MAFL-011026

MoCA Triplex Filter
5-85 / 105-1002 / 1125-1675 MHz

Features
- 75 Ohm
- SMT unit
- RoHS* Compliant

Description
The MAFL-011026 is a low profile, surface mount filter with 3 transmission paths allowing full triplexer operation. The CATV reverse and forward bands are provided along with a further band meeting the MoCA specification. This filter is specifically designed for CATV and MoCA applications.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAFL-011026</td>
<td>200 piece reel</td>
</tr>
<tr>
<td>MAFL-011026-Tray</td>
<td>480 piece tray</td>
</tr>
</tbody>
</table>

Pin Configuration

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MoCA Port</td>
</tr>
<tr>
<td>4</td>
<td>Forward Port</td>
</tr>
<tr>
<td>7</td>
<td>Reverse Port</td>
</tr>
<tr>
<td>14</td>
<td>Common Port</td>
</tr>
<tr>
<td>2, 3, 5, 6, 8-13, 15-20</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Functional Schematic


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### Electrical Specifications: \( T_A = +25^\circ \text{C}, \ Z_0 = 75\Omega \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Path Insertion Loss</td>
<td>5 - 85 MHz</td>
<td>dB</td>
<td>—</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Reverse Path Rejection</td>
<td>105 - 126 MHz</td>
<td>dB</td>
<td>62</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>126 - 1002 MHz</td>
<td></td>
<td>64</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1125 - 1675 MHz</td>
<td></td>
<td>60</td>
<td>64</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1675 - 3000 MHz</td>
<td></td>
<td>30</td>
<td>50</td>
<td>—</td>
</tr>
<tr>
<td>Forward Path Insertion Loss</td>
<td>105 - 126 MHz</td>
<td>dB</td>
<td>—</td>
<td>1.50</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>126 - 860 MHz</td>
<td></td>
<td>0.75</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>860 - 1002 MHz</td>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Path Rejection</td>
<td>5 - 85 MHz</td>
<td>dB</td>
<td>50</td>
<td>52</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1125 - 1675 MHz</td>
<td></td>
<td>43</td>
<td>45</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1675 - 3000 MHz</td>
<td></td>
<td>20</td>
<td>30</td>
<td>—</td>
</tr>
<tr>
<td>MoCA Path Insertion Loss</td>
<td>1125 - 1150 MHz</td>
<td>dB</td>
<td>—</td>
<td>2.8</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>1150 - 1650 MHz</td>
<td></td>
<td>2.5</td>
<td>2.7</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1650 - 1675 MHz</td>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MoCA Path Rejection</td>
<td>5 - 85 MHz</td>
<td>dB</td>
<td>49</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>85 - 1002 MHz</td>
<td></td>
<td>49</td>
<td>55</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>2300 - 3000 MHz</td>
<td></td>
<td>25</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>5 - 85 MHz</td>
<td>dB</td>
<td>16</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>105 - 860 MHz</td>
<td></td>
<td>16</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>860 - 1002 MHz</td>
<td></td>
<td>12</td>
<td>16</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1125 - 1675 MHz</td>
<td></td>
<td>12</td>
<td>16</td>
<td>—</td>
</tr>
<tr>
<td>Isolation - Forward to Reverse</td>
<td>5 - 38 MHz</td>
<td>dB</td>
<td>55</td>
<td>58</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>38 - 85 MHz</td>
<td></td>
<td>43</td>
<td>45</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>105 - 1002 MHz</td>
<td></td>
<td>60</td>
<td>65</td>
<td>—</td>
</tr>
<tr>
<td>Isolation - Forward to MoCA</td>
<td>5 - 85 MHz</td>
<td>dB</td>
<td>49</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>105 - 126 MHz</td>
<td></td>
<td>49</td>
<td>70</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>126 - 1002 MHz</td>
<td></td>
<td>49</td>
<td>53</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>1125 - 1675 MHz</td>
<td></td>
<td>43</td>
<td>45</td>
<td>—</td>
</tr>
</tbody>
</table>

### Recommended Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Power</td>
<td>250 mW</td>
</tr>
<tr>
<td>DC Current</td>
<td>30 mA</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40°C to +85°C</td>
</tr>
</tbody>
</table>
### PCB Layout

Dimensions are in millimetres.
Tolerance: \( \pm 0.1\text{mm} \)

### Parts List

<table>
<thead>
<tr>
<th>Part</th>
<th>Value</th>
<th>Case Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Do Not Insert</td>
<td>0402</td>
</tr>
<tr>
<td>C2</td>
<td>Do Not Insert</td>
<td>0402</td>
</tr>
<tr>
<td>C3</td>
<td>2.7pF +/- 0.25pF</td>
<td>0402</td>
</tr>
<tr>
<td>C4</td>
<td>1.3pF +/- 0.1pF</td>
<td>0402</td>
</tr>
<tr>
<td>C5</td>
<td>0.6pF +/- 0.1pF</td>
<td>0402</td>
</tr>
<tr>
<td>C6</td>
<td>2.0pF +/- 0.1pF</td>
<td>0402</td>
</tr>
<tr>
<td>C7</td>
<td>7.5pF +/- 0.25pF</td>
<td>0402</td>
</tr>
<tr>
<td>C8</td>
<td>3.9pF +/- 0.25pF</td>
<td>0402</td>
</tr>
<tr>
<td>L1</td>
<td>82nH +/- 2%</td>
<td>0603</td>
</tr>
<tr>
<td>L2</td>
<td>5.6nH +/- 2%</td>
<td>0603</td>
</tr>
<tr>
<td>L3</td>
<td>6.8nH +/- 2%</td>
<td>0603</td>
</tr>
<tr>
<td>L4</td>
<td>12nH +/- 2%</td>
<td>0603</td>
</tr>
<tr>
<td>L5</td>
<td>22nH +/- 2%</td>
<td>0603</td>
</tr>
</tbody>
</table>

### PCB Stack-Up

- [Diagram of PCB Stack-Up]

### Notes:
- Gap dimension = 1.3mm
- Track dimension = 1.15mm
- Substrate is 1.6mm thick FR4
- It is not recommended to run tracks under the filter
- A ground is required on the top layer of the application PCB
- RF shield should be kept a minimum of 10mm above the filter
- Any deviation from recommended footprint may compromise the filter performance
- For optimal filter performance the 4 transmission lines need to be at 75Ω impedance
MoCA Triplex Filter
5-85 / 105-1002 / 1125-1675 MHz

Application Schematic

Outline Dimensions

Dimensions are in millimetres.
Tolerance: ± 0.1 mm, except where specified.
MoCA Triplex Filter
5-85 / 105-1002 / 1125-1675 MHz

Typical Performance Curves

Reverse Insertion Loss

Forward Insertion Loss

MoCA Insertion Loss

Common Port Return Loss

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MoCA Triplex Filter
5-85 / 105-1002 / 1125-1675 MHz

Typical Performance Curves

Reverse Path

Forward Path

MoCA Path

Reverse to Forward Isolation

Forward to MoCA Isolation

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### Tape & Reel Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty per reel</td>
<td>-</td>
<td>200</td>
</tr>
<tr>
<td>Reel Size</td>
<td>mm</td>
<td>330</td>
</tr>
<tr>
<td>Tape Width</td>
<td>mm</td>
<td>72.0</td>
</tr>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>28.0</td>
</tr>
<tr>
<td>Ao</td>
<td>mm</td>
<td>23.3</td>
</tr>
<tr>
<td>Bo</td>
<td>mm</td>
<td>47.8</td>
</tr>
<tr>
<td>Ko</td>
<td>mm</td>
<td>6.8</td>
</tr>
<tr>
<td>Orientation</td>
<td>-</td>
<td>F54</td>
</tr>
</tbody>
</table>

Reference Application Note ANI-019 for orientation

Dimensions are in millimetres.

Tolerance: $x \pm 0.1$ mm, except where specified.
## Tray Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Order Qty</td>
<td>-</td>
<td>480</td>
</tr>
<tr>
<td>Tray Length</td>
<td>mm</td>
<td>270</td>
</tr>
<tr>
<td>Tray Width</td>
<td>mm</td>
<td>200</td>
</tr>
<tr>
<td>Height</td>
<td>mm</td>
<td>20.8</td>
</tr>
<tr>
<td>Ao</td>
<td>mm</td>
<td>35</td>
</tr>
<tr>
<td>Bo</td>
<td>mm</td>
<td>50</td>
</tr>
<tr>
<td>Ko</td>
<td>mm</td>
<td>14.4</td>
</tr>
<tr>
<td>Orientation</td>
<td>-</td>
<td>See below</td>
</tr>
</tbody>
</table>

Consecutive trays will be stacked alternately at 180°.

Dimensions are in millimetres.

Tolerance: ± 0.1 mm, except where specified.
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