

RF Driver Amplifier 250 - 4000 MHz

**MAAMSS0072
V2**

Features

- Broadband High Gain Operation
- Optimized Performance for WiMax Applications
- Excellent EVM Performance: 1.5% @ 18 dBm
- High Efficiency
- Lead-Free 4x4 mm PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MAAMSS0072 RF driver amplifier is a two-stage GaAs MMIC which exhibits exceptional linearity performance as well as high gain in a lead-free 4x4 mm PQFN surface mount plastic package. The device is biased with a single +5 volt supply and consumes 200 mA typically.

The MAAMSS0072 is fabricated using a high linearity HBT process to realize low current and high power functionality. The process features full passivation for increased performance and reliability.

The MAAMSS0072 can be externally tuned for operation anywhere within the 250 to 4000 MHz frequency band.

Ordering Information ¹

Part Number	Package
MAAMSS0072TR-3000	3000 piece reel
MAAM-000072-000SMB	Sample Only, General Frequency
MAAM-000072-001SMB	3500 MHz Configuration

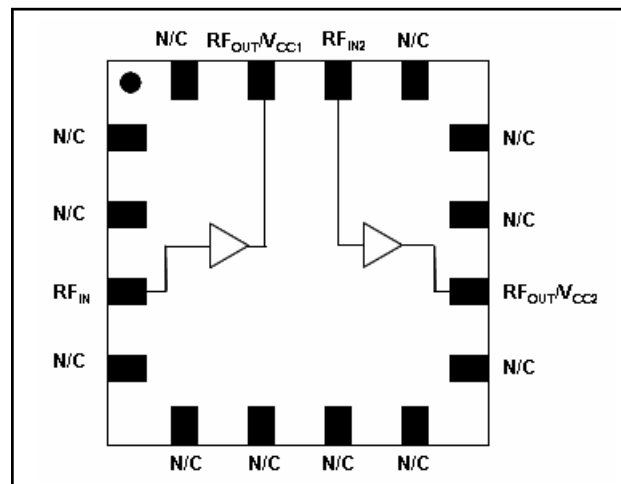
1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum
RF Output Power	+28.5 dBm
Voltage	6 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°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.

Functional Block Diagram



Pin Configuration

Pin No.	Pin Name	Description
1	N/C	No Connection
2	N/C	No Connection
3	RF _{IN}	RF Input
4	N/C	No Connection
5	N/C	No Connection
6	N/C	No Connection
7	N/C	No Connection
8	N/C	No Connection
9	N/C	No Connection
10	RF _{OUT} / V _{CC2}	RF Output, 2nd Stage Supply
11	N/C	No Connection
12	N/C	No Connection
13	N/C	No Connection
14	RF _{IN2}	2nd Stage RF Input
15	RF _{OUT} /V _{CC1}	RF Output, 1st Stage Supply
16	N/C	No Connection
17	Paddle ⁴	RF and DC Ground

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

¹ * Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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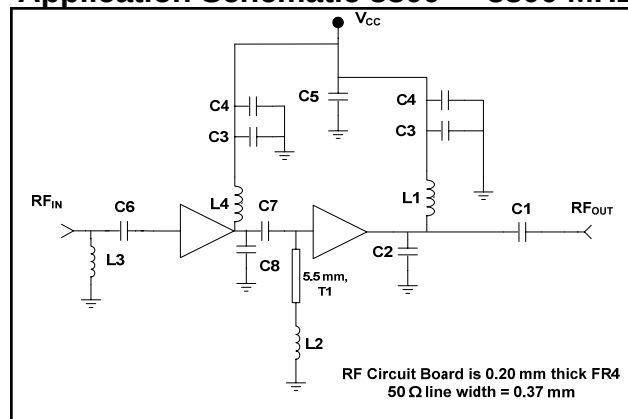
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Electrical Specifications: $V_{CC} = +5\text{ V}$, $T_A = 25^\circ\text{C}$, $Z_0 = 50\ \Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	3500 MHz	dB	21	23	—
Input Return Loss	3500 MHz	dB	—	15	—
Output Return Loss	3500 MHz	dB	—	15	—
Output P1dB	3500 MHz	dBm	—	27	—
EVM	+18 dBm channel power 54 Mbps OFDM (includes 1% system level)	% rms	—	1.5	—
OIP3	17 dBm / Tone, 1 MHz Tone Spacing	dBm	36	39	—
Noise Figure	3500 MHz	dB	—	3.7	—
Quiescent Current	+5 V	mA	—	200	—
Current	17 dBm / Tone, 1 MHz Tone Spacing	mA	—	235	300

Application Schematic 3300 - 3800 MHz



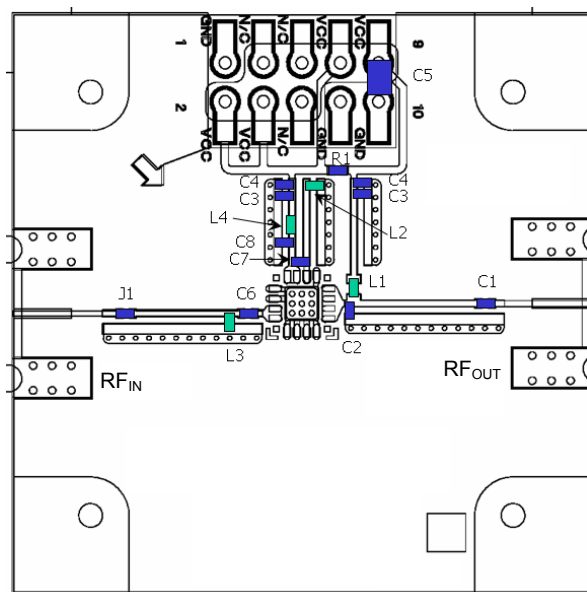
Maximum Operating Conditions⁵

Parameter	Maximum Operating Conditions
Junction Temperature ⁶	160°C
RF Output Power	28.5 dBm
Operating Temperature	-40°C to +85°C

5. Operating at or within these conditions will ensure MTTF > 1 x 10⁶ hours.

6. Typical thermal resistance (θ_{jc}) = 65°C/W.

Sample Board



MAAMSS0072 External Parts List

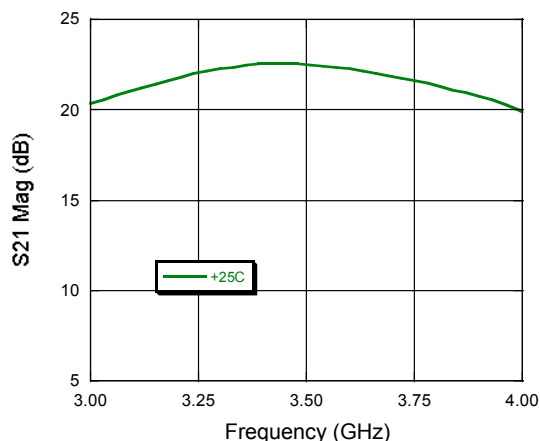
Component	Value	Case Size	Manufacturer
C1	1000 pF	0402	Murata
C2	0.5 pF	0402	Murata
C3	1000 pF	0402	Murata
C4	0.1 μ F	0402	Murata
C5	10 μ F	1206	Kemet
C6	1.2 pF	0402	Murata
C7	2.7 pF	0402	Murata
C8	1 pF	0402	Murata
L1	8.2 nH	0402	Coilcraft
L2	1 nH	0402	Toko
R1	0	0402	-
L3	1 nH	0402	Toko
L4	1.8 nH	0402	Toko
J1	Jumper	-	-
T1	50 Ω , 120° @ 3500 MHz		

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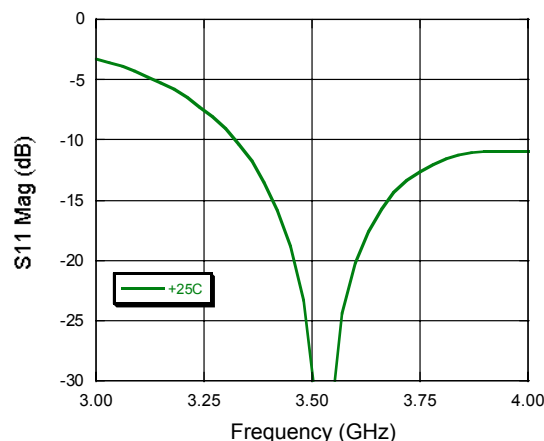
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Typical Performance Curves: @ +25°C

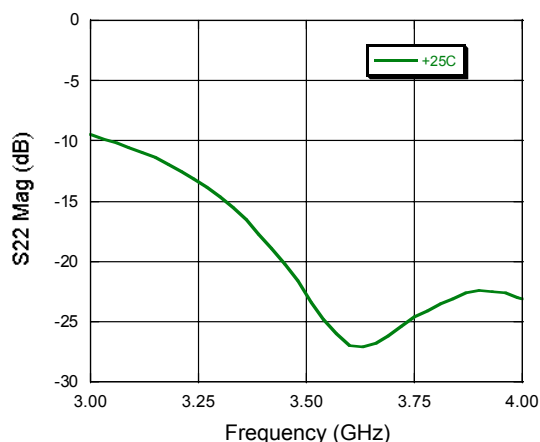
Gain



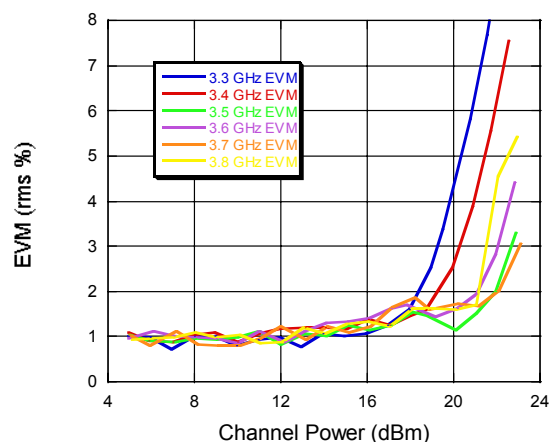
Input Return Loss



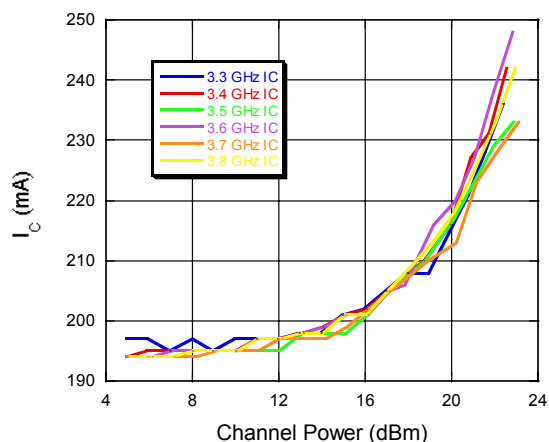
Output Return Loss



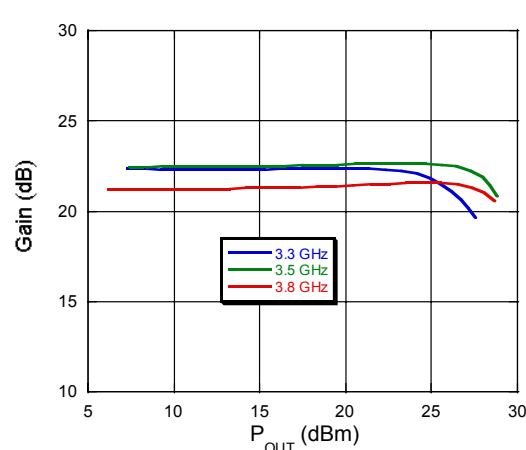
EVM



Current



P1dB

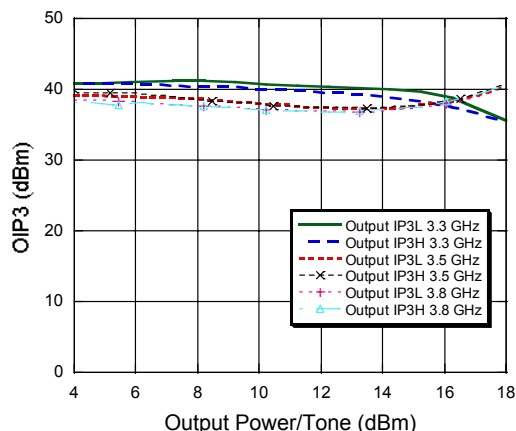


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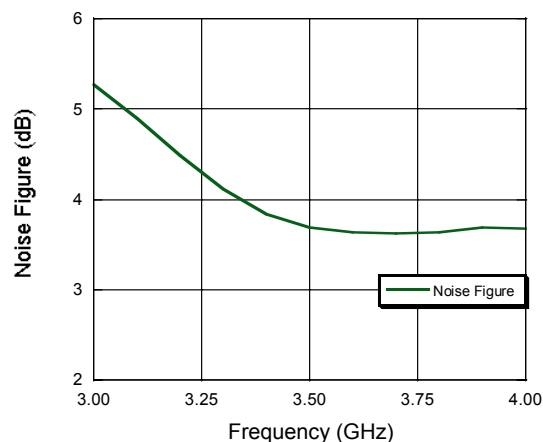
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Output IP3



Noise



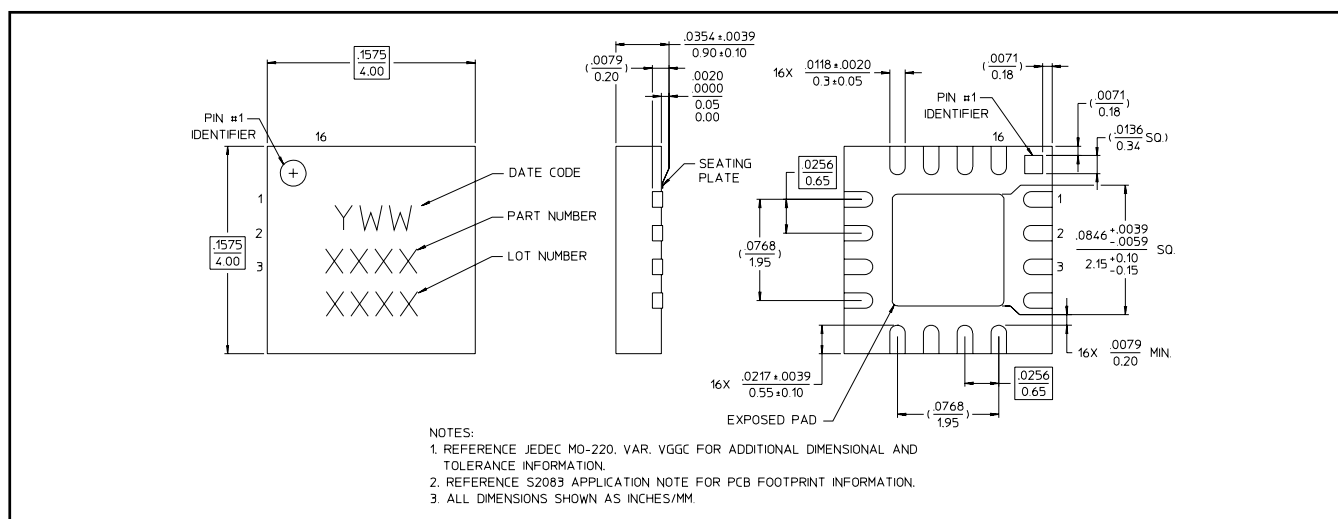
Handling Procedures

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.

Lead-Free 4 mm 16-Lead PQFN[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.