

Low Noise Amplifier

27 GHz - 31.5 GHz



MAAL-011240

Advance - Rev. V1A

Features

- 27—31.5 GHz
- Low Noise Figure: 1.5 dB
- Gain: 24 dB
- Bias Voltage: $V_{DD} = +3.5\text{ V}$
- Bias Current: $I_{DSQ} = 90\text{ mA}$
- 50 Ω Matched Input and Output
- 3mm QFN Package
- RoHS* Compliant

Applications

- Communication Systems

Description

The MAAL-011240 is an easy to use low noise amplifier. It operates from 27 GHz to 31.5 GHz and provides 1.5 dB noise figure, 24 dB gain and a P1dB of +19 dBm.. The input and output are fully matched to 50 Ω with typical return loss >12 dB.

This product is fabricated using a GaAs pHEMT process which features full passivation for enhanced reliability.

The MAAL-011240 can be used as a low noise amplifier stage or as a driver stage in higher power applications. This device is ideally suited for Ka-band communication systems.

Functional Schematic



Pin Configuration

Pin #	Function	Description
1,3,6,7,9	GND	Ground
2	RF _{IN}	RF Input
4	VBIAS	Bias Voltage
5	VDD	Drain Supply
8	RF _{OUT}	RF Output
10,11,12	NC	Not Connected ³
Paddle	4	

3. These pins are not connected internally. MACOM recommends these are grounded on the application PCB.
4. The exposed pad centered on the package bottom must be connected to RF, DC and thermal ground.

Ordering Information^{1,2}

Part Number	Package
MAAL-011240-000PPR	Bulk
MAAL-011240-SMBPPR	Sample Board

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

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_{CC} = +3.5\text{ V}$, $Z_0 = 50\ \Omega$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Frequency		GHz	27		31.5
Small Signal Gain		dB	—	24	—
Small Signal Gain Variation over Temperature		dB/°C	—	0.06	—
Gain Flatness		dB	—	0.5	—
Noise Figure		dB	—	1.5	—
Input Return Loss		dB	—	12	—
Output Return Loss		dB	—	12	—
P1dB		dBm		19	
Output 3rd Order Intercept		dBm		29	
Supply Current		mA	—	90	—

Absolute Maximum Ratings^{5,6}

Parameter	Absolute Maximum
Pin	TBD dBm
V_{DD}	4.5 V
Junction Temperature ^{7,8}	+150°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.
6. MACOM does not recommend sustained operation near these survivability limits.
7. Operating at nominal conditions with $T_J \leq + \text{___}^\circ\text{C}$ will ensure $\text{MTTF} > 1 \times 10^6$ hours.
8. Junction Temperature (T_J) = $T_C + \Theta_{jc} * (V * I)$
Typical thermal resistance (Θ_{jc}) = $\text{___}^\circ\text{C/W}$.
 - a) For $T_C = +25^\circ\text{C}$,
 $T_J = \text{___}^\circ\text{C} @ \text{___ V}, \text{___ mA}$
 - b) For $T_C = +85^\circ\text{C}$,
 $T_J = \text{___}^\circ\text{C} @ \text{___ V}, \text{___ mA}$

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

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

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