Bluetooth antenna on the PCB design specification data

The main discussion is 2.4G PCB antenna, if you do not consider the cost and volume, you can choose other antennas, such as patch antenna (small size, medium performance, medium cost) or external whip antenna (large size, high performance, high cost), and PCB antenna is the lowest cost, medium size, as long as the design is proper and can obtain sufficient performance of the antenna.

Includes three antennas:

Ultra-small PIFA antenna: PCB antenna for Nano Dongle, due to the limited PCB space, the maximum gain will be about 6dB smaller than other antennas, that is, the working distance will be half shorter. The complete board size made by the antenna and MCU is about 11mm*18mm.

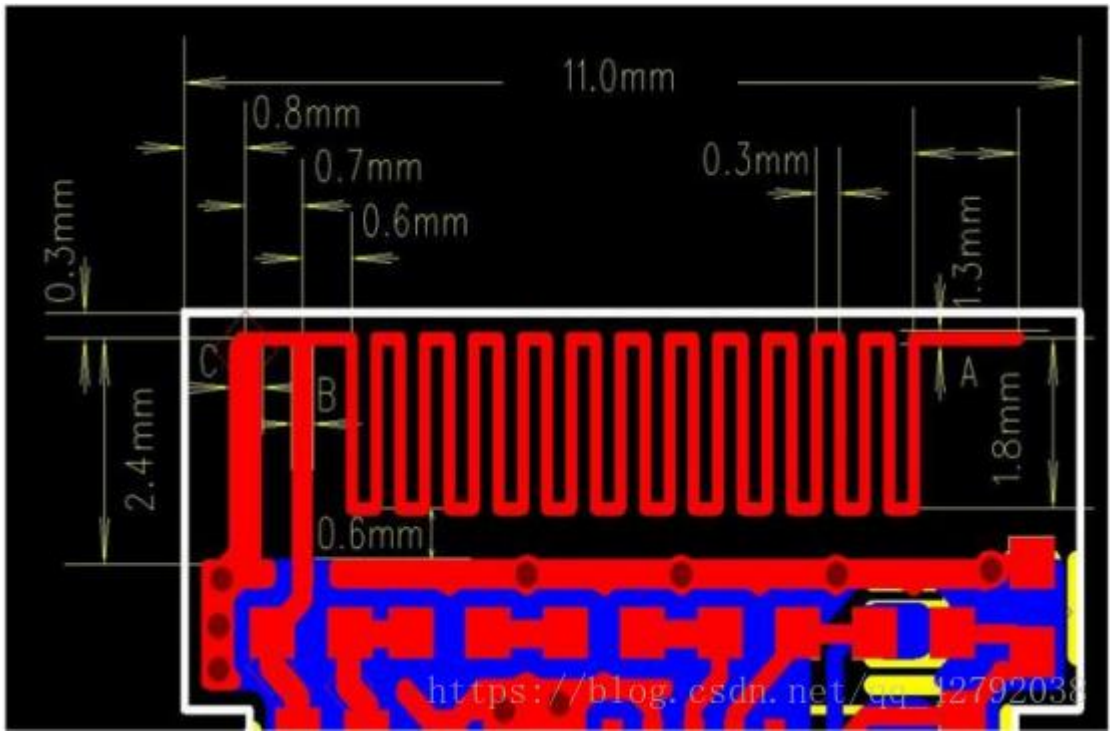
Normal PIFA antenna: The PCB antenna used in the Normal Module occupies the largest PCB space and the maximum gain can reach 1.5dB. If the PCB area is sufficient, this antenna is recommended. The RF Module board made from this antenna is about 15mm*18mm.

Normal Wiggle antenna: PCB antenna for Normal Module, the PCB space is slightly smaller than the second type, the gain is also slightly less than 1dB, can be used for wireless terminals with slight requirements for volume, such as wireless mice and other devices with relatively compact space. The RF Module board made from this antenna is about 13mm*18mm.

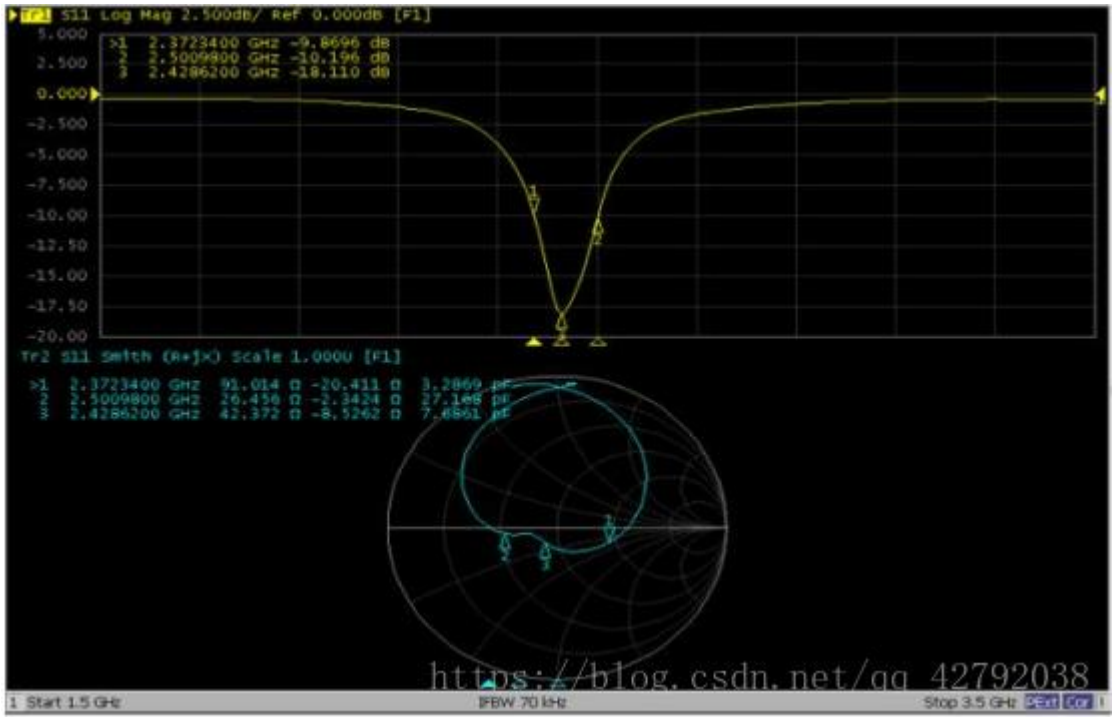
1、The small size Nano Dongle is designed with PIFA antenna

The specific size of the antenna is shown below (the plate is two layers of FR4, the plate thickness is 0.6mm) :

The antenna line width A: 0.15mm; B: 0.25mm; C: 0.4mm



Antenna performance S11 is as follows, and the operating band covers the entire 2.4G ISM band:



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The 2D and 3D gains are as follows, and the maximum gain of the antenna is only about -4dB:

Radiation pattern
@2.441GHZ

Name	Theta	Ang	Mag
m1	-4.0000	-4.0000	-5.0989
m2	178.0000	178.0000	-5.0381
m3	60.0000	60.0000	-4.9901