

ERZ-LNA-0010-0050-20-5



#### ERZ-LNA-0010-0050-20-5

The ERZ-LNA-0010-0050-20-5 is a low noise amplifier with switching capabilities, providing high isolation without compromising noise figure. The compact size and modularity makes it ideal for a wide range of applications.

#### Main Features:

- Frequency Range: 0.1 to 0.5 GHz
- Small Signal Gain: 20 dB
- Output Power: 25 dBm
- Noise Figure: 3.5 dB
- Isolation: 80 dB
- RF connectors (I/O): SMA Female
- Dsub15 Male connector for DC and Control
- · Compact aluminum housing externally painted

## Typical applications:

- Industrial / Laboratory
- Satcom / Telecom
- Space / Aerospace / Military



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## Performance

Parameter	Value			Units
	Min	Тур	Max	
Frequency	0.1	-	0.5	GHz
Small Signal Gain	18.5	20	21.5	dB
Gain Flatness	-	±1	-	dB
Gain Flatness over temperature	-	±0.5	±1	dB
Noise Figure	2	3.5	5	dB
Output Power (P1dB)	22	25	28	dBm
Output VSWR	1.0:1	1.8:1	2.0:1	-
Input VSWR	1.0:1	1.5:1	2.0:1	-
2nd Harmonic (Pin=-10 dBm)	31	40	60	dBm
3rd Harmonic (Pin=-10 dBm)	44	55	75	dBm
Switching Speed TTL [RS422] (OFF to ON / ON to OFF)	-	0.5 / 0.01 [0.7 / 0.08]	-	us
Isolation State 1 (01)	65	75	90	dB
Isolation State 2 (10)	75	85	100	dB
Isolation State 3 (11)	80	100	140	dB
Current Consumption (5V)	-	8	10	mA
Current Consumption (12V)	-	65	70	mA
Current Consumption (-12V)	-	1	2	mA
Power Consumption	-	0.7	1	W

Specifications at a case temperatura of 25°C unless otherwise indicated

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## Low Noise Amplifier ERZ-LNA-0010-0050-20-5

## Small Signal Gain

Figure 1 shows small signal gain measurement as a function of frequency at room temperature (25°C).



Figure 1: ERZ-LNA-0010-0050-20-5 Small Signal Gain

### Gain flatness over frequency and temperature

Figure 2 shows the small signal gain flatness over frequency and temperature measurement at -35 °C, 25 °C and 60 °C



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## Input and Output Matching

Figure 3 and 4 show input and output matching measurement in all states as a function of frequency at room (25°C) temperature.









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## **Noise Figure**

Figure 5 shows noise figure as a function of frequency at room temperature (25°C).





### Output Power at 1 dB compression (P1dB)

Figure 6 shows output power at 1 dB compression measurement over frequency at room temperature (25  $^{\circ}$ C)



Figure 6: ERZ-LNA-0010-0050-20-5 P1dB

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## Harmonics (Pin=-10 dBm)

Figures 7 and 8 show  $2^{nd}$  and  $3^{rd}$  harmonic at Pin=-10 dBm as a function of frequency at room temperature (25°C) .



Figure 7: ERZ-LNA-0010-0050-20-5 2nd harmonic at Pin=-10 dBm



Figure 8: ERZ-LNA-0010-0050-20-5 3rd harmonic at Pin=-10 dBm



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## Isolation

Figure 9 shows isolation measurement as a function of frequency  $\$ at different states at room temperature (25°C) .



Figure 9	: ERZ-LNA-0010-0050-2	20-5 Isolation
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CTRL		Function		
SW1	SW2	SW1	SW2	Amp
0	0	ON	ON	ON
0	1	ON	OFF	ON
1	0	OFF	ON	ON
1	1	OFF	OFF	OFF



Figure 10: Amplifier block diagram



## Switching time (TTL)

Figures 11 and 12 show switching time measurements as a function of frequency at room temperature ( $25^{\circ}$ C) .



Figure 11: ERZ-LNA-0010-0050-20-5 Switching time ON to OFF (TTL)



Figure 12: ERZ-LNA-0010-0050-20-5 Switching time OFF to ON (TTL)

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## Switching time (RS422)

Figures 13 and 14 show switching time measurements as a function of frequency at room temperature ( $25^{\circ}$ C) .



Figure 13: ERZ-LNA-0010-0050-20-5 Switching time ON to OFF (RS422)



Figure 14: ERZ-LNA-0010-0050-20-5 Switching time OFF to ON (RS422)



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## Mechanics and housing





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## **Interfaces and Pinout**

Parameter	Value
Size	60x40x25 mm
Weight	140 grams +/- 10%
RF Input Connector	SMA Female
RF Output Connector	SMA Female
DC & Control Connector	Dsub15 Male



Pin No	Label	I/O	Details
1	+5V	Power IN	Power Supply
2	GND	GND	Ground
3	+12V	Power IN	Power Supply
4	GND	GND	Ground
5	-12V	Power IN	Power Supply
6	SW1_H	CTRL IN	Pin 15 shall be OPEN
7	SW2_H	CTRL IN	Pin 15 shall be OPEN
8	SW1_TTL	CTRL IN	Pin 15 shall be connected to GND
9	SW2_TTL	CTRL IN	Pin 15 shall be connected to GND
10	GND	GND	Ground
11	SW1_L	CTRL IN	Pin 15 shall be OPEN
12	SW2_L	CTRL IN	Pin 15 shall be OPEN
13	NC	-	Not Connected
14	NC	_	Not Connected
15	RS422/TTL	IN	Open: RS422; GND: TTL

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## Absolute Maximum Ratings

Condition	Value
DC Voltage	+12.5 VDC, +5.5 VDC, -12.5 VDC
Maximum Input Power (CW / Pulsed 1% DC)	30 dBm / 50 dBm
Operation temperature (at case)	-35 to 60 °C
Storage temperature	-40 to 85 °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)	-35°C to +60°C

### **Environmental Specifications (By Design)**

Operating Temperature:	-35 to +60 °C	(MIL-STD-810G, method 520.2)
Storage Temperature:	-45 to 85 °C	(MIL-STD-810G, method 520.2)
Vibration:	8g rms	(MIL-STD-810G, method 514.5)
Shock:	20g,11ms,saw-tooth	(MIL-STD-810G, method 516.5)
Acceleration:	15g	(MIL-STD-810G, method 513.5)
Humidity	RH≥95%@35°C	(MIL-STD-810G, method 507.5)

### **RoHS & REACH Compliance**

This part is compliant with EU 2011/65/UE RoHS (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) and REACH (Registration, Evaluation, Authorization and restriction of Chemical substances) directives.



Tel: +34 942 29 13 42

sales@erzia.com

www.erzia.com

# ERZIA

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Tel: +34 942 29 13 42

sales@erzia.com

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