

Product Features

Frequency: 30MHz ~ 4GHz

Gain: 19.4dB@2GHz

Output Power for 1dB Compression:

22.7dBm@2GHz

Noise Figure: 1.2dB@2GHz

Output Third-Order Interception:

36.5dBm@2GHz

Vdd=5V, Quiescent Current: 81mA

Package: SOT89 (plastic seal)

Apply

IF/RF Driver Amplification

Test and Measurement Equipment

VHF/UHF Radios

Ordering Information

Table 1. Ordering Information

Part Number	Package	Description
BR9549TA	SOT89	30MHz ~ 4GHz Low Noise Amplifier

General Description

BR9549TA is a broadband MMIC low noise amplifier in a SOT89 package. At 2 GHz, it features a small-signal gain of 19.4 dB, a noise figure of 1.2 dB, an output P1dB of 22.7 dBm, and an Output Third-Order Interception of 36.5 dBm. The chip is internally matched to 50 Ω and exhibits good input and output return loss over a wide frequency range, making it suitable for applications requiring high linearity and low noise.

Functional Block Diagram

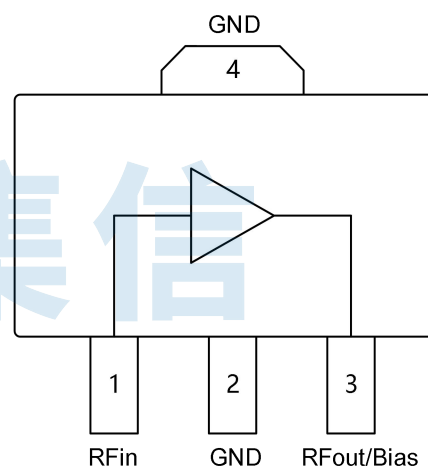


Figure 1. Functional Block Diagram
(SOT89)

Electrical Specifications

Table 2. +5V Supply

Parameters	Test Condition	Min.	Typ.	Max.	Units
Gain	30MHz	—	23.2	—	dB
	2000MHz	—	19.4	—	
	4000MHz	—	15.6	—	
Input Return Loss	2000MHz	—	-15.8	—	dB
	4000MHz	—	-8.8	—	
Output Return Loss	2000MHz	—	-10.9	—	dB
	4000MHz	—	-6.7	—	
Reverse Isolation	2000MHz	—	-27.4	—	dB
	4000MHz	—	-28.4	—	
Output Power for 1dB Compression	30MHz	—	20.7	—	dBm
	2000MHz	—	22.7	—	
	4000MHz	—	17.8	—	
Output Third-Order Interception	30MHz	—	35.7	—	dBm
	2000MHz	—	36.5	—	
	4000MHz	—	31.6	—	
Noise Figure	30MHz	—	0.9	—	dB
	2000 MHz	—	1.2	—	
	4000 MHz	—	2.4	—	
Operating Voltage	—	—	5	—	V
Static Current	—	—	81	—	mA
Test conditions: Vdd=+5V, Idd=81mA, OIP3 spacing=1MHz, Pout=5dBm/tone, TA=+25°C					

Absolute Maximum Ratings

Maximum Supply Voltage (Vdd) : +7V

Maximum RF Input Power: +23dBm

Recommended Operating Conditions

Supply Voltage: +5V

Supply Current: 77mA

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)
Table 3. +5V Supply

Parameters	Typ.											Units
Frequency	30	100	200	400	600	800	1000	1200	1400	1600	1800	MHz
Gain	23.2	23.4	23.4	23.1	22.7	22.1	21.4	20.8	20.3	20.0	19.6	dB
Input Return Loss	-14.3	-17.5	-18.3	-17.0	-15.5	-14.1	-13.1	-12.6	-12.5	-12.9	-14.0	dB
Output Return Loss	-18.5	-23.5	-25.0	-22.3	-18.2	-15.0	-12.8	-11.4	-10.6	-10.2	-10.3	dB
Reverse Isolation	-26.4	-26.0	-26.0	-26.1	-26.2	-26.3	-26.6	-26.8	-27.1	-27.3	-27.3	dB
Output Power for 1dB Compression	20.7	22.6	22.6	22.7	22.5	22.4	22.5	22.5	22.4	22.7	23.1	dBm
Output Third-Order Interception	35.7	36.6	36.9	37	36.8	36.6	36.6	37.2	36.4	36.6	36.6	dBm
Noise Figure	0.9	0.9	0.8	0.7	0.8	0.9	1.0	1.0	1.0	1.0	1.0	dB
Frequency	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	MHz
Gain	19.4	19.3	19.2	19.1	18.9	18.8	18.5	18.0	17.4	16.6	15.6	dB
Input Return Loss	-15.8	-18.9	-24.3	-31.4	-22.6	-17.5	-14.6	-12.7	-11.3	-10.0	-8.8	dB
Output Return Loss	-10.9	-12.0	-13.8	-15.8	-16.3	-14.3	-11.8	-9.6	-8.1	-7.1	-6.7	dB
Reverse Isolation	-27.4	-27.3	-27.2	-27.4	-27.3	-27.2	-27.5	-27.5	-27.8	-28.2	-28.4	dB
Output Power for 1dB Compression	22.7	22.3	21.8	21.1	19.9	19.1	18.7	18.3	17.8	17.5	17.8	dBm
Output Third-Order Interception	36.5	35.8	36.1	35.6	34.3	34.3	33.8	32.2	33.9	32.6	31.6	dBm
Noise Figure	1.2	1.2	1.4	1.4	1.4	1.5	1.6	1.7	1.8	2.1	2.4	dB
Test conditions: Vdd=+5V, Idd=81mA, OIP3 spacing=1MHz, Pout=5dBm/tone, TA=+25°C												

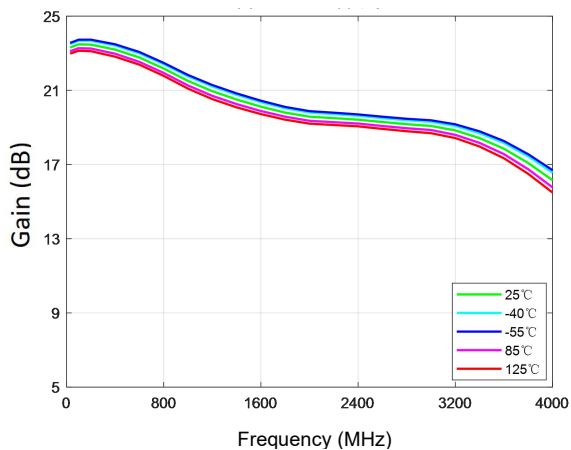


Figure 2. Gain vs. Freq

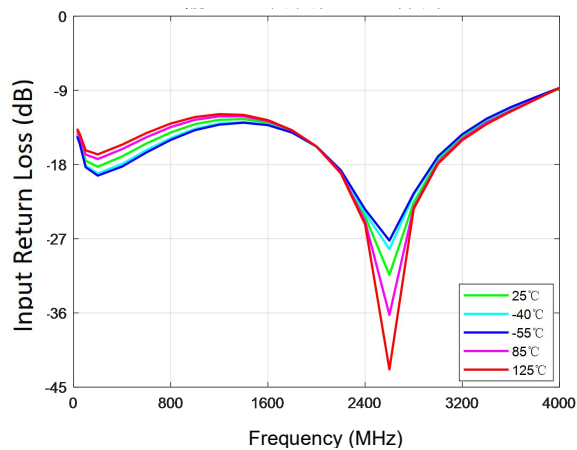


Figure 3. Input Return Loss vs. Freq

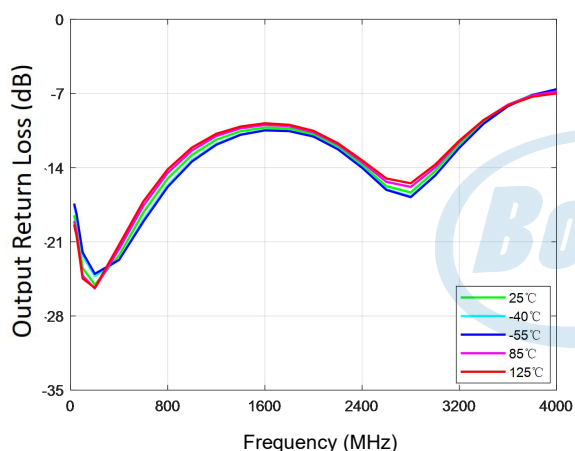


Figure 4. Output Return Loss vs. Freq

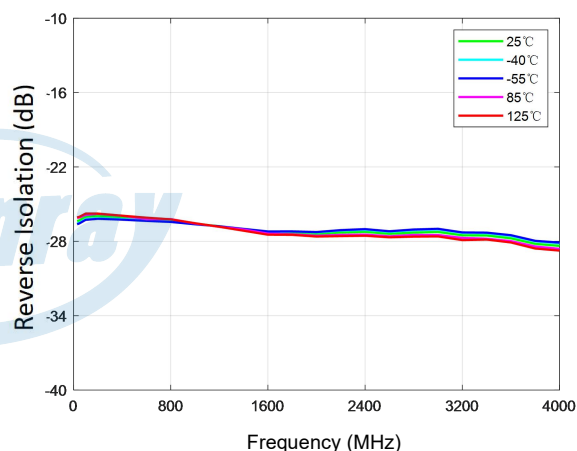


Figure 5. Reverse Isolation vs. Freq

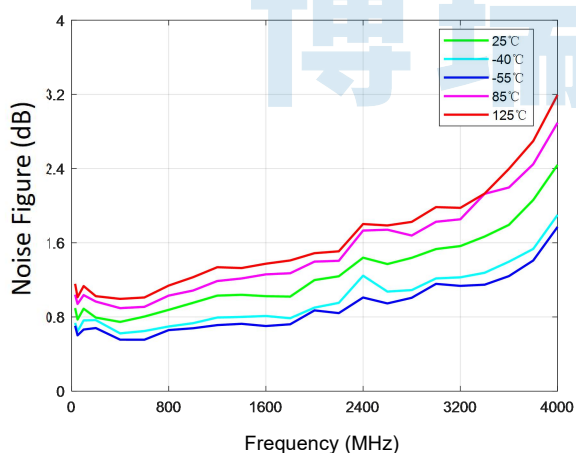


Figure 6. Noise Figure vs. Freq

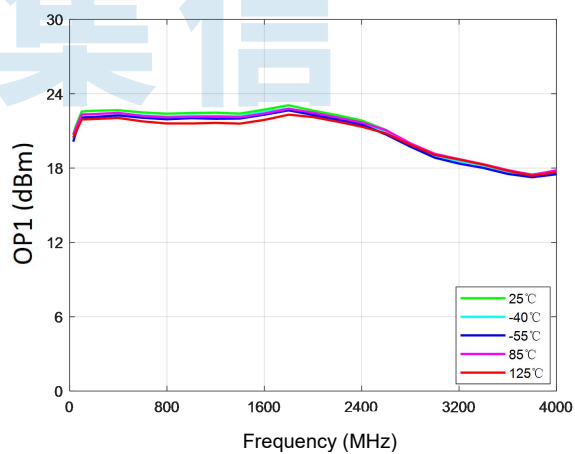


Figure 7. Output Power for 1dB Compression vs. Freq

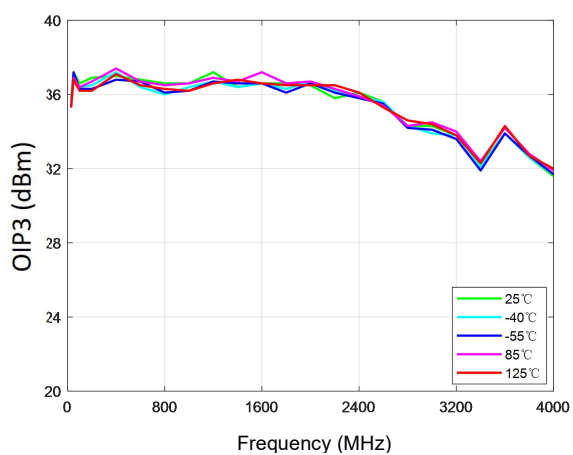


Figure 8. Output Third-Order Interception vs. Freq



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Typical Application Schematic

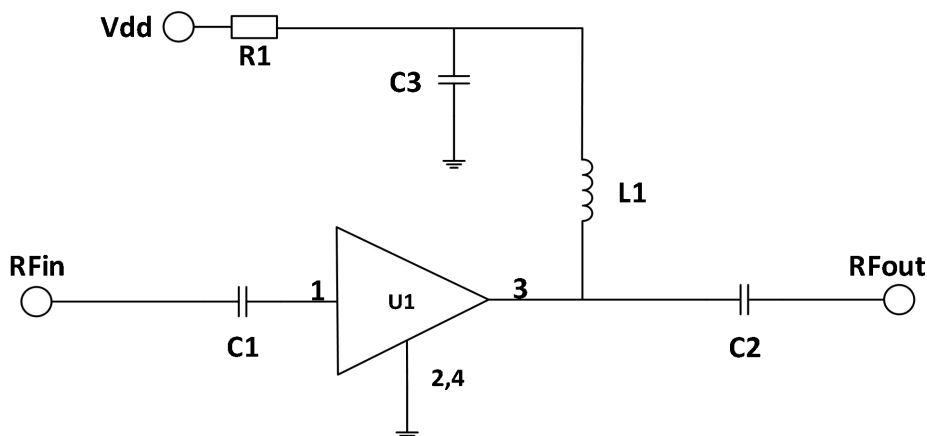


Figure 9. Typical Application Schematic

Table 4. Bill of Material

Designator	Package	Value	Part Number
U1	SOT89	30MHz ~ 4GHz	BR9549TA
C3	0402	15nF	GRM155R71E153JA61D
C1、C2	0402	2.2nF	GRM155R71H222JA01D
L1	1008	1.1uH	1008AF-112XJRB
R1	0402	0Ω	RC0402JR-070RL

Pin Configuration and Description

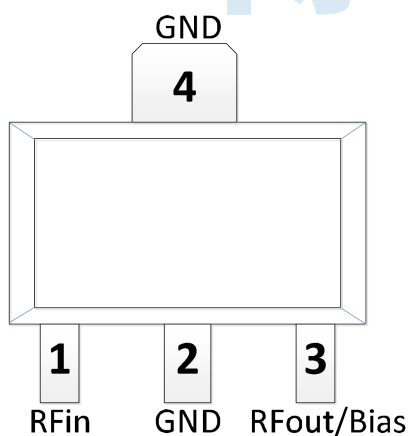


Figure 10.

Table 5.

Pin Number	Pin Name	Description
1	RFin	RF input pin.
2, 4	GND	Ground pin: This pin and the package substrate must be connected to the RF/DC ground.
3	RFout/Bias	RF output pin, also used for external DC supply.

PCB Evaluation Board

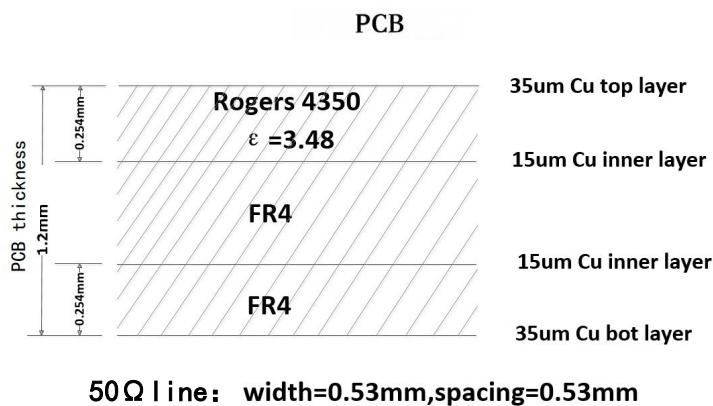
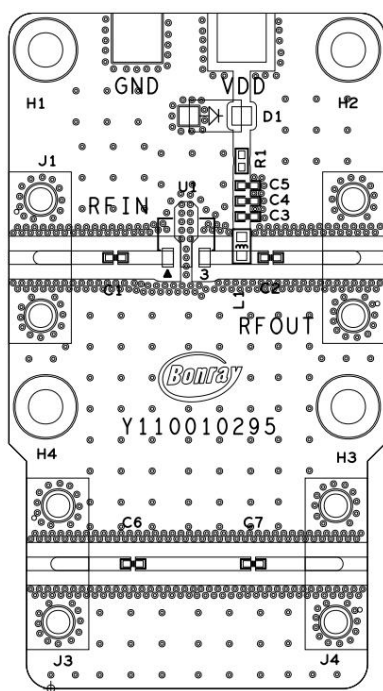
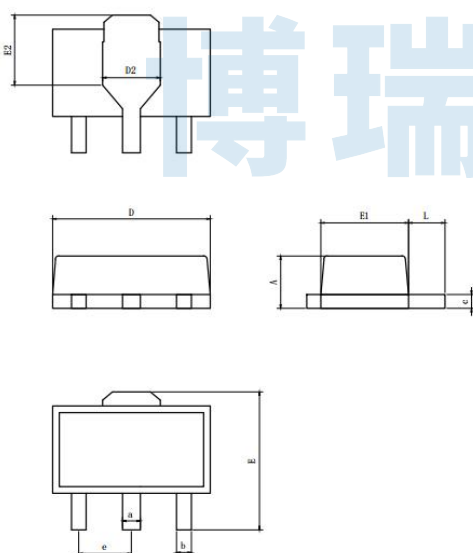


Figure 11. PCB Evaluation Board

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

Figure 12. Package Dimensions