antenova

ANTENNAS FOR WIRELESS M2M & IOT APPLICATIONS

Issues with Trace Antennas

PCB Trace Antennas

Consider the following before embarking on such a design:

1. PCB trace antennas are often used for single bands but it's extremely difficult to design a multi-band solution that's compact and efficient

2. Antenna designs rarely work first time. It takes years of experience

3. If you require good performance, distance and network approvals, then don't use a trace antenna

4. More susceptible to noise issues within PCB stack

5. A trace antenna is 2D so will take up much more real estate on your host board

6. The antenna always has to be a ground plane free solution

7. Antennas are very susceptible to variations in the substrate (PCB) material

Most digital PCBs use low cost FR4 that has a big permittivity tolerance - the frequency response of a printed PCB trace depends on the permittivity of the laminate – repeatability of tolerance and consistence is key!

8. The RF performance of an antenna printed on PCBs could be different for each batch. This can reduce the efficiency of the antenna or cause detuning with the possibility of the antenna not working!

But because it's part of your main PCB which is now fully populated, the whole batch of boards will need to be scrapped – hidden cost ££/€€/$$ K

Substrate Variation

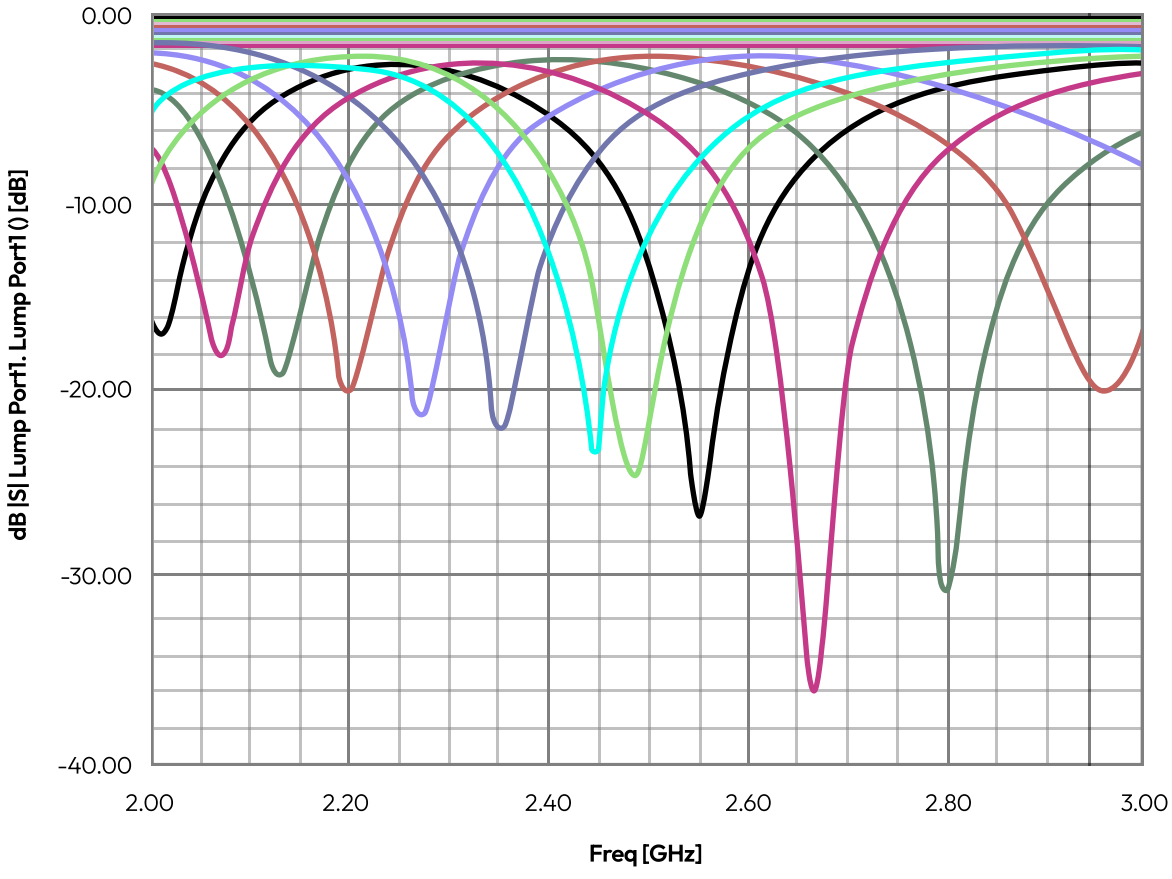
The facts:

1. The frequency response of a printed PCB trace depends on the permittivity of your board

2. Most PCBs use low cost FR4 that has a big tolerance on this permittivity

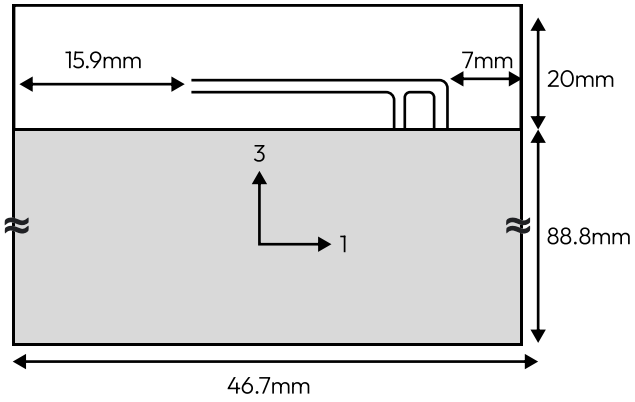
3. The RF performance of the antennas printed on PCBs could be different for each batch. This would reduce the efficiency of the antenna or cause detuning and the antenna could stop working altogether

4. Buying chip antennas is cheaper than using a high quality RF substrate for your PCB

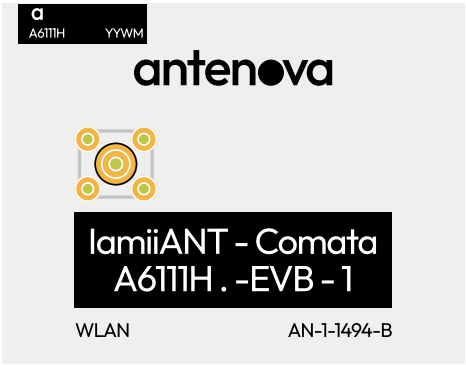


Size on PCB

The facts:



Typical printed antenna*



Comata

Antenna Type	Typical printed antenna*	Comata
Antenna Size	105mm2	12.9 x 3.6mm*
PCB Space Used	934mm2	35 x 25mm*

1. Comata 2.3x smaller in size

2. Comata 10% smaller in PCB Space