

**Low Noise GaAs MMIC Amplifier  
1.2 - 1.75 GHz**

**MAAM12000-A1  
V4**

**Features**

- Low Noise Figure: 1.35 dB
- High Gain: 26 dB
- No External Components Required
- DC Decoupled RF Input and Output
- Lead-Free 8-Lead Ceramic Package
- RoHS\* Compliant and 260°C Reflow Compatible

**Description**

M/A-COM's MAAM12000-A1 is a wide band, low noise, MMIC amplifier housed in a lead-free, small 8-lead ceramic package. It includes two integrated gain stages and employs series inductive feedback to obtain excellent noise figure and a good, 50-ohm, input and output impedance match over the 1.2 to 1.75 GHz band. The MAAM12000-A1 is fully monolithic, requires no external components and is provided in a low-cost, user-friendly, microwave package.

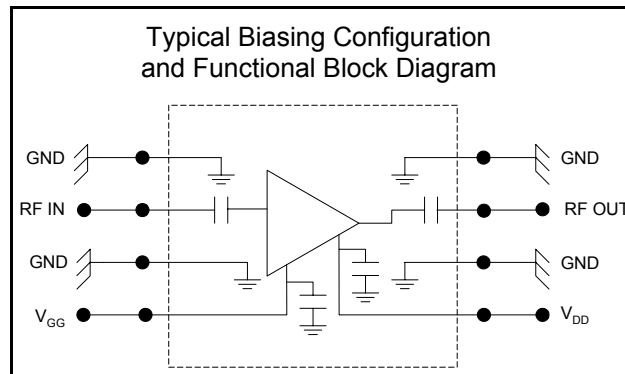
The MAAM12000-A1 is ideally suited to receivers in GPS and DGPS applications and operates over both the L1 and L2 frequency bands. Because of its wide bandwidth, the MAAM12000-A1 can also be used as a driver, buffer or IF amplifier in numerous commercial and government system applications that require high gain, excellent linearity and low power consumption.

The MAAM12000-A1 is manufactured in-house using a reliable, 0.5 micron, GaAs MESFET process. This product is 100% RF tested to ensure compliance to performance specifications.

**Ordering Information**

Part Number	Package
MAAM12000-A1	8-Lead Ceramic
MAAM12000-A1G	Gull Wing

**Schematic**



**Pin Configuration<sup>1</sup>**

Pin No.	Function	Pin No.	Function
1	Ground	5	V <sub>DD</sub>
2	RF Input	6	Ground
3	Ground	7	RF Output
4	V <sub>GG</sub>	8	Ground

1. The package bottom must be connected to RF and DC ground.

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

Parameter	Absolute Maximum
V <sub>DD</sub>	+7 V
V <sub>GG</sub>	-10 V
Input Power	+20 dBm
Current	150 mA
Channel Temperature	+150°C
Operating Temperature <sup>4</sup>	-55°C to +100°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.
- Typical thermal resistance (θ<sub>jc</sub>) = +110°C/W.

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

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

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	dB	23	26	—
Noise Figure	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	dB	—	1.35	1.8
Input VSWR	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	Ratio	—	1.4:1	—
Output VSWR	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	Ratio	—	1.4:1	—
Output 1 dB Compression	1.20 - 1.75 GHz	dBm	—	+14	—
Input IP3	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	dBm	—	-2	—
Reverse Isolation	1.20 - 1.75 GHz, $P_{IN} = -30\text{ dBm}$	dB	—	35	—
Bias Current	—	mA	—	80	110

**Handling Procedures**

Please observe the following precautions to avoid damage:

**Static Sensitivity**

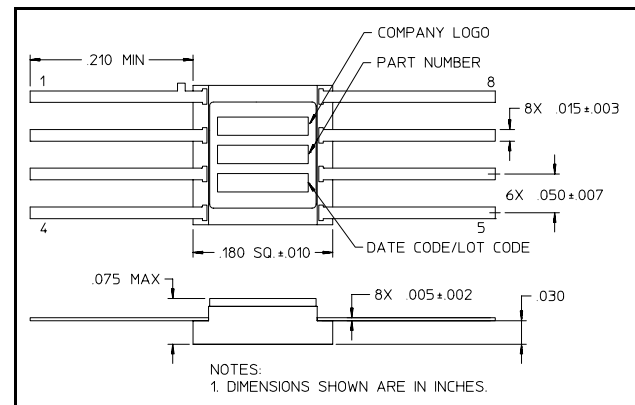
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

**Operating The MAAM12000-A1**

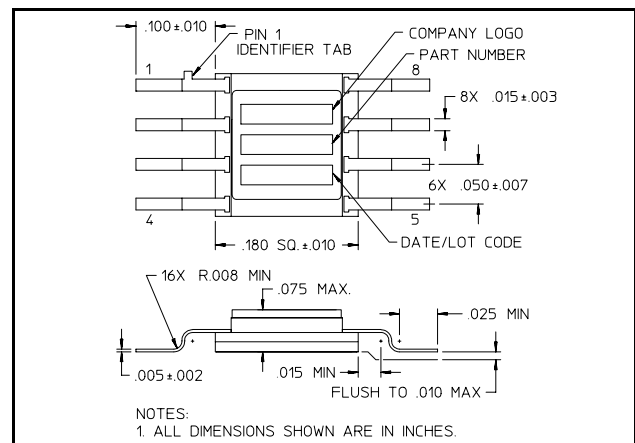
Nominal bias is obtained by connecting -5 volts to pin 4 ( $V_{GG}$ ) followed by connecting +5 volts to pin 5 ( $V_{DD}$ ). Note sequence.

Power down in reverse sequence.

**Lead-Free CR-3 (MAAM12000-A1)<sup>†</sup>**



**Lead-Free CR-10 (MAAM12000-A1G)<sup>†</sup>**



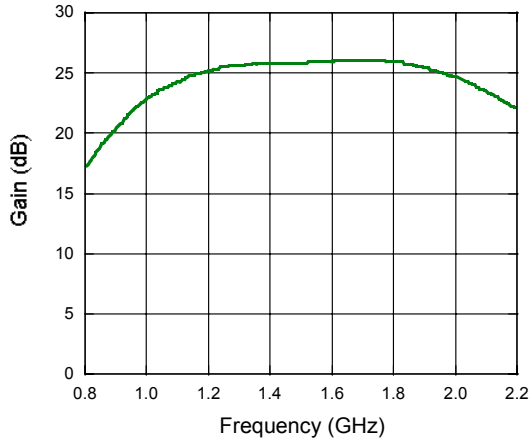
<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.

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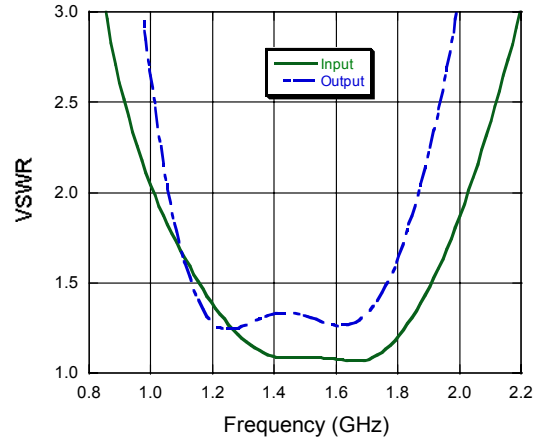
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**Typical Performance Curves**

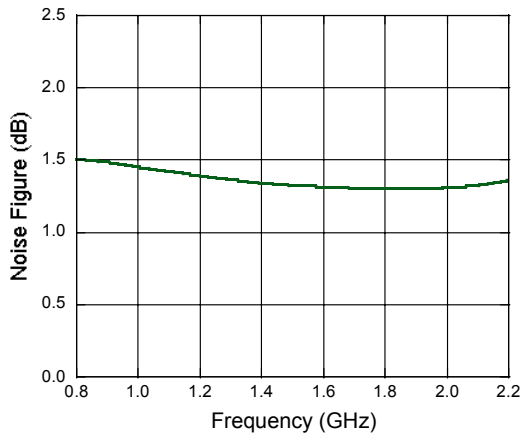
**Gain**



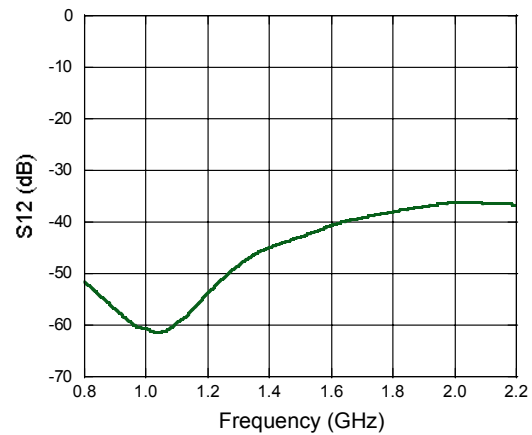
**VSWR**



**Noise Figure**



**Reverse Isolation**



**Output Power**

