

# DATASHEET

ERZ-LNA-0700-1300-21-1-NS

# ERZIA



## NEW SPACE

### Low Noise Amplifier

7 to 13 GHz

Noise Figure 1.2 dB, Gain 24 dB

### Description:

The ERZ-LNA-0700-1300-21-1-NS is a microwave low noise amplifier based in GaAs, specially prepared for New Space applications. It is based on its commercial grade equivalent, maintaining electrical performance and including key features ideal for new space applications, including radiation tolerance, performance in vacuum and outgassing compatibility, among others. See table next page.

### Key Technical Features:

- Frequency Range: 7 to 13 GHz.
- Typical values: Noise Figure 1.2 dB, Gain 24 dB
- RF connectors (I/O): SMA Female
- Micro-D Sub-9 for control and DC connection

### Electrical Performance

Parameter	Value			Units
	Min	Typ	Max	
Frequency	7	-	13	GHz
Output Power (P1dB)	9	11	13	dBm
Small Signal Gain	23	24	25	dB
Gain Flatness	-	±1	-	dB
Noise Figure	1	1.2	1.3	dB
VSWR input	1.0:1	1.5:1	2.0:1	-
VSWR output	1.0:1	1.4:1	1.8:1	-
DC Voltage	9	12	15	V
Power Consumption	-	0.65	-	W
RF Connectors	SMA Female IN/OUT			-

Specifications at case temperature of 25°C.

### New Space (-NS) versions

Feature	COTS	NEW Space (-NS)
Operating Temperature range -45 to +85 °C (MIL-STD-810F, method 520.2)	x	x
Random Vibration 8g RMS (MIL-STD-810F, method 514.5)	x	x
Mechanical Shock 20g, 11ms SawTooth (MIL-STD-810F, method 516.5)	x	x
Acceleration 15g (MIL-STD-810F, method 513.5)	x	x
Thermal cycling (Based in MIL-HDBK-2164 Rev. A)	x	x
Simplified power interface Single DC supply line	x	x
ATP at three temperatures CoC & CoO supplied	x	x
RF section radiation tolerance (TID) Technology intrinsically tolerant to 300 krad (TID)	x	x
RF section radiation SEE tolerance: SEE-aware RF design and filtering	-	x
DC section radiation tolerance (TID) Radiation Tolerant to 30 krad (TID) plus housing shielding.	-	x
DC section radiation SEE tolerance: Passive SEE mitigation plus rad-tolerant (43 MeV-cm <sup>2</sup> /mg) in key components	-	x
Vacuum-optimized mechanics (venting, joints) (ECSS-Q-ST-70-02)	-	x
Low-outgassing materials (ECSS-Q-ST-70 / NASA-ASTM-E595 compliant)	-	x
Pure-tin mitigation(whisker control / alternative finishes) (GEIA-STD-0005-2 guidelines)	-	x
Prepared for LEO (atomic-oxygen mitigation techniques)	-	x
Screening /of RF active devices / Complete burn in	-	<b>Optional</b>
Additional documentation & analyses (FMECA, Worst-Case, etc.) — NDA required	-	<b>Optional</b>
Environmental testing on demand (TVAC, vibration, ...)	-	<b>Optional</b>

### Output Power

Figure 1 shows output power at 1dB compression measurement as a function of frequency at room temperature (25°C).

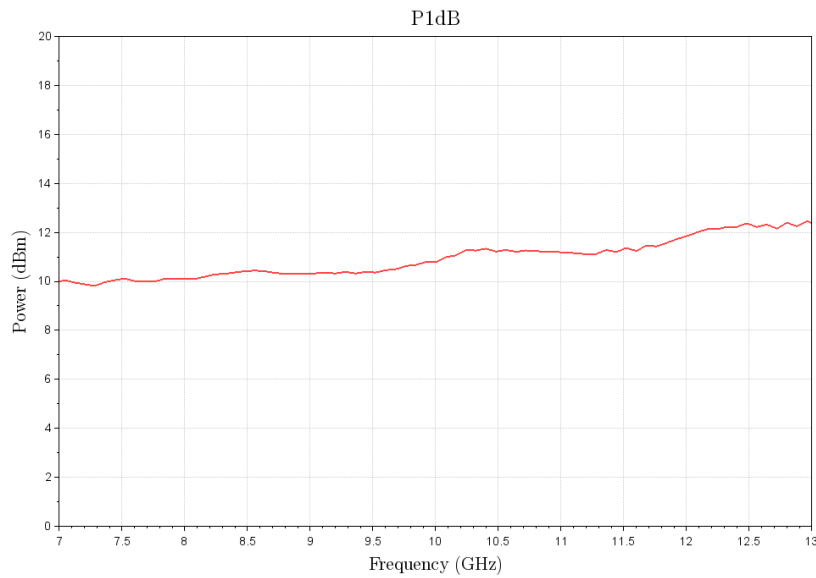


Figure 1: ERZ-LNA-0700-1300-21-1-NS P1dB

### Small Signal Gain

Figure 2 shows the small signal gain measurement as a function of frequency at room temperatures (25°C).

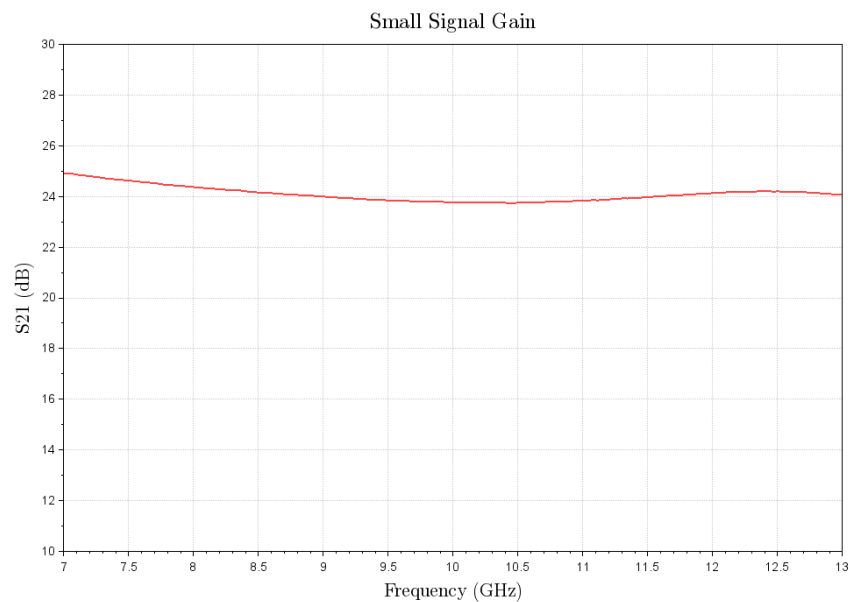


Figure 2: ERZ-LNA-0700-1300-21-1-NS Small Signal Gain

### Input and Output Matching

Figure 3 shows input (S11) and output (S22) VSWR as a function of frequency at room temperature (25°C).

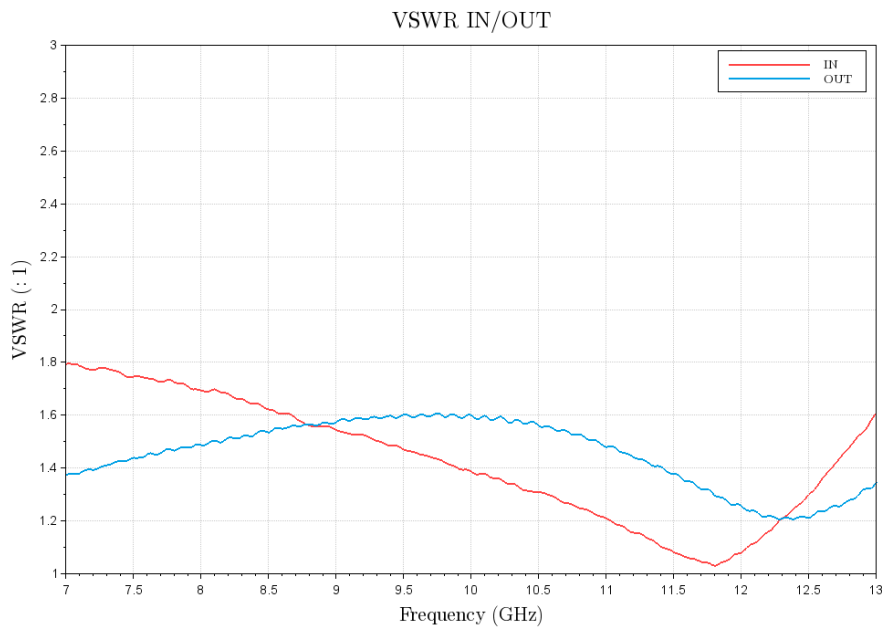


Figure 3: ERZ-LNA-0700-1300-21-1-NS Input&Output Matching

### Noise Figure

Figure 4 shows the noise figure measurement as a function of frequency at room temperature (25°C).

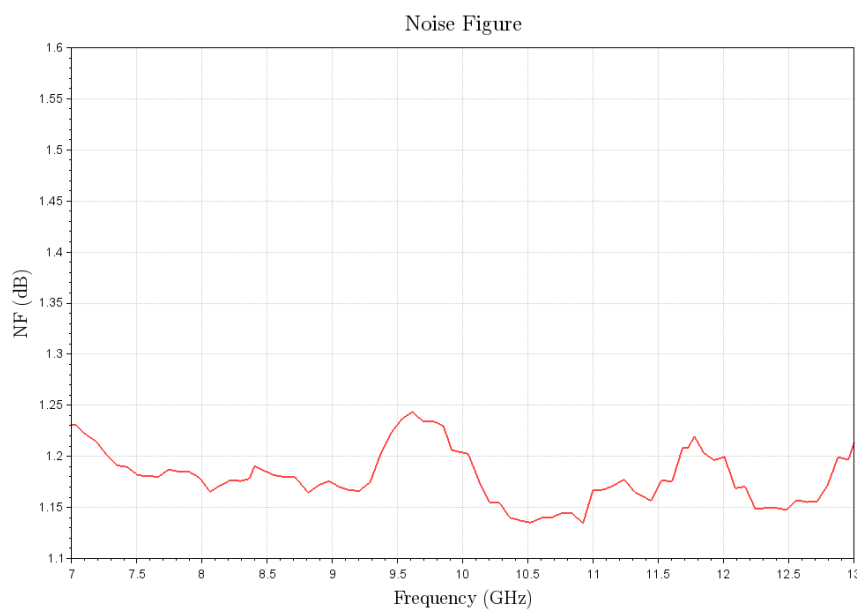


Figure 4: ERZ-LNA-0700-1300-21-1-NS Noise Figure

### Absolute Maximum Ratings

Condition	Value
DC Voltage	15 VDC
Maximum Input Power (CW)	20 dBm
Operation temperature (at case)	-45 to 85 °C
Storage temperature	-55 to 125 °C

- Stress above these ratings may cause permanent damage to the device.
- It is final user responsibility to maintain the amplifier within the specified ranges.

### Measurements Conditions

All measurements provided in this report were performed at the following conditions:

Condition	Value
Temperature (DUT ON)	25 °C ± 1°C
Humidity	44% ± 10%
DUT Warm up time	30 min
DUT minimum operation time	24 hours
Test equipment warm up time	2 hours
Additional temperature cycles in climatic chamber (DUT OFF)	-40°C to 85°C

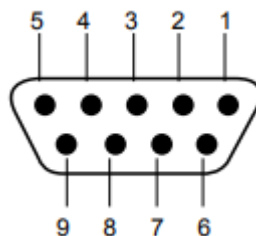
### Environmental Specifications (By Design)

Operating Temperature:	-45 to +85 °C	(MIL-STD-810F, method 520.2)
Storage Temperature:	-55 to 125 °C	(MIL-STD-810F, method 520.2)
Vibration:	8g rms	(MIL-STD-810F, method 514.5)
Shock:	20g, 11ms, saw-tooth	(MIL-STD-810F, method 516.5)
Acceleration:	15g	(MIL-STD-810F, method 513.5)
Radiation:	30 Krad, SEE mitigated	(DC section)
	300 Krad, SEE mitigated	(RF section. By Technology)
Pressure:	Sea level to Vacuum	



### DC and Control Connector

Micro-D Sub-9 female connector (M83513/02-AN or similar)



Pin No	Function	Description
1	+12 V Power Source	+(9...15) VDC
2	+12 V Power Source	+(9...15) VDC
3	NA	-
4	NA	-
5	NA	-
6	Power Ground	GND
7	Power Ground	GND
8	NA	-
9	NA	-

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