

WIFI PCB Antenna Report

1、WIFI PCB onboard antenna mode:

The structure of WIFI PCB onboard antenna is inverted L-shaped antenna, as shown in the figure below:

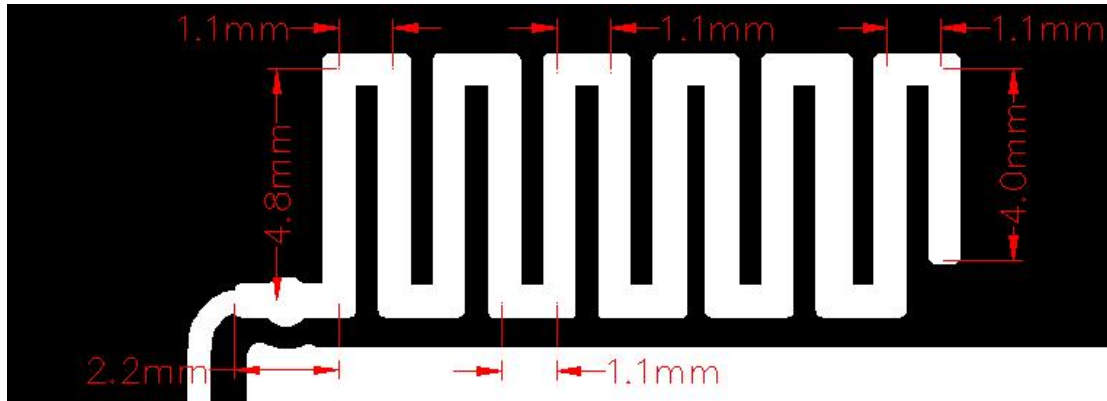


Figure 1 Inverted L antenna (serpentine routing)

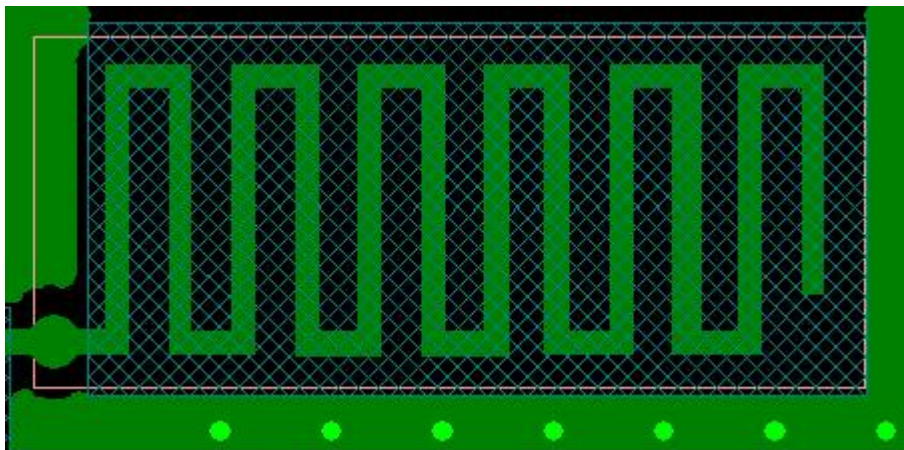


Figure 2 Inverted L antenna model

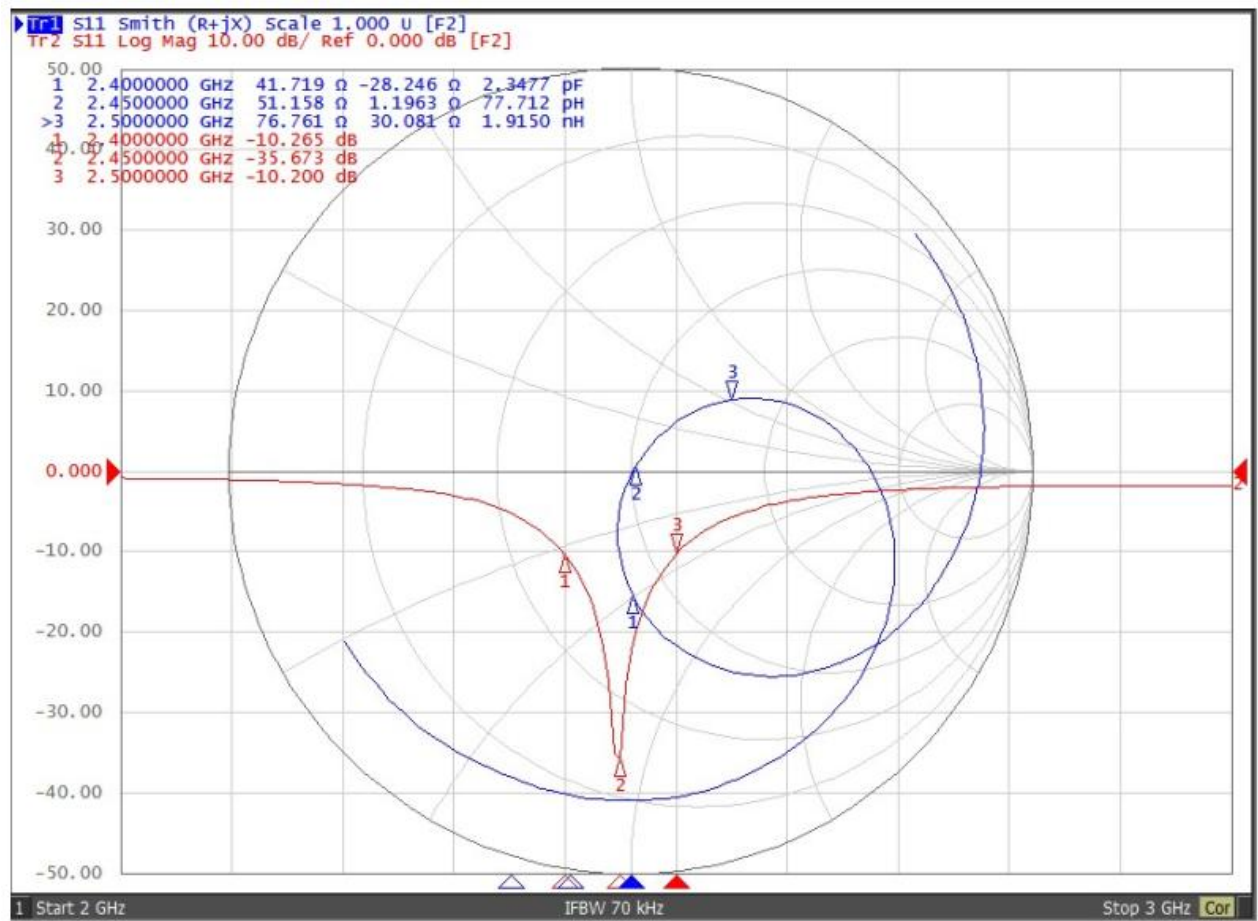
In addition to the inverted L part of the snake track, the antenna also needs a good ground to achieve signal radiation and reception, and the length of the ground surface is required to be the same as the snake track part, which is a quarter of the free space wavelength of the transmitted signal. The specific size of the antenna is shown in the figure above (the plate is two layers of FR4, plate thickness 1.0mm). If the thickness and size of the board are inconsistent with this (plate thickness and ground area affect performance), the size of the end of the antenna should be lengthened when Layout, such as increasing the length of the last end 4.8mm.

2, electrical

performance:

产品名称Name WIFI PCB天线		型号 ModelType	
电气参数ELECTRICAL SPECTFICATIONS		机械参数 MECHANICAL SPECTFICATIONS	
Central Frequency 中心频率	2450MHz	尺寸Dimensions	5.2*14.8*1.0MM
(带匹配电路测试)After Matching	100 MHz (2400~2500MHz)	V. S. W. R (in BW) 驻波比	≤2.0
Gain 增益	0~2 dBi	Polarization 极化方式	Linear 线性
Impedance 阻抗	50 Ω	Azimuth Beam width 方位角	全向
Power Capacity功率	2W max	存放温度Limit Temperature	-40℃~+85℃
工作温度WorkingTemperature	-40℃ - +85℃		

3、特性曲线:



4、Antenna performance test:

Parameter	Design Objective	Simulation Result	The result of actual measurement	Whether it reaches the standard or not
Gain	$>2.0\text{dBi}$	2.4dBi	3.4dBi	是
Operation Frequency	$>150\text{MHz}$	$2400\sim 2600\text{MHz}$	$2400\sim 2600\text{MHz}$	是
Bandwidth within S11	$<-10\text{dB}$	$<-10\text{dB}$	$<-10\text{dB}$	是
input impedance	$50+J0$	$42+J10$	$37+J8$	是
SWR	<2.0	<2.0	<1.8	是

Table 1 Test index of antenna parameters

In the simulation software, the antenna is simulated (with test base plate) and the actual antenna is tested. The test results show that all the parameters of the antenna meet the design requirements. Antenna performance has six points to pay attention to:

1. this inverted L antenna, through the simulation software to produce a special antenna;
2. The line impedance from the RF feed point must be 50Ω ;
3. grounding feed point must be grounded firmly;
4. the ground plane must be played more holes;
5. the antenna here all layers of copper foil must be clear;
6. the antenna must be placed in the corner of the PCB board, the best three sides are empty;