

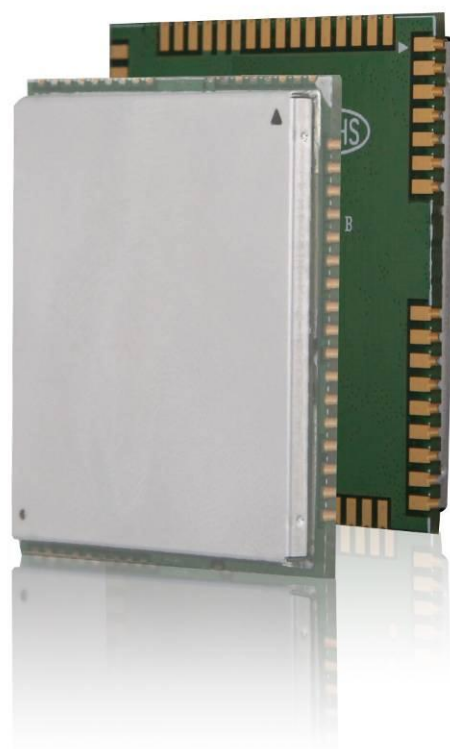


GSM

Quectel Cellular Engine

Embedded GSM Antenna User Guide

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Contents

Contents	2
Figure Index	3
0. Revision history	4
1. Introduction.....	5
2. PIFA antenna	6
3. FPC antenna	7
4. Monopole antenna.....	8
5. PCB antenna.....	9

Figure Index

FIGURE 1: PIFA ANTENNA	6
FIGURE 2: FPC ANTENNA	7
FIGURE 3: MONOPOLE ANTENNA	8
FIGURE 4: PCB ANTENNA	9

0. Revision history

Revision	Date	Author	Description of change
1.0	2011-7-13	David	Initial
1.1	2011-7-27	David	Modified Figure 1and 3

1. Introduction

This document introduces four kinds of Embedded GSM antennas including PIFA antenna, FPC antenna, Monopole antenna and PCB antenna. It aims to help you better understand the GSM antenna and choose the most suitable antenna for your applications.

2. PIFA antenna

This kind of inner antenna is widely used in mobile phone. Generally, a sheet metal in proper shape is fixed to a plastic bracket. As shown in the Figure 1, there are two feed points. One is for ground and the other is for RF_IN. For dual band, the height and the projected area of the bracket on the PCB are respectively about 7mm and 500 square millimetres. For quad band, the height is about 9mm and the projected area is about 600 square millimetres.

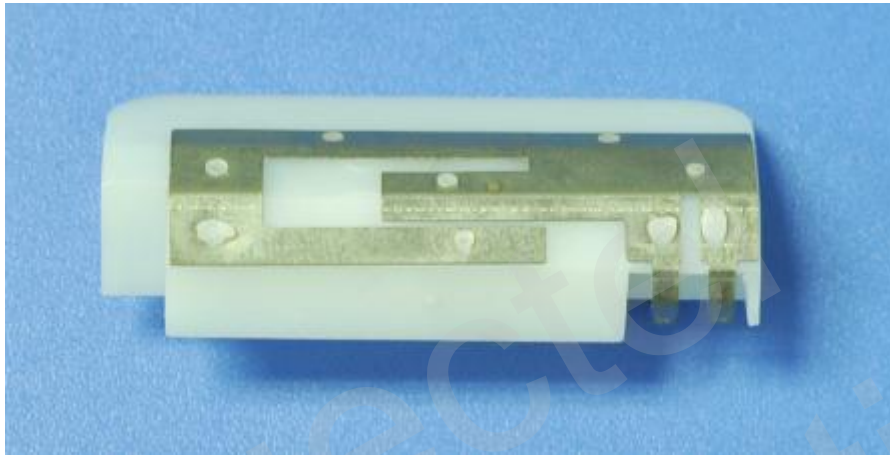


Figure 1: PIFA antenna

3. FPC antenna

This kind of antenna can be fixed to plastic box and do not need any host PCB area. But, the antenna size is generally a little big. It is about 100mm*10mm, just shown as the black area in the picture.



Figure 2: FPC antenna

4. Monopole antenna

This kind of antenna is similar with PIFA antenna in appearance. But it has only one feed point, only for RF_IN. This kind of antenna needs a certain clearance area in all layers of host PCB. For dual band antenna, the height of the bracket is more than 6mm and the clearance area in PCB should be more than 360 square millimetres. For quad band, the height and clearance area should be 8mm and 400 square millimetres respectively.

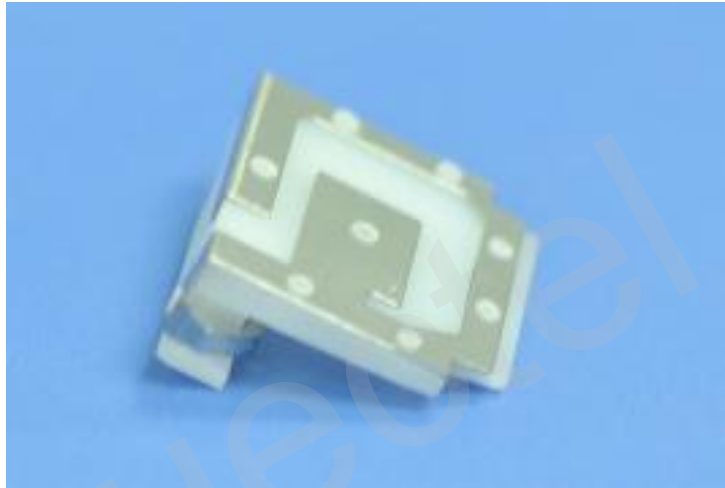


Figure 3: Monopole antenna

5. PCB antenna

This kind of antenna can be printed in host PCB. The photo below is from one of our customers. We have helped them test it. It is found that the antenna performance in 1800BAND is good, but in 900BAND, the antenna performance need to be optimized further. Although this kind of antenna will be very helpful to minimize the host PCB size and save cost, it is very difficulty to design it. For designing this antenna, firstly, you have to design and simulate the antenna with simulation software such as “Ansoft HFSS” according to the real PCB condition; secondly, devise the PCB layout based on simulation results data; then, modify the simulation figure in the finished PCB; at last, redesign the PCB, then get a PCB antenna with good performance.

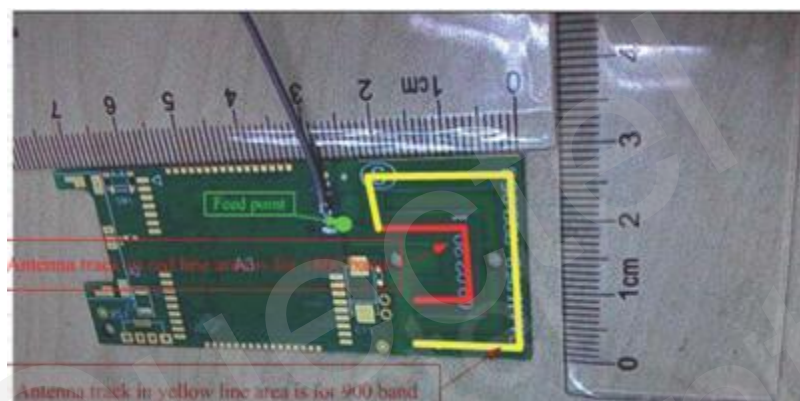


Figure 4: PCB antenna



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