



NEW SPACE

High Power Amplifiers

2 GHz to 4 GHz

Gain 38 dB, Psat 33 dBm

Description:

The ERZ-HPA-0200-0400-30-NS is a microwave power amplifier based in GaN, specially prepared for New Space applications. It is based on its COTS 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: 2 to 4 GHz.
- Typical values: Gain 39 dB, Psat 33 dBm
- RF connectors (I/O): SMA Female IN/OUT
- Sub-D for control and DC connection

Electrical Performance

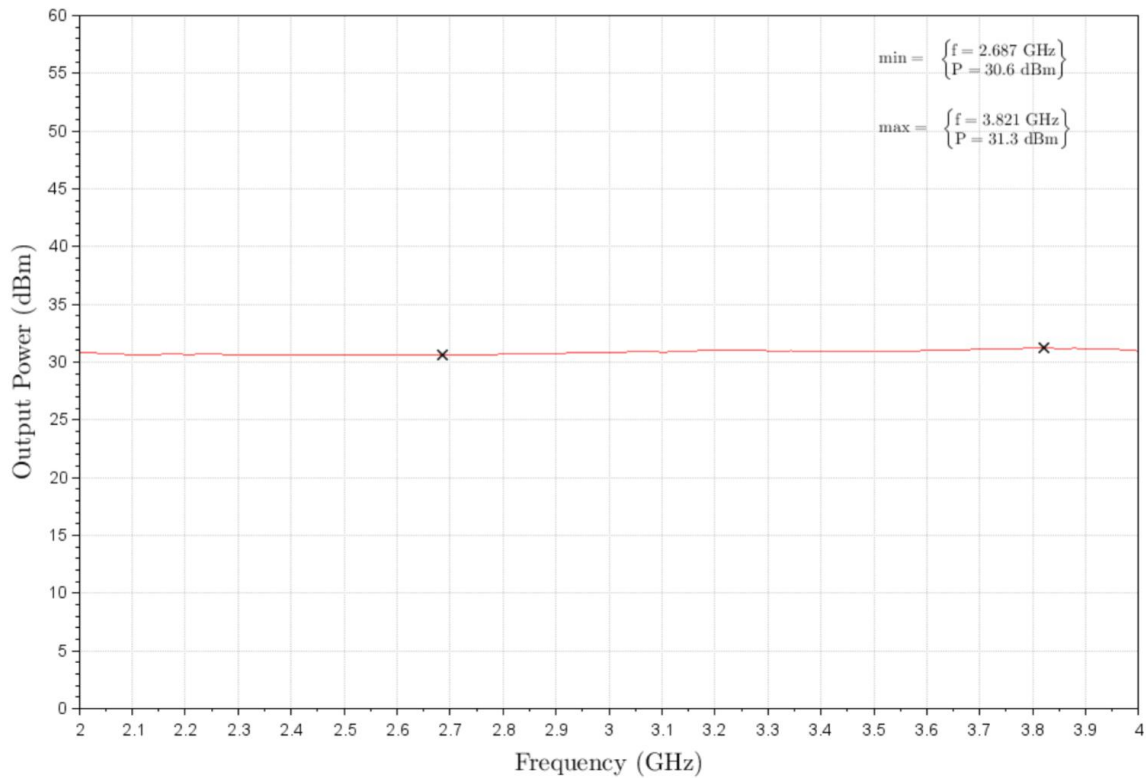
Parameter	Value			Units
	Min	Typ	Max	
Frequency	2	-	4	GHz
Output Power (P1dB)	30	31	32	dBm
Output Power (Psat)	32	33	35	dBm
Small Signal Gain	36	39	41	dB
Gain Flatness	-	±1	±1.5	dB
Noise Figure	1.2	1.5	2	dB
VSWR input	1.1:1	1.5:1	2.0:1	-
VSWR output	1.0:1	1.1:1	1.5:1	-
DC Voltage	24	28	32	V
Power Consumption	-	7	-	W
RF Connectors	SMA Female			-

Specifications at a case temperature of 25°C

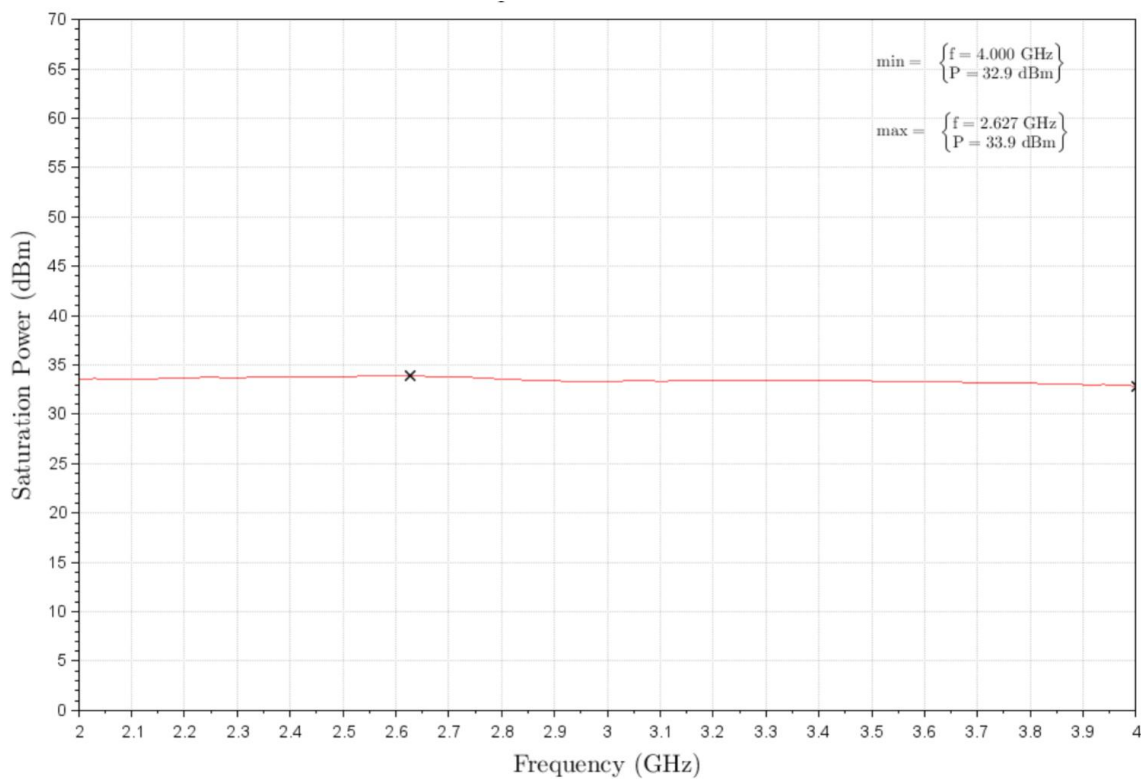
New Space (-NS) versions

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 ² /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

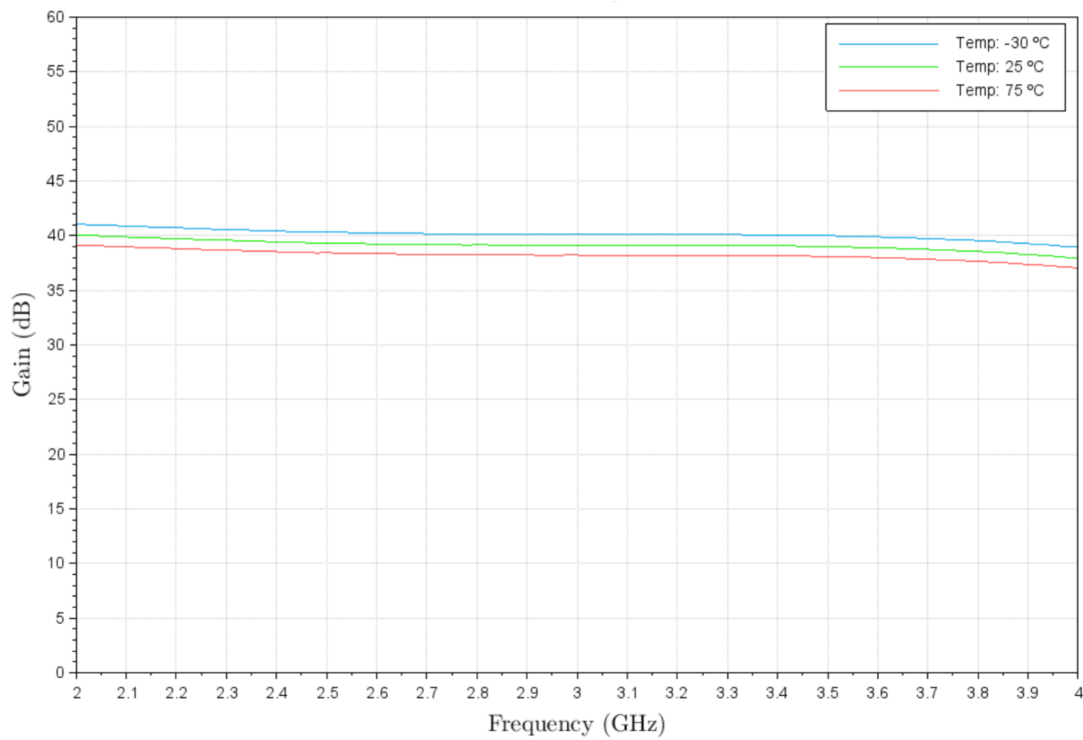
Output Power at P1dB compression (25°C)



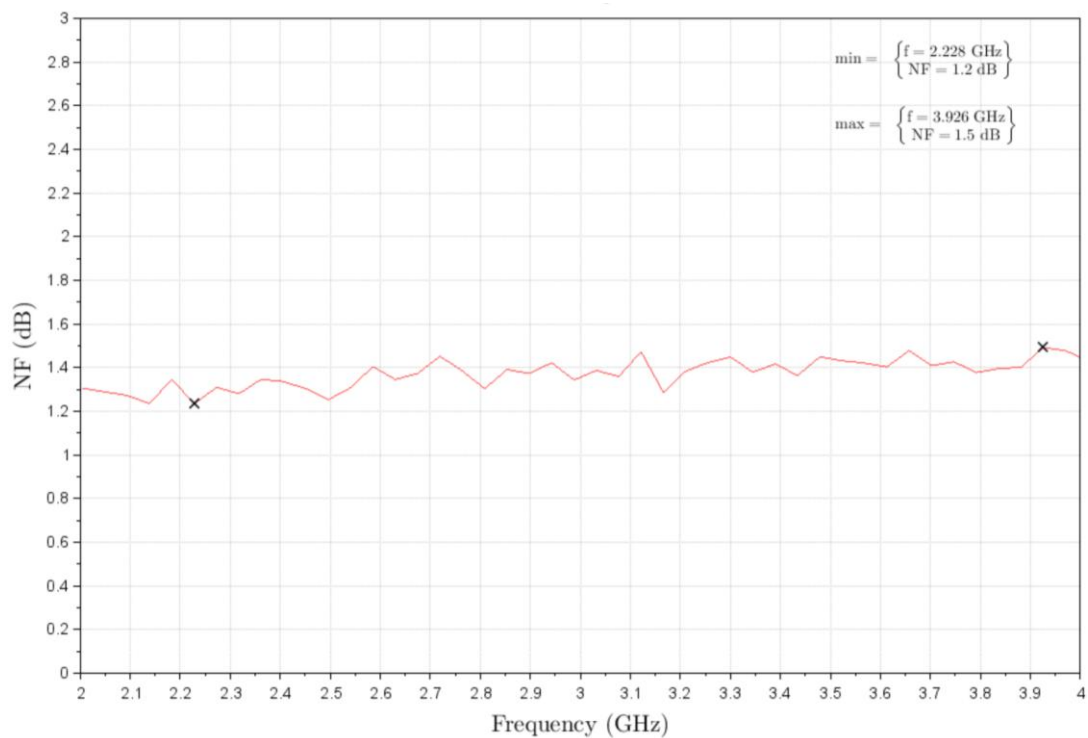
Output power at saturation (25°C)



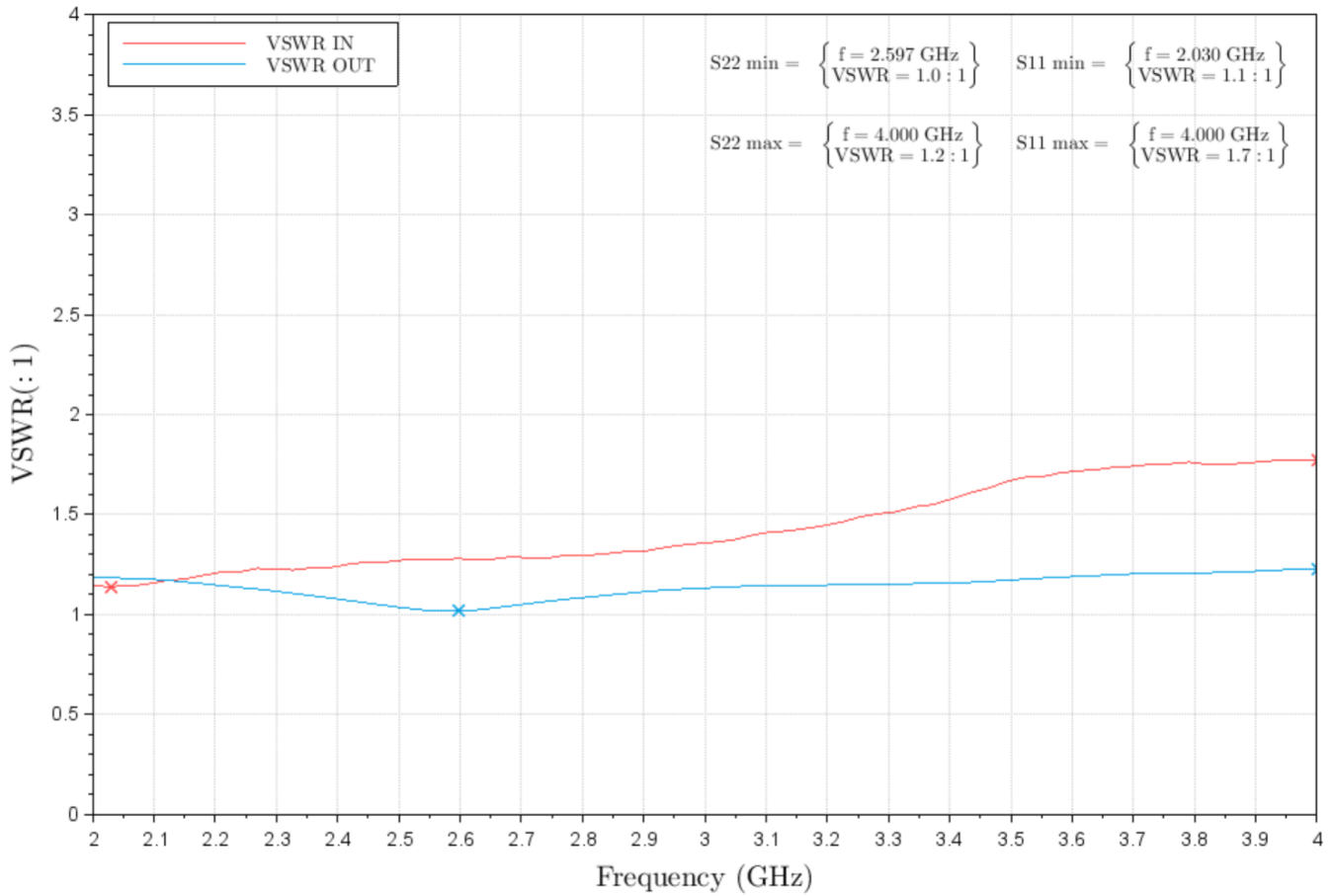
Small Signal Gain vs Temperature



Noise Figure at 25°C



Input and Output Matching



Absolute Maximum Ratings

Condition	Value
DC Voltage	+32 VDC
Maximum Input Power (CW)	13 dBm
Operation temperature (at case)	-40 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

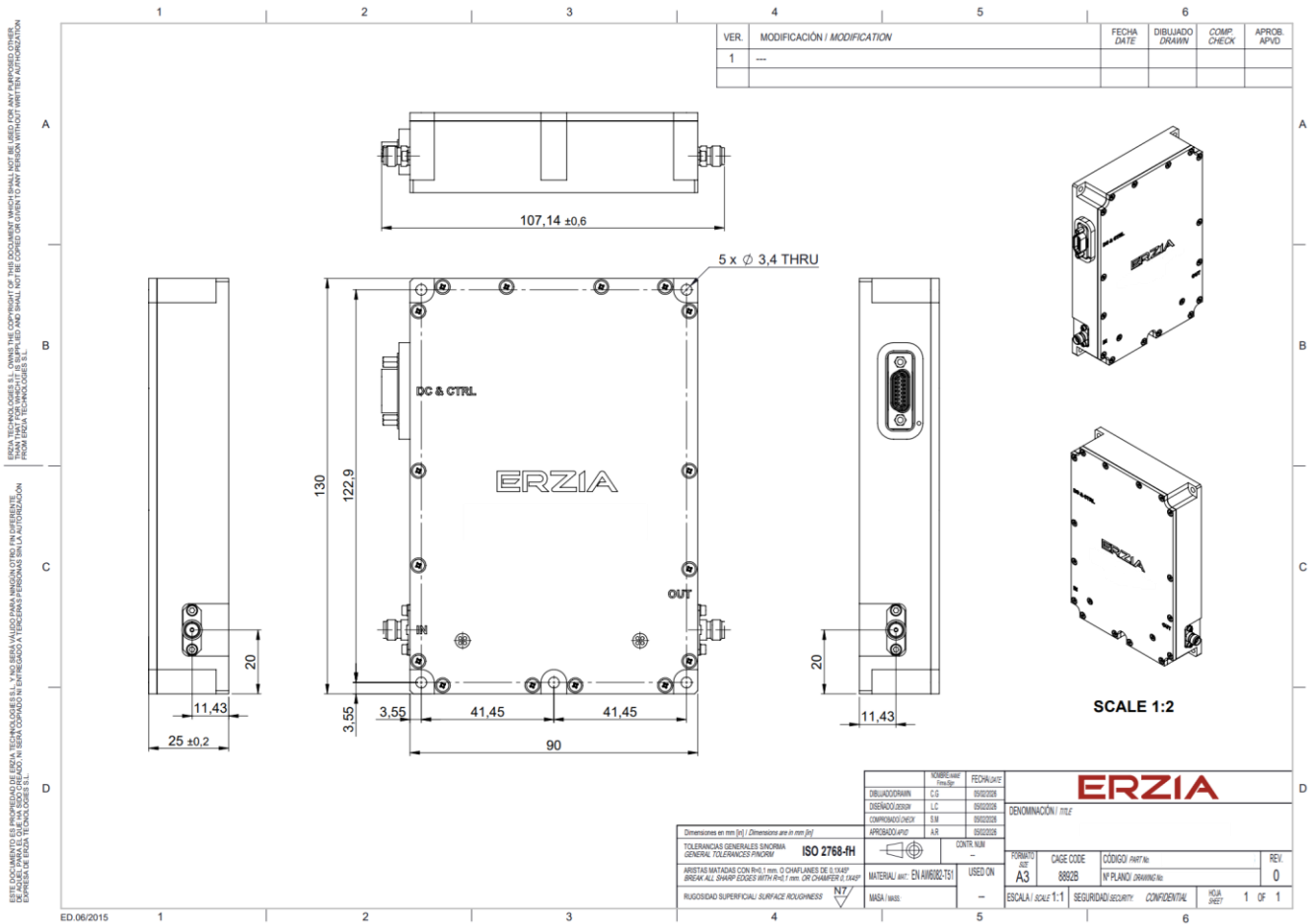
All measurements provided in this report were performed at the following conditions:

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	

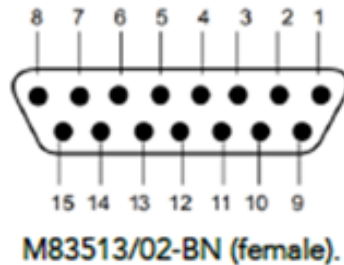
Mechanics and Housing



Parameter	Value	Units
Dimensions	90x130x25 (LxWxH)	mm
RF Connectors	IN/OUT: 2.92mm (f)	-
DC & Control Connector	MICRO-D-sub 15 female	-

DC and Control Connector

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



Pin No	Function	Description
1	+28 VDC	+(24...32) VDC
2	+28 VDC	+(24...32) VDC
3	Power Ground	Power Ground
4	Power Ground	Power Ground
5	Ground	Ground
6	Current Monitor	$V_o = 0.1V/A$
7	Temperature Monitor	NTC 10K NTCG163JX103DTDS
8	Temperature Monitor Return	
9	+28 VDC	+(24...32) VDC
10	+28 VDC	+(24...32) VDC
11	Power Ground	Power Ground
12	Power Ground	Power Ground
13	Ground	Ground
14	TTL Enable	OFF (0V to 0.8V); ON (2V to 5.5V)
15	TTL Modulation	OFF (0V to 0.8V); ON (2V to 5.5V)

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