

# X-Band Low Noise Amplifiers

## LXA-7500 Series

### Introduction

LXA-7500 series X-Band Low Noise Amplifiers are specially designed for satellite earth station receiver front ends and other telecommunications applications. Utilizing state-of-the-art HEMT and GaAs FET technology, these amplifiers have been designed for both fixed and transportable applications. High performance models are available in several gains, with noise temperatures as low as 45 K. Noise temperature specifications are guaranteed over the full bandwidth of the LNA.

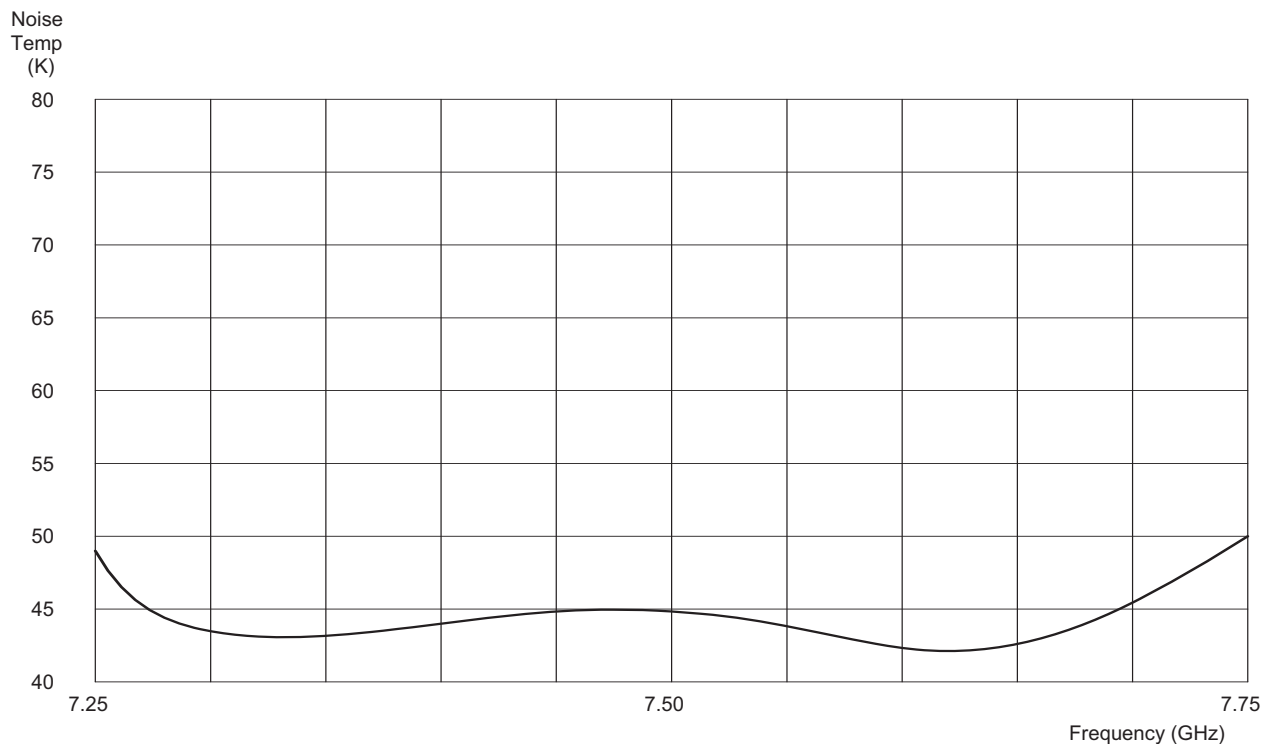
### Features

- State-of-the-art noise performance
- HEMT/GaAs FET design
- Weatherproof enclosure
- Internal low-loss input isolator
- Internal regulator
- Reverse polarity protection
- Surge and transient protection
- High reliability
- Form 'C' alarm

### Options

- Low gain, 50 dB
- High output power, +20 dBm
- Interstage transmit reject filter

### Typical Performance, Model LXA7550



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Parameter	Notes	Min.	Nom./Typ. <sup>†</sup>	Max.	Units
Frequency Range		7.25		7.75	GHz
Gain	Standard	60	64		dB
	Option 1	50	54		dB
Gain Flatness	Full band Per 40 MHz			±0.5	dB
				±0.2	dB
VSWR	Input		1.20	1.25	:1
	Output		1.30	1.50	:1
Noise Temperature <sup>A</sup>	At +23 °C Versus temperature		See Table 1 See Table 2		
Power Output at 1 dB compression	Standard	+15	+17		dBm
	Option 2	+20	+21		dBm
3rd Order Output intercept Point	Standard	+25	+27		dBm
	Option 2	+30	+31		dBm
Group Delay per 40 MHz	Linear (Standard)			0.01	ns/MHz
	Parabolic (Standard)			0.001	ns/MHz <sup>2</sup>
	Ripple (Standard)			0.1	ns p-p
	Linear (Option 7)			0.05	ns/MHz
	Parabolic (Option 7)			0.005	ns/MHz <sup>2</sup>
	Ripple (Option 7)			1.0	ns p-p
AM/PM Conversion	-5 dBm output power			0.05	°/dB
Gain Stability (Constant Temp)	Short term (10 min)			±0.1	dB
	Medium term (24 hrs)			±0.2	dB
	Long term (1 week)			±0.5	dB
Gain Stability versus temperature	Standard		-0.05		dB per °C
	Option 1		-0.04		dB per °C
Maximum Input Power	Damage threshold			0	dBm
	Desens. threshold, Std.			-50	dBm
	Desens. threshold, Opt. 7 <sup>B</sup>			-30	dBm
Connectors	Input		CPR112G Flange		
	Output		Type N Female		
	Power, Standard <sup>C</sup>		MS3112E10-6P (mate supplied)		
Power Requirements	Voltage	11	15	24	V
	Current, Standard		240	270	mA
	Current, Option 2		300	330	mA
Operating Temperature		-40		+60	°C

<sup>†</sup> When there is only one value on a line, the Nom./Typ. column is a nominal value; otherwise it is a typical value. Typical values are intended to illustrate typical performance, but are not guaranteed.

<sup>A</sup> Maximum noise temperature at +23 °C at any frequency in the specified band.

<sup>B</sup> Desens. threshold for 7.90-8.40 GHz frequency range.

<sup>C</sup> power may be supplied either via the RF output connector (cable powered) or via the MS connector.

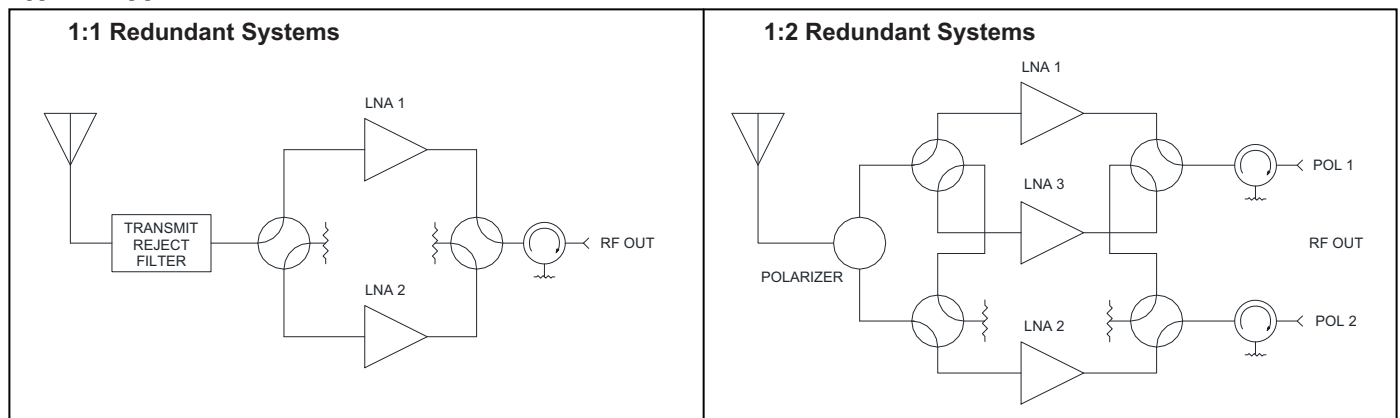
**Table 1 – Part Number/Ordering Information**

<b>LXA-75</b> <span style="border: 1px solid black; display: inline-block; width: 15px; height: 15px; vertical-align: middle;"></span> <span style="border: 1px solid black; display: inline-block; width: 15px; height: 15px; vertical-align: middle;"></span>	
<b>Noise Temperature</b>	
65 K .....	65
60 K .....	60
55 K .....	55
50 K .....	50
45 K * .....	45
<b>Options</b>	
50 dB gain .....	/1
+20 dBm output .....	/2
Interstage transmit reject filter, >15 dB rejection, 7.90-8.40 GHz .....	/7
* Consult factory for 45 K.	

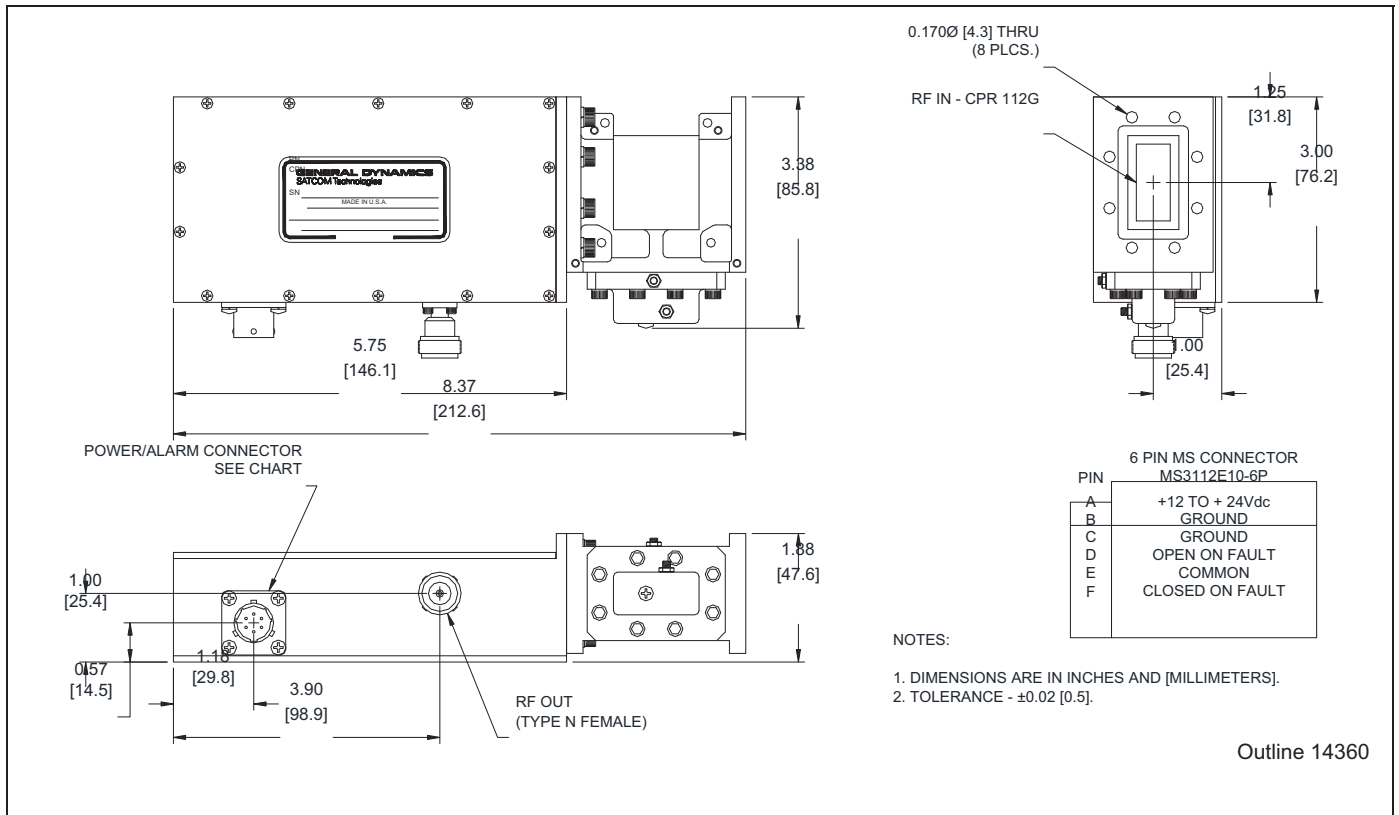
**Table 2 – Noise Temperature vs. Ambient Temperature**

<p>Noise temperature vs. ambient temperature can be found from the equation,</p> $NT_2/NT_1 = (T_2/T_1)^{1.6}$ <p>where:</p> <p>NT<sub>2</sub> = Noise Temperature at T<sub>2</sub></p> <p>NT<sub>1</sub> = Noise Temperature at T<sub>1</sub></p> <p>T<sub>2</sub> = Temperature 2 in K</p> <p>T<sub>1</sub> = Temperature 1 in K (K = °C + 273)</p>	<p>For the case where T<sub>1</sub> = 296 K (+23 °C), the ratio NT<sub>2</sub> / NT<sub>1</sub> is shown in the table below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Ambient Temperature T<sub>2</sub> (°C)</th> <th>Ratio NT<sub>2</sub> / NT<sub>1</sub></th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.88</td> </tr> <tr> <td>+23</td> <td>1.00</td> </tr> <tr> <td>+40</td> <td>1.09</td> </tr> <tr> <td>+50</td> <td>1.15</td> </tr> <tr> <td>+60</td> <td>1.21</td> </tr> </tbody> </table> <p>Example: For model LXA-7560, NT<sub>1</sub> = 60 K at +23 °C; what is NT<sub>2</sub> at +50 °C? From the table, NT<sub>2</sub> / NT<sub>1</sub> at 50 °C = 1.15: NT<sub>2</sub> = 1.15 x (60 K) = 69 K at 50 °C</p>	Ambient Temperature T <sub>2</sub> (°C)	Ratio NT <sub>2</sub> / NT <sub>1</sub>	0	0.88	+23	1.00	+40	1.09	+50	1.15	+60	1.21
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**Typical Applications**



## Outline Drawing



## Other Products

- Low Noise Amplifiers and LNA Systems
- Solid-State Power Amplifiers and SSPA Systems
- General Purpose Converters
- Satellite Communications Equipment
- Custom Subsystems

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