

Electronics

Low Noise GaAs MMIC Amplifier 3.5 - 7.0 GHz

Features

- Low Noise Figure: 2.2 dB Typical
- High Gain: 17 dB Typical
- Gain Flatness: +0.5 dB
- Single Supply: +4 V
- 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 MAAM37000-A1 is a wide-band, low noise, MMIC amplifier housed in a small, lead-free, 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 entire frequency band. The MAAM37000-A1 operates from a single +4 V supply. It is fully monolithic, requires no external components, and is provided in a user-friendly, microwave package.

The MAAM37000-A1 performs well as a low noise amplifier in receive applications and as a driver or buffer amplifier where high gain, excellent linearity and low power consumption are important. Because of its wide bandwidth, the MAAM37000-A1 can be used in numerous commercial and government system applications, such as TVRO, VSAT, missile guidance and radar.

The MAAM37000-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

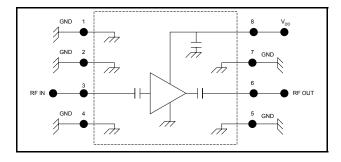
| Part Number | Package | | |
|---------------|-----------------------|--|--|
| MAAM37000-A1 | 8-lead Ceramic (CR-3) | | |
| MAAM37000-A1G | Gull Wing (CR-10) | | |

RoHS Compliant



MAAM37000-A1 V5

Functional Schematic



Pin Configuration¹

| Pin No. | Function | Pin No. | Function |
|---------|----------|---------|-----------------|
| 1 | Ground | 5 | Ground |
| 2 | Ground | 6 | RF Output |
| 3 | RF Input | 7 | Ground |
| 4 | Ground | 8 | V _{DD} |

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

Absolute Maximum Ratings ^{2,3}

| Parameter | Absolute Maximum | | |
|------------------------------------|------------------|--|--|
| V _{DD} | +7 V | | |
| Input Power | +20 dBm | | |
| Current | 150 mA | | |
| Channel Temperature | +150°C | | |
| Operating Temperature ⁴ | -55°C to +100°C | | |
| Storage Temperature | -65°C to +150°C | | |

2. 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.

4. Typical thermal resistance (Θ_{jc}) = +120°C/W

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

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RoHS Compliant



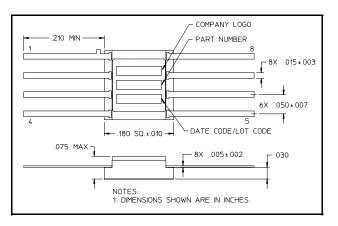
Low Noise GaAs MMIC Amplifier 3.5 - 7.0 GHz

MAAM37000-A1 V5

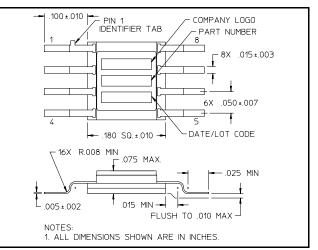
Electrical Specifications: $T_A = 25^{\circ}C$, $V_{DD} = +4 V$, $Z_0 = 50 \Omega$

| Parameter | Test Conditions | Units | Min. | Тур. | Max. |
|-------------------------|------------------------------------------|-------|------|-------|------|
| Gain | 3.5 - 7.0 GHz, P _{IN} = -30 dBm | dB | 15 | 17 | — |
| Noise Figure | 3.5 - 7.0 GHz | dB | _ | 2.2 | 3.2 |
| Input VSWR | 3.5 - 7.0 GHz, P _{IN} = -30 dBm | Ratio | — | 2.0:1 | — |
| Output VSWR | 3.5 - 7.0 GHz, P _{IN} = -30 dBm | Ratio | _ | 2.0:1 | _ |
| Output 1 dB Compression | 3.5 - 7.0 GHz | dBm | _ | +14 | _ |
| Input IP3 | 3.5 - 7.0 GHz, P _{IN} = -30 dBm | dBm | — | +8 | — |
| Reverse Isolation | 3.5 - 7.0 GHz, P _{IN} = -30 dBm | dB | — | 35 | — |
| Bias Current | _ | mA | — | 75 | 110 |

Lead-Free CR-3 (MAAM37000-A1)[†]



Lead-Free CR-10 (MAAM37000-A1G)[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.

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RoHS Compliant

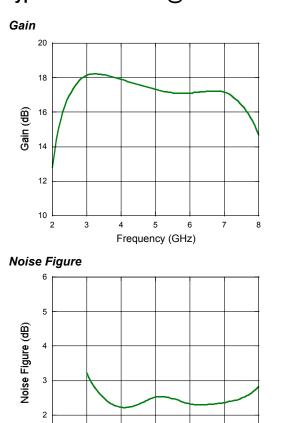


MAAM37000-A1

V5

Low Noise GaAs MMIC Amplifier 3.5 - 7.0 GHz

Typical Performance @ +25°C



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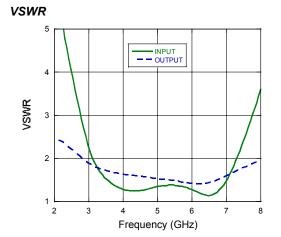
Frequency (GHz)

4

6

7

8



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