



Description

The RF7 Series X-Band Low Noise Amplifier (LNA) offers premium performance and reliability in the most versatile package available for a X-Band LNA.

The latest technology in GaAs HEMT devices produces the lowest possible noise temperatures in an uncooled LNA. In addition, the RF7 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 RF7 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 RF7 Series LNA is ready for integration into your system.

FEATURES

- Noise Temperatures as low as 45K
- Embedded inter-stage transmit reject filter
- 36-Month Warranty
- Input and Output Isolators
- +12 to +28 VDC Operation
- Cable Power Standard 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)

SPECIFICATIONS

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

Electrical

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range		7.250 to 7.750	GHz
Noise Temperature	(See configuration matrix)	45 to 70	K @ +23 °C ambient
Gain	50 dB optional (See configuration matrix)	60 (min.)	dB
Gain Flatness	Full band	±0.50 (max.)	dB
Gain Slope	Per 40MHz	±0.20 (max.)	dB/40 MHz
Gain Stability vs. Time		±0.10 (max.)	dB/hour
		±0.20 (max.)	dB/24 hours
		±0.20 (max.)	dB/month
Output Power @ 1dB Gain Compression (P _{1dB})		+10 (min.)	dBm
Output Third Order Intercept Point	Measured with two tone input; each tone @ -65 dBm input	+20 (min.)	dBm
Input/Output VSWR		1.25:1 (max.)	
Input Overdrive	(Maximum level)	0	dBm CW
Out-of-Band Susceptibility	Amplifier will tolerate while remaining specification-compliant	-30 (max.)	dBm CW input; in 7.9 to 8.4 GHz band
Group Delay	Per 40 MHz		
Linear		0.05 (max.)	ns/MHz
Parabolic		0.005 (max.)	ns/MHz ²
Ripple		1.0 (max.)	ns peak-to-peak
AM/PM Conversion	@ -10 dBm output power	0.05 (max.)	°/dB
Primary Power	(See configuration matrix for available options)		
Voltage	(+ 15 VDC for fault option)	+12 to +28	VDC
Current, typical		185	mA
Optional AC Power Supply	Contact factory for mechanical outline drawing	100 - 240 47 - 440	VAC Hz

Mechanical

Size	width X length X height	3.38 X 10.70 X 1.93 86 X 272 X 49	in. mm.
Weight		3	lbs.
Finish		Paint	White; epoxy enamel
Feed Pressure		2	PSI
Connectors	RF Input RF Output (standard) RF Output (option) DC/Fault (option)	WR112 Waveguide ¹ SMA Type N ² 6-pin MS ² 6-pin MS mate	CPR112G flange Female Female 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.

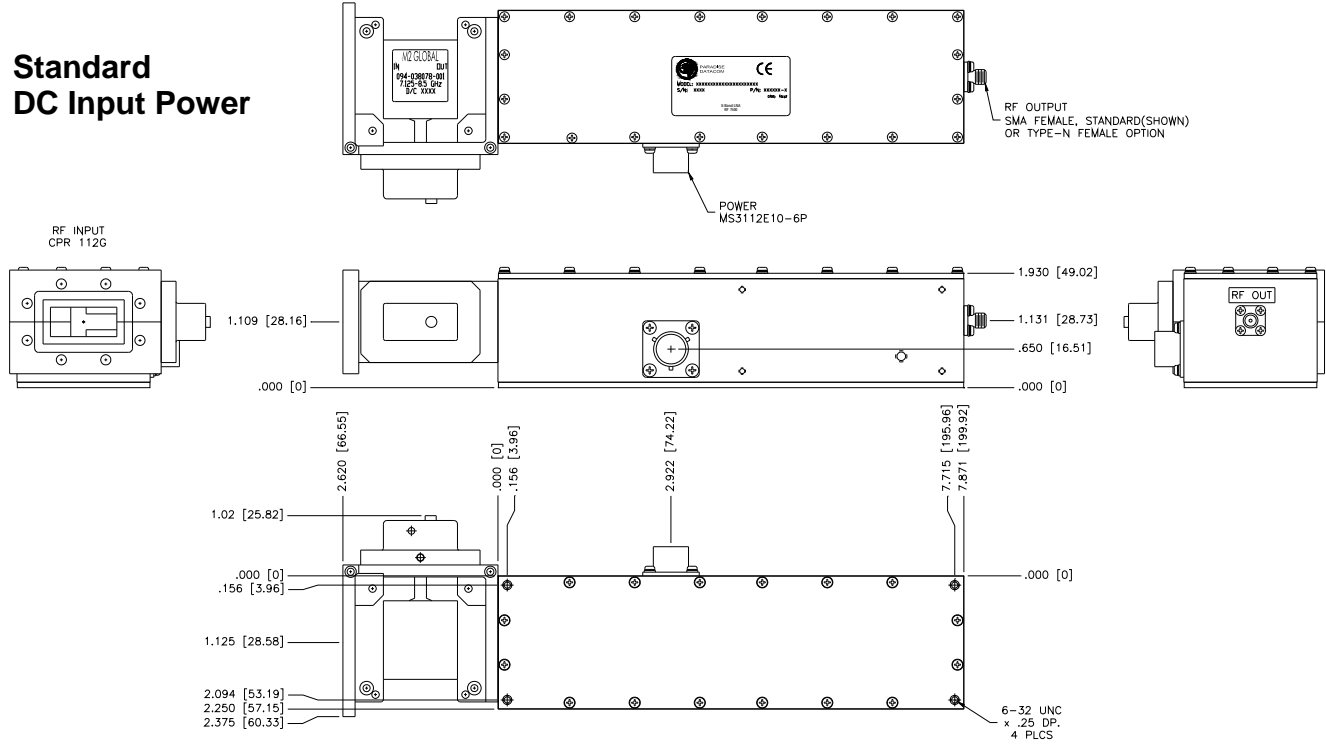
2 Cover connectors with electrical putty or tape to ensure a weatherproof seal.

Environmental

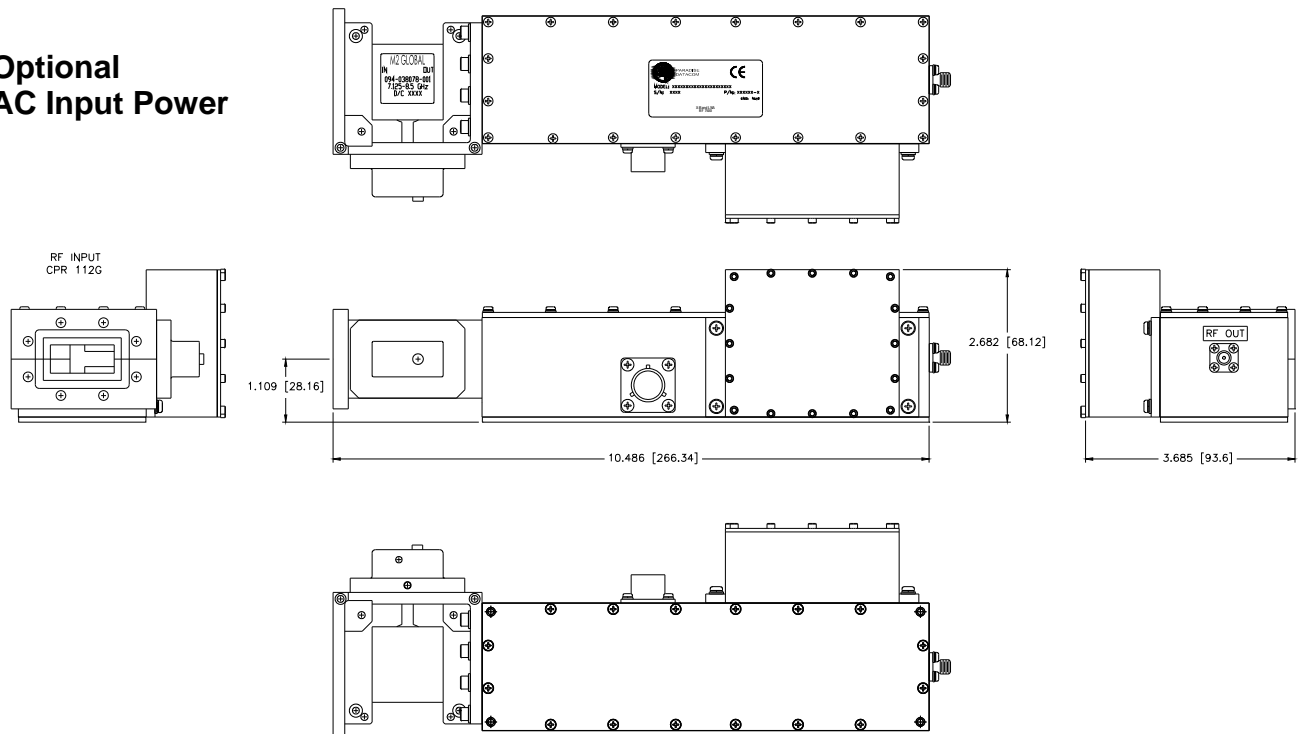
Operating Temperature	Ambient	-40 to +60	°C
Storage Temperature	Ambient	-40 to +70	°C
Relative Humidity	Condensing	100	%

OUTLINE DRAWINGS

**Standard
 DC Input Power**



**Optional
 AC Input Power**



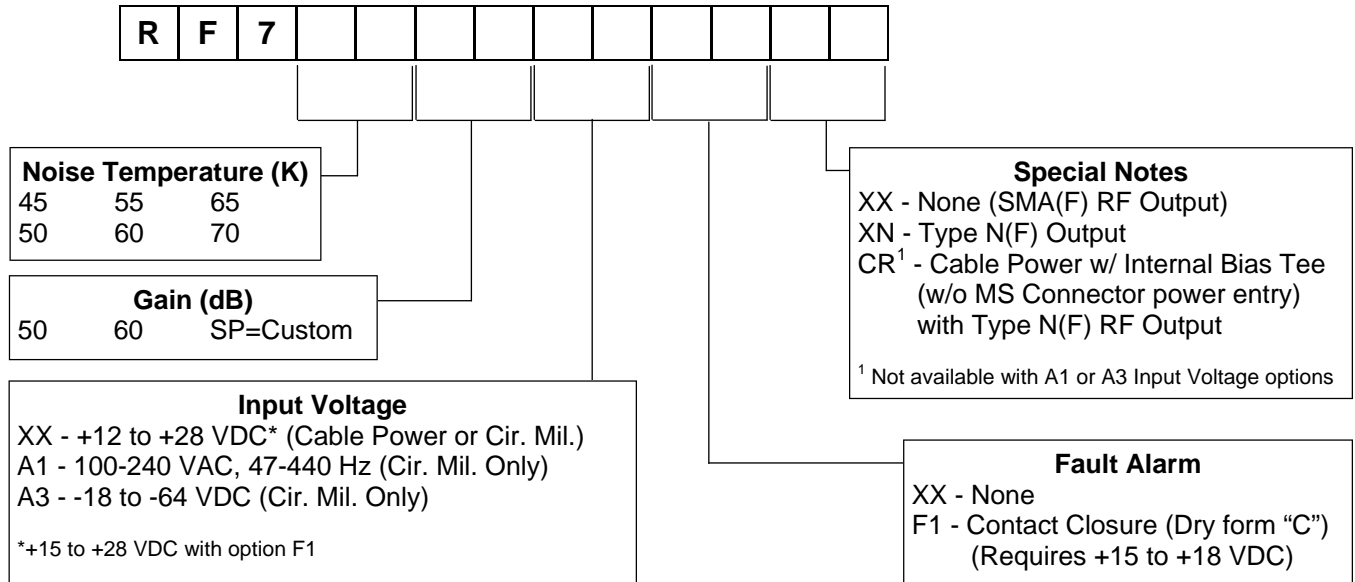
PRIME POWER / ALARM INTERFACE

PIN	STANDARD	-48VDC POWER Option A3	ALARM Option F1	AC POWER Option A1	ALARM / AC POWER Option A1F1
A	+12 to +28 VDC	-18 to -64 VDC	+15 to +28 VDC	100 to 240 VAC LINE	100 to 240 VAC LINE
B	GROUND	-18 to -64 VDC RTN	GROUND	AC GROUND	AC GROUND
C	GROUND	GROUND	GROUND	100 to 240 VAC RTN.	100 to 240 VAC RTN.
D	NC	NC	OPEN ON FAULT	NC	OPEN ON FAULT
E	NC	NC	COMMON	NC	COMMON
F	NC	NC	CLOSED ON FAULT	NC	CLOSED ON FAULT

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 temperatures 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" data-bbox="875 989 1317 1262"> <thead> <tr> <th>Noise Temp. (K)</th> <th>Noise Figure (dB)</th> </tr> </thead> <tbody> <tr> <td>45</td> <td>0.63</td> </tr> <tr> <td>50</td> <td>0.69</td> </tr> <tr> <td>55</td> <td>0.75</td> </tr> <tr> <td>60</td> <td>0.82</td> </tr> <tr> <td>65</td> <td>0.88</td> </tr> <tr> <td>70</td> <td>0.94</td> </tr> </tbody> </table>	Noise Temp. (K)	Noise Figure (dB)	45	0.63	50	0.69	55	0.75	60	0.82	65	0.88	70	0.94
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X-Band LNA Configuration Matrix



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