

# RF Driver Amplifier, 28.5 dBm P1dB 250 - 4000 MHz



MAAM-009560

Rev. V3

## Features

- Broadband Operation
- Output P1dB: 28.5 dBm
- Output IP3: 42 dBm
- Single Supply: 5 V
- Lead-Free SOT-89 Package
- RoHS\* Compliant
- Class 2 ESD Rating

## Applications

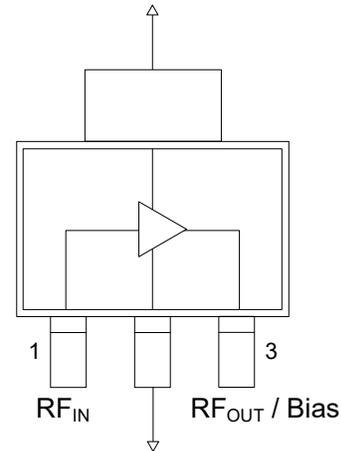
- ISM
- Wireless Networking & Communication

## Description

The MAAM-009560 RF driver amplifier is a GaAs MMIC which exhibits exceptional linearity performance of 42 dBm Output IP3, 28.5 dBm P1dB, as well as featuring high gain in a lead-free miniature SOT-89 surface mount plastic package. The device is biased with a single +5 volt supply and consumes 225 mA typically.

The MAAM-009560 is fabricated using an HBT process to realize low current and high linearity. The process features full passivation for increased performance and reliability.

## Functional Schematic



## Pin Configuration

Pin #	Function
1	RF Input
2	Ground
3	RF Output/Bias

## Ordering Information<sup>1,2</sup>

Part Number	Package
MAAM-009560-000000	Bulk Packaging
MAAM-009560-TR1000	1000 piece reel
MAAM-009560-001SMB	Sample Board

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

\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

# RF Driver Amplifier, 28.5 dBm P1dB 250 - 4000 MHz



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**Electrical Specifications: Freq. = 2140 MHz, T<sub>A</sub> = 25°C, V<sub>CC</sub> = +5 V, Z<sub>0</sub> = 50 Ω**

Parameter	Units	Min.	Typ.	Max.
Gain	dB	14	15	—
Noise Figure	dB	—	3	—
Input Return Loss	dB	—	15	—
Output Return Loss	dB	—	17	—
Output P1dB	dBm	—	28.5	—
Output IP3	dBm	40	42	—
Quiescent Current	mA	—	220	—
Current (P <sub>IN</sub> = 0 dBm)	mA	—	225	—

## Maximum Operating Conditions<sup>3</sup>

Parameter	Maximum Operating Conditions
Junction Temperature <sup>4</sup>	170 °C
RF Output Power	28 dBm
Operating Temperature	-40 °C to +105 °C

3. These operating conditions will ensure MTTF > 1 x 10<sup>6</sup> hours.

4. Junction Temperature (T<sub>J</sub>) = T<sub>A</sub> + Θ<sub>JC</sub> \* ((V \* I) - (P<sub>OUT</sub> - P<sub>IN</sub>))

Typical thermal resistance (Θ<sub>JC</sub>) = 47° C/W

a) For T<sub>A</sub> = 25°C,

T<sub>J</sub> = 73 °C @ 5 V, 225 mA, P<sub>OUT</sub> = 20 dBm, P<sub>IN</sub> = 5.0 dBm

b) For T<sub>A</sub> = 85°C,

T<sub>J</sub> = 123 °C @ 5 V, 180 mA, P<sub>OUT</sub> = 20 dBm, P<sub>IN</sub> = 5.5 dBm

c) For T<sub>A</sub> = 105°C,

T<sub>J</sub> = 140 °C @ 5 V, 170 mA, P<sub>OUT</sub> = 20 dBm, P<sub>IN</sub> = 5.7 dBm

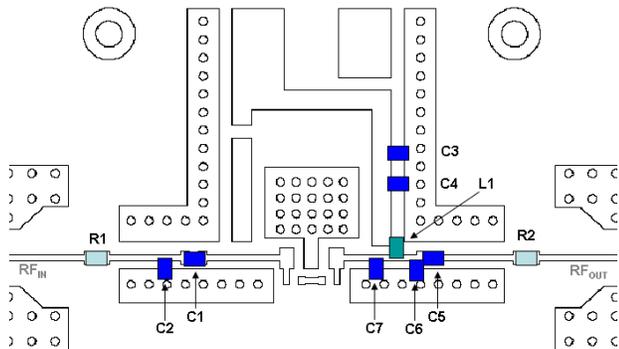
## Absolute Maximum Ratings<sup>5,6</sup>

Parameter	Absolute Maximum
RF Output Power	30 dBm
Voltage	6 volts
Storage Temperature	-65 °C to +150 °C
Junction Temperature	210 °C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.

6. MACOM does not recommend sustained operation near these survivability limits.

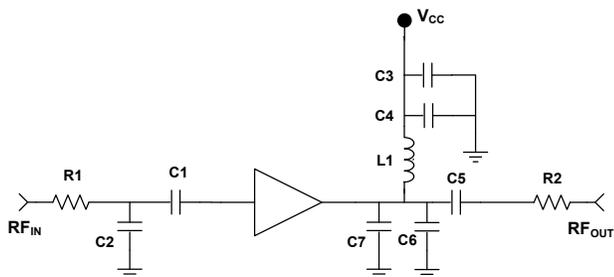
### 2140 MHz PCB Layout



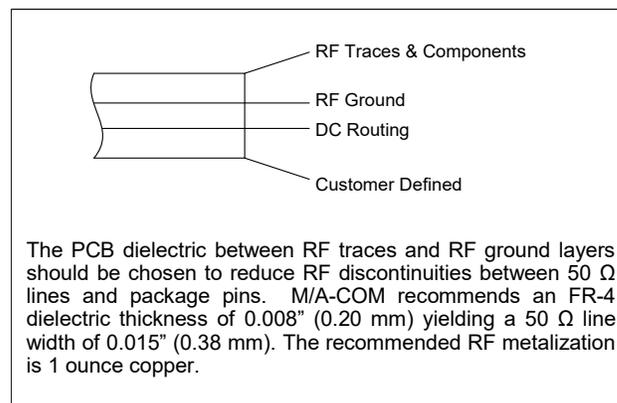
### Parts List

Part	Value	Case Style
C1	2.4 pF	0402
C2	2.2 pF	0402
C3	0.1 $\mu$ F	0402
C4	1000 pF	0402
C5	39 pF	0402
C6	1 pF	0402
C7	2 pF	0402
L1	3.6 nH	0402
R1, R2	0 $\Omega$	0402

### 2140 Schematic

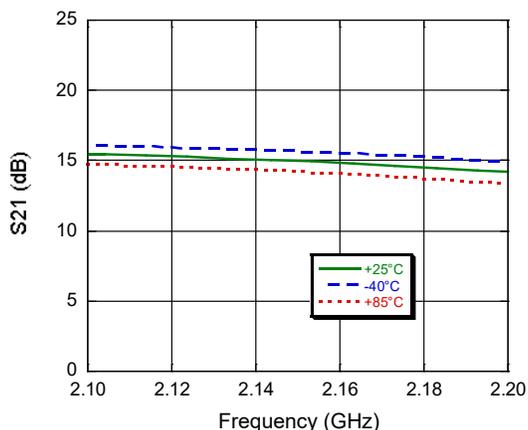


### Cross Section View

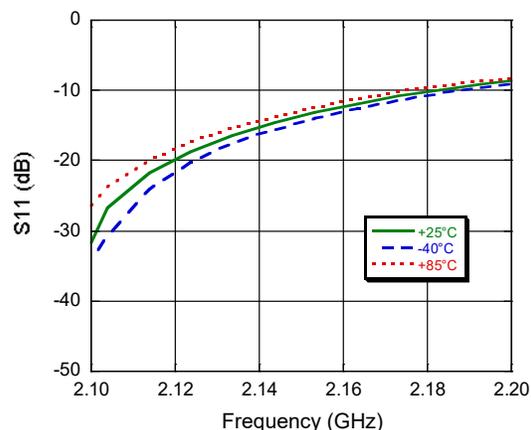


**Typical Performance Curves, 2140 MHz Configuration**

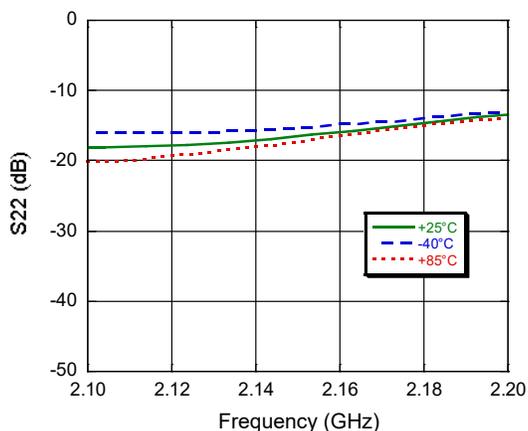
**Gain**



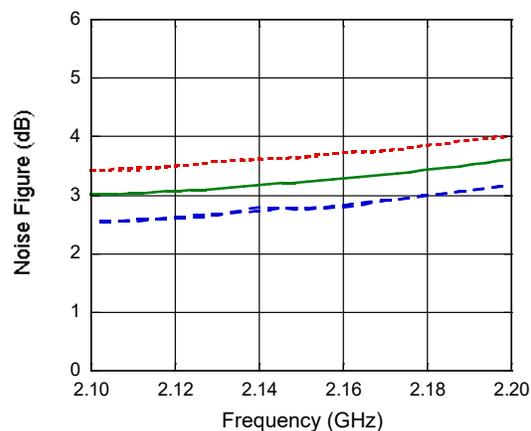
**Input Return Loss**



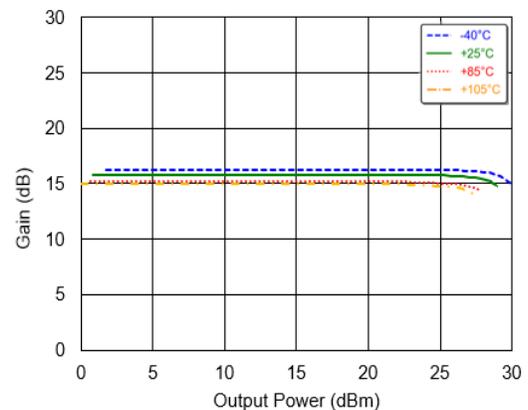
**Output Return Loss**



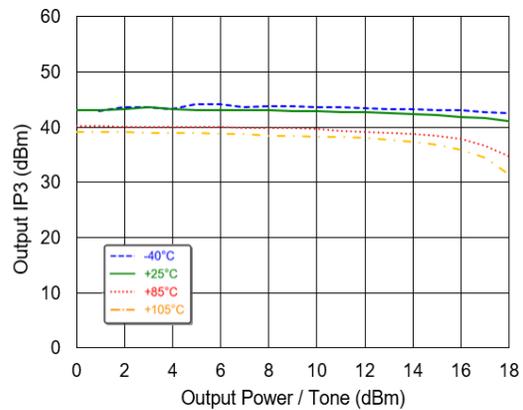
**Noise Figure**



**P1dB**

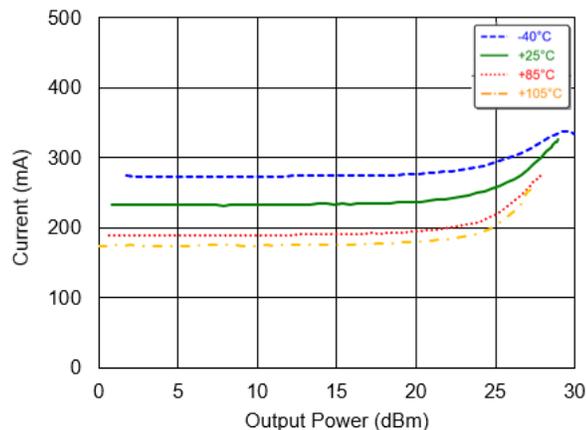


**Output IP3**



### Typical Performance Curves, 2140 MHz Configuration

#### Current



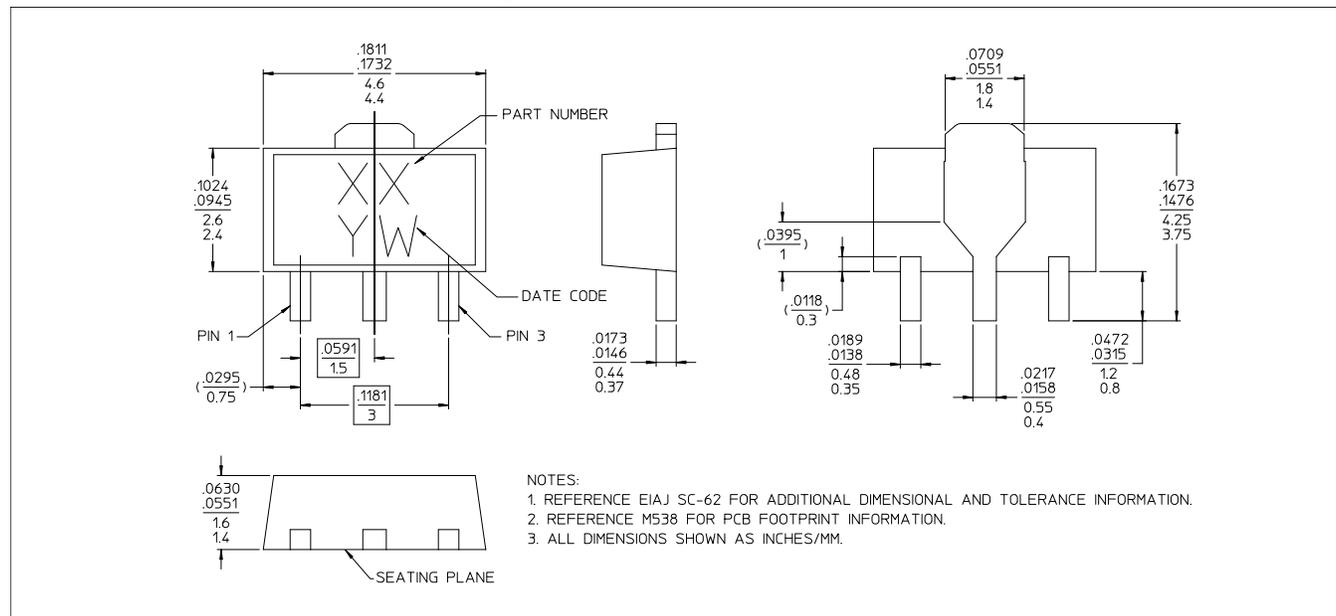
#### Handling Procedures

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 2 devices.

### Lead-Free SOT-89 Plastic Package†



† 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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