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## **RF Exposure Exhibit**

**EUT Name:** Smart Sensor

**EUT Model:** SU-5S

CFR47 Part 2.1093, RSS-102 Issue 5

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## 1.1 Maximum Permissible Exposure

### 1.1.1 Test Methodology

In this section, we try to prove the safety of radiation harmfulness to the human body for our product. The KDB 447498 D01v06 General RF Exposure Guidance is followed. The Gain of the antenna used in this calculation is declared by the manufacturer, and the maximum average power input to the antenna is measured. Using the general SAR test exclusion guidance in Section 4.3 of KDB 447498 D01v06, we show that the device meets the SAR exclusion threshold found in Appendix A of KDB 447498 D01v06 and the SAR exemption limits found in table 1 of RSS-102 Issue 5.

ISED accepts the KDB 447498 D01v06 Procedure.

### 1.1.2 FCC KDB 447498 D01v06 – General SAR Test Exclusion Guidance

The SAR exclusion threshold conditions are listed:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq$  50 mm are determined by the following formula:

$$\text{Exclusion Threshold} = [ P / d ] * [\sqrt{f}]$$

Where

P = max power of channel (including tune-up tolerance) in mW

d = min. test separation distance in mm

f = the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

Limits:             $\leq 3.0$  for 1-g SAR             $\leq 7.5$  for 10-g extremity SAR

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

### 1.1.3 EUT Operating Condition

The software provided by the manufacturer enabled the EUT to transmit data at lowest, middle and highest channel individually.

### 1.1.4 Classification

The antenna of the product, under normal use condition, is less than 20cm away from the body of the user. This device is classified as a **Portable Device**.

### 1.1.5 SAR Test Exclusion Evaluation

#### *FCC SAR Exclusion Threshold Calculation*

Mode	Frequency (GHz)	Min. Distance (mm)	Max Power (dBm)	Max Power (mW)	Calculated Excl. Threshold	1-g SAR Limit	10-g extremity SAR Limit	Result
BLE 4.0	2.402	5	3.24	2.11	0.653	<3.0	<7.5	Exempted *
802.15.4	2.440	5	3.47	2.22	0.688	<3.0	<7.5	Exempted *

Note:

1. Since EUT can operate at distance less than 50 mm, the minimum distance, 5 mm, was used for calculation per condition #1 of SAR Exclusion Threshold.
2. The maximum output power was taken from Table 2 of "Enlighted - FCC –IC 2.4GHz Report – 31760333 001".
3. (\*) The calculated threshold is less than 3.0; therefore, EUT is SAR exempted for head and body usage.

#### *RSS-102 SAR Exclusion Calculation*

Mode	Frequency (GHz)	Min. Distance (mm)	Max Power (dBm)	Max Power (mW)	SAR Exemption Limit (mW)	Result
BLE 4.0	2.402	5	3.24	2.11	≤4	Exempted *
802.15.4	2.440	5	3.47	2.22	≤4	Exempted *

Note:

1. Since EUT can operate at distance less than 50 mm, the minimum distance, 5 mm, was used for calculation per condition #1 of SAR Exclusion Threshold.
2. The maximum output power was taken from Table 2 of "Enlighted - FCC –IC 2.4GHz Report – 31760333 001".
3. (\*) The maximum power in mW is below the limit of 4mW, therefore, the EUT is SAR exempted for head and body usage.