

## 1:1 Transmission Line Balun Transformer 5 - 1200 MHz

Rev. V5

### Features

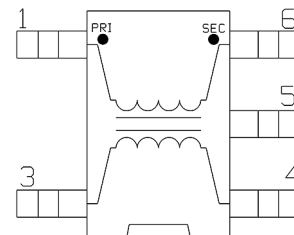
- 1:1 Impedance Ratio
- Surface Mount Package
- Excellent Amplitude and Phase Balance
- Can be used in both 50  $\Omega$  & 75  $\Omega$  Systems
- 260°C Reflow Compatible
- RoHS Compliant
- Available on Tape & Reel

### Description

The MABACT0043 is a 1:1 transmission line transformer in a surface mount package.

Ideally suited for broadband CATV applications.

### Schematic



### Pin Configuration

| Pin # | Function                 |
|-------|--------------------------|
| 1     | Primary Dot (input)      |
| 3     | Primary (ground)         |
| 4     | Secondary (output 2)     |
| 5     | Not used (ground)        |
| 6     | Secondary Dot (output 1) |

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

| Parameter           | Frequency Test Condition (MHz) | Units | Min. | Typ.       | Max.      |
|---------------------|--------------------------------|-------|------|------------|-----------|
| Insertion Loss      | 5 - 700                        | dB    | —    | 0.56       | 0.70      |
|                     | 700 - 870                      |       |      | 0.51       | 1.10      |
|                     | 870 - 1000                     |       |      | 0.55       | 1.50      |
|                     | 1000 - 1200                    |       |      | 0.79       | 2.40      |
| Amplitude Unbalance | 5 - 870                        | dB    | —    | $\pm 0.33$ | $\pm 1.0$ |
|                     | 870 - 1200                     |       |      | $\pm 0.47$ | $\pm 1.3$ |
| Phase Unbalance     | 5 - 450                        | °     | —    | 1.6        | $\pm 5$   |
|                     | 450 - 1200                     |       |      | 4.2        | $\pm 7$   |
| Input Return Loss   | 5 - 90                         | dB    | 30   | 38         | —         |
|                     | 90 - 550                       |       | 15   | 22         |           |
|                     | 550 - 1200                     |       | 5    | 11         |           |

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

| Part #        | Description         |
|---------------|---------------------|
| MABACT0043    | 2000 piece reel     |
| MABACT0043-TB | Customer Test Board |

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

### Recommended Maximum Ratings<sup>3</sup>

| Parameter             | Value            |
|-----------------------|------------------|
| Input Power           | +24 dBm (250 mW) |
| DC Current            | 40 mA            |
| Operating Temperature | -40°C to +85°C   |
| Storage Temperature   | -40°C to +85°C   |

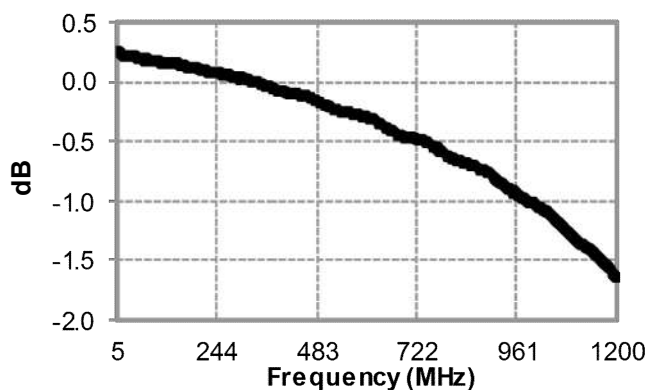
3. Exceeding any one or combination of these limits may cause permanent damage to this device.

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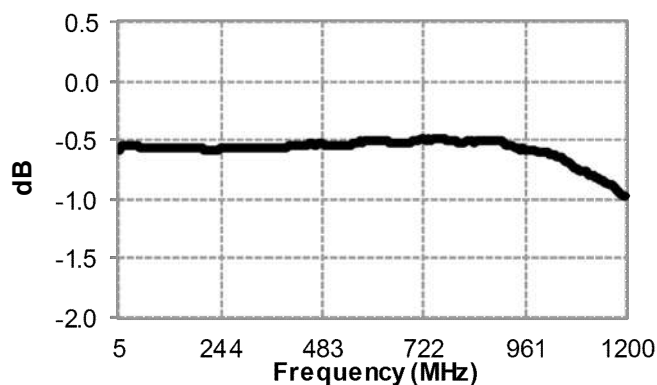
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Typical Performance Curves:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 75\ \Omega$ ,  $P_{IN} = 0\ \text{dBm}^4$

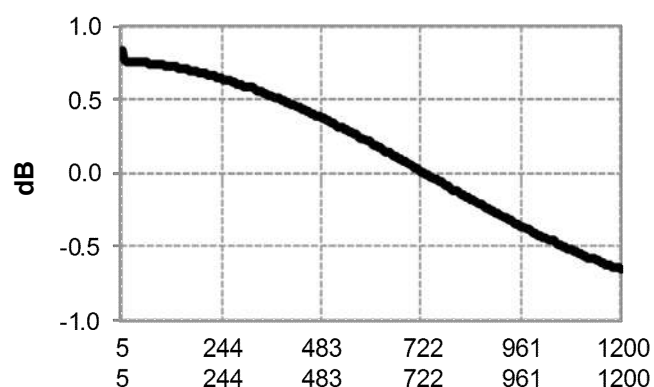
Insertion Loss 1: (Pin 1 to 6)



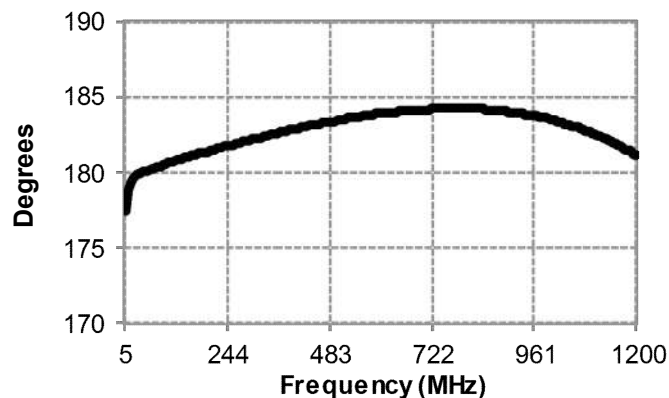
Insertion Loss 2: (Pin 1 to 4)



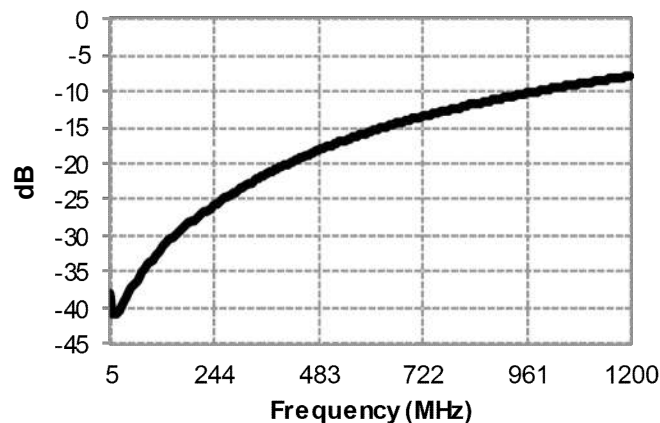
Amplitude Balance



Phase Balance



Return Loss: Input

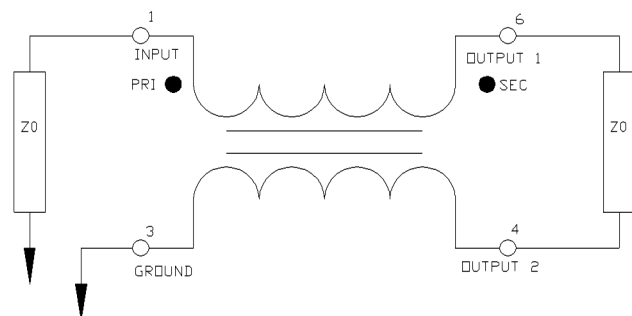


4. Temperature plots available on request.

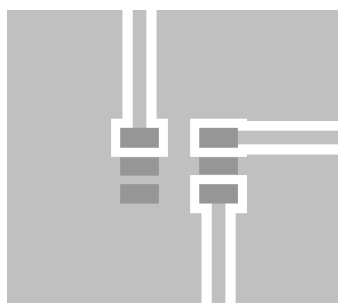
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### Application Circuit

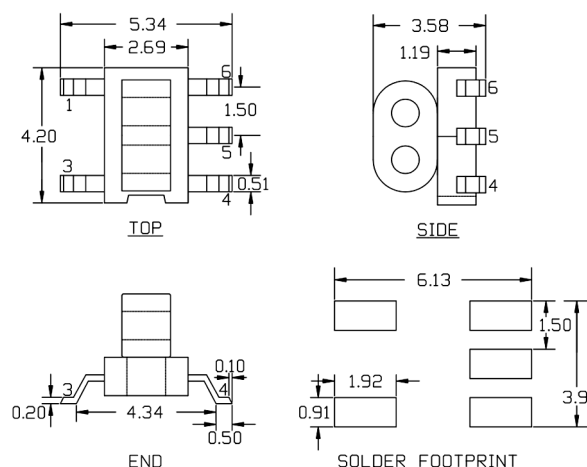


### Recommended Board Layout<sup>5</sup>



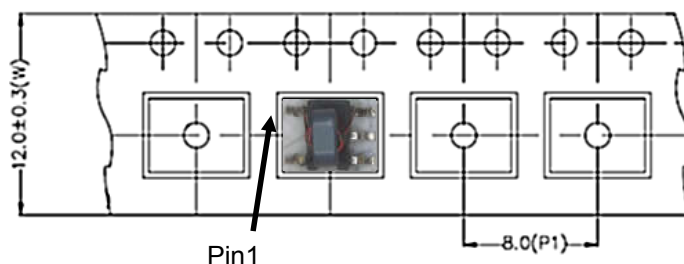
5. Recommended PCB layout shown above uses 1.6 mm FR4, Grounded coplanar wave guide, transmission line width 0.70 mm and gap 0.57 mm.

### Outline Drawing<sup>6,7,8,9</sup>



- 6. Dimensions in mm.
- 7. Tolerance:  $\pm 0.2$  mm unless otherwise noted.
- 8. Model number and lot code are printed on the reel.
- 9. Finish: Pin material CuSn6.

### Reel Orientation



### Tape & Reel Information

| Item | Dimension             |
|------|-----------------------|
| W    | 12.0 mm, $\pm 0.3$ mm |
| P1   | 8.0 mm, $\pm 0.1$ mm  |

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