

**RF Driver Amplifier  
250 - 4000 MHz**

**MAAMSS0057  
V2**

**Features**

- Broadband Operation
- Output Intercept Point Greater than +45 dBm
- Excellent ACPR performance
- High Efficiency
- Lead-Free SOIC-8EP Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS\* Compliant and 260°C Reflow Compatible

**Description**

M/A-COM's MAAMSS0057 RF driver amplifier is a two stage GaAs MMIC which exhibits exceptional linearity performance as well as featuring high gain in a lead-free SOIC-8EP surface mount plastic package. The device runs off a single +5 volt supply and draws 490 mA typically.

The MAAMSS0057 is fabricated using a high reliability GaAs HBT process to realize low current and high power functionality. The process features full passivation for increased performance and reliability.

The MAAMSS0057 has been designed to be a functional driver amplifier from 250 to 4000 MHz.

**Ordering Information <sup>1</sup>**

| Part Number        | Package                           |
|--------------------|-----------------------------------|
| MAAMSS0057         | Bulk Packaging                    |
| MAAMSS0057TR-3000  | 3000 piece reel                   |
| MAAMSS0057SMB      | 2140 MHz Configuration            |
| MAAM-000057-000SMB | Sample Only,<br>General Frequency |

1. Reference Application Note M513 for reel size information.

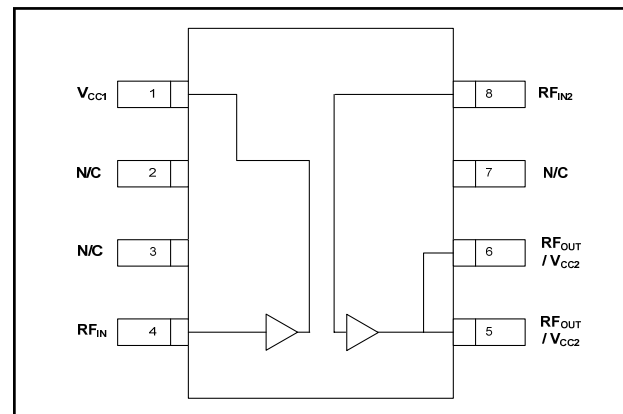
**Absolute Maximum Ratings <sup>2,3</sup>**

| Parameter            | Absolute Maximum |
|----------------------|------------------|
| RF Output Power      | 32 dBm           |
| Voltage              | 6 volts          |
| Storage Temperature  | -65°C to +150°C  |
| Junction Temperature | 200°C            |

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- M/A-COM does not recommend sustained operation near these survivability limits.

\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

**Functional Block Diagram**



**Pin Configuration <sup>4</sup>**

| Pin No. | Pin Name                            | Description                                  |
|---------|-------------------------------------|--|
| 1       | V <sub>CC1</sub>                    | 1st Stage V <sub>CC</sub> & RF Output        |
| 2       | N/C                                 | No Connection                                |
| 3       | N/C                                 | No Connection                                |
| 4       | RF <sub>IN</sub>                    | Amplifier Input                              |
| 5       | RF <sub>OUT</sub> /V <sub>CC2</sub> | Amplifier Output & 2nd Stage V <sub>CC</sub> |
| 6       | RF <sub>OUT</sub> /V <sub>CC2</sub> | Amplifier Output & 2nd Stage V <sub>CC</sub> |
| 7       | N/C                                 | No Connection                                |
| 8       | RF <sub>IN2</sub>                   | 2nd Stage RF Input                           |

4. The exposed pad centered on the package bottom must be connected to the RF and DC ground.

**Maximum Operating Conditions <sup>5</sup>**

| Parameter                         | Maximum Operating Conditions |
|-----------------------------------|------------------------------|
| Junction Temperature <sup>6</sup> | 160°C                        |
| RF Output Power                   | 32 dBm                       |
| Operating Temperature             | -40°C to +85°C               |

- Operating at or within these conditions will ensure MTTF > 1 x 10<sup>6</sup> hours.
- Typical thermal resistance (θ<sub>jc</sub>) = 35°C/W.

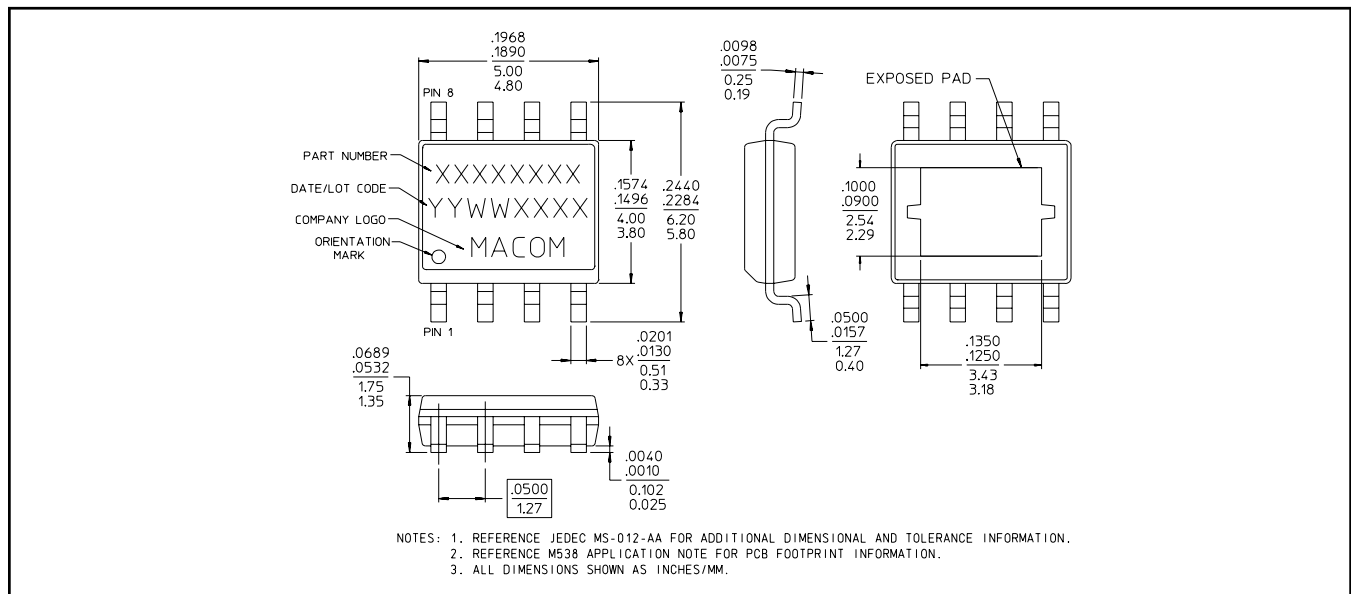
RF Driver Amplifier  
250 - 4000 MHz

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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$ ,  $V_{CC} = 5\text{V}$**

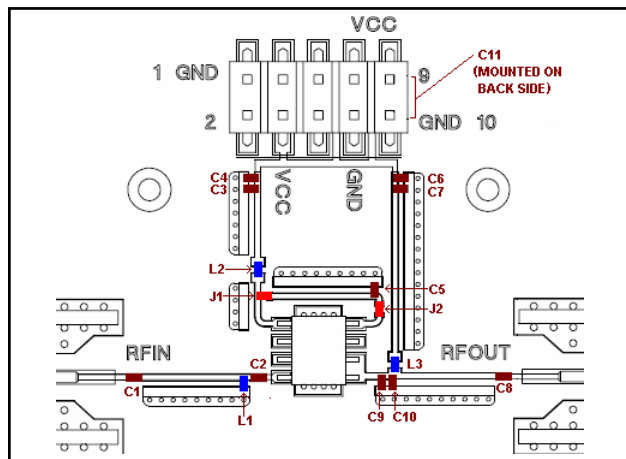
| Parameter               | Test Conditions                                     | Units | Min. | Typ. | Max. |
|-------------------------|---|-------|------|------|------|
| Gain                    | 2140 MHz  | dB    | 19   | 21   | —    |
| Input Return Loss       | 2140 MHz  | dB    | —    | -10  | —    |
| Output Return Loss      | 2140 MHz  | dB    | —    | -8   | —    |
| Output P1dB             | 2140 MHz  | dBm   | —    | 31   | —    |
| Output IP3              | (+22 dBm / tone, 1 MHz spacing)<br>2140 MHz         | dBm   | 42   | 45   | —    |
| Channel Power           | (@ -45 dBc ACPR, WCDMA 64 channels fwd)<br>2140 MHz | dBm   | —    | 24   | —    |
| Noise Figure            | 2140 MHz  | dB    | —    | 4.5  | —    |
| Quiescent Current       | +5V   | mA    | —    | 490  | —    |
| Current @ 22 dBm Output | (+22 dBm / tone, 1 MHz spacing)<br>2140 MHz         | mA    | —    | 600  | 750  |

**Lead-Free SOIC-8EP<sup>†</sup>**

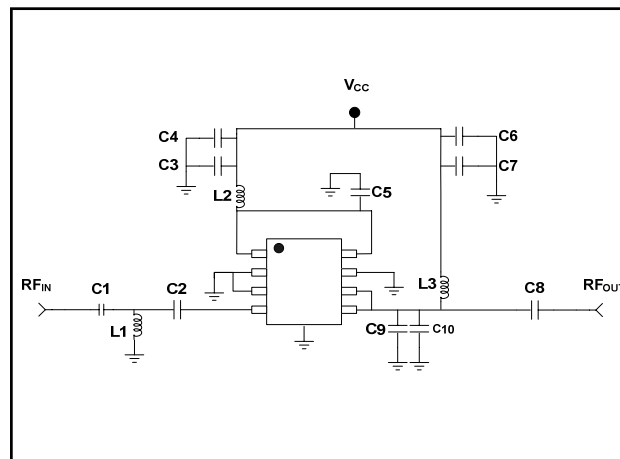


<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

**2140 MHz PCB Layout**



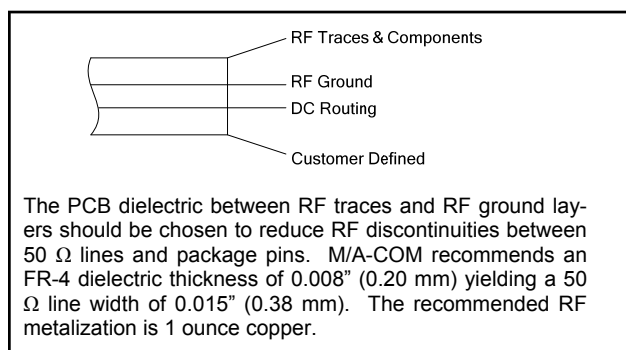
**2140 MHz Schematic**



**Parts List**

| Part | Value   | Case Style | Manufacturer | Purpose            |
|------|---------|------------|--------------|--------------------|
| C1   | 1000 pF | 0402       | Murata       | DC Block           |
| C2   | 1.5 pF  | 0402       | Murata       | Input Tuning       |
| C3   | 1000 pF | 0402       | Murata       | Bypass             |
| C4   | 0.1 μF  | 0402       | Murata       | Bypass             |
| C5   | 1.5 pF  | 0402       | Murata       | Inter-stage Tuning |
| C6   | 0.1 μF  | 0402       | Murata       | Bypass             |
| C7   | 1000 pF | 0402       | Murata       | Bypass             |
| C8   | 1000 pF | 0402       | Murata       | Output Tuning      |
| C9   | 1.2 pF  | 0402       | Murata       | Inter-stage Tuning |
| C10  | 1.2 pF  | 0402       | Murata       | Inter-stage Tuning |
| C11  | 3.3 μF  | 1206       | Murata       | Bypass             |
| L1   | 2.7 nH  | 0402       | Coilcraft    | Input Tuning       |
| L2   | 7.5 nH  | 0402       | Coilcraft    | Bias Injection     |
| L3   | 8.2 nH  | 0402       | Coilcraft    | Bias Injection     |
| J1   | Jumper  | -          | -            | Jumper             |
| J2   | Jumper  | -          | -            | Jumper             |

**Cross Section View**



**Handling Procedures**

Please observe the following precautions to avoid damage:

**Static Sensitivity**

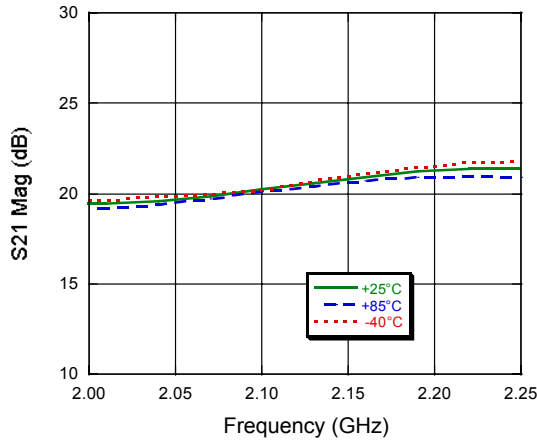
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

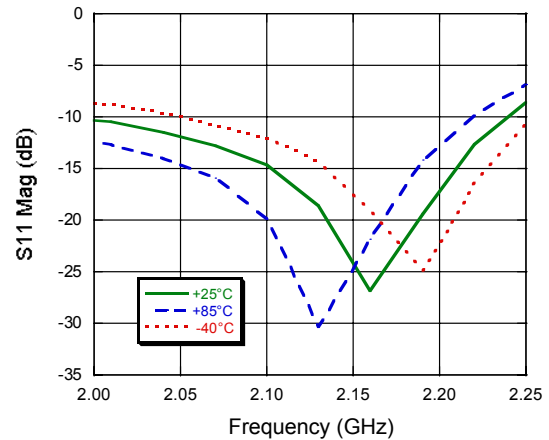
Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

**Typical Performance Curves: 2140 MHz Configuration over temperature**

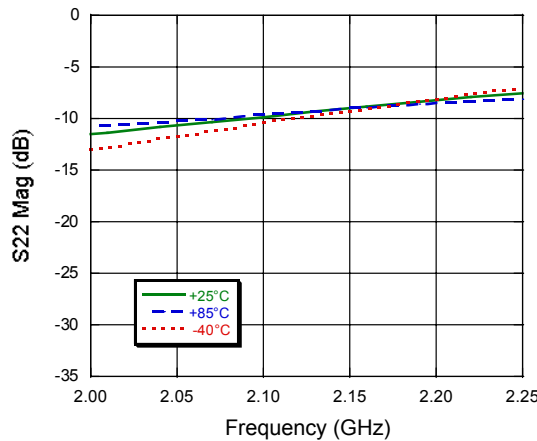
**Gain**



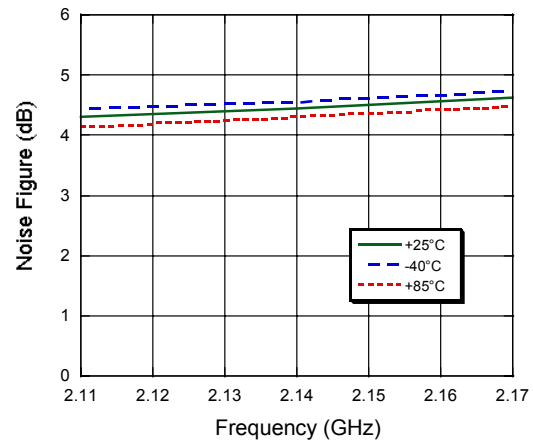
**S11**



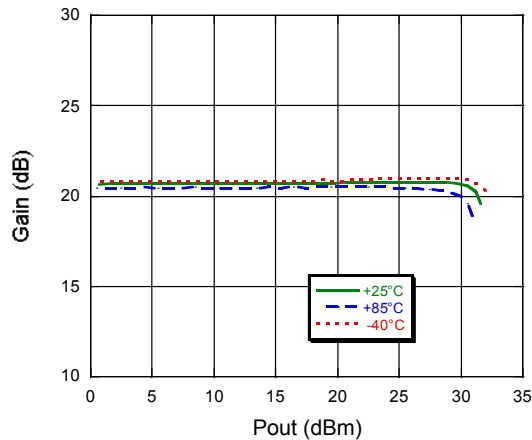
**S22**



**Noise Figure**



**P1dB**



**Output IP3**

