MABA-011002

4:1 Step Down Balun Transformer
5 - 200 MHz

Rev. V3

Features
- Surface Mount Package
- 4:1 Step Down Transformer
- Excellent performance under DC bias current, also when current flows is imbalanced through outputs
- 260°C Reflow Compatible
- RoHS* Compliant, lead free
- Available on Tape and Reel.

Description
The MABA-011002 is a 4:1 step down balun transformer.
This transformer is ideally suited for CATV Broadband applications.

Functional Schematic

Pin Configuration

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Secondary Dot (output1)</td>
</tr>
<tr>
<td>2</td>
<td>Ground (center tap)</td>
</tr>
<tr>
<td>3</td>
<td>Secondary (output2)</td>
</tr>
<tr>
<td>4</td>
<td>Primary (RF ground)</td>
</tr>
<tr>
<td>5</td>
<td>Ground (not used)</td>
</tr>
<tr>
<td>6</td>
<td>Primary dot (input)</td>
</tr>
</tbody>
</table>

Electrical Specifications: Freq. = 5 - 200 MHz, \( T_A = +25°C, \ Z_0 = 75 \, \Omega, \ P_{IN} = 0 \, \text{dBm} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency Test Conditions (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>4:1</td>
<td>—</td>
</tr>
<tr>
<td>Insertion Loss (pin 6 - pin 1)</td>
<td>5 - 50 50 - 150 150 - 200</td>
<td>dB</td>
<td>0.4</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>2.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Insertion Loss (pin 6 - pin 3)</td>
<td>5 - 50 50 - 150 150 - 200</td>
<td>dB</td>
<td>0.4</td>
<td>1.1</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.1</td>
<td>2.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Amplitude Balance</td>
<td>5 - 50 50 - 150 150 - 200</td>
<td>dB</td>
<td>0.0</td>
<td>0.0</td>
<td>±0.4</td>
</tr>
<tr>
<td>Phase Balance</td>
<td>5 - 50 50 - 200</td>
<td>o</td>
<td>0.6</td>
<td>0.3</td>
<td>±1.4</td>
</tr>
<tr>
<td>Input Return Loss (pin 6)</td>
<td>5 - 25 25 - 50 50 - 150 150 - 200</td>
<td>dB</td>
<td>17</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>15</td>
<td>—</td>
</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MABA-011002</td>
<td>900 piece reel</td>
</tr>
<tr>
<td>MABA-011002-TB</td>
<td>Customer Evaluation Board</td>
</tr>
</tbody>
</table>

Recommended Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input RF Power</td>
<td>1 W</td>
</tr>
<tr>
<td>Internal Load Dissipation</td>
<td>0.125 W</td>
</tr>
<tr>
<td>DC Bias Current</td>
<td>&gt;900 mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C - +85°C</td>
</tr>
</tbody>
</table>
Typical Performance Curves

**Insertion loss (Pin6-1)**

**Insertion loss (pin6-3)**

**Amplitude Balance**

**Phase Balance**

**Input Return Loss (pin6)**
Application Circuit

Outline Drawing

PCB Layout

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>900</td>
</tr>
<tr>
<td>Reel Size</td>
<td>mm</td>
<td>330</td>
</tr>
<tr>
<td>Tape Width</td>
<td>mm</td>
<td>16.00</td>
</tr>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>12.00</td>
</tr>
<tr>
<td>Ao</td>
<td>mm</td>
<td>6.60</td>
</tr>
<tr>
<td>Bo</td>
<td>mm</td>
<td>7.40</td>
</tr>
<tr>
<td>Ko</td>
<td>mm</td>
<td>4.10</td>
</tr>
<tr>
<td>Orientation</td>
<td>-</td>
<td>F38</td>
</tr>
</tbody>
</table>

Reference Application Note ANI-019 for orientation
MACOM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with MACOM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.