

## 15.2 dB Coupler 5 - 1225 MHz

Rev. V1

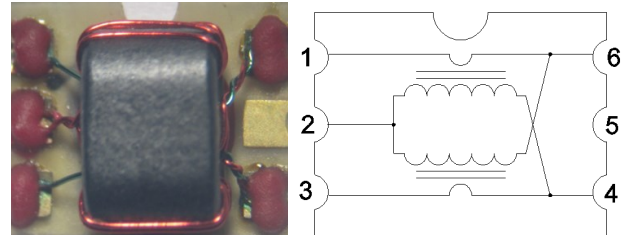
### Features

- 15.2 dB Coupling Ratio
- Surface Mount
- Bi-directional
- Similar performance in both configurations
- Available on Tape and Reel
- Excellent Temperature Stability
- RoHS Compliant and lead free
- 260°C Reflow Compatible

### Description

The MACP-011055 is a 15.2 dB coupler in a surface mount package. Ideally suited for broadband CATV applications. The bi-directional flexibility to use in either direction with similar performance.

### Functional Schematic



### Pin Configuration<sup>2</sup>

| Pin # | Function            | Pin # | Function  |
|-------|---------------------|-------|-----------|
| 1     | Input               | 4     | Isolation |
| 2     | Center Tap (Ground) | 5     | Not Used  |
| 3     | Coupling            | 6     | Output    |

2. 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 Conditions                 | Units | Min.     | Typ.       | Max.       |
|--------------------------------|---------------------------------|-------|----------|------------|------------|
| Coupling Ratio                 | -                               | dB    | —        | 15.2       | —          |
| Coupling (Pin 1 - Pin 3)       | 5 - 1225 MHz                    | dB    | 14.8     | 15.2       | 15.8       |
| Main Line Loss (Pin 1 - Pin 6) | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | —        | 0.7<br>0.9 | 1.0<br>1.2 |
| Isolation (Pin 1 - Pin 4)      | 5 - 1225 MHz                    | dB    | 30       | 37         | —          |
| Input Return Loss (Pin 1)      | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 19<br>18 | 23<br>22   | —          |
| Output Return Loss (Pin 6)     | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 18<br>18 | 24<br>20   | —          |
| Coupling Return Loss (Pin 3)   | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 18<br>18 | 23<br>22   | —          |

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

| Part Number    | Package        |
|----------------|----------------|
| MACP-011055    | 900 piece reel |
| MACP-011055-TB | Sample Board   |

1. All sample boards include 5 loose parts.

### Absolute Maximum Ratings<sup>3,4</sup>

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Input Power           | 1.5 W            |
| DC Current            | 500 mA           |
| Operating Temperature | -40°C to +85°C   |

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

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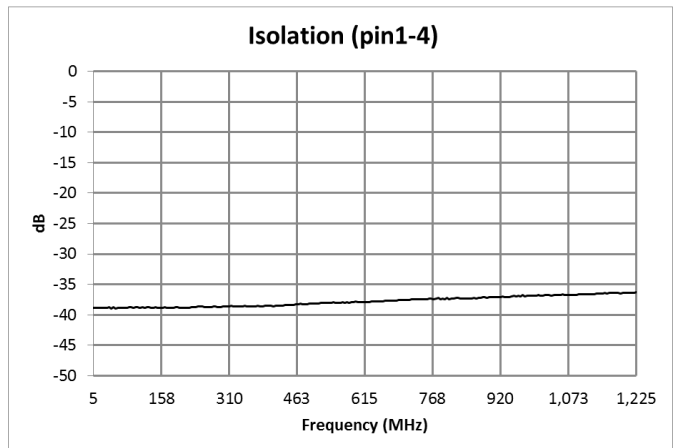
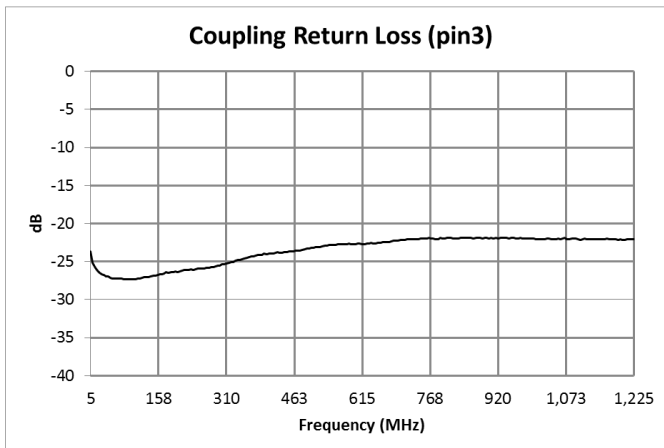
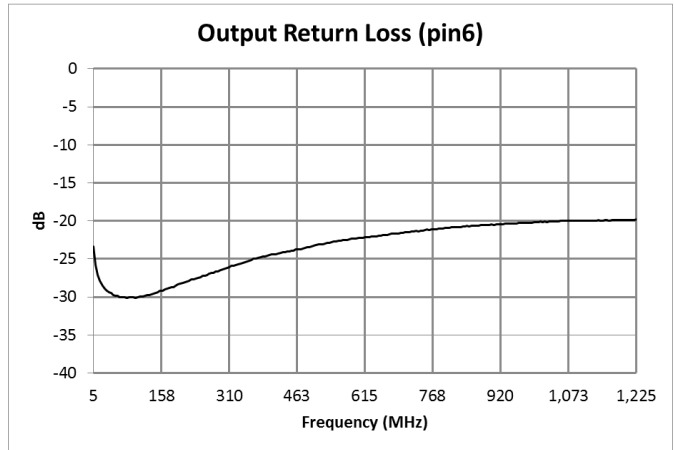
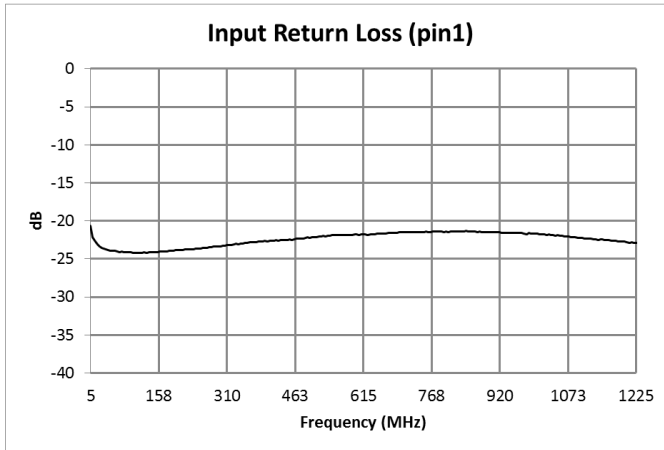
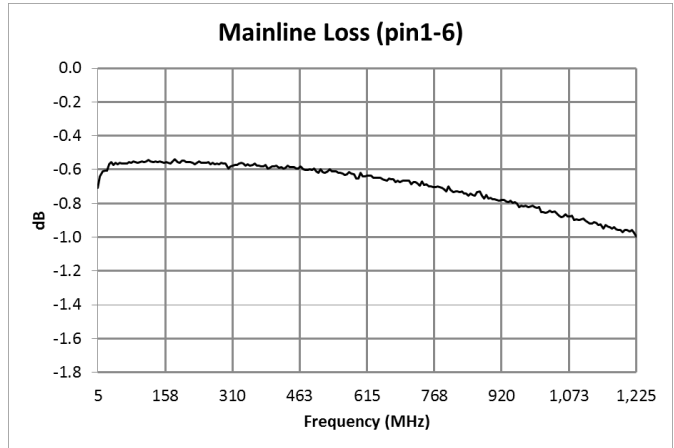
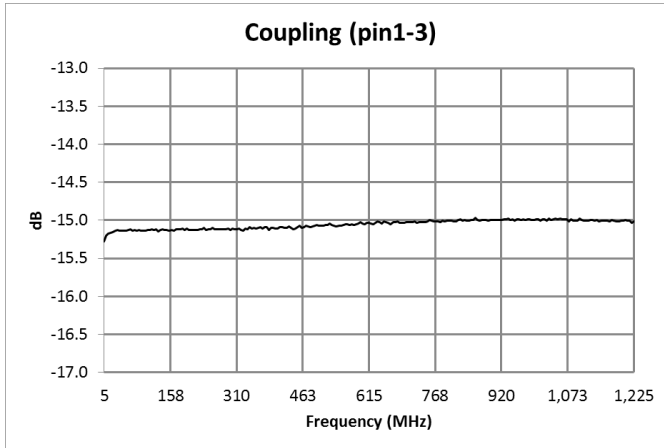
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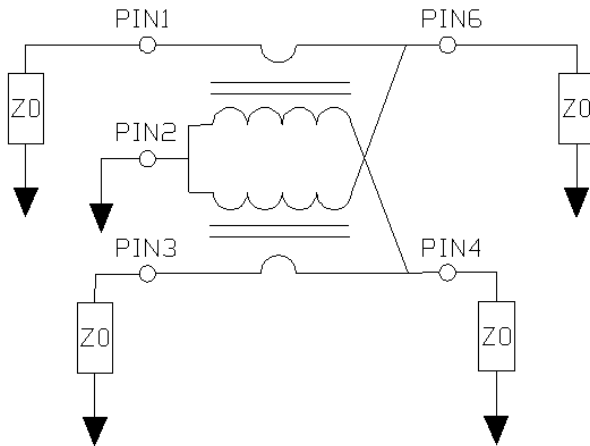
DC-0017762

### Typical Performance Curves<sup>5</sup>

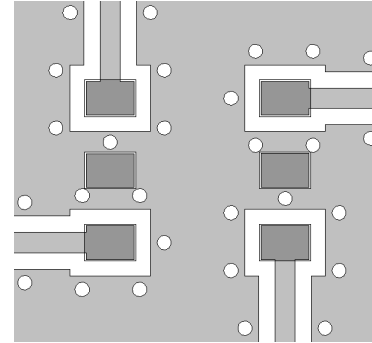


5. Full temperature plots available on request.

## Application Schematic

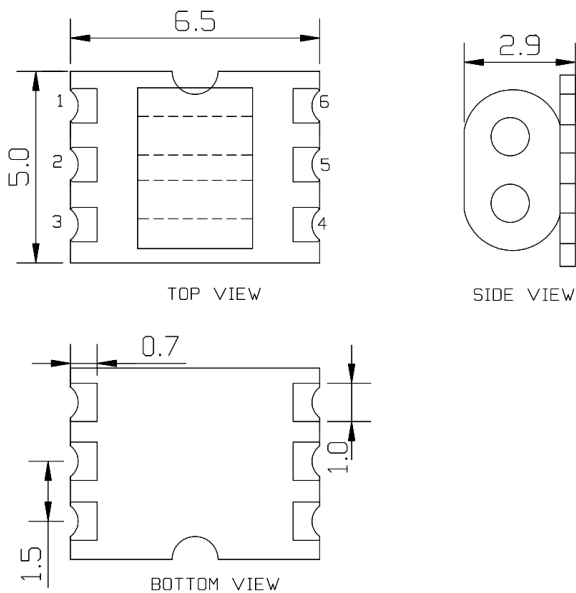


## Recommended Board Layout<sup>10</sup>

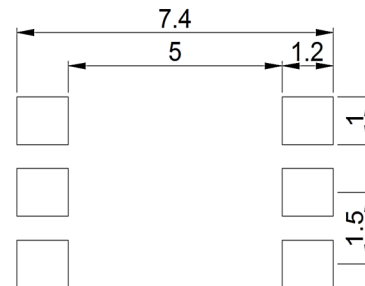


10. Recommended PCB layout shown above uses 1.6 mm FR4, rounded coplanar wave guide, transmission line width 0.70 mm and gap 0.57 mm.

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



## Recommended Footprint

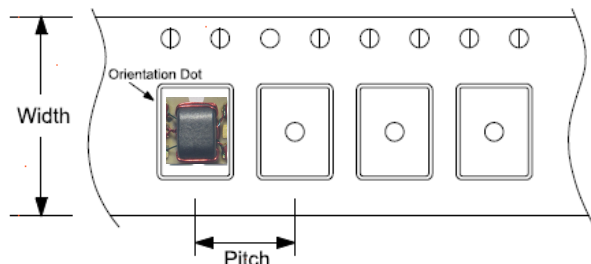


## Tape & Reel Information

| Parameter  | Units | Value |
|--|-------|-------|
| Qty per reel                                       | -     | 900   |
| Reel Size  | mm    | 330   |
| Tape Width   | mm    | 16.00 |
| Pitch  | mm    | 12.00 |
| Orientation  | -     | F45   |
| Reference Application Note ANI-019 for orientation |       |       |

6. Dimensions in mm.
7. Tolerance:  $\pm 0.2$  mm unless otherwise noted.
8. Model number and lot code printed on reel.
9. Plating finish: ENIG on both sides, 0.05 to 0.1  $\mu\text{m}$  gold over 3 to 6  $\mu\text{m}$  nickel.

## Carrier Tape Orientation



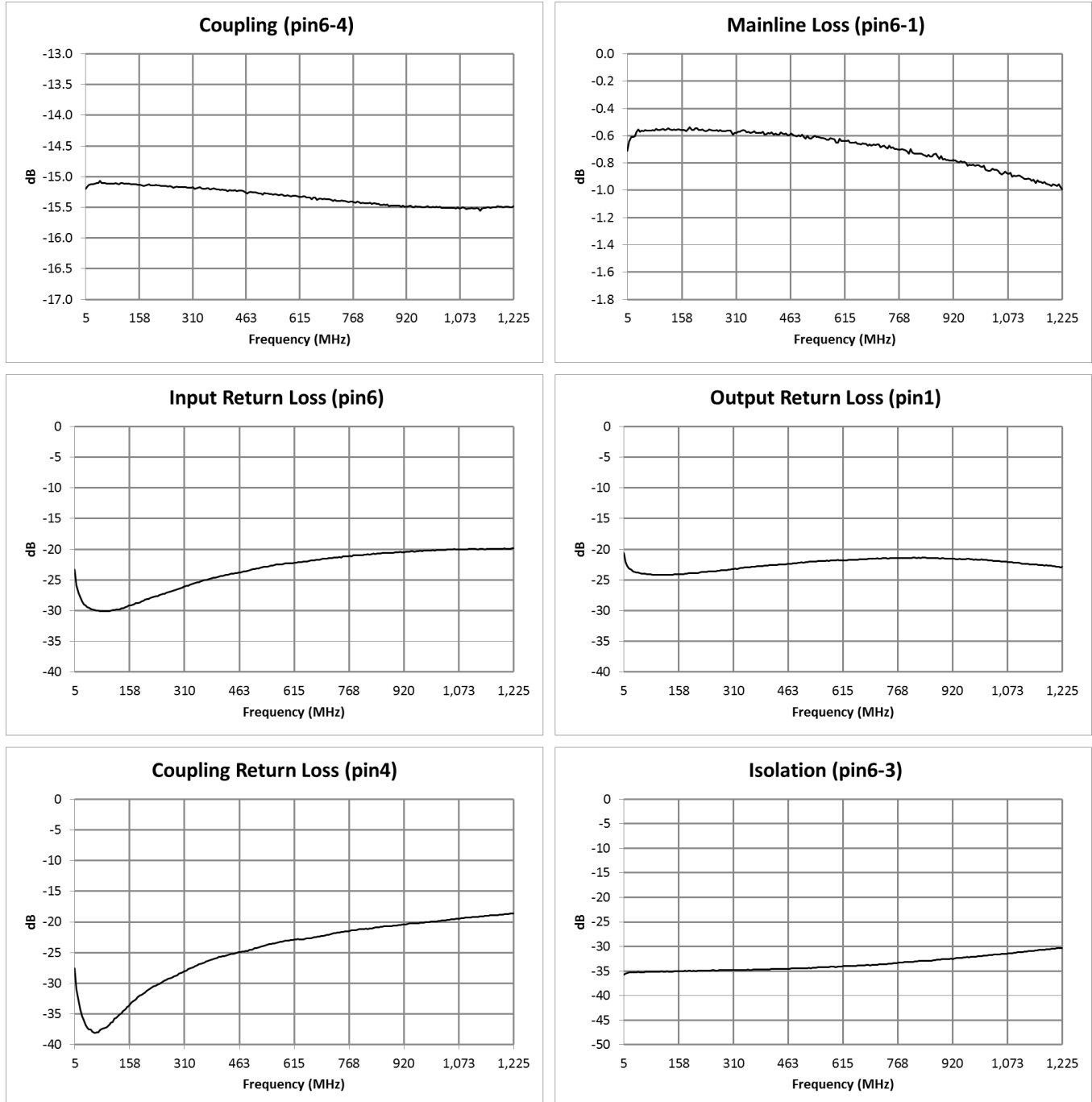
## Alternate Configuration

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

| Parameter                         | Test Conditions                 | Units | Min.     | Typ.       | Max.       |
|-----------------------------------|---------------------------------|-------|----------|------------|------------|
| Coupling Ratio                    | -                               | dB    | —        | 15.2       | —          |
| Coupling<br>(Pin 6 - Pin 4)       | 5 - 1225 MHz                    | dB    | 14.8     | 15.2       | 16.0       |
| Main Line Loss<br>(Pin 6 - Pin 1) | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | —        | 0.7<br>0.9 | 1.0<br>1.2 |
| Isolation<br>(Pin 6 - Pin 3)      | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 29<br>27 | 34<br>31   | —          |
| Input Return Loss<br>(Pin 6)      | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 18<br>18 | 24<br>20   | —          |
| Output Return Loss<br>(Pin 1)     | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 19<br>18 | 23<br>22   | —          |
| Coupling Return Loss<br>(Pin 4)   | 5 - 1000 MHz<br>1000 - 1225 MHz | dB    | 18<br>17 | 24<br>19   | —          |

## Alternate Configuration

### Typical Performance Curves<sup>11</sup>



11. Full temperature plots available on request.

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