

Features

- Output Intercept Point of +40 dBm over a 20 dB Input Power Range
- Broadband Operation
- Lead-Free SOT-89 Package
- Halogen-Free “Green” Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MAAM-009560 RF driver amplifier is a GaAs MMIC which exhibits exceptional linearity performance over a >20 dB dynamic range, as well as featuring high gain in a lead-free miniature SOT-89 surface mount plastic package. The device runs off a single +5 volt supply and draws 230 mA typically.

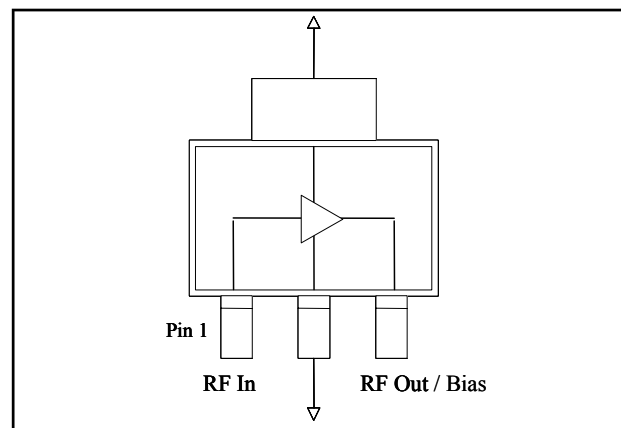
The MAAM-009560 is fabricated using an HBT process to realize low current and high linearity. The process features full passivation for increased performance and reliability.

Ordering Information ^{1,2}

Part Number	Package
MAAM-009560-000000	Bulk Packaging
MAAM-009560-TR3000	3000 piece reel
MAAM-009560-001SMB	Sample Board 2140 MHz Configuration

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

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	RF Input	3	RF Output/Bias
2	Ground		

Maximum Operating Conditions ³

Parameter	Maximum Operating Conditions
Junction Temperature ⁴	140 °C
RF Output Power	28 dBm
Operating Temperature	-40 °C to +85 °C

3. These operating conditions will ensure MTTF > 1 x 10⁶ hours.

4. Junction Temperature (T_J) = $T_A + \theta_{jc} * ((V * I) - (P_{OUT} - P_{IN}))$

Typical thermal resistance (θ_{jc}) = 30° C/W

a) For $T_A = 25^\circ\text{C}$,

$T_J = 57^\circ\text{C}$ @ 5 V, 230 mA, $P_{OUT} = 20$ dBm, $P_{IN} = 6$ dBm

b) For $T_A = 85^\circ\text{C}$,

$T_J = 114^\circ\text{C}$ @ 5 V, 210 mA, $P_{OUT} = 20$ dBm, $P_{IN} = 6.5$ dBm

Absolute Maximum Ratings ^{5,6}

Parameter	Absolute Maximum
RF Output Power	29 dBm
Voltage	6 volts
Storage Temperature	-65 °C to +150 °C
Junction Temperature	160 °C

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

6. M/A-COM does not recommend sustained operation near these survivability limits.

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

ADVANCED: Data Sheets contain information regarding a product M/A-COM is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

• **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

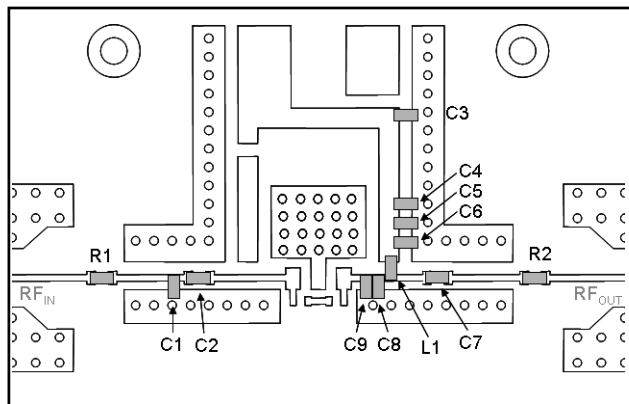
Visit www.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

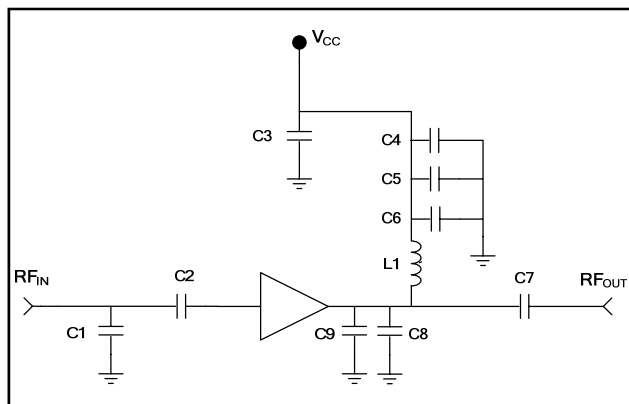
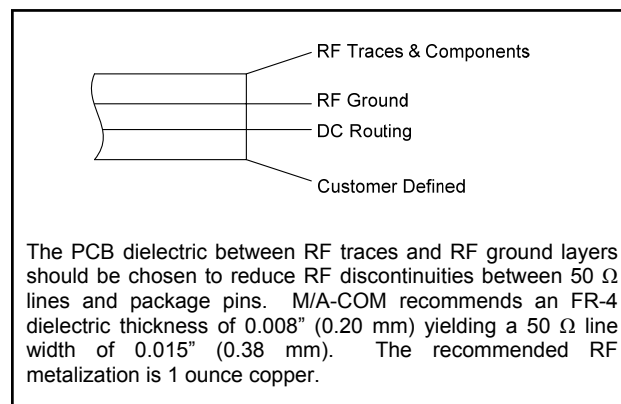
RF Driver Amplifier
250 - 4000 MHz
M/A-COM Products
 Rev V1

Electrical Specifications: Freq. = 2140 MHz, $T_A = 25^\circ\text{C}$, $V_{CC} = +5\text{ V}$, $Z_0 = 50\ \Omega$

Parameter	Units	Min.	Typ.	Max.
Gain	dB	13.0	14.25	—
Noise Figure	dB	—	2.7	—
Input Return Loss	dB	—	19	—
Output Return Loss	dB	—	30	—
Output P1dB	dBm	—	28.5	—
Output IP3 $P_{OUT} = +20\text{ dBm / tone, 1 MHz spacing}$ $P_{IN} = +6\text{ dBm / tone, 1 MHz spacing}$	dBm	— 38	40 40	— —
Quiescent Current	mA	—	220	—
Current ($P_{IN} = +9\text{ dBm}$)	mA	—	250	325

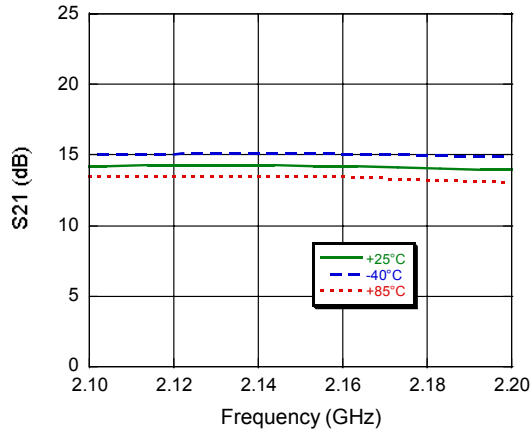
2140 MHz PCB Layout

Parts List

Part	Value	Case Style
C1	2.2 pF	0402
C2	1.8 pF	0402
C3, C4	0.1 μF	0402
C5	1000 pF	0402
C6	15 pF	0402
C7	39 pF	0402
C8	1 pF	0402
C9	2 pF	0402
L1	3.6 nH	0402
R1, R2	0 Ω	0402

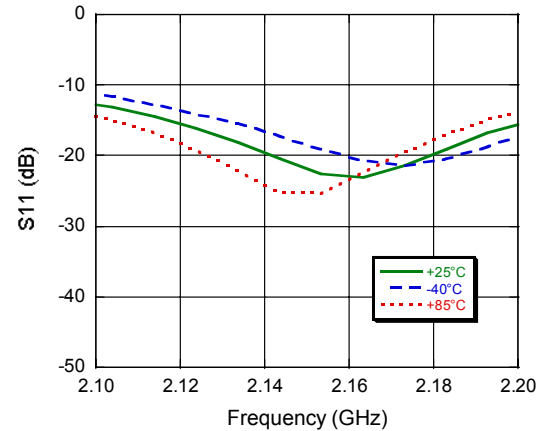
2140 Schematic

Cross Section View


Typical Performance Curves, 2140 MHz Configuration

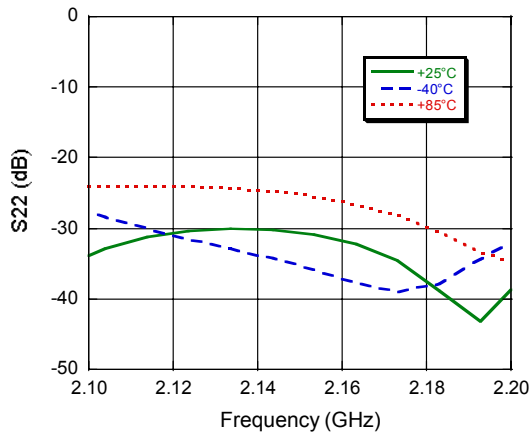
Gain



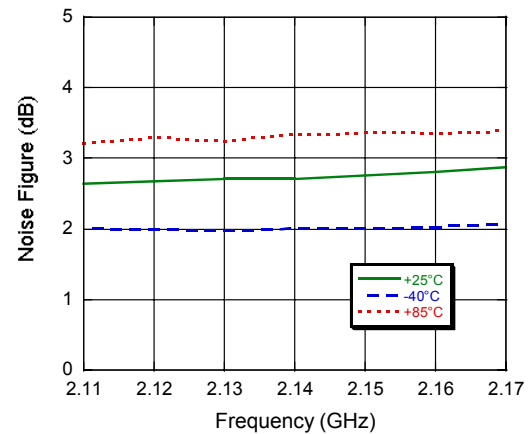
Input Return Loss



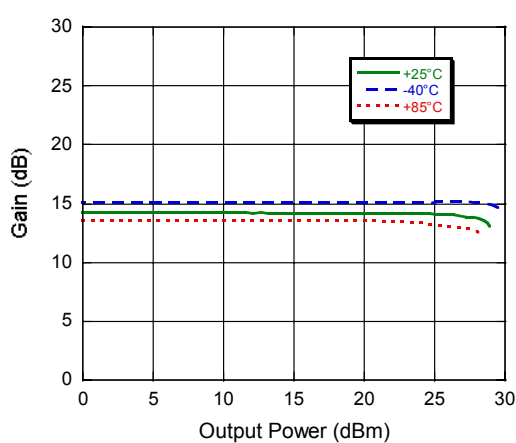
Output Return Loss



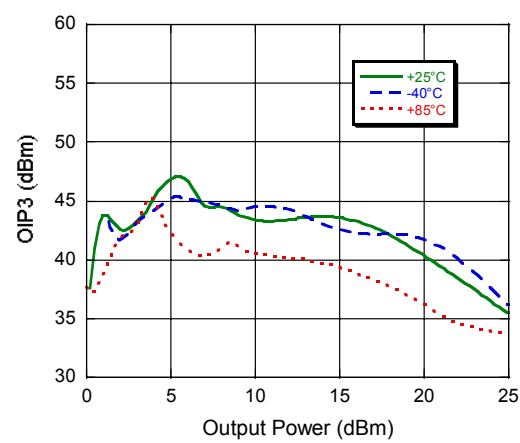
Noise Figure



P1dB

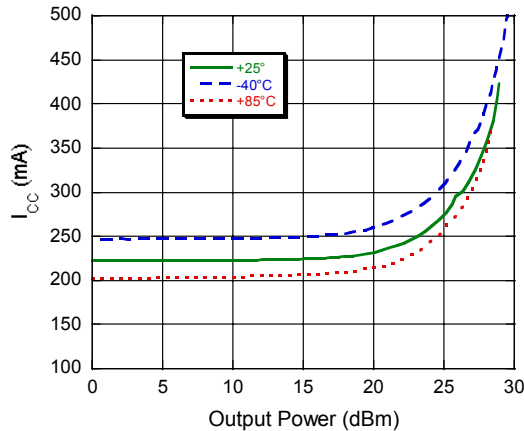


Output IP3



Typical Performance Curves, 2140 MHz Configuration

Current



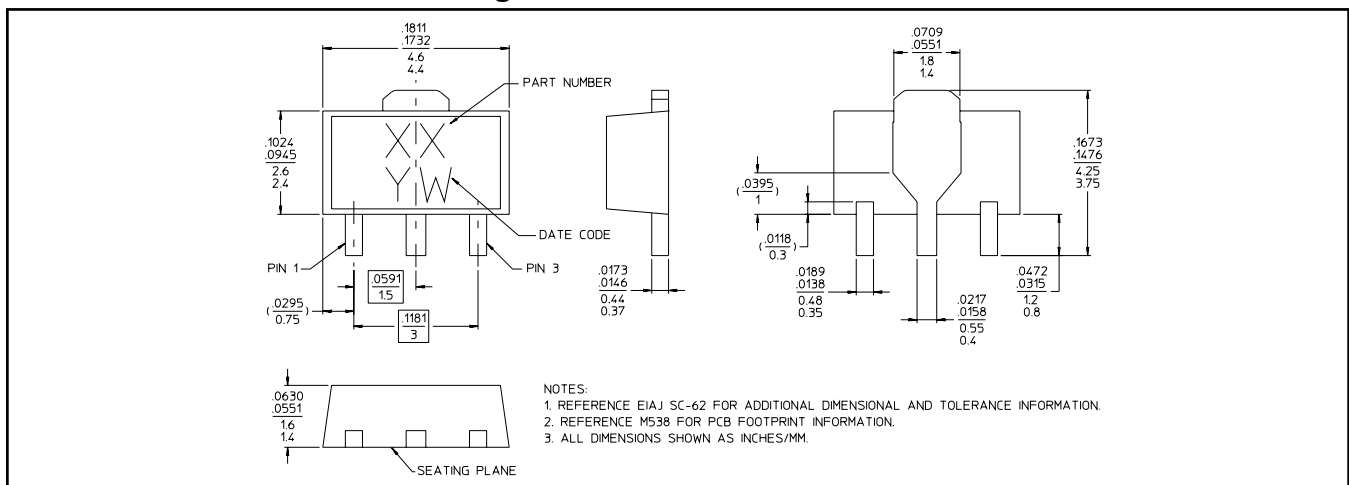
Handling Procedures

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 zero 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.