# DATASHEET

ERZ-LNA-0100-0310-30-2-NS

## NEW SPACE

## Low Noise Amplifier

1 to 3.1 GHz

Noise Figure 1.6 dB, Gain 30 dB

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## Description:

The ERZ-LNA-0100-0310-30-2-NS is a microwave low noise amplifier based in GaAs, specially prepared for New Space applications. It is based on its comercial 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: 1 to 3.1 GHz.
- Typical values: Noise Figure 1.6 dB, Gain 30 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 | 1.0 | - | 3.1 | GHz |
| Output Power (P1dB) | 17 | 19 | 21 | dBm |
| Small Signal Gain | 29 | 30 | 32 | dB |
| Gain Flatness | - | ±0.5 | - | dB |
| Noise Figure | 1.5 | 1.6 | 2.0 | dB |
| VSWR input | 1.7:1 | 1.8:1 | 2.0:1 | - |
| VSWR output | 1.3:1 | 1.4:1 | 1.8:1 | - |
| DC Voltage | 10 | 15 | 20 | V |
| Power Consumption | - | 3 | - | W |
| RF Connectors | SMA Female IN/OUT | | | - |

Specifications at case temperatura of 25ºC.

## New Space (-NS) versions

| Feature | COTS | NEW Space (-NS) |
|---|---|---|
| Operating Temperature range -45 to +85 ºC (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-cm2/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 | - | **Optional** |
| Additional documentation & analyses (FMECA, Worst-Case, etc.) — NDA required | - | **Optional** |
| Environmental testing on demand (TVAC, vibration, …) | - | **Optional** |

## Output Power

Figure 1 shows output power at 1dB compression  measurement as a function of frequency at room temperatura (25ºC).

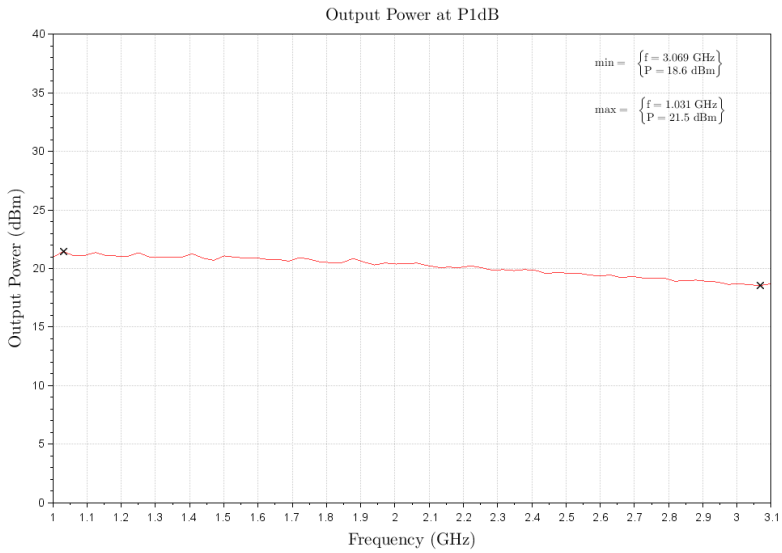



Figure 1: ERZ-LNA-0100-0310-30-2-NS P1dB

## Small Signal Gain

Figure 2 shows the small signal gain measurement as a function of frequency at different temperatures.

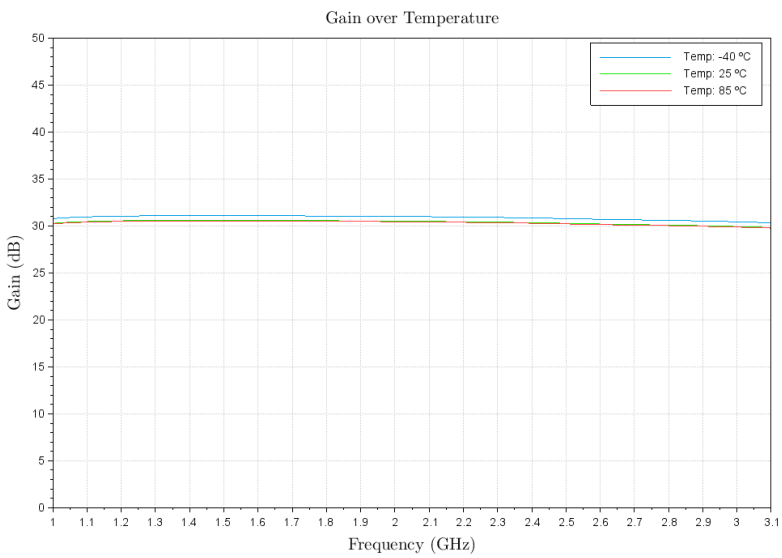



Figure 2: ERZ-LNA-0100-0310-30-2-NS Small Signal Gain

## Input and Output Matching

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

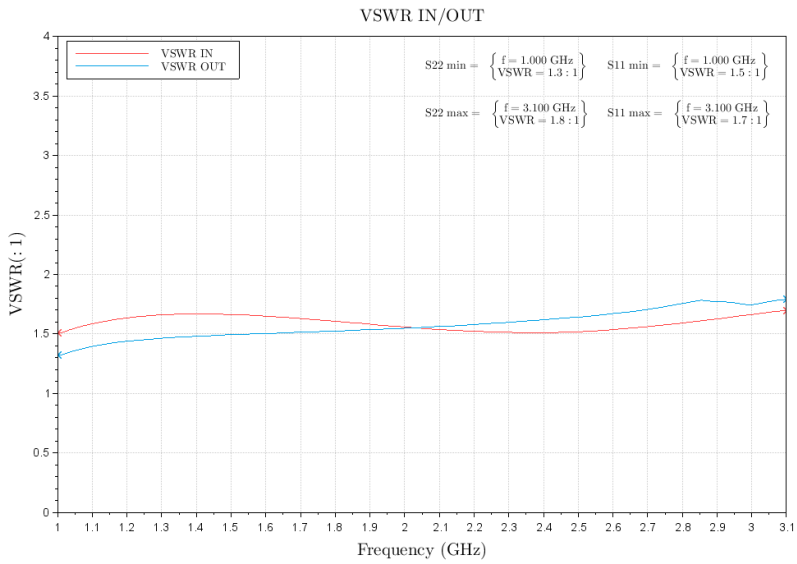



Figure 3: ERZ-LNA-0100-0310-30-2-NS Input&Output Matching

## Noise Figure

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

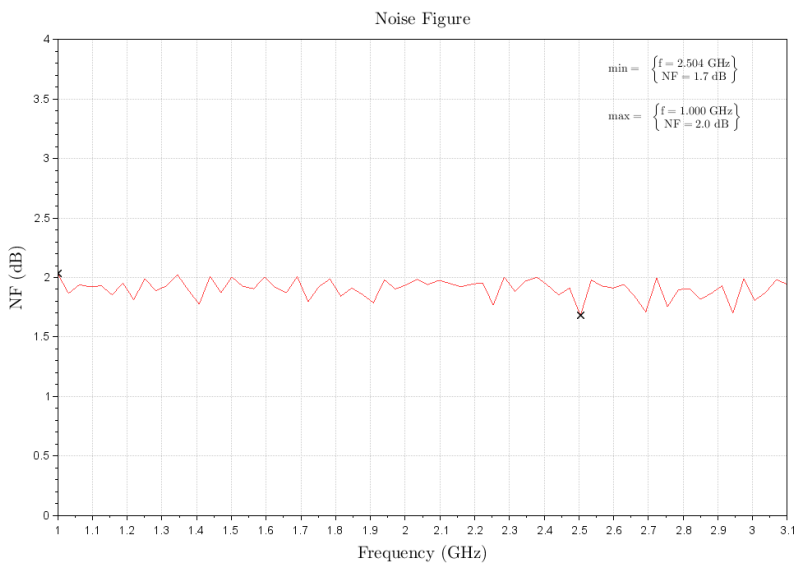



Figure 4: ERZ-LNA-0100-0310-30-2-NS Noise Figure

## Absolute Maximum Ratings

| Condition | Value |
|---|---|
| DC Voltage | 15 VDC |
| Maximum Input Power (CW) | 10 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

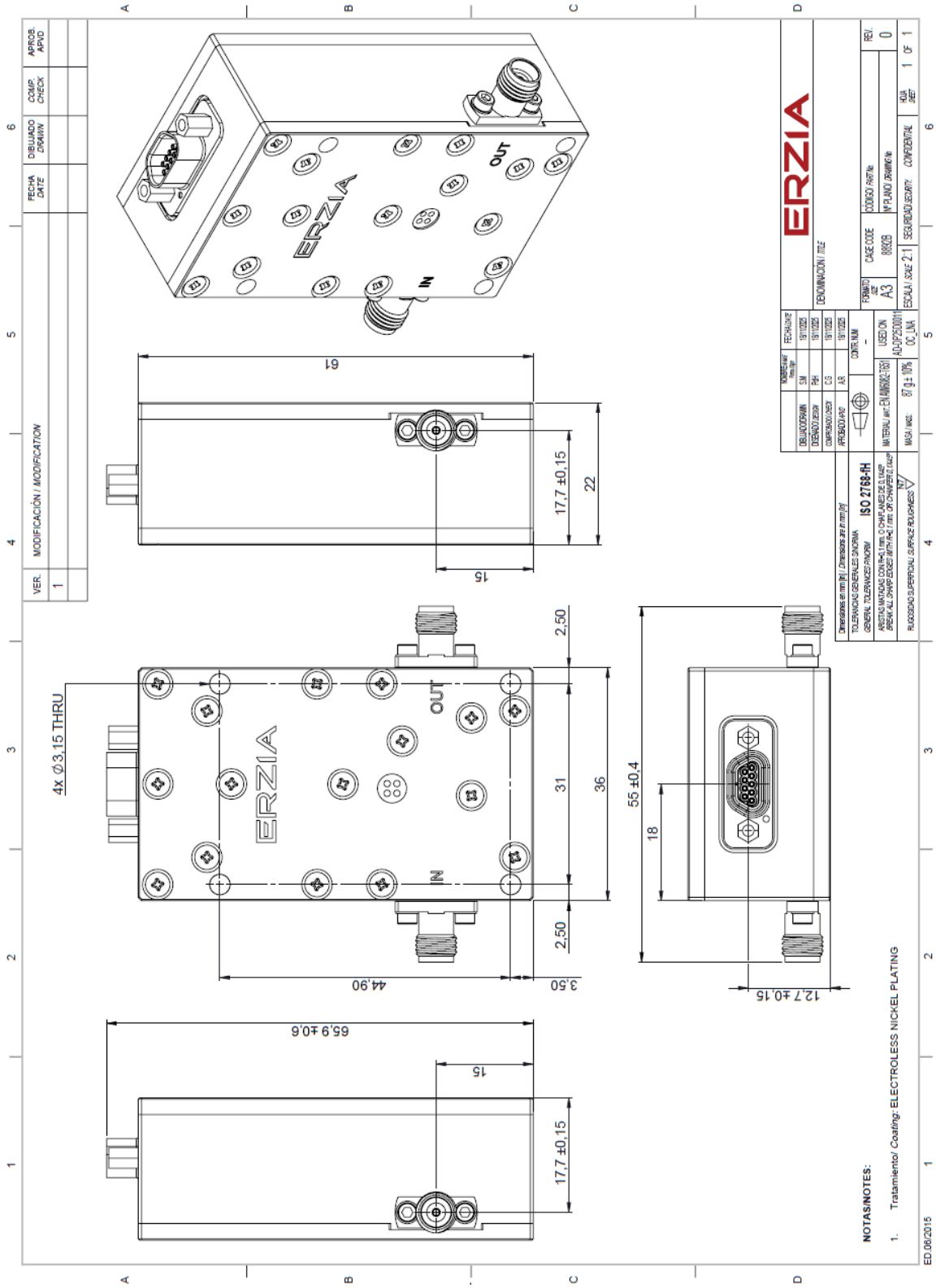
All measurements provided in this report were performed at the following conditions:

| 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)

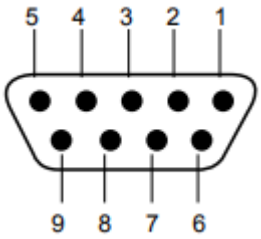
| | | |
|---|---|---|
| Operating Temperature: | -45 to +85 °C | (MIL-STD-810F, method 520.2) |
| Storage Temperature: | -55 to 125 °C | (MIL-STD-810F, method 520.2) |
| Vibration: | 8g rms | (MIL-STD-810F, method 514.5) |
| Shock: | 20g,11ms,saw-tooth | (MIL-STD-810F, method 516.5) |
| Acceleration: | 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 | |

## Mechanics and Housing



## 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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