

Product Description

The Nxbeam NLN2000-DE is a Ka-band low noise amplifier MMIC fabricated in 0.1um InP HEMT. This part is ideally suited for satellite communications and point-to-point digital radio applications. The MMIC operates from 24 to 31 GHz and provides 30 dB of gain and < 1.3 dB noise figure.

The NLN2000-DE comes in die form with RF input and output matched to 50 Ω with DC blocking capacitors for easy system integration. The HEMT devices are fully passivated for reliable operation. Bond pad and backside metallization are Au-based for compatibility with eutectic die attachment methods.



Key Features

- Frequency: 24 – 31 GHz
- Gain: 30 dB
- Noise Figure: < 1.3 dB
- DC Power: 27 mW
- Substrate Thickness: 75um
- Chip Dimensions: 2.5 x 1.0 (mm)

Electrical Specifications

Test Condition: $V_d = 1\text{ V}$, $I_d = 27\text{ mA}$, $Temp = 25\text{ }^\circ\text{C}$

Parameter	Min	Typical	Max	Unit
Frequency	24		31	GHz
Gain		30		dB
Noise Figure		< 1.3		W
Input Return Loss		> 9		dB
Output Return Loss		> 8		dB

Absolute Maximum Ratings (Temp. = 25°C)

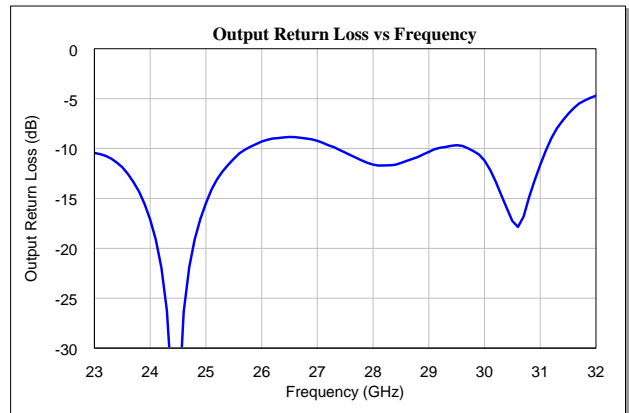
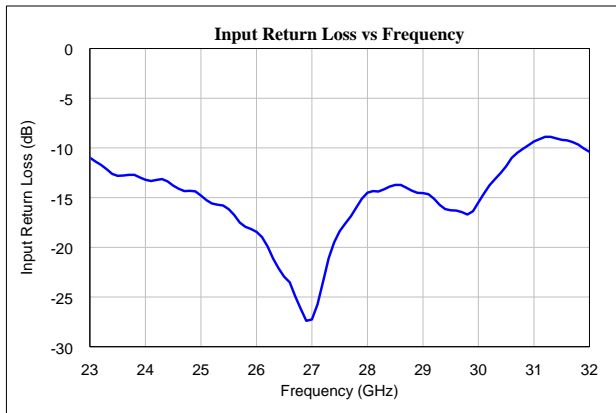
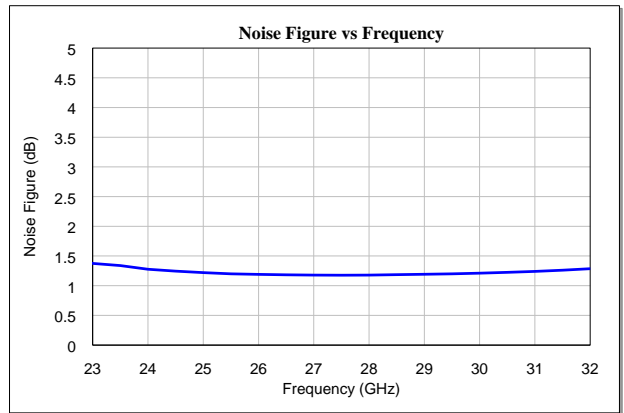
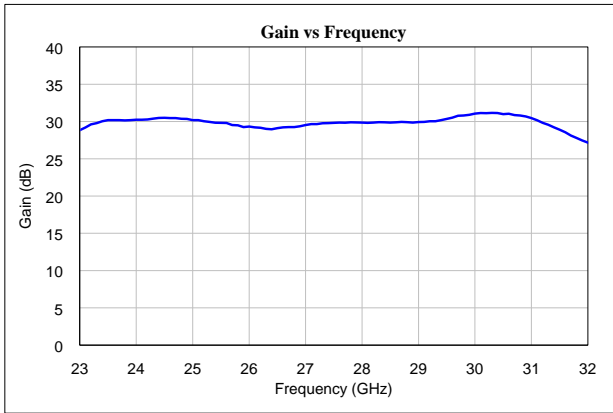
Parameter	Min	Max	Unit
Drain Voltage (V_{d1} , V_{d2} , V_{d3})		1.4	V
Drain Current (I_{d1})		24	mA
Drain Current (I_{d2})		24	mA
Drain Current (I_{d3})		24	mA
Gate Voltage (V_{g1} , V_{g2} , V_{g3})	-1	0.4	V
Input Power (P_{in})		TBD	dBm
Assembly Temperature (30 seconds)		320	$^\circ\text{C}$

Recommended Operating Range

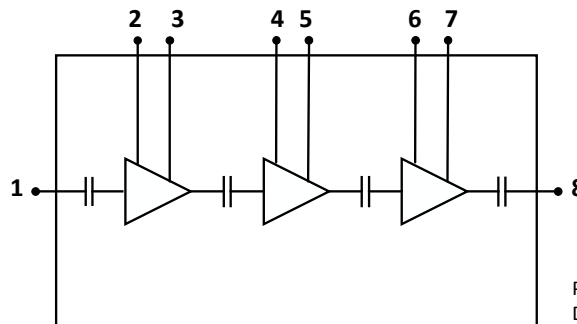
Parameter	Value	Unit
Drain Voltage (V_d)	0.8 - 1.1	V
Drain Current	18 - 36	mA
Gate Voltage (V_g) (Typical)	0.0	V

Small Signal Performance

Test Condition: $V_d = 1.0\text{ V}$, $I_d = 27\text{ mA}$ (all stages 9 mA)



Circuit Block Diagram



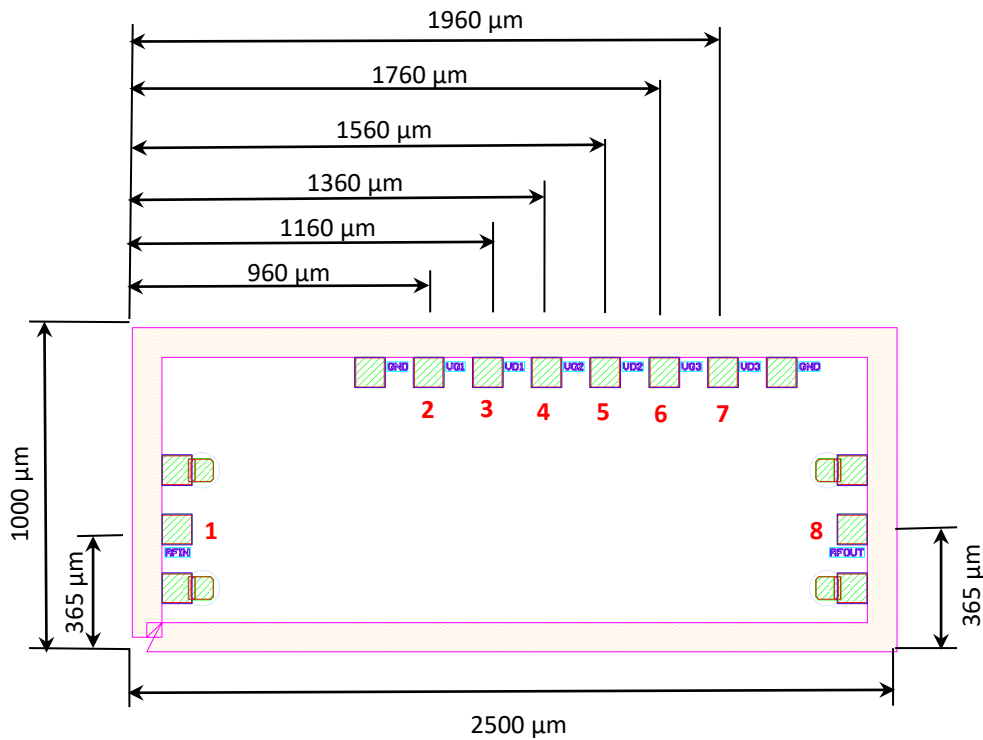
Pin number information detailed under Die Size and Bond Pad Information

Die Size and Bond Pad Information

Chip Size = 2500 ±25 μm x 1000 ±25 μm
 Chip Thickness = 75 μm
 Chip Backside metal is ground

RF Input/Output Pad Dimensions = 100 μm x 100 μm
 DC Pad Dimensions = 100 μm x 100 μm

Pad Num.	Function
1	RF in
2	Vg1
3	Vd1
4	Vg2
5	Vd2
6	Vg3
7	Vd3
8	RF out



Bias Information

Bias-up Procedure:

- 1.) It is recommended that voltage and current limits are set on the voltage supply's prior to biasing the product.
- 2.) Ensure power supplies are properly grounded to the product test fixture.
- 3.) Apply negative gate voltage (-0.6 V) to ensure all devices are pinched off.
- 4.) Gradually increase the drain bias voltage to the desired bias level but not to exceed the maximum voltage of 1.4 V.
- 5.) Gradually increase the gate voltage while monitoring the drain current until the desired drain current is achieved.
- 6.) Apply RF signal.

Bias-down Procedure:

- 1.) Turn off RF signal.
- 2.) Gradually decrease the gate voltage down to -0.6 V.
- 3.) Gradually decrease the drain voltage down to 0 V.
- 4.) Gradually increase gate voltage to 0 V.
- 5.) Turn off supply voltages

ESD Sensitive Product



Important Information

The data contained in this document is preliminary data based on limited measured samples and simulation. Nxbeam Inc. reserves the right to update and change without notice the characteristic data and other specifications as they apply to this document. Customers should obtain and verify the most recent product information before placing orders. Nxbeam Inc. assumes no responsibility or liability whatsoever for the use of the information contained herein.

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