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Doc-00117545.docx ver.3,TA certification preparation_Cirrus_version1.zip ver.2

1 CHANGE LOG

Revision	Reason
0	Initial

2 ANTENNA SPECIFICATION OF SENTIO 1 MINI

For the RF & Safety Approval of Sentio 1 Mini, the BLE antenna mounted on a dedicated PCB needs to be specified with regards to key parameters such as antenna directivity and gain, antenna location in the device, and antenna radiation patterns.
A dedicated coil is used as an antenna for the inductive link.

Basic information on the antenna is stated in Table 1 below.

	Sentio 1 Mini BLE Antenna	Sentio 1 Mini Inductive Link Antenna
Antenna type	Loop antenna on PCB	Wirewound coil
Band of operation	2402 – 2480 MHz	120 kHz +/- 9.5kHz

Table 1

3 BLE ANTENNA DIRECTIVITY AND GAIN

The directivity and gain parameters of the Sentio 1 Mini antenna are stated in Table 2 below.

Typical directivity is the dB average of the directivity across all samples for each channel.
Typical gain is the dB average of the gain across all samples for each channel.
Maximum gain is the maximum gain across all samples for each channel.

BLE Antenna directivity and gain, based on 14 samples			
Frequency	Low channel (2402 MHz)	Mid channel (2442 MHz)	High channel (2480 MHz)
Typical Directivity (dBi)	3.3	4.1	4.4
Typical Gain (dBi)	-8.3	-7.2	-9.1
Maximum Gain (dBi)	-8.2	-7.1	-8.7

Table 2

Gain has been calculated as

$$G = EIRP - P_{out}$$

$G = gain$
$EIRP = Effective\ Isotropic\ Radiated\ Power$
$P_{out} = Measured\ output\ power\ at\ RF\ connector\ (50\ \Omega)$

4 ANTENNA LOCATION

4.1 BLE Antenna Location

The 2.4 GHz BLE transceiver implemented in the Sentio 1 Mini device is consisting of an integrated BLE radio transmitter and receiver and an antenna structure. The BLE chip feeds its RF signal through a matching/feed structure to the internal loop antenna.

The location of the BLE antenna in the Sentio 1 Mini device is shown in Figure 1 below.

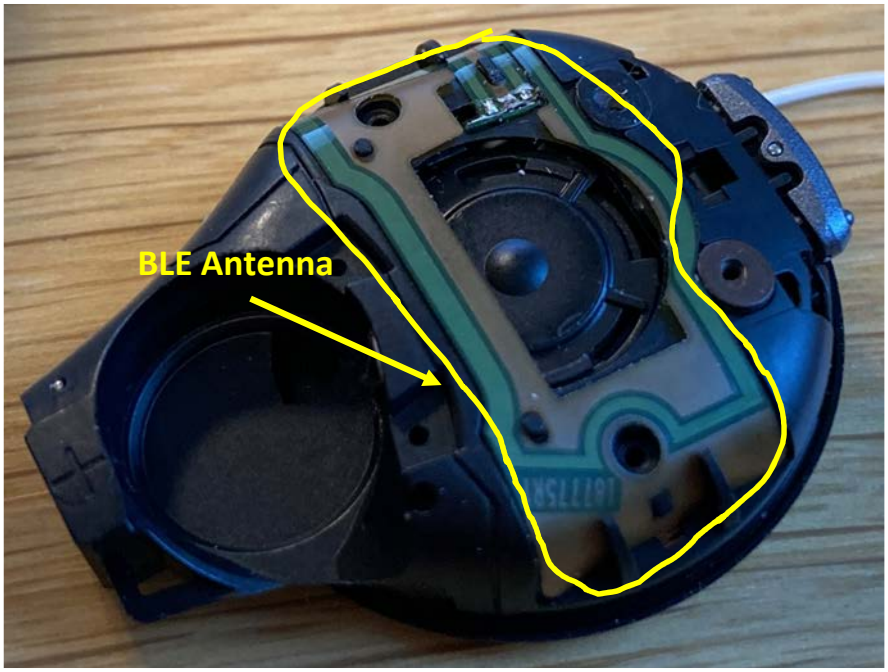

Figure 1

4.2 Inductive Link Antenna Location

The inductive link antenna in Sentio 1 Mini, consist of an integrated antenna. The location of the antenna is shown in Figure 2.

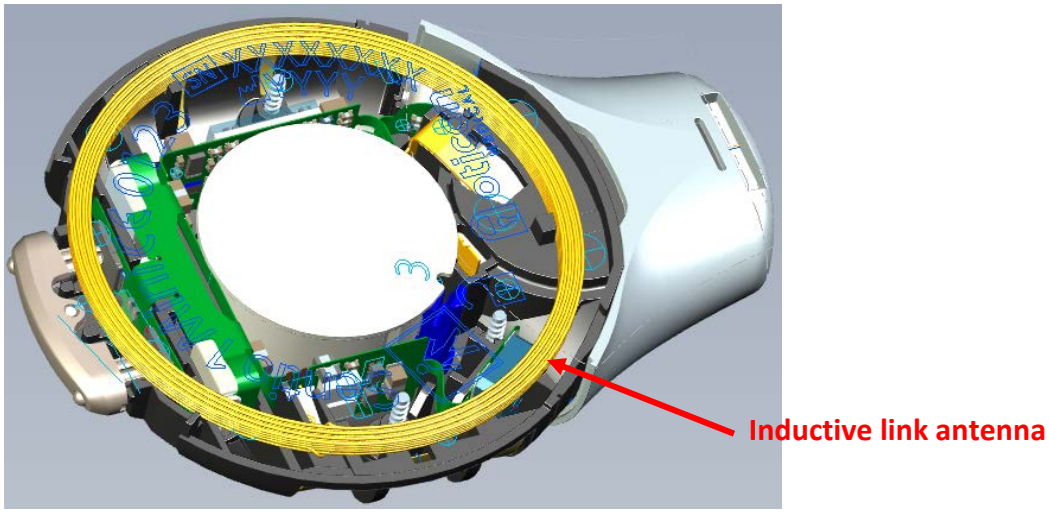

Figure 2

5 BLE ANTENNA PATTERNS

The antenna patterns are shown for low channel (2402 MHz), mid channel (2442 MHz), and high channel (2480 MHz) respectively, in Figure 3, Figure 4, and Figure 5 below.

5.1 Antenna Pattern Low Channel (2402 MHz)

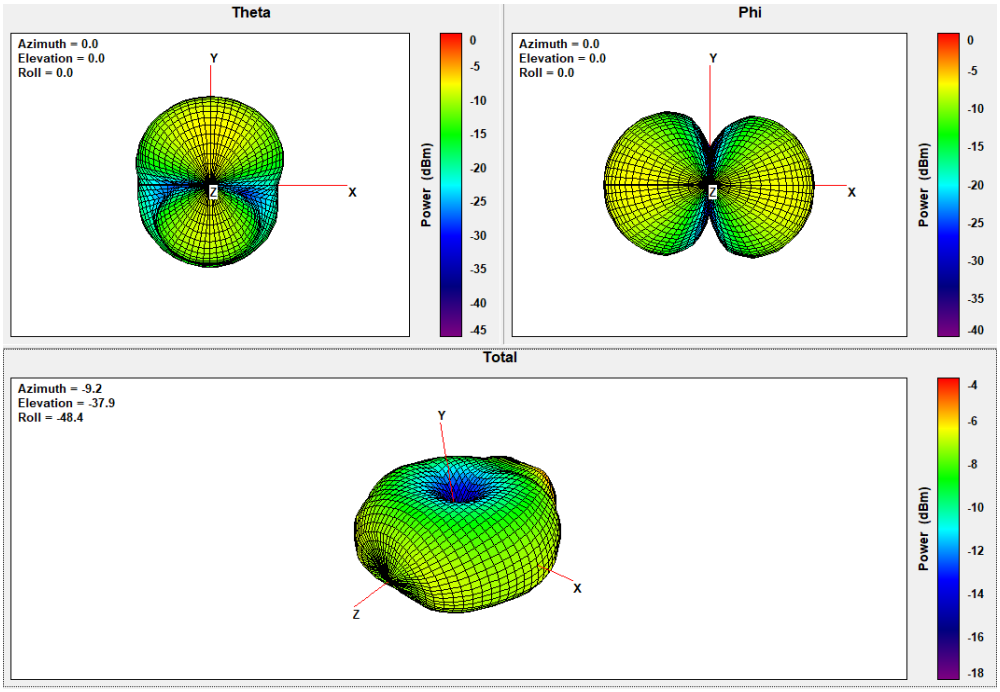

Figure 3

5.2 Antenna Pattern Mid Channel (2442 MHz)

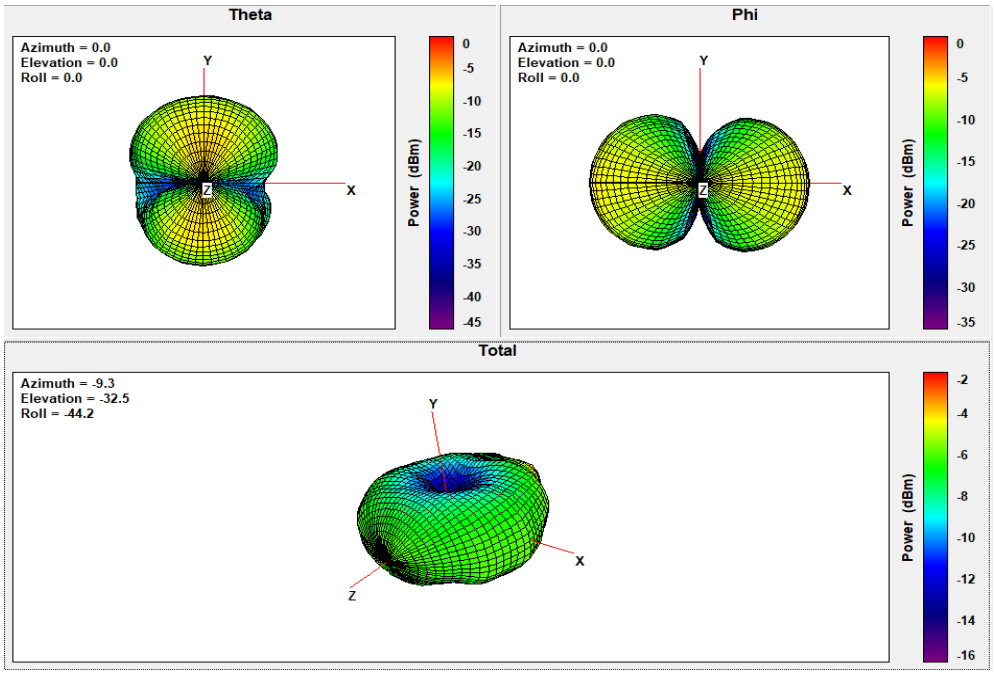

Figure 4

5.3 Antenna Pattern High Channel (2480 MHz)

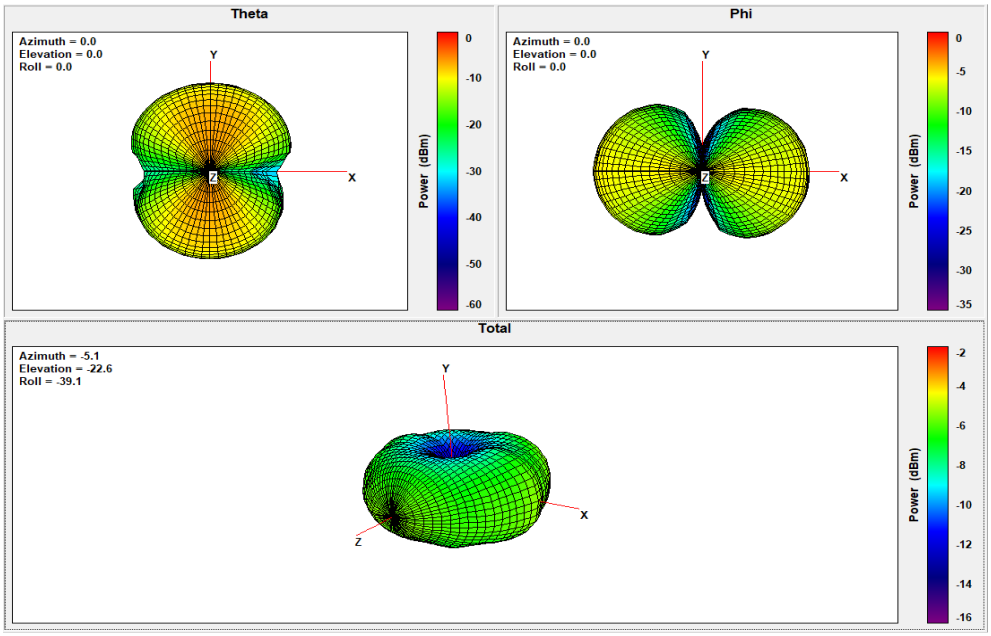

Figure 5