

## Features

- Low Noise Figure: 0.7 dB at 2.3 GHz
- Single +3 to +5 V Supply Bias
- Low Current: 11.5 mA typical
- Lead-Free SOT-26 Plastic Package
- RoHS\* Compliant and 260°C Reflow Compatible

## Description

M/A-COM's MAAL-007304 low noise amplifier is a GaAs MMIC amplifier in a lead-free SOT-26 surface mount plastic package. The MAAL-007304 employs a monolithic 2-stage self-biased design and can be biased between +3 to +5 volts, depending on system requirements. The MAAL-007304 offers low noise, low current, and high gain. It can be tuned for various applications from 0.5 to 3 GHz.

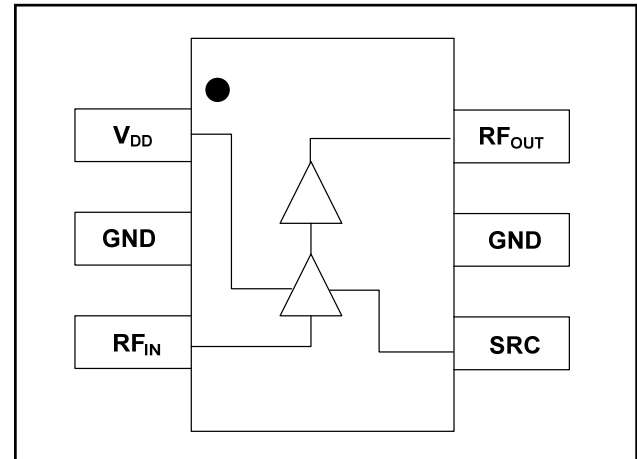
M/A-COM fabricates the MAAL-007304 using a low noise pHEMT process to realize low noise and high gain. The process features full passivation for performance and reliability.

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

Part Number	Package
MAAL-007304-000000	Bulk Packaging
MAAL-007304-TR3000	3000 piece reel
MAAL-007304-001SMB	Sample Board 2.3 - 2.5 GHz Tuning

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

## Functional Schematic



## Pin Configuration

Pin No.	Pin Name	Description
1	V <sub>DD</sub>	Bias
2	GND	Ground
3	RF <sub>IN</sub>	RF Input
4	SRC	Source
5	GND	Ground
6	RF <sub>OUT</sub>	RF Output

## Absolute Maximum Ratings <sup>3,4</sup>

Parameter	Absolute Maximum
RF Input Power	+10 dBm
Voltage	6.0 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM does not recommend sustained operation near these survivability limits.

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

Low Noise Amplifier  
0.5 - 3.0 GHz

Rev. V4

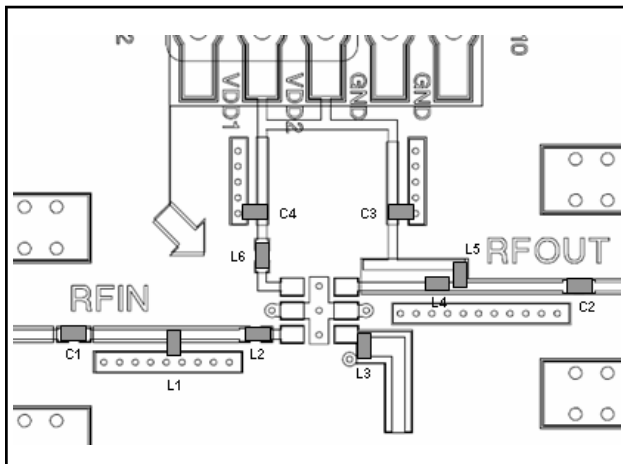
**Electrical Specifications: F = 2.3 GHz, V<sub>DD</sub> = +3 V, T<sub>A</sub> = +25°C, Z<sub>O</sub> = 50 Ω**

Parameter	Units	Min.	Typ.	Max.
Gain	dB	24.0	25.5	27.0
Noise Figure	dB	—	0.7	0.85
Current	mA	—	11.5	13.0

**Typical Performance: F = 2.3 GHz, V<sub>DD</sub> = +3 V, T<sub>A</sub> = +25°C, Z<sub>O</sub> = 50 Ω**

Parameter	Units	Typ.
Input Return Loss	dB	15
Output Return Loss	dB	10
Input IP <sub>3</sub>	dBm	-6
Output IP <sub>3</sub>	dBm	19
Output P1dB	dBm	7

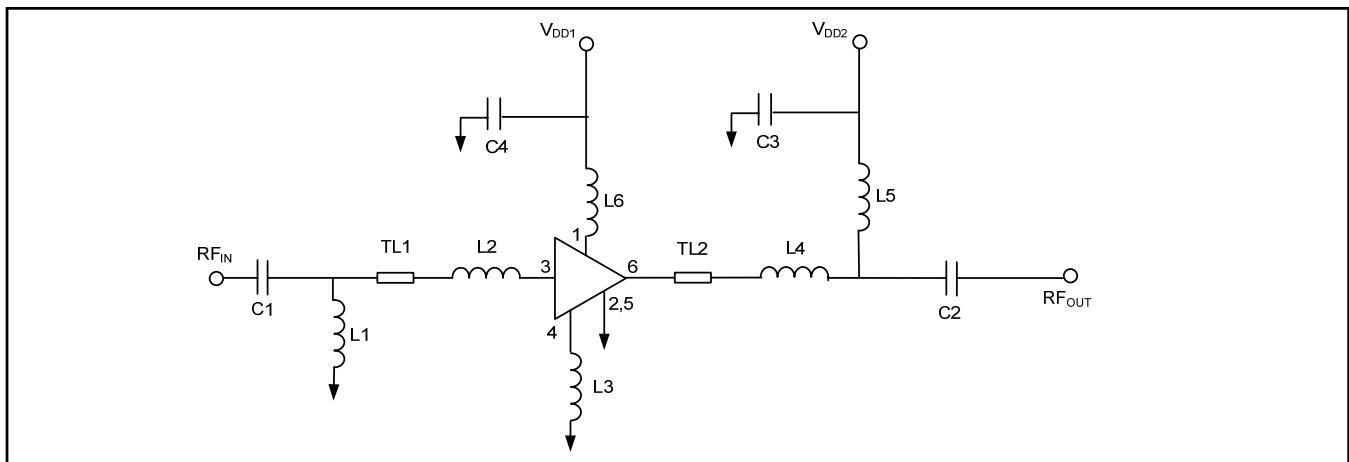
## Recommended PCB Configuration



## External Parts List

Component	Value	Footprint	Manufacturer
C1	3 pF	0603	ATC
C2	8.2 pF	0603	ATC
C3, C4	0.1 μF	0402	Panasonic
L1	5.6 nH	0402	Panasonic
L2, L5	6.8 nH	0402	Coilcraft
L3	1.5 nH	0402	Toko
L4	3.9 nH	0402	Toko
L6	7.5 nH	0402	Coilcraft
TL1	47.5 Ω, 34° @ 2.3 GHz		
TL2	47.5 Ω, 15.5° @ 2.3 GHz		

## Schematic



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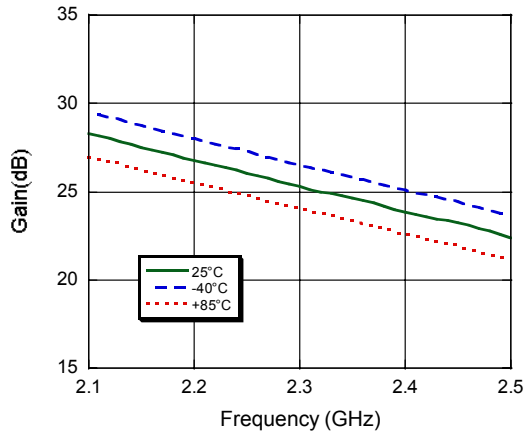
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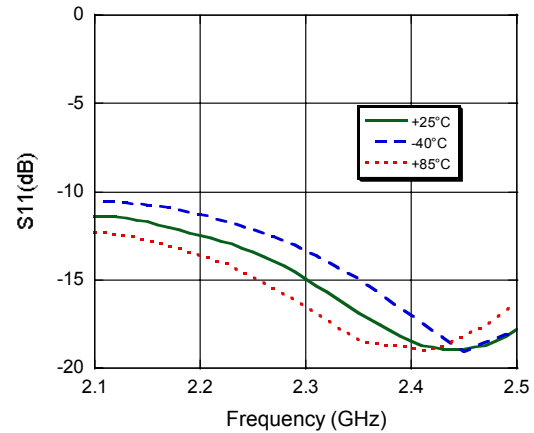
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## Typical Performance Curves

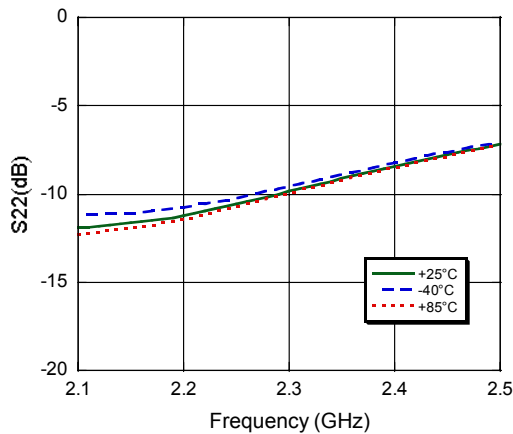
**Gain**



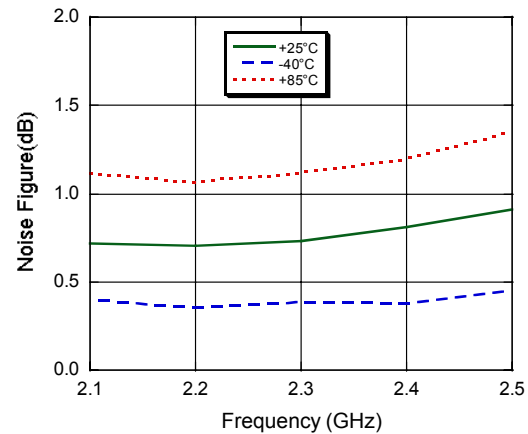
**Input Return Loss**



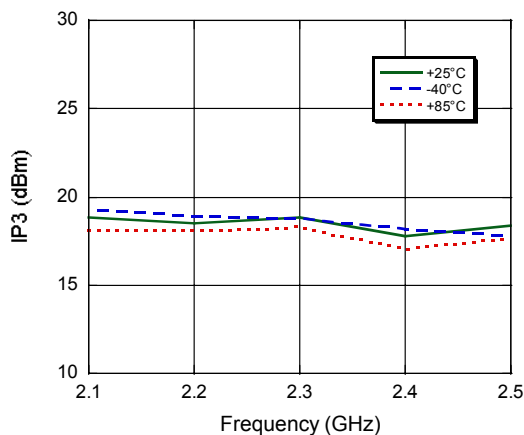
**Output Return Loss**



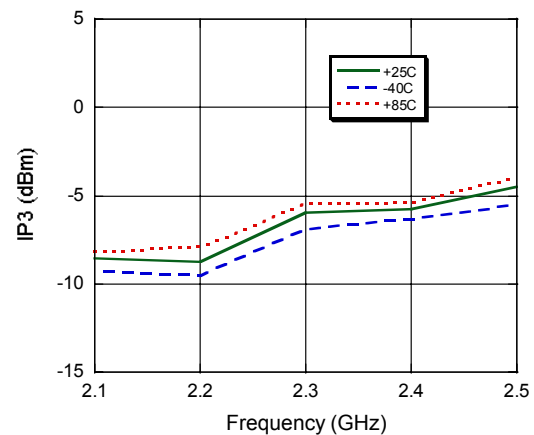
**Noise Figure**



**Output IP3**



**Input IP3**



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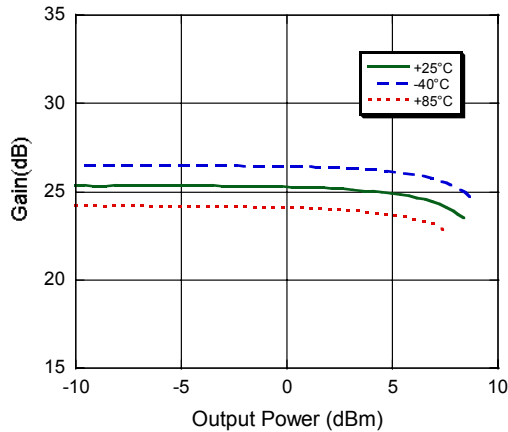
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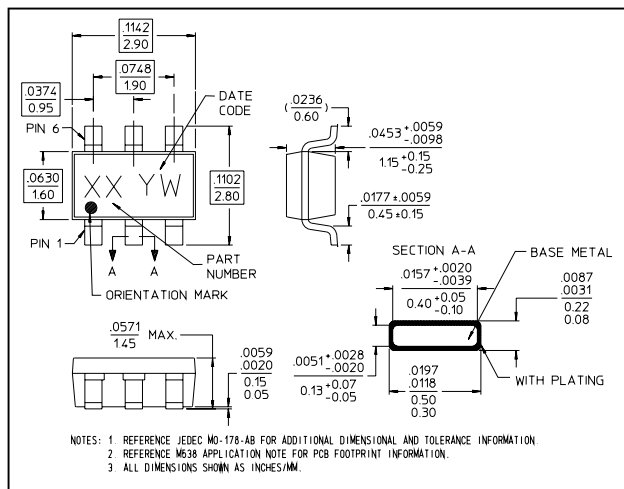
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## Typical Performance Curves

### P1dB @ 2.3 GHz



## Lead-Free SOT-26 Plastic Package†



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

## 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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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