

Product Features

Operating Frequency: 30MHz ~ 4GHz

Gain: 17.3dB@900MHz

Output Power for 1dB Compression:

20.3dBm@900MHz

Noise Figure: 1.7dB@900MHz

Output Third-Order Intercept:

35.1dBm@900MHz

Vdd=5V, Static Supply Current 66mA

Package: SOT89 (Plastic seal)

Application

Cellular, PCS, GSM

Satellite Navigation

Drive Amplifier

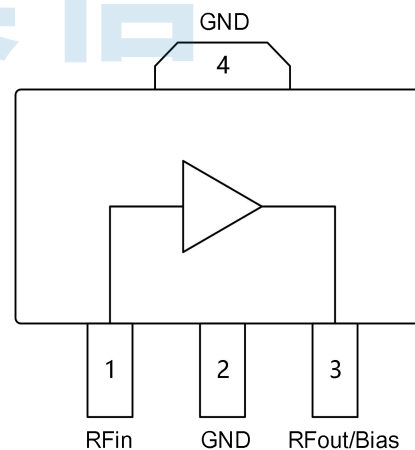
General Description

The BR9104TA is a high performance MMIC low noise amplifier chip designed based on the GaAs process. The product can cover the frequency range of 30MHz ~ 4GHz, and has been matched to 50 ohms, the RF input and output ports only need to apply a direct isolation capacitor, and the on-chip active bias network ensures that the Supply Current is not affected by threshold voltage and temperature. Using +5V single power supply Supply Voltage, it has the characteristics of high stability, high linearity, low Noise Figure, high output power 1dB compression point and third-order crossmodulation, which makes the product can be used in the system with high dynamic range.

Ordering Information

Part Number	Package	Description
BR9104TA	SOT89	30MHz to 4GHz Low Noise Amplifier

Functional Block Diagram



Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Test Conditions
Gain	-	17.9	-	dB	50MHz
	-	17.6	-	dB	700MHz
	-	15.4	-	dB	2500MHz
Output Power for 1dB Compression	-	20.0	-	dBm	50MHz
	-	20.4	-	dBm	700MHz
Output Third-Order Interception	-	36.9	-	dBm	50MHz
	-	36.1	-	dBm	700MHz
Noise Figure	-	1.5	-	dB	50MHz
	-	1.6	-	dB	700MHz
Input Return Loss	-	-23.6	-	dB	700MHz
Output Return Loss	-	-17.9	-	dB	700MHz
Reverse Isolation	-	-21.2	-	dB	700MHz
Operating Voltage	-	5	-	V	-
Static Supply Current	-	66	-	mA	-
Test Conditions: Vdd=+5V, I=66mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C					

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +7V;

Maximum RF input Power: +20dBm.

Recommended Working Conditions

Power Supply Voltage: +5V

Storage Temperature: -65°C ~ +150°C

Operating Temperature: -55°C ~ +125°C

Note: Operation of this device outside the parameter ranges given above may cause permanent damage. These are stress ratings only, and functional operation of the device at these conditions is not implied. Please pay attention to good heat dissipation under high temperature operation.

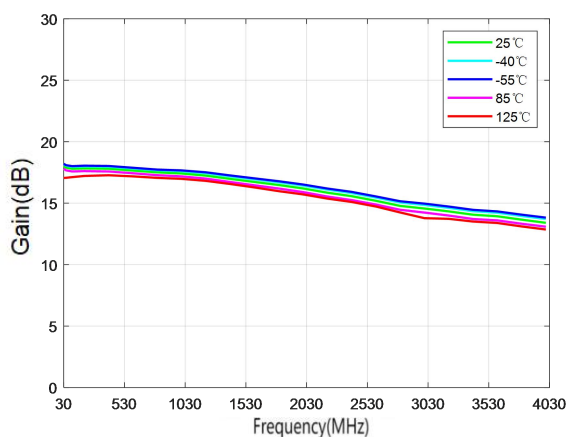
ESD WARNING


ELECTROSTATIC SENSITIVE DEVICE

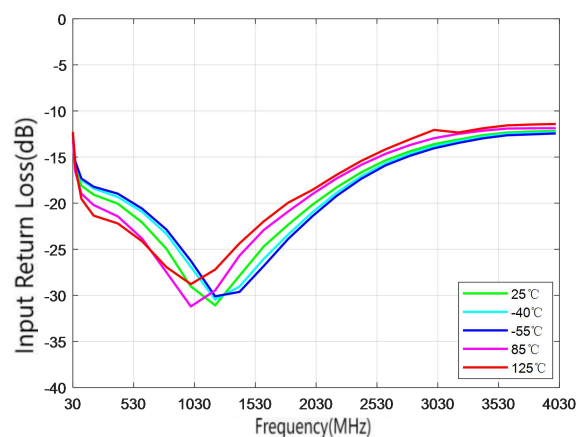
OBSERVE HANDLING PRECAUTIONS

Typical Performance((EVB test results at +5V supply voltage)

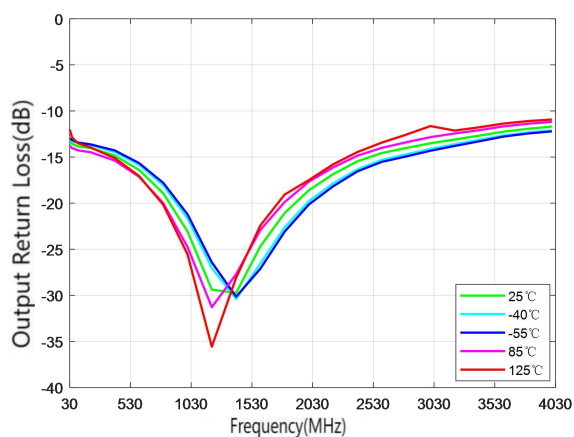
Parameters	Typ.							Units
Frequency	30	50	100	400	600	800	1000	MHz
Gain	17.9	17.8	17.7	17.7	17.5	17.3	17.2	dB
Input Return Loss	-12.9	-16.1	-18.1	-20.1	-22.1	-25.1	-29.0	dB
Output Return Loss	-13.4	-13.6	-13.9	-14.8	-16.4	-19.1	-23.1	dB
Output Power for 1dB Compression	19.6	20.0	21.5	21.6	20.5	20.3	20.2	dBm
Output Third-Order Interception	36.4	36.9	35.6	36.2	36.4	35.3	34.7	dBm
Noise Figure	1.5	1.5	1.5	1.4	1.5	1.7	1.7	dB
Frequency	1400	1600	2000	2600	3000	3600	4000	MHz
Gain	16.7	16.4	15.8	14.7	14.1	13.4	12.8	dB
Input Return Loss	-27.9	-24.7	-20.2	-15.4	-13.6	-12.3	-12.2	dB
Output Return Loss	-29.7	-24.7	-18.6	-14.6	-13.5	-12.2	-11.7	dB
Output Power for 1dB Compression	19.8	19.7	19.9	19.5	19.8	20.1	20.2	dBm
Output Third-Order Interception	34.9	34.7	34.1	34.7	34.2	35.3	35.1	dBm
Noise Figure	1.7	1.7	1.7	1.9	2.1	2.2	2.3	dB
Test Conditions: Vdd=+5V, I=66mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C								



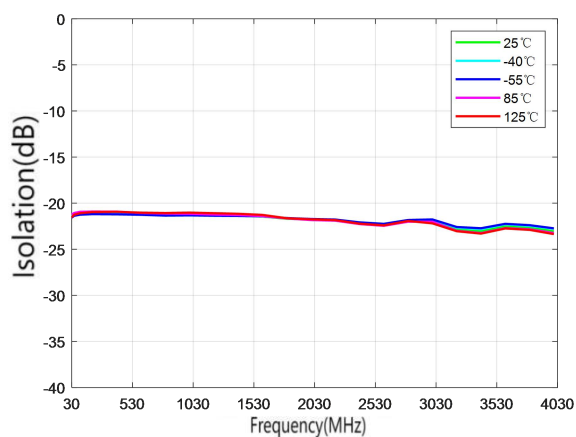
Gain vs. Freq



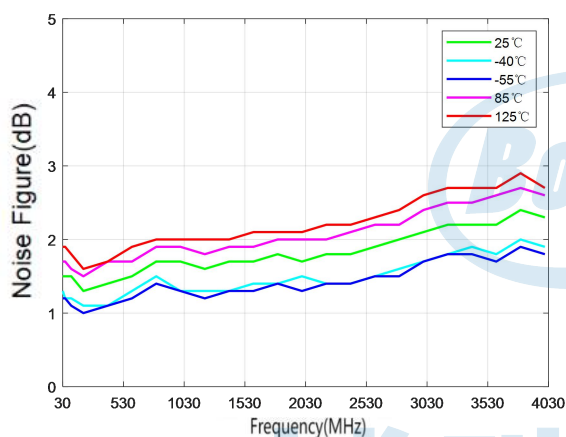
Input Return Loss vs. Freq



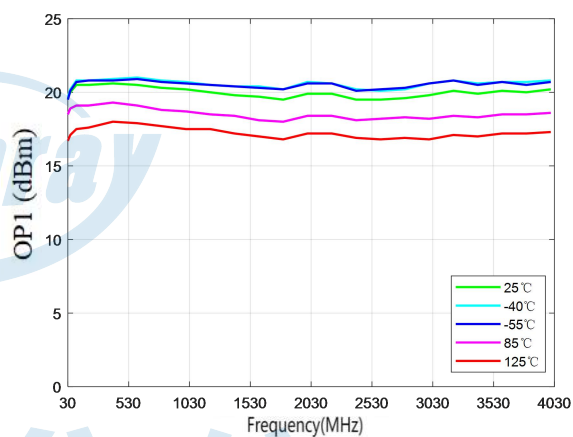
Output Return Loss vs. Freq



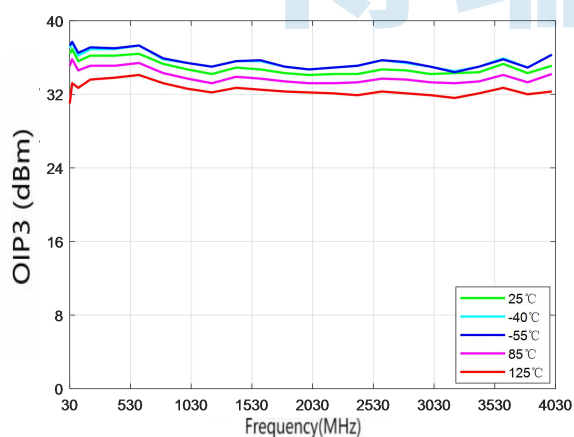
Reverse Isolation vs. Freq



Noise Figure vs. Freq

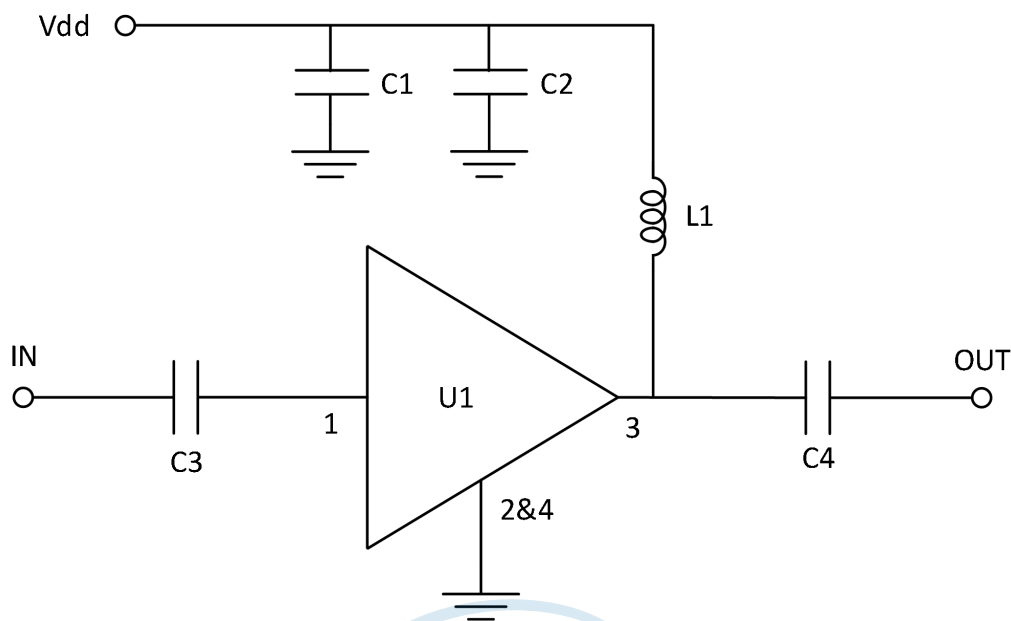


Output Power for 1dB Compression vs. Freq



Output Third-Order Intercept vs. Freq

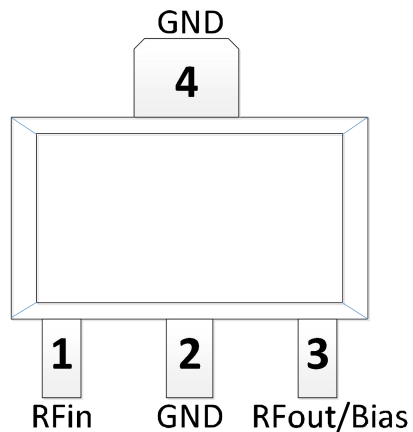
Typical Application Schematic



Bill of Material

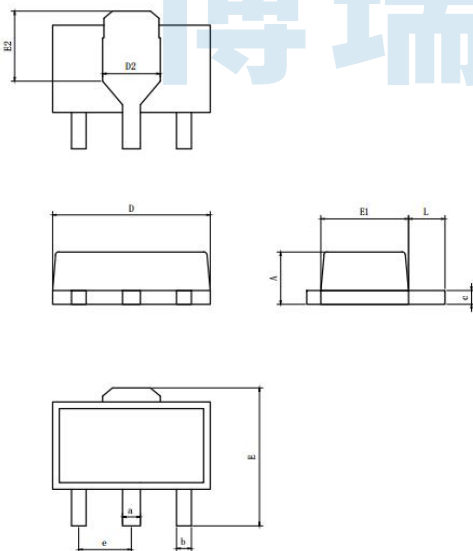
Reference Designator	Package Size	Value	P/N
U1	SOT89	30MHz ~ 4GHz	BR9104TA
C1	0402	2.2uF	GRM155C71A225KE11D
C2	0402	100pF	GRM1555C1H101JA01D
C3, C4	0402	2.2the nF	GCJ188C70J222KE02D
L1	1008	1.1uH	1008AF-112X_EC

Pin Configuration and Description



Pins Number	Part Name	Description
1	RFin	Rf input pins; The pin is DC coupled and has been internally matched to 50 ohms, and only needs to be added with a spacer capacitor.
2,4	GND	Ground pins; This pin and the package substrate must be connected to the RF/DC ground.
3	RFout/Bias	Rf output pin; The pin is DC coupled and has been internally matched to 50 ohms, only need to add a isolating capacitor.

Package Information (unit: mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.37	0.42	0.45
c	0.38	—	0.42
a	0.45	0.48	0.51
D	4.40	4.50	4.60
E	4.00	4.10	4.20
E1	2.40	2.50	2.60
e	1.50BSC		
L	0.89	1.045	1.20
D2	1.50	1.60	1.70
E2	2.218	2.318	2.418