

## 1:1 Transmission Line Balun 5 MHz - 10GHz

Rev. V1

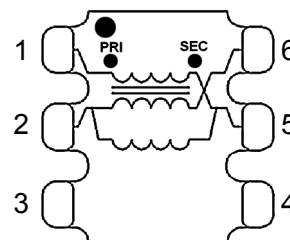
### Features

- Wide Bandwidth
- Low Insertion Loss
- Excellent Amplitude balance
- Small Surface Mount assembly
- Available on Tape and Reel
- RoHS\* Compliant and Lead Free
- 260°C Reflow Compatible

### Description

The MABA-011108 is a 1:1 balun transformer covering a very wide bandwidth. Appropriate for many applications including Cellular, Wideband Differential Amplifiers, Analog-to-digital Converters, Mixers, and Differential Modulators.

### Functional Schematic



### Pin Configuration<sup>3</sup>

| Pin | Function            | Pin | Function                 |
|-----|---------------------|-----|--------------------------|
| 1   | Primary Dot (Input) | 4   | Not used (Ground)        |
| 2   | Primary (Ground)    | 5   | Secondary Dot (Output 2) |
| 3   | Not used (Ground)   | 6   | Secondary (Output 1)     |

3. MACOM recommends connecting unused package pins to ground.

### Electrical Specifications: Freq. = 5 MHz - 10 GHz, T<sub>A</sub> = +25°C, Z<sub>0</sub> = 50 Ω, P<sub>IN</sub> = 0 dBm

| Parameter                       | Test Conditions Frequency (MHz) | Units | Min | Typ | Max  |
|---------------------------------|---------------------------------|-------|-----|-----|------|
| Impedance Ratio                 | -                               | ratio | —   | 1:1 | —    |
| Balanced Insertion Loss         | 5 - 500                         | dB    | —   | 1.7 | 1.9  |
|                                 | 500 - 1000                      |       |     | 1.5 | 1.6  |
|                                 | 1000 - 6000                     |       |     | 1.4 | 1.7  |
|                                 | 6000 - 8000                     |       |     | 1.4 | 2.9  |
|                                 | 8000 - 10000                    |       |     | 2.2 | —    |
| Amplitude Balance               | 5 - 3000                        | dB    | —   | 0.0 | ±0.8 |
|                                 | 3000 - 8000                     |       |     | 1.5 | ±3.1 |
|                                 | 8000 - 10000                    |       |     | 2.0 | —    |
| Phase Balance                   | 5 - 500                         | °     | —   | 3   | ±8.0 |
|                                 | 500 - 8000                      |       |     | 14  | ±20  |
|                                 | 8000 - 10000                    |       |     | 5   | —    |
| Input Return Loss<br>(Pin 1)    | 5 - 500                         | dB    | 13  | 17  | —    |
|                                 | 500 - 3000                      |       | 10  | 15  |      |
|                                 | 3000 - 7000                     |       | 6   | 15  |      |
|                                 | 7000 - 8000                     |       | 5   | 9   |      |
|                                 | 8000 - 10000                    |       | —   | 7   |      |
| Output Return Loss<br>(Pin 5-6) | 5 - 5500                        | dB    | 9   | 14  | —    |
|                                 | 5500 - 8000                     |       | 5   | 13  |      |
|                                 | 8000 - 10000                    |       | —   | 7   |      |

### Ordering Information<sup>1,2</sup>

| Part Number    | Description     |
|----------------|-----------------|
| MABA-011108    | 2000 piece reel |
| MABA-011108-TB | Sample Board    |

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

\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

### Absolute Maximum Ratings<sup>4,5</sup>

| Parameter             | Absolute Maximum    |
|-----------------------|---------------------|
| Input RF Power        | 1 W, @ +25°C, 1 GHz |
| DC Current            | 1 A                 |
| Operating Temperature | -55°C to +85°C      |

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. MACOM does not recommend sustained operation near these survivability limits.

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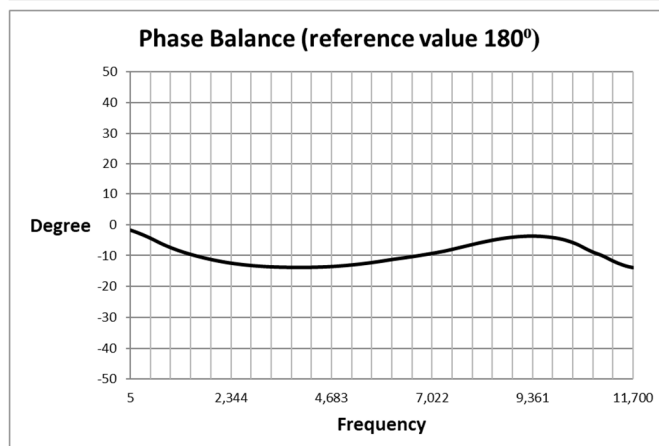
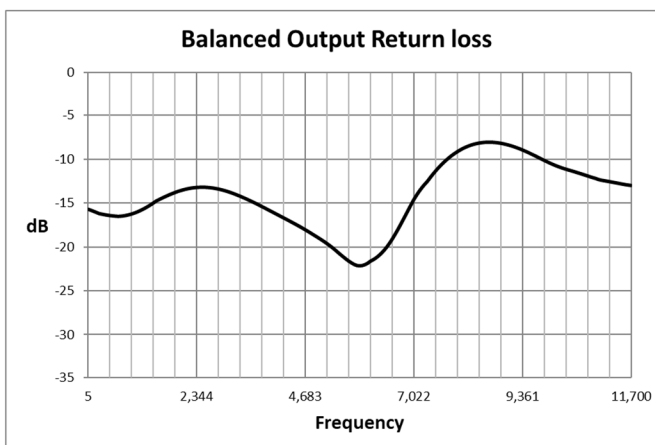
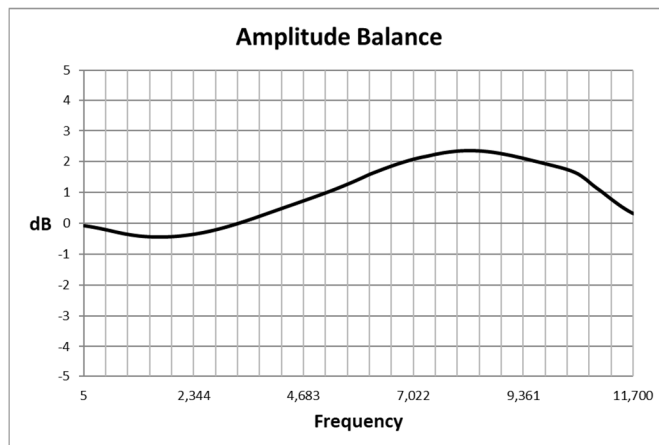
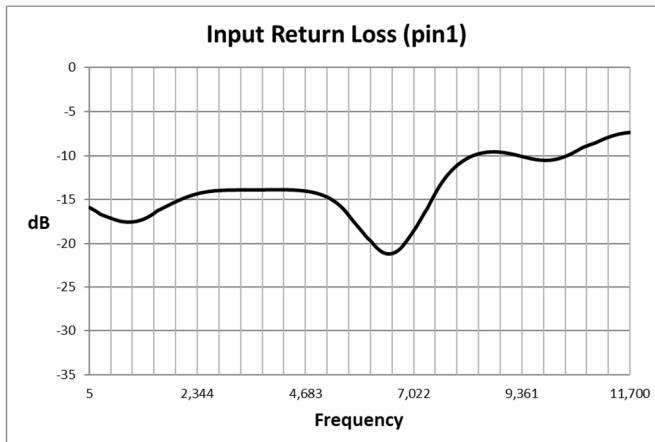
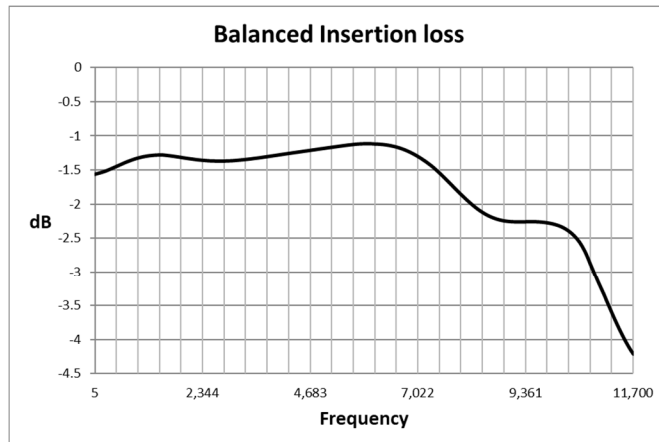
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## 1:1 Transmission Line Balun 5 MHz - 10GHz

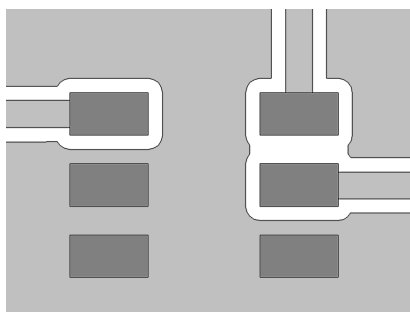
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Typical Performance Curves<sup>6</sup>: Freq. = 5 MHz - 10 GHz,  $T_A = +25^\circ\text{C}$ ,  $Z_0 = 50\ \Omega$ ,  $P_{IN} = 0\ \text{dBm}$



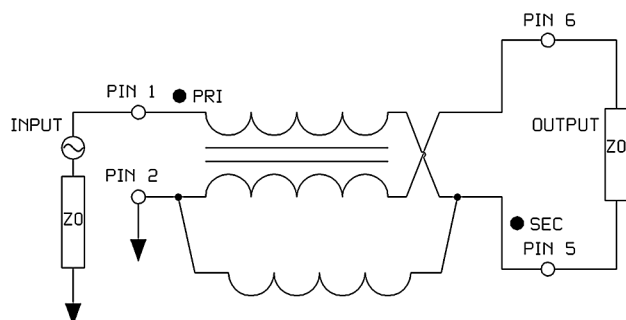
6. Temperature plots available on request.

### Recommended Board Layout<sup>7,8</sup>

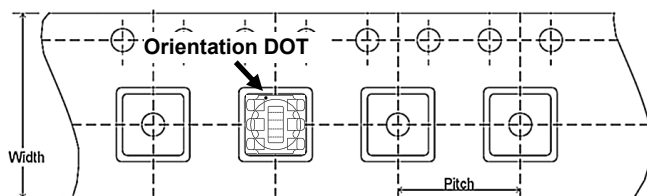


7. Recommended PCB layout shown above uses Rogers RO4350B substrate, thickness 0.254 mm.
8. Grounded coplanar wave guide trace, width 0.48 mm and Gap 0.25 mm.

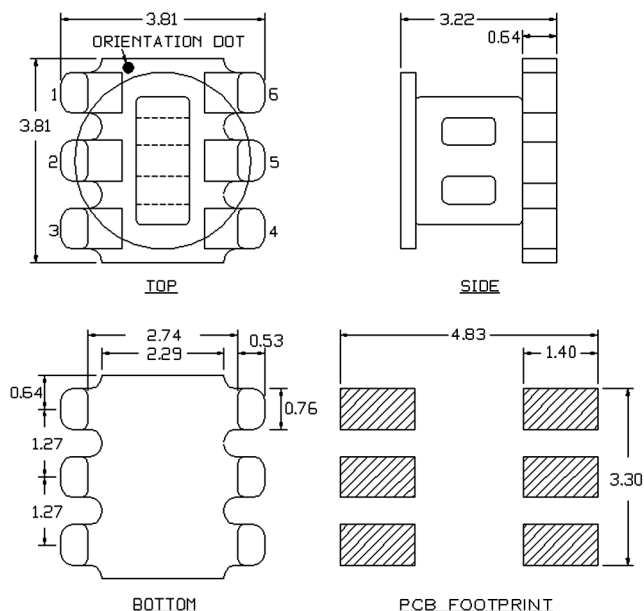
### Application Schematic



### Carrier Tape Orientation



### Outline Drawing<sup>9,10,11,12</sup>



9. Dimensions in mm.
10. Tolerance:  $\pm 0.2$  mm unless otherwise noted.
11. Model number and lot code are printed on the reel.
12. Plating finish: ENIG.

### Tape & Reel Information<sup>13</sup>

| Parameter    | Units | Value |
|--------------|-------|-------|
| Qty per Reel | -     | 2000  |
| Reel Size    | mm    | 330   |
| Tape Width   | mm    | 12.00 |
| Pitch        | mm    | 8.00  |
| Orientation  | -     | F33   |

13. Reference Application Note ANI-019 for orientation.

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