Transmission Line MIM Capacitor
(Metal-Insulator-Metal)

BENEFITS
• HFSS Design Unique for every device
• Gold Wirebondable
• Copper Conductor Design for improved Circuit Conductivity
• Designs Optimized for RF/Performance
• ROHS Compliant

DESCRIPTION
AVX Thin Film Technologies is pleased to introduce a novel MIM (Metal-Insulator-Metal) capacitor using a transmission line wire bond pad structure with backside ground.

The TL MIM can be supplied on quartz, alumina, glass and other substrates to minimize losses. Copper traces are used for optimal conductivity. Front and backside gold metalization make this device suitable for epoxy, gold wire bond/ribbon bond attachments.

APPLICATIONS
• DC Blocking at UHF
• High Frequency Link
• RF Microwave applications

SUBSTRATE MATERIALS
Fused Silica (Quartz)
Alumina (Al2O3)

MECHANICAL DIMENSIONS
Based on Transmission Line Design Request

CAPACITOR MATERIALS
<table>
<thead>
<tr>
<th>Rated Voltage</th>
<th>Specific Capacitance</th>
<th>Dissipation Factor</th>
<th>TCC (ppm/°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100</td>
<td>50 - 100 * pf/mm²</td>
<td>&lt;0.1%</td>
<td>±60</td>
</tr>
</tbody>
</table>

*Actual maximum capacitance values depend on transmission line dimensions

TEST METHODS

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-STD-883-2011.8</td>
<td>BOND STRENGTH &gt; 3 gm min. w/0.001” Au Wire</td>
</tr>
<tr>
<td>MIL-STD-883-2018</td>
<td>SHEAR STRENGTH Size Dependent See Procedure</td>
</tr>
<tr>
<td>MIL-STD-202-108</td>
<td>LIFE 1000 hrs @ 125°C</td>
</tr>
</tbody>
</table>
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**GENERAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>DESIGN DEPENDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacitor Range</td>
<td>0.3 - 50 Pf</td>
</tr>
<tr>
<td>Tolerance</td>
<td>± 20%</td>
</tr>
<tr>
<td>Backing</td>
<td>Gold Metalization</td>
</tr>
<tr>
<td>Termination Type</td>
<td>Gold Wire Bond</td>
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</tbody>
</table>

**AVAILABLE PART NUMBERS**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Substrate</th>
<th>Length (mils)</th>
<th>Width (mils)</th>
<th>Thickness (mils)</th>
<th>Cap Value (pF)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV0404CA1R0MQAW</td>
<td>Quartz</td>
<td>40</td>
<td>40</td>
<td>5</td>
<td>1</td>
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<td>40</td>
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<tr>
<td>MV0404CA150MQAW</td>
<td>Quartz</td>
<td>40</td>
<td>40</td>
<td>5</td>
<td>15</td>
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<tr>
<td>MV0204CA1R0MQAW</td>
<td>Quartz</td>
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<td>40</td>
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<td>1</td>
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<tr>
<td>MV0304CA150MABW</td>
<td>Alumina</td>
<td>30</td>
<td>40</td>
<td>10</td>
<td>15</td>
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<tr>
<td>MV0402CA150MAAW</td>
<td>Alumina</td>
<td>40</td>
<td>20</td>
<td>5</td>
<td>15</td>
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<tr>
<td>MV0802CA150MAAW</td>
<td>Alumina</td>
<td>80</td>
<td>20</td>
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<tr>
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<td>40</td>
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<td>1</td>
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<tr>
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<td>Alumina</td>
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<td>40</td>
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<td>MV3204CA150MABW</td>
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</tr>
<tr>
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<td>Alumina</td>
<td>40</td>
<td>40</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

*Capable Capacitance Value Ranging From: 0.3-50 (pF)
Most Common Capacitance Values Requested are 1, 5, and 15 (pF)

**HOW TO ORDER**

MV

Series Code

Substrate Length in tens of mils

Substrate Width in tens of mils

Working Voltage C = 100 WVDC

Standard Impedance A = 500

Contact Factory X = Other

Capacitance code in pF

First two digits = significant figures or R for decimal place.

Third digit - number of zero or after “R” significant figures.

Capacitance Tolerance M = ± 20%

Substrate A = Alumina

Q = Quartz

Glass X = Other

Substrate Thickness (mils) A = 5 mils

B = 10 mils

C = 15 mils

Contact Factory X = Contact Factory

Packaging W = antistatic waffle pack

T = tested, undiced

D = Tested and diced on tape

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Transmission Line MIM Capacitor
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Substrate: Al₂O₃
Size: 1mm x 0.5mm x 0.125mm
Capacitance: 8pF

Substrate: Al₂O₃
Size: 2mm x 0.5mm x 0.125mm
Capacitance: 15 pF
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Equivalent Circuit
Port 1
20-50
TL1 C1 ESR ESL TL2 Port 2
Z=39.3 69
C=0.117pf R=0.400 L=0.015 Z=50.493
20-50
L=29.538 L=1.27

Substrate: Al₂O₃
Size: 8.12mm x 1mm x 0.25mm
Capacitance: 15 pF