11. Antenna Specification

Antenna Gain: 0dBi

3. Inductively Tapped Loop Antenna Design Example

3.1. 434 MHz Antenna Dimensions and Measured Data

This antenna design uses the Si4010-C2-GS version of the Si4010 chip. The designed antenna top layout with final outer dimensions is shown in Figure 2. The bottom layout is shown in Figure 3. The schematic is shown in Figure 4. The manufacturing pack (including CAM/CAD/PDF files and the BOM) is available at www.silabs.com. The whole unit is encapsulated by the Polycase FB-20 plastic enclosure as shown in Figure 5 and Figure 6.

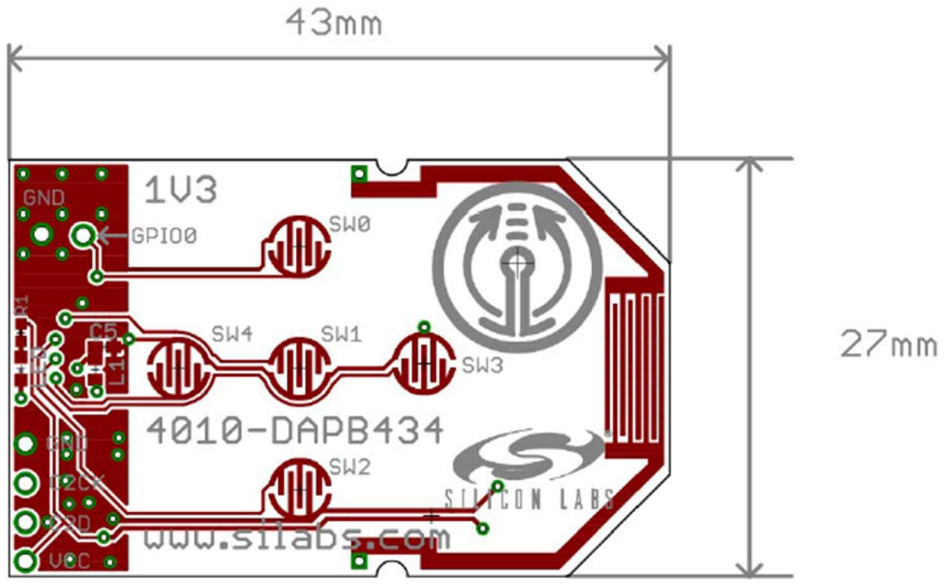

Figure 2. Antenna Top Layout with Final Outer Dimensions

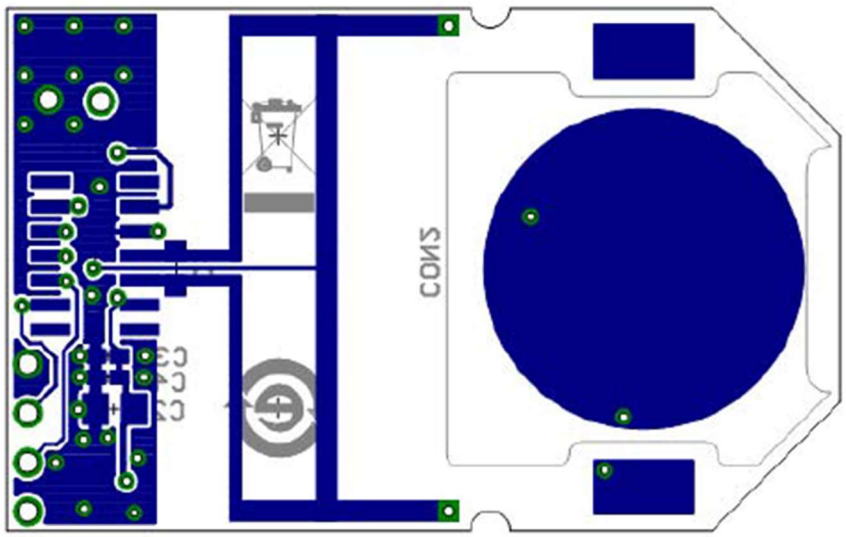

Figure 3. Antenna Bottom Layout with Final Outer Dimensions

Simulated impedance:

The simulated antenna impedance with 3.8 pF at the input is shown in Figure 16. The resonance is near 434 MHz (the slight detuning will be compensated by the automatic tuning).

The residual impedance at resonance is ~517 Ω.

Note: Accurate tuning of the real impedance part is difficult due to the strong tapping ratio.

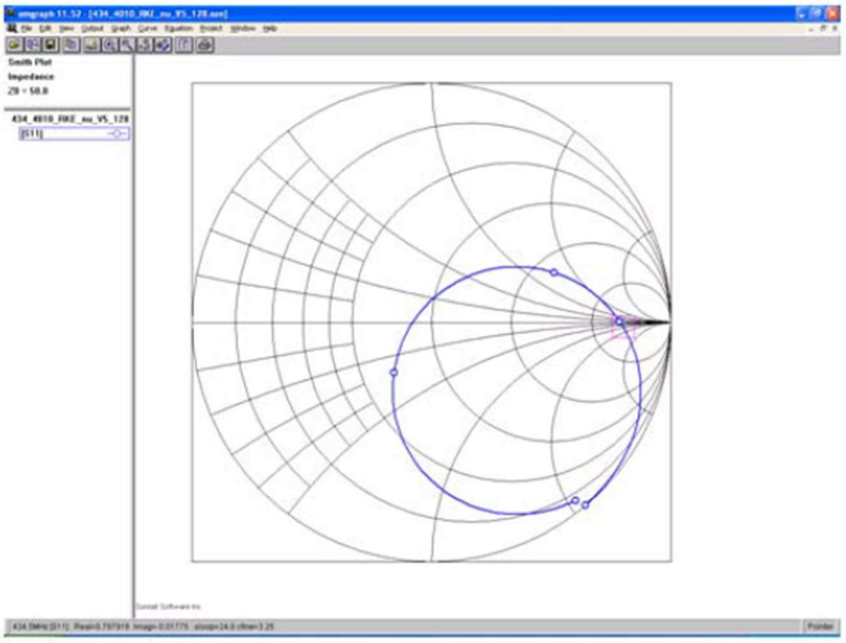

Figure 16. S11 Real/Img Resonance at 434 MHz, Cload=3.8 pF

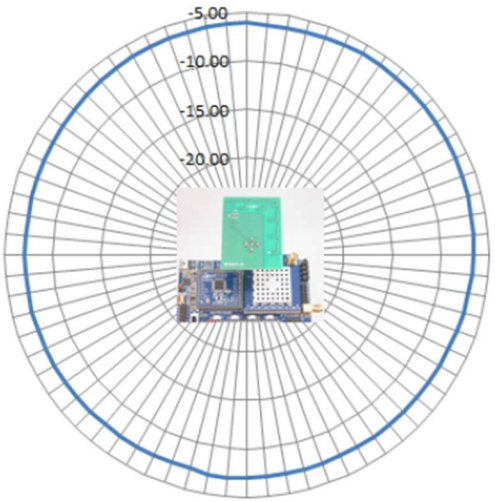

Figure 9. Radiation Pattern in the XY Cut with Vertical Receiver Antenna Polarization

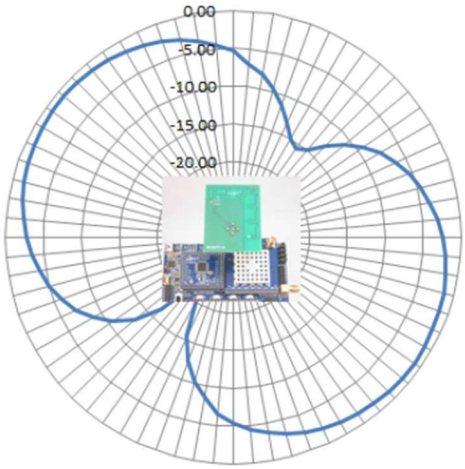

Figure 10. Radiation Pattern in the XY Cut with Horizontal Receiver Antenna Polarization

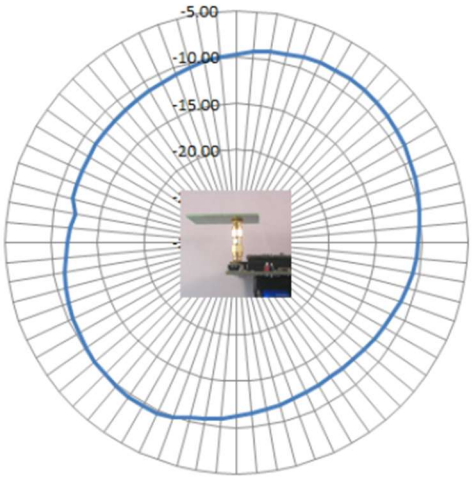

Figure 11. Radiation Pattern in the XZ Cut with Vertical Receiver Antenna Polarization

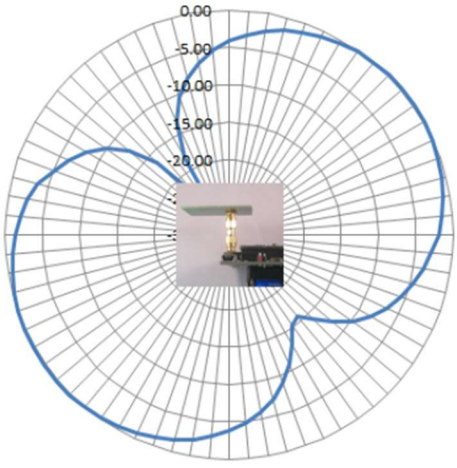

Figure 12. Radiation Pattern in the XZ Cut with Horizontal Receiver Antenna Polarization

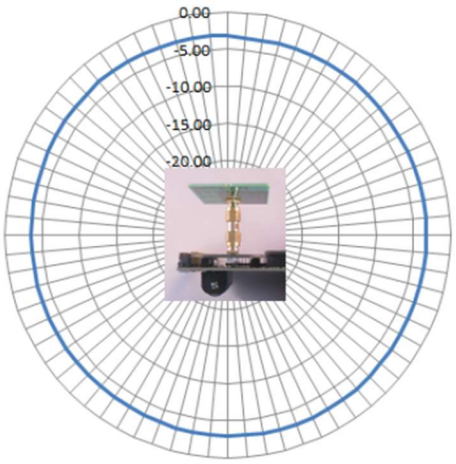

Figure 13. Radiation Pattern in the YZ Cut with Vertical Receiver Antenna Polarization

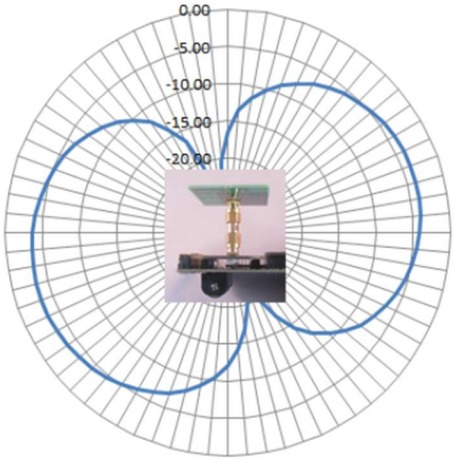

Figure 14. Radiation Pattern in the YZ Cut with Horizontal Receiver Antenna Polarization