

## 1.4 dB NF Low Noise Amplifier, Operating from 10 MHz to 3 GHz with 34 dB Gain, 11 dBm P1dB and SMA



### FMAM1009

#### Features

- 10 MHz to 3 GHz Frequency Range
- P1dB: 11 dBm
- Flat Small Signal Gain: 34 dB
- Gain Flatness:  $\pm 0.75$  dB
- Gain Variance over OTR:  $\pm 1.25$  dB
- Noise Figure: 1.4 dB typ
- IP3: +25dBm
- Reverse Isolation: 50 dB
- 50 Ohms Input and Output Matched
- -40 to 85°C Operating Temperature
- Unconditionally Stable
- Regulated Supply & Bias Sequencing
- Overvoltage Protection

#### Applications

- Laboratory Applications
- R&D Labs
- Military Radio
- Radar Systems
- Telecom Infrastructure
- Test Instrumentation
- Military & Space
- Communication Systems
- Wireless Communication
- Microwave Radio Systems
- Cellular Base Stations
- Low Noise Amplifier
- General Purpose Amplification
- General Purpose Wireless
- Wideband Gain Block
- IF Amplifier/RF Driver Amplifier
- RF Wideband Front Ends
- RF Pre-amplification

#### Description

FMAM1009 is a wideband low noise RF coaxial power amplifier operating in the 10 MHz to 3 GHz frequency range. The amplifier offers 1.4 dB typical noise figure, 11 dBm of P1dB, 25 dBm of IP3 and 34 dB small signal gain with the excellent gain flatness of  $\pm 0.75$  dB max. This exceptional technical performance is achieved through the use of hybrid MIC design and advanced GaAs PHEMT devices. The low noise amplifier requires typically a +12V DC power supply. The connectorized SMA module is unconditionally stable and includes built-in voltage regulation, bias sequencing, and reverse bias protection for added reliability. The amplifier operates over the temperature range of -40°C and +85°C.

#### Electrical Specifications (TA = +25°C, DC Voltage = +12Vdc, DC Current = 95mA)

Description	Min	Typ	Max	Unit
Frequency Range	0.01		3000	MHz
Small Signal Gain	32.5	34	36.5	dB
Gain Flatness		0.75	1	dB
Gain Variance at OTR*		1.25		dB
Output at 1 dB Compression Point*	+10	+11		dBm
Output 3rd Intercept Point*	+23	+25		dBm
Noise Figure* (50 MHz to 3000 MHz)		1.4	1.75	dB
Input VSWR*		1.4:1	1.6:1	
Output VSWR*		1.4:1	1.6:1	
Reverse Isolation*	40	50		dB
Operating DC Voltage	+10	+12	+15	Volts
Operating DC Current	85	95	105	mA
Operating Temperature Range	-40		+85	°C

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### Absolute Maximum Rating

Parameter	Rating
DC Voltage	+15V
RF Input Power	+10dBm
Storage Temperature	-55~+125°C
Operating Temperature	-40~+85°C



ESD Sensitive Material,  
Transport material in  
Approved ESD bags. Handle  
only in approved

### Mechanical Specifications

<b>Size</b>	
Length	1.5 in [38.1 mm]
Width	0.85 in [21.59 mm]
Height	0.375 in [9.53 mm]
Weight	0.0605 lbs [27.44 g]
Input Connector	SMA Female
Output Connector	SMA Female

### Environmental Specifications

<b>Temperature</b>	
Operating Range	-40 to +85 deg C
Storage Range	-55 to +125 deg C

**Compliance Certifications** (see [product page](#) for current document)

### Plotted and Other Data

- Notes:
- Values at 25 °C, sea level
  - ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.

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#### Amplifier Power-up Precautions

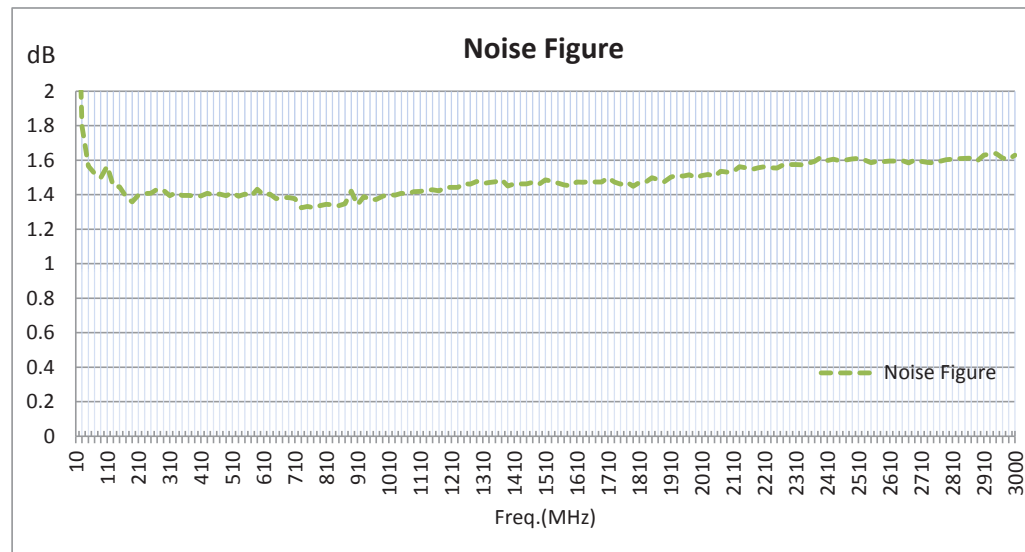
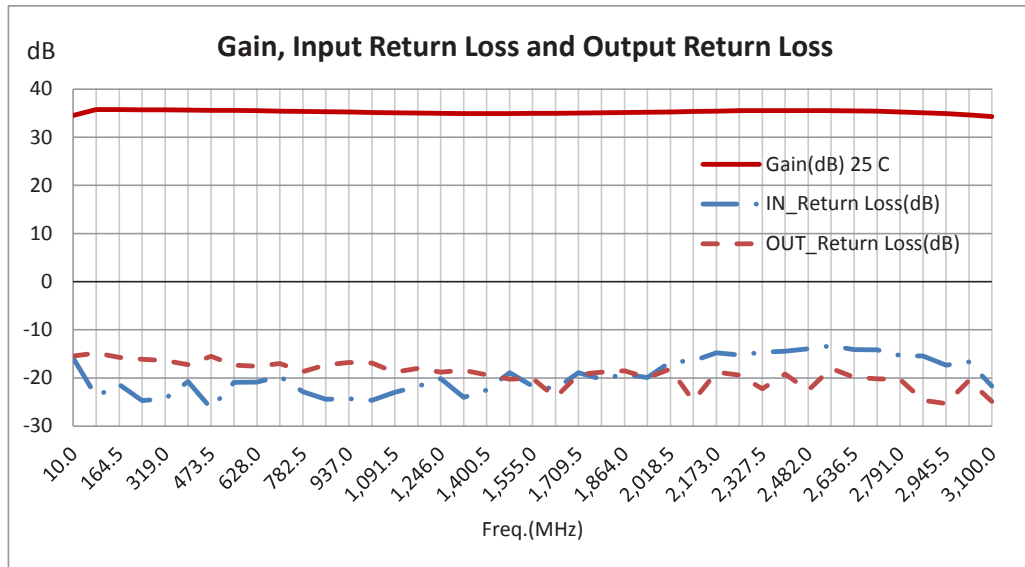
- 1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.
- 2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational temperature range stated in the Amplifier datasheet. Depending on the design and thermal requirements, using a heatsink with cooling fan is always recommended for safe reliable operation. A heat sink without a cooling fan may also be used. Damage caused from overheating will void the warranty.
- 3.) Confirm adequate system grounding is established. The DC power supply and Amplifier must have a common ground in order to operate properly.
- 4.) Power Amplifiers may require additional DC Current when initially powered-up. Depending on the design, the input current draw could range from an additional 10% to 100% above the maximum rated DC current of the Amplifier. This varies based on product part number.
- 5.) Confirm the DC power supply, if limited, is set to allow for additional start-up current that's rated for the Power Amplifier.
- 6.) Confirm the system is designed and calibrated for 50 ohms. Any impedance mismatch may cause performance issues.
- 7.) Perform a CALIBRATION (if required) with the loads before connecting the Amplifier to the Network Analyzer to ensure proper performance.
- 8.) Use a fixed attenuator between the signal source and input port of the Amplifier to optimize the input VSWR match.
- 9.) Confirm the input power level at the input port of the amplifier does not exceed the maximum rated limit for input power (as stated in the Amplifier datasheet).  
 $P_{in}$  for Small Signal Gain = P1dB-SSG-10 dB  
 $P_{in}$  for P1dB = P1dB-SSG+1 dB
- 10.) Confirm the Network Analyzer is always connected to the Amplifier first before DC power is applied to the Amplifier.
- 11.) As long as the input and output ports of the amplifier are connected to a 50Ohm load and RF signal power is applied, the Amplifier can be powered up with DC voltage.
- 12.) Confirm the Amplifier output load is matched for a 50 Ohm impedance and will not exceed the maximum rated VSWR or Return Loss limit for the Amplifier. Exceeding the maximum rated VSWR or Return Loss limit will result in reflected signal power that could damage the Amplifier and void the warranty.
- 13.) **Power Amplifier connected to an Antenna for signal transmission** - It's strongly recommended to use a high power fixed attenuator pad or an Isolator between the output port of the Amplifier and input port to the antenna. Any reflected signal power due to impedance mismatch will likely damage the Amplifier and void the warranty.
- 14.) The attenuator or isolator used at the output port of the Amplifier must be rated to handle the output power level and operational frequency band of the amplifier.

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### Typical Performance Data



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1.4 dB NF Low Noise Amplifier, Operating from 10 MHz to 3 GHz with 34 dB Gain, 11 dBm P1dB and SMA from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [1.4 dB NF Low Noise Amplifier, Operating from 10 MHz to 3 GHz with 34 dB Gain, 11 dBm P1dB and SMA FMAM1009](https://www.fairviewmicrowave.com/1.4db-nf-low-noise-amplifier-34db-fmam1009-p.aspx)

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FMAM1009 CAD Drawing

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