

Rev. V4

# 1:1 Transmission Line Balun with Tertiary Winding 5 - 1225 MHz

#### Features

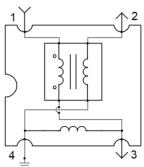
- Surface Mount
- 1:1 Impedance
- Available on Tape and Reel
- RoHS Compliant and Pb Free
- 260°C Reflow Compatible
- Excellent Temperature Stability

#### Description

The MABA-011085 is a 1:1 transmission line balun with tertiary winding in a low cost surface mount package.

Ideally suited for all CATV Broadband and FTTx applications.

## Functional Schematic



### **Pin Configuration**

Pin #	Function	Pin #	Function
1	Primary (input)	3	Secondary (output 1)
2	Secondary (output 2)	4	Primary (ground)

### Electrical Specifications: Freq. = 5 - 1225 MHz, $T_A = 25^{\circ}C$ , $Z_0 = 75 \Omega$ , $P_{IN} = 0 \text{ dBm}$

Parameter	Test Conditions Frequency (MHz)	Units	Min.	Тур.	Max.
Impedance Ratio	_	_	_	1:1	_
Insertion Loss 1 (Pin 1 - Pin 3)	5 - 300 300 - 1000 1000 - 1225	dB	_	0.2 0.4 0.7	0.4 0.8 1.0
Insertion Loss 2 (Pin 1 - Pin 2)	5 - 300 300 - 1000 1000 - 1225	dB		0.4 0.6 0.7	0.7 0.9 0.9
Amplitude Balance	5 - 300 300 - 1225	dB	_	0.2 0.1	±0.4 ±0.5
Phase Balance (ref value 180°)	5 - 300 300 - 1225	dB		1.0 2.0	±4.0 ±9.0
Input Return Loss (Pin 1)	5 - 300 300 - 1225	dB	23 15	28 23	_

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

Part Number	Description
MABA-011085	900 piece reel
MABA-011085-TB	Sample Board

1. All sample boards include 5 loose parts.

### Absolute Maximum Ratings<sup>2,3</sup>

Parameter	Absolute Maximum
Input RF Power <sup>4</sup>	2000 mW
DC Current	1500 mA
Operating Temperature	-40°C to +125°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.

- 3. MACOM does not recommend sustained operation near these survivability limits.
- 4. Specified at +25°C only.

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit <u>www.macom.com</u> for additional data sheets and product information.

1

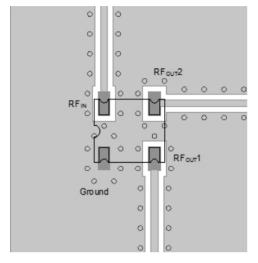
For further information and support please visit: <u>https://www.macom.com/support</u>

# 1:1 Transmission Line Balun with Tertiary Winding 5 - 1225 MHz

Rev. V4

MACOM

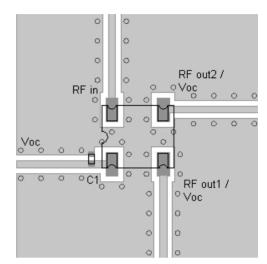
# Recommended PCB Layout<sup>5,6,7,8</sup>



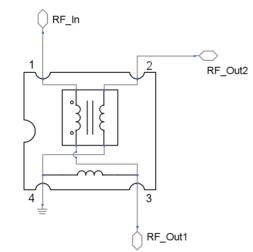
Layout Option 1 - no dc voltage on tertiary winding

- 5. Recommended PCB layout shown above uses 1.6 mm FR4.
- 6. Grounded coplanar wave guide transmission line.
- 7. Trace width 0.70 mm.
- 8. Gap 0.57 mm.

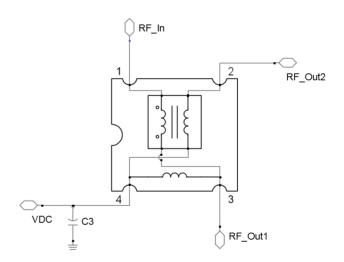
#### **Application Schematics**



Layout Option 2 - dc voltage on tertiary winding



Option 1 - no dc voltage on tertiary winding



Option 2 - dc voltage on tertiary winding

#### **Parts List**

Component	Value	Package
C1	10 nF	0402

2

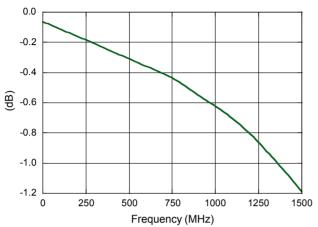
MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit <u>www.macom.com</u> for additional data sheets and product information.

# 1:1 Transmission Line Balun with Tertiary Winding

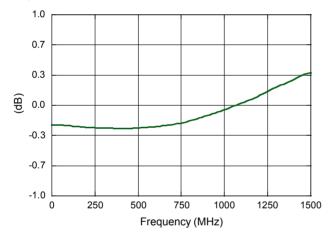
#### 5 - 1225 MHz

# Typical Performance Curves: $T_A = 25^{\circ}C$ , $Z_0 = 75 \Omega$ , $P_{IN} = 0 \text{ dBm}$

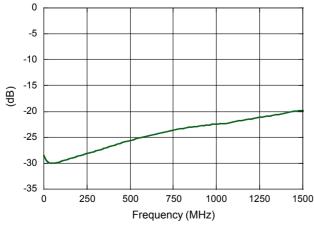
Insertion Loss (pin 1-3)



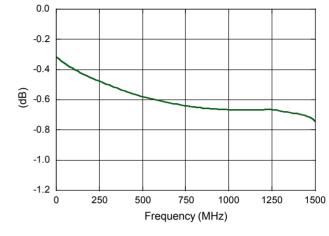
Amplitude Balance



Input Return Loss (pin 1)

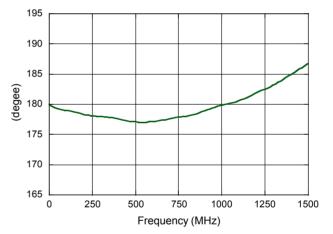


3 Full temperature plots available on request.

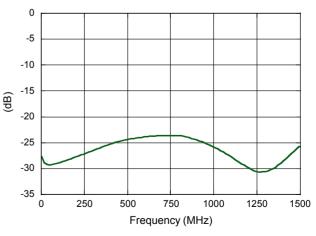


Phase Balance

Insertion Loss (pin 1-2)







MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit <u>www.macom.com</u> for additional data sheets and product information.



Rev. V4

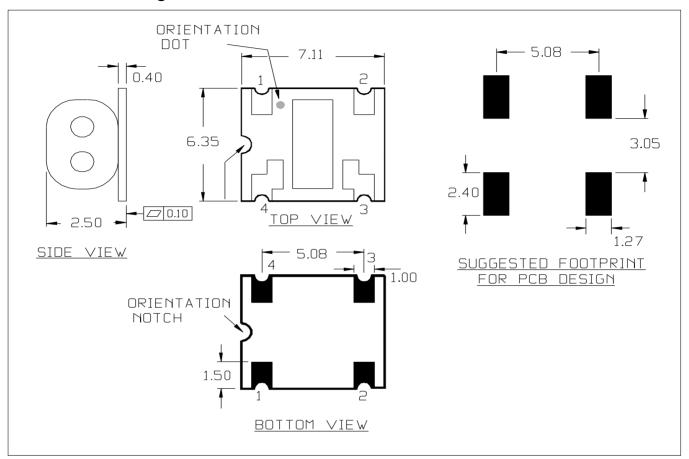
# 1:1 Transmission Line Balun with Tertiary Winding

## 5 - 1225 MHz

Rev. V4

MACOM

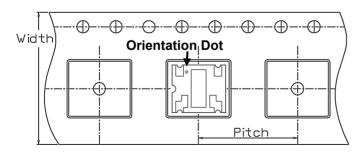
# Part Outline Drawing<sup>9,10,11,12</sup>



9. Dimensions in mm

- 10. Tolerance: ±0.2 mm unless otherwise noted
- 11. Model number and lot code are printed on the reel
- 12. Plating finish: ENIG

#### **Carrier Tape Orientation**



### **Tape & Reel Information**

Parameter	Units	Value	
Qty per reel	-	900	
Reel Size	mm	330	
Tape Width	mm	16.00	
Pitch	mm	12.00	
Orientation	-	F60	
Reference Application Note ANI-019 for orientation			

4

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit www.macom.com for additional data sheets and product information.

1:1 Transmission Line Balun with Tertiary Winding 5 - 1225 MHz



Rev. V4

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.

<sup>5</sup> 

MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit <u>www.macom.com</u> for additional data sheets and product information.