

DATASHEET

ERZ-HPA-1730-2120-44-NS

ERZIA



NEW SPACE

High Power Amplifiers

17.3 to 21.2 GHz

Gain 50 dB, Psat 43.5 dBm

Description:

The ERZ-HPA-1730-2120-44-NS is a microwave power amplifier based in GaN, specially prepared for New Space applications. It is based on its commercial 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: 17.3 to 21.2 GHz.
- Typical values: Gain 50 dB, Psat 43.5 dBm
- RF connectors (I/O): 2.92 mm (F) / WR42
- Micro DB15 (MDM) for control and DC connection

Electrical Performance

Parameter	Value			Units
	Min	Typ	Max	
Frequency	17.3	-	21.2	GHz
Output Power (Psat)	42	43.5		dBm
Small Signal Gain	46	50	55	dB
Gain Flatness	-	±4	-	dB
VSWR input	1.2:1	1.8:1	2.5:1	-
VSWR output	1.0:1	1.2:1	1.5:1	-
DC Voltage	24	28	32	V
Power Consumption @PSat	-	160	170	W
RF Connectors	2.92 mm (F) IN/ WR42 OUT			-

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 saturation

Figure 1 shows output power at saturation measurement as a function of frequency at different temperatures.

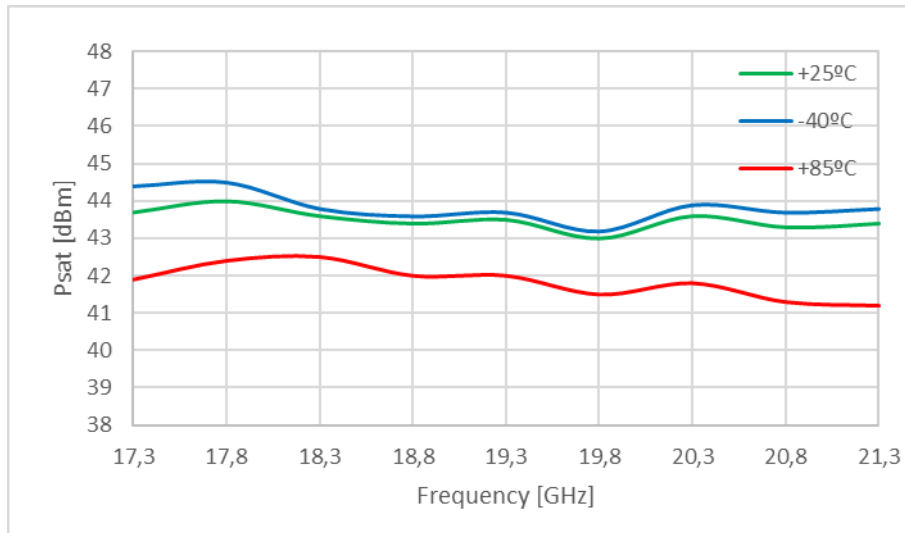


Figure 1: ERZ-HPA-1730-2120-44-NS Psat

Small Signal Gain

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

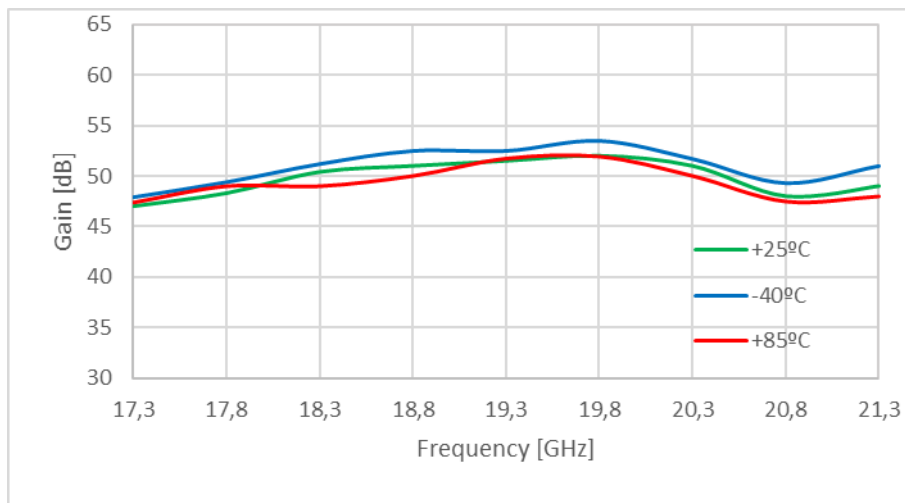


Figure 2: ERZ-HPA-1730-2120-44-NS Small Signal Gain

Input and Output Matching

Figure 3 and Figure 4 show input (S11) and output (S22) VSWR as a function of frequency at room temperature (25°C).

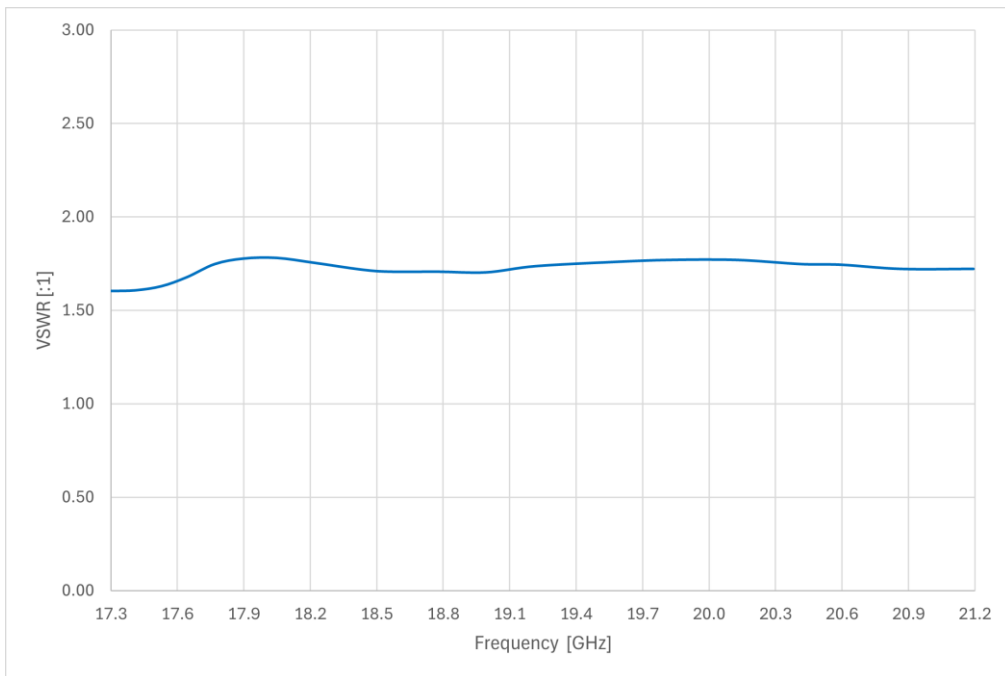


Figure 3: ERZ-HPA-1730-2120-44-NS Input Matching

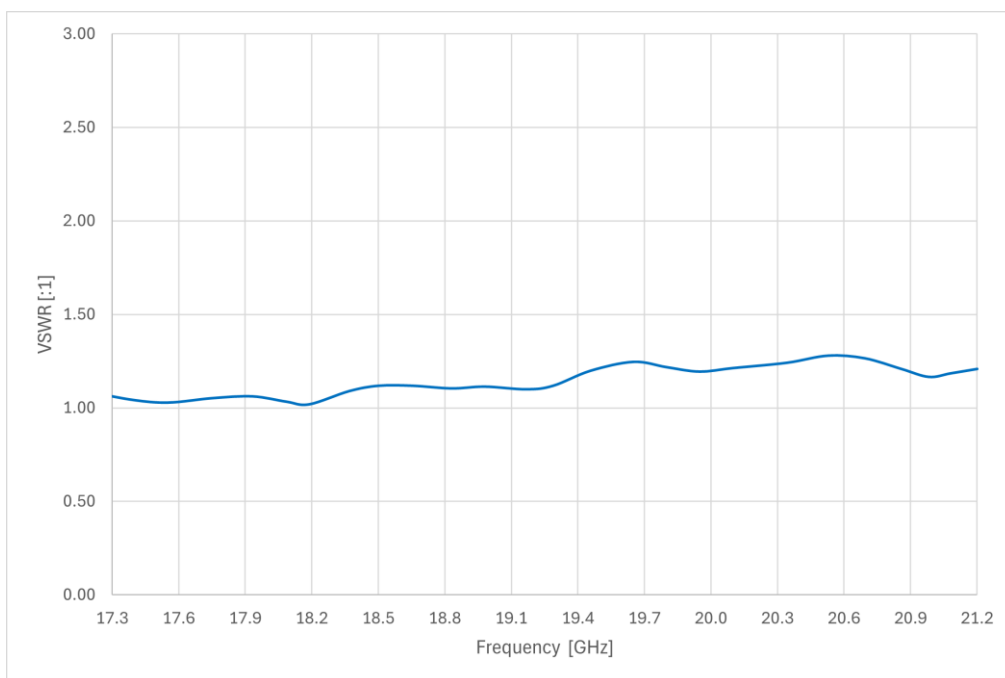


Figure 4: ERZ-HPA-1730-2120-44-NS Output Matching

Absolute Maximum Ratings

Condition	Value
DC Voltage	+32 VDC
Maximum Input Power (CW)	10 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

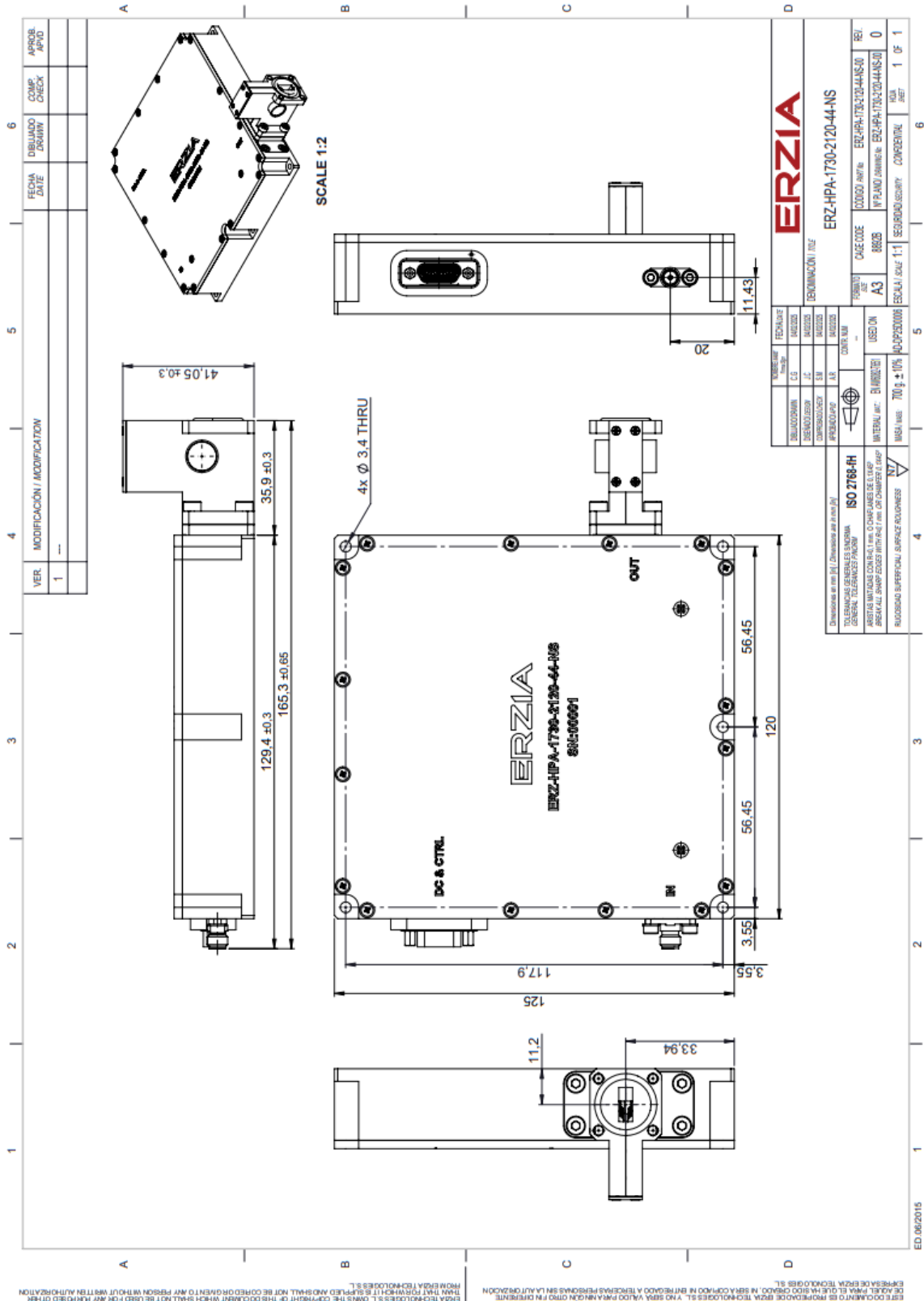
All measurements provided in this report were performed at the following conditions:

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



DC and Control Connector

Micro-D Sub-15 female connector

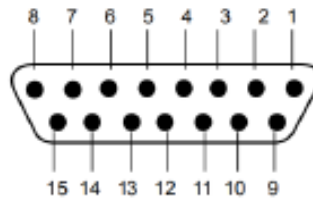


Figure 3-1: M83513/02-BN (female).

PIN	LABEL	SIGNAL	DESCRIPTION
1	VCC	+28VDC	
2	VCC	+28VDC	
3	PGND	Power Ground	Power Ground
4	PGND	Power Ground	
5	GND	Ground	Ground
6	I_SEN	Current Monitor	Vo = 0.1 V/A
7	NTC_P	Temperature Monitor	NTC 10K NTCG163JX103DTDS
8	NTC_N	Temperature Monitor Return	
9	VCC	+28VDC	
10	VCC	+28VDC	
11	PGND	Power Ground	Power Ground
12	PGND	Power Ground	
13	GND	Ground	Ground
14	EN	TTL Enable	OFF (0V to 0.8V); ON (2V to 5.5V)
15	MOD	TTL Modulation	OFF (0V to 0.8V); ON (2V to 5.5V)

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