

Antenna Description - RF Antenna

The Hailie™ Sensor uses a 2.4GHz radio frequency antenna to communicate using the Bluetooth Low Energy protocol. The antenna is driven by the Nordic nRF52832 microcontroller, which is configured to operate at 1.0 mW (0dBm) output power at 2.40 - 2.48 GHz on 40 channels of 2MHz bandwidth using GFSK modulation.

An omnidirectional antenna is implemented in copper tracks as part of the printed circuit board in NF0110. The antenna is used for both transmitting and receiving.

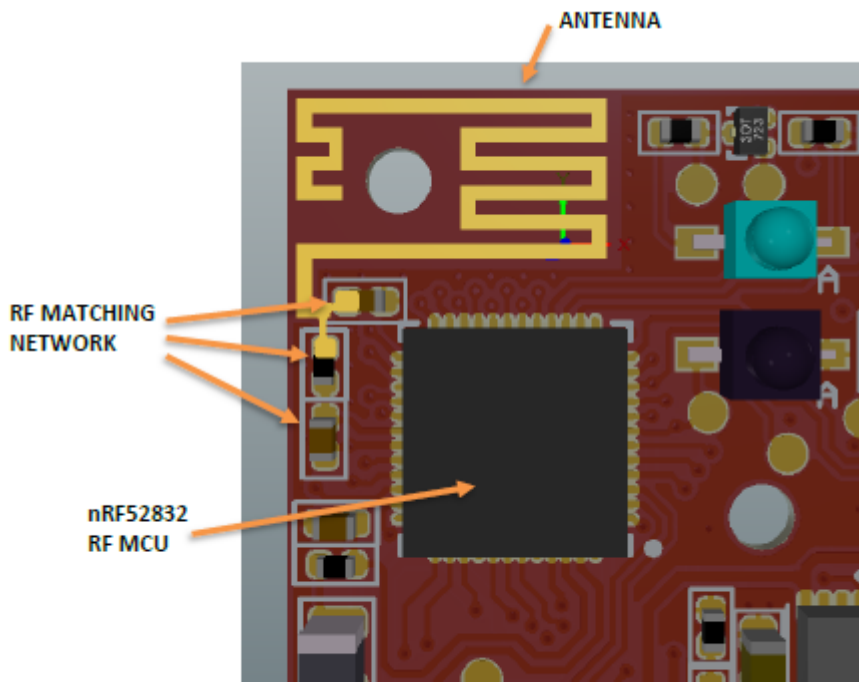


Figure 1 NF0110 PCB Layout

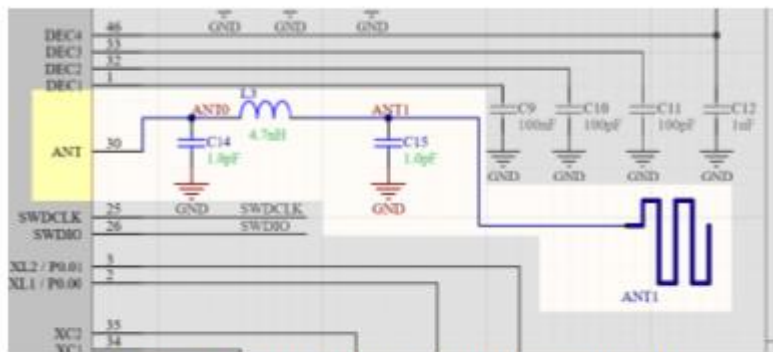


Figure 2 – NF0110 Schematic and RF Matching Network

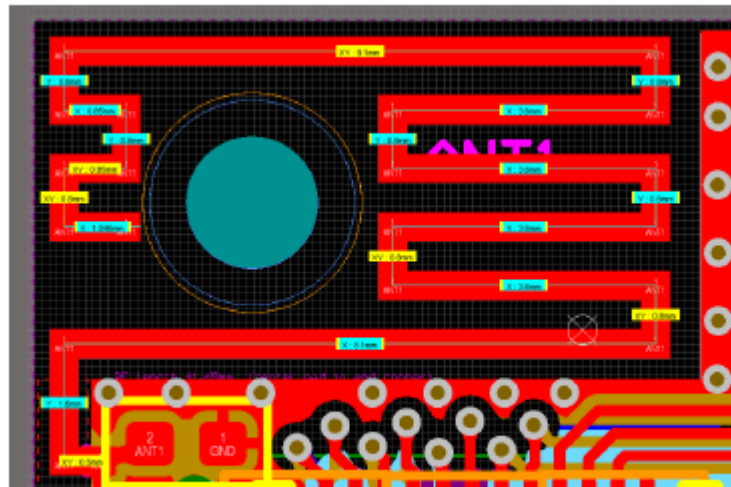


Figure 3 – NF0110 Antenna Dimensions

Total PCB Antenna Length =

$$0.5 + 1.6 + 8.1 + 0.8 + 3.6 + 0.8 + 3.6 + 0.8 + 3.6 + 0.8 + 3.6 + 0.8 + 3.6 + 0.8 + 3.6 + 0.8 + 0.85 + 0.8 + 0.85 + 0.8 + 1.045 = 41.8\text{mm}$$

Antenna Style = Folded Monopole

Antenna Type = Omni-directional

EMC – Antenna RF Test Results

NF0110

Channel	Frequency (MHz)	Measured Maximum EIRP (dBm)	Measured Peak Power Deliver to Antenna (dBm)	Antenna Gain (dBi)
Bottom	2402	-8.0	-6.9	-1.1
Middle	2440	-8.2	-7.7	-0.5
Top	2480	-7.9	-6.2	-1.7

Antenna Gain (dBi) = Maximum EIRP (dBm) – Power Delivered to Antenna (dBm)

Antenna Gain

The highest antenna gain measured was -0.5 dBi at 2440 MHz.