MACP-011051

7.5 dB Coupler
5 - 1225 MHz

Features
- 7.5 dB Coupling Ratio
- Surface Mount Package
- Available on Tape & Reel
- High isolation from 100 - 700 MHz
- Excellent Temperature Stability
- RoHS Compliant and Pb Free
- 260°C Reflow Compatible

Description
The MACP-011051 is a 7.5 dB coupler in a surface mount package.

Ideally suited for CATV, Full Duplex and DOCSIS 3.1 applications.

Functional Schematic

Pin Configuration

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Function</th>
<th>Pin #</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input</td>
<td>4</td>
<td>External 75 Ω</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
<td>5</td>
<td>Output</td>
</tr>
<tr>
<td>3</td>
<td>Coupled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. MACOM recommends connecting unused package pins to ground.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling Ratio</td>
<td>—</td>
<td>dB</td>
<td>—</td>
<td>7.5</td>
<td>—</td>
</tr>
<tr>
<td>Coupling (Pin 1 - Pin 3)</td>
<td>5 - 1225</td>
<td>dB</td>
<td>7.0</td>
<td>7.5</td>
<td>8.0</td>
</tr>
<tr>
<td>Main Line Loss</td>
<td>5 - 700</td>
<td>dB</td>
<td>—</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td>(Pin 1 - Pin 5)</td>
<td>700 - 1225</td>
<td></td>
<td>1.8</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Isolation</td>
<td>5 - 100</td>
<td>dB</td>
<td>28</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 5 - Pin 3)</td>
<td>100 - 700</td>
<td></td>
<td>40</td>
<td>42</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td>26</td>
<td>29</td>
<td>—</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>5 - 700</td>
<td>dB</td>
<td>15</td>
<td>17</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 1)</td>
<td>700 - 1225</td>
<td></td>
<td>15</td>
<td>16</td>
<td>—</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>5 - 700</td>
<td>dB</td>
<td>18</td>
<td>26</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 5)</td>
<td>700 - 1225</td>
<td></td>
<td>18</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Coupling Return Loss</td>
<td>5 - 700</td>
<td>dB</td>
<td>15</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 3)</td>
<td>700 - 1225</td>
<td></td>
<td>15</td>
<td>16</td>
<td>—</td>
</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACP-011051</td>
<td>900 piece reel</td>
</tr>
<tr>
<td>MACP-011051-TB</td>
<td>Sample Board</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>2 W</td>
</tr>
<tr>
<td>DC Current</td>
<td>500 mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
</tbody>
</table>

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

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Typical Performance Curves

**Coupling (pin 1 - 3)**

-6.5 dB Coupler

**Mainline Loss (pin 1 - 5)**

**Input Return Loss (pin 1)**

**Output Return Loss (pin 5)**

**Coupling Return Loss (pin 3)**

**Isolation (pin 3 - 5)**
MACP-011051

7.5 dB Coupler
5 - 1225 MHz

Application Schematic

Outline Drawing

Recommended Board Layout

Carrier Tape Orientation

Tape & Reel Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty per reel</td>
<td>—</td>
<td>900</td>
</tr>
<tr>
<td>Reel Size</td>
<td>mm</td>
<td>330</td>
</tr>
<tr>
<td>Tape Width</td>
<td>mm</td>
<td>16.0</td>
</tr>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>12.0</td>
</tr>
<tr>
<td>Orientation</td>
<td>—</td>
<td>F33</td>
</tr>
</tbody>
</table>

Reference Application Note ANI-019 for orientation

6. 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.

7. Dimensions in mm.
8. Tolerance: ±0.2 mm unless otherwise noted.
9. Model number and lot code printed on reel.