MAAM-008822

Broadband CATV Single Ended 3-Way Active Splitter
50 - 1100 MHz

Revision: V1

Features

- 3-Way Splitter
- Single Ended Input and Outputs
- 1.3 dB Gain at output port 1
- 4.5 dB Gain at output ports 2 & 3
- +15 dBmV/Channel Input
- 4.5 dB Noise Figure at output port 1
- 4.0 dB Noise Figure at output ports 2 & 3
- Single +5 Volt Supply
- Lead-Free 2 mm 8-Lead PDFN Package
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MAAM-008822 CATV 3-way active splitter is a GaAs MMIC which exhibits low noise figure and distortion in a lead-free 2mm 8-lead PDFN plastic package. The design features 75 Ω inputs and outputs.

The MAAM-008822 is ideally suited for multi-tuner set top boxes, home gateways, and other broadband internet based appliances.

The MAAM-008822 is fabricated using M/A-COM's PHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAAM-008822-TR1000</td>
<td>1000 piece reel</td>
</tr>
<tr>
<td>MAAM-008822-TR3000</td>
<td>3000 piece reel</td>
</tr>
<tr>
<td>MAAM-008822-001SMB</td>
<td>Sample Test Board</td>
</tr>
</tbody>
</table>

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


For further information and support please visit: https://www.macom.com/support
### Electrical Specifications:

Freq. = 1000 MHz, \( T_A = 25^\circ \text{C} \), \( V_{DD} = +5 \text{ Volts} \), \( Z_0 = 75 \Omega \)

<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>Gain</td>
<td>IN to OUT1, IN to OUT2, IN to OUT3</td>
<td>dB</td>
<td>1</td>
<td>1.3</td>
<td>3</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>IN to OUT1, IN to OUT2, IN to OUT3</td>
<td>dB</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>IN to OUT1, IN to OUT2, IN to OUT3</td>
<td>dB</td>
<td>-</td>
<td>4.5</td>
<td>-</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>IN</td>
<td>dB</td>
<td>-</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>OUT1, OUT2, OUT3</td>
<td>dB</td>
<td>-</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>Composite Triple Beat, CTB</td>
<td>132 channels, +15 dBmV/channel at the input All Outputs</td>
<td>dBV</td>
<td>-</td>
<td>-63</td>
<td>-</td>
</tr>
<tr>
<td>Composite Second Order, CSO</td>
<td>132 channels, +15 dBmV/channel at the input All Outputs</td>
<td>dBV</td>
<td>-</td>
<td>-60</td>
<td>-</td>
</tr>
<tr>
<td>Reverse Isolation</td>
<td>OUT1 to IN, OUT2 to IN, OUT3 to IN</td>
<td>dB</td>
<td>-</td>
<td>-30</td>
<td>-</td>
</tr>
<tr>
<td>Output to Output Isolation</td>
<td>OUT1 to OUT2; OUT1 to OUT3, OUT2 to OUT3</td>
<td>dB</td>
<td>-</td>
<td>21</td>
<td>-</td>
</tr>
<tr>
<td>Output Power at 1dB Compression, P1dB</td>
<td>OUT1, OUT2, OUT3</td>
<td>dBm</td>
<td>-</td>
<td>7.5</td>
<td>-</td>
</tr>
<tr>
<td>Output 3rd Order Intercept Point, OIP3</td>
<td>500 MHz, 2-tone, 6 MHz spacing, -15 dBm Pout</td>
<td>dBm</td>
<td>-</td>
<td>23</td>
<td>-</td>
</tr>
<tr>
<td>Output 2nd Order Intercept Point, OIP2</td>
<td>500 MHz, 2-tone, 6 MHz spacing, -15 dBm Pout</td>
<td>dBm</td>
<td>-</td>
<td>45</td>
<td>-</td>
</tr>
<tr>
<td>IDD</td>
<td>VDD= +5 Volts</td>
<td>mA</td>
<td>-</td>
<td>120</td>
<td>150</td>
</tr>
</tbody>
</table>

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Input Power</td>
<td>+12 dBm</td>
</tr>
<tr>
<td>Vbias</td>
<td>+10.0 V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C to +85°C</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>150°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
</tbody>
</table>

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. M/A-COM does not recommend sustained operation near these survivability limits.
6. These operating conditions will ensure MTTF > 1 x 10^6 hours.
7. Junction Temperature \( T_J \) = \( T_C + \Theta_{JC} * (V - I) - (P_{OUT} - P_{IN}) \)
   - Typical thermal resistance (\( \Theta_{JC} \)) = 77°C/W.
   - a) For \( T_C = 25^\circ \text{C} \),
     \( T_J = 71^\circ \text{C} @ 5 \text{ V}, 120 \text{ mA} \)
   - b) For \( T_C = 85^\circ \text{C} \),
     \( T_J = 127^\circ \text{C} @ 5 \text{ V}, 110 \text{ mA} \)

### Handling Procedures

Please observe the following precautions to avoid damage:

#### Static Sensitivity

Gallium Arsenide Integrated 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.
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Recommended PCB

PCB Land Pattern

Schematic Including Off-Chip Components

Off-Chip Component Values

8. The exposed pad centered on the package bottom must be connected to ground for RF, DC and thermal considerations.

9. L1 supplied from EPCOS, part number B82422A1102K100.
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50 - 1100 MHz

Typical Performance Curves

Gain to 1100 MHz__OUT1

Gain to 3000 MHz__OUT1

Noise Figure__OUT1

Gain to 1100 MHz__OUT2 & OUT3

Gain to 3000 MHz__OUT2 & OUT3

Noise Figure__OUT2 & OUT3

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Typical Performance Curves

**Input Return Loss**

![Input Return Loss Graph](image)

**Output Return Loss__OUT1**

![Output Return Loss__OUT1 Graph](image)

**Output Return Loss__OUT2 & OUT3**

![Output Return Loss__OUT2 & OUT3 Graph](image)

**Reverse Isolation__OUT1-IN**

![Reverse Isolation__OUT1-IN Graph](image)

**Reverse Isolation__OUT2-IN &OUT3-IN**

![Reverse Isolation__OUT2-IN &OUT3-IN Graph](image)

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Typical Performance Curves

**OUT-OUT Isolation to 1100 MHz**

**OUT2-OUT3**

**OUT-OUT Isolation to 1100 MHz**

**OUT1-OUT2 & OUT1-OUT3**

**OUT-OUT Isolation to 3000 MHz**

**OUT2-OUT3**

**OUT-OUT Isolation to 3000 MHz**

**OUT1-OUT2 & OUT1-OUT3**
Broadband CATV Single Ended 3-Way Active Splitter
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**Lead-Free 2 mm 8-Lead PDFN†**

† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin over copper.
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