1:1 Transmission Line Balun
5 - 1800 MHz

Features
- Surface Mount Package
- 1:1 Impedance
- DOCSIS 4.0 Compatible
- Tertiary Windings
- Excellent Return Loss up to 1800 MHz
- Available on Tape and Reel
- RoHS* Compliant and Lead Free
- 260°C Reflow Compatible

Description
The MABA-011112 is a 1:1 transmission line balun in a surface mount package, designed for best in class insertion loss and return loss performance in DOCSIS 4.0 band. This balun incorporates tertiary windings to simplify biasing of active devices.

Ideally suited for all CATV Broadband and FTTx applications.

Electrical Specifications: $T_A = 25^\circ$C, $Z_0 = 75$ Ω, $P_{IN} = 0$ dBm

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Frequency (MHz)</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance Ratio</td>
<td>—</td>
<td>Ratio</td>
<td>—</td>
<td>1:1</td>
<td>—</td>
</tr>
<tr>
<td>Insertion Loss 2 (pin 1 to pin 2)</td>
<td>5 - 500 500 - 1218 1218 -1800</td>
<td>dB</td>
<td>0.5</td>
<td>0.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Insertion Loss 1 (pin 1 to pin 4)</td>
<td>5 - 500 500 - 1218 1218 -1800</td>
<td>dB</td>
<td>0.7</td>
<td>0.9</td>
<td>1.3</td>
</tr>
<tr>
<td>Balance Insertion Loss</td>
<td>5 - 500 500 - 1218 1218 -1800</td>
<td>dB</td>
<td>0.6</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Amplitude Balance</td>
<td>5 - 500 500 - 1218 1218 -1800</td>
<td>dB</td>
<td>0.3</td>
<td>±0.6</td>
<td>±0.6</td>
</tr>
<tr>
<td>Phase Balance</td>
<td>5 - 500 500 - 1218 1218 -1800</td>
<td>°</td>
<td>-6.0</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Input Return Loss (pin 1)</td>
<td>5 - 1218 1218 -1800</td>
<td>dB</td>
<td>18</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Balance Output Return Loss</td>
<td>5 - 1218 1218 -1800</td>
<td>dB</td>
<td>18</td>
<td>22</td>
<td>21</td>
</tr>
</tbody>
</table>

Ordering Information
- MABA-011112 2000 piece reel
- MABA-011112-TB Customer test board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
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</thead>
<tbody>
<tr>
<td>Input RF Power</td>
<td>0.5 W</td>
</tr>
<tr>
<td>DC Current</td>
<td>600 mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
</tbody>
</table>

4. Exceeding anyone or combination of these limits may cause permanent damage to this device.
5. MACOM does not recommend sustained operation near these survivability limits.
6. Specified at 25°C only and measured at 800 MHz.
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Typical Performance Curves

**Insertion Loss 1 (pin1-4)**

![Graph showing Insertion Loss 1](image)

**Insertion Loss 2 (pin1-2)**

![Graph showing Insertion Loss 2](image)

**Amplitude Balance**

![Graph showing Amplitude Balance](image)

**Phase Balance**

![Graph showing Phase Balance](image)

**Input Return Loss (pin 1)**

![Graph showing Input Return Loss](image)

**Balanced Insertion Loss**

![Graph showing Balanced Insertion Loss](image)

**Balanced Output Return Loss**

![Graph showing Balanced Output Return Loss](image)

7. Temperature plots available on request.
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Recommended Board Layout

Recommended PCB layout shown above uses 1.6 mm FR4, Grounded coplanar wave guide, transmission line width 0.70 mm and gap 0.57 mm.

Outline Drawing

Dimensions in mm.
Tolerance: ±0.2 mm unless otherwise noted.
Model number and lot code are printed on the reel.
Plating finish: ENIG.

Carrier Tape Orientation

Recommended PCB layout shown above uses 1.6 mm FR4, Grounded coplanar wave guide, transmission line width 0.70 mm and gap 0.57 mm.

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>2000</td>
</tr>
<tr>
<td>Reel Size</td>
<td>mm</td>
<td>330</td>
</tr>
<tr>
<td>Tape Width</td>
<td>mm</td>
<td>12.00</td>
</tr>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>8.00</td>
</tr>
<tr>
<td>Orientation</td>
<td>-</td>
<td>F31</td>
</tr>
</tbody>
</table>

Reference Application Note ANI-019 for orientation
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