

Description

The RF3 Series C-Band LNA offers premium performance and reliability in a small package. The latest technology in GaAs HEMT devices produces the lowest possible noise temperatures in an un-cooled LNA. In addition, the RF3 Series LNA is backed by a 36-month warranty and by more than 30 years experience in the design of high performance communications amplifiers.

The performance of the RF3 Series LNA is matched by a full range of features chosen with the communication system designer in mind. From the compact weatherproof housing to the standard combination of RF cable and circular connector DC input, the RF3 Series LNA is ready for integration into your system.

FEATURES

- Noise Temperatures as low as 30K
- All C-Band Frequencies available
- 36-Month Warranty
- Compact Design - No Add-On Modules for AC Power or Fault Alarm Options
- Input and Output Isolators
- +12 to +28 VDC Operation
- Cable Power Standard (+12 to +28 VDC operation; +15 to +28 VDC with F1 option) in Addition to the DC Connector
- Waterproof, Painted Aluminum Housing
- Voltage Surge Protection
- Reverse Voltage Protection
- Pressurizable Feed

OPTIONS

- Universal AC Power Supply
- Fault Alarm (Current Sensing)

CONFIGURATIONS

- 1:1 Redundant LNA System
- 1:2 Redundant LNA System

Electrical

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	Frequency Selection "XX" Frequency Selection "B1" Frequency Selection "B2" Frequency Selection "B3" Frequency Selection "B4" Frequency Selection "B5"	3.700 to 4.200 3.400 to 4.200 3.600 to 4.200 3.625 to 4.200 4.500 to 4.800 3.350 to 4.200	GHz GHz GHz GHz GHz GHz
Noise Temperature	(See configuration matrix)	30 to 45	K @ +23 °C ambient
Gain Gain Flatness Gain Slope Gain Stability vs. Time	50, 60, 65, & 70 dB available Full band Per 40MHz	60 (min.) ± 0.50 (max.) ± 0.20 (max.) ± 0.10 (max.) ± 0.20 (max.) ± 0.20 (max.)	dB dB dB/40 MHz dB/hour dB/24 hours dB/month
Output Power @ 1dB Gain Compression (P _{1dB})	+ 20 dBm optional (see configuration matrix)	+12 (min.)	dBm
Output Third Order Intercept Point	Measured with two tone input; each tone @ -65 dBm input	+22 (min.)	dBm
Input/Output VSWR		1.25:1 (max.)	
Input Overdrive	(Maximum level)	0	dBm CW
Out-of-Band Signal Presence	Specification-compliant	-10	dBm CW input; in 5.850 to 6.425 GHz band
Group Delay Linear Parabolic Ripple	Per 40 MHz	0.01 (max.) 0.001 (max.) 0.1 (max.)	ns/MHz ns/MHz ² ns peak-to-peak
AM/PM Conversion	@ -10 dBm output power	0.03 (max.)	°/dB
Primary Power Voltage Current, typical	(See configuration matrix for options) (+15 VDC for fault option) (200 mA for +20 dBm power option)	+12 to +28 120	VDC mA

Mechanical

Size	width X length X height	4.00 X 6.11 X 2.75 102 X 155 X 70	in. mm.
Weight		3	lbs.
Finish		Paint	White; epoxy enamel
Feed Pressure		2	PSI
Connectors	RF Input RF Output (standard) RF Output (option) DC Voltage AC/Fault (option)	WR229 Waveguide ¹ Type N ² SMA 3-pin MS ² 3-pin MS mate 6-pin MS ² 6-pin MS mate	CPR229G flange Female Female MS3112E8-3P MS3116F8-3S MS3112E10-6P MS3116F10-6S

1 Use supplied full (for mating with a grooved flange) or half (for mating with a flat flange) gasket to ensure a weatherproof seal.

2 Cover connectors with electrical putty or tape to ensure a weatherproof seal.

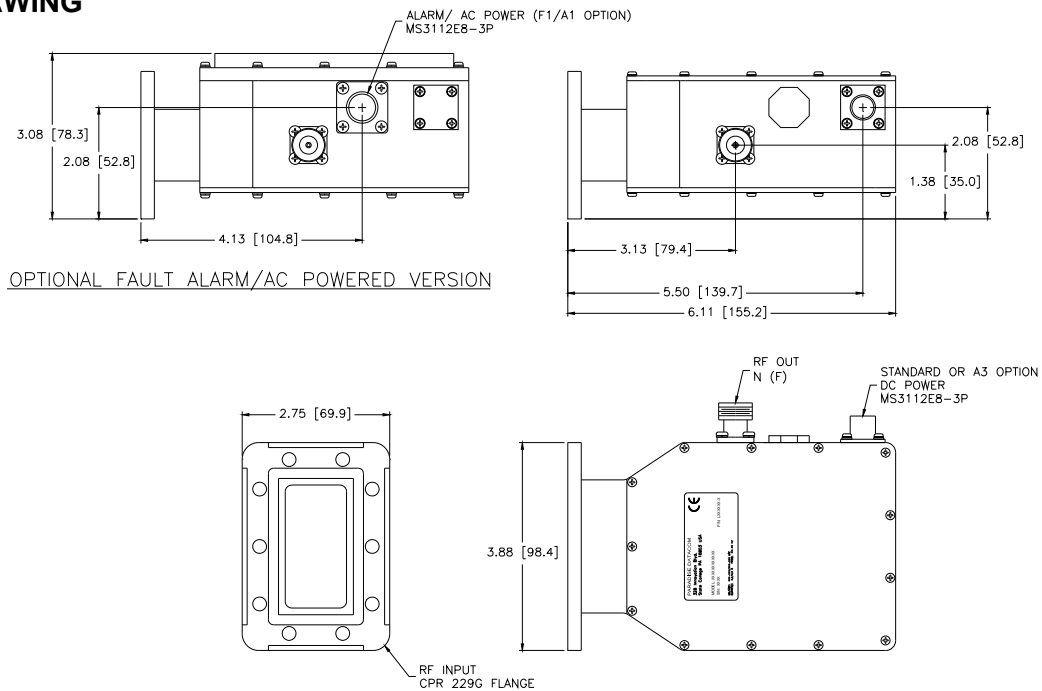
Environmental

Operating Temperature	Ambient	-40 to +60	°C
Storage Temperature	Ambient	-40 to +70	°C
Relative Humidity	Condensing	100	%

TECHNICAL NOTES

Gain vs. Ambient Temperature Coefficient	-0.04 dB/°C for Units with 50 dB Gain -0.05 dB/°C for Units with 60 - 75 dB Gain										
Noise Temperature vs. Ambient Temperature	De-rate noise temperature by 0.33K/°C for ambient temps over +23 °C										
Noise Temperature to Noise Figure Conversion	$10 \times \log \left(\frac{T_{noise}(K)}{T_{ref}(K)} + 1 \right) \text{ where } T_{ref}(K) = 290(K)$ <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Noise Temp. (K)</th> <th>Noise Figure (dB)</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>0.43</td> </tr> <tr> <td>35</td> <td>0.49</td> </tr> <tr> <td>40</td> <td>0.56</td> </tr> <tr> <td>45</td> <td>0.63</td> </tr> </tbody> </table>	Noise Temp. (K)	Noise Figure (dB)	30	0.43	35	0.49	40	0.56	45	0.63
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OUTLINE DRAWING



PRIME POWER / ALARM INTERFACE

PIN	STANDARD (3-PIN)	DC POWER (A3 ONLY OPTION)	ALARM (F1 ONLY OPTION)	AC POWER (A1 ONLY OPTION)	ALARM/ AC POWER	ALARM/ DC POWER (F1 & A3 OPTIONS)
A	+12 to +28 VDC	-18 to -64 VDC	+15 to +28 VDC	85 to 265 VAC LINE	85 to 265 VAC LINE	-18 to -64 VDC
B	GROUND	-18 to -64 VDC RTN.	GROUND	AC GROUND	AC GROUND	-18 to -64 VDC RTN
C	GROUND	GROUND	GROUND	85 to 265 VAC RTN.	85 to 265 VAC RTN.	GROUND
D	--	--	OPEN ON FAULT	NC	OPEN ON FAULT	OPEN ON FAULT
E	--	--	COMMON	NC	COMMON	COMMON
F	--	--	CLOSED ON	NC	CLOSED ON FAULT	CLOSED ON FAULT

C-Band LNA Part Number Configuration Matrix

R	F	3	3	0	7	0	B	2	X	X	X	X	X	X
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Noise Temperature (K)
 (dependent on freq. band)

Freq. Band	Noise Temp.
XX	30,35,40
B1	30,35,40
B2	30,35,40
B3	30,35,40
B4	40,45
B5	30,35,40

Gain (dB)

50	65	SP=Custom
60	70	

Frequency Band (GHz)

XX	3.7 - 4.2
B1	3.4 - 4.2
B2	3.6 - 4.2
B3	3.625 - 4.2
B4	4.5 - 4.8
B5	3.35 - 4.2

Special Notes

XX - Standard
 P3 - +20 dBm P_{1dB} / +30 dBm OIP3
 CR¹ - Cable Power w/ Internal Bias Tee
 (w/o MS Connector power entry)
 with Type N (f) RF Output

¹ Not available with A1 or A3 Input Voltage options

Fault Alarm

XX - None
 F1 - Contact Closure (Dry form "C")
 (Requires +15 to +28 VDC)

Input Voltage

XX - +12 to +28 VDC* (Cable Power or Cir. Mil.)
 A1 - 85-265 VAC, 47-440 Hz (Cir. Mil. Only)
 A3 - -18 to -64 VDC (Cir. Mil. Only)

* +15 to +28 VDC with option F1

Example: The example in the part number configuration matrix above shows a C-Band LNA operating at 3.6 to 4.2 GHz with a noise temperature of 30 K and 70 dB of gain. Thus, it is part number **RF33070B2XXXXXX**.

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