Product Features

Frequency: 0.02GHz ~ 8GHz

Noise Figure: 1.1dB@1GHz

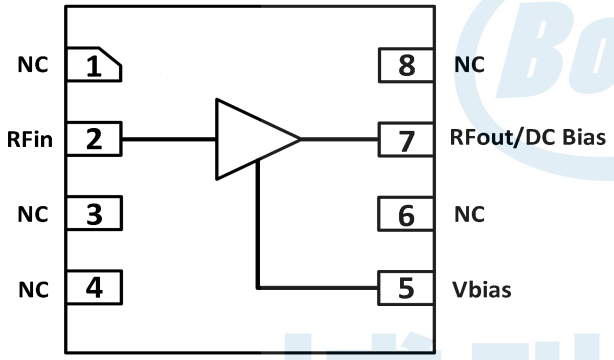
Gain: 23.2dB@1GHz

Output Third-Order Interception: 36.3dBm@1GHz

Output Power for 1dB Compression: 20.1dBm@1GHz

Package: DFN8

Functional Block Diagram



General Description

BR9617DAJ is a high-performance broadband low noise amplifier manufactured using GaAs process over the frequency range of 0.02GHz~8GHz. The amplifier is internally matched to 50 ohms, and only requires an external RF choke and blocking/bypass capacitors. The amplifier contains on-chip active bias network to ensures that the quiescent current is not affected by fluctuation of process and temperature. The product, with +5V single power supply, provides high gain flatness, high linearity, low noise figure, high output power for 1dB compression and output third-order interception, which can be applied in the system with high dynamic range.

Ordering Information

Part Number	Package	Description
BR9617DAJ	DFN8	0.02GHz ~ 8GHz Low Noise Amplifier

Electrical Specifications

Parameters	Test Conditions	Min.	Typ.	Max.	Units
Gain	1GHz	-	23.2	-	dB
	4GHz	-	22.5	-	dB
Input Return Loss	1GHz	-	-15.9	-	dB
	4GHz	-	-16.7	-	dB
Output Return Loss	1GHz	-	-24.2	-	dB
	4GHz	-	-35.1	-	dB
Reverse Isolation	1GHz	-	-27.1	-	dB
	4GHz	-	-27.9	-	dB
Output Power for 1dB Compression	1GHz	-	20.1	-	dBm
	4GHz	-	20.0	-	dBm
Output Third-Order Interception	1GHz	-	36.3	-	dBm
	4GHz	-	34.6	-	dBm
Noise Figure	1GHz	-	1.1	-	dB
	4GHz	-	1.1	-	dB
Supply Voltage	-	-	+5	-	V
Supply Current	-	-	87	-	mA
Test Condition: V_{dd}=+5V, I=87mA, OIP3 spacing=1MHz, P_{out}=5dBm/tone, TA=+25℃					

Absolute Maximum Ratings

Maximum Supply Voltage (Vdd): +6V

Maximum RF input Power: +23dBm

Recommended Operating Conditions

Supply Voltage: +5V

Supply Current: 87mA

Operating Temperature: -55℃ ~ +125℃

Storage Temperature: -65℃ ~ +150℃

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

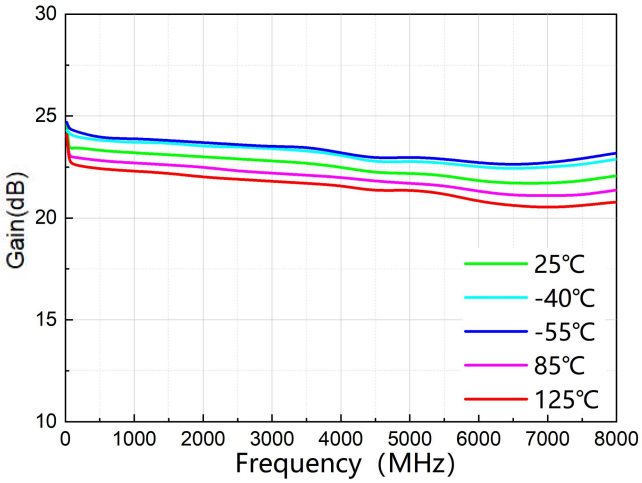
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

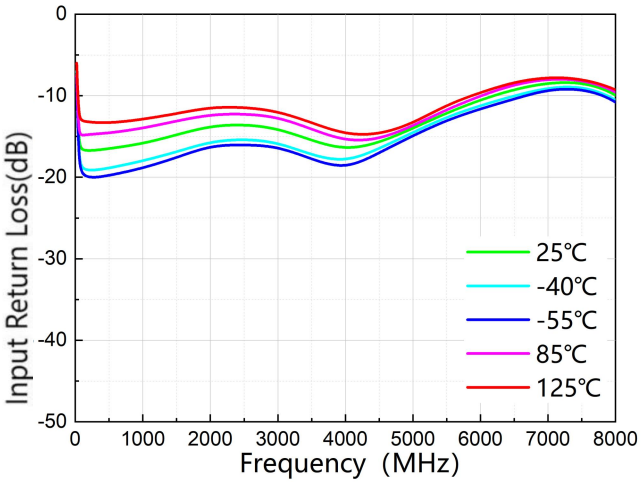
Typical Performance (EVB test results at+5V Supply Voltage)

Parameters	Typ.									Units
Frequency	20	50	100	500	1000	1500	2000	2500	3000	MHz
Gain	24.7	23.3	23.5	23.3	23.2	23.1	23.0	22.9	22.8	dB
Input Return Loss	-7.4	-16.1	-16.9	-16.5	-15.9	-14.8	-13.7	-13.5	-14.0	dB
Output Return Loss	-15.4	-21.4	-23.0	-22.2	-24.2	-27.3	-26.9	-26.8	-27.0	dB
Reverse Isolation	-23.5	-27.2	-26.7	-26.9	-27.1	-27.2	-27.3	-27.5	-27.6	dB
Output Power for 1dB Compression	19.2	19.8	20.2	20.4	20.1	20.2	20.1	19.9	19.7	dBm
Output Third-Order Interception	31.0	32.4	33.8	37.0	36.3	35.6	35.1	34.5	34.5	dBm
Noise Figure	5.8	2.8	1.8	1.1	1.1	1.2	1.1	1.2	1.1	dB
Parameters	**Typ.**									**Units**
Frequency	3500	4000	4500	5000	5500	6000	6500	7000	8000	MHz
Gain	22.7	22.5	22.2	22.2	22.1	21.8	21.7	21.7	22.1	dB
Input Return Loss	-15.5	-16.7	-15.8	-14.0	-12.1	-10.5	-9.2	-8.4	-9.6	dB
Output Return Loss	-35.2	-35.1	-24.8	-21.0	-23.8	-31.6	-19.0	-14.5	-13.0	dB
Reverse Isolation	-27.7	-27.9	-28.2	-28.4	-28.6	-28.9	-29.3	-29.7	-30.0	dB
Output Power for 1dB Compression	20.0	20.0	20.0	20.0	19.2	18.4	18.3	18.6	18.4	dBm
Output Third-Order Interception	34.4	34.6	34.8	34.6	33.4	32.4	32.2	32.2	32.3	dBm
Noise Figure	1.1	1.1	1.1	1.2	1.2	1.4	1.6	1.5	1.3	dB

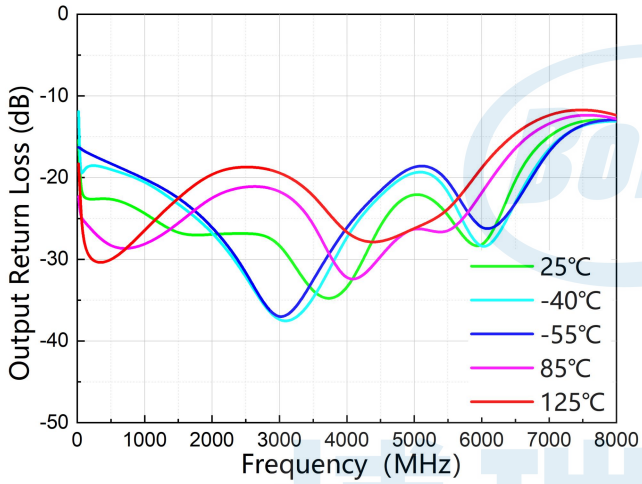
Test Conditions: Vdd=+5V, I=87mA, OIP3 spacing=1MHz, P_{out}=5dBm/tone, TA=+25℃



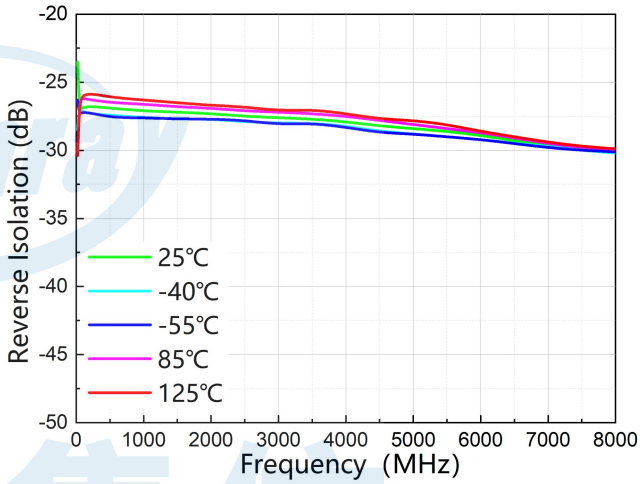
Gain



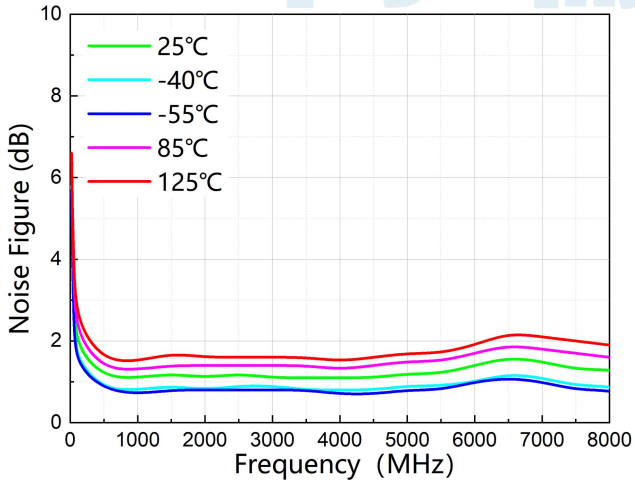
Input Return Loss



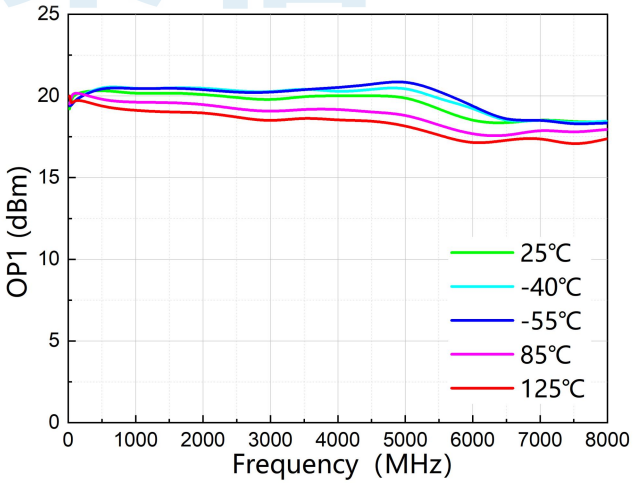
Output Return Loss



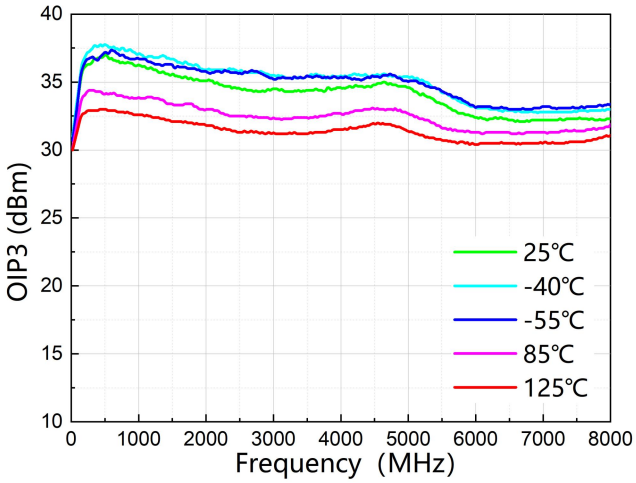
Reverse Isolation



Noise Figure

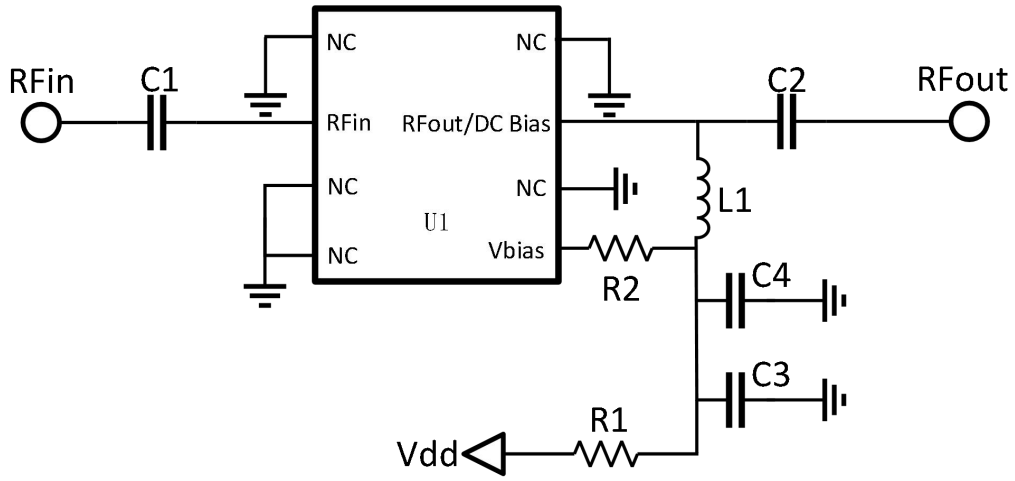


Output Power for 1dB Compression



Output Third-Order Interception

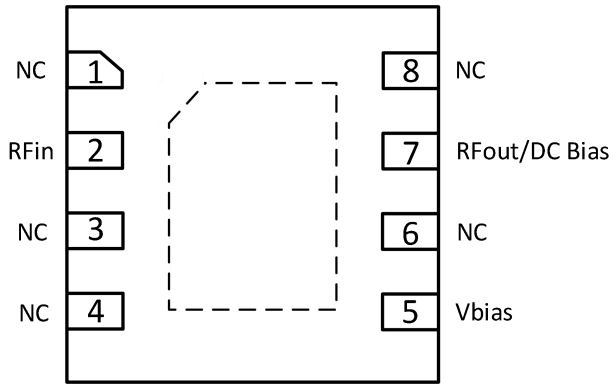
Typical Application Schematic



Bill of Material

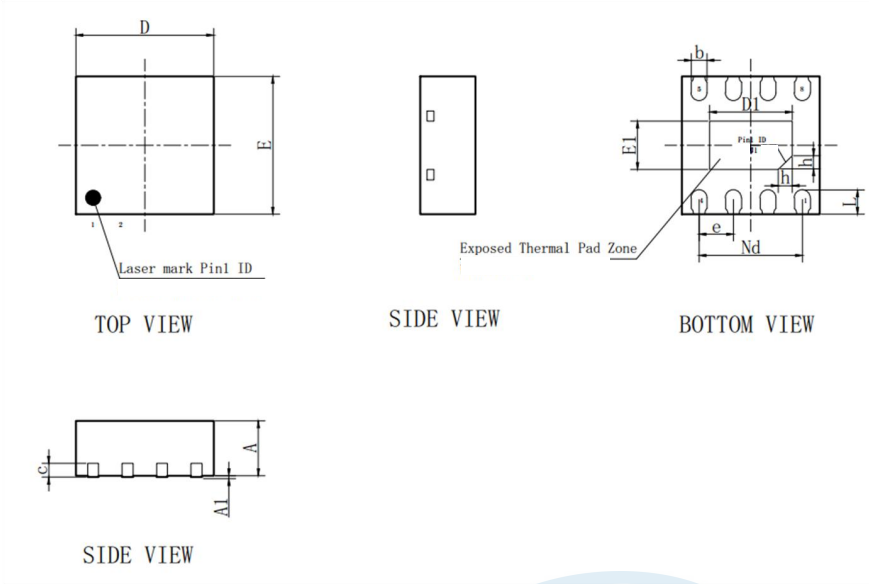
Designator	Package	Description	Part Number
U1	DFN8	Low noise amplifier	BR9617DAJ
L1	1008	1.1uH	1008AF-112XJRB
C3	0603	1nF	GCD188R71H102KA01D
C4	0402	100pF	GRM1555C1H101JA01D
C1, C2	0402	330pF	GRM1555C1H331JA01D
R1	0402	5.6Ω	RC0402JR-075R6L
R2	0402	10Ω	RC0402FR-0710RL

Pin Configuration and Description



Pin Number	Pin Name	Description
2	RFin	RF input pin. A DC Block is required.
5	Vbias	Bias pin. Sets the Icq bias point for the device.
7	RFout /DC Bias	RF Output pin. DC bias will also need to be injected through a RF bias choke/inductor for operation.
1, 3, 4, 6, 8	NC	No electrical connection. Provide grounded land pads for PCB mounting integrity.
-	EP	RF/DC ground. Use recommended via pattern to minimize inductance and thermal resistant; see PCB Mounting Pattern for suggested footprint.

Package Dimensions (mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.75	0.80	0.85
A1	0.01	0.02	0.05
b	0.20	0.25	0.30
c		0.270REF	
D	1.95	2.00	2.05
D1	1.50	1.60	1.70
e		0.50BSC	
Nd		1.50BSC	
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
L	0.20	0.25	0.30
h	0.25	0.30	0.35