Product Features

Frequency: 20MHz ~ 1GHz

Noise Figure: 1.5dB@600MHz

Gain: 10.7dB@600MHz

Output Third-Order Interception: 37.2dBm@600MHz

Output 1dB Compressed Power: 19.1dBm@600MHz

Supply Current 61mA@ Vdd=+5V

Package: Compatible with SMO-8C

General Description

BR8121AF is a surface-mount, PCB-based anti-blocking amplifier with a shielded metal enclosure, which covers a frequency range of 20MHz~1GHz, At 600MHz, the amplifier typically provides a gain of 10.7dB, an output IP3 of 37.2dBm, a noise figure of 1.5dB, and a quiescent current of only 61mA under the condition of +5V single power supply. The product delivers excellent gain flatness across a wide frequency band, combined with high linearity, making it suitable for high-performance transceiver systems.

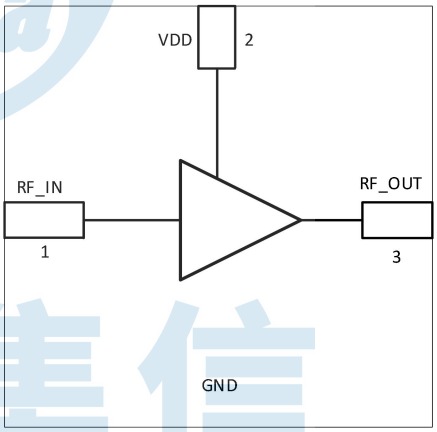
Applications

Ultrashort-Wave Application

Large Dynamic Range Receiver

Anti-blocking Amplification System

Functional Block Diagram



Ordering Information

Part Number	Package	Description
BR8121AF	Compatible SMO-8C	20MHz ~ 1GHz Anti-Blocking Amplifier

Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Test Condition
Gain	-	10.7	-	dB	600MHz
Output Power for 1dB Compression	-	19.1	-	dBm	600MHz
Output Third-Order Interception	-	37.2	-	dBm	600MHz
Noise Figure	-	1.49	-	dB	600MHz
Input Return Loss	-	-19.1	-	dB	600MHz
Output Return Loss	-	-24.9	-	dB	600MHz
Reverse Isolation	-	-14.4	-	dB	600MHz
Operating Voltage	-	5	-	V	-
Static Working Current	-	61	-	mA	-
Test Conditions: Vdd=+5V, I=61mA, OIP3 spacing=1MHz, Pout=+5dBm/tone, TA=+25℃					

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +7V

Maximum RF Pin (dBm): +17dBm

ESD Rating: Class 1C (< 1500V)

Recommended Working Conditions

Power Supply Voltage: +5V

Static Working Current: 61mA

Working Temperature: -55℃ ~ +85℃

Storage Temperature: -65℃ ~ +125℃

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

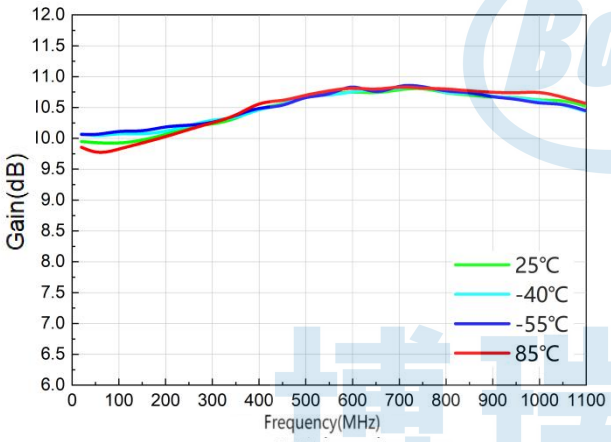
ESD WARNING

ELECTROSTATIC SENSITIVE DEVICE

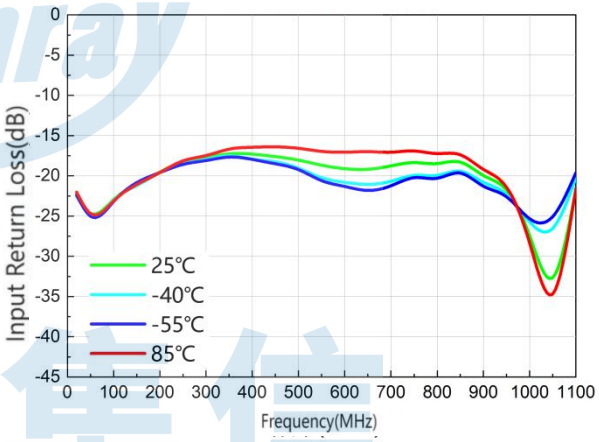
OBSERVE HANDLING PRECAUTIONS

Typical Performance((EVB test results at +5V supply voltage, 20MHz~1000MHz, 25℃)

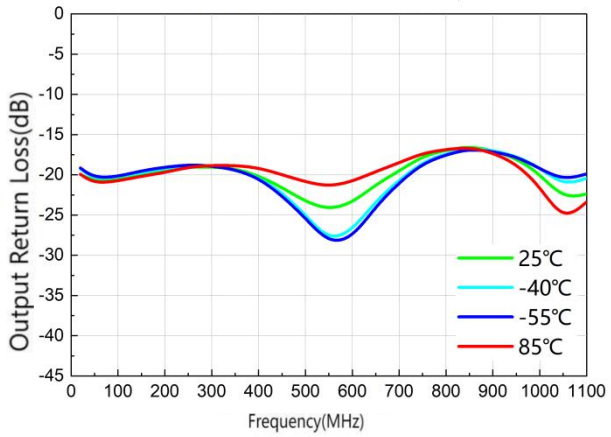
Parameters	Typ.							Units
Frequency	20	100	200	400	600	800	1000	MHz
Gain	9.9	9.9	10	10.4	10.7	10.7	10.6	dB
Input Return Loss	-22.1	-23.1	-19.4	-16.9	-19.1	-18.8	-27.5	dB
Output Return Loss	-19.7	-20.8	-19.3	-19.6	-24.9	-18.4	-20.4	dB
Isolation	-13.3	-13.6	-13.7	-14.1	-14.4	-14.8	-15.5	dB
Output Power for 1dB Compression	19.5	19.6	19.5	19.4	19.1	18.4	18.1	dBm
Output Third-Order Intercept	38.8	39.5	39.4	39.4	37.2	36.4	35.3	dBm
Noise Figure	1.10	1.02	1.12	1.19	1.49	2.03	2.38	dB
Test Conditions: Vdd=+5V, I=61mA, OIP3 spacing=1MHz, Pout=+5dBm/tone, TA=+25℃								



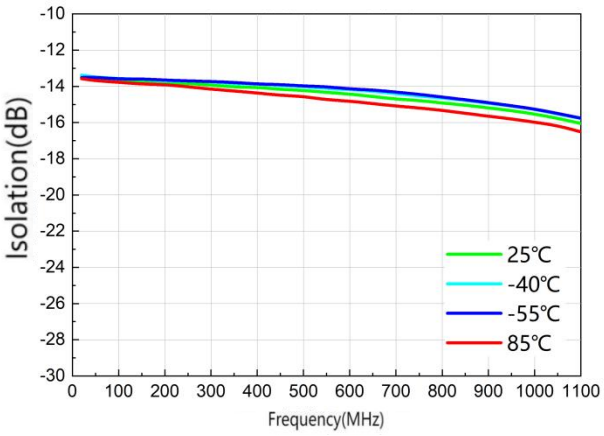
Gain vs. Freq



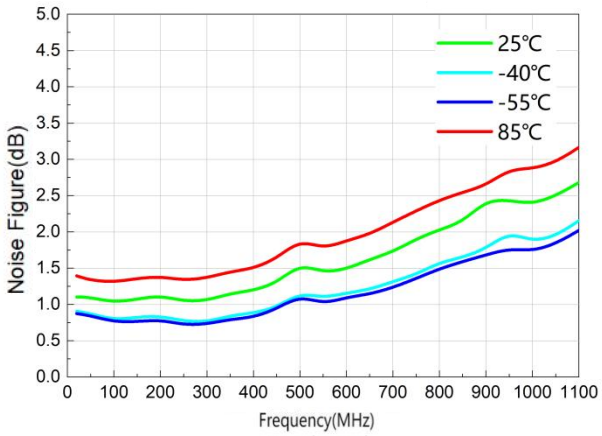
Input Return Loss vs. Freq



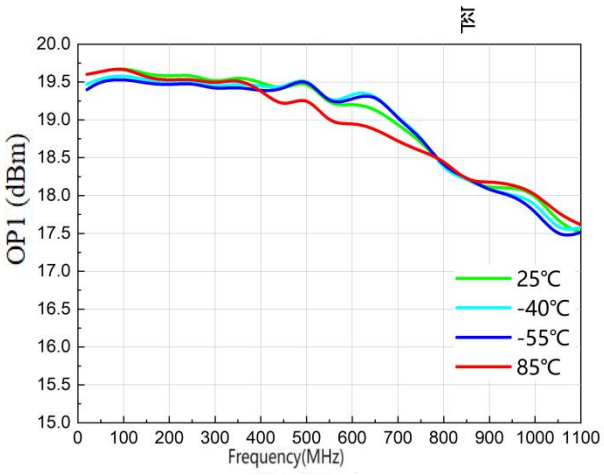
Output Return Loss vs. Freq



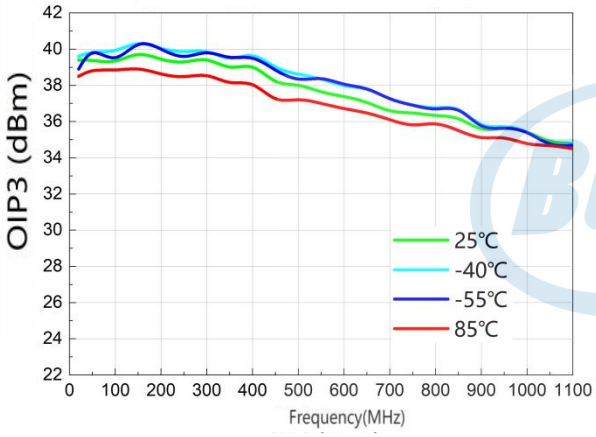
Reverse Isolation vs. Freq



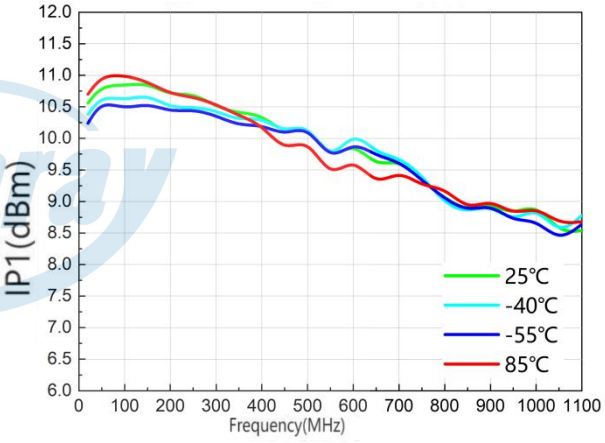
Noise Figure vs. Freq



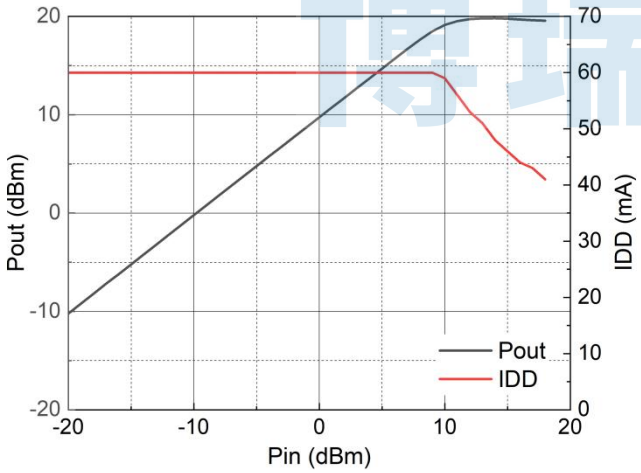
Output Power for 1dB Compression vs. Freq



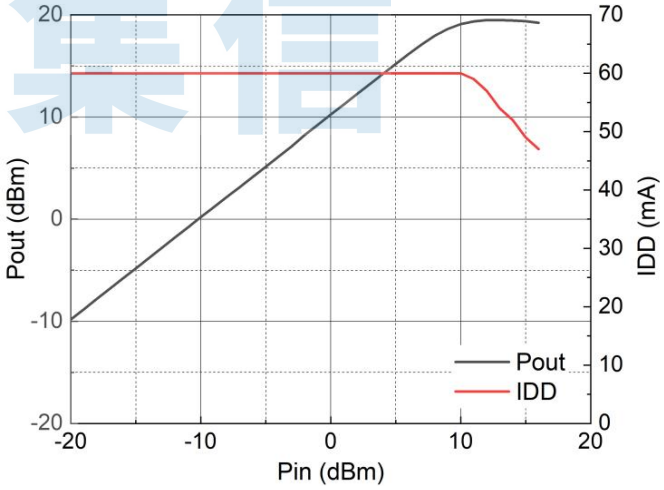
Output Third-Order Intercept vs. Freq



Input Power for 1dB Compression vs. Freq

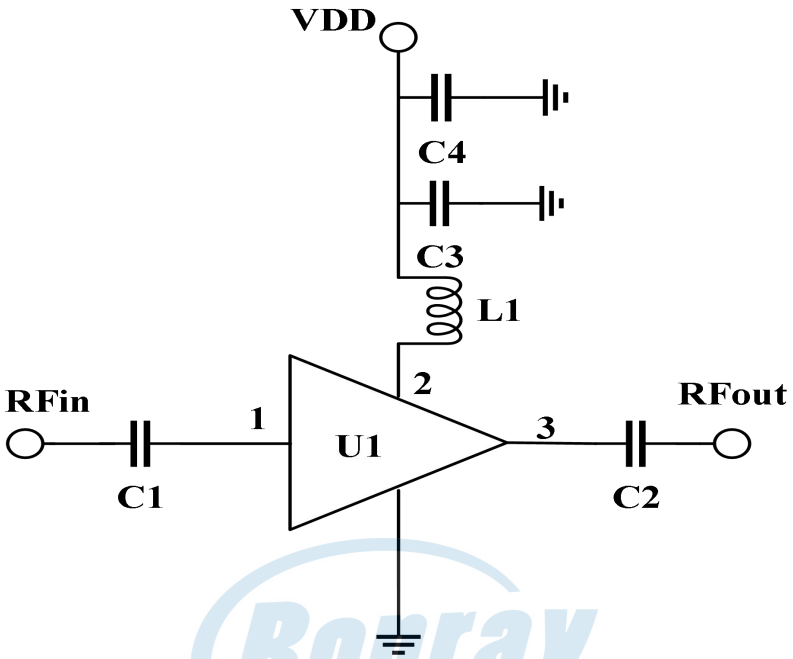


P_{out}, IDD vs P_{in} (100MHz)



P_{out}, IDD vs P_{in} (600MHz)

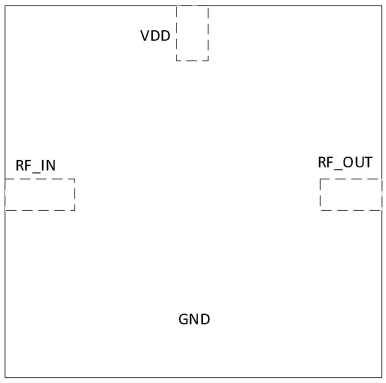
Typical Application Schematic



Bill of Material

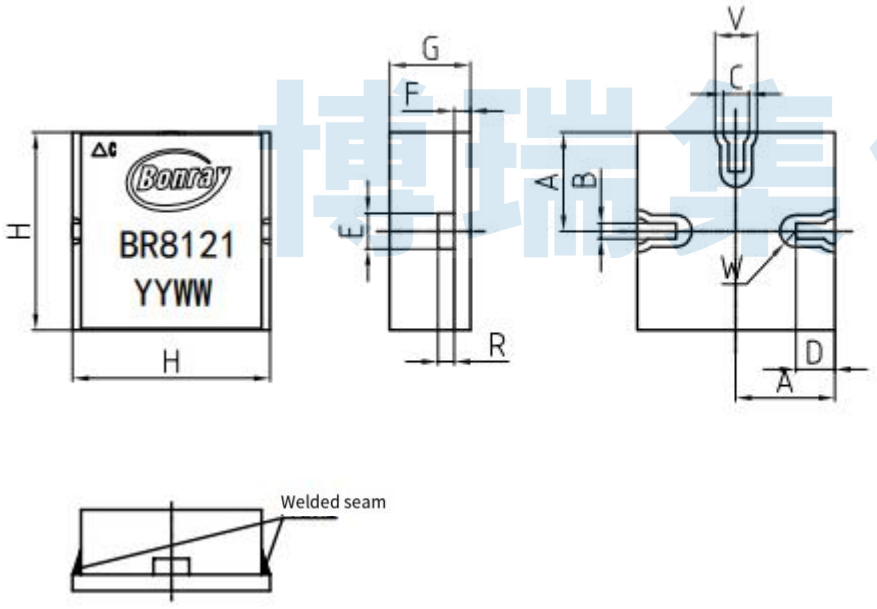
Reference Designator	Package Size	Value	P/N
L1	0603	3.3 uH	1008AF-332X_EC
C1, C2	0402	10nF	GRM155R71H103JA88D
C3	0402	1nF	GRM1555C1H102JA01D
C4	0402	1uF	C1005X5R1V105K050BC

Pin Configuration and Description



Pin Number	Pin name	Description
1	RFin	RF input pins. The pin is AC coupled
2	VDD	Power supply pin.
3	RFout	RF output pin. The pin is AC Coupled
4	GND	Ground pin. The pin must be connected to the RF/DC ground.

Package Dimensions (unit: mm)



Numbering	Min.	Typ.	Max.
A	5.9	6.1	6.3
B	0.9	1.0	1.1
C	1.5	1.6	1.7
D	2.3	2.4	2.5
E	3.2	3.4	3.6
F	-	1.0	-
G	4.8	5.0	5.2
H	12.1	12.2	12.3
R	0.8	1.0	1.2
V	2.2	2.4	2.6
W	-	0.99	-

4 PIN Notes: The pin is GND grounded and needs to be welded. The size of the welding surface is 12.2mm x 12.2mm rectangle minus the size of the PIN avoidance.

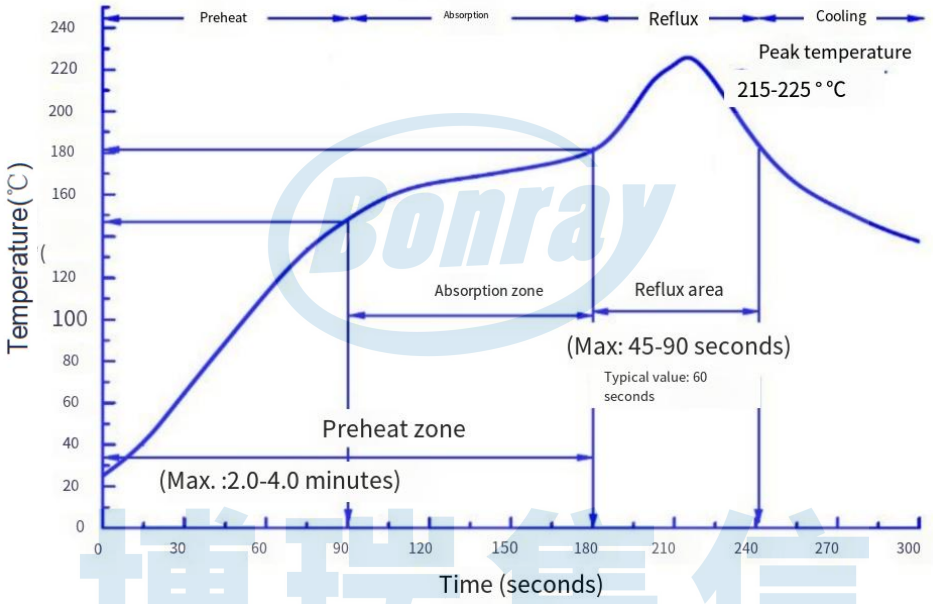
Handling Precautions:

1. The product is an ESD-sensitive device. Proper electrostatic protection measures must be implemented during transportation, assembly, and operation.

2. The component is classified as Moisture Sensitivity Level 3 (MSL3). Storage, handling, transportation, and packaging must comply with IPC/JEDEC J-STD-033 standards.

3. Ensure reliable grounding by connecting both the GND pin and the bottom metallized pad to the system ground plane.

4. Recommended assembly method: SMT (Surface Mount Technology) with Sn63/Pb37 solder paste (melting point: 183°C). Refer to the attached reflow temperature profile for process parameters.



The provided reflow temperature profile is a general recommendation. Actual parameters may vary depending on the substrate and reflow oven performance. The measured substrate temperature during reflow must not exceed the maximum assembly temperature specified in the absolute maximum ratings.

5. If rework or repair is necessary, the device must be baked according to Section 1 requirements prior to any heating process to prevent thermal damage. The total number of reflow and rework cycles shall not exceed three (3).

6. Customers must evaluate environmental conditions to determine if protective coating is required. For applications exposed to salt spray or corrosive environments, conformal coating (e.g., acrylic, silicone) must be applied after soldering and cleaning to enhance environmental resistance.