MACP-011058

10 dB Coupler
5 - 1250 MHz

Features
- 10 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-011058 is a 10 dB coupler in a surface mount package.

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

Functional Schematic

Features
- 10 dB Coupling Ratio
- Surface Mount Package
- Available on Tape & Reel
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- Excellent Temperature Stability
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- 260°C Reflow Compatible

Pin Configuration

- Pin # 1: Input
- Pin # 3: Coupled
- Pin # 4: External 75 Ω
- Pin # 5: Output

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- Pin # 3: Coupled
- Pin # 4: External 75 Ω
- Pin # 5: Output

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>Freq. Test Conditions (MHz)</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>10</td>
<td>—</td>
</tr>
<tr>
<td>Coupling (Pin 1 - Pin 3)</td>
<td>5 - 700</td>
<td>dB</td>
<td>9.4</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td>9.4</td>
<td>10.0</td>
<td>10.6</td>
</tr>
<tr>
<td>Main Line Loss</td>
<td></td>
<td>dB</td>
<td>—</td>
<td>1.35</td>
<td>1.5</td>
</tr>
<tr>
<td>(Pin 1 - Pin 5)</td>
<td>5 - 700</td>
<td></td>
<td>1.35</td>
<td>1.90</td>
<td>1.90</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation</td>
<td></td>
<td>dB</td>
<td>34</td>
<td>42</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 5 - Pin 3)</td>
<td>5 - 700</td>
<td></td>
<td>26</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Return Loss</td>
<td></td>
<td>dB</td>
<td>15</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>(Pin 1)</td>
<td>5 - 700</td>
<td></td>
<td>17</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Return Loss</td>
<td></td>
<td>dB</td>
<td>20</td>
<td>25</td>
<td>—</td>
</tr>
<tr>
<td>(Pin 5)</td>
<td>5 - 700</td>
<td></td>
<td>20</td>
<td>23</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coupling Return Loss</td>
<td></td>
<td>dB</td>
<td>17</td>
<td>18</td>
<td>—</td>
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<tr>
<td>(Pin 3)</td>
<td>5 - 700</td>
<td></td>
<td>15</td>
<td>19</td>
<td>—</td>
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<tr>
<td></td>
<td>700 - 1225</td>
<td></td>
<td></td>
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</table>

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACP-011058</td>
<td>900 piece reel</td>
</tr>
<tr>
<td>MACP-011058-TB</td>
<td>Sample Board</td>
</tr>
</tbody>
</table>

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

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
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<tbody>
<tr>
<td>Input Power</td>
<td>2 W</td>
</tr>
<tr>
<td>DC Current</td>
<td>500 mA</td>
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</tbody>
</table>

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

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DC-0018481
**Typical Performance Curves**

1. **Coupling (pin1-3)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: -8.0 to -14.0 dB

2. **Mainline Loss (pin1-5)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: -0.0 to -1.5 dB

3. **Input Return Loss (pin1)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: 0 to -15 dB

4. **Output Return Loss (pin5)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: 0 to -25 dB

5. **Coupling Return Loss (pin3)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: 0 to -25 dB

6. **Isolation (pin3-5)**
   - Frequency (MHz): 5, 143, 282, 420, 558, 697, 835, 973, 1,111, 1,250
   - Value Range: 0 to -50 dB

7. Full temperature plots available on request.
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MACP-011058

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5 - 1250 MHz

Rev. V2

Application Schematic

Outline Drawing

Recommended Board Layout

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.

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>
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</table>

Reference Application Note ANI-019 for orientation
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