

AH102 Applications Circuits

Summary:

This application note describes four band specific circuits for the AH102. These circuits are optimized for the cellular, PCS, MMDS and WLL bands. These circuits offer improved performance in the respective bands when compared to using the AH102 as a 50 Ohm gain block.

Details:

For applications requiring improved VSWR, application circuits that optimize the AH102 input VSWR by using a simple two element matching circuit are given. This Application note describes four circuits, which optimize the performance of the AH102 over four bandwidths, 700 -1000MHz, 1700 - 2300MHz, 2500 – 3000MHz and 3200 – 3500MHz. The performance, component values used, schematic diagram and the layout are given. The device can be optimized to any band within the overall frequency range of 350-3,500 MHz by selection of the two components. For any bands other than described below WJ Communications Applications Engineers will be on hand to give advice.

Circuit description:

The schematic is shown below, C1 and L1 are the matching components. C1 and L1 must be placed as close as possible to PIN1. The land pattern, mounting configuration, biasing network and blocking capacitors are given in the AH102 data sheet. For the 3200 – 3500MHz band L1 is not used and C1 is again placed as close to PIN1 as possible.

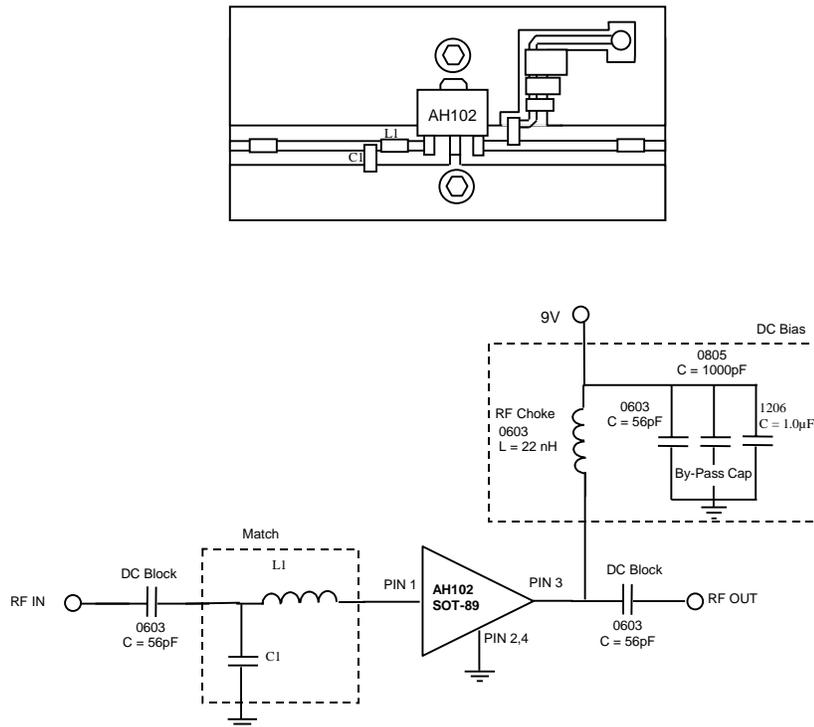


Fig 1: Circuit Layout and Schematic

Test Results:

	Frequency	900MHz
Application Circuit # 1	S21 – Gain	13.9 dB
Frequency: 700MHz – 1000MHz	S11-Input RL	-14.4dB
	S22-Output RL	-18.7dB
C1 = 3.3pF	Noise Figure	3.34 dB
L1 = 6.8nH	P1dB	26.5 dBm
	Output IP3	46.0dBm

	Frequency	1900MHz
Application Circuit # 2	S21 – Gain	13.5 dB
Frequency: 1700MHz – 2300MHz	S11-Input RL	-18.6 dB
	S22-Output RL	-17.5 dB
C1 = 1.5pF	Noise Figure	3.56 dB
L1 = 1.5nH	P1dB	26.5 dBm
	Output IP3	46.0dBm

	Frequency	2700MHz
Application Circuit # 3	S21 – Gain	12.4dB
Frequency: 2500MHz – 3000MHz	S11-Input RL	-15.5dB
	S22-Output RL	-14.3dB
C1 = 1.2pF	Noise Figure	4.5 dB
L1 = removed	P1dB	26.5 dBm
	Output IP3	45.4dBm

	Frequency	3500MHz
Application Circuit # 4	S21 – Gain	11.3 dB
Frequency: 3200MHz – 3500MHz	S11-Input RL	-15.4dB
	S22-Output RL	-16.7dB
C1 = 0.5pF	Noise Figure	5.2 dB
L1 = removed	P1dB	26.5 dBm
	Output IP3	45.0dBm

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