td>D</td>
<td>101</td>
<td>J</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>MIN02</td>
<td>002</td>
<td>001X</td>
<td>009X</td>
<td>010</td>
<td>010X</td>
<td>009X</td>
<td>010</td>
<td>010X</td>
</tr>
</tbody>
</table>

*Most Popular Series, others available, consult factory

† Surface mount and T&R

‡ 1kV

<table>
<thead>
<tr>
<th>Style</th>
<th>Capacitance Range</th>
<th>Temperature Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1 pF to 20 pF</td>
<td>±200 ppm/°C</td>
</tr>
<tr>
<td>D</td>
<td>21 pF to 56 pF</td>
<td>±100 ppm/°C</td>
</tr>
<tr>
<td>E</td>
<td>57 pF to 1500 pF</td>
<td>±20 to +100 ppm/°C</td>
</tr>
</tbody>
</table>

*TC code letter is left blank for PTFE items

Measured at 1 MHz for ≤1000 pF and 1 kHz for >1000 pF
Typical Performance Data

click here to see additional rating charts

**ESR vs. Frequency for 470 pF**

**Current Rating (IRMS) for 470 pF at 60 °C Rise**
Types MCM and MIN  SMT Clad RF Capacitors

Q vs. Frequency 470 pF @ 25 ºC

Impedance Z vs. Frequency for 470 pF @ 25 ºC
Outline Drawings for Popular Items

**MIN02-002**

```
.312"  .187"
.207".163"
.218"
.100"
.020"
.042" .010" ±.001"
```

“T” (thickness) depending on capacitance value = .065 to .125±.015

**MCM01-001**

```
.093" DIA.
.604" MAX.
.460" MAX
.365" MAX
.010" ±.001
```

“T” (thickness) depending on capacitance value = .110 to .165±.015

**MCM01-009**

```
0.605" ±.010
0.365" Max.
0.460" Max.
0.203" Max.
0.145" Max.
0.203"
0.030" ±0.001"
```

**MCM01-010**

```
.400" .500" MAX
Terminal A
.100" .170" .020" .001"
.062" DIA. 2 Holes
For Terminal “A”
.081" DIA. 2 Holes
```

For single plate construction
270 pF or less

“T” (thickness) depending on capacitance value = .110 to .165±.015

“T” (thickness) depending on capacitance value = .110 to .165±.015

“T” varies with capacitance
Types MCM and MIN  SMT Clad RF Capacitors

Standard Minimum Quantities

Bulk Pack: 100 pieces per bag  Reel Pack: 500 pieces per reel

Tape Specifications

Types MCM and MIN  SMT Clad RF Capacitors

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Solder Profile

Specifications:

Lead free finish

Case and Terminal Material:
Silver plated, copper flashed, brass

Tape Dimensions (mm)

<table>
<thead>
<tr>
<th>Case</th>
<th>W</th>
<th>A</th>
<th>B</th>
<th>P1</th>
<th>F</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN02-002 &lt; 150 pF</td>
<td>16</td>
<td>5.56</td>
<td>8.18</td>
<td>8</td>
<td>7.5</td>
<td>2.16</td>
</tr>
<tr>
<td>MIN02-002 ≥ 150 pF</td>
<td>16</td>
<td>5.66</td>
<td>8.10</td>
<td>8</td>
<td>7.5</td>
<td>3.20</td>
</tr>
</tbody>
</table>

Note: 24 mm tape for MCM01-009 and 32 mm tape for MCM01-004 are available upon request.

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