

### 3.5 dB NF Input Protected Low Noise Amplifier, Operating from 100 MHz to 18 GHz with 33 dB Gain, 25 dBm Psat and SMA

The FMAM63020 is an Input Protected broadband Low Noise amplifier operating across a 100 MHz to 18 GHz and is rated up to 1 Watt RF input power handling. The 50 ohm design uses a PIN Diode limiter circuit on the input stage and 2 GaAs pHEMT MMIC gain stages, along with series DC blocking capacitors on the input/output RF ports. Impressive typical performance includes 33 dB small signal gain, 3.0 dB noise figure, and an output P1dB up to +23 dBm. The amplifier requires a single +12 Vdc supply, and has internal voltage regulation. The rugged Mil Grade aluminum package supports SMA female connectors, DC feedthru pin, and has an operational temperature range of -40°C to +85°C.



**Electrical Specifications** (TA = +25°C , DC Voltage = +12Vdc , DC Current = 280mA)

Description	Min	Typ	Max	Unit
Frequency Range	0.1		18	GHz
Small Signal Gain	30	33	36	dB
Gain Flatness		±1.5	±2	dB
Gain Variance at OTR*		2		dB
Output at 1 dB Compression Point	+18	+21.5		dBm
Saturated Output Power (Psat)	+23	+25		dBm
Output 3rd Intercept Point	+24	+30		dBm
Noise Figure		3.5	5.5	dB
Input VSWR		1.5:1	2:1	
Output VSWR		1.8:1	2.5:1	
Reverse Isolation	40	50		dB
Spurious			-70	dBc
Input Power (CW)			+30	dBm
Operating DC Voltage	+10	+12	+15	Volts
Operating DC Current	240	280	350	mA
Operating Temperature Range	-40		+85	°C

\*OTR= Base Plate Operating Temperature Range

#### Absolute Maximum Rating

Parameter	Rating
DC Voltage	+18V
RF Input Power	+30dBm
Storage Temperature	-55~+125°C
Operating Temperature	-40~+85°C



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

#### Features:

- Input Protected Low Noise Amplifier
- Frequency Range 100 MHz to 18 GHz
- 1 Watt Input Power Handling
- PIN Diode Limiter and pHEMT Semiconductor Technology
- DC Blocking Capacitors on the Input/Output RF Ports
- Small Signal Gain 33 dB
- 3 dB Noise Figure
- Output P1dB +23.0 dBm
- Nominal DC Voltage +12Vdc
- DC Current 280 mA
- 50 Ohm design
- -40°C to +85°C Operating Temperature
- SMA Female Connectors
- Rugged Mil Grade Aluminum Package Design

#### Applications:

- Military & Commercial Communication Systems
- Microwave Radio Systems
- Radar Systems
- Test & Measurement
- Research & Development
- RF Wideband Front Ends

Fairview Microwave  
301 Leora Ln., Suite 100  
Lewisville, TX 75056  
Tel: 1-800-715-4396 / (972) 649-6678  
Fax: (972) 649-6689  
[www.fairviewmicrowave.com](http://www.fairviewmicrowave.com)  
[sales@fairviewmicrowave.com](mailto:sales@fairviewmicrowave.com)

**Mechanical Specifications**

**Size**

Length	1.5 in [38.1 mm]
Width	1 in [25.4 mm]
Height	0.4 in [10.16 mm]
Input Connector	SMA Female
Output Connector	SMA Female

**Environmental Specifications**

**Temperature**

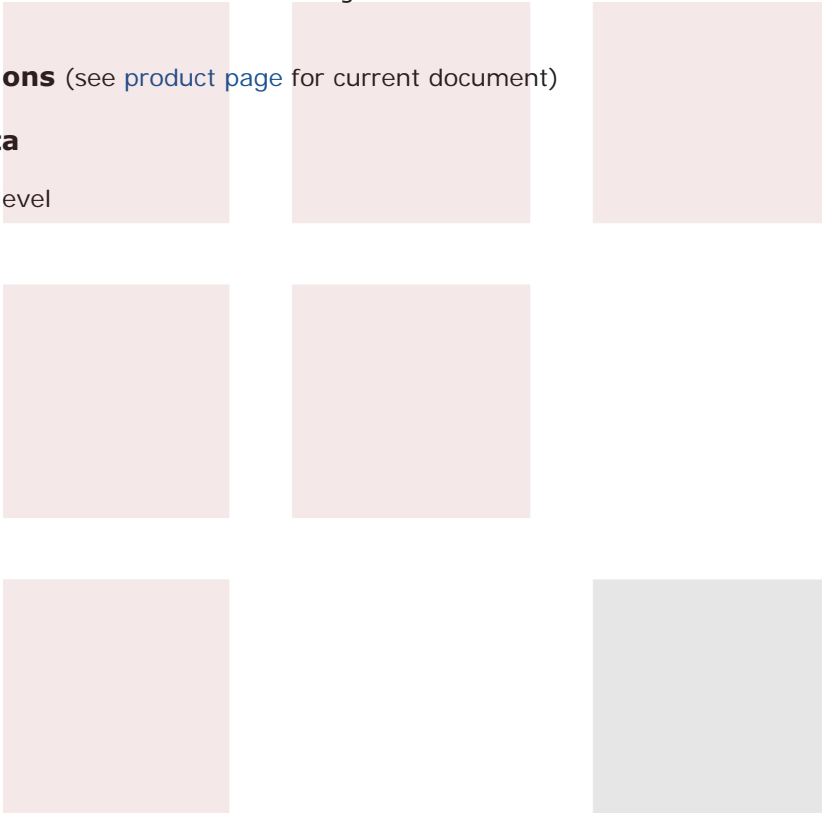
Operating Range	-40 to +85 deg C
Storage Range	-55 to +125 deg C

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

**Plotted and Other Data**

Notes:

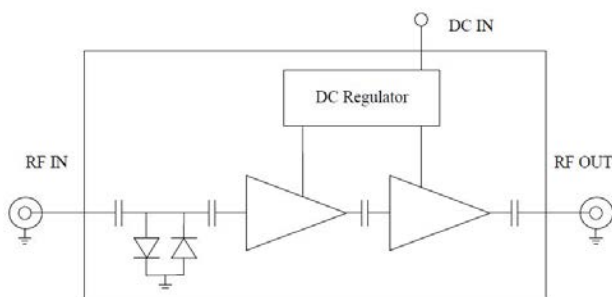
- Values at 25 °C, sea level



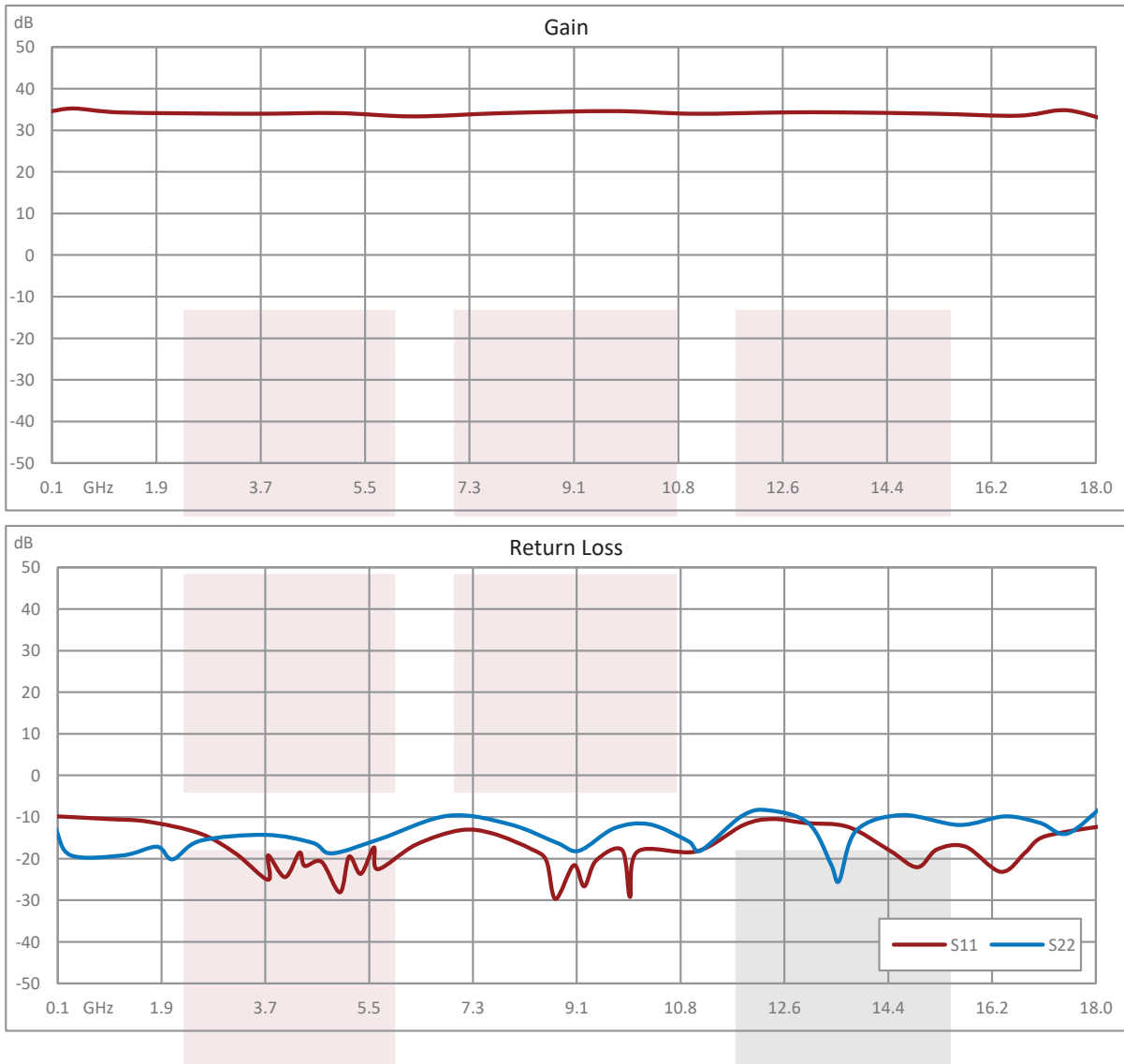
### Amplifier Power-up Precautions

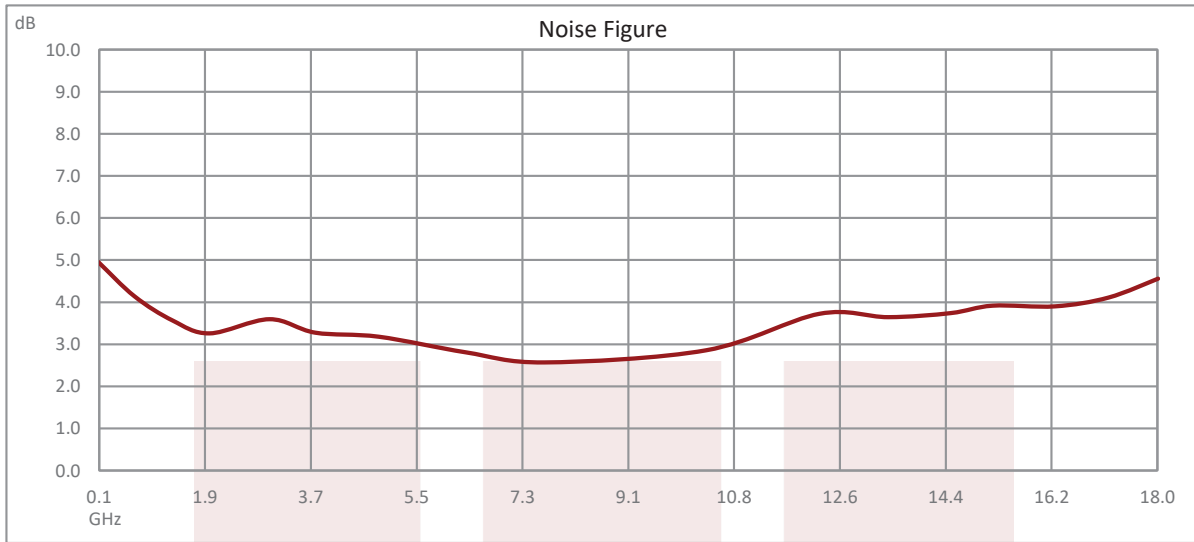
- 1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.
- 2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational 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.

### Functional Block Diagram



**Typical Performance Data**





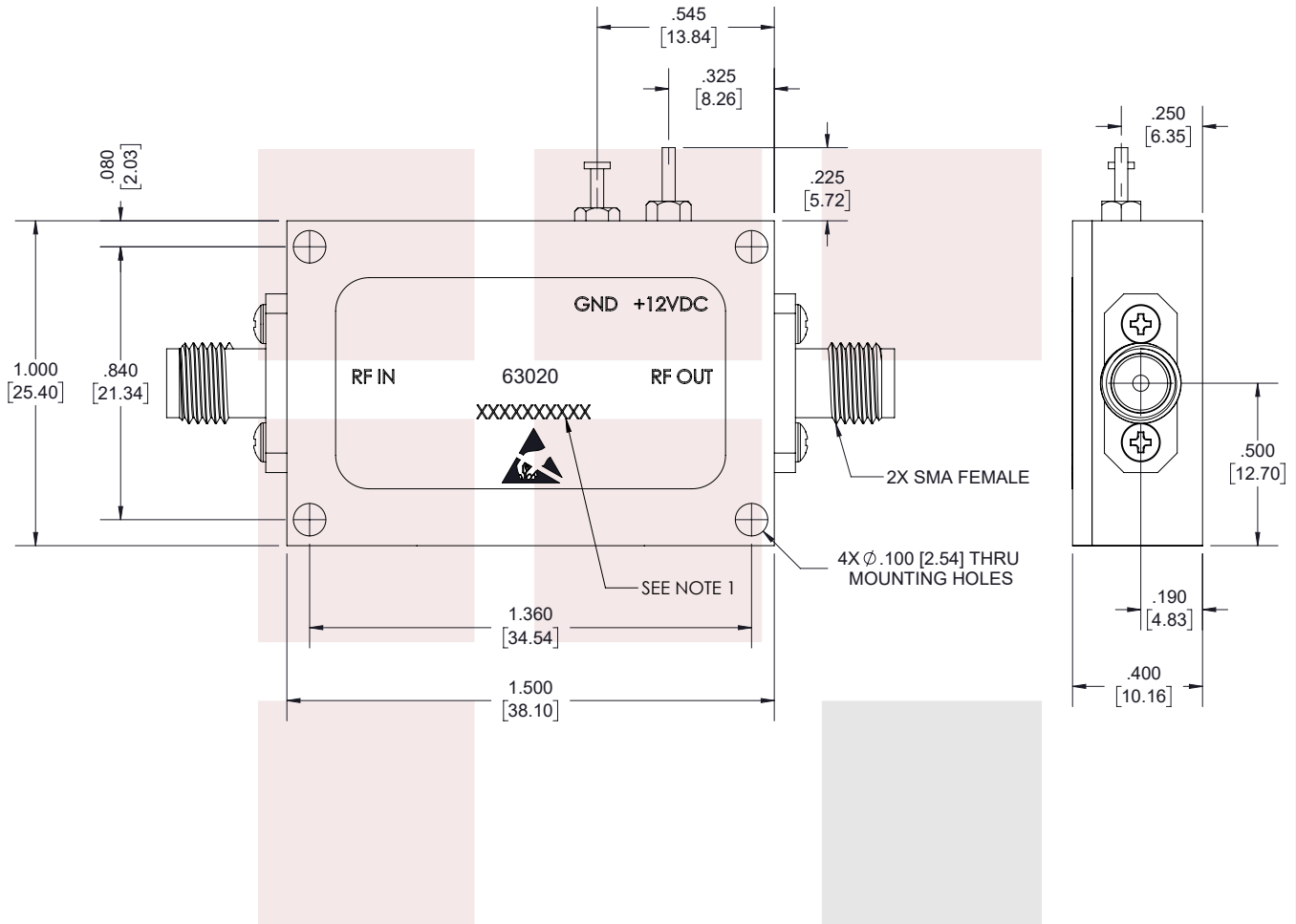
3.5 dB NF Input Protected Low Noise Amplifier, Operating from 100 MHz to 18 GHz with 33 dB Gain, 25 dBm Psat and SMA from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [3.5 dB NF Input Protected Low Noise Amplifier, Operating from 100 MHz to 18 GHz with 33 dB Gain, 25 dBm Psat and SMA FMAM63020](https://www.fairviewmicrowave.com/3.5db-nf-low-noise-amplifier-33db-fmam63020-p.aspx)

URL: <https://www.fairviewmicrowave.com/3.5db-nf-low-noise-amplifier-33db-fmam63020-p.aspx>

The information contained in this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part, in order to implement improvements. Fairview Microwave reserves the right to make such changes as required. Unless otherwise stated, all specifications are nominal. Fairview Microwave does not make any representation or warranty regarding the suitability of the part described herein for any particular purpose, and Fairview Microwave does not assume any liability arising out of the use of any part or documentation.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	07/12/2021	TGALLA



**NOTES:**

- 1. SERIAL NUMBER AND DATE CODE ARE COMBINED. EX: 202008280001.

THESE COMMODITIES, TECHNOLOGY OR SOFTWARE WERE EXPORTED FROM THE UNITED STATES IN ACCORDANCE WITH THE EXPORT ADMINISTRATION REGULATIONS. DIVERSION CONTRARY TO U.S. LAW PROHIBITED.

<p><b>Fairview Microwave</b> an INFINIT<sup>®</sup> brand</p>	<p>UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES DIMENSIONS IN [ ] ARE MILLIMETERS</p> <p>TOLERANCES:</p> <table> <tr> <td>.X = ±.2 [5.08]</td> <td>FRACTIONS</td> <td>L ≤ 12 [305] = +1 [25] / -0</td> </tr> <tr> <td>.XX = ±.02 [.51]</td> <td>± 1/32</td> <td>12 [305] &lt; L ≤ 60 [1524] = +2 [51] / -0</td> </tr> <tr> <td>.XXX = ±.005 [.13]</td> <td>ANGLES ± 1°</td> <td>60 [1524] &lt; L ≤ 120 [3048] = +4 [102] / -0</td> </tr> <tr> <td></td> <td></td> <td>120 [3048] &lt; L ≤ 300 [7620] = +6 [152] / -0</td> </tr> <tr> <td></td> <td></td> <td>300 [7620] &lt; L = +5%L / -0</td> </tr> </table>		.X = ±.2 [5.08]	FRACTIONS	L ≤ 12 [305] = +1 [25] / -0	.XX = ±.02 [.51]	± 1/32	12 [305] < L ≤ 60 [1524] = +2 [51] / -0	.XXX = ±.005 [.13]	ANGLES ± 1°	60 [1524] < L ≤ 120 [3048] = +4 [102] / -0			120 [3048] < L ≤ 300 [7620] = +6 [152] / -0			300 [7620] < L = +5%L / -0	<p>THIRD-ANGLE PROJECTION</p> <p>THE INFORMATION AND DESIGN IN THIS DOCUMENT IS THE PROPERTY OF FAIRVIEW MICROWAVE CORPORATION. ALL RIGHTS RESERVED.</p> <p>SHEET 1 OF 1</p>
	.X = ±.2 [5.08]	FRACTIONS	L ≤ 12 [305] = +1 [25] / -0															
.XX = ±.02 [.51]	± 1/32	12 [305] < L ≤ 60 [1524] = +2 [51] / -0																
.XXX = ±.005 [.13]	ANGLES ± 1°	60 [1524] < L ≤ 120 [3048] = +4 [102] / -0																
		120 [3048] < L ≤ 300 [7620] = +6 [152] / -0																
		300 [7620] < L = +5%L / -0																
<p>TITLE</p> <p><b>3.5 dB NF Input Protected Low Noise Amplifier, Operating from 100 MHz to 18 GHz with 33 dB Gain, 25 dBm Psat and SMA</b></p>	<p>ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.</p> <p>SCALE N/A</p>		<p>REV A</p>															
<p>SIZE A</p>	<p>CAGE CODE 3FKR5</p>	<p>DRAWN BY MVEERAPPAN</p>	<p>ITEM NO. FMAM63020</p>															

T-Rev.D