5 MHz – 1.3 GHz 2W RF Power Amplifier

P/N: ZP51G3

Version 1.0 | December 2025

1. Product Overview

The ZP51G3 is a broadband 2W RF power amplifier covering 5 MHz to 1.3 GHz. It features a wide frequency range, high gain, low noise figure, and excellent in-band flatness. It can be used as a driver amplifier in various RF applications, including scientific research, industrial communications, university research, and other fields. Due to its ultra-wide bandwidth, it is also suitable for radio spectrum management, full-band spectrum reconnaissance testing, and EMC (electromagnetic compatibility) receiver-end testing.

The amplifier housing is precision CNC-milled from aerospace-grade aluminum alloy, providing high accuracy and light weight. The surface undergoes natural conductive oxidation treatment, delivering excellent electrical conductivity and electromagnetic shielding performance. This effectively shields the amplifier's own radiation and isolates external environmental radiation. The power supply port uses an RF feed-through capacitor that effectively filters spike pulses and other noise on the power line.



Figure 1. ZP51G3 Product Appearance

2. Key Features

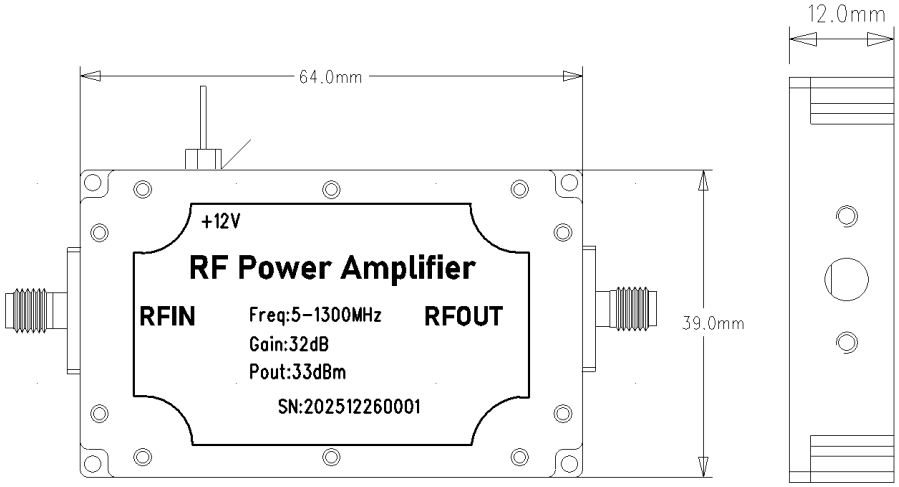
- Frequency Range: 5 MHz – 1.3 GHz
- Small-Signal Gain: 35 dB typ.
- Large-Signal Gain: 28 dB typ.
- P1dB: 33.5 dBm
- Noise Figure: 4.0 dB typ.
- Power Supply Voltage: 10 – 15 V
- Operating Current: 0.85 A @ 12 V
- RF Connector: SMA-Female
- Power Feed: 3000 pF feed-through capacitor

3. Electrical Specifications

Parameter	Min	Typ	Max	Units
Frequency Range	0.005	—	1.3	GHz
Small-Signal Gain	34	35	36	dB
Gain Flatness	—	±2	—	dB
Noise Figure	3.5	4.0	5.0	dB
P1dB	33	33.5	34.2	dBm
Input VSWR	—	< 2.5	—	—

Output VSWR	—	< 2.5	—	—
Characteristic Impedance	—	50	—	Ω
Input Power (CW)	—	—	10	dBm
Supply Voltage	10	12	15	V
Current @ 12 V	0.7	0.85	0.9	A
Operating Temperature	-40	+25	+55	°C
Storage Temperature	-55	+25	+90	°C

4. Outline Drawing



Top View **Side View**

Unit: mm

5. Test Report

5.1 Test Conditions

Ambient Temperature (TA): +25 °C | Supply: DC = 12 V, 850 mA

Test Instruments: Keysight E5071C, Agilent 346A, N5182A, N9020A

Typical Results (5 MHz – 1.3 GHz): Gain ≈ 35 dB, Noise Figure ≈ 4.2 dB



Figure 2. Gain vs. Frequency (30 MHz – 1.2 GHz)

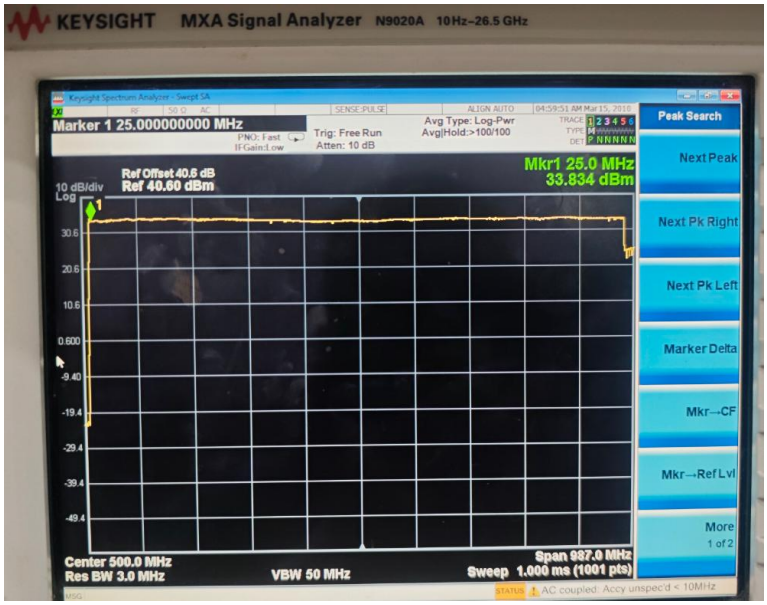


Figure 3. Output Power (25 MHz – 970 MHz)

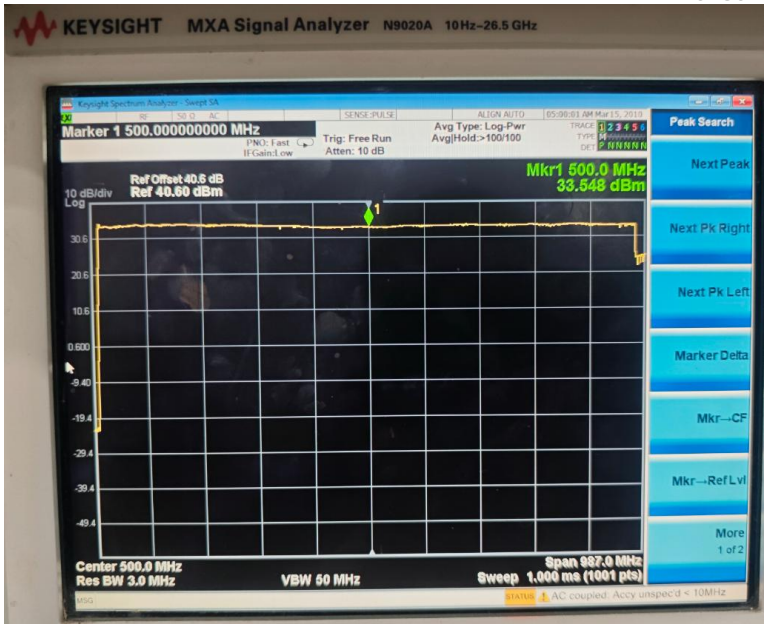


Figure 4. Output Power (25 MHz – 970 MHz)

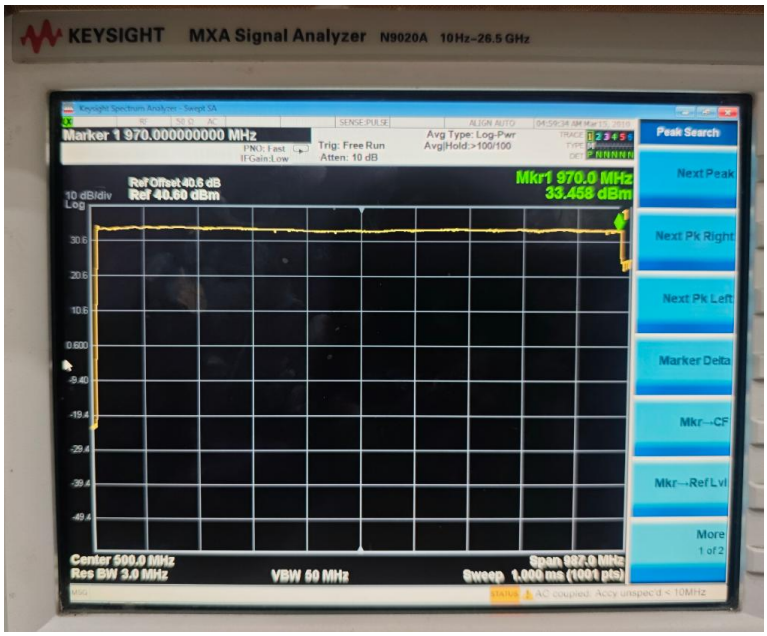


Figure 5. Output Power (25 MHz – 970 MHz)



Figure 6. Output Power (800 MHz – 1320 MHz)

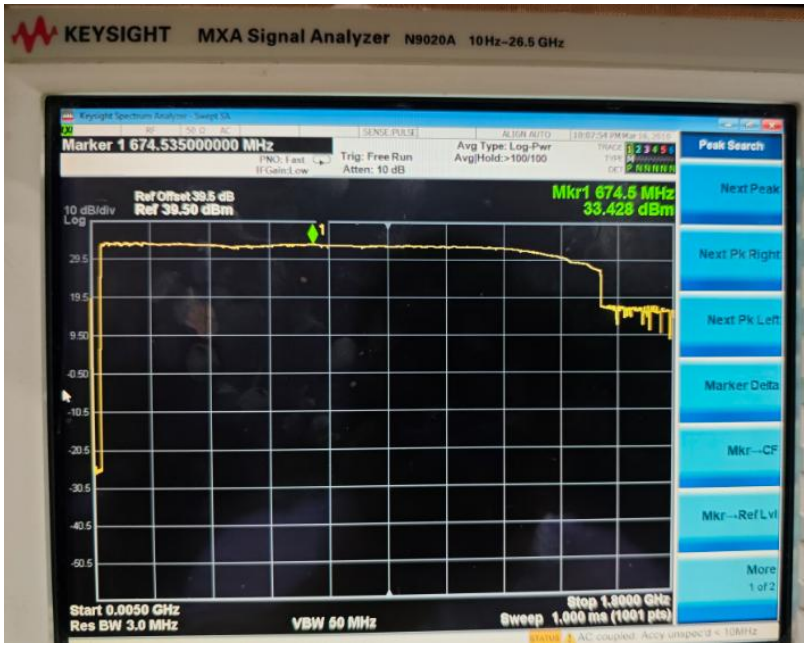


Figure 7. Power Performance (5 MHz – 1300 MHz)

5.2 Measured Performance Data

Conditions: TA = 25 °C, VCC = 12 V; Small-signal input = –30 dBm; Large-signal input = +5 dBm

Freq (MHz)	Small-Signal Gain (dB)	Large-Signal Gain (dB)	Pout (dBm)
5	35.8	28.8	34.2
100	35.3	29.0	33.5
200	35.8	28.9	33.5
300	35.7	29.1	33.6
400	35.4	29.1	33.7
500	34.9	29.1	33.4
600	34.9	29.2	33.2
700	34.9	28.8	33.2

800	35.3	28.8	33.3
900	35.3	28.8	33.5
1000	35.5	28.8	33.5
1100	35.3	28.8	33.5
1200	35.3	28.8	33.4
1300	33.2	26.8	33.2

6. RoHS Compliance

Products manufactured by our company do not contain cadmium (Cd), lead (Pb), mercury (Hg), hexavalent chromium, polybrominated biphenyls (PBB), or polybrominated diphenyl ethers (PBDE), and are therefore considered compliant with RoHS standards.

7. Electrostatic Discharge (ESD) Protection

Although this product is designed to be as robust as possible, electrostatic discharge may damage the device. Appropriate ESD precautions should be observed during handling and operation.

8. Disclaimer

The information provided herein is believed to be reliable at the time of publication. Our company reserves the right to change its products, specifications, and product descriptions at any time without prior notice.

Our company assumes no responsibility for the use of this information; all risks associated with such information are entirely borne by the user. Our company does not warrant that its products are suitable for any particular purpose, nor does it assume any liability, including but not limited to indirect or incidental damages. Our company does not authorize or warrant the use of any of its products in life-support equipment or systems.