MACPCC0002

Low Cost SMT 17dB Bi-Directional Coupler
824 – 960 MHz

Features
- Device is Bi-Directional
- Small Size and Low Profile
- Superior Repeatability
- Typical Insertion Loss 0.3 dB
- Typical Directivity 15 dB
- 2 Watt Power Handling
- Lead-Free SO-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of CH20-0032-17G

Description
M/A-COM’s MACPCC0002 is an IC based monolithic bi-directional coupler in a low cost SO-8 plastic package. This 17 dB coupler is ideally suited for applications where power monitoring, small size, low insertion loss, superior repeatability, and low cost are required. Typical applications include base station switching networks, power monitoring in handhelds and other communication applications where size and PCB real estate is a premium. Available in tape and reel.

The MACPCC0002 is fabricated using a passive-integrated circuit process. The process features full chip passivation for increased performance and reliability.

Functional Block Diagram

1. Pins 2, 3, 6, and 7 must be RF and DC grounded.

Pin Configuration

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Pin No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RF IN</td>
<td>5</td>
<td>ISOLATED</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>RF OUT</td>
<td>8</td>
<td>COUPLED</td>
</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACPCC0002</td>
<td>Bulk Packaging</td>
</tr>
<tr>
<td>MACPCC0002-TR</td>
<td>1000 piece reel</td>
</tr>
<tr>
<td>MACPCC0002-TB</td>
<td>Sample Test Board</td>
</tr>
</tbody>
</table>

Note: Reference Application Note M513 for reel size information.

Electrical Specifications: $T_A = 25^\circ C$, $Z_0 = 50\Omega$  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion Loss</td>
<td>dB</td>
<td>—</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>VSWR</td>
<td></td>
<td>—</td>
<td>1.3:1</td>
<td>1.6:1</td>
</tr>
<tr>
<td>Coupling</td>
<td>dB</td>
<td>—</td>
<td>17±2</td>
<td>—</td>
</tr>
<tr>
<td>Coupling Flatness</td>
<td>dB</td>
<td>—</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Directivity</td>
<td>dB</td>
<td>10</td>
<td>15</td>
<td>—</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings$^2,3$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>2W CW</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
</tbody>
</table>

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. M/A-COM does not recommend sustained operation near these survivability limits.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

GMIC Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Recommended PCB Configuration
Low Cost SMT 17dB Bi-Directional Coupler
824 – 960 MHz

Typical Performance Curves @ +25°C

**Directivity vs. Frequency**

**Insertion Loss vs. Frequency**

**VSWR vs. Frequency**

**Coupling vs. Frequency**
Lead-Free, SOIC-8™

NOTES:
1. REFERENCE JEDEC MS-012-AA, FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFERENCE M538 APPLICATION NOTE FOR FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

† Reference Application Note M538 for lead-free solder reflow recommendations.
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