

Broadband Low Noise Amplifier 2.4 - 18.5 GHz

Advance - Rev. V1

Features

- 20 dB typical Gain
- 50 Ω match on input and output
- 1.4 dB typical Noise Figure in 50 Ω
- +13 dBm output power (P_{-1dB})
- Current adjust, from Power Down to 80 mA
- +5V or +3.3V positive DC supply
- Lead-Free 2x2mm 8 lead DFN Pkg
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible
- Class 1A ESD protection all pins

Description

The MAAL-011130 is an easy-to-use, broadband, low noise amplifier with 20 dB typical gain from 2.4 to 18.5 GHz.

The MAAL-011130 has integrated matching, DC blocking and bias circuits and is designed to provide low noise with good input and output match. Typical P_{-1dB} power is +13 dBm. The device is typically biased with a single +5V or 3.3V V_D supply and current can be adjusted with a separate DC bias pin. It typically consumes only 30 mA and allows full power-down with V_B pin.

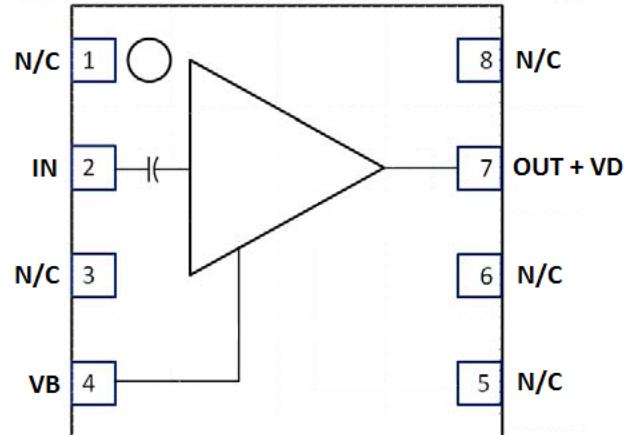
The IC is fabricated using a GaAs E-mode which features full passivation for increased performance and reliability.

Ordering Information ^{1,2}

Part Number	Package
MAAL-011130	3000 piece reel
MAAL-011130-SMB	Sample Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 3 loose parts.

Functional Schematic



Pin Configuration ^{3,4}

Pin No.	Pin Name	Description
1	N/C	No connect
2	RF _{IN}	RF input
3	N/C	No connect
4	V _B	Bias control voltage
5	N/C	No connect
6	N/C	No connect
7	RF _{OUT} + V _D	RF output and supply voltage
8	N/C	No connect
9	Paddle	DC + RF Ground

3. MACOM recommends connecting unused package pins to ground.
4. The exposed pad centered on the package bottom must be connected to RF and DC ground.

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

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Electrical Specifications:

Freq. = 10 GHz, $T_A = +25^\circ\text{C}$, $V_D = +5\text{V}$, $V_B = \text{open}$, $Z_0 = 50 \Omega$ (unless otherwise specified)

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain		dB		20	
$P_{-1\text{dB}}$		dBm		16	
Noise Figure		dB		1.4	
Output IP3		dBm		21	
Input Return Loss		dB		-10	
Output Return Loss		dB		-15	
Isolation		dB		38	
Stability	Any load			Unconditional	
Voltage Supply		V	3	5	6
Bias Current	$V_D = 5\text{V}$, $V_B = \text{open}$	mA		30	

Absolute Maximum Ratings ^{5,6}

Parameter	Absolute Maximum
Input Power	+12 dBm
Operating Voltage	7 V
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C
Junction Temperature	150 °C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- MACOM does not recommend sustained operation near these survivability limits.

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

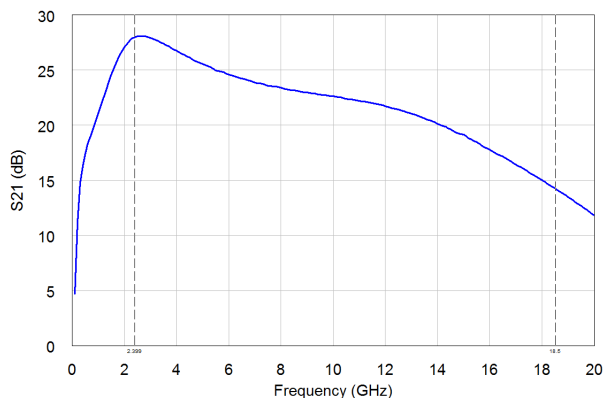
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these Class 1A devices.

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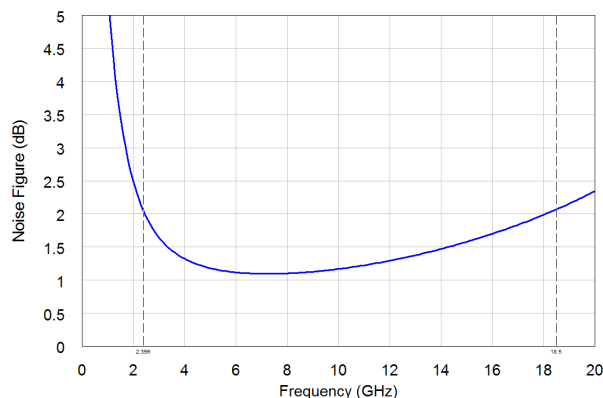
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Typical Performance Curves

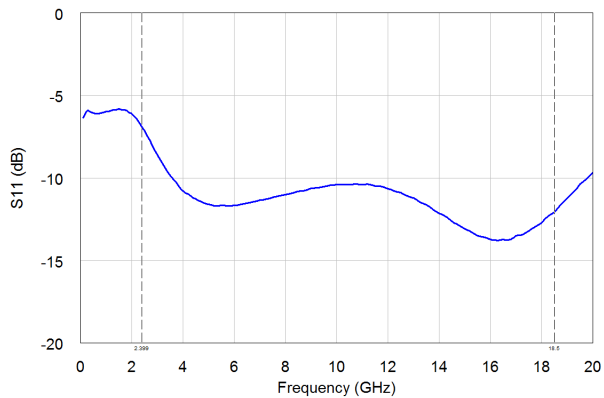
Gain



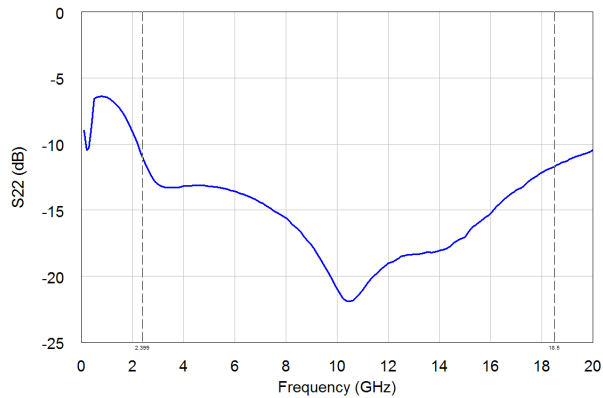
Noise Figure



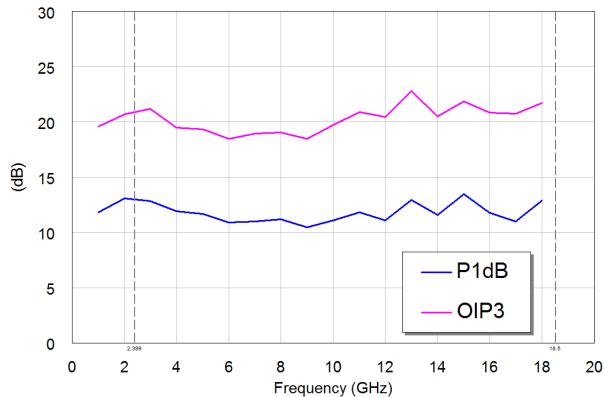
Input Return Loss



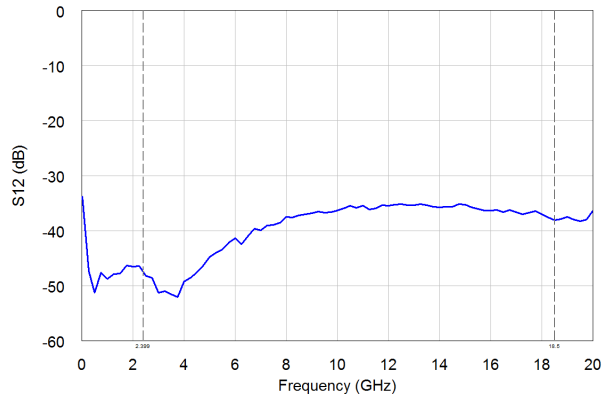
Output Return Loss



P-1dB and Output IP3



Isolation



ADVANCE: Data Sheets contain information regarding a product MACOM 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 MACOM 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.

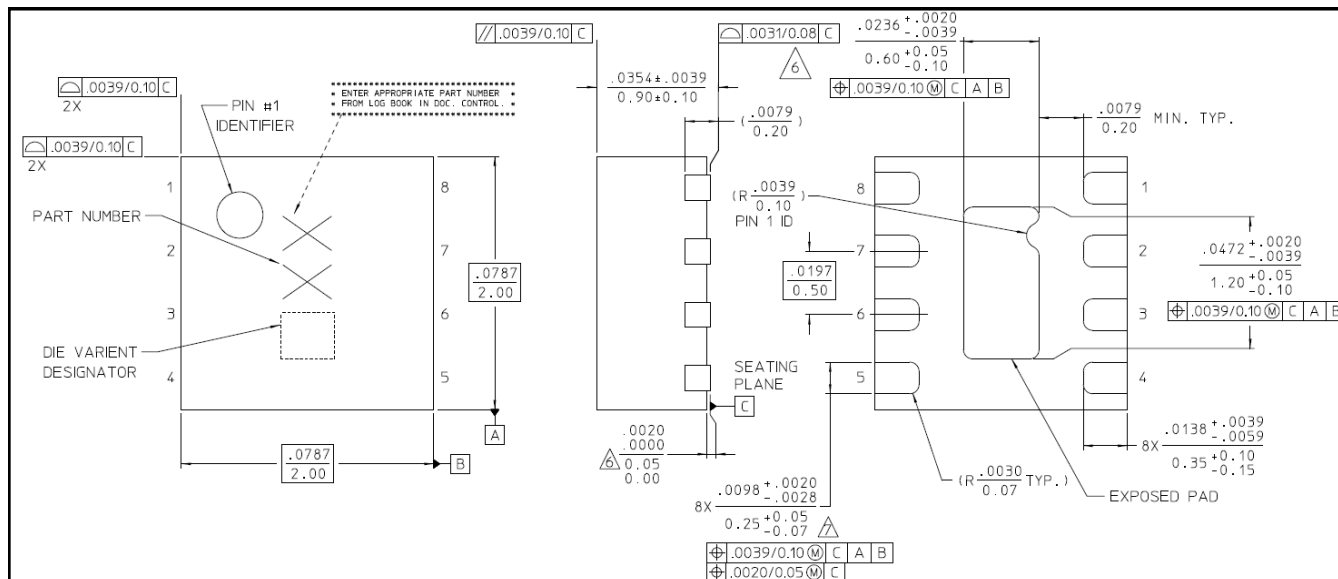
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Lead-Free 2 mm 8-Lead PDFN†



† Reference Application Note S2083 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin over copper.

Application Schematic

