Driver Amplifier
17.7 - 23.6 GHz

Features
- 3 Stage Driver Amplifier for 18/23 GHz Bands
- 23 dB Gain
- 33 dBm Output Third Order Intercept (OIP3)
- 21 dBm Output P1dB
- 2.8 dB Noise Figure
- Variable Gain with Adjustable Bias
- Lead-Free 4 mm 16-Lead PQFN Package
- RoHS* Compliant

Description
The MAAM-011132 is a packaged driver amplifier that operates from 17.7 - 23.6 GHz. The amplifier provides 23 dB small signal gain. The input and output are internally matched to 50 ohms with on-chip DC blocking capacitors. The 33 dBm output third order intercept point (OIP3) and 21 dBm output P1dB provide excellent linearity for transmit lineups.

The packaged amplifier comes in an industry standard lead free 4 mm QFN package. The device includes on-chip ESD protection structures and DC by-pass capacitors to ease the implementation and volume assembly of the packaged part.

The device is specifically designed for use in 18 and 23 GHz point-to-point radios for cellular backhaul applications.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAAM-011132-TR0500</td>
<td>500 Piece Reel</td>
</tr>
<tr>
<td>MAAM-011132-TR1000</td>
<td>1000 Piece Reel</td>
</tr>
<tr>
<td>MAAM-011132-000SMB</td>
<td>Sample Board</td>
</tr>
</tbody>
</table>

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

3. For optimum RF performance, all N/Cs should be terminated to ground.
4. The exposed pad centered on the package bottom must be connected to RF and DC ground.

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Electrical Specifications:
RF Freq: 17.7 - 23.6 GHz, \( V_D = 4 \) V, \( I_{D1} = 90 \) mA, \( I_{D2} = 90 \) mA, \( T_A = +25^\circ C \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range (LO)</td>
<td>GHz</td>
<td>17.7</td>
<td>—</td>
<td>23.6</td>
</tr>
<tr>
<td>Gain</td>
<td>dB</td>
<td>20</td>
<td>23</td>
<td>—</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>dB</td>
<td>—</td>
<td>12</td>
<td>—</td>
</tr>
<tr>
<td>Output Return Loss</td>
<td>dB</td>
<td>—</td>
<td>12</td>
<td>—</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>dB</td>
<td>—</td>
<td>2.8</td>
<td>—</td>
</tr>
<tr>
<td>Output P1dB</td>
<td>dBm</td>
<td>—</td>
<td>21</td>
<td>—</td>
</tr>
<tr>
<td>Output IP3</td>
<td>dBm</td>
<td>—</td>
<td>33</td>
<td>—</td>
</tr>
</tbody>
</table>

5. Apply gate voltages prior to drain voltages. Adjust \( V_{G1} \) and \( V_{G2} \) between -1.0 and -0.1 V to achieve specified drain current. Typical current, 180 mA = 90 \( (I_{D1}) + 90 (I_{D2}) \)

Absolute Maximum Ratings:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain Voltage</td>
<td>+4.3 V</td>
</tr>
<tr>
<td>Drain Current per Stage</td>
<td>133 mA</td>
</tr>
<tr>
<td>Gate Bias Voltage (( V_{G1,2} ))</td>
<td>-1.5 V &lt; ( V_G &lt; 0 ) V</td>
</tr>
<tr>
<td>Input Power</td>
<td>+3 dBm</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +150°C</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>
</tbody>
</table>

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 HBM Class 1B devices.
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Typical Performance Curves: \( V_{D1,2} = 4 \) V, \( I_{D1} = I_{D2} = 90 \) mA

**S-Parameters vs. Frequency**

**Output / Input IP3 vs. Frequency**

**Output P1dB vs. Frequency**

**Output IP3 vs. Frequency**

**Noise Figure vs. Frequency**
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Lead-Free 4 mm 16-Lead PQFN†

† Reference Application Note S2083 for lead-free solder reflow recommendations and PCB footprint information.
Reference JEDEC MO-220, VAR, VGGC for additional dimensional and tolerance information.
Meets JEDEC moisture sensitivity level 1 requirements
All dimensions shown as in/mm
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