

Product Features

Frequency: 30MHz ~ 3GHz

OIP3: 28.9dBm@1000MHz

OP1dB: 17.1dBm@1000MHz

Gain: 15dB@1000MHz

Noise Figure: 1.7dB@1000MHz

36mA @Vdd=+5V

Package: SOT89

Application

Cellular

CATV

Base Station

High Linearity Application

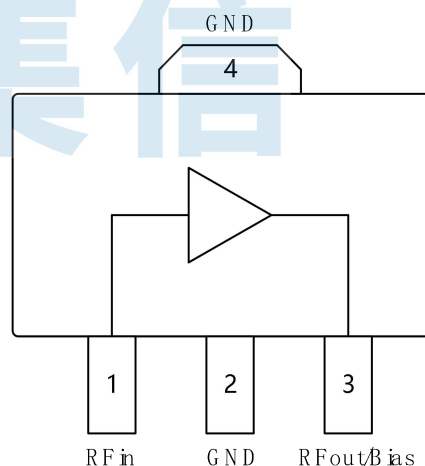
General Description

BR9116TA is a high-performance MMIC low noise amplifier, which can cover a frequency range of 30MHz ~ 3GHz. It has been internally matched to 50 ohms, and only requires an external RF choke and blocking/bypass capacitors. The on-chip active bias network ensures that the quiescent current is not affected by temperature. The product is powered by +5V single power supply with the characteristics of high stability, high linearity, low noise figure, high output P1dB and output IP3, which can be applied in high dynamic range system.

Ordering Information

Part Number	Package	Description
BR9116TA	SOT89	30MHz ~ 3GHz Low Noise Amplifier

Functional Block Diagram



Electrical Specifications

Parameter	Min.	Typ.	Max.	Units	Test Condition
Gain	-	16.3	-	dB	100MHz
	-	14.0	-	dB	1500MHz
Output Power for 1dB Compression	-	17.3	-	dBm	100MHz
	-	16.7	-	dBm	1500MHz
Output Third-Order Interception	-	29.1	-	dBm	100MHz
	-	28.1	-	dBm	1500MHz
Noise Figure	-	1.64	-	dB	100MHz
	-	1.76	-	dB	1500MHz
Input Return Loss	-	-16	-	dB	100MHz
	-	-9.6	-	dB	1500MHz
Output Return Loss	-	-28.3	-	dB	100MHz
	-	-15.2	-	dB	1500MHz
Reverse Isolation	-	-20.5	-	dB	100MHz
	-	-21.3	-	dB	1500MHz
Supply Voltage	-	+5	-	V	-
Supply Current	-	36	-	mA	-
Test Condition: Vdd=+5V, I=36mA, OIP3 spacing=1MHz, Pout=5dBm/tone, TA=+25°C					

Absolute Maximum Ratings

Maximum Operating Voltage: +6V

Maximum RF input Power: +20dBm

Recommended Working Conditions

Supply Voltage: +5V

Supply Current: 36mA @ Vdd=+5V

Operating Temperature: -55°C ~ +125°C

Storage Temperature: -65°C ~ +150°C

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

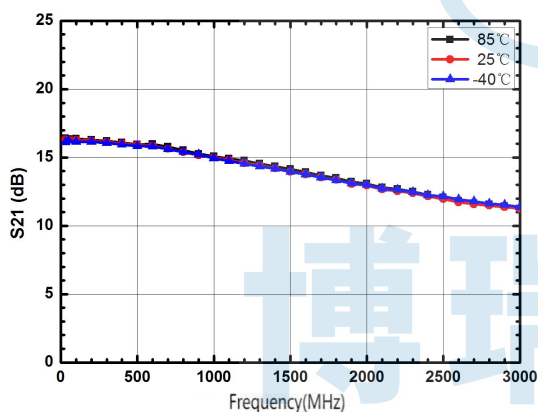


ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

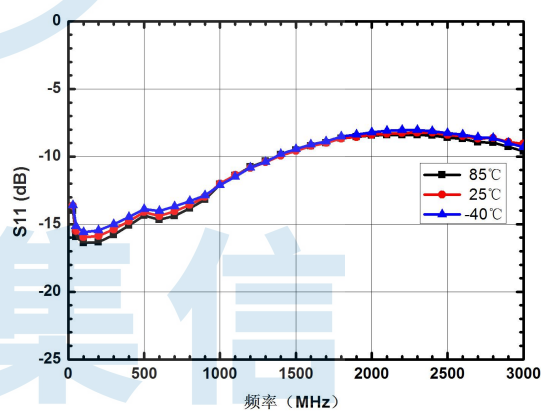
Typical Performance (EVB test results at +5V supply voltage)

Parameter	Typ.							Units
Frequency	30	100	500	800	1500	2400	3000	MHz
Gain	16.3	16.3	15.9	15.4	13.9	12.1	11.2	dB
Output Power for 1dB Compression	17.8	17.3	17.3	17.3	16.7	16	16.6	dBm
Output-Third-Order Interception	28.8	29.1	28.2	29	28.1	26.3	26.9	dBm
Noise Figure	2.5	1.64	1.65	1.67	1.76	1.84	2.16	dB
Input Return Loss	-13.6	-15.9	-14.1	-13.6	-9.6	-8.2	-9.1	dB
Output Return Loss	-20.8	-28.3	-22.6	-22.2	-15.2	-10.6	-10.7	dB
Reverse Isolation	-20.7	-20.5	-20.7	-20.9	-21.3	-21.3	-21.2	dB

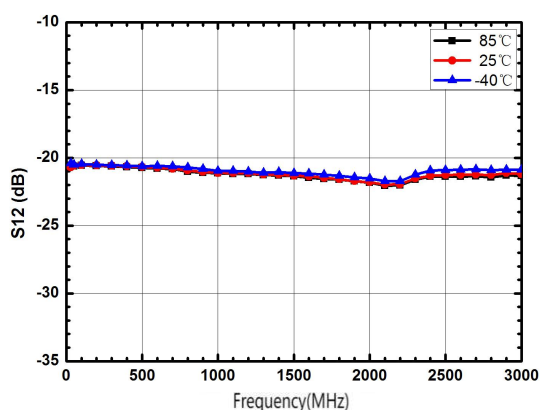
Test Condition: Vdd=+5V, I=36mA, OIP3 spacing=1MHz, Pout=5dBm/tone, TA=+25°C



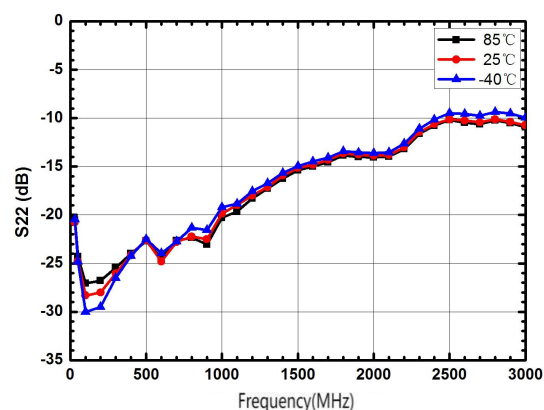
Gain vs. Freq



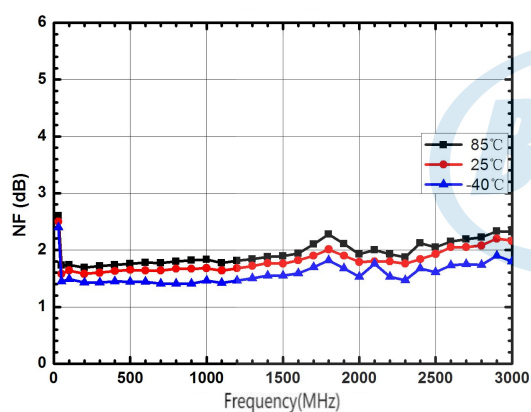
Reverse Isolation vs. Freq



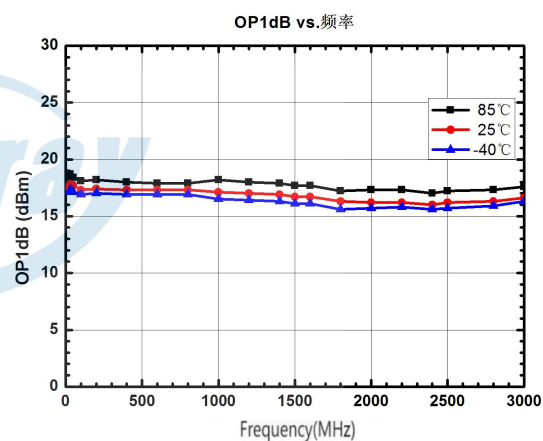
Input Return Loss vs. Freq



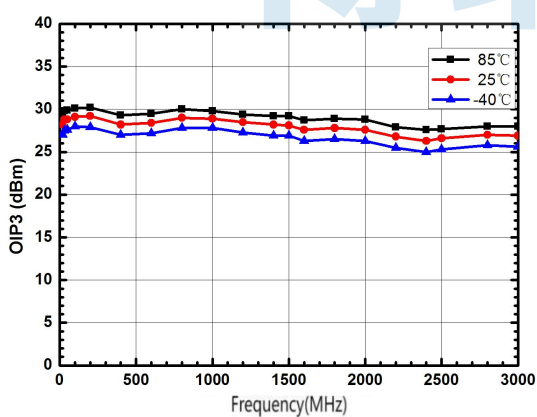
Output Return Loss vs. Freq



Noise Figure vs. Freq

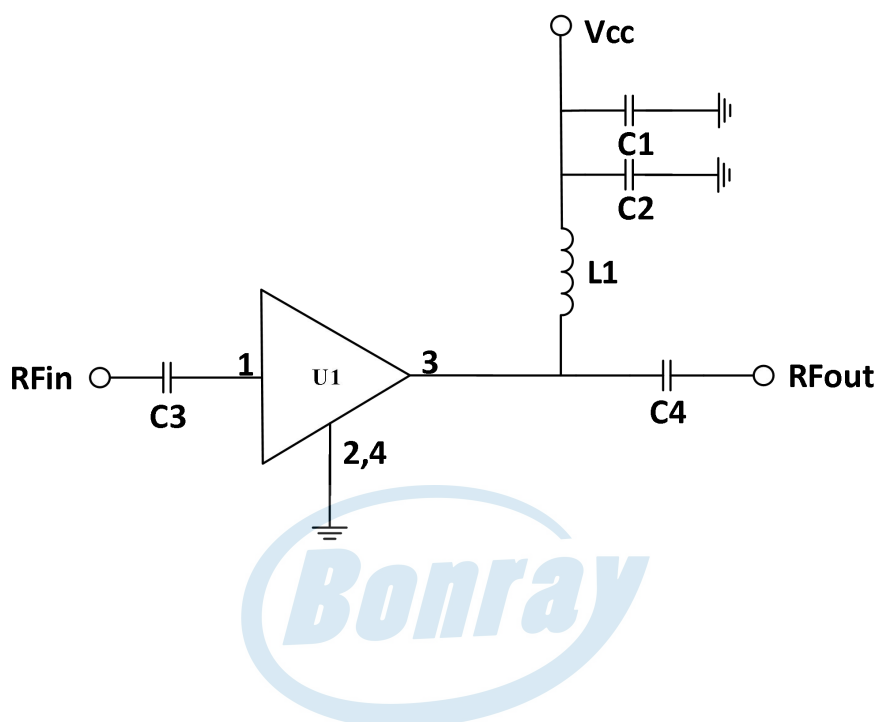


Output Power for 1dB Compression vs. Freq



Output Third-Order Intercept vs. Freq

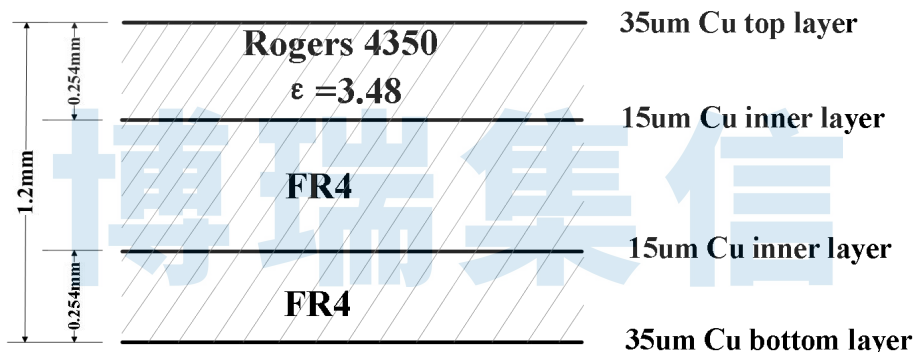
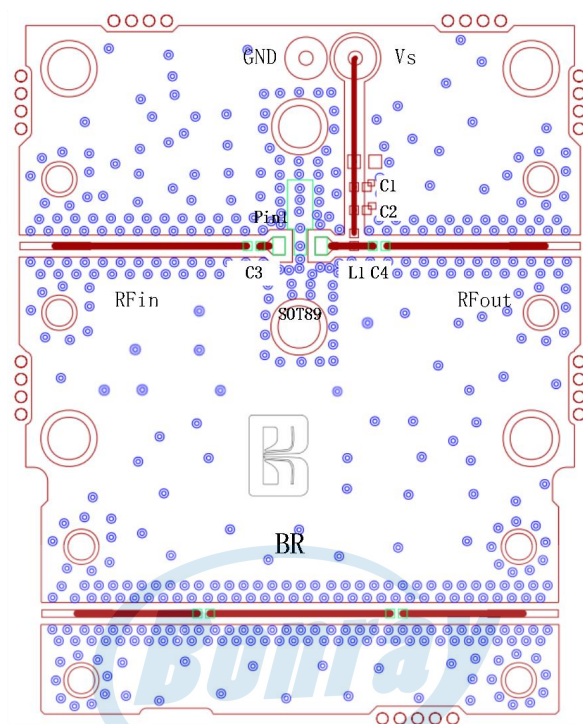
Typical Application Schematic



Bill of Material

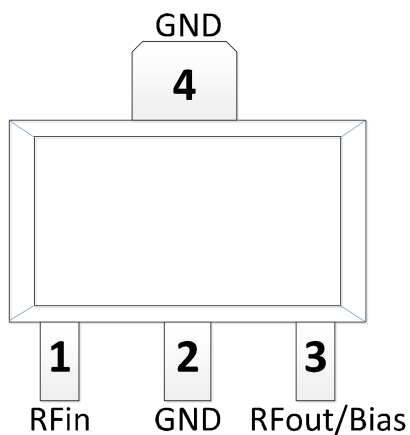
Reference Designator	P/N(30MHz-1000MHz)	P/N(1000MHz-3000MHz)
L1	1000nH, Murata,0603 Pkg, LQW18CNR102J00	100nH, Murata,0603 Pkg, LQW18ANR10J00
C1	2.2 μ F, Murata,0402 Pkg, GRM155C71A225KE11	2.2 μ F, Murata,0402 Pkg, GRM155C71A225KE11
C2, C3, C4	1000pF, Murata,0402 Pkg GRM1555C1H102JA01	100pF, Murata,0402 Pkg, GRM1555C1H101JA01

PCB Evaluation Board



50ohm transmission line:
width=0.53mm,spacing=0.53mm

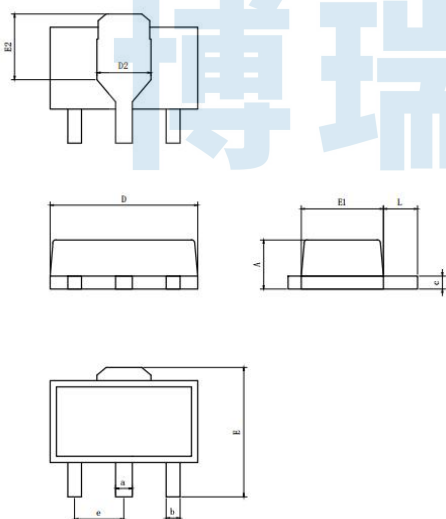
Pin Configuration and Description



Pin Number	Pin Name	Description
1	RFin	RF input pin. A DC Block is required.
2,4	GND	Ground pins. These pins must be connected to RF/DC ground
3	RFout/Bias	RF Output and DC bias pin. DC bias will also need to be injected through a RF bias choke/inductor for operation.



Package Dimensions (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
d	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