

# 1:1 Transmission Line Balun

## 5 - 1800 MHz



MABA-011112

Rev. V3

### Features

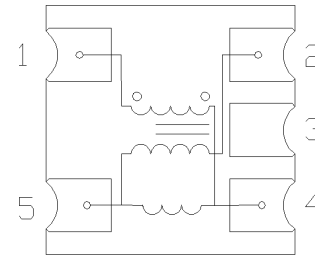
- Surface Mount Package
- 1:1 Impedance
- DOCSIS 4.0 Compatible
- Tertiary Windings
- Excellent Return Loss up to 1800 MHz
- Available on Tape and Reel
- RoHS\* Compliant and Lead Free
- 260°C Reflow Compatible

### 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.

### Functional Schematic



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

Pin #	Function	Pin #	Function
1	Input (PRI dot)	4	Output 1 (SEC dot)
2	Output 2 (SEC)	5	Ground (PRI)
3	Not used		

3. MACOM recommends connecting unused package pins to ground.

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

Parameter	Test Frequency (MHz)	Units	Min.	Typ.	Max.
Impedance Ratio	—	Ratio	—	1:1	—
Insertion Loss 2 (pin 1 to pin 2)	5 - 500	dB	—	0.5	0.7
	500 - 1218			0.9	1.1
	1218 - 1800			1.2	1.5
Insertion Loss 1 (pin 1 to pin 4)	5 - 500	dB	—	0.7	0.9
	500 - 1218			1.0	1.3
	1218 - 1800			1.7	2.1
Balance Insertion Loss	5 - 500	dB	—	0.6	0.8
	500 - 1218			0.9	1.2
	1218 - 1800			1.3	1.7
Amplitude Balance	5 - 500	dB	—	0.3	$\pm 0.6$
	500 - 1218			0.2	$\pm 0.6$
	1218 - 1800			0.7	$\pm 1.0$
Phase Balance	5 - 500	°	-6.0	3.0	2.0
	500 - 1218		-6.0	-4.0	2.0
	1218 - 1800		-6.0	4.0	6.0
Input Return Loss (pin 1)	5 - 1218	dB	18	22	—
	1218 - 1800		18	21	
Balance Output Return Loss	5 - 1218	dB	18	22	—
	1218 - 1800		18	21	

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

Part #	Description
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<sup>4,5,6</sup>

Parameter	Absolute Maximum
Input RF Power	0.5 W
DC Current	600 mA
Operating Temperature	-40°C to +85°C

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.

# 1:1 Transmission Line Balun 5 - 1800 MHz

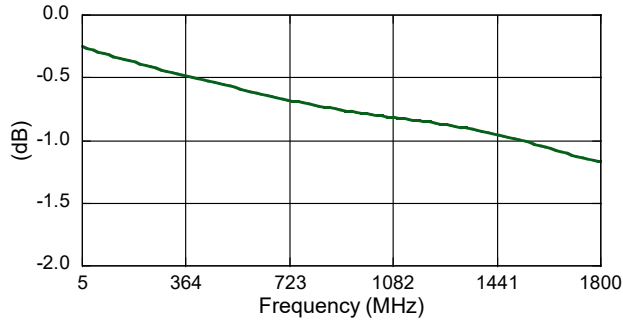


MABA-011112

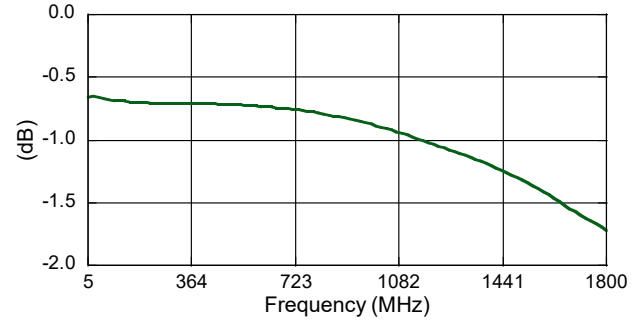
Rev. V3

## Typical Performance Curves<sup>7</sup>

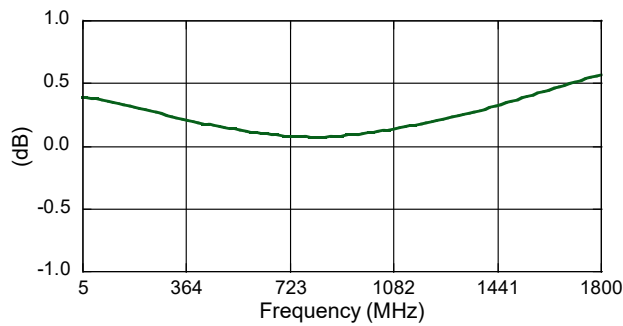
**Insertion Loss 1 (pin1-4)**



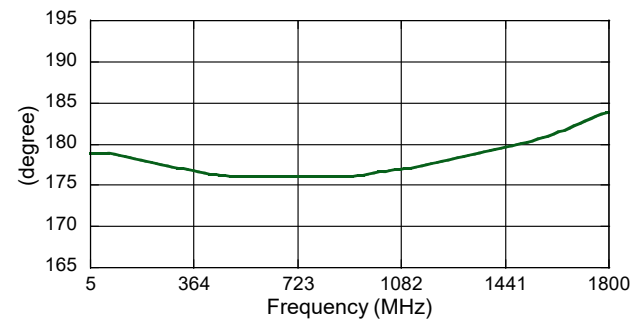
**Insertion Loss 2 (pin1-2)**



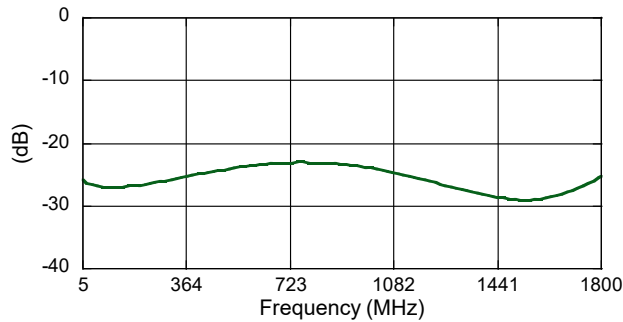
**Amplitude Balance**



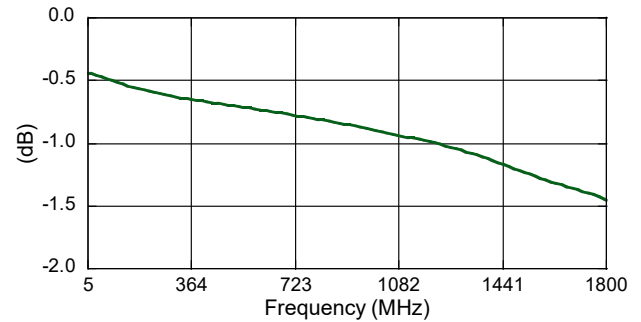
**Phase Balance**



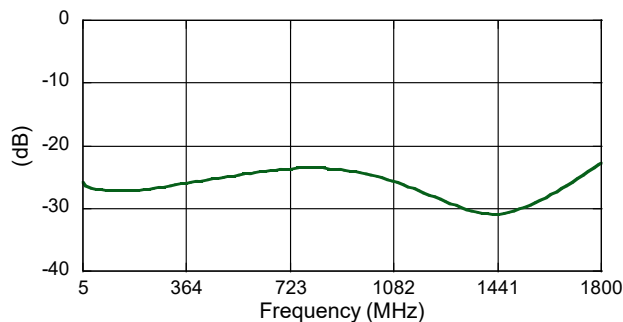
**Input Return Loss (pin 1)**



**Balanced Insertion Loss**



**Balanced Output Return Loss**



7. Temperature plots available on request.

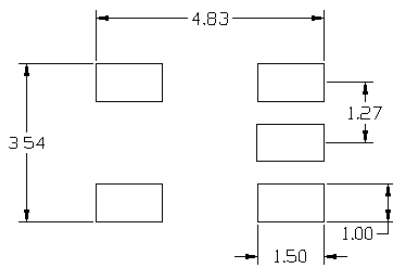
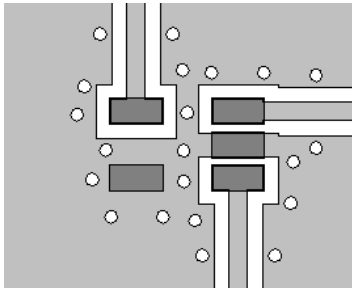
# 1:1 Transmission Line Balun 5 - 1800 MHz



MABA-011112

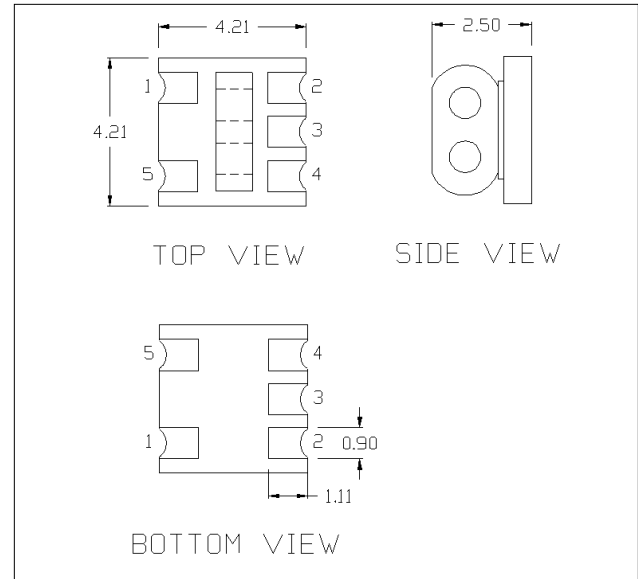
Rev. V3

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



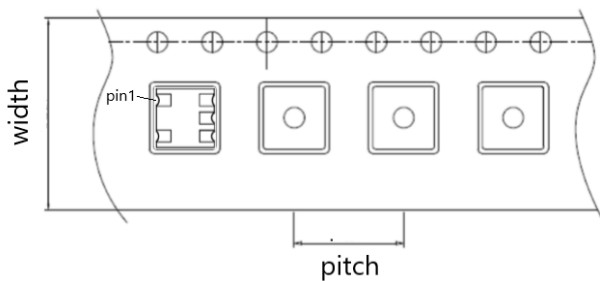
8. Recommended PCB layout shown above uses 1.6 mm FR4, Grounded coplanar wave guide, transmission line width 0.70 mm and gap 0.57 mm.

## Outline Drawing<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.

## Carrier Tape Orientation



## Tape & Reel Information

Parameter	Units	Value
Qty per reel	-	2000
Reel Size	mm	330
Tape Width	mm	12.00
Pitch	mm	8.00
Orientation	-	F31
Reference Application Note ANI-019 for orientation		

# 1:1 Transmission Line Balun

## 5 - 1800 MHz



MABA-011112

Rev. V3

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM 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.