



# FCC CFR 47 Part 15

# Antenna Verification

SC20 Hand-portable radio

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# 1. Introduction

The SC20 series of portable handheld radios have an optional Bluetooth and Wi-Fi module. This module falls under the scope of FCC 47 CFR 15 subpart C for intentional radiators.

This document contains the technical information and test data required for the antenna used with the Bluetooth and Wi-Fi module.

## 1.1. Scope

This document covers the antenna used with the SBSC2/94 Bluetooth and Wi-Fi module used with the SC20 series of radios. Only one antenna is used for this module, Sepura part number SPR-07029.

## 1.2. Abbreviations

Table 1. Abbreviations

Abbreviation	Meaning
<b>FCC</b>	Federal Communications Commission
<b>CFR</b>	Code of Federal Regulations
<b>Wi-Fi</b>	Wireless Fidelity
<b>PCB</b>	Printed Circuit Board
<b>PIFA</b>	Planar Inverted-F Antenna
<b>EIRP</b>	Effective Isotropic Radiated Power or Equivalent Isotropic Radiated Power

## 1.3. References

1. 47 CFR 15 Radio Frequency Devices

## 2. Antenna Details

The SPR-07029 Bluetooth and Wi-Fi antenna is an inverted F-type (PIFA) antenna structure. The antenna is internal to the SC20 radio and is not configurable by the user. It is soldered to the Bluetooth and Wi-Fi module PCB and is therefore a permanently attached antenna. Only one antenna option is available for the Bluetooth and Wi-Fi module.

### 2.1. Specification

Table 2. Antenna specification

Parameter	Value
Frequency	2.4-2.48 GHz
Gain	2.5 dBi maximum
Impedance	50 Ohms with matching capacitor
Return loss	6 dB maximum
Part number	SPR-07029 Issue 1

## 2.2. Diagrams

Figure 1. Antenna parts

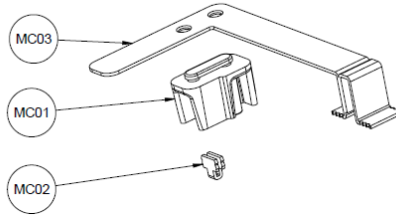


Figure 2. Antenna assembly

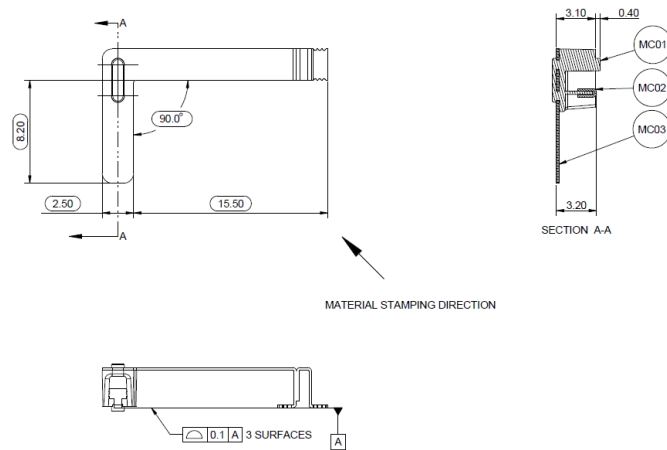


Figure 3. Antenna position on module



### 3. Evidence

Test report 75961387-03 was completed as part of the FCC certification of the SC2021 portable mobile radio. This report contained spurious radiated emissions measurements of the emissions from the Bluetooth and Wi-Fi module used for the certification of the SC2021. These results show the fundamental output power under all worst-case scenarios was less than 110 dB $\mu$ V/m when measured at a 3 m distance.

The FCC limit for the maximum emission from the Bluetooth and Wi-Fi module is 30 dBm EIRP, and 110 dB $\mu$ V/m at 3 m equates to 30 mW or 14.77 dBm EIRP. The emissions are therefore shown to be less than the FCC limit.

Spurious radiated emissions were also included in the report and shown to be within the required limits.

## 4. Justification Statement

As can be seen in test report 75961387-03, all necessary measurements were performed radiated and therefore additional antenna gain documentation is not required.

Only radiated measurements are used to show compliance with FCC limits for fundamental and spurious emissions.



## 5. Document Revision History

Table 3. Document revision history

Issue	Description
1	First release under project 225

**END OF DOCUMENT**