MAAM-011139

Driver Amplifier
27.5 - 33.4 GHz

Features
• 3 Stage Driver Amplifier for 28/32 GHz Bands
• 21 dB Gain
• 32 dBm Output Third Order Intercept (OIP3)
• 20 dBm Output P1dB
• Variable Gain with Adjustable Bias
• Lead-Free 4 mm 24 Lead PQFN Package
• RoHS* Compliant and 260°C Reflow Compatible

Description
The MAAM-011139 is a driver amplifier assembled in a lead-free 4 mm 24-lead PQFN plastic package that operates from 27.5 - 33.4 GHz.

The amplifier provides 21 dB small signal gain. The input and output are internally matched to 50 ohms with on-chip DC blocking capacitors. The 32 dBm Output Third Order Intercept Point (OIP3) and 20 dBm output P1dB provide excellent linearity for transmit lineups.

Each device is 100% RF tested to ensure performance compliance.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAAM-011139-TR0500</td>
<td>500 piece reel</td>
</tr>
<tr>
<td>MAAM-011139-TR1000</td>
<td>1000 piece reel</td>
</tr>
<tr>
<td>MAAM-011139-000SMB</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.


For further information and support please visit:
https://www.macomtech.com/content/customersupport
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27.5 - 33.4 GHz

Electrical Specifications5:
Freq = 27.5 - 33.4 GHz, \( T_A = 25^\circ C \), \( V_{D1,2} = 4.0 \) V, \( I_{D1} = 100 \) mA, \( I_{D2} = 100 \) mA

<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>27.5 - 29.5 GHz</td>
<td>dB</td>
<td>19.0</td>
<td>21.0</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>29.5 - 33.4 GHz</td>
<td></td>
<td>15.5</td>
<td>17.5</td>
<td>—</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>—</td>
<td>dB</td>
<td>—</td>
<td>-10</td>
<td>—</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>—</td>
<td>dB</td>
<td>—</td>
<td>-8</td>
<td>—</td>
</tr>
<tr>
<td>Output P1dB</td>
<td>—</td>
<td>dBm</td>
<td>—</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>Output IP3</td>
<td>27.5 - 29.5 GHz</td>
<td>dBm</td>
<td>28</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>29.5 - 33.4 GHz</td>
<td></td>
<td>30</td>
<td>32</td>
<td>—</td>
</tr>
</tbody>
</table>

5. Apply gate voltages prior to drain voltages. Adjust \( VG1 \) and \( VG2 \) between \(-1.0 \) and \(-0.1 \) V to achieve specified current.
   Typical current, 200 mA = 100 (\( I_{D1} \)) + 100 (\( I_{D2} \))

Absolute Maximum Ratings6,7

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>+20 dBm</td>
</tr>
<tr>
<td>Drain Supply Voltage</td>
<td>+4.3 Volts</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>+150°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +150°C</td>
</tr>
</tbody>
</table>

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

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 Class 1C devices.
Typical Performance Curves

- AvgIIP3, Gain, OPI3 vs Freq. Pin=-12 dBm, Id1,2=100 mA
- Gain & Linearity vs DC Power at 28 and 32 GHz
- P1dB vs. Frequency VD1,2=4V, Id1,2=100 mA
- Gain vs. Pin VD1,2=4V, Id1,2=100 mA
- Gain vs. Pout VD1,2=4V, Id1,2=100 mA
- Gain vs. Pout VD1,2=4V, Id1,2=100 mA

Gain vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pout VD1,2=4V, Id1,2=100 mA

Gain & Linearity vs DC Power at 28 and 32 GHz

P1dB vs. Frequency VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pout VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA

Gain & Linearity vs DC Power at 28 and 32 GHz

P1dB vs. Frequency VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pout VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA

Gain & Linearity vs DC Power at 28 and 32 GHz

P1dB vs. Frequency VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pin VD1,2=4V, Id1,2=100 mA

Gain vs. Pout VD1,2=4V, Id1,2=100 mA

Pout vs. Pin VD1,2=4V, Id1,2=100 mA
Lead-Free 4 mm 24-Lead PQFN†

† Reference Application Note S2083 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin over copper.
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