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 as part of the flexible printed circuit board and is used for both transmit and receive.

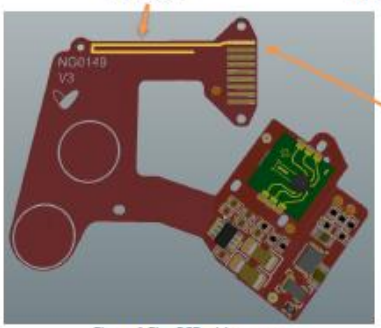

Figure 1 Flex PCB with antenna

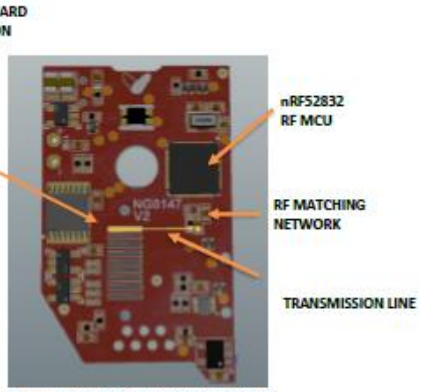

Figure 2 Main PCB with nRF52832 RF MCU

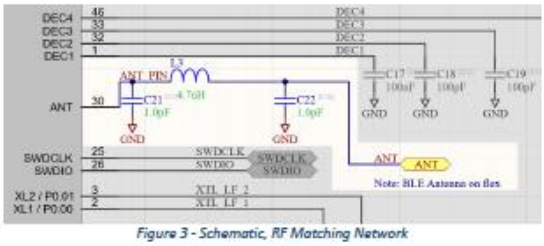

Figure 3 - Schematic, RF Matching Network

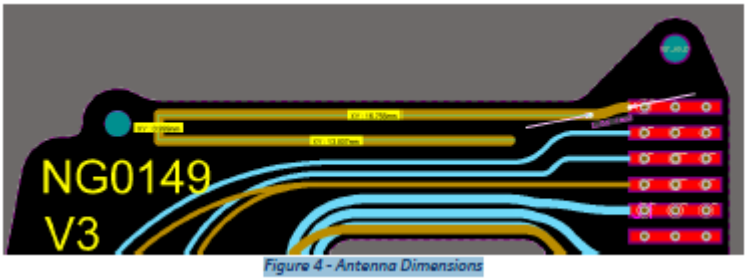

Figure 4 - Antenna Dimensions

Total PCB Antenna Length = 1.594 + 16.910 + 0.999 + 13.803 = 33.3 mm

Antenna Style = Folded Monopole

Antenna Type = Omni-directional

EMC – Antenna RF Test Results

Product	Test	Result
NF0108	NF0108 Conducted power after matching network	-10.5dBm
NF0108	NF0108 Radiated Power (EIRP) -	-7.8dBm

Antenna Gain

Antenna Gain = Radiated Power – Conducted Power

(−7.8 dBm) − (−10.5 dBm) = +2.7 dBi Gain