

# Low Noise Amplifier

## PRODUCT DATASHEET

RFLNAM12\_EV1

### Features:

- RF Frequency: 8 - 12 GHz
- Small signal gain: 22.5 dB
- Noise Figure: 1.78 dB
- Output P1dB: 17.8 dBm
- Saturated Output Power: 20.8 dBm
- DC drain bias voltage: 4 V
- DC supply current: 90 mA.
- DC Gate Bias Voltage: -0.5 V
- 0.1um GaAs pHEMT Technology.
- Die Size: 1.15 mm \* 1.78 mm.

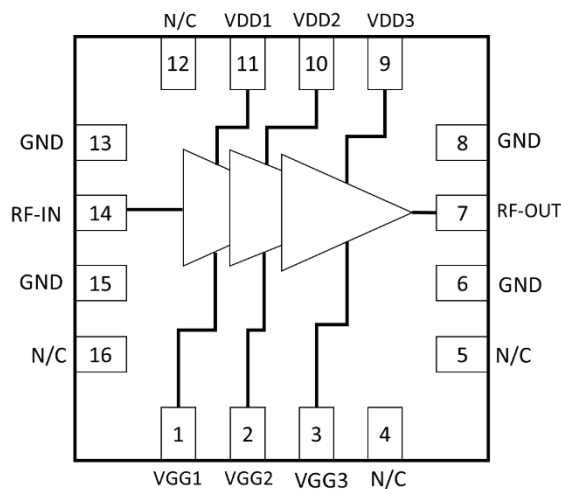
### Applications:

- Radar Systems
- SATCOM
- Electrical Warfare

### Deliverables:

- Sample Ready Die
- Test Results

### Functional Block Diagram:



### Pin Configuration:

| Pin No.   | Pin Name | Description          |
|-----------|----------|----------------------|
| 6,8,13,15 | GND      | Ground               |
| 11        | VDD1     | Drain Bias Voltage 1 |
| 10        | VDD2     | Drain Bias Voltage 2 |
| 9         | VDD3     | Drain Bias Voltage 3 |
| 1         | VGG1     | Gate Bias Voltage 1  |
| 2         | VGG2     | Gate Bias Voltage 2  |
| 3         | VGG3     | Gate Bias Voltage 3  |
| 14        | RF-IN    | RF Input             |
| 7         | RF-OUT   | RF Output            |
| 4,5,12,16 | N/C      | Not Connected        |

### Description:

RFLNAM12 is a three-stage Low Noise Amplifier operating from 8-12 GHz, intended for front-end signal amplification in RF receiver systems. The amplifier provides 21 dB of small-signal gain, with input and output matched to 50 ohms using on-chip DC blocking capacitors.

The device is specifically designed for use in Fixed Wireless Broadband, Microwave Links, WiFi, IoT, SATCOM, and Radar Systems Applications.

The Technology used to design the LNA is a 0.1 μm GaAs pHEMT Process.

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### Electrical Specification:

Freq= 8 - 12 GHz, VDD1=VDD2= VDD3=4V, VGG1=VGG2=VGG3= -0.5V, ID= 90 mA, Zo=50 Ω

| Parameters                                    | Test Condition | Units | Typ  |
|---|----------------|-------|------|
| Gain  | 8 GHz          | dB    | 21.5 |
|   | 10 GHz         |       | 22.5 |
|   | 12 GHz         |       | 24   |
| Output P1 dB                                  | 8 GHz          | dBm   |      |
|   | 10 GHz         |       | 17.8 |
|   | 12 GHz         |       |      |
| OIP3<br>Pin = -23 dBm<br>$\Delta f = 100$ kHz | 8 GHz          | dBm   |      |
|   | 10 GHz         |       | 27.2 |
|   | 12 GHz         |       |      |
| Noise Figure                                  | 8 GHz          | dB    |      |
|   | 10 GHz         |       | 1.78 |
|   | 12 GHz         |       |      |
| Input Return Loss                             | 8 GHz          | dB    |      |
|   | 10 GHz         |       | 13   |
|   | 12 GHz         |       |      |
| Output Return Loss                            | 8 GHz          | dB    |      |
|   | 10 GHz         |       | 6    |
|   | 12 GHz         |       |      |
| <b>Operating Bias Conditions</b>              |                |       |      |
| Drain Current (Id)                            | -              | mA    | 90   |
| Drain Voltage (VDD)                           | -              | V     | 4    |
| Gate Voltage (VGG)                            | -              | V     | -0.5 |

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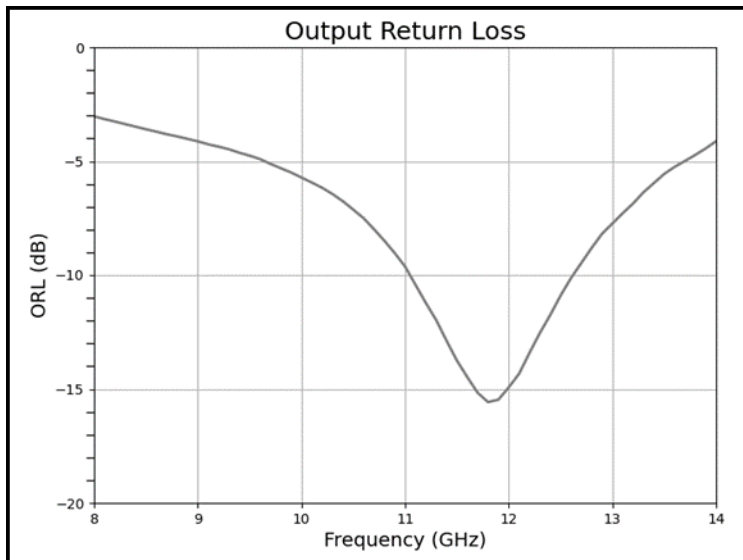
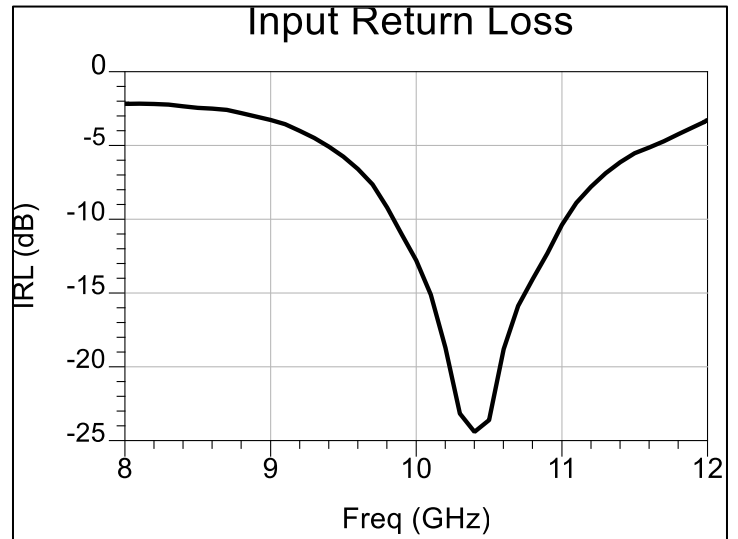
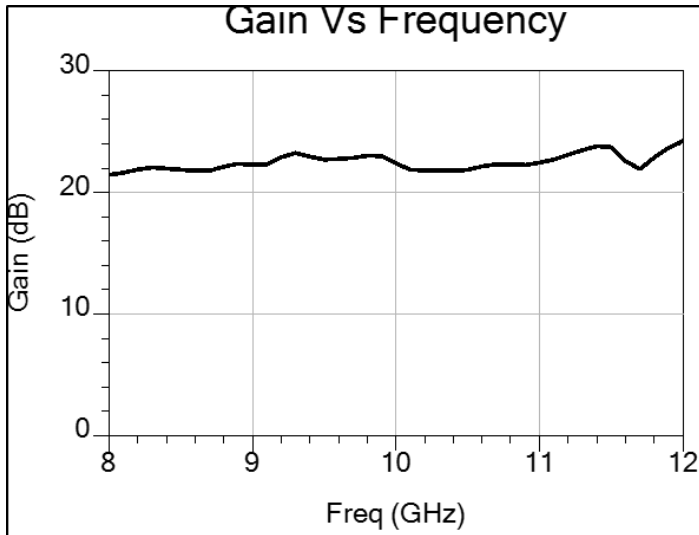
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### EVB Test Results:

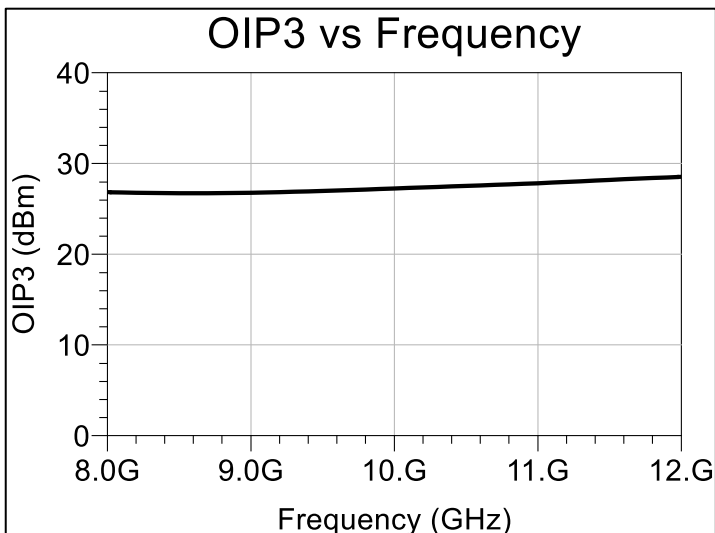
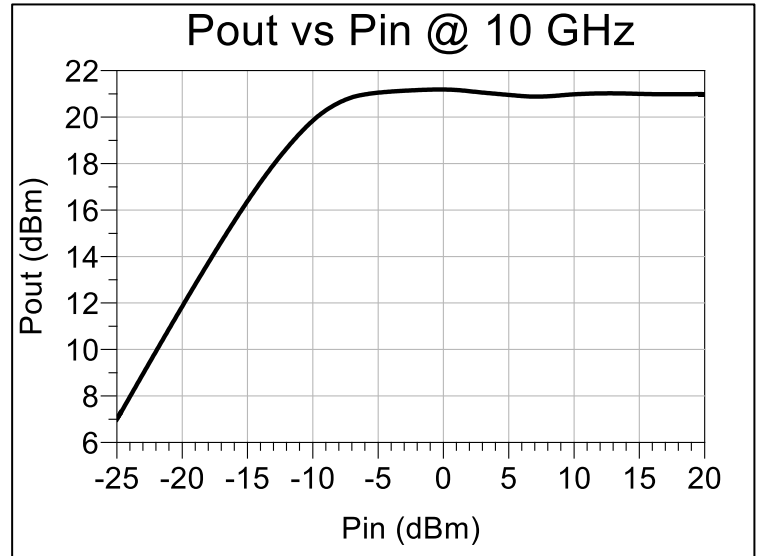
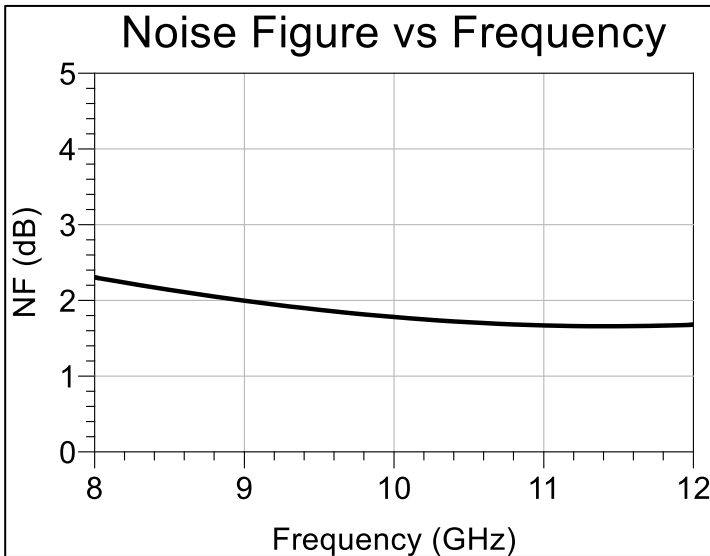


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### Typical Performance Curves:



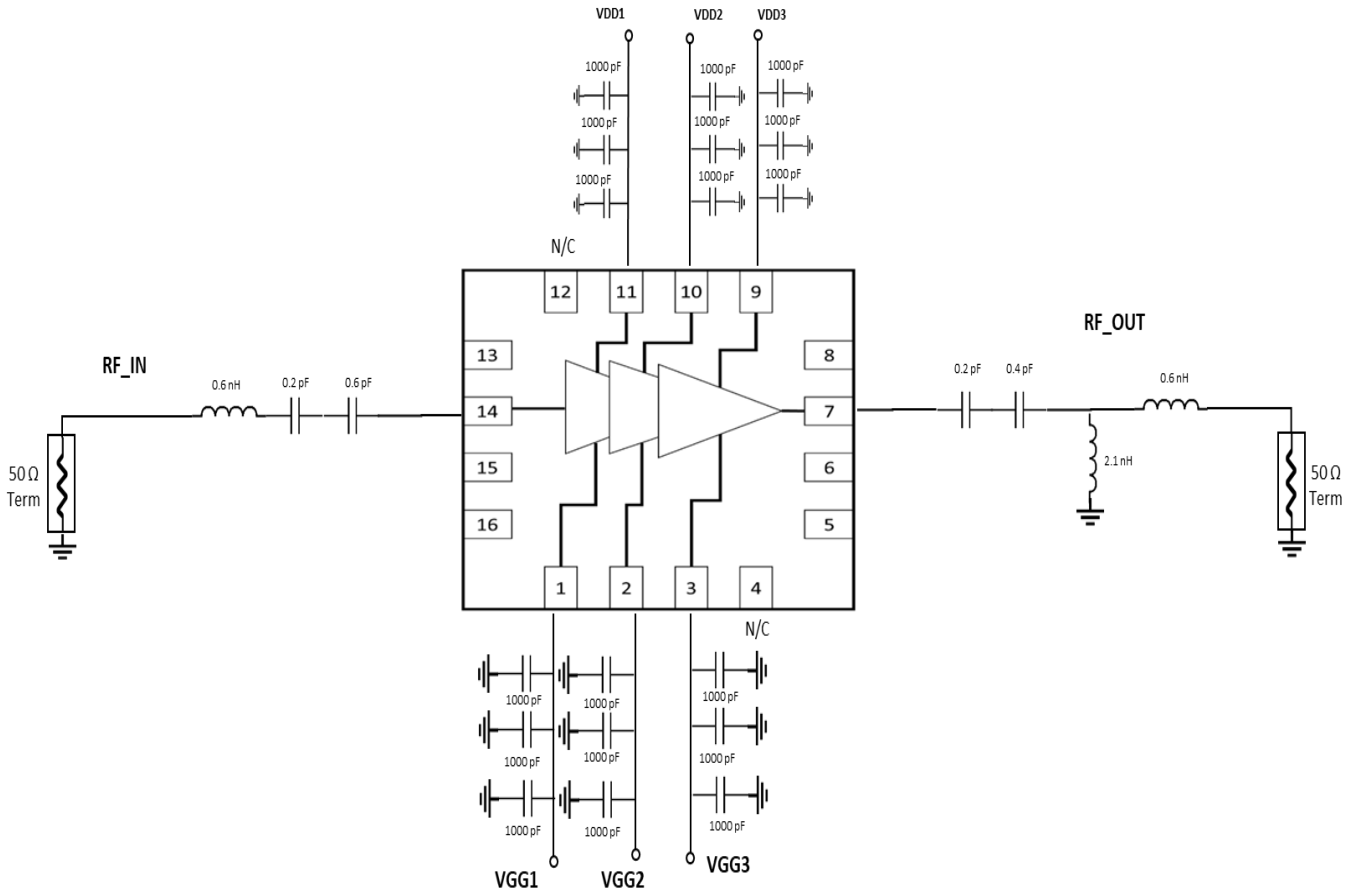
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### Application Diagram:



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