1:1 Transmission Line Transformer
5 - 3000 MHz

Features
- Surface Mount
- 1:1 Impedance
- Available on Tape and Reel
- RoHS Compliant
- 260°C Reflow Compatible

Description
MABACT0039 is a 1:1 transmission line transformer in a surface mount package. Suitable for use in both 50 Ω and 75 Ω systems. Ideally suited for high volume 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 (Output 1)</td>
</tr>
<tr>
<td>2</td>
<td>Not Used</td>
</tr>
<tr>
<td>3</td>
<td>Secondary (Output 2)</td>
</tr>
<tr>
<td>4</td>
<td>Primary (Ground)</td>
</tr>
<tr>
<td>5</td>
<td>Primary Dot (Input)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance Ratio</td>
<td>5 - 3000 MHz</td>
<td>ratio</td>
<td>1:1</td>
<td>1:1</td>
<td>1:1</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>50 - 2150 MHz</td>
<td>dB</td>
<td>1.0</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Amplitude Balance</td>
<td>50 - 2150 MHz</td>
<td>dB</td>
<td>1.0</td>
<td>±1.0</td>
<td>±2.2</td>
</tr>
<tr>
<td>Phase Balance</td>
<td>50 - 2150 MHz</td>
<td>°</td>
<td>5.0</td>
<td>±5.0</td>
<td>±13</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>5 - 550 MHz</td>
<td>dB</td>
<td>20</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>550 - 2100 MHz</td>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MABACT0039</td>
<td>2000 piece reel</td>
</tr>
<tr>
<td>MABA-008031-CT39TB</td>
<td>Sample Board</td>
</tr>
</tbody>
</table>

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>
</tr>
</thead>
<tbody>
<tr>
<td>RF Input 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>
</tbody>
</table>

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.
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Typical Performance Curves\(^5\): \(T_A = 25^\circ C, Z_0 = 75 \Omega, P_{IN} = 0 \text{ dBm}\)

- **Insertion Loss 1**
  - Pin 5-1 (through)

![Graph of Insertion Loss 1](image1)

- **Insertion Loss 2**
  - Pin 5-3 (coupled)

![Graph of Insertion Loss 2](image2)

- **Amplitude Balance**

![Graph of Amplitude Balance](image3)

- **Phase Balance**

![Graph of Phase Balance](image4)

5. Full temperature plots available on request
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Application Schematic

PCB Layout

Outline Drawing

Tape & Reel Information

Parameter | Units | Value
---|---|---
Qty per reel | - | 2000
Reel Size | mm | 330
Tape Width | mm | 12.0
Pitch | mm | 8.0
Orientation | - | F26

Reference Application Note ANI-019 for orientation

[7] Tolerance: ±0.2 mm unless otherwise noted.
[9] Lead plating (CuSn6) Lead finish SAC-305.

Recommended Board Layout

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