Material Selection Guide

Magnetodielectric materials with tailored permeability and permittivity can be used to miniaturize RF devices without sacrificing bandwidth.

<table>
<thead>
<tr>
<th>Material</th>
<th>Application Freq. (MHz)</th>
<th>Material</th>
<th>Mechanic</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMMDF1xx</td>
<td>30-800</td>
<td>ceramic</td>
<td>rigid, machinable</td>
<td>4&quot;x4&quot;x1cm</td>
</tr>
<tr>
<td>SMMDF2xx</td>
<td>30-2,000</td>
<td>ceramic</td>
<td>rigid,machinable</td>
<td>4&quot;x4&quot;x1cm</td>
</tr>
<tr>
<td>SMMDF3xx</td>
<td>30-500</td>
<td>ceramic</td>
<td>rigid,machinable</td>
<td>4&quot;x4&quot;x1cm</td>
</tr>
<tr>
<td>SMMDF100</td>
<td>230</td>
<td>12-15</td>
<td>0.3 (μ=230)</td>
<td>5.6 (4.3)</td>
</tr>
<tr>
<td>SMMDF101</td>
<td>16</td>
<td>12</td>
<td>&lt;0.001 (16)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>SMMDF201</td>
<td>42</td>
<td>13</td>
<td>0.004 (42)</td>
<td>2.1 (8)</td>
</tr>
<tr>
<td>SMMDF300</td>
<td>67</td>
<td>8</td>
<td>0.006</td>
<td>0.1</td>
</tr>
<tr>
<td>SMMDF301</td>
<td>10</td>
<td>7</td>
<td>0.01</td>
<td>0.6 (6)</td>
</tr>
<tr>
<td>SMMDF400</td>
<td>1.7</td>
<td>3</td>
<td>&lt;0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>SMMDF401</td>
<td>2.4</td>
<td>4.8</td>
<td>&lt;0.01</td>
<td>0.16</td>
</tr>
</tbody>
</table>
Antenna Substrate Materials

Spectrum Magnetics, LLC
1210 First State Blvd
Wilmington, DE 19804-3561

Phone: (302) 993-1070
Fax: (302) 993-1071
BD@spectrum-magnetics.com

Magnetic oxide materials for applications >30MHz
- SMMDF100: lower $\mu$
- SMMDF101: matched $\mu$ and $\varepsilon$

SMMDF100 Series
- 5" long bar & 4" dia. disk
- 3"x3" tile

www.spectrum-magnetics.com
SMMDF200 Series

- Magnetic oxide materials for applications >30MHz
- SMMDF200: lower $\mu$
- SMMDF201: higher $\mu$ and $\varepsilon$

www.spectrum-magnetics.com
SMMDF300 Series

- Magnetic materials for applications 30~500MHz
- SMMDF300: high $\mu$ at 30MHz
- SMMDF301, 302: $\mu > \varepsilon$ at 1-400MHz

3"x3" ceramic tiles

www.spectrum-magnetics.com
SMMDP100 Series

- Magnetic composite materials for application 30-2,000MHz
- SMMDP100: lower $\mu$ and $\varepsilon$
- SMMDP101: higher $\mu$ and $\varepsilon$

8" wide rolls
18" x 18" plates
Antenna Substrate Materials

Spectrum Magnetics, LLC
1210 First State Blvd
Wilmington, DE 19804-3561

Phone: (302) 993-1070
Fax: (302) 993-1071
BD@spectrum-magnetics.com

SMMDP400 Series

- Magnetic composite materials for application 30-2,000MHz
- SMMDP400: lower $\mu$ and $\varepsilon$
- SMMDP401: higher $\mu$ and $\varepsilon$

4" and 8" wide rolls

- Loss of SMMDP401 at 1GHz can be reduced from 0.11 to 0.06 with assistance of external fields
- SMMDP4xx material is anisotropic material and the preferred orientation: H//sheet, E\perp sheet

www.spectrum-magnetics.com