

Product Features

Frequency: 1MHz ~ 1GHz
 Gain: 17.1dB@100MHz
 Output Power for 1dB Compression:
 21.6dBm@100MHz
 Noise Figure: 1.8dB@100MHz
 Output Third-Order Interception:
 33dBm@100MHz
 Supply Current: 68mA @ Vdd=5V
 Package: SOT89

Application

Shortwave communication
 Cellular
 Receiver

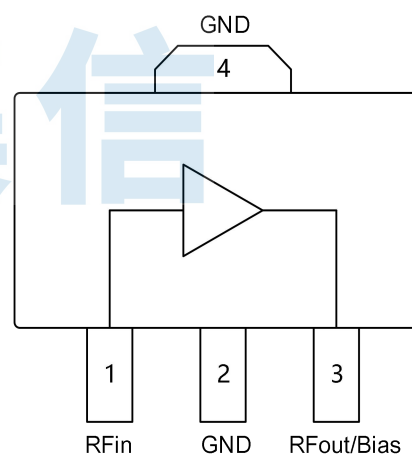
General Description

BR9513TA is a high-performance MMIC low noise amplifier, which can cover the frequency range of 1MHz to 1GHz. It has been internally matched to 50 ohms and requires an external RF choke and blocking/bypass capacitors. The on-chip active bias network ensures that the quiescent current of the amplifier is not affected by temperature. The amplifier is powered by a single supply voltage of +5V 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 systems.

Ordering Information

Part Number	Package	Description
BR9513TA	SOT89	1MHz ~ 1GHz Low Noise Amplifier

Functional Block Diagram



Electrical Specifications

Parameter	Min.	Typ.	Max.	Units	Test Condition
Gain	-	17.1	-	dB	1MHz
	-	17.1	-	dB	100MHz
	-	13.9	-	dB	1000MHz
Output Power for 1dB	-	21.6	-	dBm	100MHz
Compression	-	21.3	-	dBm	1000MHz
Output Third-Order	-	33.0	-	dBm	100MHz
Interception	-	33.1	-	dBm	1000MHz
Noise Figure	-	1.8	-	dB	100MHz
	-	2.1	-	dB	1000MHz
Input Return Loss	-	-23.5	-	dB	100MHz
Output Return Loss	-	-16.8	-	dB	100MHz
Reverse Isolation	-	-21.3	-	dB	100MHz
Supply Voltage	-	+5	-	V	-
Supply Current	-	68	-	mA	-

Test Condition: Vdd=+5V, I=68mA, OIP3 spacing=1MHz, OIP3 spacing=20KHz(at 1MHz), Pout=+10dBm/tone, Temp=+25°C

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +6V

Maximum RF input Power: +20dBm

Recommended Operating Conditions

Supply Voltage: +5V

Storage Temperature: -65°C ~ +150°C

Operating Temperature: -55°C ~ +125°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

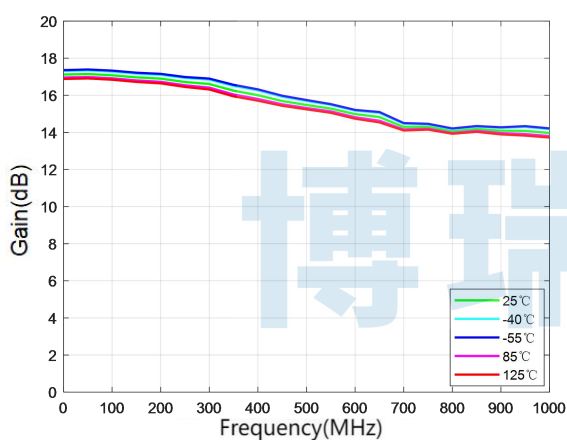

ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

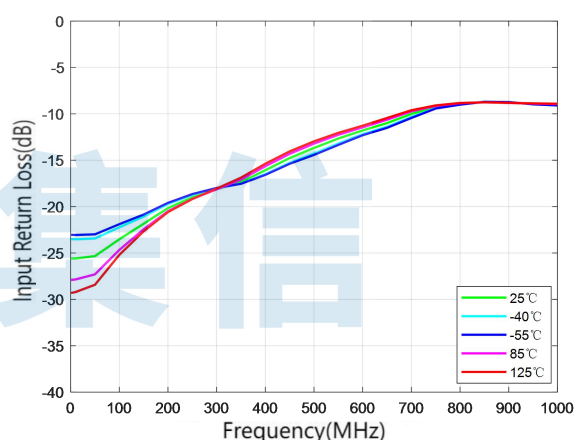
Typical Performance (EVB test results at +5V power supply)

Parameter	Typ.									Units
Frequency	1	10	50	100	200	400	600	800	1000	MHz
Gain	17.1	17.1	17.1	17.1	16.9	15.9	14.8	14.0	13.9	dB
Input Return Loss	-25.6	-25.6	-25.3	-23.5	-20.2	-16.1	-11.8	-8.9	-9.0	dB
Output Return Loss	-16.6	-16.7	-17.0	-16.8	-15.8	-13.1	-13.2	-13.3	-16.3	dB
Output Power for 1dB Compression	21.0	21.1	21.2	21.6	21.8	21.9	21.8	21.1	21.3	dBm
Output Third-Order Interception	30.6	31.9	32.4	33.0	33.1	35.5	33.8	33.2	33.1	dBm
Noise Figure	-	2.5	1.7	1.8	1.8	2.3	2.7	2.3	2.1	dB

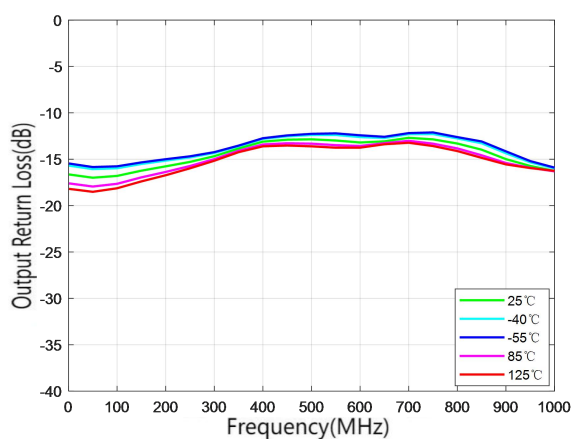
Test Condition: Vdd=+5V, I=68mA, OIP3 spacing=1MHz, OIP3 spacing=20KHz(at 1MHz), Pout=+10dBm/tone, Temp=+25°C



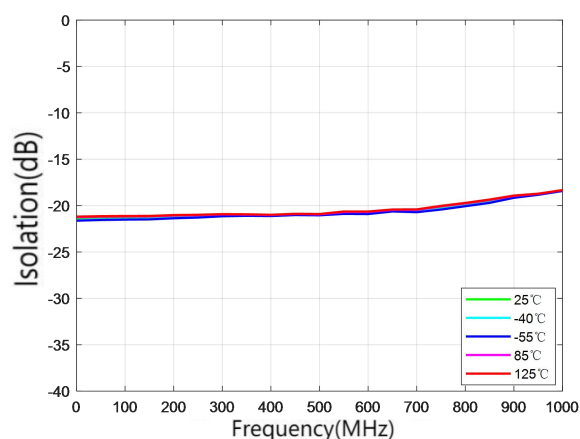
Gain



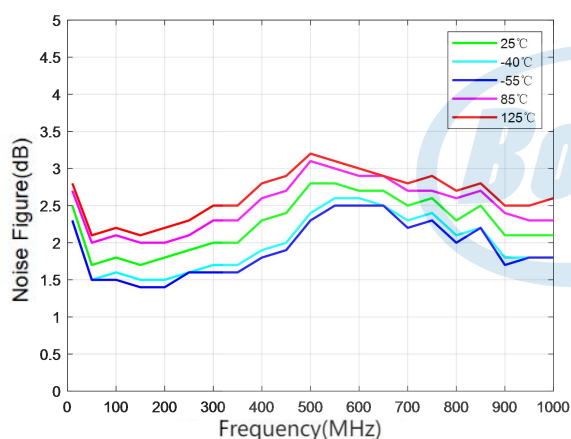
Input Return Loss



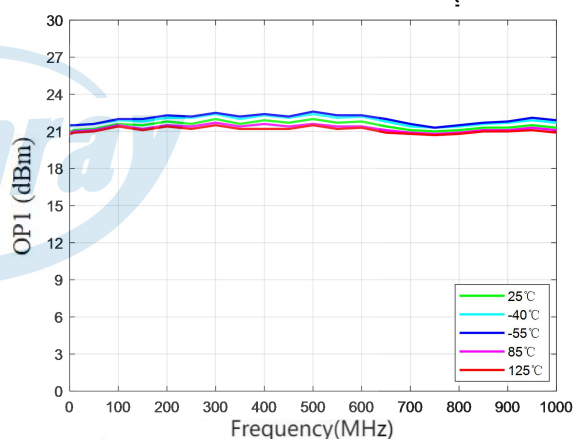
Output Return Loss



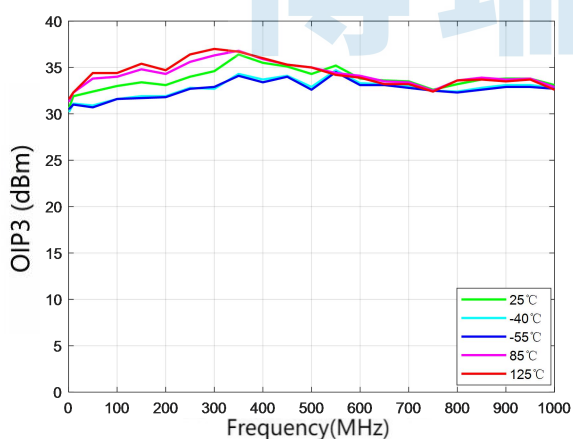
Reverse Isolation



Noise Figure

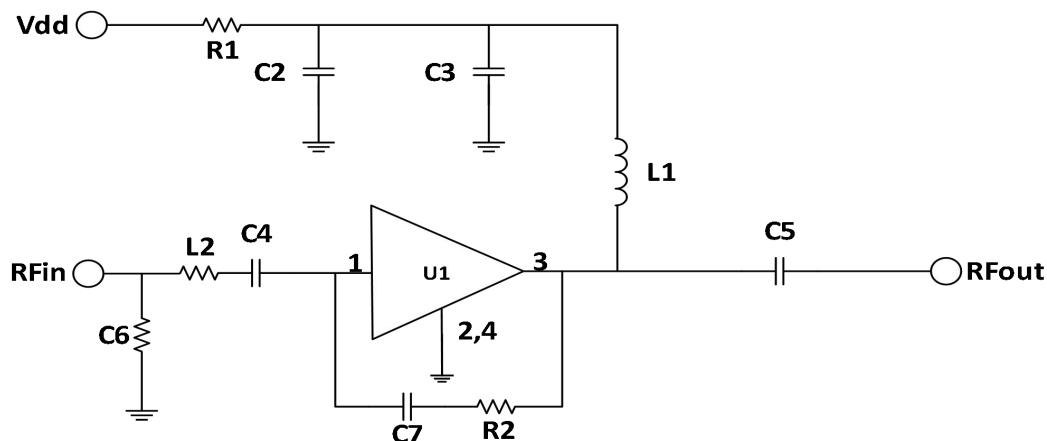


Output Power for 1dB Compression



Output Third-Order Interception

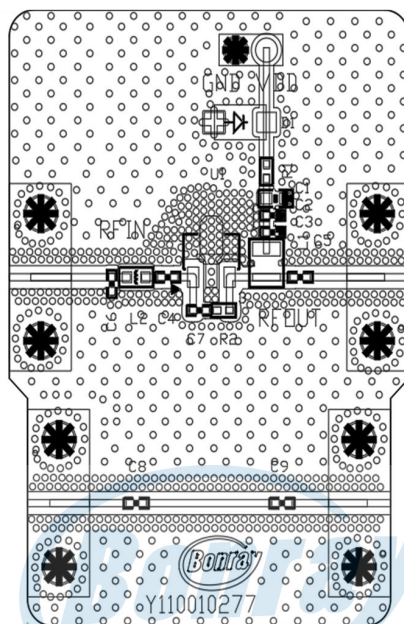
Typical Application Schematic



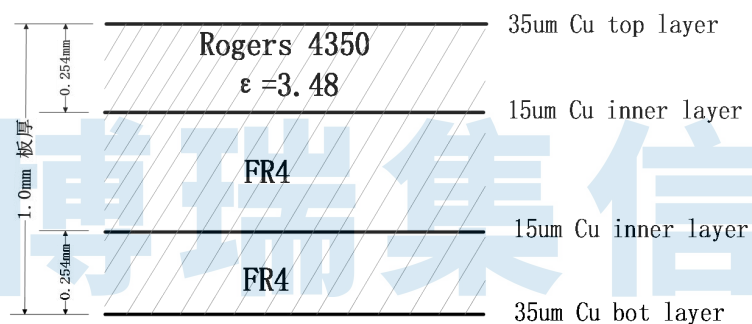
Bill of Material

Reference Designator	Package	Value	P/N
C2	0402	1uF	GRM1555C1H105JA01
C3	0402	1000pF	GRM1555C1H102JA01D
C4、C5	0603	3.3uF	GCJ188C70J335KE02D
L1	1008	33uH	1008LS-333XJEC
C7	0402	0.1uF	GRM155R71H104ME14
C6	0402	1K Ω	RC0402JR-071KL
R2	0402	430 Ω	RC0402JR-07430RL
R1	0402	0 Ω	RC0402JR-070RL
L2	0603	0 Ω	RC0603JR-070RL

PCB Evaluation Board

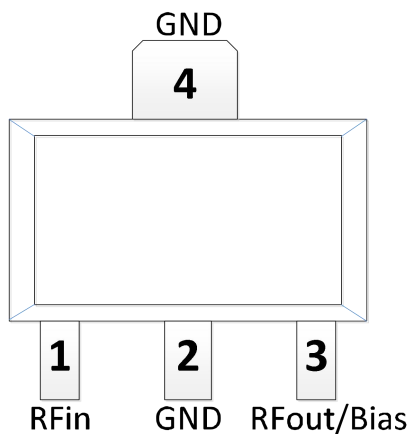


PCB 参数信息



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

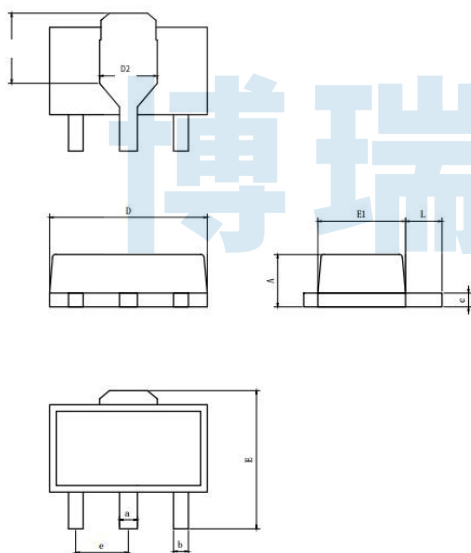
Pin Configuration and Description



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
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